# ibi™ WebFOCUS®

## Creating Reports with ibi™ WebFOCUS® Language

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# Creating Reports Overview

ibi™ WebFOCUS® is a complete information control system with comprehensive features for retrieving and analyzing data that enables you to create reports quickly and easily. It provides facilities for creating highly complex reports, but its strength lies in the simplicity of the request language. You can begin with simple queries and progress to complex reports as you learn about additional facilities.

WebFOCUS® serves the needs of both end users with no formal training in data processing, and data processing professionals who need powerful tools for developing complete applications. A variety of tools are available that enable you to create reports and charts even if you do not know HTML or WebFOCUS reporting language commands and syntax.

***Draft comments:*** *To do: Please check the product name: ibi FOCUS. Also, I have added first and second occurrences based on the conditional tags.*

# Requirements for Creating a Report

To create a report, only two things are required:

- **Data.** You need data from which to report. If the data is protected by an underlying security system, you may need permission to report from the data source. In addition, the server must be able to locate the data source. For more information on data source locations, see the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

  You can report from many different types of data sources (with variations for different operating environments), including the following:

  - Relational data sources, such as DB2, Teradata, Oracle, and Sybase.
  - Hierarchical data sources, such as IMS and FOCUS.
  - Indexed data sources, such as ISAM and VSAM.
  - Network data sources, such as CA-IDMS.
  - Sequential data sources, both fixed-format and delimited format.

    - Multi-dimensional data sources, such as SAP BW and Essbase.
    - XML data sources.

  For a complete list, see the *Describing Data With ibi™ WebFOCUS® Language* manual.

- **A data description.** You need a Master File, which describes the data source from which you are reporting. The Master File is a map of the segments in the data source and all of the fields in each segment. For some types of data sources, the Master File is supplemented by an Access File. For more information on Master Files and Access Files, see the *ibi™ WebFOCUS® Describing Data With ibi™ WebFOCUS® Language* manual.

  By looking at the Master File, you can determine what fields are in the data source, what they are named, and how they are formatted. You can also determine how the segments in the data source relate to each other. Although you can create a very simple report without this information, knowing the structure of the data source enables you to generate creative and sophisticated reports.

  You can supplement the information in the Master File by generating a picture of the data source structure (that is, of how the data source segments relate to each other). Use the following command:

  ```
  CHECK FILE filename PICTURE RETRIEVE
  ```

  In the picture, segments are shown in the order in which they are retrieved. Four fields of each segment appear. For details see Displaying Report Data.

# Report Types

With WebFOCUS, you can create the following basic report types using graphical tools:

- **Tabular reports.** Displays information in rows and columns. This is the basic report type, incorporating the fundamental reporting concepts. Most of the other report formats build on these concepts. You can display these reports in formats such as HTML, Excel®, and PDF.
- **Financial reports.** Specifically designed to handle the task of creating, calculating, and presenting financially oriented data, such as balance sheets, consolidations, and budgets. You can build these reports with the Report canvas. The Matrix Report canvas enables you to define the content of the report on a row-by-row basis. This organization provides a number of advantages. You can:

- Identify and display a title for each row of the report.
- Perform row-based calculations and include the results at any point on the report.
- Include the same record in multiple categories.
- Include many types of formatting enhancements on a cell-by-cell basis.
- Save individual rows and row titles in extract files.

- **Free-form reports.** Presents detailed information about a single record in a form-like context that is often used with letters and forms. If your goal is to present a detailed picture of one record per report page, you can use free-form reports to:
  - Position headers, footers, free text, and fields precisely on a page.
  - Customize your headers and footers by including fields as display variables.
  - Incorporate prefix operators in your headers and footers to perform calculations on the aggregated values of a single field.
  - Use vertical (BY) sorting to put one or more report records on each page.

  For details about free-form reports, see Creating a Free-Form Report.
- **Graphs,** which can present the same kinds of information as tabular reports, but in a wide variety of two-dimensional and three-dimensional graph types.

  For details, see Creating a Graph.
- **SQL requests,** which retrieve information using the SQL reporting language, and can directly incorporate WebFOCUS formatting commands. For details, see Using SQL to Create Reports.
- **Drill Through reports.** Allow users to create a PDF document that contains a summary report plus a detail report, where the detail report contains all the detail data for designated fields in the summary report. Clicking a Drill Through hyperlink navigates internally in the PDF file and no additional reports are run. Drill Through reports are static. You can save the PDF file to disk or distribute it using ReportCaster. When opened with Acrobat® Reader, it retains its full Drill Through functionality. For more information about the Drill Through feature, see Creating a PDF Compound Report With Drill Through Links. For more information about Compound Reports, see Creating a Compound Report.
- **Excel Compound reports.** Provides a way to generate multiple worksheet reports using the EXL2K output format. By default, each of the component reports from the

compound report is placed in a new Excel worksheet. If the NOBREAK keyword is used, the next report follows the current report on the same worksheet.

For more information, see Creating a Compound Excel Report Using EXL2K.

- **Excel Table of Contents reports.** Provides a way to generate a multiple worksheet report where a separate worksheet is generated for each value of the first BY field in the WebFOCUS report.

  For more information, see Choosing a Display Format.

# Developing Your Report Request

The only requirement for reporting is identifying a data source. Beyond that, the structure of a report request is very flexible and you only need to include the report elements you want. For example, you only need to include sorting instructions if you want your report to be sorted, or selection criteria if you want to report on a subset of your data.

A report request begins with the TABLE FILE command and ends with the END command. The commands and phrases between the beginning and end of a request define the contents and format of a report. These parts of the request are optional; you only need to include the commands and phrases that produce the report functions you want.

The following are the most frequently used options for structuring a report request.

- **Specifying fields and columns.** Each column in your report represents a field. You can specify which fields you want to display, which fields you want to use to sort the report, which fields you want to use to select records, and which data source fields you want to use in creating temporary fields. Therefore, specifying the fields you want in a report is fundamentally tied to how you want to use those fields in your report.
- **Displaying data.** You can display data in your report by listing all the records for a field (detailed presentation), or by totaling the records for a field (summary presentation). You can also perform calculations and other operations on fields, such as finding the highest value of a field or calculating the average sum of squares of all the values of a field, and present the results of the operation in your report.
- **Sorting a report column.** Sorting a report enables you to organize column information. WebFOCUS displays the sort field, which is the field that controls the sorting order, at the left of the report if you are sorting vertically, or at the top, if you are sorting horizontally. Sort fields appear when their values change. You can also

choose not to display sort fields.

You can sort information vertically, down a column, or horizontally, across a row. You can also combine vertical sorting and horizontal sorting to create a simple matrix.

- **Selecting records.** When you generate a report, you may not want to include every record. Selecting records enables you to define a subset of the data source based on your criteria and then report on that subset. Your selection criteria can be as simple or complex as you wish.
- **Showing subtotals and totals.** You can display column and row totals, grand totals, and section subtotals in your report.
- **Customizing the presentation.** A successful report depends upon the information presented and how it is presented. A report that identifies related groups of information and draws attention to important facts will be more effective than one that simply shows columns of data. For example, you can:
  - Give column titles more meaningful names.
  - Control the display of columns in your report.
  - Create headings and footings for different levels of the report (including each sort group, each page, and the entire report), and dynamically control the display of headings and footings based on conditions you set.
  - Add fonts, colors, grids, and images.
  - Highlight a group of related information and separate it from other groups by inserting blank lines, underlines, and page breaks.
- **Creating temporary fields.** When you create a report, you are not limited to the fields that already exist in the data source. You can create temporary fields, deriving their values from real data source fields, and include them in your report.

  For details see, Creating Temporary Fields.
- **Joining data sources.** You can join two or more data sources to create a larger integrated data structure from which you can report in a single request.

  For details, see Joining Data Sources.
- **Storing and reusing the results.** You can store your report data as a data source against which you can make additional queries. This is especially helpful for creating a subset of your data source and for generating two-step reports. You can also format the new data source for use by other data processing tools, such as spreadsheets and word processors.

For details, see Saving and Reusing Your Report Output.

You can run the request as an ad hoc query or save it as a procedure. Saving a report request as a procedure enables you to run or edit it at any time.

# Starting a Report Request

A report request begins with the designation of a data source. You can then specify the details of your report request. A data source can be specified in the following ways:

- The TABLE FILE *filename* command sets the data source for a single request.
- The FILE SET parameter sets a data source for all requests within a procedure.

  For details on the FILE SET parameter, see the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

# Begin a Report Request

To begin a report request, use the command

```
TABLE FILE filename
```

where:

**filename**

Is the data source for the report.

# Requesting Help When Issuing a Report Request

If you issue report requests interactively at the command prompt rather than from a procedure, online error correction is provided with help text after you issue the END command. For example, if you enter

```
TABLE FI EMPLOYEE
PRINT LAST_NAME FIRST_NAME
BY DEPARTMENT
END
```

at the command prompt, the following error message displays:

```
(FOC001) THE NAME OF THE FILE OR THE WORD 'FILE' IS MISSING
```

However, if the information provided by the error message is not sufficient, issue the following command for a more detailed explanation of the error:

```
? errornumber
```

Every command you enter is scanned, and a report is generated immediately after you enter the END command.

When the value of the MESSAGE parameter is ON (the default value), the number of records retrieved from the data source and the number of lines displayed in the report displays at the beginning of each report.

# Completing a Report Request

To complete a report request, use the END or RUN command. These commands must be typed on a line by themselves. To discontinue a report request without executing it, enter the QUIT command.

If you plan to issue consecutive report requests against the same data source during one session, you have the option of using the RUN command. RUN keeps the TABLE facility and the data source active for the duration of the TABLE session. After viewing one report you do not need to repeat the TABLE command to produce another report. You terminate the TABLE session by issuing the END command after the last request.

# Creating a Report Example

The example in this topic is a simple report request that illustrates some of the basic functions of WebFOCUS. However, there are many more functions not shown here that you

can find information on throughout this documentation.

# Creating a Simple Report

The following annotated example illustrates some of the basic functions of WebFOCUS. The numbered explanation in this example corresponds with the code in this request. This request can be generated by typing the commands into a text editor.

```
1.  JOIN PIN IN EMPDATA TO ALL PIN IN TRAINING AS J1
2.  DEFINE FILE EMPDATA
    YEAR/YY=COURSESTART;
3.  END

4.  TABLE FILE EMPDATA
5.  HEADING CENTER
    "Education Cost vs. Salary"
6.  SUM EXPENSES AS 'Education,Cost' SALARY AS 'Current,Salary'
7.  AND COMPUTE PERCENT/D8.2=EXPENSES/SALARY * 100; AS 'Percent'
8.  BY DIV
    BY DEPT
9.  WHERE YEAR EQ 1991
10. ON TABLE SUMMARIZE
11. ON TABLE SET STYLE *
    TYPE=HEADING, STYLE=BOLD, COLOR=BLUE,$
    TYPE=REPORT, FONT=TIMES, SIZE=8,$
    TYPE=REPORT, GRID=OFF,$
    ENDSTYLE
12. END
```

The output is:

Education Cost vs. Salary

| DIV | DEPT | Education Cost | Current Salary | Percent |
|---|---|---|---|---|
| CE | ADMIN SERVICES | 1,250.00 | $25,400.00 | 4.92 |
| | PROGRAMMING & DVLPMT | 1,580.00 | $40,900.00 | 3.86 |
| CORP | ACCOUNTING | 2,050.00 | $62,500.00 | 3.28 |
| NE | CUSTOMER SUPPORT | 1,800.00 | $19,300.00 | 9.33 |
| | MARKETING | 3,100.00 | $32,300.00 | 9.60 |
| | SALES | 1,800.00 | $43,600.00 | 4.13 |
| SE | CONSULTING | 3,350.00 | $35,900.00 | 9.33 |
| WE | MARKETING | 9,850.00 | $102,200.00 | 9.64 |
| | PROGRAMMING & DVLPMT | 5,310.00 | $42,900.00 | 12.38 |
| | SALES | 4,500.00 | $100,500.00 | 4.48 |
| TOTAL | | 34,590.00 | $505,500.00 | 6.84 |

The request processes in the following way:

1. The JOIN command joins the EMPDATA and TRAINING data sources, allowing the request to access information from both data sources as if it were a single structure.
2. The DEFINE command creates a virtual field which extracts the year from the COURSESTART field in the TRAINING data source.
3. The END command ends the DEFINE command.
4. The TABLE command begins the report request.
5. The HEADING command adds the heading, Education Cost vs. Salary to the report output.
6. The SUM command adds the values within both the EXPENSES field and the SALARY field. The AS phrase changes the name of the column headings.
7. The COMPUTE command creates a calculated value using the values that have been aggregated in the SUM command and sorted with the BY command.
8. The BY phrase sorts the data in the report by the DIV field, and then by the DEPT field.
9. The WHERE command includes only the data that falls in the year 1991.
10. The ON TABLE SUMMARIZE command adds all values in both the EXPENSES and SALARY columns, and recalculates the Percent column.
11. The StyleSheet information formats the report heading and content.
12. The END command ends the report request.

# Customizing a Report

A successful report depends on the information presented and how it is presented. A report that identifies related groups of information and draws attention to important facts will be more effective than one that simply shows columns of data.

When you have selected the data that is going to be included in your report and how you want it to appear, you can then continue developing your report with custom formatting. There are many things you can add to your request in order to make your report more effective. You can:

- Add titles, headings, and footings. You can also change column titles with the AS

phrase, and create headings and footings for different levels of the report (including each sort group, each page, and the entire report).

- Change the format of a field and the justification of a column title. For details, see Formatting Report Data.
- Determine the width of a report column. For details, see Formatting Report Data.
- Dynamically control the display of subtotals, headings, and footings based on conditions you define. For details, see Controlling Report Formatting.
- Highlight a group of related information and separate it from other groups by inserting blank lines or underlines between each group.
- Emphasize data using color to highlight certain values in your report based on conditions you define. For details, see Formatting Report Data.
- Format your report using external cascading style sheets. For details, see Using an External Cascading Style Sheet.
- Add drill-down capability to your report. This adds extra value by linking your report to other reports or URLs that provide more detail. For details, see Linking a Report to Other Resources.

# Selecting a Report Output Destination

After you create a report, you can send it:

- **To the screen.** When you run a report, the default output destination is the screen. Reports run in WebFOCUS usually appear in a web browser, or in a helper application (such as, Adobe® Reader® or Microsoft® Excel), within a web browser.

  You can also view reports outside of the browser in a standalone helper application such as Adobe Reader or Microsoft Excel. In Windows Folder Options, File Types (Advanced Settings), uncheck the **Browse in same window** option for the file type; such as .pdf or .xls. When the **Browse in same window option** is not selected, the browser window created by WebFOCUS is blank because the report output is displayed in the helper application window.

  Note that if you selected the **Save Report** check box in the configuration pane of the WebFOCUS Administration Console (under Redirection Settings), you will be prompted whether to save or open the output file. If the procedure contained a

PCHOLD command that specified an AS name for the output file, the name is retained if you choose to save the file. If no AS name was specified, a random filename is generated.

If the output is produced as a result of a GRAPH request, the returned HTML file contains a link to the actual graph output, which is stored as a temporary image file (for example, as a JPEG, GIF, or SVG file). The image file will eventually expire and be deleted from the server. For information about saving the graph output, see Creating a Graph.

- **To a file.** You can store the results of your report for reuse using the HOLD, SAVE, or SAVB commands. For details see Saving and Reusing Your Report Output.
- **To a printer.** If you wish to print a report using a format such as PDF or HTML, first display the report using the desired format, and then print the report from the display application (for example, from Adobe Reader or from the web browser).

  You cannot send a report directly to a printer in WebFOCUS.

# Displaying Report Data

Reporting, at the simplest level, retrieves field values from a data source and displays those values. There are three ways to do this:

- List each field value (PRINT and LIST commands).
- Add all the values and display the sum (SUM command).
- Count all the values and display the quantity (COUNT command).

# Using Display Commands in a Request

The four display commands (PRINT, LIST, SUM, and COUNT) are also known as verbs. These commands are flexible; you can report from several fields using a single command, and include several different display commands in a single report request.

# Use Display Commands in a Request

```
display [THE] [SEG.]fieldname1 [AND] [THE] fieldname2 ...
```

or

```
display *
```

where:

**display**

Is the PRINT, LIST, SUM, or COUNT command. WRITE and ADD are synonyms of SUM and can be substituted for it.

**SEG.**

Displays all fields in a segment (a group of related fields in a Master File). The field name you specify can be any field in the segment.

**fieldname**

Is the name of the field to be displayed in the report.

The maximum number of display fields your report can contain is determined by a combination of factors. For details, see Maximum Number of Display Fields Supported in a Request.

The fields appear in the report in the same order in which they are specified in the report request. For example, the report column for *fieldname1* appears first, followed by the report column for *fieldname2*.

The field to be displayed is also known as the display field.

**AND**

Is optional and is used to enhance readability. It can be used between any two field names, and does not affect the report.

**THE**

Is optional and is used to enhance readability. It can be used before any field name, and does not affect the report.

*****

Applies the display command to every field in the left path of the data source.

**Note:** The SEG. and * options do not display virtual fields. To print virtual fields, explicitly reference them in the PRINT statement (PRINT * virtual field name). This is true even if the virtual field name redefines a real field.

# Displaying Individual Values

The display commands LIST and PRINT list the individual values of the fields you specify in your report request. LIST numbers the items in the report. PRINT does not number the items.

You can easily display all of the fields in the data source by specifying an asterisk (*) wildcard instead of a specific field name, as described in Displaying All Fields.

For all PRINT and LIST requests, the number of records retrieved and the number of lines displayed are the same. In addition, there is no order to the report rows. The PRINT and LIST commands display all the values of the selected fields found in the data source in the order in which they are accessed. The order in which data is displayed may be affected by the AUTOPATH setting. For more information, see Optimizing Retrieval Speed for ibi FOCUS Data Sources, and the documentation on SET parameters in the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

In general, when using PRINT or LIST, the order of the values displayed in the report depends on whether or not the field is a key field, as described in the *Describing Data With ibi™ WebFOCUS® Language* manual.

Alternatively, you can sort the values using the BY or ACROSS sort phrases. When LIST is used in a request that includes a sort phrase, the list counter is reset to 1 every time the value in the outermost sort field changes. For more information on sorting, see Sorting Tabular Reports.

PRINT * or PRINT SEG.* prints only the real fields in the Master File. To print virtual fields, explicitly reference them in the PRINT statement (PRINT * virtual field name). This is true even if the virtual field name is a re-defines of a real field.

For PRINT and LIST syntax, see Using Display Commands in a Request.

# Displaying Individual Field Values

To display the values of individual fields, use the PRINT command. The following request displays the values of two fields, LAST_NAME and FIRST_NAME, for all employees.

```
TABLE FILE EMPLOYEE
PRINT LAST_NAME AND FIRST_NAME
END
```

The following shows the report output.

```
LAST_NAME
---------
```

```
FIRST_NAME
----------
```

```
STEVENS
SMITH
JONES
SMITH
BANNING
IRVING
ROMANS
MCCOY
BLACKWOOD
MCKNIGHT
GREENSPAN
CROSS
```

```
ALFRED
MARY
DIANE
RICHARD
JOHN
JOAN
ANTHONY
JOHN
ROSEMARIE
ROGER
MARY
BARBARA
```

# Listing Records

To number the records in a report, use the LIST command.

```
TABLE FILE EMPLOYEE
LIST LAST_NAME AND FIRST_NAME
END
```

The following shows the report output.

```
LIST
----

   1
   2
   3
   4
   5
   6
   7
   8
   9
  10
  11
  12
```

```
LAST_NAME
---------

STEVENS
SMITH
JONES
SMITH
BANNING
IRVING
ROMANS
MCCOY
BLACKWOOD
MCKNIGHT
GREENSPAN
CROSS
```

```
FIRST_NAME
----------

ALFRED
MARY
DIANE
RICHARD
JOHN
JOAN
ANTHONY
JOHN
ROSEMARIE
ROGER
MARY
BARBARA
```

# Displaying All Fields

You can easily display all of the fields in the left path of the data source by specifying an asterisk (*) wildcard instead of a specific field name. For additional information about Master File structures and segment paths, including left paths and short paths, see the *Describing Data With ibi™ WebFOCUS® Language* manual.

# Displaying All Fields

The following request produces a report displaying all of the fields in the EDUCFILE data source.

```
TABLE FILE EDUCFILE
LIST *
END
```

The following shows the report output.

| LIST | COURSE_ CODE | COURSE_NAME | DATE_ ATTEND | EMP_ID |
|---|---|---|---|---|
| 1 | 101 | FILE DESCRPT & MAINT | 83/01/04 | 212289111 |
| 2 | 101 | FILE DESCRPT & MAINT | 82/05/25 | 117593129 |

| | | | | |
|---|---|---|---|---|
| 3 | 101 | FILE DESCRPT & MAINT | 82/05/25 | 071382660 |
| 4 | 101 | FILE DESCRPT & MAINT | 81/11/15 | 451123478 |
| 5 | 101 | FILE DESCRPT & MAINT | 81/11/15 | 112847612 |
| 6 | 102 | BASIC REPORT PREP NON-PROG | 82/07/12 | 326179357 |
| 7 | 103 | BASIC REPORT PREP NON-PROG | 83/01/05 | 212289111 |
| 8 | 103 | BASIC REPORT PREP NON-PROG | 82/05/26 | 117593129 |
| 9 | 103 | BASIC REPORT PREP NON-PROG | 81/11/16 | 112847612 |
| 10 | 104 | FILE DESC & MAINT NON-PROG | 82/07/14 | 326179357 |
| 11 | 106 | TIMESHARING WORKSHOP | 82/07/15 | 326179357 |

| | | | | |
|---|---|---|---|---|
| 12 | 202 | WHAT'S NEW IN FOCUS | 82/10/28 | 326179357 |
| 13 | 301 | DECISION SUPPORT WORKSHOP | 82/09/03 | 326179357 |
| 14 | 107 | BASIC REPORT PREP DP MGRS | 82/08/02 | 818692173 |
| 15 | 302 | HOST LANGUAGE INTERFACE | 82/10/21 | 818692173 |
| 16 | 108 | BASIC RPT NON-DP MGRS | 82/10/10 | 315548712 |
| 17 | 108 | BASIC RPT NON-DP MGRS | 82/08/24 | 119265415 |
| 18 | 201 | ADVANCED TECHNIQUES | 82/07/26 | 117593129 |
| 19 | 203 | FOCUS INTERNALS | 82/10/28 | 117593129 |

# Displaying All Fields in a Segment

You can easily display all fields in a segment by adding the prefix "SEG." to any field in the desired segment.

# Display All Fields in a Segment

```
seg.anyfield
```

where:

**anyfield**

Is any field that is in the desired segment.

# Displaying All Fields in a Segment

The following request produces a report displaying all of the fields in the segment that contains the QTY_IN_STOCK field.

```
TABLE FILE CENTINV
PRINT SEG.QTY_IN_STOCK
BY PRODNAME NOPRINT
END
```

The following shows the report output.

| Product Number: | Product Name: | Quantity In Stock: | Price: | Our Cost: |
|---|---|---|---|---|
| 1024 | 110 VHS-C Camcorder 20 X | 4000 | 349.00 | 249.00 |
| 1022 | 120 VHS-C Camcorder 40 X | 2300 | 399.00 | 259.00 |
| 1020 | 150 8MM Camcorder 20 X | 5961 | 319.00 | 240.00 |
| 1004 | 2 Hd VCR LCD Menu | 43068 | 179.00 | 129.00 |
| 1018 | 250 8MM Camcorder 40 X | 60073 | 399.00 | 320.00 |
| 1016 | 330DX Digital Camera 1024K P | 12707 | 279.00 | 199.00 |
| 1014 | 340SX Digital Camera 65K P | 990 | 249.00 | 199.00 |
| 1012 | 650DL Digital Camcorder 150 X | 2972 | 899.00 | 710.00 |
| 1010 | 750SL Digital Camcorder 300 X | 10758 | 999.00 | 750.00 |
| 1028 | AR2 35MM Camera 8 X | 11499 | 109.00 | 79.00 |
| 1026 | AR3 35MM Camera 10 X | 12444 | 129.00 | 95.00 |
| 1006 | Combo Player - 4 Hd VCR + DVD | 13527 | 399.00 | 289.00 |
| 1008 | DVD Upgrade Unit for Cent. VCR | 199 | 199.00 | 139.00 |
| 1030 | QX Portable CD Player | 22000 | 169.00 | 99.00 |
| 1032 | R5 Micro Digital Tape Recorder | 1990 | 89.00 | 69.00 |
| 1036 | ZC Digital PDA - Standard | 33000 | 299.00 | 249.00 |
| 1034 | ZT Digital PDA - Commercial | 21000 | 499.00 | 349.00 |

# Displaying the Structure and Retrieval Order of a Multi-Path Data Source

When using display commands, it is important to understand the structure of the data source and the relationship between segments, since these factors affect your results. You can use the CHECK command PICTURE option to display a diagram of the data source structure defined by the Master File.

You can also display the retrieval order of a data source using the CHECK command PICTURE RETRIEVE option. It should be noted that retrieval is controlled by the minimum referenced subtree. For more information, see *Understanding the Efficiency of the Minimum Referenced Subtree* in the *Describing a Group of Fields* chapter in the *Describing Data With ibi™ WebFOCUS® Language* manual.

# Displaying the Structure of a Multi-Path Data Source

To display the structure diagram of the CENTORD data source, which is joined to the CENTINV and CENTCOMP data sources, issue the following command:

```
CHECK FILE CENTORD PICTURE
```

The following shows the structure diagram output.

```
 NUMBER OF ERRORS=     0
 NUMBER OF SEGMENTS=   4  ( REAL=    2  VIRTUAL=   2 )
 NUMBER OF FIELDS=    23  INDEXES=   4  FILES=     3
 NUMBER OF DEFINES=    8
 TOTAL LENGTH OF ALL FIELDS=  139

SECTION 01
              STRUCTURE OF FOCUS    FILE CENTORD  ON 07/18/03 AT
11.06.34

          OINFO
  01      S1
 **************
 *ORDER_NUM   **I
 *STORE_CODE  **I
 *PLANT       **I
 *ORDER_DATE  **
 *            **
 ***************
  **************
        I
        +-----------------+
        I                 I
        I STOSEG          I PINFO
  02    I KU        03    I S1
 ..............    **************
 :STORE_CODE  :K   *PROD_NUM    **I
 :STORENAME   :    *QUANTITY    **
 :STATE       :    *LINEPRICE   **
 :            :    *            **
 :            :    *            **
 :............:    ***************
  JOINED  CENTCOMPFO**************
                          I
```

```
                      I
                      I
                      I INVSEG
                04    I KU
               ..............
               :PROD_NUM    :K
               :PRODNAME    :
               :QTY_IN_STOCK:
               :PRICE       :
               :            :
               :............:
                JOINED  CENTINV FOCUS   A1
```

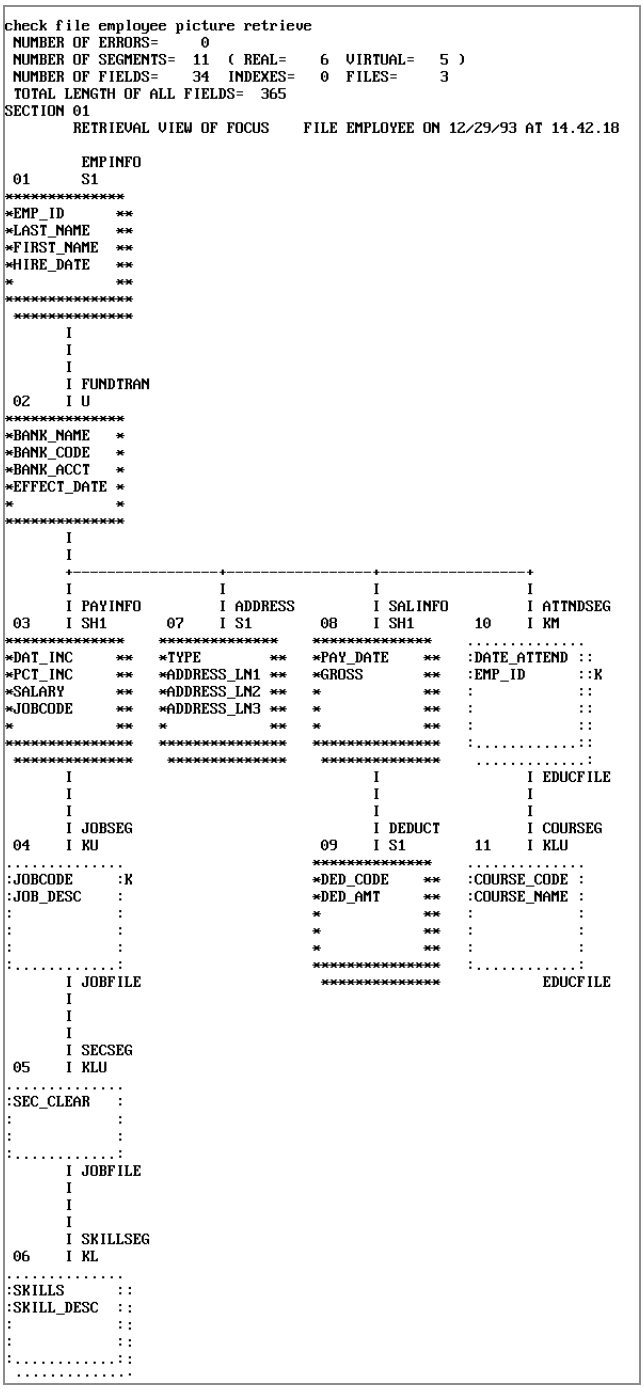
# Displaying the Retrieval Order of a Multi-Path Data Source

To display the retrieval order of the EMPLOYEE data source, which is joined to the JOBFILE and EDUCFILE data sources, issue the following command:

```
CHECK FILE EMPLOYEE PICTURE RETRIEVE
```

The following shows the command output that adds the numbers that display at the top left of each segment, indicating the retrieval order of the segments. A unique segment such as FUNDTRAN is treated as a logical addition to the parent segment for retrieval. FUNDTRAN and SECSEG are unique segments, and are therefore treated as part of their parents.

The following shows the retrieval order:




# Displaying Fields From a Multi-Path Data Source

The following request produces a report displaying all of the fields on the left path of the EMPLOYEE data source.

```
TABLE FILE EMPLOYEE
PRINT *
END
```

The following shows a list of the output fields the previous request produces. Due to the size of the report, only the fields for which all instances will be printed are listed here. In the report, these fields would be displayed from left to right, starting with EMP_ID.

```
EMP_ID
LAST_NAME
FIRST_NAME
HIRE_DATE
DEPARTMENT
CURR_SAL
CURR_JOBCODE
ED_HRS
BANK_NAME
BANK_CODE
BANK_ACCT
EFFECT_DATE
DAT_INC
PCT_INC
SALARY
JOBCODE
JOBCODE
JOB_DESC
SEC_CLEAR
SKILLS
SKILL_DESC
```

Each field in this list appears in segments on the left path of the EMPLOYEE data source. To view the retrieval order structure of the EMPLOYEE data source, see Displaying the Retrieval Order of a Multi-Path Data Source.

**Tip:** In some environments, the following warning is displayed whenever you use PRINT * with a multi-path data source, to remind you that PRINT * only displays the left path:

```
(FOC757) WARNING. YOU REQUESTED PRINT * OR COUNT * FOR A MULTI-PATH FILE
```

# Adding Values

SUM, WRITE, and ADD sum the values of a numeric field. The three commands are synonyms; they can be used interchangeably, and every reference to SUM in this documentation also refers to WRITE and ADD.

When you use SUM, multiple records are read from the data source, but only one summary line is produced. If you use SUM with a non-numeric field—such as an alphanumeric, text, or date field—SUM does not add the values. Instead, by default, it displays the last value retrieved from the data source. You can change this to the first value, minimum value, or maximum value using the SUMPREFIX parameter.

For SUM, WRITE, and ADD syntax, see Using Display Commands in a Request.

# Adding Values

This request adds all the values of the field CURR_SAL:

```
TABLE FILE EMPLOYEE
SUM CURR_SAL
END
```

The following shows the output of the request.

| CURR_SAL | |
|---|---|
| -------- | |
| $222,284.00 | |

# Adding Non-Numeric Values

This request attempts to add non-numeric fields. Any request for aggregation on non-numeric data returns the last record retrieved from the data source.

```
TABLE FILE EMPLOYEE
SUM LAST_NAME AND FIRST_NAME
END
```

The following shows the output of the request.

| LAST_NAME | FIRST_NAME |
|---|---|
| --------- | ---------- |
| CROSS | BARBARA |

Note that any request for aggregation on all date format fields also returns the last record retrieved from the data source.

**Tip:** You can set the SUMPREFIX parameter to FST, MIN, MAX, or LST to control the sort order. For details, see Sorting Tabular Reports.

# Counting Values

The COUNT command counts the number of instances that exist for a specified field. The COUNT command is particularly useful combined with the BY phrase, which is discussed in Sorting Tabular Reports.

COUNT counts the instances of data contained in a report, not the data values.

For COUNT syntax, see Using Display Commands in a Request.

By default, a COUNT field is a five-digit integer. You can reformat it using the COMPUTE command, and change its field length using the SET COUNTWIDTH parameter. For details

about the COMPUTE command, see Creating Temporary Fields. For information about SET COUNTWIDTH, see the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

When COUNT is used in a request, the word COUNT is appended to the default column title, unless the column title is changed with an AS phrase.

# Counting Values

To determine how many employees are in the EMPLOYEE data source, you can count the instances of EMP_ID, the employee identification number.

```
TABLE FILE EMPLOYEE
COUNT EMP_ID
END
```

The following shows the output of the request.

```
EMP_ID
COUNT
------
    12
```

# Counting Values With a Sort Phrase

To count the instances of EMP_ID for each department, use this request:

```
TABLE FILE EMPLOYEE
COUNT EMP_ID
```

```
BY DEPARTMENT
END
```

The following shows the output of the request indicating that of the 12 EMP_IDs in the data source, six are from the MIS department and six are from the PRODUCTION department:

```
             EMP_ID
DEPARTMENT   COUNT
----------   ------
MIS               6
PRODUCTION        6
```

# Counting Instances of Data

The following example counts the instances of data in the LAST_NAME, DEPARTMENT, and JOBCODE fields in the EMPLOYEE data source.

```
TABLE FILE EMPLOYEE
COUNT LAST_NAME AND DEPARTMENT AND JOBCODE
END
```

The following shows the output of the request.

```
LAST_NAME  DEPARTMENT  JOBCODE
COUNT      COUNT       COUNT
---------  ----------  -------
       12          12       19
```

The EMPLOYEE data source contains data on 12 employees, with one instance for each LAST_NAME. While there are only two values for DEPARTMENT, there are 12 instances of the DEPARTMENT field because each employee works for one of the two departments. Similarly, there are 19 instances of the JOBCODE field because employees can have more than one job code during their employment.

# Counting Segment Instances

You can easily count the instances of the lowest segment in the left path of a data source by specifying an asterisk (*) wildcard instead of a specific field name. In a single-segment

data source, this effectively counts all instances in the data source.

COUNT * accomplishes this by counting the values of the first field in the segment. Instances with a missing value in the first field are not counted (when SET MISSING=ON).

Segment instances in short paths are not counted by COUNT *, regardless of the value of the ALL parameter of the SET command.

For more information about missing values, short paths, and the SET ALL parameter, see Handling Records With Missing Field Values.

# Counting Segments From a Multi-Path Data Source

The following request counts the number of instances of the SKILLSEG segment of the EMPLOYEE data source.

```
TABLE FILE EMPLOYEE
COUNT *
END
```

The following shows the output of the request.

```
COUNT *

COUNT

-------

      19
```

COUNT * counts the number of instances of the SKILLSEG segment, which is the lowest segment in the left path of the EMPLOYEE data source structure (that is, the EMPLOYEE data source joined to the JOBFILE and EDUCFILE data sources). You can see a picture of the path structure in Displaying the Structure and Retrieval Order of a Multi-Path Data Source.

**Tip:** In some environments, the following warning is displayed if you use COUNT * with a multi-path data source (such as EMPLOYEE in the above example):

```
(FOC757) WARNING. YOU REQUESTED PRINT * OR COUNT * FOR A MULTI-PATH FILE
```

# Expanding Byte Precision for COUNT and LIST

By default, the number of characters that display for counter values retrieved using the COUNT and LIST commands is five. You can increase the number of characters to nine.

For example, if the number of records retrieved for a field exceeds 99,999 (5 bytes), asterisks appear in the report to indicate an overflow condition. You can increase the display to allow as large a count as 999,999,999 (9 bytes) using SET COUNTWIDTH.

**Note:** You can change the overflow character by issuing the SET OVERFLOWCHAR command.

# Set the Precision for COUNT and LIST

```
SET COUNTWIDTH = {OFF|ON}
```

where:

**OFF**

Displays five characters (bytes) for COUNT and LIST counter values. Asterisks are displayed if the number of records retrieved for a field exceeds five characters. OFF is the default.

**ON**

Displays up to nine characters (bytes) for COUNT and LIST counter values. Asterisks are displayed if the value exceeds nine characters.

# Setting Precision for COUNT and LIST

The following example shows the COUNT command with SET COUNTWIDTH = OFF:

```
TABLE FILE filename
COUNT Fldxx
BY Fldyy
END
```

| | Fldxx |
|---|---|
| Fldyy | COUNT |
| value | ***** |

The following example shows the COUNT command with SET COUNTWIDTH = ON:

```
TABLE FILE filename
COUNT Fldxx
BY Fldyy
END
```

| | Fldxx |
|---|---|
| Fldyy | COUNT |
| value | 999999999 |

**Note:** This feature affects the width of a report when COUNTWIDTH is set to ON. Calculating the width of a report now requires an additional four display positions for each COUNT or LIST column.

# Maximum Number of Display Fields Supported in a Request

There is no limit to the number of verb objects in a TABLE or MATCH request.

However, an error can occur under the following conditions:

- The report output format has a limit to the number of columns supported. For example, Excel, FOCUS, and XFOCUS formats have limits on the number of columns.
- The operating system has a maximum record length that cannot fit all of the columns.
- The amount of memory needed to store the output is not available.

If the combined length of the display fields in the data area exceeds the maximum capacity, an error message displays. To correct the problem, adjust the number or lengths of the fields in the request.

# Manipulating Display Fields With Prefix Operators

You can use prefix operators to perform calculations directly on the values of fields.

**Note:** Unless you change a column or ACROSS title with an AS phrase, the prefix operator is automatically added to the title. Without an AS phrase, the column title is constructed using the prefix operator and either the field name or the TITLE attribute in the Master File (if there is one):

- If there is no TITLE attribute, the field name is used.
- If there is a TITLE attribute in the Master File, the choice between using the field name or the TITLE attribute depends on the value of the TITLES parameter:
    - If SET TITLES = ON, the TITLE attribute is used.
    - If SET TITLES = OFF or NOPREFIX, the field name is used.

You can use the SET PRFTITLE command to create descriptive and translatable column titles for prefixed fields. For example, the following request sets PRFTITLE to LONG.

```
SET PRFTITLE = LONG
TABLE FILE WF_RETAIL_LITE
SUM COGS_US CNT.COGS_US AVE.COGS_US CNT.DST.COGS_US MIN.COGS_US
MAX.COGS_US MDN.COGS_US
BY PRODUCT_CATEGORY
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image. The prefix operator names are converted to descriptive text.

| Product Category | Cost of Goods | Count Cost of Goods | Average Cost of Goods | Count of Distinct Cost of Goods | Minimum Cost of Goods | Maximum Cost of Goods | Median Cost of Goods |
|---|---|---|---|---|---|---|---|
| Accessories | $342,877.00 | 1484 | $231.05 | 50 | $16.00 | $2,850.00 | $174.00 |
| Camcorder | $453,205.00 | 1417 | $319.83 | 46 | $60.00 | $8,610.00 | $180.00 |
| Computers | $109,281.00 | 600 | $182.13 | 8 | $81.00 | $668.00 | $167.00 |
| Media Player | $779,593.00 | 2249 | $346.64 | 77 | $36.00 | $1,640.00 | $310.00 |
| Stereo Systems | $857,042.00 | 3338 | $256.75 | 100 | $48.00 | $2,700.00 | $166.00 |
| Televisions | $227,820.00 | 267 | $853.26 | 22 | $275.00 | $9,750.00 | $550.00 |
| Video Production | $180,540.00 | 645 | $279.91 | 21 | $78.00 | $1,880.00 | $190.00 |

If PRFTITLE had been set to SHORT (the default), the prefix operator name would have been used instead of the descriptive text.

For a list of prefix operators and their functions, see Manipulating Display Fields With Prefix Operators.

# Prefix Operator Basics

This topic describes basic syntax and notes for using prefix operators.

# Use Prefix Operators

Each prefix operator is applied to a single field, and affects only that field.

```
{SUM|COUNT} prefix.fieldname AS 'coltitle'
```

```
{PRINT|COMPUTE} RNK.byfield
```

where:

**prefix**

Is any prefix operator.

**fieldname**

Is the name of the field to be displayed in the report.

**'coltitle'**

Is the column title for the report column, enclosed in single quotation marks.

**byfield**

Is the name of a vertical sort field to be ranked in the report.

# Usage Notes for Prefix Operators

- Because PRINT and LIST display individual field values, not an aggregate value, they are not used with prefix operators, except TOT. and DST.
- To sort by the results of a prefix command, use the phrase BY TOTAL to aggregate and sort numeric columns simultaneously. For details, see Sorting Tabular Reports.
- The WITHIN phrase is very useful when using prefixes. The WITHIN phrase is not supported with the MDN., MDE., DST., CNT.DST., AVE.DST., or SUM.DST. prefix operators in an aggregation display command, such as SUM. The WITHIN phrase is supported with the DST. operator with the PRINT display command.
- You can use the results of prefix operators in COMPUTE commands.
- With the exception of PCT., RPCT., CNT. and PCT.CNT., resulting values have the same format as the field against which the prefix operation was performed.
- For percent-based prefix operators PCT. and RPCT., if you set the PCTFORMAT parameter to OLD, resulting values have the same format as the field against which the prefix operation was performed. By default, PCTFORMAT is set to PERCENT, which displays the prefixed column with a percent sign and removes other options, such as currency symbols, although you can reformat it. PCT.CNT.*field* will always display with two decimal places and a percent sign, unless reformatted. With PCTFORMAT = PERCENT, the format of the output column may depend on the format

of the original field. For a field with a:

- Precision-based format (F, D, M, X), the column will display with length 7 and two decimal places.
- Packed format, the column will display with its original number of decimal places.
- Integer format, the column will display with no decimal places.

- Text fields can only be used with the FST., LST., and CNT. prefix operators.
- PCT., TOT., PCT.CNT., RNK., and RPCT. are *not* supported with TABLEF and should not be used with TABLEF.
- It is recommended to avoid using a prefix operator as a Master File name, either from the ibi™ WebFOCUS® Reporting Server or in a HOLD file.

# Functions You Can Perform With Prefix Operators

The following table lists prefix operators and describes the function of each.

| Prefix | Function |
|---|---|
| `ASQ.` | Computes the average sum of squares for standard deviation in statistical analysis. |
| `AVE.` | Computes the average value of the field. |
| `CNT.` | Counts the number of occurrences of the field. The data type of the result is always Integer. |
| `AVE.DST.` | Averages the distinct values within a field. |

| Prefix | Function |
|---|---|
| `CNT.DST.` | Counts the number of distinct values within a field. |
| `SUM.DST.` | Sums the distinct values within a field. |
| `CT.` | Produces a cumulative total of the specified field. This operator only applies when used in subfootings. For details, see Using Headings, Footings, Titles, and Labels. |
| `DST.` | Determines the total number of distinct values in a single pass of a data source. |
| `FST.` | Generates the first physical instance of the field. Can be used with numeric or text fields. |
| `LST.` | Generates the last physical instance of the field. Can be used with numeric or text fields. |
| `MAX.` | Generates the maximum value of the field. |
| `MDE.` | Computes the mode of the field values. |
| `MDN.` | Computes the median of the field values. |
| `MIN.` | Generates the minimum value of the field. |
| `PCT.` | Computes a field percentage based on the total values for the field. The PCT operator can be used with detail as well as summary fields. |

| Prefix | Function |
|---|---|
| `PCT.CNT.` | Computes a field percentage based on the number of instances found. The format of the result is always F6.2 and cannot be reformatted. |
| `RNK.` | Ranks the instances of a BY sort field in the request. Can be used in PRINT commands, COMPUTE commands, and IF or WHERE TOTAL tests. |
| `ROLL.` | Recalculates values on summary lines using the aggregated values from lower level summary lines. |
| `RPCT.` | Computes a field percentage based on the total values for the field across a row. |
| `ST.` | Produces a subtotal value of the specified field at a sort break in the report. This operator only applies when used in subfootings. For details, see Using Headings, Footings, Titles, and Labels. |
| `STDP.` | Computes the standard deviation for a population. |
| `STDS.` | Computes the standard deviation for a sample. |
| `SUM.` | Sums the field values. |
| `TOT.` | Totals the field values for use in a heading (includes footings, subheads, and subfoots). |

# Averaging Values of a Field

The AVE. prefix computes the average value of a particular field. The computation is performed at the lowest sort level of the display command. It is computed as the sum of the field values within a sort group divided by the number of records in that sort group. If

the request does not include a sort phrase, AVE. calculates the average for the entire report.

# Averaging Values of a Field

This request calculates the average number of education hours spent in each department.

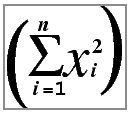
```
TABLE FILE EMPLOYEE
SUM AVE.ED_HRS BY DEPARTMENT
END
```

The following shows the output of the request.

```
            AVE
DEPARTMENT  ED_HRS
----------  ------
MIS          38.50
PRODUCTION   20.00
```

# Averaging the Sum of Squared Fields

The ASQ. prefix computes the average sum of squares, which is a component of the standard deviation in statistical analysis (shown as a formula in the following image).



**Note:** If the field format is integer and you get a large set of numbers, the ASQ. result may exceed the limit of the I4 field, which is 2,147,483,647. The display of any number larger than this will generate a negative number or an incorrect positive number. For this reason, we recommend that you do not use Integer fields if this result could occur.

# Averaging the Sum of Squared Fields

This request calculates the sum and the sum of squared fields for the DELIVER_AMT field.

```
TABLE FILE SALES
SUM DELIVER_AMT AND ASQ.DELIVER_AMT
BY CITY
END
```

The following shows the output of the request.

```
                              ASQ
CITY             DELIVER_AMT  DELIVER_AMT
----             -----------  -----------
NEW YORK                 300          980
NEWARK                    60          900
STAMFORD                 430         3637
UNIONDALE                 80         1600
```

# Calculating Maximum and Minimum Field Values

The prefixes MAX. and MIN. produce the maximum and minimum values, respectively, within a sort group. If the request does not include a sort phrase, MAX. and MIN. produce the maximum and minimum values for the entire report.

## Calculating Maximum and Minimum Field Values

This report request calculates the maximum and minimum values of SALARY.

```
TABLE FILE EMPLOYEE
SUM MAX.SALARY AND MIN.SALARY
END
```

The following shows the output of the request.

```
    MAX              MIN
    SALARY           SALARY
    ------           ------
$29,700.00        $8,650.00
```

# Calculating Median and Mode Values for a Field

You can use the MDN. (median) and MDE. (mode) prefix operators, in conjunction with an aggregation display command (SUM, WRITE) and a numeric or smart date field, to calculate the statistical median and mode of the values in the field.

These calculations are not supported in a DEFINE command, in WHERE or IF expressions, in a WITHIN phrase, or in a summary command. If used in a multi-verb request, they must be used at the lowest level of aggregation.

The median is the middle value (50th percentile). If there is an even number of values, the median is the average of the middle two values. The mode is the value that occurs most frequently within the set of values. If no value occurs more frequently than the others, MDE. returns the lowest value.

# Calculating the Median and Mode

The following request against the EMPLOYEE data source displays the current salaries and calculates the average (mean), median, and mode within each department.

```
TABLE FILE EMPLOYEE
SUM CURR_SAL AS 'INDIVIDUAL,SALARIES'
AVE.CURR_SAL AS 'DEPARTMENT,AVERAGE'
MDN.CURR_SAL AS 'DEPARTMENT,MEDIAN'
MDE.CURR_SAL AS 'DEPARTMENT,MODE'
BY DEPARTMENT
ON TABLE SET PAGE NOPAGE
END
```

Both departments have an even number of employees. For the MIS department, the two middle values are the same, making that value ($18,480.00) both the median and the mode. For the PRODUCTION department, the median is the average of the two middle values ($16,100.00 and $21,120.00) and, since there are no duplicate values, the mode is the lowest value ($9,500.00).

| DEPARTMENT | INDIVIDUAL SALARIES | DEPARTMENT AVERAGE | DEPARTMENT MEDIAN | DEPARTMENT MODE |
|---|---|---|---|---|
| MIS | $108,002.00 | $18,000.33 | $18,480.00 | $18,480.00 |
| PRODUCTION | $114,282.00 | $19,047.00 | $18,610.00 | $9,500.00 |

# Calculating Column and Row Percentages

For each individual value in a column, PCT. calculates what percentage that field makes up of the column total value. You can control how values are distributed down the column by sorting the column using the BY phrase.

You can also determine percentages for row values. For each individual value in a row that has been sorted using the ACROSS phrase, the RPCT. operator calculates what percentage it makes up for the total value of the row.

# Calculating Column Percentages

To calculate each employee share of education hours, issue the following request:

```
TABLE FILE EMPLOYEE
SUM ED_HRS PCT.ED_HRS BY LAST_NAME
ON TABLE COLUMN-TOTAL
ON TABLE SET PAGE NOPAGE
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image:

| LAST_NAME | ED_HRS | PCT ED_HRS |
|---|---|---|
| BANNING | .00 | .00% |
| BLACKWOOD | 75.00 | 21.37% |
| CROSS | 45.00 | 12.82% |
| GREENSPAN | 25.00 | 7.12% |
| IRVING | 30.00 | 8.55% |
| JONES | 50.00 | 14.25% |
| MCCOY | .00 | .00% |
| MCKNIGHT | 50.00 | 14.25% |
| ROMANS | 5.00 | 1.42% |
| SMITH | 46.00 | 13.11% |
| STEVENS | 25.00 | 7.12% |
| TOTAL | 351.00 | 100.00% |

If you set PCFORMAT to OLD, PCT. and RPCT. WILL take the same format as the field, and the column may not always total exactly 100 because of the nature of floating-point arithmetic.

# Calculating Row Percentages

The following request calculates the total units sold for each product (UNIT_SOLD column), and the percentage that total makes up in relation to the sum of all products sold (RPCT.UNIT_SOLD column) in each city.

```
TABLE FILE SALES
SUM UNIT_SOLD RPCT.UNIT_SOLD ROW-TOTAL
BY PROD_CODE
ACROSS CITY    WHERE
CITY EQ 'NEW YORK' OR 'STAMFORD'
ON TABLE SET PAGE NOPAGE
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image.

| | CITY NEW YORK | | STAMFORD | | TOTAL | |
|---|---|---|---|---|---|---|
| PROD_CODE | UNIT_SOLD | RPCT UNIT_SOLD | UNIT_SOLD | RPCT UNIT_SOLD | UNIT_SOLD | RPCT UNIT_SOLD |
| B10 | 30 | 33% | 60 | 66% | 90 | 99% |
| B12 | . | . | 40 | 100% | 40 | 100% |
| B17 | 20 | 40% | 29 | 59% | 49 | 99% |
| B20 | 15 | 100% | . | . | 15 | 100% |
| C13 | . | . | 25 | 100% | 25 | 100% |
| C17 | 12 | 100% | . | . | 12 | 100% |
| C7 | . | . | 45 | 100% | 45 | 100% |
| D12 | 20 | 42% | 27 | 57% | 47 | 99% |
| E1 | 30 | 100% | . | . | 30 | 100% |
| E2 | . | . | 80 | 100% | 80 | 100% |
| E3 | 35 | 33% | 70 | 66% | 105 | 99% |

Because UNIT_SOLD has an integer format, the columns created by RPCT. also have integer (I) formats. Therefore, individual percentages may be truncated and the total percentage may be less than 100%. If you require precise totals, redefine the field with a format that declares decimal places (D, F).

# Producing a Direct Percent of a Count

When counting occurrences in a file, a common reporting need is determining the relative percentages of each row's count within the total number of instances. You can do this, for columns only, with the following syntax:

```
PCT.CNT.fieldname
```

The format is a decimal value of length seven, with two decimal places and a percent sign.

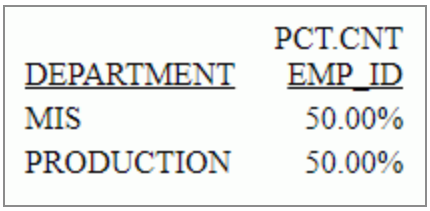
# Producing a Direct Percent of a Count

This request illustrates the relative percentage of the values in the EMP_ID field for each department.

```
TABLE FILE EMPLOYEE
SUM PCT.CNT.EMP_ID
BY DEPARTMENT
ON TABLE SET PAGE NOPAGE
ON TABLE SET STYLE *
```

```
GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image:



| DEPARTMENT | PCT.CNT EMP_ID |
|---|---|
| MIS | 50.00% |
| PRODUCTION | 50.00% |

# Aggregating and Listing Unique Values

The distinct prefix operator (DST.) may be used to aggregate and list unique values of any data source field. Similar in function to the SQL COUNT, SUM, and AVG(DISTINCT col) column functions, it permits you to determine the total number of distinct values in a single pass of the data source.

The DST. operator can be used with the SUM, PRINT or COUNT commands, and also in conjunction with the aggregate prefix operators SUM., CNT., and AVE. Multiple DST. operators are supported in TABLE and TABLEF requests. They are supported in requests that use the BY, ACROSS, and FOR phrases.

Note that in a request using the PRINT command and multiple DST operators, you should issue the command SET PRINTDST=NEW. For more information, see the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

# Use the Distinct Operator

```
command DST.fieldname
```

or

```
SUM [operator].DST.fieldname
```

where:

**command**

Is SUM, PRINT, or COUNT.

**DST.**

Indicates the distinct operator.

**fieldname**

Indicates the display-field object or field name.

**operator**

Indicates SUM., CNT., or AVE.

# Using the Distinct Operator

The procedure requesting a count of unique ED_HRS values is either:

```
TABLE FILE EMPLOYEE
SUM CNT.DST.ED_HRS
END
```

or

```
TABLE FILE EMPLOYEE
COUNT DST.ED_HRS
END
```

The output is:

```
COUNT
DISTINCT
ED_HRS
--------
       9
```

Notice that the count includes records for both employees with the last name SMITH, but excludes the second records for values 50.00, 25.00, and .0, resulting in nine unique ED_HRS values.

# Counting Distinct Field Values With Multiple Display Commands

The following request against the GGSALES data source counts the total number of records by region, then the number of records, distinct categories, and distinct products by region and by state. The DST or CNT.DST operator can be used only with the last display command:

```
TABLE FILE GGSALES
COUNT CATEGORY AS 'TOTAL,COUNT'
  BY REGION
SUM CNT.CATEGORY AS 'STATE,COUNT'
    CNT.DST.CATEGORY    CNT.DST.PRODUCT
  BY REGION
  BY ST
END
```

The output is:

```
                                 COUNT     COUNT
             TOTAL         STATE DISTINCT  DISTINCT
Region       COUNT  State  COUNT CATEGORY  PRODUCT
------       -----  -----  ----- --------  --------
Midwest       1085  IL       362         3         9
                    MO       361         3         9
                    TX       362         3         9
Northeast     1084  CT       361         3        10
                    MA       360         3        10
                    NY       363         3        10
Southeast     1082  FL       361         3        10
                    GA       361         3        10
                    TN       360         3        10
West          1080  CA       721         3        10
                    WA       359         3        10
```

# Distinct Operator Limitations

- If you reformat a column created using COUNT DST. or the CNT.DST operator, you must reformat it to an integer (I) data type. If you specify another data type, the

following error occurs:

```
(FOC950) INVALID REFORMAT OPTION WITH COUNT OR CNT.
```

- The following error occurs if you use the prefix operators CNT., SUM., and AVE. with any other display command:

```
(FOC1853) CNT/SUM/AVE.DST CAN ONLY BE USED WITH AGGREGATION VERBS
```

- The following error occurs if you use DST. in a MATCH command:

```
(FOC1854) THE DST OPERATOR IS ONLY SUPPORTED IN TABLE REQUESTS
```

- The following error occurs if you reformat a BY field (when used with the PRINT command, the DST.*fieldname* becomes a BY field):

```
(FOC1862) REFORMAT DST.FIELD IS NOT SUPPORTED WITH PRINT
```

- The following error occurs if you use the DST. operator with NOSPLIT:

```
(FOC1864) THE DST OPERATOR IS NOT SUPPORTED WITH NOSPLIT
```

- The following error occurs if you use a multi-verb request, SUM DST.*fieldname* BY *field* PRINT *fld* BY *fld* (a verb object operator used with the SUM command must be at the lowest level of aggregation):

```
(FOC1867) DST OPERATOR MUST BE AT THE LOWEST LEVEL OF AGGREGATION
```

- The DST. operator may not be used as part of a HEADING or a FOOTING.
- The DST., AVE.DST, CNT.DST., and SUM.DST. operators are not supported with WITHIN in a request that uses an aggregation display command, such as SUM. The DST. operator is supported with WITHIN when the request uses the PRINT display command.

# Retrieving First and Last Records

FST. is a prefix that displays the first retrieved record selected for a given field. LST. displays the last retrieved record selected for a given field.

When using the FST. and LST. prefix operators, it is important to understand how your data source is structured.

- If the record is in a segment with values organized from lowest to highest (segment type S1), the first logical record that the FST. prefix operator retrieves is the lowest value in the set of values. The LST. prefix operator would, therefore, retrieve the highest value in the set of values.
- If the record is in a segment with values organized from highest to lowest (segment type SH1), the first logical record that the FST. prefix operator retrieves is the highest value in the set of values. The LST. prefix operator would, therefore, retrieve the lowest value in the set of values.

For more information on segment types and file design, see the *Describing Data With ibi™ WebFOCUS® Language* manual. If you wish to reorganize the data in the data source or restructure the data source while reporting, see Improving Report Processing.

# Retrieving the First Record

The following request retrieves the first logical record in the EMP_ID field:

```
TABLE FILE EMPLOYEE
SUM FST.EMP_ID
END
```

The output is:

```
FST
EMP_ID
------
071382660
```

# Segment Types and Retrieving Records

The EMPLOYEE data source contains the DEDUCT segment, which orders the fields DED_CODE and DED_AMT from lowest value to highest value (segment type of S1). The DED_CODE field indicates the type of deduction, such as CITY, STATE, FED, and FICA. The following request retrieves the first logical record for DED_CODE for each employee:

```
TABLE FILE EMPLOYEE
SUM FST.DED_CODE
BY EMP_ID
END
```

The output is:

```
           FST
EMP_ID     DED_CODE
------     --------
071382660  CITY
112847612  CITY
117593129  CITY
119265415  CITY
119329144  CITY
123764317  CITY
126724188  CITY
219984371  CITY
326179357  CITY
451123478  CITY
543729165  CITY
818692173  CITY
```

Note, however, the command SUM LST.DED_CODE would have retrieved the last logical record for DED_CODE for each employee.

If the record is in a segment with values organized from highest to lowest (segment type SH1), the first logical record that the FST. prefix operator retrieves is the highest value in the set of values. The LST. prefix operator would therefore retrieve the lowest value in the set of values.

For example, the EMPLOYEE data source contains the PAYINFO segment, which orders the fields JOBCODE, SALARY, PCT_INC, and DAT_INC from highest value to lowest value (segment type SH1). The following request retrieves the first logical record for SALARY for each employee:

```
TABLEF FILE EMPLOYEE
SUM FST.SALARY
BY EMP_ID
END
```

The output is:

```
                    FST
EMP_ID              SALARY
------              ------
071382660       $11,000.00
112847612       $13,200.00
117593129       $18,480.00
119265415        $9,500.00
119329144       $29,700.00
123764317       $26,862.00
126724188       $21,120.00
219984371       $18,480.00
326179357       $21,780.00
451123478       $16,100.00
543729165        $9,000.00
818692173       $27,062.00
```

However, the command SUM LST.SALARY would have retrieved the last logical record for SALARY for each employee.

# Summing and Counting Values

You can count occurrences and summarize values with one display command using the prefix operators CNT., SUM., and TOT. Just like the COUNT command, CNT. counts the occurrences of the field it prefixes. Just like the SUM command, SUM. sums the values of the field it prefixes. TOT. sums the values of the field it prefixes when used in a heading (including footings, subheads, and subfoots).

# Counting Values With CNT

The following request counts the occurrences of PRODUCT_ID, and sums the value of UNIT_PRICE.

```
TABLE FILE GGPRODS
SUM CNT.PRODUCT_ID AND UNIT_PRICE
END
```

The output is:

```
Product
Code         Unit
COUNT        Price
-------      -----
     10     660.00
```

# Summing Values With SUM

The following request counts the occurrences of PRODUCT_ID, and sums the value of UNIT_PRICE.

```
TABLE FILE GGPRODS
COUNT PRODUCT_ID AND SUM.UNIT_PRICE
END
```

The output is:

```
Product
Code         Unit
COUNT        Price
-------      -----
     10     660.00
```

# Summing Values With TOT

The following request uses the TOT prefix operator to show the total of current salaries for all employees.

```
TABLE FILE EMPLOYEE
PRINT LAST_NAME
BY DEPARTMENT
ON TABLE SUBFOOT
"Total salaries equal: <TOT.CURR_SAL"
END
```

The output is:

```
DEPARTMENT  LAST_NAME
----------  ---------
MIS         SMITH
            JONES
            MCCOY
            BLACKWOOD
            GREENSPAN
            CROSS
PRODUCTION  STEVENS
            SMITH
            BANNING
            IRVING
            ROMANS
            MCKNIGHT
Total salaries equal:     $222,284.00
```

# Ranking Sort Field Values With RNK.

RANKED BY *fieldname*, when used in a sort phrase in a TABLE request, not only sorts the data by the specified field, but assigns a RANK value to the instances. The RNK. prefix operator also calculates the rank while allowing the RANK value to be printed anywhere on the page. You use this operator by specifying RNK.*fieldname*, where *fieldname* is a BY field in the request.

The ranking process occurs after selecting and sorting records. Therefore, the RNK. operator cannot be used in a WHERE or IF selection test or in a virtual (DEFINE) field. However, RNK.*fieldname* can be used in a WHERE TOTAL or IF TOTAL test or in a calculated (COMPUTE) value. You can change the default column title for the rank field using an AS phrase.

You can apply the RNK. operator to multiple sort fields, in which case the rank for each BY field is calculated within its higher level BY field.

# Calculate Ranks Using the RNK. Prefix Operator

In a PRINT command, COMPUTE expression, or IF/WHERE TOTAL expression :

```
RNK.field  ...
```

where:

**field**

Is a vertical (BY) sort field in the request.

# Ranking Within Sort Groups

The following request ranks years of service within department and ranks salary within years of service and department. Note that years of service depends on the value of TODAY. The output for this example was valid when run in September, 2006:

```
DEFINE FILE EMPDATA
  TODAY/YYMD = &YYMD;
  YRS_SERVICE/I9 = DATEDIF(HIREDATE,TODAY,'Y');
END
TABLE FILE EMPDATA
PRINT SALARY
  RNK.YRS_SERVICE AS 'RANKING,BY,SERVICE'
  RNK.SALARY AS 'SALARY,RANK'
     BY DEPT
     BY HIGHEST YRS_SERVICE
     BY HIGHEST SALARY NOPRINT
WHERE DEPT EQ 'MARKETING' OR 'SALES'
ON TABLE SET PAGE NOPAGE
END
```

The output is:

```
                                                RANKING
                                                BY       SALARY
DEPT                 YRS_SERVICE          SALARY SERVICE  RANK
----                 -----------          ------ -------  ------
MARKETING                     17      $55,500.00       1       1
                                      $55,500.00       1       1
                              16      $62,500.00       2       1
                                      $62,500.00       2       1
                                      $62,500.00       2       1
                                      $58,800.00       2       2
                                      $52,000.00       2       3
                                      $35,200.00       2       4
                                      $32,300.00       2       5
                              15      $50,500.00       3       1
                                      $43,400.00       3       2
```

```
SALES                          17      $115,000.00        1       1
                                        $54,100.00        1       2
                               16       $70,000.00        2       1
                                        $43,000.00        2       2
                               15       $43,600.00        3       1
                                        $39,000.00        3       2
                               15       $30,500.00        3       3
```

# Using RNK. in a WHERE TOTAL Test

The following request displays only those rows in the highest two salary ranks within the years of service category. Note that years of service depends on the value of TODAY. The output for this example was valid when run in September, 2006:

```
DEFINE FILE EMPDATA
  TODAY/YYMD = &YYMD;
  YRS_SERVICE/I9 = DATEDIF(HIREDATE,TODAY,'Y');
END
TABLE FILE EMPDATA
PRINT LASTNAME FIRSTNAME RNK.SALARY
BY HIGHEST YRS_SERVICE BY HIGHEST SALARY
WHERE TOTAL RNK.SALARY LE 2
END
```

The output is:

```
                                                                RANK
YRS_SERVICE           SALARY  LASTNAME        FIRSTNAME       SALARY
-----------           ------  --------        ---------       ------
         17      $115,000.00  LASTRA          KAREN                1
                  $80,500.00  NOZAWA          JIM                  2
         16       $83,000.00  SANCHEZ         EVELYN               1
                  $70,000.00  CASSANOVA       LOIS                 2
         15       $62,500.00  HIRSCHMAN       ROSE                 1
                              WANG            JOHN                 1
                  $50,500.00  LEWIS           CASSANDRA            2
```

# Using RNK. in a COMPUTE Command

The following request sets a flag to **Y** for records in which the salary rank within department is less than or equal to 5 and the rank of years of service within salary and department is less than or equal to 6. Otherwise, the flag has the value **N**. Note that the years of service depends on the value of TODAY. The output for this example was valid when run in September, 2006:

```
DEFINE FILE EMPDATA
  TODAY/YYMD = &YYMD;
  YRS_SERVICE/I9 = DATEDIF(HIREDATE,TODAY,'Y');
END
TABLE FILE EMPDATA
PRINT RNK.SALARY RNK.YRS_SERVICE
COMPUTE FLAG/A1 = IF RNK.SALARY LE 5  AND RNK.YRS_SERVICE LE 6
    THEN 'Y' ELSE 'N';
BY DEPT BY SALARY BY YRS_SERVICE
WHERE DEPT EQ 'MARKETING' OR 'SALES'
ON TABLE SET PAGE NOPAGE
END
```

The output is:

```
                                          RANK   RANK
DEPT                      SALARY YRS_SERVICE SALARY YRS_SERVICE FLAG
----                      ------ ----------- ------ ----------- ----
MARKETING              $32,300.00          16      1           1 Y
                       $35,200.00          16      2           1 Y
                       $43,400.00          15      3           1 Y
                       $50,500.00          15      4           1 Y
                       $52,000.00          16      5           1 Y
                       $55,500.00          17      6           1 N
                                               6               1 N
                       $58,800.00          16      7           1 N
                       $62,500.00          16      8           1 N
                                               8               1 N
                                               8               1 N
SALES                  $30,500.00          15      1           1 Y
                       $39,000.00          15      2           1 Y
                       $43,000.00          16      3           1 Y
                       $43,600.00          15      4           1 Y
                       $54,100.00          17      5           1 Y
```

```
                          $70,000.00          16      6           1 N
                         $115,000.00          17      7           1 N
```

# Rolling Up Calculations on Summary Rows

Using SUMMARIZE and RECOMPUTE, you can recalculate values at sort field breaks, but these calculations use the detail data to calculate the value for the summary line.

Using the ROLL. operator in conjunction with another prefix operator on a summary line recalculates the sort break values using the values from summary lines generated for the lower level sort break.

The operator combinations supported are:

- ROLL.SUM. (same as ROLL.). Alphanumeric fields are supported with SUM. This returns either the first, minimum, maximum, or last value according to the SUMPREFIX parameter.
- ROLL.AVE.
- ROLL.MAX. (supported with alphanumeric fields as well as numeric fields)
- ROLL.MIN. (supported with alphanumeric fields as well as numeric fields)
- ROLL.FST. (supported with alphanumeric fields as well as numeric fields)
- ROLL.LST. (supported with alphanumeric fields as well as numeric fields)
- ROLL.CNT.
- ROLL.ASQ.

ROLL.**prefix** on a summary line indicates that the prefix operation will be performed on the summary values from the next lowest level of summary command.

If the ROLL. operator is used without another prefix operator, it is treated as a SUM. Therefore, if the summary command for the lowest BY field specifies AVE., and the next higher specifies ROLL., the result will be the sum of the averages. To get the average of the averages, you would use ROLL.AVE at the higher level.

**Note:** With SUMMARIZE and SUB-TOTAL, the same calculations are propagated to all higher level sort breaks.

# Roll Up Summary Values

```
BY field {SUMMARIZE|SUBTOTAL|SUB-TOTAL|RECOMPUTE} [ROLL.][prefix1.]
[field1field2 ...|*] [ROLL.][prefix2.] [fieldn ...]
```

Or:

```
BY field
```

```
ON field {SUMMARIZE|SUBTOTAL|SUB-TOTAL|RECOMPUTE} ROLL.[prefix.]
[field1field2 ...|*]
```

where:

**ROLL.**

Indicates that the summary values should be calculated using the summary values from the next lowest level summary command.

**field**

Is a BY field in the request.

**prefix1, prefix2**

Are prefix operators to use for the summary values. It can be one of the following operators: SUM. (the default operator if none is specified), AVE., MAX., MIN., FST., LST., CNT., ASQ.

**field1field2fieldn**

Are fields to be summarized.

*****

Indicates that all fields, numeric and alphanumeric, should be included on the summary lines. You can either use the asterisk to display all columns or reference the specific columns you want to display.

# Rolling Up an Average Calculation

The following request against the GGSALES data source contains two sort fields, REGION and ST. The summary command for REGION applies the AVE. operator to the sum of the units value for each state.

```
TABLE FILE GGSALES
   SUM UNITS AS 'Inventory '
     BY REGION
   BY ST
   ON REGION SUBTOTAL      AVE.  AS 'Average'
   WHERE DATE GE 19971001
   WHERE REGION EQ 'West' OR 'Northeast'
   ON TABLE SET PAGE NOPAGE
   END
```

On the output, the UNITS values for each state are averaged to calculate the subtotal for each region. The UNITS values for each state are also used to calculate the average for the grand total row.

```
Region       State  Inventory
------       -----  ----------
Northeast    CT          37234
             MA          35720
             NY          36248

Average Northeast
                         36400

West         CA          75553
             WA          40969

Average West
                         58261


TOTAL                    45144
```

The following version of the request adds a summary command for the grand total line that includes the ROLL. operator:

```
TABLE FILE GGSALES
   SUM UNITS AS 'Inventory '
     BY REGION
   BY ST
   ON REGION SUBTOTAL  AVE.  AS 'Average'
   WHERE DATE GE 19971001
   WHERE REGION EQ 'West' OR 'Northeast'
   ON TABLE SUBTOTAL ROLL.AVE. AS ROLL.AVE
   ON TABLE SET PAGE NOPAGE
   END
```

On the output, the UNITS values for each state are averaged to calculate the subtotal for each region, and those region subtotal values are used to calculate the average for the grand total row:

```
Region       State  Inventory
  ------       -----  ----------
  Northeast    CT          37234
               MA          35720
               NY          36248

  Average Northeast
                           36400

  West         CA          75553
               WA          40969

  Average West
                           58261


  ROLL.AVE                 47330
```

# Propagating Rollups to Higher Level Sort Breaks

The following request against the GGSALES data source has three BY fields. The SUBTOTAL command for the PRODUCT sort field specifies AVE., and the SUMMARIZE command for the higher level sort field, REGION, specifies ROLL.AVE.

```
TABLE FILE GGSALES
SUM UNITS
```

```
BY REGION
BY PRODUCT
BY HIGHEST DATE
WHERE DATE GE 19971001
  WHERE REGION EQ 'Midwest' OR 'Northeast'
  WHERE PRODUCT LIKE 'C%'
  ON PRODUCT SUBTOTAL AVE.
  ON REGION SUMMARIZE ROLL.AVE. AS ROLL.AVE
ON TABLE SET PAGE NOPAGE
END
```

On the output, the detail rows for each date are used to calculate the average for each product. Because of the ROLL.AVE. at the region level, the averages for each product are used to calculate the averages for each region, and the region averages are used to calculate the average for the grand total line:

```
Region       Product                Date  Unit Sales
  ------       -------                ----  ----------
  Midwest      Coffee Grinder    1997/12/01        4648
                                 1997/11/01        3144
                                 1997/10/01        1597

  *TOTAL PRODUCT Coffee Grinder                     3129

               Coffee Pot        1997/12/01        1769
                                 1997/11/01        1462
                                 1997/10/01        2346

  *TOTAL PRODUCT Coffee Pot                         1859

               Croissant         1997/12/01        7436
                                 1997/11/01        5528
                                 1997/10/01        6060

  *TOTAL PRODUCT Croissant                          6341
  ROLL.AVE Midwest                                  3776

  Northeast    Capuccino         1997/12/01        1188
                                 1997/11/01        2282
                                 1997/10/01        3675

  *TOTAL PRODUCT Capuccino                          2381

               Coffee Grinder    1997/12/01        1536
                                 1997/11/01        1399
```

```
                              1997/10/01        1315

*TOTAL PRODUCT Coffee Grinder                   1416

             Coffee Pot       1997/12/01        1442
                              1997/11/01        2129
                              1997/10/01        2082

*TOTAL PRODUCT Coffee Pot                       1884

             Croissant        1997/12/01        4291
                              1997/11/01        6978
                              1997/10/01        4741

*TOTAL PRODUCT Croissant                        5336
ROLL.AVE Northeast                              2754


TOTAL                                           3265
```

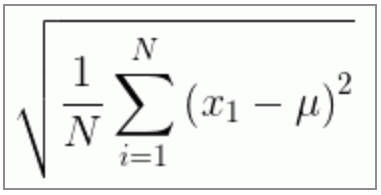
# Usage Notes for ROLL.

- ROLL.**prefix** on a summary line indicates that the prefix operation will be performed on the summary values from the next lowest level of summary command.
- If no summary command was issued at the level below the ROLL., and no other operator was used in conjunction with the ROLL., a SUM. will be calculated. If the lower level had no summary command and ROLL. was used with another prefix operator (for example, ROLL.AVE.), the specified prefix operator will be used. For example, ROLL.AVE. will become AVE.
- CNT. **prefix** shows the number of data lines displayed, which is not affected by MULTILINES.
- ROLL.CNT. **prefix** shows the number of summary lines displayed, which is affected by MULTILINES.

# Calculating the Standard Deviation for a Population or a Sample

The standard deviation prefix operators return a numeric value that represents the amount of dispersion in the data. The set of data can be specified as the entire population (STDP.) or a sample (STDS.). The standard deviation is the square root of the variance, which is a measure of how observations deviate from their expected value (mean). If specified as a population, the divisor in the standard deviation calculation (also called degrees of freedom) will be the total number of data points, N. If specified as a sample, the divisor will be N-1.

If $x_i$ is an observation, N is the number of observations, and μ is the mean of all of the observations, the formula for calculating the standard deviation for a population is:



$$\sqrt{\frac{1}{N}\sum_{i=1}^{N}(x_1-\mu)^2}$$

To calculate the standard deviation for a sample, the mean is calculated using the sample observations, and the divisor is N-1 instead of N.

To calculate the standard deviation for a population, the syntax is:

```
STDP.field
```

To calculate the standard deviation for a sample, the syntax is:

```
STDS.field
```

where:

**field**

Numeric

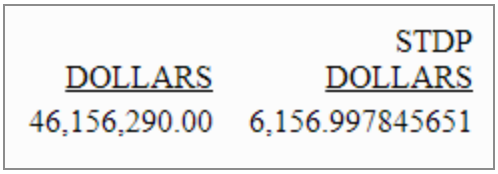
Is the set of observations for the standard deviation calculation.

# Calculating the Standard Deviation of a Population

The following request calculates the standard deviation of the population of the DOLLARS field converted to double precision.

```
DEFINE FILE ibisamp/ggsales
DOLLARS/D12.2 = DOLLARS;
END
TABLE FILE ibisamp/ggsales
SUM DOLLARS STDP.DOLLARS
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image.



| DOLLARS | STDP DOLLARS |
|---|---|
| 46,156,290.00 | 6,156.997845651 |

# Using Report-Level Prefix Operators

Report level prefix operators are available for headings, footings, subheadings, subfootings, verb objects, and calculated values (COMPUTEs) that calculate the average, maximum, minimum, and count for the entire report. They are based on the TOT. operator, which calculates total values to include in a heading.

These operators cannot be referenced in WHERE or WHERE TOTAL tests. However, they can be used in a COMPUTE command to generate a calculated value that can be used in a WHERE TOTAL test.

# Calculate Report-Level Average, Maximum, Minimum, and Count Values

```
operator.field
```

where:

**operator**

Can be one of the following prefix operators.

- **TOTAVE.** Calculates the average value of the field for the entire table.
- **TOTMAX.** Calculates the maximum value of the field for the entire table.
- **TOTMIN.** Calculates the minimum value of the field for the entire table.
- **TOTCNT.** Calculates the count of the field instances for the entire table.

**field**

Is a verb object or calculated value in the request.

# Using Prefix Operators in a Heading

The following request uses prefix operators in the heading.

```
TABLE WF_RETAIL_LITE
HEADING
"Heading Calculations:"
"Total:      <TOT.COGS_US"
"Count:                  <TOTCNT.COGS_US"
"Average:           <TOTAVE.COGS_US"
"Minimum:            <TOTMIN.COGS_US"
"Maximum:      <TOTMAX.COGS_US"
SUM COGS_US CNT.COGS_US AS Count AVE.COGS_US AS Average
MIN.COGS_US AS Minimum MAX.COGS_US AS Maximum
BY BUSINESS_REGION AS Region
BY PRODUCT_CATEGORY AS Category
WHERE BUSINESS_REGION NE 'Oceania'
ON TABLE SUBTOTAL COGS_US CNT.COGS_US  AS Total
ON TABLE SET PAGE NOPAGE
```

```
ON TABLE SET SHOWBLANKS ON
ON TABLE SET STYLE *
type=report,grid=off, size=11,$
ENDSTYLE
END
```

The output is shown in the following image.

Heading Calculations:
Total: $2,940,745.00
Count: 9961
Average: $295.23
Minimum: $16.00
Maximum: $9,750.00

| Region | Category | Cost of Goods | Count | Average | Minimum | Maximum |
|---|---|---|---|---|---|---|
| EMEA | Accessories | $143,987.00 | 630 | $228.55 | $16.00 | $2,850.00 |
| | Camcorder | $187,000.00 | 611 | $306.06 | $60.00 | $8,610.00 |
| | Computers | $47,616.00 | 266 | $179.01 | $81.00 | $668.00 |
| | Media Player | $328,401.00 | 956 | $343.52 | $36.00 | $1,640.00 |
| | Stereo Systems | $361,756.00 | 1412 | $256.20 | $48.00 | $2,295.00 |
| | Televisions | $100,443.00 | 120 | $837.02 | $275.00 | $6,500.00 |
| | Video Production | $78,722.00 | 276 | $285.22 | $78.00 | $1,880.00 |
| North America | Accessories | $171,306.00 | 743 | $230.56 | $16.00 | $2,040.00 |
| | Camcorder | $242,967.00 | 692 | $351.11 | $60.00 | $6,000.00 |
| | Computers | $53,329.00 | 284 | $187.78 | $81.00 | $668.00 |
| | Media Player | $386,681.00 | 1118 | $345.87 | $36.00 | $1,600.00 |
| | Stereo Systems | $412,036.00 | 1636 | $251.86 | $48.00 | $2,700.00 |
| | Televisions | $101,212.00 | 121 | $836.46 | $275.00 | $6,500.00 |
| | Video Production | $89,489.00 | 325 | $275.35 | $78.00 | $1,410.00 |
| South America | Accessories | $25,723.00 | 103 | $249.74 | $16.00 | $1,470.00 |
| | Camcorder | $22,686.00 | 110 | $206.24 | $60.00 | $1,000.00 |
| | Computers | $7,845.00 | 47 | $166.91 | $81.00 | $501.00 |
| | Media Player | $60,183.00 | 161 | $373.81 | $36.00 | $1,480.00 |
| | Stereo Systems | $81,823.00 | 284 | $288.11 | $48.00 | $2,700.00 |
| | Televisions | $25,800.00 | 25 | $1,032.00 | $275.00 | $9,750.00 |
| | Video Production | $11,740.00 | 41 | $286.34 | $78.00 | $1,410.00 |
| Total | | $2,940,745.00 | 9961 | | | |

# Usage Notes for Report-Level Prefix Operators

- These operators can be used on a field in a heading or footing without being referenced in a display command in the request.
- They work in a heading or footing for real or virtual (DEFINE) fields. They work in a display command field list on real fields, virtual (DEFINE) fields, and calculated (COMPUTE) values that are calculated prior to their use in the request.
- They can be used in subheadings and subfootings to reference the total value for the entire report.

# Displaying Pop-up Field Descriptions for Column Titles

You can have pop-up field descriptions display in an HTML report when the mouse pointer is positioned over column titles. Field description text displays in a pop-up box near the column title using the default font for the report. Pop-up text appears for report column titles including titles created with ACROSS phrases and stacked column titles created with OVER phrases.

The pop-up text displayed for a column title is defined by the Description attribute in the Master File for the corresponding field. If a column title has no Description entry in the Master File, then no pop-up box is generated when your mouse is positioned over the title.

For more information about the Description attribute, see *Null or MISSING Values: MISSING* in the *Describing Data With ibi™ WebFOCUS® Language* manual.

# Use the POPUPDESC Command

```
SET POPUPDESC = {ON|OFF}
```

where:

**ON**

Enables pop-up field descriptions when your mouse pointer is positioned over column titles.

**OFF**

Disables pop-up field descriptions when your mouse pointer is positioned over column titles. OFF is the default value.

# Using the POPUPDESC Command

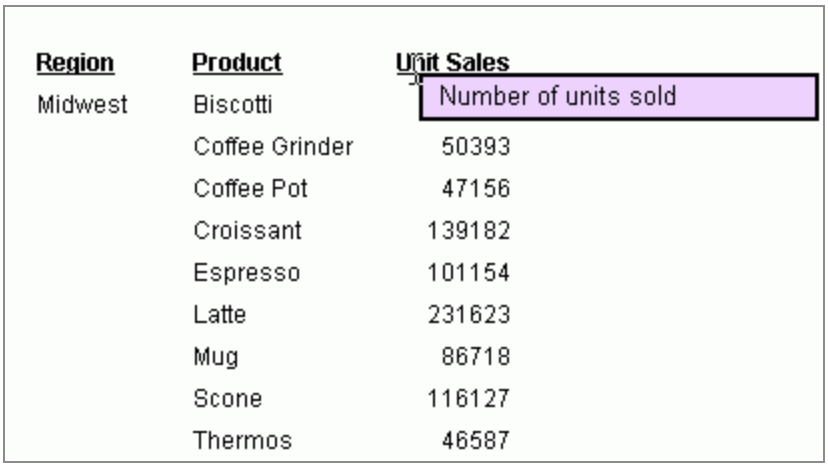
The Master File referenced by the report contains the following:

```
FIELD=UNITS, ALIAS=E10, FORMAT=I08, TITLE='Unit Sales',
 DESC='Number of units sold',$
```

The code used to create the report is:

```
TABLE FILE GGSALES
SUM UNITS
BY REGION
BY PRODUCT
WHERE REGION EQ 'Midwest'
ON TABLE SET POPUPDESC ON
END
```

The following image shows the report output and the pop-up field description text that displays when your mouse pointer is positioned over the Unit Sales column title.



# Distributing Reports With Pop-up Field Descriptions Using ReportCaster

Distributing an HTML report containing pop-up field descriptions with ReportCaster requires the use of JavaScript components located on the WebFOCUS Client. To access these components from a report distributed by ReportCaster, the scheduled procedure must contain the SET FOCHTMLURL command, which must be set to an absolute URL, instead of the default value. For example,

```
SET FOCHTMLURL = http://hostname[:port]/ibi_apps/ibi_html
```

where:

**hostname[:port]**

Is the host name and optional port number (specified only if you are not using the default port number) where the WebFOCUS Web application is deployed.

**ibi_apps/ibi_html**

ibi_apps is the site-customized web server alias pointing to the WEBFOCUS82/ibi_apps directory (where ibi_apps is the default value). ibi_html is a directory within the path to the JavaScript files that are required to be accessible.

For more information about coding reports for use with ReportCaster, see the *Tips and Techniques for Coding a ReportCaster Report* appendix in the *ibi™ WebFOCUS® ReportCaster* manual.

# Sorting Tabular Reports

Sorting enables you to group or organize report information vertically and horizontally, in rows and columns, and specify a desired sequence of data items in the report.

Any field in the data source can be the sort field. If you wish, you can select several sort fields, nesting one within another. Sort fields appear only when their values change.

# Sorting Tabular Reports Overview

You sort a report using vertical (BY) and horizontal (ACROSS) phrases:

- BY displays the sort field values vertically, creating rows. Vertical sort fields are displayed in the left-most columns of the report.
- ACROSS displays the sort field values horizontally, creating columns. Horizontal sort fields are displayed across the top of the report.
- BY and ACROSS phrases used in the same report create rows and columns, producing a grid or matrix.

A request can include up to 128 sort phrases consisting of any combination of BY and ACROSS phrases.

Additional sorting options include:

- Sorting from low to high values or from high to low values, and defining your own sorting sequence.
- Sorting based on case-sensitive or case-insensitive collation sequence.
- Leaving the value of the sort field out of the report.
- Grouping numeric data into tiles such as percentiles or deciles.
- Aggregating and sorting numeric columns simultaneously.
- Grouping numeric data into ranges.
- Ranking data, and selecting data based on rank.

# Sorting and Displaying Data

There are two ways that you can sort information, depending on the type of display command you use:

- You can sort and display individual values of a field using the PRINT or LIST command.
- You can group and aggregate information. For example, you can show the number of field occurrences per sort value using the COUNT command, or summing the field values using the SUM command.

When you use the display commands PRINT and LIST, the report may generate several rows per sort value; specifically, one row for each occurrence of the display field. When you use the commands SUM and COUNT, the report generates one row for each unique set of sort values. For related information, see Sorting With Multiple Display Commands.

For details on all display commands, see Displaying Report Data.

# Sorting Rows

You can sort report information vertically using the BY phrase. This creates rows in your report. You can include up to 128 sort phrases (BY phrases plus ACROSS phrases) per report request (127 if using PRINT or LIST display commands).

Sort fields appear when their value changes. However, you can display every sort value using the BYDISPLAY parameter. For an example, see Controlling Display of Sort Field Values.

# Sort by Rows

```
BY {HIGHEST|LOWEST} [n] sortfield [AS 'text']
```

where:

**HIGHEST**

Sorts in descending order.

**LOWEST**

Sorts in ascending order. LOWEST is the default value.

**n**

Specifies that only **n** sort field values are included in the report.

**sortfield**

Is the name of the sort field.

**text**

Is the column heading to use for the sort field column on the report output.

# Usage Notes for Sorting Rows

- When using the display command LIST with a BY phrase, the LIST counter is reset to 1 each time the major sort value changes.
- The default sort sequence is low-to-high, with the following variations for different operating systems. In z/OS the sequence is a-z, A-Z, 0-9 for alphanumeric fields; 0-9 for numeric fields. In UNIX and Windows the sequence is 0-9, A-Z, a-z for alphanumeric fields; 0-9 for numeric. You can specify other sorting sequences, as described in Specifying the Sort Order.
- You cannot use text fields as sort fields. Text fields are those described in the Master File with a FORMAT value of TX.
- You can use a temporary field created by a DEFINE command, or by the DEFINE attribute in a Master File, as a sort field. In order to use a temporary field created by a COMPUTE command as a sort field, you must use the BY TOTAL phrase instead of the BY phrase.
- If you specify several sort fields when reporting from a multi-path data source, all the sort fields must be in the same path.
- Sort phrases cannot contain format information for fields.

- Each sort field value appears only once in the report. For example, if there are six employees in the MIS department, a request that declares

  ```
  PRINT LAST_NAME BY DEPARTMENT
  ```

  prints MIS once, followed by six employee names. You can populate every vertical sort column cell with a value, even if the value is repeating, using the SET BYDISPLAY parameter. For details, see Controlling Display of Sort Field Values.

# Sorting Rows With BY

The following illustrates how to display all employee IDs by department.

```
TABLE FILE EMPLOYEE
PRINT EMP_ID
BY DEPARTMENT
END
```

The output displays a row for each EMP_ID in each department:

| DEPARTMENT | EMP_ID |
|---|---|
| MIS | 112847612 |
| | 117593129 |
| | 219984371 |
| | 326179357 |
| | 543729165 |
| | 818692173 |
| PRODUCTION | 071382660 |
| | 119265415 |
| | 119329144 |
| | 123764317 |
| | 126724188 |
| | 451123478 |

# Using Multiple Vertical (BY) Sort Fields

You can organize information in a report by using more than one sort field. When you specify several sort fields, the sequence of the BY phrases determines the sort order. The first BY phrase sets the major sort break, the second BY phrase sets the second sort break, and so on. Each successive sort is nested within the previous one.

## Sorting With Multiple Vertical (BY) Sort Fields

The following request uses multiple vertical (BY) sort fields.

```
TABLE FILE EMPLOYEE
PRINT CURR_SAL
BY DEPARTMENT BY LAST_NAME
WHERE CURR_SAL GT 21500
END
```

The output is:

```
DEPARTMENT  LAST_NAME              CURR_SAL
----------  ---------              --------
MIS         BLACKWOOD             $21,780.00
            CROSS                 $27,062.00
PRODUCTION  BANNING               $29,700.00
            IRVING                $26,862.00
```

# Displaying a Row for Data Excluded by a Sort Phrase

In a sort phrase, you can restrict the number of sort values displayed. With the PLUS OTHERS phrase, you can aggregate all other values to a separate group and display this group as an additional report row.

# Display Data Excluded by a Sort Phrase

```
[RANKED] BY {HIGHEST|LOWEST|TOP|BOTTOM}  n srtfield [AS 'text']
            [PLUS OTHERS AS 'othertext']
            [IN-GROUPS-OF m1 [TOP n2]]
            [IN-RANGES-OF m3 [TOP n4]
```

where:

**LOWEST**

Sorts in ascending order, beginning with the lowest value and continuing to the highest value (a-z, A-Z, 0-9 for alphanumeric fields; 0-9 for numeric fields). BOTTOM is a synonym for LOWEST.

**HIGHEST**

Sorts in descending order, beginning with the highest value and continuing to the lowest value. TOP is a synonym for HIGHEST.

**n**

Specifies that only *n* sort field values are included in the report.

**srtfield**

Is the name of the sort field.

**text**

Is the text to be used as the column heading for the sort field values.

**othertext**

Is the text to be used as the row title for the "others" grouping. This AS phrase must be the AS phrase immediately following the PLUS OTHERS phrase.

**m1**

Is the incremental value between sort field groups.

**n2**

Is an optional number that defines the highest group label to be included in the report.

**m3**

Is an integer greater than zero indicating the range by which sort field values are grouped.

**n4**

Is an optional number that defines the highest range label to be included in the report. The range is extended to include all data values higher than this value.

# Usage Notes for PLUS OTHERS

- Alphanumeric group keys are not supported.
- Only one PLUS OTHERS phrase is supported in a request.
- In a request with multiple display commands, the BY field that has the PLUS OTHERS phrase must be the lowest level BY field in the request. If it is not, a message will display and the request will not be processed.
- The BY ROWS OVER, TILES, ACROSS, and BY TOTAL phrases are not supported with PLUS OTHERS.
- PLUS OTHERS is not supported in a MATCH FILE request. However, MORE in a TABLE request is supported.
- HOLD is supported for formats PDF, PS, HTML, DOC, and WP.

# Displaying a Row Representing Sort Field Values Excluded by a Sort Phrase

The following request displays the top two ED_HRS values and aggregates the values not included in a row labeled Others:

```
TABLE FILE EMPLOYEE
PRINT CURR_SAL LAST_NAME
  BY HIGHEST 2 ED_HRS
  PLUS OTHERS AS 'Others'
END
```

The output is:

```
ED_HRS         CURR_SAL  LAST_NAME
------         --------  ---------
 75.00       $21,780.00  BLACKWOOD
 50.00       $18,480.00  JONES
             $16,100.00  MCKNIGHT
Others      $165,924.00
```

# Displaying a Row Representing Data Not Included in Any Sort Field Grouping

The following request sorts by highest 2 ED_HRS and groups the sort field values by increments of 25 ED_HRS. Values that fall below the lowest group label are included in the Others category. All values above the top group label are included in the top group:

```
TABLE FILE EMPLOYEE
PRINT CURR_SAL LAST_NAME
  BY HIGHEST 2 ED_HRS
  PLUS OTHERS AS 'Others'
IN-GROUPS-OF 25 TOP 50
END
```

The output is:

```
ED_HRS         CURR_SAL  LAST_NAME
------         --------  ---------
 50.00       $18,480.00  JONES
             $21,780.00  BLACKWOOD
             $16,100.00  MCKNIGHT
 25.00       $11,000.00  STEVENS
             $13,200.00  SMITH
             $26,862.00  IRVING
              $9,000.00  GREENSPAN
             $27,062.00  CROSS
Others       $78,800.00
```

If the BY HIGHEST phrase is changed to BY LOWEST, all values above the top grouping (50 ED_HRS and above) are included in the Others category:

```
TABLE FILE EMPLOYEE
PRINT CURR_SAL LAST_NAME
  BY LOWEST 2 ED_HRS
  PLUS OTHERS AS 'Others'
IN-GROUPS-OF 25 TOP 50
END
```

The output is:

```
ED_HRS          CURR_SAL  LAST_NAME
------          --------  ---------
   .00         $9,500.00  SMITH
              $29,700.00  BANNING
              $21,120.00  ROMANS
              $18,480.00  MCCOY
 25.00        $11,000.00  STEVENS
              $13,200.00  SMITH
              $26,862.00  IRVING
               $9,000.00  GREENSPAN
              $27,062.00  CROSS
Others        $56,360.00
```

# Sorting Columns

You can sort report information horizontally using the ACROSS phrase. This creates columns in your report. The total number of ACROSS columns is equal to the total number of ACROSS sort field values multiplied by the total number of display fields.

A request can include up to 128 sort phrases consisting of any combination of BY and ACROSS phrases.

The maximum number of display fields your report can contain is determined by a combination of factors. In general, if a horizontal (ACROSS) sort field contains many data values, you may exceed the allowed width for reports, or create a report that is difficult to read. For details, see Displaying Report Data.

You can produce column totals or summaries for ACROSS sort field values using ACROSS-TOTAL, SUBTOTAL, SUB-TOTAL, RECOMPUTE, and SUMMARIZE. For details, see Including Totals and Subtotals.

# Sort Columns

```
ACROSS sortfield
```

where:

**sortfield**

Is the name of the sort field.

# Usage Notes for Sorting Columns

- You cannot use text fields as sort fields. Text fields are those described in the Master File with a FORMAT value of TX.
- You can use a temporary field created by a DEFINE command, or by the DEFINE attribute in a Master File, as a sort field. However, you cannot use a temporary field created by a COMPUTE command as a sort field. You can accomplish this using the BY TOTAL phrase or indirectly by first creating a HOLD file that includes the field, and then reporting from the HOLD file. HOLD files are described in Saving and Reusing Your Report Output.
- For an ACROSS phrase, the SET SPACES parameter controls the distance between ACROSS sets. For more information, see Laying Out the Report Page.
- If you specify several sort fields when reporting from a multipath data source, all the sort fields must be in the same path.
- In styled output formats (PDF, HTML, DHTML, PPT, PPTX, and XLSX), the width of ACROSS titles and ACROSS values above the data columns is defined as the largest width of all data columns, and associated column titles, within the ACROSS groups. To change the size of the ACROSS groups, apply SQUEEZE, WRAP, or WIDTH definitions to the data columns within each group.
- Each sort field value is displayed only once in the report unless you change this default using the SET BYDISPLAY command. For example, if there are six employees in the MIS department, a report that declares

  ```
  PRINT LAST_NAME ACROSS DEPARTMENT
  ```

  prints MIS once, followed by six employee names.

# Sorting Columns With ACROSS

The following illustrates how to show the total salary outlay for each department. This request is sorted horizontally with an ACROSS phrase.

```
TABLE FILE EMPLOYEE
SUM CURR_SAL ACROSS DEPARTMENT
END
```

The output is:

```
DEPARTMENT
MIS                    PRODUCTION
---------------------------------
$108,002.00           $114,282.00
```

Notice that the horizontal sort displays a column for each sort field (department).

# Controlling Display of an ACROSS Title for a Single Field

Using the SET ACRSVRBTITL command, you can control the display of an ACROSS column title in an ACROSS group. The behavior of the title is determined by the number of verb columns in the ACROSS group. The field count is affected by the following features, which add internal matrix columns to the report:

- Fields in a heading or footing.
- Fields whose display is suppressed with the NOPRINT phrase.
- Reformatted fields (which are normally counted twice).
- A COMPUTE command referencing multiple fields.

# Control Display of an ACROSS Title for a Single Field

```
SET ACRSVRBTITL = {HIDEONE|ON|OFF}
ON TABLE SET ACRSVRBTITL {HIDEONE|ON|OFF}
```

where:

**HIDEONE**

Suppresses the title when there is only one display field, or there is only one display field and the request contains one or more of the features that add internal matrix columns to the report. This value is the default.

**ON**

Always displays the title even if there is only one display field.

**OFF**

Suppresses the title when there is only one display field. Displays the title when there is only one display field and the request contains one or more of the features that add internal matrix columns to the report. This is legacy behavior.

# Hiding an ACROSS Title With ACRSVRBTITL

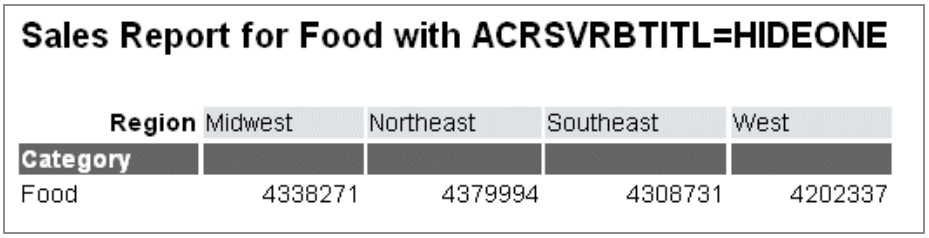
The following request against the GGSALES data source has a display field in the heading:

```
SET ACRSVRBTITL=HIDEONE
TABLE FILE GGSALES
HEADING
"Sales Report for <CATEGORY with ACRSVRBTITL=HIDEONE"
" "
SUM DOLLARS AS Sales
BY CATEGORY
ACROSS REGION
WHERE CATEGORY EQ 'Food'
ON TABLE SET PAGE NOPAGE
ON TABLE SET ACROSSTITLE SIDE
ON TABLE SET ACROSSLINE SKIP
```

```
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, FONT='ARIAL', SIZE=9, SQUEEZE=ON,$
TYPE=TITLE,JUSTIFY=LEFT,BACKCOLOR=RGB(102 102 102),COLOR=RGB(255 255
255),STYLE=BOLD,$
TYPE=HEADING, SIZE=11, STYLE=BOLD,JUSTIFY=CENTER, $
TYPE=ACROSSTITLE,STYLE=BOLD,$
TYPE=ACROSSVALUE,BACKCOLOR=RGB(218 225 232),$
END
```

Using the default value for ACRSVRBTITL, HIDEONE, suppresses the ACROSS title **Sales**, even though the heading displays a field value that adds a report column to the internal matrix.

The report output is shown in the following image:



**Sales Report for Food with ACRSVRBTITL=HIDEONE**

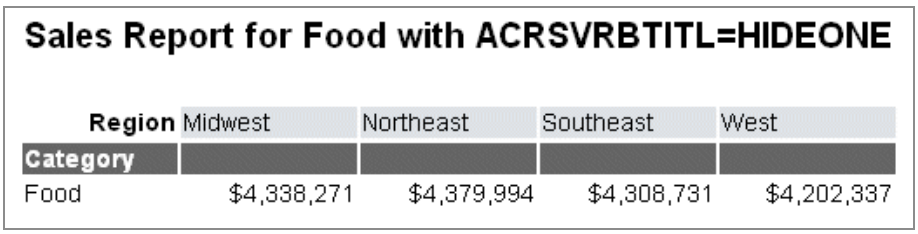
| Region | Midwest | Northeast | Southeast | West |
|---|---|---|---|---|
| **Category** | | | | |
| Food | 4338271 | 4379994 | 4308731 | 4202337 |

If you change the SUM command to the following:

```
SUM DOLLARS/D12CM
```

the field in the heading and the reformatted dollar sales values add report columns to the internal matrix, but the ACROSS title **Sales** is still suppressed.

The report output is shown in the following image:



**Sales Report for Food with ACRSVRBTITL=HIDEONE**

| Region | Midwest | Northeast | Southeast | West |
|---|---|---|---|---|
| **Category** | | | | |
| Food | $4,338,271 | $4,379,994 | $4,308,731 | $4,202,337 |

Using the ACRSVRBTITL value ON, without reformatting the dollar sales column, does not suppress the ACROSS title **Sales** because the heading displays a field value that adds a report column to the internal matrix.

The report output is shown in the following image:

**Sales Report for Food with ACRSVRBTITL=ON**

| Region | Midwest | Northeast | Southeast | West |
|---|---|---|---|---|
| **Category** | **Sales** | **Sales** | **Sales** | **Sales** |
| Food | 4338271 | 4379994 | 4308731 | 4202337 |

If you change the SUM command to the following:

```
SUM DOLLARS/D12CMC
```

the field in the heading and the reformatted dollar sales values add report columns to the internal matrix, so the ACROSS title **Sales** is not suppressed.

The report output is shown in the following image:

**Sales Report for Food with ACRSVRBTITL=ON**

| Region | Midwest | Northeast | Southeast | West |
|---|---|---|---|---|
| **Category** | **Sales** | **Sales** | **Sales** | **Sales** |
| Food | $4,338,271 | $4,379,994 | $4,308,731 | $4,202,337 |

With the setting ACRSVRBTITL=OFF, the field in the heading adds a report column to the internal matrix, and the ACROSS title **Sales** is not suppressed.

The report output is shown in the following image:

**Sales Report for Food with ACRSVRBTITL=OFF**

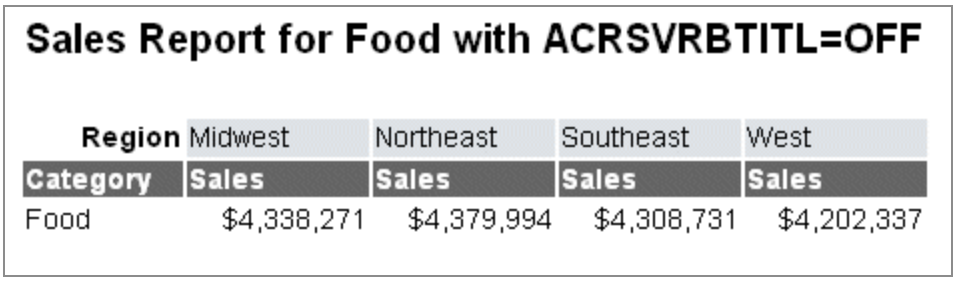
| Region | Midwest | Northeast | Southeast | West |
|---|---|---|---|---|
| **Category** | **Sales** | **Sales** | **Sales** | **Sales** |
| Food | 4338271 | 4379994 | 4308731 | 4202337 |

If you change the SUM command to the following:

```
SUM DOLLARS/D12CM
```

the field in the heading and the reformatted dollar sales values add report columns to the internal matrix, and the ACROSS title **Sales** is not suppressed.

The report output is shown in the following image:



Sales Report for Food with ACRSVRBTITL=OFF

| Region | Midwest | Northeast | Southeast | West |
|---|---|---|---|---|
| Category | Sales | Sales | Sales | Sales |
| Food | $4,338,271 | $4,379,994 | $4,308,731 | $4,202,337 |

# Positioning ACROSS Titles on Report Output

In a report that uses the ACROSS sort phrase to sort values horizontally across the page, by default, two lines are generated on the report output for the ACROSS columns. The first line displays the name of the sort field (ACROSS title), and the second line displays the values for that sort field (ACROSS value). The ACROSS field name is left justified above the first ACROSS value.

If you want to display both the ACROSS title and the ACROSS values on one line in the PDF, HTML, EXL2K, or XLSX report output, you can issue the SET ACROSSTITLE = SIDE command. This command places ACROSS titles to the left of the ACROSS values. By default, the titles are right justified in the space above the BY field titles. You can change the justification of the ACROSS title by adding the JUSTIFY attribute to the StyleSheet declaration for the ACROSSTITLE component. If there are no BY fields, the heading line that is created by default to display the ACROSS title will not be generated.

This feature is designed for use in requests that have both ACROSS fields and BY fields. For requests with ACROSS fields but no BY fields, the set command is ignored, and the ACROSS titles are not moved.

Note that for certain output formats, you can control whether column titles are underlined using the SET TITLELINE command. SET ACROSSLINE is a synonym for SET TITLELINE. For information, see Using Headings, Footings, Titles, and Labels.

# Control the Position of ACROSS Field Names

```
SET ACROSSTITLE = {ABOVE|SIDE}
```

where:

**ABOVE**

Displays ACROSS titles above their ACROSS values. ABOVE is the default value.

**SIDE**

Displays ACROSS titles to the left of their ACROSS values, above the BY columns.

# Usage Notes for SET ACROSSTITLE

- When the ACROSS value wraps, the ACROSS title aligns with the top line of the wrapped ACROSS values.
- The ACROSS title spans the width of the BY columns. If the ACROSS title value is larger than the width of the BY columns on the current page, the value is truncated. The first panel may have more BY fields than subsequent panels, if SET BYPANEL is set to a value smaller than the total number of BY fields.
- This setting will not create a new column within the report for the title placement.
    - If the request does not have any BY fields, the ACROSS title is not moved.
    - With BYPANEL=OFF, the ACROSS title is not displayed on subsequent panels.
- WRAP is not supported for ACROSSTITLE with SET ACROSSTITLE=SIDE.

# Placing the ACROSS Title on the Same Line as the ACROSS Values

The following example against the GGSALES data source has two ACROSS sort fields, CATEGORY and PRODUCT. SET ACROSSTITLE=SIDE moves the ACROSS title to the left of the ACROSS values. With BYPANEL=ON the ACROSS titles are repeated in the same location on each subsequent panel.

```
SET ACROSSTITLE=SIDE
SET BYPANEL=ON
TABLE FILE GGSALES
SUM
     DOLLARS/I8M AS ''
BY REGION
BY ST
BY CITY
ACROSS CATEGORY
ACROSS PRODUCT
WHERE PRODUCT NE 'Capuccino';
ON TABLE SET PAGE-NUM ON
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
     UNITS=IN,
     SQUEEZE=ON,
     ORIENTATION=PORTRAIT,
$
TYPE=REPORT,
     FONT='ARIAL',
     SIZE=10,
     BORDER=LIGHT,
$
TYPE=ACROSSVALUE,
     WRAP=ON,
$
ENDSTYLE
END
```

The ACROSS title *Category* displays to the left of the ACROSS values *Coffee*, *Food*, and *Gifts*. The ACROSS title *Product* displays to the left of the ACROSS values *Espresso*, *Latte*, *Biscotti*, and so on. The ACROSS titles are right-justified above the space occupied by the BY field names *Region*, *State*, and *City*. Notice that the ACROSS value *Croissant* wraps onto a second line, and the ACROSS title is aligned with the top line. The following shows panel 1:

PAGE 1.1

| | | Category | Coffee | | Food | | | Gifts |
|---|---|---|---|---|---|---|---|---|
| | | Product | Espresso | Latte | Biscotti | Croissant | Scone | Coffee Grinder |
| Region | State | City | | | | | | |
| Midwest | IL | Chicago | $420,439 | $978,340 | $378,412 | $549,366 | $595,069 | $233,292 |
| | MO | St. Louis | $419,143 | $966,981 | $368,077 | $613,871 | $481,953 | $181,570 |
| | TX | Houston | $455,365 | $938,245 | $345,238 | $587,887 | $418,398 | $204,292 |
| Northeast | CT | New Haven | $279,373 | $926,052 | $589,355 | $551,489 | $283,874 | $169,908 |
| | MA | Boston | $248,356 | $917,737 | $570,391 | $497,234 | $332,486 | $177,940 |
| | NY | New York | $322,378 | $928,026 | $642,259 | $622,095 | $290,811 | $161,352 |
| Southeast | FL | Orlando | $256,539 | $889,887 | $511,597 | $602,076 | $311,836 | $217,204 |
| | GA | Atlanta | $317,389 | $907,365 | $555,231 | $661,806 | $273,420 | $217,254 |
| | TN | Memphis | $279,644 | $820,584 | $438,889 | $638,477 | $315,399 | $171,319 |
| West | CA | Los Angeles | $267,809 | $809,647 | $266,030 | $800,084 | $315,584 | $214,557 |
| | | San Francisco | $338,270 | $935,862 | $269,518 | $824,457 | $292,839 | $187,123 |
| | WA | Seattle | $301,538 | $924,896 | $328,320 | $801,060 | $304,445 | $201,756 |

The following shows panel 2:

PAGE 1.2

| | | Category | Gifts | | |
|---|---|---|---|---|---|
| | | Product | Coffee Pot | Mug | Thermos |
| Region | State | City | | | |
| Midwest | IL | Chicago | $204,828 | $376,754 | $187,901 |
| | MO | St. Louis | $190,153 | $343,852 | $195,686 |
| | TX | Houston | $204,897 | $366,337 | $194,319 |
| Northeast | CT | New Haven | $208,209 | $392,967 | $221,827 |
| | MA | Boston | $184,119 | $401,944 | $203,435 |
| | NY | New York | $198,452 | $349,300 | $178,836 |
| Southeast | FL | Orlando | $212,057 | $409,466 | $195,526 |
| | GA | Atlanta | $232,552 | $355,447 | $227,482 |
| | TN | Memphis | $200,694 | $337,790 | $209,449 |
| West | CA | Los Angeles | $202,285 | $381,926 | $207,613 |
| | | San Francisco | $197,845 | $379,399 | $165,115 |
| | WA | Seattle | $213,494 | $427,339 | $198,640 |

# ACROSS Title Spacing

The following example against the GGSALES data source has two BY fields and two ACROSS fields. This example does not set borders on and does not enable wrapping of the ACROSS values. SET ACROSSTITLE=SIDE moves the ACROSS title to the left of the ACROSS values. The SET BYPANEL=1 command repeats only the first BY field on the second panel. To

prevent the ACROSS titles from being truncated to fit above the BY field on the second panel, the first BY field has an AS name that is longer than the default name:

```
SET ACROSSTITLE=SIDE
SET BYPANEL=1
TABLE FILE GGSALES
SUM
     DOLLARS/I8M AS ''
BY ST AS 'State Code'
BY CITY
ACROSS CATEGORY AS 'Categories'
ACROSS PRODUCT AS 'Products'
WHERE PRODUCT NE 'Capuccino';
ON TABLE SET PAGE-NUM ON
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
     UNITS=IN,
     SQUEEZE=ON,
     ORIENTATION=PORTRAIT,
$
TYPE=REPORT,
     FONT='ARIAL',
     SIZE=10,
   $
ENDSTYLE
END
```

The first panel follows:

PAGE 1.1

| State Code | Categories / Products / City | Coffee / Espresso | Latte | Food / Biscotti | Croissant | Scone |
|---|---|---|---|---|---|---|
| CA | Los Angeles | $267,809 | $809,647 | $266,030 | $800,084 | $315,584 |
| | San Francisco | $338,270 | $935,862 | $269,518 | $824,457 | $292,839 |
| CT | New Haven | $279,373 | $926,052 | $589,355 | $551,489 | $283,874 |
| FL | Orlando | $256,539 | $889,887 | $511,597 | $602,076 | $311,836 |
| GA | Atlanta | $317,389 | $907,365 | $555,231 | $661,806 | $273,420 |
| IL | Chicago | $420,439 | $978,340 | $378,412 | $549,366 | $595,069 |
| MA | Boston | $248,356 | $917,737 | $570,391 | $497,234 | $332,486 |
| MO | St. Louis | $419,143 | $966,981 | $368,077 | $613,871 | $481,953 |
| NY | New York | $322,378 | $928,026 | $642,259 | $622,095 | $290,811 |
| TN | Memphis | $279,644 | $820,584 | $438,889 | $638,477 | $315,399 |
| TX | Houston | $455,365 | $938,245 | $345,238 | $587,887 | $418,398 |
| WA | Seattle | $301,538 | $924,896 | $328,320 | $801,060 | $304,445 |

Because of the SET BYPANEL=1 command, the space available above the BY fields on the second panel is smaller than the space on the initial panel. The AS name **State Code** adds space for the ACROSS titles, so the titles are not truncated on the second panel:

PAGE 1.2

| Categories<br>Products<br>State Code | Gifts<br>Coffee Grinder | Coffee Pot | Mug | Thermos |
|---|---|---|---|---|
| CA | $214,557 | $202,285 | $381,926 | $207,613 |
| | $187,123 | $197,845 | $379,399 | $165,115 |
| CT | $169,908 | $208,209 | $392,967 | $221,827 |
| FL | $217,204 | $212,057 | $409,466 | $195,526 |
| GA | $217,254 | $232,552 | $355,447 | $227,482 |
| IL | $233,292 | $204,828 | $376,754 | $187,901 |
| MA | $177,940 | $184,119 | $401,944 | $203,435 |
| MO | $181,570 | $190,153 | $343,852 | $195,686 |
| NY | $161,352 | $198,452 | $349,300 | $178,836 |
| TN | $171,319 | $200,694 | $337,790 | $209,449 |
| TX | $204,292 | $204,897 | $366,337 | $194,319 |
| WA | $201,756 | $213,494 | $427,339 | $198,640 |

# Specifying Background Color for ACROSS Values With ACROSSTITLE=SIDE

The following request against the GGSALES data source places the ACROSS titles next to the ACROSS values and sets matching styling of font color and backcolor for the ACROSSTITLES, ACROSSVALUES, and column titles to white text on grey background color.

```
SET ACROSSTITLE=SIDE
TABLE FILE GGSALES
SUM DOLLARS/I8M AS ''
BY REGION
BY ST
BY CITY
ACROSS CATEGORY
ACROSS PRODUCT
WHERE CATEGORY EQ 'Coffee' OR 'Food';
ON TABLE SET PAGE-NUM NOPAGE
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT HTML
```

```
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
SQUEEZE=ON,UNITS=IN,ORIENTATION=PORTRAIT,$
TYPE=REPORT,FONT='ARIAL',SIZE=10,BORDER=LIGHT,$
TYPE=ACROSSTITLE,COLOR=WHITE, BACKCOLOR=GREY,$
TYPE=ACROSSVALUE,COLOR=WHITE, BACKCOLOR=GREY,$
TYPE=TITLE,COLOR=WHITE, BACKCOLOR=GREY,$
ENDSTYLE
END
```

The output has a grey background color and white text for the ACROSS titles, ACROSS values, and column titles.

| | | Category | Coffee | | | Food | | |
|---|---|---|---|---|---|---|---|---|
| | | Product | Capuccino | Espresso | Latte | Biscotti | Croissant | Scone |
| Region | State | City | | | | | | |
| Midwest | IL | Chicago | . | $420,439 | $978,340 | $378,412 | $549,366 | $595,069 |
| | MO | St. Louis | . | $419,143 | $966,981 | $368,077 | $613,871 | $481,953 |
| | TX | Houston | . | $455,365 | $938,245 | $345,238 | $587,887 | $418,398 |
| Northeast | CT | New Haven | $158,995 | $279,373 | $926,052 | $589,355 | $551,489 | $283,874 |
| | MA | Boston | $174,344 | $248,356 | $917,737 | $570,391 | $497,234 | $332,486 |
| | NY | New York | $208,756 | $322,378 | $928,026 | $642,259 | $622,095 | $290,811 |
| Southeast | FL | Orlando | $317,027 | $256,539 | $889,887 | $511,597 | $602,076 | $311,836 |
| | GA | Atlanta | $352,161 | $317,389 | $907,365 | $555,231 | $661,806 | $273,420 |
| | TN | Memphis | $274,812 | $279,644 | $820,584 | $438,889 | $638,477 | $315,399 |
| West | CA | Los Angeles | $306,468 | $267,809 | $809,647 | $266,030 | $800,084 | $315,584 |
| | | San Francisco | $279,830 | $338,270 | $935,862 | $269,518 | $824,457 | $292,839 |
| | WA | Seattle | $309,197 | $301,538 | $924,896 | $328,320 | $801,060 | $304,445 |

# Using Multiple Horizontal (ACROSS) Sort Fields

You can sort a report using more than one sort field. When several sort fields are used, the ACROSS phrase order determines the sorting order. The first ACROSS phrase sets the first sort break, the second ACROSS phrase sets the second sort break, and so on. Each successive sort is nested within the previous one.

## Sorting With Multiple Horizontal (ACROSS) Phrases

The following request sorts the sum of current salaries, first by department and then by job code.

```
TABLE FILE EMPLOYEE
SUM CURR_SAL
ACROSS DEPARTMENT ACROSS CURR_JOBCODE
WHERE CURR_SAL GT 21500
END
```

The output is:

```
DEPARTMENT
                  MIS                                PRODUCTION

CURR_JOBCODE
                  A17              B04               A15               A17

------------------------------------------------------------------------
           $27,062.00       $21,780.00       $26,862.00       $29,700.00
```

# Collapsing PRINT With ACROSS

The PRINT command generates a report that has a single line for each record retrieved from the data source after screening out those that fail IF or WHERE tests. When PRINT is used in conjunction with an ACROSS phrase, many of the generated columns may be empty. Those columns display the missing data symbol.

To avoid printing such a sparse report, you can use the SET ACROSSPRT command to compress the lines in the report. The number of lines is reduced within each sort group by swapping non-missing values from lower lines with missing values from higher lines, and then eliminating any lines whose columns all have missing values.

Because data may be moved to different report lines, row-based calculations such as ROW-TOTAL and ACROSS-TOTAL in a compressed report are different from those in a non-compressed report. Column calculations are not affected by compressing the report lines.

# Compress Report Lines

```
SET ACROSSPRT = {NORMAL|COMPRESS}
```

```
ON TABLE SET ACROSSPRT{NORMAL|COMPRESS}
```

where:

**NORMAL**

Does not compress report lines. NORMAL is the default value.

**COMPRESS**

Compresses report lines by promoting data values up to replace missing values within a sort group.

# Usage Notes for SET ACROSSPRT

- Compression applies only to ACROSS fields, including ACROSS … COLUMNS. It has no effect on BY fields.
- The only data values that are subject to compression are true missing values. If the value of the stored data is either 0 or blank and the metadata indicates that MISSING is ON, that value is not subject to compression.

# Compressing Report Output With SET ACROSSPRT

The following request against the GGSALES data source prints unit sales by product across region:

```
TABLE FILE GGSALES
PRINT UNITS/I5
BY PRODUCT
ACROSS REGION
WHERE DATE FROM '19971201' TO '19971231';
WHERE PRODUCT EQ 'Capuccino' OR 'Espresso';
ON TABLE SET ACROSSPRT NORMAL
ON TABLE SET PAGE NOPAGE
END
```

Each line of the report represents one sale in one region, so at most one column in each row has a non-missing value when ACROSSPRT is set to NORMAL.

```
                  Region
                  Midwest     Northeast   Southeast   West
Product           Unit Sales  Unit Sales  Unit Sales  Unit Sales
-------------------------------------------------------------------
Capuccino                .         936           .           .
                         .         116           .           .
                         .         136           .           .
                         .           .        1616           .
                         .           .        1118           .
                         .           .         774           .
                         .           .           .        1696
                         .           .           .        1519
                         .           .           .         836
Espresso              1333           .           .           .
                       280           .           .           .
                       139           .           .           .
                         .        1363           .           .
                         .         634           .           .
                         .         406           .           .
                         .           .        1028           .
                         .           .        1014           .
                         .           .         885           .
                         .           .           .        1782
                         .           .           .        1399
                         .           .           .         551
```

Setting ACROSSPRT to COMPRESS promotes non-missing values up to replace missing values within the same BY group and then eliminates lines consisting of all missing values.

```
TABLE FILE GGSALES
PRINT UNITS/I5
BY PRODUCT
ACROSS REGION
WHERE DATE FROM '19971201' TO '19971231';
WHERE PRODUCT EQ 'Capuccino' OR 'Espresso';
ON TABLE SET ACROSSPRT COMPRESS
ON TABLE SET PAGE NOPAGE
END
```

The output is:

```
                  Region
                  Midwest     Northeast   Southeast   West
Product           Unit Sales  Unit Sales  Unit Sales  Unit Sales
-------------------------------------------------------------------
```

```
Capuccino                .         936        1616        1696
                         .         116        1118        1519
                         .         136         774         836
Espresso              1333        1363        1028        1782
                       280         634        1014        1399
                       139         406         885         551
```

# Hiding Null Columns in ACROSS Groups

Report requests that use the ACROSS sort phrase generate a group of columns (one for each display field in the request) under each value of the ACROSS field. In many cases, some of these columns have only missing or null values. You can use the HIDENULLACRS parameter to hide the display of ACROSS groups containing only null columns in styled output formats. If there is a BY field with a PAGE-BREAK option, columns are hidden on each page of output generated by that PAGE-BREAK option. If the request contains no BY page breaks, ACROSS groups that are missing for the entire report are hidden.

Hiding null ACROSS columns is supported for all styled output formats except for the EXL2K PIVOT and EXL2K FORMULA options.

# Hide Null ACROSS Columns

```
SET HIDENULLACRS = {ON|OFF}
```

```
ON TABLE SET HIDENULLACRS {ON|OFF}
```

where:

**ON**

Hides columns with missing data in ACROSS groups within a BY-generated page break.

**OFF**

Does not hide columns. OFF is the default value.

# Usage Notes for Hiding Null Columns Within ACROSS Groups

- Aligning items in headings with the associated data columns (HEADALIGN) is not supported for ACROSS reports.
- Hiding ACROSS columns will not affect items placed in heading elements with spot markers or explicit positioning. This means that after ACROSS group columns are hidden, items may align with the ACROSS columns differently than expected.

# Features Not Supported For Hiding Null ACROSS Columns

- EXL2K FORMULA.
- EXL2K PIVOT.
- OVER.
- HIDENULLACRS is only supported with page breaks specified in ON **byfieldname** PAGE-BREAK phrases or BY **fieldname** PAGE-BREAK phrases. It is not supported with:
  - BY **field** ROWS **value** OVER.
  - FML FOR fields (FOR **fieldvalue** OVER PAGE-BREAK).

# Hiding ACROSS Groups and Columns Within BY Page Breaks

Hiding null columns is most useful when a BY sort field has the PAGE-BREAK option, either on the BY phrase itself or in an ON phrase. The change in value of the BY field determines when a page break is generated for that BY field. The change in BY field value defines the limits within which the ACROSS columns will be hidden, even if the BY field value spans multiple physical pages.

There is no way to specify a particular BY field with this setting, so if the request has multiple BY fields with page breaks, the setting applies to all of them. If there are no BY fields with page breaks, an ACROSS column must be missing for the entire report in order to be hidden.

The entire ACROSS group will be hidden either when the ACROSS value is missing or when all of the rows for all of the display columns under that ACROSS value contain null or missing values within the given BY field value.

The set of pages generated for a BY field value with a page break will be hidden if all ACROSS groups within that BY field value are hidden.

When columns are removed from a page or a panel, the existing columns are resituated to fill the missing space.

# Hiding Null ACROSS Groups

The following request against the GGSALES data source has a page break on the BY field named REGION and an ACROSS phrase on the CITY field. The display fields in each ACROSS group are UNITS and DOLLARS:

```
SET HIDENULLACRS=OFF
TABLE FILE GGSALES
SUM UNITS DOLLARS
BY REGION PAGE-BREAK
BY ST
ACROSS CITY
WHERE CITY LE 'Memphis'
ON TABLE SET HTMLCSS ON
ON TABLE PCHOLD FORMAT HTML
ON TABLE SET STYLE *
TYPE=REPORT, FONT=ARIAL, SIZE=9,$
ENDSTYLE
END
```

With SET HIDENULLACRS=OFF, all columns display:

PAGE 1

| | | City | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Atlanta | | Boston | | Chicago | | Houston | | Los Angeles | | Memphis | |
| Region | State | Unit Sales | Dollar Sales | Unit Sales | Dollar Sales | Unit Sales | Dollar Sales | Unit Sales | Dollar Sales | Unit Sales | Dollar Sales | Unit Sales | Dollar Sales |
| Midwest | IL | . | . | . | . | 307581 | 3924401 | . | . | . | . | . | . |
| | TX | . | . | . | . | . | . | 299737 | 3714978 | . | . | . | . |

PAGE 2

| | | City | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Atlanta | | Boston | | Chicago | | Houston | | Los Angeles | | Memphis | |
| Region | State | Unit Sales | Dollar Sales | Unit Sales | Dollar Sales | Unit Sales | Dollar Sales | Unit Sales | Dollar Sales | Unit Sales | Dollar Sales | Unit Sales | Dollar Sales |
| Northeast | MA | . | . | 301909 | 3707986 | . | . | . | . | . | . | . | . |

PAGE 3

| | | City | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Atlanta | | Boston | | Chicago | | Houston | | Los Angeles | | Memphis | |
| Region | State | Unit Sales | Dollar Sales | Unit Sales | Dollar Sales | Unit Sales | Dollar Sales | Unit Sales | Dollar Sales | Unit Sales | Dollar Sales | Unit Sales | Dollar Sales |
| Southeast | GA | 330283 | 4100107 | . | . | . | . | . | . | . | . | . | . |
| | TN | . | . | . | . | . | . | . | . | . | . | 294647 | 3687057 |

PAGE 4

| | | City | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Atlanta | | Boston | | Chicago | | Houston | | Los Angeles | | Memphis | |
| Region | State | Unit Sales | Dollar Sales | Unit Sales | Dollar Sales | Unit Sales | Dollar Sales | Unit Sales | Dollar Sales | Unit Sales | Dollar Sales | Unit Sales | Dollar Sales |
| West | CA | . | . | . | . | . | . | . | . | 298070 | 3772003 | . | . |

Running the request with SET HIDENULLACRS=ON eliminates the ACROSS groups for cities with missing data within each region. For example, the Midwest region has no columns for Atlanta or Boston:

PAGE 1

| | | City | | | |
|---|---|---|---|---|---|
| | | Chicago | | Houston | |
| Region | State | Unit Sales | Dollar Sales | Unit Sales | Dollar Sales |
| Midwest | IL | 307581 | 3924401 | . | . |
| | TX | . | . | 299737 | 3714978 |

PAGE 2

| | | City | |
|---|---|---|---|
| | | Boston | |
| Region | State | Unit Sales | Dollar Sales |
| Northeast | MA | 301909 | 3707986 |

PAGE 3

| | | City | | | |
|---|---|---|---|---|---|
| | | Atlanta | | Memphis | |
| Region | State | Unit Sales | Dollar Sales | Unit Sales | Dollar Sales |
| Southeast | GA | 330283 | 4100107 | . | . |
| | TN | . | . | 294647 | 3687057 |

PAGE 4

| | | City | |
|---|---|---|---|
| | | Los Angeles | |
| Region | State | Unit Sales | Dollar Sales |
| West | CA | 298070 | 3772003 |

# Hiding Columns Within ACROSS Groups

In the following request against the GGSALES data source, REGION is a BY field with a PAGE-BREAK, and PRODUCT is the ACROSS field. The DEFINE command creates a field named SHOWDOLLARS that has missing values for the Espresso column within the ACROSS group Coffee:

```
SET HIDENULLACRS=OFF
SET BYPANEL=2
DEFINE FILE GGSALES
SHOWDOLLARS/I8M MISSING ON = IF (PRODUCT EQ 'Espresso') THEN MISSING
ELSE DOLLARS;
END
TABLE FILE GGSALES
HEADING
```

```
"Page <TABPAGENO "
SUM SHOWDOLLARS AS ''
BY REGION
BY ST
BY CITY
ACROSS PRODUCT
WHERE REGION EQ 'Midwest' OR 'Northeast'
WHERE CATEGORY EQ 'Coffee';
ON REGION PAGE-BREAK
ON TABLE SET PAGE-NUM ON
ON TABLE NOTOTAL
ON TABLE SET HTMLCSS ON
ON TABLE PCHOLD FORMAT HTML
ON TABLE SET STYLE *
     UNITS=IN,
     SQUEEZE=ON,
     ORIENTATION=PORTRAIT,
$
TYPE=REPORT,
     GRID=OFF,
     FONT='ARIAL',
     SIZE=9,
$
ENDSTYLE
END
```

Running the request with SET HIDENULLACRS=OFF displays the Espresso column and any other column containing missing values within the Coffee group:

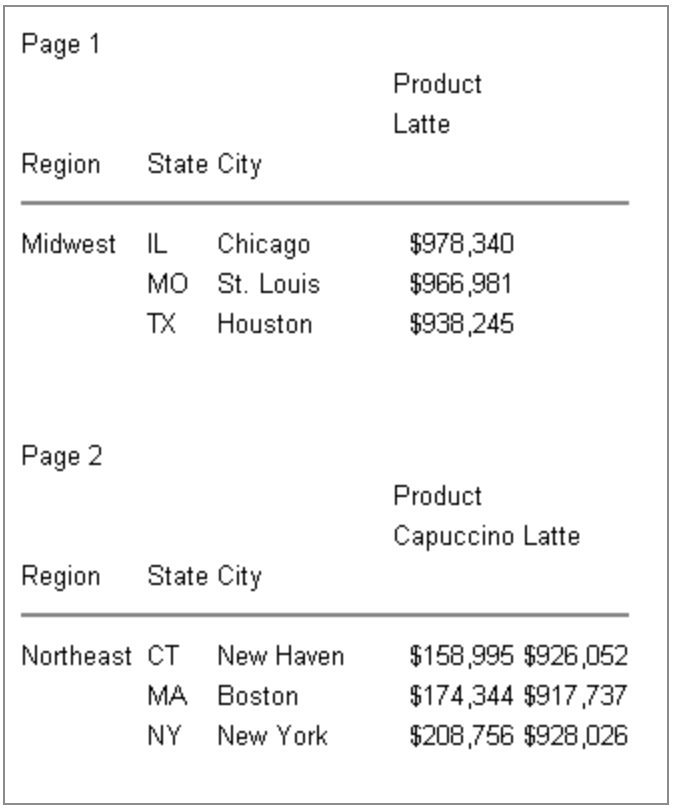
Page 1

| Region | State | City | Product Capuccino | Espresso | Latte |
|---|---|---|---|---|---|
| Midwest | IL | Chicago | . | . | $978,340 |
| | MO | St. Louis | . | . | $966,981 |
| | TX | Houston | . | . | $938,245 |

Page 2

| Region | State | City | Product Capuccino | Espresso | Latte |
|---|---|---|---|---|---|
| Northeast | CT | New Haven | $158,995 | . | $926,052 |
| | MA | Boston | $174,344 | . | $917,737 |
| | NY | New York | $208,756 | . | $928,026 |

Running the request with SET HIDENULLACRS=ON hides columns with missing data within each region. On page 1 (Midwest), both the Capuccino and Espresso columns are hidden, while on page 2 (Northeast), only the Espresso column is hidden:



Page 1

| Region | State | City | Product Latte |
|---|---|---|---|
| Midwest | IL | Chicago | $978,340 |
| | MO | St. Louis | $966,981 |
| | TX | Houston | $938,245 |

Page 2

| Region | State | City | Product Capuccino | Latte |
|---|---|---|---|---|
| Northeast | CT | New Haven | $158,995 | $926,052 |
| | MA | Boston | $174,344 | $917,737 |
| | NY | New York | $208,756 | $928,026 |

# Hiding Null Columns With Multiple ACROSS Fields

The following request against the GGSALES data source has two ACROSS fields, PRODUCT and CATEGORY. The BY field with the page break is REGION. The DEFINE command creates a field named SHOWDOLLARS that has missing values for the Espresso column within the ACROSS group **Coffee** and for the entire ACROSS group **Gifts**.

```
SET HIDENULLACRS=OFF
DEFINE FILE GGSALES
SHOWDOLLARS/I8M MISSING ON = IF (PRODUCT EQ 'Espresso' OR
   CATEGORY EQ 'Gifts') THEN MISSING ELSE DOLLARS;
END
TABLE FILE GGSALES
SUM SHOWDOLLARS AS ''
BY REGION
BY ST
BY CITY
ACROSS CATEGORY
ACROSS PRODUCT
WHERE REGION EQ 'Midwest' OR 'Northeast'
```

```
ON REGION PAGE-BREAK
HEADING
"Page <TABPAGENO /<TABLASTPAGE "
ON TABLE SET PAGE-NUM OFF
ON TABLE SET BYPANEL ON
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT HTML
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
     UNITS=IN,
     PAGESIZE='Letter',
     SQUEEZE=ON,
     ORIENTATION=PORTRAIT,
$
TYPE=REPORT,
     HEADPANEL=ON,
     GRID=OFF,
     FONT='ARIAL',
     SIZE=8,
$
ENDSTYLE
END
```

Running the request with SET HIDENULLACRS=OFF displays all of the columns:

Page 1 /2

| | | | Category | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Coffee | | | Food | | | Gifts | | | |
| | | | Product | | | | | | | | | |
| Region | State | City | Capuccino | Espresso | Latte | Biscotti | Croissant | Scone | Coffee Grinder | Coffee Pot | Mug | Thermos |
| Midwest | IL | Chicago | . | . | $978,340 | $378,412 | $549,366 | $595,069 | . | . | . | . |
| | MO | St. Louis | . | . | $966,981 | $368,077 | $613,871 | $481,953 | . | . | . | . |
| | TX | Houston | . | . | $938,245 | $345,238 | $587,887 | $418,398 | . | . | . | . |

Page 2 /2

| | | | Category | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Coffee | | | Food | | | Gifts | | | |
| | | | Product | | | | | | | | | |
| Region | State | City | Capuccino | Espresso | Latte | Biscotti | Croissant | Scone | Coffee Grinder | Coffee Pot | Mug | Thermos |
| Northeast | CT | New Haven | $158,995 | . | $926,052 | $589,355 | $551,489 | $283,874 | . | . | . | . |
| | MA | Boston | $174,344 | . | $917,737 | $570,391 | $497,234 | $332,486 | . | . | . | . |
| | NY | New York | $208,756 | . | $928,026 | $642,259 | $622,095 | $290,811 | . | . | . | . |

Running the request with SET HIDENULLACRS=ON hides the Espresso product and the entire Gifts category within each region. On page 1 (Midwest), the Gifts group and the

Espresso and Capuccino columns are hidden, while on page 2 (Northeast), the Gifts group and the Espresso column are hidden:

Page 1 /2

| | | | Category | Coffee | Food | | |
|---|---|---|---|---|---|---|---|
| | | | Product | Latte | Biscotti | Croissant | Scone |
| Region | State | City | | | | | |
| Midwest | IL | Chicago | | $978,340 | $378,412 | $549,366 | $595,069 |
| | MO | St. Louis | | $966,981 | $368,077 | $613,871 | $481,953 |
| | TX | Houston | | $938,245 | $345,238 | $587,887 | $418,398 |

Page 2 /2

| | | | Category | Coffee | | Food | | |
|---|---|---|---|---|---|---|---|---|
| | | | Product | Capuccino | Latte | Biscotti | Croissant | Scone |
| Region | State | City | | | | | | |
| Northeast | CT | New Haven | | $158,995 | $926,052 | $589,355 | $551,489 | $283,874 |
| | MA | Boston | | $174,344 | $917,737 | $570,391 | $497,234 | $332,486 |
| | NY | New York | | $208,756 | $928,026 | $642,259 | $622,095 | $290,811 |

# Generating Summary Lines and Hiding Null ACROSS Columns

If an entire ACROSS group is hidden, so are the totals generated for the associated BY field value. If any of the columns for the ACROSS value contain non-missing data, the ACROSS group will display with the non-missing columns.

Summary elements remain tied to their ACROSS group columns. If an ACROSS group is hidden, the associated summary value will be hidden, and subsequent values will realign with their ACROSS columns.

Summary lines generated at BY field breaks display at the end of the final page for that BY field value. All ACROSS groups that contain any non-null data within the entire BY value (even if they were hidden on some pages within the BY value) will display on the summary lines so that associated summary values can be displayed.

Grand totals can contain ACROSS columns that have been hidden on some pages within a BY field value. Therefore, they are always placed on a new page and presented for all ACROSS groups and columns that displayed on any page within the report, regardless of what was hidden on other pages.

Summary lines defined for BY fields outside of the innermost BY page break may also contain ACROSS columns that have been hidden for some of the internal BY fields. For this reason, these summary lines will always present all available ACROSS columns and will be presented on a new page.

All totals calculated in columns (ACROSSTOTAL, ROWTOTAL) will be hidden if all of the column totals are missing.

# Generating Column Totals and Hiding Null ACROSS Columns

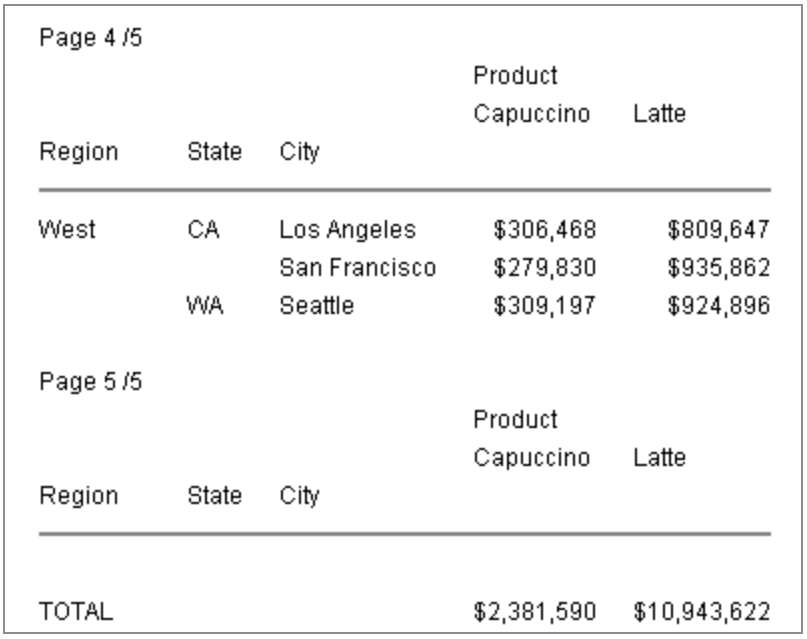
In the following request against the GGSALES data source, REGION is a BY field with a PAGE-BREAK, and PRODUCT is the ACROSS field. The DEFINE command creates a field named SHOWDOLLARS that has missing values for the Espresso column within the ACROSS group **Coffee**. Column totals are generated at the end of the report:

```
SET HIDENULLACRS=ON
DEFINE FILE GGSALES
SHOWDOLLARS/I8M MISSING ON = IF (PRODUCT EQ 'Espresso') THEN MISSING
ELSE DOLLARS;
END
TABLE FILE GGSALES
SUM SHOWDOLLARS AS ''
BY REGION
BY ST
BY CITY
ACROSS PRODUCT
ON REGION PAGE-BREAK
HEADING
"Page <TABPAGENO /<TABLASTPAGE "
WHERE CATEGORY EQ 'Coffee';
ON TABLE SET PAGE-NUM OFF
ON TABLE SET BYPANEL ON
ON TABLE COLUMN-TOTAL AS 'TOTAL'
ON TABLE PCHOLD FORMAT HTML
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
```

```
     UNITS=IN,
     PAGESIZE='Letter',
     SQUEEZE=ON,
     ORIENTATION=PORTRAIT,
$
TYPE=REPORT,
     HEADPANEL=ON,
     GRID=OFF,
     FONT='ARIAL',
     SIZE=9,
$
ENDSTYLE
END
```

Running the request hides the null columns within each REGION page break and generates a separate page for the column totals.

The following shows pages one through three. On page 1, the Espresso and Capuccino columns are hidden. On pages 2 and 3, the Espresso column is hidden:



Page 4 /5

| Region | State | City | Product Capuccino | Latte |
|---|---|---|---|---|
| West | CA | Los Angeles | $306,468 | $809,647 |
| | | San Francisco | $279,830 | $935,862 |
| | WA | Seattle | $309,197 | $924,896 |

Page 5 /5

| Region | State | City | Product Capuccino | Latte |
|---|---|---|---|---|
| TOTAL | | | $2,381,590 | $10,943,622 |

The following shows pages four and five. On page 4, the Espresso column is hidden. Page 5 is the totals page. The Espresso column is hidden since it was hidden on every detail page. However, Capuccino is not hidden since it appeared on some pages:

Page 4 /5

| Region | State | City | Product Capuccino | Latte |
|---|---|---|---|---|
| West | CA | Los Angeles | $306,468 | $809,647 |
| | | San Francisco | $279,830 | $935,862 |
| | WA | Seattle | $309,197 | $924,896 |

Page 5 /5

| Region | State | City | Product Capuccino | Latte |
|---|---|---|---|---|
| TOTAL | | | $2,381,590 | $10,943,622 |

# Using Column Styling and Hiding Null ACROSS Columns

Column styling remains attached to the original column, regardless of whether the column remains in the same place on the report output because of hiding null columns. In particular:

- BORDERS and BACKCOLOR will readjust to fit the resulting panel or page layout after the columns are hidden.
- Styling specified for a designated column will remain attached to the designated column and be unaffected by the hidden columns. For example, if the third ACROSS column is defined with conditional styling, and the second ACROSS column is hidden, the formatting will remain on the column that was initially third, even though it becomes the second column on the output.

For information about styling columns, see Identifying a Report Component in a WebFOCUS StyleSheet.

# Using Column Styling and Hiding Null ACROSS Columns

In the following request against the GGSALES data source, REGION is a BY field with a PAGE-BREAK and PRODUCT is the ACROSS field. The DEFINE command creates a field named SHOWDOLLARS that has missing values for the Capuccino column in the Midwest region, the Thermos column in the Northeast region, the Scone column in the Southeast region, and the entire West region. Column totals, row totals, and a subtotal for each region are generated.

Some of the columns are assigned background colors:

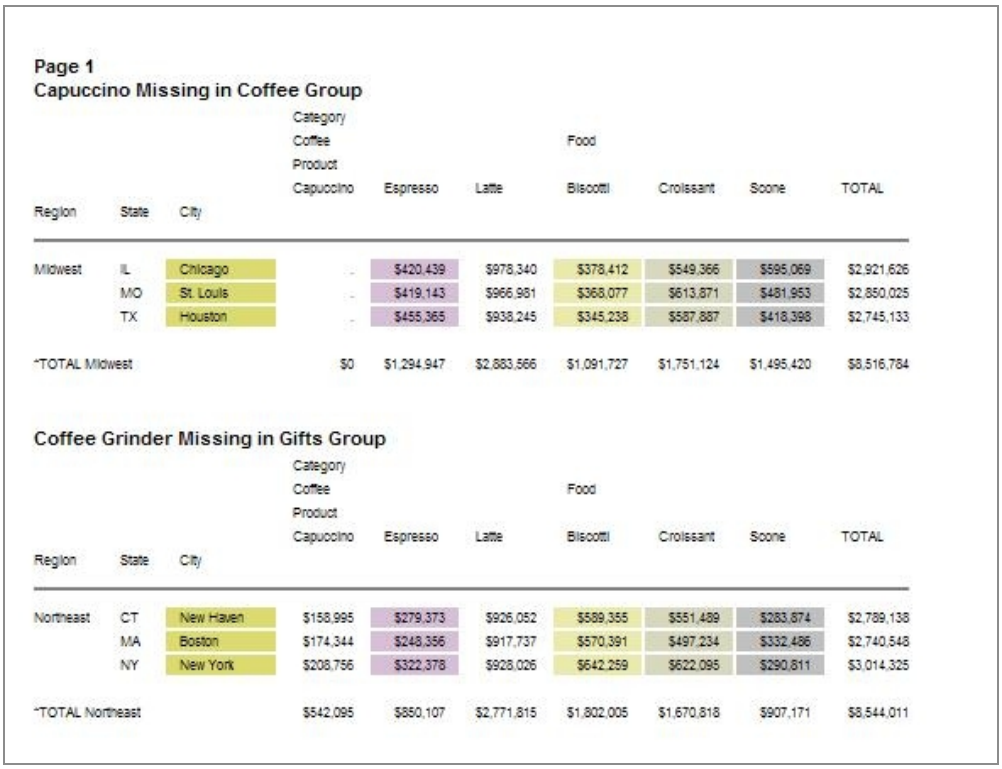
- Column C5 has BACKCOLOR=WHEAT. C5 is the fifth column counting display fields from left to right, but not counting BY fields or ROW-TOTAL fields. Column C5 corresponds to the **Croissant** column in the **Coffee** group.
- Column P5 has BACKCOLOR=THISTLE. P5 is the fifth column counting display fields, BY fields, and ROW-TOTAL fields, but not NOPRINT fields. Column P5 corresponds to the **Espresso** column in the **Coffee** group.
- Column N7 has BACKCOLOR=MEDIUM GOLDENROD. N7 is the seventh column counting display fields, BY fields, ROW-TOTAL fields, and NOPRINT fields. Column N7 corresponds to the **Biscotti** column in the **Food** group.
- Column B3 has BACKCOLOR=GOLDENROD. B3 is the third BY field, counting all BY fields, even if not printed. Column B3 corresponds to the **CITY** sort field.
- Column SHOWDOLLARS(6) has BACKCOLOR=SILVER. SHOWDOLLARS(6) is the sixth occurrence of the SHOWDOLLARS field and corresponds to the **Scone** column in the **Food** group.

The request follows:

```
SET HIDENULLACRS=OFF
DEFINE FILE GGSALES
SHOWDOLLARS/I8M MISSING ON =
IF ((PRODUCT EQ 'Capuccino' AND REGION EQ 'Midwest') OR
(PRODUCT EQ 'Coffee Grinder' AND REGION EQ 'Northeast') OR
(PRODUCT EQ 'Scone' AND REGION EQ 'Southeast') OR
(REGION EQ 'West')) THEN MISSING ELSE DOLLARS;
END
```

```
TABLE FILE GGSALES
SUM SHOWDOLLARS AS ''
BY REGION
BY ST
BY CITY
ACROSS CATEGORY
ACROSS PRODUCT
ON REGION SUBTOTAL AS '*TOTAL'
ON REGION PAGE-BREAK
HEADING
" Page <TABPAGENO "HEADING
" Capuccino Missing in Coffee Group "
WHEN REGION EQ 'Midwest';
HEADING
" Coffee Grinder Missing in Gifts Group "
WHEN REGION EQ 'Northeast';
HEADING
" Scone Missing in Food Group "
WHEN REGION EQ 'Southeast';
WHERE CATEGORY EQ 'Coffee' OR 'Food'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET BYPANEL ON
ON TABLE ROW-TOTAL AS 'TOTAL'
ON TABLE COLUMN-TOTAL AS 'TOTAL'
ON TABLE SET HTMLCSS ON
ON TABLE PCHOLD FORMAT HTML
ON TABLE SET STYLE *
UNITS=IN,PAGESIZE='Letter',SQUEEZE=ON,ORIENTATION=PORTRAIT,$
TYPE=REPORT,HEADPANEL=ON,GRID=OFF,FONT='ARIAL',SIZE=6,$
TYPE=HEADING, style=bold, size=8,$
TYPE=DATA, COLUMN = C5, BACKCOLOR=WHEAT,$
TYPE=DATA, COLUMN = P5, BACKCOLOR=THISTLE,$
TYPE=DATA, COLUMN = N7, BACKCOLOR=MEDIUM GOLDENROD,$
TYPE=DATA, COLUMN = B3, BACKCOLOR=GOLDENROD,$
TYPE=DATA, COLUMN = SHOWDOLLARS(6), BACKCOLOR=silver,$
ENDSTYLE
END
```

Running the report with SET HIDENULLACRS=OFF shows all columns. A page is generated for the West region and subtotals are calculated, even though all of the values are missing:



Page 1

**Capuccino Missing in Coffee Group**

| | | | Category | Coffee | | Food | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Product | | | | | | |
| Region | State | City | Capuccino | Espresso | Latte | Biscotti | Croissant | Scone | TOTAL |
| Midwest | IL | Chicago | . | $420,439 | $978,340 | $378,412 | $549,366 | $595,069 | $2,921,626 |
| | MO | St. Louis | . | $419,143 | $966,981 | $368,077 | $613,871 | $481,953 | $2,850,025 |
| | TX | Houston | . | $455,365 | $938,245 | $345,238 | $587,887 | $418,398 | $2,745,133 |
| *TOTAL Midwest | | | $0 | $1,294,947 | $2,883,566 | $1,091,727 | $1,751,124 | $1,495,420 | $8,516,784 |

**Coffee Grinder Missing in Gifts Group**

| | | | Category | Coffee | | Food | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Product | | | | | | |
| Region | State | City | Capuccino | Espresso | Latte | Biscotti | Croissant | Scone | TOTAL |
| Northeast | CT | New Haven | $158,995 | $279,373 | $926,052 | $589,355 | $551,489 | $283,874 | $2,789,138 |
| | MA | Boston | $174,344 | $248,356 | $917,737 | $570,391 | $497,234 | $332,486 | $2,740,548 |
| | NY | New York | $208,756 | $322,378 | $928,026 | $642,259 | $622,095 | $290,811 | $3,014,325 |
| *TOTAL Northeast | | | $542,095 | $850,107 | $2,771,815 | $1,802,005 | $1,670,818 | $907,171 | $8,544,011 |

**Scone Missing in Food Group**

| Region | State | City | Category: Coffee / Product: Capuccino | Espresso | Latte | Food: Biscotti | Croissant | Scone | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| Southeast | FL | Orlando | $317,027 | $256,539 | $889,887 | $511,597 | $602,076 | . | $2,577,126 |
| | GA | Atlanta | $352,161 | $317,389 | $907,365 | $555,231 | $661,806 | . | $2,793,952 |
| | TN | Memphis | $274,812 | $279,644 | $820,584 | $438,889 | $638,477 | . | $2,452,406 |
| *TOTAL Southeast | | | $944,000 | $853,572 | $2,617,836 | $1,505,717 | $1,902,359 | $0 | $7,823,484 |

| Region | State | City | Category: Coffee / Product: Capuccino | Espresso | Latte | Food: Biscotti | Croissant | Scone | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| West | CA | Los Angeles | . | . | . | . | . | . | $0 |
| | | San Francisco | . | . | . | . | . | . | $0 |
| | WA | Seattle | . | . | . | . | . | . | $0 |
| *TOTAL West | | | $0 | $0 | $0 | $0 | $0 | $0 | $0 |

| Region | State | City | Category: Coffee / Product: Capuccino | Espresso | Latte | Food: Biscotti | Croissant | Scone | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| TOTAL | | | $1,486,095 | $2,998,626 | $8,273,217 | $4,399,449 | $5,324,301 | $2,402,591 | $24,884,279 |

Running the report with SET HIDENULLACRS=ON, shows:

- On page 1, the Capuccino column is hidden and, therefore, the Espresso column is no longer P5 on the report, but it still has BACKCOLOR=THISTLE. Similarly, the Biscotti column has MEDIUM, GOLDENROD, the Croissant column has WHEAT, and the Scone column has SILVER.
- The subtotals for each region are calculated only for columns that display for that region.
- No page is generated for the West region since all of its values are missing.
- Every column is represented on the page with the grand totals.

The output is:

**Page 1**

**Capuccino Missing in Coffee Group**

| | | | Category | | Food | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Coffee | | | | | |
| | | | Product | | | | | |
| | | | Espresso | Latte | Biscotti | Croissant | Scone | TOTAL |
| Region | State | City | | | | | | |
| Midwest | IL | Chicago | $420,439 | $978,340 | $378,412 | $549,366 | $595,069 | $2,921,626 |
| | MO | St. Louis | $419,143 | $966,961 | $368,077 | $613,871 | $481,953 | $2,850,025 |
| | TX | Houston | $455,365 | $938,245 | $345,238 | $587,887 | $416,398 | $2,745,133 |
| *TOTAL Midwest | | | $1,294,947 | $2,883,566 | $1,091,727 | $1,751,124 | $1,495,420 | $8,516,784 |

**Coffee Grinder Missing in Gifts Group**

| | | | Category | | | Food | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Coffee | | | | | | |
| | | | Product | | | | | | |
| | | | Capuccino | Espresso | Latte | Biscotti | Croissant | Scone | TOTAL |
| Region | State | City | | | | | | | |
| Northeast | CT | New Haven | $158,995 | $279,373 | $926,052 | $589,355 | $551,489 | $283,874 | $2,789,138 |
| | MA | Boston | $174,344 | $248,356 | $917,737 | $570,391 | $497,234 | $332,486 | $2,740,548 |
| | NY | New York | $208,756 | $322,378 | $928,026 | $642,259 | $622,095 | $290,811 | $3,014,325 |
| *TOTAL Northeast | | | $542,095 | $850,107 | $2,771,815 | $1,802,005 | $1,670,818 | $907,171 | $8,544,011 |

**Scone Missing in Food Group**

| | | | Category | | | Food | | |
|---|---|---|---|---|---|---|---|---|
| | | | Coffee | | | | | |
| | | | Product | | | | | |
| | | | Capuccino | Espresso | Latte | Biscotti | Croissant | TOTAL |
| Region | State | City | | | | | | |
| Southeast | FL | Orlando | $317,027 | $256,539 | $889,887 | $511,597 | $602,076 | $2,577,126 |
| | GA | Atlanta | $352,161 | $317,389 | $907,365 | $555,231 | $661,806 | $2,793,952 |
| | TN | Memphis | $274,812 | $279,644 | $820,584 | $438,889 | $638,477 | $2,452,406 |
| *TOTAL Southeast | | | $944,000 | $853,572 | $2,617,836 | $1,505,717 | $1,902,359 | $7,823,484 |

| | | | Category | | | Food | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Coffee | | | | | | |
| | | | Product | | | | | | |
| | | | Capuccino | Espresso | Latte | Biscotti | Croissant | Scone | TOTAL |
| Region | State | City | | | | | | | |
| TOTAL | | | $1,486,095 | $2,998,626 | $8,273,217 | $4,399,449 | $5,324,301 | $2,402,591 | $24,884,279 |

# Hiding Null ACROSS Columns in an FML Request

An FML request always has a FOR field that defines the order of specific rows. The FOR field cannot be used to trigger hiding of null ACROSS columns. However, the request can also have a BY field with a PAGE-BREAK option and this can be used to hide null ACROSS columns.

## Hiding Null ACROSS Columns in an FML Request

The following FML request against the GGSALES data source has a BY field named REGION with the PAGE-BREAK option and an ACROSS field named QTR. The FOR field is PRODUCT. The DEFINE command creates the QTR field and contains missing values for Q4 in the Midwest region, Q2 in the Northeast region, and for all quarters in the Southeast region.

```
SET HIDENULLACRS=ON
DEFINE FILE GGSALES
QTR/Q=DATE;
SHOWDOLLARS/D12CM MISSING ON =
          IF REGION EQ 'Midwest' AND QTR EQ 'Q4' THEN MISSING
     ELSE IF REGION EQ 'Northeast' AND QTR EQ 'Q2' THEN MISSING
     ELSE IF REGION EQ 'Southeast' THEN MISSING
     ELSE DOLLARS;
END
TABLE FILE GGSALES
SUM SHOWDOLLARS
BY REGION
ACROSS QTR
FOR PRODUCT
'Biscotti' AS 'Biscotti' LABEL R1 OVER
'Capuccino' AS 'Capuccino' LABEL R2 OVER
'Latte' AS 'Latte' LABEL R3 OVER
'Mug' AS 'Mug' LABEL R4 OVER
'Coffee Pot' AS 'Coffee Pot' LABEL R5 OVER
RECAP R6/D12.2=R1+R2+R3+R4+R5;
 AS ''
ON REGION PAGE-BREAK
ON TABLE SET PAGE-NUM OFF
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT HTML
ON TABLE SET HTMLCSS ON
```

```
ON TABLE SET STYLE *
     UNITS=IN,
     SQUEEZE=ON,
     ORIENTATION=PORTRAIT,$
TYPE=REPORT,
     GRID=OFF,
     FONT='ARIAL',
     SIZE=9,$
TYPE=TITLE,
     STYLE=BOLD,$
TYPE=ACROSSTITLE,
     STYLE=BOLD,$
ENDSTYLE
END
```

Running the request with SET HIDENULLACRS=OFF generates all columns and a page for all regions, including the Southeast regions where all values are missing:

| | | QTR | | | |
|---|---|---|---|---|---|
| | | Q1 | Q2 | Q3 | Q4 |
| **Region** | | | | | |
| Midwest | Biscotti | $205,440 | $252,072 | $275,976 | . |
| | Capuccino | . | . | . | . |
| | Latte | $630,883 | $704,089 | $776,434 | . |
| | Mug | $261,825 | $264,003 | $261,527 | . |
| | Coffee Pot | $128,026 | $169,533 | $164,565 | . |
| | | 1,226,174.00 | 1,389,697.00 | 1,478,502.00 | . |

| | | QTR | | | |
|---|---|---|---|---|---|
| | | Q1 | Q2 | Q3 | Q4 |
| **Region** | | | | | |
| Northeast | Biscotti | $393,362 | . | $512,375 | $453,794 |
| | Capuccino | $62,070 | . | $175,864 | $185,712 |
| | Latte | $791,332 | . | $652,872 | $628,026 |
| | Mug | $265,133 | . | $307,917 | $308,783 |
| | Coffee Pot | $130,517 | . | $145,670 | $163,594 |
| | | 1,642,414.00 | . | 1,794,698.00 | 1,739,909.00 |

| Region | | QTR Q1 | Q2 | Q3 | Q4 |
|---|---|---|---|---|---|
| Southeast | Biscotti | . | . | . | . |
| | Capuccino | . | . | . | . |
| | Latte | . | . | . | . |
| | Mug | . | . | . | . |
| | Coffee Pot | . | . | . | . |
| | | . | . | . | . |

| Region | | QTR Q1 | Q2 | Q3 | Q4 |
|---|---|---|---|---|---|
| West | Biscotti | $229,781 | $224,070 | $230,649 | $179,368 |
| | Capuccino | $205,057 | $194,149 | $237,778 | $258,511 |
| | Latte | $727,734 | $664,618 | $619,832 | $658,221 |
| | Mug | $296,839 | $281,809 | $313,692 | $296,324 |
| | Coffee Pot | $132,354 | $159,799 | $153,072 | $168,399 |
| | | 1,591,765.00 | 1,524,445.00 | 1,555,023.00 | 1,560,823.00 |

Running the request with SET HIDENULLACRS=ON hides column Q4 for the Midwest region, Q2 for the Northeast region, and the entire page for the Southeast region:

| | | QTR | | |
|---|---|---|---|---|
| | | Q1 | Q2 | Q3 |
| **Region** | | | | |
| Midwest | Biscotti | $205,440 | $252,072 | $275,976 |
| | Capuccino | . | . | . |
| | Latte | $630,883 | $704,089 | $776,434 |
| | Mug | $261,825 | $264,003 | $261,527 |
| | Coffee Pot | $128,026 | $169,533 | $164,565 |
| | | 1,226,174.00 | 1,389,697.00 | 1,478,502.00 |

| | | QTR | | |
|---|---|---|---|---|
| | | Q1 | Q3 | Q4 |
| **Region** | | | | |
| Northeast | Biscotti | $393,362 | $512,375 | $453,794 |
| | Capuccino | $62,070 | $175,864 | $185,712 |
| | Latte | $791,332 | $652,872 | $628,026 |
| | Mug | $265,133 | $307,917 | $308,783 |
| | Coffee Pot | $130,517 | $145,670 | $163,594 |
| | | 1,642,414.00 | 1,794,698.00 | 1,739,909.00 |

| | | QTR | | | |
|---|---|---|---|---|---|
| | | Q1 | Q2 | Q3 | Q4 |
| **Region** | | | | | |
| West | Biscotti | $229,781 | $224,070 | $230,649 | $179,368 |
| | Capuccino | $205,057 | $194,149 | $237,778 | $258,511 |
| | Latte | $727,734 | $664,618 | $619,832 | $658,221 |
| | Mug | $296,839 | $281,809 | $313,692 | $296,324 |
| | Coffee Pot | $132,354 | $159,799 | $153,072 | $168,399 |
| | | 1,591,765.00 | 1,524,445.00 | 1,555,023.00 | 1,560,823.00 |

# Controlling Display of Sort Field Values

By default, a sort field value displays only on the first row or column of the set of detail rows or columns generated for that sort field value. You can control this behavior using the BYDISPLAY parameter. BYDISPLAY is supported for all output formats and can control display of ACROSS values as well as BY values.

This feature enables you to avoid specifying the sort field twice, once as a display field and once for sorting (with the NOPRINT option). For example:

```
PRINT FIRST_NAME LAST_NAME
BY FIRST_NAME NOPRINT
```

# Control Display of Sort Field Values

```
SET BYDISPLAY = {OFF|ON|BY|ACROSS|ALL}
```

```
ON TABLE SET BYDISPLAY {OFF|ON|BY|ACROSS|ALL}
```

where:

**OFF**

Displays a sort field value only on the first line or column of the report output for the sort group and on the first line or column of a page. OFF is the default value.

**ON or BY**

Displays the relevant BY field value on every line of report output produced. BY is a synonym for ON.

**ACROSS**

Displays the relevant ACROSS field value on every column of report output produced.

**ALL**

Displays the relevant BY field value on every line of report output and the relevant ACROSS field value on every column of report output.

# Controlling Display of Sort Field Values on Report Output

The following request generates a report on which sort field values only display when they change (BYDISPLAY OFF).

```
-SET &BYDISP = OFF;
SET BYDISPLAY = &BYDISP
TABLE FILE WF_RETAIL_LITE
HEADING CENTER
" BYDISPLAY = &BYDISP"
" "
SUM QUANTITY_SOLD DAYSDELAYED
BY PRODUCT_CATEGORY
BY PRODUCT_SUBCATEG
ACROSS BUSINESS_REGION
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image.

BYDISPLAY = OFF

| | | Customer,Business,Region | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | EMEA | | North America | | Oceania | | South America | |
| Product Category | Product Subcategory | Quantity Sold | Days Delayed | Quantity Sold | Days Delayed | Quantity Sold | Days Delayed | Quantity Sold | Days Delayed |
| Accessories | Charger | 187 | 55 | 220 | 84 | . | . | 26 | 25 |
| | Headphones | 403 | 137 | 470 | 180 | 2 | 0 | 56 | 18 |
| | Universal Remote Controls | 287 | 102 | 325 | 132 | 7 | 7 | 51 | 23 |
| Camcorder | Handheld | 466 | 200 | 527 | 209 | 4 | 1 | 94 | 20 |
| | Professional | 23 | 4 | 35 | 17 | . | . | . | . |
| | Standard | 344 | 157 | 404 | 130 | 1 | 0 | 58 | 37 |
| Computers | Smartphone | 384 | 162 | 411 | 151 | 5 | 2 | 65 | 27 |
| Media Player | Blu Ray | 1,206 | 495 | 1,395 | 518 | 15 | 11 | 203 | 78 |
| | DVD Players | 32 | 14 | 48 | 17 | . | . | 13 | 0 |
| | Streaming | 88 | 30 | 124 | 53 | 3 | 0 | 13 | 2 |
| Stereo Systems | Home Theater Systems | 741 | 239 | 847 | 349 | 4 | 5 | 138 | 59 |
| | Receivers | 266 | 90 | 282 | 109 | . | . | 68 | 21 |
| | Speaker Kits | 451 | 172 | 476 | 199 | . | . | 95 | 33 |
| | iPod Docking Station | 529 | 186 | 673 | 272 | 7 | 0 | 102 | 62 |
| Televisions | Flat Panel TV | 159 | 67 | 166 | 62 | 1 | 0 | 36 | 15 |
| Video Production | Video Editing | 381 | 139 | 445 | 150 | 3 | 1 | 58 | 27 |

Changing BYDISPLAY to ON or BY displays BY field values on every row, as shown in the following image.

BYDISPLAY = BY

| | | Customer,Business,Region | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | EMEA | | North America | | Oceania | | South America | |
| Product Category | Product Subcategory | Quantity Sold | Days Delayed | Quantity Sold | Days Delayed | Quantity Sold | Days Delayed | Quantity Sold | Days Delayed |
| Accessories | Charger | 187 | 55 | 220 | 84 | . | . | 26 | 25 |
| Accessories | Headphones | 403 | 137 | 470 | 180 | 2 | 0 | 56 | 18 |
| Accessories | Universal Remote Controls | 287 | 102 | 325 | 132 | 7 | 7 | 51 | 23 |
| Camcorder | Handheld | 466 | 200 | 527 | 209 | 4 | 1 | 94 | 20 |
| Camcorder | Professional | 23 | 4 | 35 | 17 | . | . | . | . |
| Camcorder | Standard | 344 | 157 | 404 | 130 | 1 | 0 | 58 | 37 |
| Computers | Smartphone | 384 | 162 | 411 | 151 | 5 | 2 | 65 | 27 |
| Media Player | Blu Ray | 1,206 | 495 | 1,395 | 518 | 15 | 11 | 203 | 78 |
| Media Player | DVD Players | 32 | 14 | 48 | 17 | . | . | 13 | 0 |
| Media Player | Streaming | 88 | 30 | 124 | 53 | 3 | 0 | 13 | 2 |
| Stereo Systems | Home Theater Systems | 741 | 239 | 847 | 349 | 4 | 5 | 138 | 59 |
| Stereo Systems | Receivers | 266 | 90 | 282 | 109 | . | . | 68 | 21 |
| Stereo Systems | Speaker Kits | 451 | 172 | 476 | 199 | . | . | 95 | 33 |
| Stereo Systems | iPod Docking Station | 529 | 186 | 673 | 272 | 7 | 0 | 102 | 62 |
| Televisions | Flat Panel TV | 159 | 67 | 166 | 62 | 1 | 0 | 36 | 15 |
| Video Production | Video Editing | 381 | 139 | 445 | 150 | 3 | 1 | 58 | 27 |

Changing BYDISPLAY to ACROSS displays ACROSS field values over every column, as shown in the following image.

BYDISPLAY = ACROSS

| | | Customer,Business,Region | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Product Category | Product Subcategory | EMEA Quantity Sold | EMEA Days Delayed | North America Quantity Sold | North America Days Delayed | Oceania Quantity Sold | Oceania Days Delayed | South America Quantity Sold | South America Days Delayed |
| Accessories | Charger | 187 | 55 | 220 | 84 | . | . | 26 | 25 |
| | Headphones | 403 | 137 | 470 | 180 | 2 | 0 | 56 | 18 |
| | Universal Remote Controls | 287 | 102 | 325 | 132 | 7 | 7 | 51 | 23 |
| Camcorder | Handheld | 466 | 200 | 527 | 209 | 4 | 1 | 94 | 20 |
| | Professional | 23 | 4 | 35 | 17 | . | . | . | . |
| | Standard | 344 | 157 | 404 | 130 | 1 | 0 | 58 | 37 |
| Computers | Smartphone | 384 | 162 | 411 | 151 | 5 | 2 | 65 | 27 |
| Media Player | Blu Ray | 1,206 | 495 | 1,395 | 518 | 15 | 11 | 203 | 78 |
| | DVD Players | 32 | 14 | 48 | 17 | . | . | 13 | 0 |
| | Streaming | 88 | 30 | 124 | 53 | 3 | 0 | 13 | 2 |
| Stereo Systems | Home Theater Systems | 741 | 239 | 847 | 349 | 4 | 5 | 138 | 59 |
| | Receivers | 266 | 90 | 282 | 109 | . | . | 68 | 21 |
| | Speaker Kits | 451 | 172 | 476 | 199 | . | . | 95 | 33 |
| | iPod Docking Station | 529 | 186 | 673 | 272 | 7 | 0 | 102 | 62 |
| Televisions | Flat Panel TV | 159 | 67 | 166 | 62 | 1 | 0 | 36 | 15 |
| Video Production | Video Editing | 381 | 139 | 445 | 150 | 3 | 1 | 58 | 27 |

Changing BYDISPLAY to ALL displays BY field values on every row and ACROSS field values over every column, as shown in the following image.

BYDISPLAY = ALL

| | | Customer,Business,Region | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Product Category | Product Subcategory | EMEA Quantity Sold | EMEA Days Delayed | North America Quantity Sold | North America Days Delayed | Oceania Quantity Sold | Oceania Days Delayed | South America Quantity Sold | South America Days Delayed |
| Accessories | Charger | 187 | 55 | 220 | 84 | . | . | 26 | 25 |
| Accessories | Headphones | 403 | 137 | 470 | 180 | 2 | 0 | 56 | 18 |
| Accessories | Universal Remote Controls | 287 | 102 | 325 | 132 | 7 | 7 | 51 | 23 |
| Camcorder | Handheld | 466 | 200 | 527 | 209 | 4 | 1 | 94 | 20 |
| Camcorder | Professional | 23 | 4 | 35 | 17 | . | . | . | . |
| Camcorder | Standard | 344 | 157 | 404 | 130 | 1 | 0 | 58 | 37 |
| Computers | Smartphone | 384 | 162 | 411 | 151 | 5 | 2 | 65 | 27 |
| Media Player | Blu Ray | 1,206 | 495 | 1,395 | 518 | 15 | 11 | 203 | 78 |
| Media Player | DVD Players | 32 | 14 | 48 | 17 | . | . | 13 | 0 |
| Media Player | Streaming | 88 | 30 | 124 | 53 | 3 | 0 | 13 | 2 |
| Stereo Systems | Home Theater Systems | 741 | 239 | 847 | 349 | 4 | 5 | 138 | 59 |
| Stereo Systems | Receivers | 266 | 90 | 282 | 109 | . | . | 68 | 21 |
| Stereo Systems | Speaker Kits | 451 | 172 | 476 | 199 | . | . | 95 | 33 |
| Stereo Systems | iPod Docking Station | 529 | 186 | 673 | 272 | 7 | 0 | 102 | 62 |
| Televisions | Flat Panel TV | 159 | 67 | 166 | 62 | 1 | 0 | 36 | 15 |
| Video Production | Video Editing | 381 | 139 | 445 | 150 | 3 | 1 | 58 | 27 |

# Reformatting Sort Fields

When displaying a vertical (BY) sort column or horizontal (ACROSS) sort row on report output, you can reformat the sort field values by specifying the new format in the sort phrase. The reformatting affects only the sort field value as displayed on the sort row or column. That is, if the field used as a sort field is referenced in a heading, subheading, footing, subfooting, or summary line, it displays with its original format.

# Reformat a Sort Field

```
{BY [TOTAL]|ACROSS [TOTAL]} sortfield/fmt ...
```

where:

**sortfield**

Is the sort field.

**fmt**

Is the new display format.

# Usage Notes for Reformatting Sort Fields

- Reformatting is not supported in an ON phrase.
- Reformatting is only applied to the row or column generated by the sort phrase, not to subheading, subfooting, or summary rows that reference the sort field.
- Field-based reformatting (the format is stored in a field) is not supported for sort fields. For information on field-based reformatting, see Field-Based Reformatting.
- BY field reformatting is propagated to HOLD files. ACROSS field reformatting *is not* propagated to HOLD files.
- The following features issue a warning, ignore the reformatting, and proceed with the request:
  - IN-GROUPS/RANGES-OF
  - ROWS
  - COLUMNS
  - FOR field/reformat
- All decisions are made based on an original field, therefore any option on a reformatted sort field should be placed on an original sort field break point. As a consequence, whenever the sort field value should appear (for example, in SUBTOTALS) an original field value displays.

# Reformatting Sort Fields

The following request against the GGSALES data source includes the following reformatted sort fields:

- BY CATEGORY, with CATEGORY reformatted as A3.
- BY PRODUCT, with PRODUCT reformatted as A4.
- ACROSS REGION, with region reformatted as A6.

```
TABLE FILE GGSALES
SUM UNIT
BY CATEGORY/A3
```

```
BY PRODUCT/A4
ACROSS REGION/A6
ON CATEGORY SUBTOTAL
ON CATEGORY SUBHEAD
"CATEGORY IS <CATEGORY "
" "
ON TABLE SET PAGE NOPAGE
END
```

On the output, the reformatting displays on the BY and ACROSS rows but is not propagated to the subheading and subtotal rows:

```
                    REGION
                      Midwes       Northe       Southe       West
CATEGORY  PRODUCT
-------------------------------------------------------------------------
CATEGORY IS Coffee

Cof       Capu              .        44785        73264        72831
          Espr         101154        68127        68030        71675
          Latt         231623       226243       211063       213920

*TOTAL CATEGORY Coffee
                       332777       339155       352357       358426

CATEGORY IS Food

Foo       Bisc          90413       149793       119594        70569
          Croi         139881       137394       156456       197022
          Scon         116127        70732        73779        72776
*TOTAL CATEGORY Food
                       346421       357919       349829       340367

CATEGORY IS Gifts

Gif       Coff          54002        40977        50556        48081
          Coff          47156        46185        49922        47432
          Mug           86718        91497        88474        93881
          Ther          46587        48870        48976        45648
*TOTAL CATEGORY Gifts
                       234463       227529       237928       235042


TOTAL                  913661       924603       940114       933835
```

# Manipulating Display Field Values in a Sort Group

You can use the WITHIN phrase to manipulate a display field values as they are aggregated within a sort group. This technique can be used with a prefix operator to perform calculations on a specific aggregate field rather than a report column. In contrast, the SUM and COUNT commands aggregate an entire column.

The WITHIN phrase requires a BY phrase and/or an ACROSS phrase. A maximum of two WITHIN phrases can be used per display field. If one WITHIN phrase is used, it must act on a BY phrase. If two WITHIN phrases are used, the first must act on a BY phrase and the second on an ACROSS phrase.

You can also use WITHIN TABLE, which allows you to return the original value within a request command. The WITHIN TABLE command can also be used when an ACROSS phrase is needed without a BY phrase. Otherwise, a single WITHIN phrase requires a BY phrase.

# Use WITHIN to Manipulate Display Fields

```
{SUM|COUNT} display_field WITHIN by_sort_field [WITHIN across_sort_
field]
   BY by_sort_field [ACROSS across_sort_field]
```

where:

**display_field**

Is the object of a SUM or COUNT display command.

**by_sort_field**

Is the object of a BY phrase.

**across_sort_field**

Is the object of an ACROSS phrase.

# Summing Values Within Sort Groups

The following report shows the units sold and the percent of units sold for each product within store and within the table:

```
TABLE FILE SALES
SUM UNIT_SOLD AS 'UNITS'
AND PCT.UNIT_SOLD AS 'PCT,SOLD,WITHIN,TABLE'
AND PCT.UNIT_SOLD WITHIN STORE_CODE AS 'PCT,SOLD,WITHIN,STORE'
BY STORE_CODE SKIP-LINE BY PROD_CODE
END
```

The output is:

| STORE_CODE | PROD_CODE | UNITS | PCT SOLD WITHIN TABLE | PCT SOLD WITHIN STORE |
|---|---|---|---|---|
| 14B | B10 | 60 | 9 | 15 |
| | B12 | 40 | 6 | 10 |
| | B17 | 29 | 4 | 7 |
| | C13 | 25 | 3 | 6 |
| | C7 | 45 | 6 | 11 |
| | D12 | 27 | 4 | 7 |
| | E2 | 80 | 12 | 21 |
| | E3 | 70 | 10 | 18 |
| 14Z | B10 | 30 | 4 | 18 |
| | B17 | 20 | 3 | 12 |
| | B20 | 15 | 2 | 9 |
| | C17 | 12 | 1 | 7 |
| | D12 | 20 | 3 | 12 |
| | E1 | 30 | 4 | 18 |
| | E3 | 35 | 5 | 21 |
| 77F | B20 | 25 | 3 | 38 |
| | C7 | 40 | 6 | 61 |
| K1 | B10 | 13 | 2 | 30 |
| | B12 | 29 | 4 | 69 |

# Creating a Matrix Report

You can create a matrix report by sorting both rows and columns. When you include both BY and ACROSS phrases in a report request, information is sorted vertically and

horizontally, turning the report into a matrix of information that you read like a grid. A matrix report can have multiple BY and ACROSS sort fields.

# Creating a Simple Matrix

The following request displays total salary outlay across departments and by job codes, creating a matrix report.

```
TABLE FILE EMPLOYEE
SUM CURR_SAL
ACROSS DEPARTMENT
BY CURR_JOBCODE
END
```

The output is:

```
                  DEPARTMENT
                  MIS              PRODUCTION
CURR_JOBCODE
------------------------------------------------
A01                         .        $9,500.00
A07                  $9,000.00       $11,000.00
A15                         .       $26,862.00
A17                 $27,062.00       $29,700.00
B02                 $18,480.00       $16,100.00
B03                 $18,480.00                .
B04                 $21,780.00       $21,120.00
B14                 $13,200.00                .
```

# Creating a Matrix With Several Sort Fields

The following request uses several BY and ACROSS sort fields to create a matrix report.

```
TABLE FILE EMPLOYEE
SUM CURR_SAL
ACROSS DEPARTMENT ACROSS LAST_NAME
BY CURR_JOBCODE BY ED_HRS
WHERE DEPARTMENT EQ 'MIS'
```

```
WHERE CURR_SAL GT 21500
END
```

The output is:

```
                            DEPARTMENT
                            MIS
                            LAST_NAME
                            BLACKWOOD            CROSS
CURR_JOBCODE  ED_HRS
------------------------------------------------------
A17            45.00                .       $27,062.00
B04            75.00       $21,780.00                .
```

# Controlling Collation Sequence

Collation is defined as a set of rules that apply to the ordering and matching of all language elements that involve comparison of two values. A wide variety of elements are affected by this feature. Among these features are sorting, aggregation, WHERE conditions, and StyleSheets. By default, items are sorted based on their binary values. The COLLATION settings SRV_CI and SRV_CS, case-insensitive and case-sensitive collation, implement collation based on the LANGUAGE setting. Case-insensitive collation means that all WHERE clauses and sorts ignore the case of the elements being compared. COLLATION is a session level setting (it is not supported in an ON TABLE phrase and should be set in the edasprof server profile).

The collation setting applies only to alphanumeric values.

# Establish Binary or Case-Insensitive Collation Sequence

Add the following command to the server edasprof.prf profile:

```
SET COLLATION = {BINARY|SRV_CI|SRV_CS|CODEPAGE}
```

where:

**BINARY**

Bases the collation sequence on binary values.

**SRV_CI**

Bases collation sequence on the LANGUAGE setting, and is case-insensitive.

**SRV_CS**

Bases collation sequence on the LANGUAGE setting, and is case-sensitive.

**CODEPAGE**

Bases collation sequence on the code page in effect, and is case-sensitive. CODEPAGE is the default value.

In most cases, CODEPAGE is the same as BINARY. The only differences are for Danish, Finnish, German, Norwegian, and Swedish in an EBCDIC environment.

# Usage Notes for SET COLLATION

- SUFFIX=FIX or SUFFIX=FOCUS/XFOCUS HOLD files created in one mode may not be usable as targets for a JOIN in another mode if the join field is on alphanumeric data with mixed-cases.
- FIXRETRIEVE is supported only for binary data, so setting COLLATION to anything other than BINARY will turn FIXRETRIEVE OFF, which may affect join performance.

**Rules for Sorting and Aggregation**

- Records with the same characters in the same order, but with variations in case, are considered to be identical. If multiple input records have these variations, the value used is from the first such record.
- In a detail level report, the sort value is the same for each output record. That value will be the one for the input record that had the lowest value (collated first).
- When the MIN (or the MAX) value for two or more alphanumeric display fields having a given instance of the sort field values is the same by case-insensitive collation, but the two values vary by case in some positions, the one retained is the last one in the input file (highest input record number) when SUMPREF=LST and the first (lowest record number) when SUMPREF=FST.

# Using Binary and Case-Insensitive Collation Sequence for Sorting

The following request creates a FOCUS data source named COLLATE that has some records with product names that differ only by the case of one letter:

```
CREATE FILE COLLATE
-RUN
MODIFY FILE COLLATE
FIXFORM PROD_NUM/C4 PRODNAME/C30 QTY_IN_STOCK/C7 PRICE/C12 COST/C12
CHECK OFF
DATA
10042 Hd VCR LCD Menu               43068      179.00      129.00
10052 HD VCR LCD Menu               43068      179.00      129.00
1006Combo Player - 4 HD VCR + DVD   13527      399.00      289.00
1007Combo Player - 4 Hd VCR + DVD   13527      399.00      289.00
1008DVD Upgrade Unit for Cent. VCR    199      199.00      139.00
1010750SL Digital Camcorder 300 X   10758      999.00      750.00
1012650DL Digital Camcorder 150 X    2972      899.00      710.00
1014340SX Digital Camera 65K P        990      249.00      199.00
1015340SX digital Camera 65K P        990      249.00      199.00
1016330DX Digital Camera 1024K P    12707      279.00      199.00
1018250 8MM Camcorder 40 X          60073      399.00      320.00
1019250 8mm Camcorder 40 X          60073      399.00      320.00
1020150 8MM Camcorder 20 X           5961      319.00      240.00
1022120 VHS-C Camcorder 40 X         2300      399.00      259.00
1024110 VHS-C Camcorder 20 X         4000      349.00      249.00
1026AR2 35mm Camera 8 X             12444      129.00       95.00
1029AR2 35MM Camera 8 X             11499      109.00       79.00
1028AR3 35MM Camera 10 X            11499      109.00       79.00
1030QX Portable CD Player           22000      169.00       99.00
1032R5 Micro Digital Tape Recorder   1990       89.00       69.00
1034ZT Digital PDA - Commercial     21000      499.00      349.00
1036ZC Digital PDA - Standard       33000      299.00      249.00
END
```

The following request prints the values of PRODNAME in the order in which they are encountered in the input stream:

```
TABLE FILE COLLATE
PRINT PROD_NUM PRODNAME
END
```

On the output, the rows with product numbers 1004 and 1005 differ only in the case of the letter **d** in **HD**. The record with the lowercase **d** is before the record with the uppercase **D**. The rows with record numbers 1006 and 1007 also differ only in the case of the letter **d** in **HD**. In this case, the record with the uppercase **D** is before the record with the lowercase **d**:

```
Product  Product
Number:  Name:
-------  -------
1004     2 Hd VCR LCD Menu
1005     2 HD VCR LCD Menu
1006     Combo Player - 4 HD VCR + DVD
1007     Combo Player - 4 Hd VCR + DVD
1008     DVD Upgrade Unit for Cent. VCR
1010     750SL Digital Camcorder 300 X
1012     650DL Digital Camcorder 150 X
1014     340SX Digital Camera 65K P
1015     340SX digital Camera 65K P
1016     330DX Digital Camera 1024K P
1018     250 8MM Camcorder 40 X
1019     250 8mm Camcorder 40 X
1020     150 8MM Camcorder 20 X
1022     120 VHS-C Camcorder 40 X
1024     110 VHS-C Camcorder 20 X
1026     AR2 35mm Camera 8 X
1029     AR2 35MM Camera 8 X
1028     AR3 35MM Camera 10 X
1030     QX Portable CD Player
1032     R5 Micro Digital Tape Recorder
1034     ZT Digital PDA - Commercial
1036     ZC Digital PDA - Standard
```

The next request sorts the output in BINARY order. The setting COLLATION = BINARY is in effect:

```
TABLE FILE COLLATE
PRINT PROD_NUM
BY PRODNAME
END
```

In an EBCDIC environment, the records with the lowercase letters sort in front of the records with the uppercase letters, so the row with product number 1007 sorts in front of the row with product number 1006:

```
Product                         Product
Name:                           Number:
-------                         -------
AR2 35mm Camera 8 X             1026
AR2 35MM Camera 8 X             1029
AR3 35MM Camera 10 X            1028
Combo Player - 4 Hd VCR + DVD   1007
Combo Player - 4 HD VCR + DVD   1006
DVD Upgrade Unit for Cent. VCR  1008
QX Portable CD Player           1030
R5 Micro Digital Tape Recorder  1032
ZC Digital PDA - Standard       1036
ZT Digital PDA - Commercial     1034
110 VHS-C Camcorder 20 X        1024
120 VHS-C Camcorder 40 X        1022
150 8MM Camcorder 20 X          1020
2 Hd VCR LCD Menu               1004
2 HD VCR LCD Menu               1005
250 8mm Camcorder 40 X          1019
250 8MM Camcorder 40 X          1018
330DX Digital Camera 1024K P    1016
340SX digital Camera 65K P      1015
340SX Digital Camera 65K P      1014
650DL Digital Camcorder 150 X   1012
750SL Digital Camcorder 300 X   1010
```

In an ASCII environment, the records with the uppercase letters sort in front of the records with the lowercase letters, so the row with product number 1005 sorts in front of the row with product number 1004:

```
Product                         Product
Name:                           Number:
-------                         -------
110 VHS-C Camcorder 20 X        1024
120 VHS-C Camcorder 40 X        1022
150 8MM Camcorder 20 X          1020
2 HD VCR LCD Menu               1005
2 Hd VCR LCD Menu               1004
250 8MM Camcorder 40 X          1018
250 8mm Camcorder 40 X          1019
330DX Digital Camera 1024K P    1016
340SX Digital Camera 65K P      1014
340SX digital Camera 65K P      1015
650DL Digital Camcorder 150 X   1012
750SL Digital Camcorder 300 X   1010
```

```
AR2 35MM Camera 8 X             1029
AR2 35mm Camera 8 X             1026
AR3 35MM Camera 10 X            1028
Combo Player - 4 HD VCR + DVD   1006
Combo Player - 4 Hd VCR + DVD   1007
DVD Upgrade Unit for Cent. VCR  1008
QX Portable CD Player           1030
R5 Micro Digital Tape Recorder  1032
ZC Digital PDA - Standard       1036
ZT Digital PDA - Commercial     1034
```

With COLLATION set to SRV_CI and a sort on the PRODNAME field, the uppercase and lowercase letters have the same value, so the row displays only once for multiple record numbers. For example, the rows with product numbers 1004 and 1005 display with the same PRODNAME value and the sort field value for the display is the first one in the input stream.

The following shows the output in an EBCDIC environment:

```
Product                         Product
Name:                           Number:
-------                         -------
AR2 35mm Camera 8 X             1026
                                1029
AR3 35MM Camera 10 X            1028
Combo Player - 4 HD VCR + DVD   1006
                                1007
DVD Upgrade Unit for Cent. VCR  1008
QX Portable CD Player           1030
R5 Micro Digital Tape Recorder  1032
ZC Digital PDA - Standard       1036
ZT Digital PDA - Commercial     1034
110 VHS-C Camcorder 20 X        1024
120 VHS-C Camcorder 40 X        1022
150 8MM Camcorder 20 X          1020
2 Hd VCR LCD Menu               1004
                                1005
250 8MM Camcorder 40 X          1018
250 8MM Camcorder 40 X          1019
330DX Digital Camera 1024K P    1016
340SX Digital Camera 65K P      1014
                                1015
650DL Digital Camcorder 150 X   1012
750SL Digital Camcorder 300 X   1010
```

The following shows the output in an ASCII environment:

```
Product                          Product
Name:                            Number:
-------                          -------
110 VHS-C Camcorder 20 X         1024
120 VHS-C Camcorder 40 X         1022
150 8MM Camcorder 20 X           1020
2 Hd VCR LCD Menu                1004
                                 1005
250 8MM Camcorder 40 X           1018
                                 1019
330DX Digital Camera 1024K P     1016
340SX Digital Camera 65K P       1014
                                 1015
650DL Digital Camcorder 150 X    1012
750SL Digital Camcorder 300 X    1010
AR2 35mm Camera 8 X              1026
                                 1029
AR3 35MM Camera 10 X             1028
Combo Player - 4 HD VCR + DVD    1006
                                 1007
DVD Upgrade Unit for Cent. VCR   1008
QX Portable CD Player            1030
R5 Micro Digital Tape Recorder   1032
ZC Digital PDA - Standard        1036
ZT Digital PDA - Commercial      1034
```

# Using Binary and Case-Insensitive Collation Sequence for Selection

The following request against the COLLATE data source selects records in which the PRODNAME contains the characters 'HD':

```
TABLE FILE COLLATE
PRINT PROD_NUM PRODNAME
WHERE PRODNAME CONTAINS 'HD'
END
```

With COLLATION set to BINARY, only the records with an exact match (uppercase HD) are selected. The output is:

```
Product  Product
Number:  Name:
-------  -------
1005     2 HD VCR LCD Menu
1006     Combo Player - 4 HD VCR + DVD
```

Running the same request but changing the COLLATION parameter to SRV_CI selects all records with any combination of uppercase and lowercase values for H and D. The rows are displayed in the order in which they appeared in the data source:

```
Product  Product
Number:  Name:
-------  -------
1004     2 Hd VCR LCD Menu
1005     2 HD VCR LCD Menu
1006     Combo Player - 4 HD VCR + DVD
1007     Combo Player - 4 Hd VCR + DVD
```

# Specifying the Sort Order

Sort field values are automatically displayed in ascending order, beginning with the lowest value and continuing to the highest. The default sorting sequence varies for operating systems. On z/OS it is a-z, A-Z, 0-9 for alphanumeric fields; 0-9 for numeric fields. On UNIX and Windows it is 0-9, A-Z, a-z for alphanumeric fields; 0-9 for numeric fields.

You have the option of overriding this default and displaying values in descending order, ranging from the highest value to the lowest value, by including HIGHEST in the sort phrase.

# Specify the Sort Order

```
{BY|ACROSS} {LOWEST|HIGHEST} sortfield
```

where:

**LOWEST**

Sorts in ascending order, beginning with the lowest value and continuing to the highest value (a-z, A-Z, 0-9 for alphanumeric fields; 0-9 for numeric fields). This option is the default.

**HIGHEST**

Sorts in descending order, beginning with the highest value and continuing to the lowest value. You can also use TOP as a synonym for HIGHEST.

**sortfield**

Is the name of the sort field.

# Sorting in Ascending Order

The following report request does not specify a particular sorting order, and so, by default, it lists salaries ranging from the lowest to the highest.

```
TABLE FILE EMPLOYEE
PRINT LAST_NAME
BY CURR_SAL
END
```

You can specify this same ascending order explicitly by including LOWEST in the sort phrase.

```
TABLE FILE EMPLOYEE
PRINT LAST_NAME
BY LOWEST CURR_SAL
END
```

The output is:

| CURR_SAL | LAST_NAME |
|---|---|
| $9,000.00 | GREENSPAN |
| $9,500.00 | SMITH |
| $11,000.00 | STEVENS |
| $13,200.00 | SMITH |
| $16,100.00 | MCKNIGHT |
| $18,480.00 | JONES |
| | MCCOY |
| $21,120.00 | ROMANS |
| $21,780.00 | BLACKWOOD |
| $26,862.00 | IRVING |
| $27,062.00 | CROSS |
| $29,700.00 | BANNING |

# Sorting in Descending Order

The following request lists salaries ranging from the highest to lowest.

```
TABLE FILE EMPLOYEE
PRINT LAST_NAME
BY HIGHEST CURR_SAL
END
```

The output is:

| CURR_SAL | LAST_NAME |
|---|---|
| $29,700.00 | BANNING |
| $27,062.00 | CROSS |
| $26,862.00 | IRVING |
| $21,780.00 | BLACKWOOD |
| $21,120.00 | ROMANS |
| $18,480.00 | JONES |
| | MCCOY |
| $16,100.00 | MCKNIGHT |
| $13,200.00 | SMITH |
| $11,000.00 | STEVENS |
| $9,500.00 | SMITH |
| $9,000.00 | GREENSPAN |

# Specifying Your Own Sort Order

Sort field values are automatically displayed in ascending order, beginning with the lowest value and continuing to the highest.

You can override the default order and display values in your own user-defined sorting sequence. To do this, you need to decide the following:

1. Which sort field values you want to allow. You can specify every sort field value, or a subset of values. When you issue your report request, only records containing those values are included in the report.
2. The order in which you want the values to appear. You can specify any order. For example, you could specify that an A1 sort field containing a single-letter code be sorted in the order A, Z, B, C, Y, and so on.

There are two ways to specify your own sorting order, depending on whether you are sorting rows with BY, or sorting columns with ACROSS:

- The BY ROWS OVER phrase, for defining your own row sort sequence.
- The ACROSS COLUMNS AND phrase, for defining your own column sort sequence.

# Define Your Own Sort Order

```
BY sortfield AS 'coltitle' ROWS value1 [AS 'text1']
OVER value2 [AS 'text2']
[... OVER valuen [ AS 'textn']]
END
```

where:

**sortfield**

Is the last BY field in the report.

**coltitle**

Is the column title for the BY field on the report output.

**value1**

Is the sort field value that is first in the sorting sequence.

**AS 'text1'**

Enables you to assign alternate text for the first row, which replaces the field value in the output. Enclose the text in single quotation marks.

**value2**

Is the sort field value that is second in the sorting sequence.

**AS 'text2'**

Enables you to assign alternate text for the second row, which replaces the field value in the output. Enclose the text in single quotation marks.

**valuen**

Is the sort field value that is last in the sorting sequence.

**AS 'textn'**

Enables you to assign alternate text for the last row, which replaces the field value in the output. Enclose the text in single quotation marks.

An alternative syntax is

```
FOR sortfield
value1 OVER value2 [... OVER valuen]
```

which uses the row-based reporting phrase FOR, described in Creating Financial Reports With Financial Modeling Language (FML).

# Usage Notes for Defining Your Sort Order

- Any sort field value that you do not specify in the BY ROWS OVER phrase is not included in the sorting sequence, and does not appear in the report.
- Sort field values that contain embedded blank spaces should be enclosed in single quotation marks (').
- Any sort field value that you do specify in the BY ROWS OVER phrase is included in the report, whether or not there is data.
- If missing data is included in the report, it must be inserted at the lowest sort level.

- The name of the sort field is not included in the report.
- Each report request can contain only one BY ROWS OVER phrase. BY ROWS OVER is not supported with the FOR phrase. For information about the FOR phrase, see Creating Financial Reports With Financial Modeling Language (FML).

# Defining Your Row Sort Order

The following illustrates how to sort employees by the banks at which their paychecks are automatically deposited, and how to define your own label in the sorting sequence for the bank field.

```
TABLE FILE EMPLOYEE
PRINT LAST_NAME
BY BANK_NAME ROWS 'BEST BANK' OVER STATE
   OVER ASSOCIATED OVER 'BANK ASSOCIATION'
END
```

The output is:

| | LAST_NAME |
|---|---|
| BEST BANK | BANNING |
| STATE | JONES |
| ASSOCIATED | IRVING |
| ASSOCIATED | BLACKWOOD |
| ASSOCIATED | MCKNIGHT |
| BANK ASSOCIATION | CROSS |

# Define Column Sort Sequence

```
ACROSS sortfield COLUMNS value1 AND value2 [... AND valuen]
```

where:

**sortfield**

Is the name of the sort field.

**value1**

Is the sort field value that is first in the sorting sequence.

**value2**

Is the sort field value that is second in the sorting sequence.

**valuen**

Is the sort field value that is last in the sorting sequence.

# ACROSS COLUMNS AND phrase

- Any sort field value that you do not specify in the ACROSS COLUMNS AND phrase is not included in the label within the sorting sequence, and does not appear in the report.
- Sort field values that contain embedded blank spaces should be enclosed in single quotation marks.
- Any sort field value that you do specify in the ACROSS COLUMNS AND phrase is included in the report, whether or not there is data.
- When using a COMPUTE with an ACROSS COLUMNS phrase, the COLUMNS should be specified last:

  ```
  ACROSS acrossfield [AND] COMPUTE compute_expression; COLUMNS values
  ```

- Each report request may contain only one ACROSS COLUMNS AND phrase.

# Defining Column Sort Sequence

The following illustrates how to sum employee salaries by the bank at which they are automatically deposited, and to define your own label within the sorting sequence for the bank field.

```
TABLE FILE EMPLOYEE
SUM CURR_SAL
```

```
ACROSS BANK_NAME COLUMNS 'BEST BANK' AND STATE
   AND ASSOCIATED AND 'BANK ASSOCIATION'
END
```

The output is:

```
BANK_NAME

BEST BANK          STATE              ASSOCIATED         BANK
ASSOCIATION
-------------------------------------------------------------------------
-
     $29,700.00         $18,480.00         $64,742.00         $27,062.00
```

# Selecting and Assigning Column Titles to ACROSS Values

When you use the ACROSS COLUMNS phrase to select and order the columns that display on the report output for an ACROSS sort field, you can assign each selected column a new column title using an AS phrase.

# Assign Column Titles To ACROSS Values

```
ACROSS sortfield [AS title]
 COLUMNS aval1 [AS val1title] [{AND|OR} aval2 [AS val2title] [...
{AND|OR} avaln [AS valntitle]]]
```

where:

**sortfield**

Is the ACROSS field name.

**title**

Is the title for the ACROSS field name.

**AND|OR**

Is required to separate the selected ACROSS values. AND and OR are synonyms for this purpose.

**aval1, aval2, ... avaln**

Are the selected ACROSS values to display on the report output.

**val1title, val2title ...valntitle**

Are the column titles for the selected ACROSS values.

# Usage Notes for Assigning Column Titles to ACROSS Values

- Any value you specify as an ACROSS value in the sort phrase will appear on the report output, even if the value is screened out by an IF or WHERE test, or if the value does not exist at all in the data source.

  **Note:** For styled output formats, SET HIDENULLACRS=ON removes empty columns in ACROSS groups from the report output.
- Column titles for ACROSS fields appear on a single line of the report output.
- Support for AS names for ACROSS values is limited to the TABLE FILE command.
- When you create a HOLD file with SET ASNAMES = ON, the original field name is propagated to the output Master File, *not* the AS name.

# Selecting and Assigning Column Titles to ACROSS Values

The following request against the GGSALES data source selects the columns **Coffee Grinder**, **Latte**, and **Coffee Pot** for the ACROSS field PRODUCT, and assigns each of them a new column title:

```
 TABLE FILE GGSALES
 SUM
 DOLLARS/I8M AS ''
 BY REGION
 ACROSS PRODUCT  AS 'Products'
   COLUMNS 'Coffee Grinder' AS 'Grinder'
    OR Latte AS 'caffellatte'
    AND 'Coffee Pot' AS 'Carafe'
ON TABLE SET PAGE NOPAGE
END
```

The output is:

```
             Products
             Grinder          caffellatte      Carafe
Region
----------------------------------------------------------------
Midwest         $666,622       $2,883,566         $599,878
Northeast       $509,200       $2,808,855         $590,780
Southeast       $656,957       $2,637,562         $645,303
West            $603,436       $2,670,405         $613,624
```

# Ranking Sort Field Values

When you sort report rows using the BY phrase, you can indicate the numeric rank of each row. Ranking sort field values is frequently combined with restricting sort field values by rank.

Note that it is possible for several report rows to have the same rank if they have identical sort field values.

The default column title for RANKED BY is RANK. You can change the title using an AS phrase. The RANK field has format I7. Therefore, the RANK column in a report can be up to seven digits. For more information, see Using Headings, Footings, Titles, and Labels.

You can rank aggregated values using the syntax RANKED BY TOTAL. For details, see Sorting and Aggregating Report Columns.

# Rank Sort Field Values

```
RANKED [AS 'name'] BY  {HIGHEST|LOWEST} [n]  sortfield [AS 'text']
```

where:

**name**

Is the new name for the RANK column title.

**sortfield**

Is the name of the sort field. The field can be numeric or alphanumeric.

**n**

Is the number of rank categories to display on the report output.

**text**

Is the column heading to use for the sort field column on the report output.

# Ranking Sort Field Values

Issue the following request to display a list of employee names in salary order, indicating the rank of each employee by salary. Note that employees Jones and McCoy have the same rank since their current salary is the same.

```
TABLE FILE EMPLOYEE
PRINT LAST_NAME
RANKED AS 'Sequence' BY CURR_SAL
END
```

The output is:

| Sequence | CURR_SAL | LAST_NAME |
|---|---|---|
| 1 | $9,000.00 | GREENSPAN |
| 2 | $9,500.00 | SMITH |
| 3 | $11,000.00 | STEVENS |
| 4 | $13,200.00 | SMITH |
| 5 | $16,100.00 | MCKNIGHT |
| 6 | $18,480.00 | JONES |
| | | MCCOY |
| 7 | $21,120.00 | ROMANS |
| 8 | $21,780.00 | BLACKWOOD |
| 9 | $26,862.00 | IRVING |
| 10 | $27,062.00 | CROSS |
| 11 | $29,700.00 | BANNING |

# Ranking and Restricting Sort Field Values

Ranking sort field values is frequently combined with restricting sort field values by rank, as in the following example.

```
TABLE FILE EMPLOYEE
PRINT LAST_NAME
RANKED BY HIGHEST 5 CURR_SAL
END
```

The output is:

```
RANK         CURR_SAL  LAST_NAME
----         --------  ---------
   1       $29,700.00  BANNING
   2       $27,062.00  CROSS
   3       $26,862.00  IRVING
   4       $21,780.00  BLACKWOOD
   5       $21,120.00  ROMANS
```

# DENSE and SPARSE Ranking

The WebFOCUS sort phrases RANK BY and BY {HIGHEST|LOWEST} **n** sort the report output and assign rank numbers to the sequence of data values. When assigning a rank to a data

value, by default WebFOCUS does not skip rank numbers. This means that even when multiple data values are assigned the same rank, the rank number for the next group of values is the next sequential integer. This method of assigning rank numbers is called **dense**.

Some of the relational engines assign rank numbers using a method called **sparse**. With sparse ranking, if multiple data values are assigned the same rank number, the next rank number will be the previous rank number plus the number of multiples.

You can use the WebFOCUS RANK parameter to control the type of ranking done by WebFOCUS. In addition, if you are accessing a relational data source, you can set the ranking method to the type of ranking done by your relational engine so that the rank calculation can be optimized. Some relational engines have functions for both dense and sparse ranking. In this case, either setting can be optimized.

# Optimizing Ranking

In order to pass rank processing to a relational engine your request must:

- Use the SUM (or WRITE or ADD) command to aggregate values.
- Specify the number of rank categories to be displayed. That is, you must specify a value for **n**:

```
[RANKED] BY [HIGHEST] n
```

# Control the Ranking Method

```
SET RANK={DENSE|SPARSE}
```

where:

**DENSE**

Specifies dense ranking. With this method, each rank number is the next sequential integer, even when the same rank is assigned to multiple data values. DENSE is the

default value.

**SPARSE**

Specifies sparse ranking. With this method, if the same rank number is assigned to multiple data values, the next rank number will be the previous rank number plus the number of multiples.

Then, in your request, use one of the following forms of the BY phrase:

```
RANKED BY {HIGHEST|LOWEST} [n] sortfield [AS 'text']
```

or

```
BY {HIGHEST|LOWEST} n sortfield [AS 'text']
```

where:

**n**

Is the highest rank number to display on the report output when the RANKED BY phrase is used. When RANKED is not used, it is the number of distinct sort field values to display on the report output when SET RANK=DENSE, and the total number of lines of output for the sort field when SET RANK=SPARSE.

**sortfield**

Is the name of the sort field.

**text**

Is the column heading to be used for the sort field column on the report output.

# Usage Notes for SET RANK

- The RNK. prefix operator is not affected by the RANK parameter.
- The rank numbers propagated to a HOLD file depend on the RANK parameter setting.

# Ranking Values in a FOCUS Data Source

The following request against the EMPDATA data source ranks salaries in descending order by division. The RANK parameter is set to DENSE (the default).

```
SET RANK = DENSE
TABLE FILE EMPDATA
PRINT LASTNAME FIRSTNAME
RANKED BY HIGHEST 12 SALARY
BY DIV
ON TABLE SET PAGE NOPAGE
END
```

On the output, six employees are included in rank number 6. With dense ranking, the next rank number is the next highest integer, 7.

```
RANK           SALARY  DIV   LASTNAME         FIRSTNAME
----           ------  ---   --------         ---------
   1      $115,000.00  CE    LASTRA           KAREN
   2       $83,000.00  CORP  SANCHEZ          EVELYN
   3       $80,500.00  SE    NOZAWA           JIM
   4       $79,000.00  CORP  SOPENA           BEN
   5       $70,000.00  WE    CASSANOVA        LOIS
   6       $62,500.00  CE    ADAMS            RUTH
                       CORP  CVEK             MARCUS
                             WANG             JOHN
                       NE    WHITE            VERONICA
                       SE    BELLA            MICHAEL
                             HIRSCHMAN        ROSE
   7       $58,800.00  WE    GOTLIEB          CHRIS
   8       $55,500.00  CORP  VALINO           DANIEL
                       NE    PATEL            DORINA
   9       $54,100.00  CE    ADDAMS           PETER
                       WE    FERNSTEIN        ERWIN
  10       $52,000.00  NE    LIEBER           JEFF
  11       $50,500.00  SE    LEWIS            CASSANDRA
  12       $49,500.00  CE    ROSENTHAL        KATRINA
                       SE    WANG             KATE
```

Running the same request with SET RANK=SPARSE produces the following output. Since rank category 6 includes six employees, the next rank number is 6 + 6.

```
RANK           SALARY  DIV   LASTNAME         FIRSTNAME
----           ------  ---   --------         ---------
   1      $115,000.00  CE    LASTRA           KAREN
   2       $83,000.00  CORP  SANCHEZ          EVELYN
   3       $80,500.00  SE    NOZAWA           JIM
   4       $79,000.00  CORP  SOPENA           BEN
   5       $70,000.00  WE    CASSANOVA        LOIS
   6       $62,500.00  CE    ADAMS            RUTH
                       CORP  CVEK             MARCUS
                             WANG             JOHN
                       NE    WHITE            VERONICA
                       SE    BELLA            MICHAEL
                             HIRSCHMAN        ROSE
  12       $58,800.00  WE    GOTLIEB          CHRIS
```

# Limiting the Number of Sort Field Values

The following request against the EMPDATA data source sorts salaries in descending order by division and prints the 12 highest salaries. The RANK parameter is set to DENSE (the default).

```
SET RANK = DENSE
TABLE FILE EMPDATA
PRINT LASTNAME FIRSTNAME
BY HIGHEST 12 SALARY
BY DIV
ON TABLE SET PAGE NOPAGE
END
```

On the output, 12 distinct salary values are displayed, even though some of the employees have the same salaries.

```
     SALARY  DIV   LASTNAME         FIRSTNAME
     ------  ---   --------         ---------
$115,000.00  CE    LASTRA           KAREN
 $83,000.00  CORP  SANCHEZ          EVELYN
 $80,500.00  SE    NOZAWA           JIM
 $79,000.00  CORP  SOPENA           BEN
 $70,000.00  WE    CASSANOVA        LOIS
 $62,500.00  CE    ADAMS            RUTH
             CORP  CVEK             MARCUS
                   WANG             JOHN
```

```
             NE    WHITE           VERONICA
             SE    BELLA           MICHAEL
                   HIRSCHMAN       ROSE
 $58,800.00  WE    GOTLIEB         CHRIS
 $55,500.00  CORP  VALINO          DANIEL
             NE    PATEL           DORINA
 $54,100.00  CE    ADDAMS          PETER
             WE    FERNSTEIN       ERWIN
 $52,000.00  NE    LIEBER          JEFF
 $50,500.00  SE    LEWIS           CASSANDRA
 $49,500.00  CE    ROSENTHAL       KATRINA
             SE    WANG            KATE
```

Running the same request with SET RANK=SPARSE produces the following output. Since six employees have salary $62,500, that value is counted 6 times so that only 12 lines (seven distinct salary values) display on the output.

```
     SALARY  DIV   LASTNAME        FIRSTNAME
     ------  ---   --------        ---------
$115,000.00  CE    LASTRA          KAREN
 $83,000.00  CORP  SANCHEZ         EVELYN
 $80,500.00  SE    NOZAWA          JIM
 $79,000.00  CORP  SOPENA          BEN
 $70,000.00  WE    CASSANOVA       LOIS
 $62,500.00  CE    ADAMS           RUTH
             CORP  CVEK            MARCUS
                   WANG            JOHN
             NE    WHITE           VERONICA
             SE    BELLA           MICHAEL
                   HIRSCHMAN       ROSE
 $58,800.00  WE    GOTLIEB         CHRIS
```

# Grouping Numeric Data Into Ranges

When you sort a report using a numeric sort field, you can group the sort field values together and define the range of each group.

There are several ways of defining groups. You can define groups of:

- Equal range using the IN-GROUPS-OF phrase.

  Each report request can contain a total of five IN-GROUPS-OF phrases plus IN-

RANGES-OF phrases. The IN-GROUPS-OF phrase can only be used once per BY field. The first sort field range starts from the lowest value of a multiple of the IN-GROUPS-OF value, and the value displayed is the start point of each range.

- Equal range using the IN-RANGES-OF phrase.

  Each report request can contain a total of five IN-GROUPS-OF phrases plus IN-RANGES-OF phrases. The IN-RANGES-OF phrase can only be used once per BY field, and it generates an additional internal sort phrase that must be counted in the total number of sort phrases. The first sort field range starts from the lowest value of a multiple of the IN-GROUPS-OF value. No message is generated if you specify a range of zero, but the values displayed on the report are unpredictable.

- Unequal range using the FOR phrase.
- Tiles. These include percentiles, quartiles, or deciles. For details, see Grouping Numeric Data Into Tiles.

The FOR phrase is usually used to produce matrix reports and is part of the Financial Modeling Language (FML). However, you can also use it to create columnar reports that group sort field values in unequal ranges.

The FOR phrase displays the sort value for each individual row. The ranges do not have to be contiguous, that is, you can define your ranges with gaps between them. The FOR phrase is described in more detail in Creating Financial Reports With Financial Modeling Language (FML).

**Note:** If there is not any data for a group, a row for the group still appears in the report.

# Define Groups of Equal Range

```
{BY|ACROSS} sortfield IN-GROUPS-OF value [TOP limit]
```

where:

**sortfield**

Is the name of the sort field. The sort field must be numeric: its format must be I (integer), F (floating-point number), D (decimal number), or P (packed number).

**value**

Is a positive integer that specifies the range by which sort field values are grouped.

**limit**

Is an optional number that defines the highest group label to be included in the report.

# Defining Groups of Equal Ranges

The following illustrates how to show which employees fall into which salary ranges, and to define the ranges by $5,000 increments.

```
TABLE FILE EMPLOYEE
PRINT LAST_NAME
BY CURR_SAL IN-GROUPS-OF 5000
END
```

The output is:

```
  CURR_SAL  LAST_NAME
  --------  ---------
 $5,000.00  SMITH
            GREENSPAN
$10,000.00  STEVENS
            SMITH
$15,000.00  JONES
            MCCOY
            MCKNIGHT
$20,000.00  ROMANS
            BLACKWOOD
$25,000.00  BANNING
            IRVING
            CROSS
```

# Define Equal Ranges

```
{BY|ACROSS} sortfield IN-RANGES-OF value [TOP limit]
```

where:

**sortfield**

Is the name of the sort field. The sort field must be numeric: its format must be I (Integer), F (floating-point), D (double-precision), or P (packed).

**value**

Is an integer greater than zero indicating the range by which sort field values are grouped.

**limit**

Is an optional number that defines the highest range label to be included in the report. The range is extended to include all data values higher than this value.

**Note:** IN-RANGES-OF generates an internal sort phrase that must be counted in the total number of sort phrases.

# Defining Equal Ranges

```
TABLE FILE EMPLOYEE
PRINT LAST_NAME
BY CURR_SAL IN-RANGES-OF 5000
END
```

The output is:

| CURR SAL | LAST NAME |
|---|---|
| $5,000.00 - $9,999.99 | SMITH |
| | GREENSPAN |
| $10,000.00 - $14,999.99 | STEVENS |
| | SMITH |
| $15,000.00 - $19,999.99 | JONES |
| | MCCOY |
| | MCKNIGHT |
| $20,000.00 - $24,999.99 | ROMANS |
| | BLACKWOOD |
| $25,000.00 - $29,999.99 | BANNING |
| | IRVING |
| | CROSS |

# Define Custom Groups of Data Values

```
FOR sortfield
begin1 TO end1 [OVER begin2 TO end2 ... ]
```

where:

**sortfield**

Is the name of the sort field.

**begin**

Is a value that identifies the beginning of a range.

**end**

Is a value that identifies the end of a range.

# Defining Custom Groups of Data Values

The following request displays employee salaries, but it groups them in an arbitrary way. Notice that the starting value of each range prints in the report.

```
TABLE FILE EMPLOYEE
PRINT LAST_NAME
FOR CURR_SAL
9000 TO 13500 OVER
14000 TO 19700 OVER
19800 TO 30000
END
```

The output is:

| | LAST_NAME |
|---|---|
| 9000 | STEVENS |
| 9000 | SMITH |
| 9000 | SMITH |
| 9000 | GREENSPAN |
| 14000 | JONES |
| 14000 | MCCOY |
| 14000 | MCKNIGHT |
| 19800 | BANNING |
| 19800 | IRVING |
| 19800 | ROMANS |
| 19800 | BLACKWOOD |
| 19800 | CROSS |

# Grouping Numeric Data Into Tiles

You can group numeric data into any number of tiles (percentiles, deciles, quartiles, etc.) in tabular reports. For example, you can group student test scores into deciles to determine which students are in the top ten percent of the class, or determine which sales representatives are in the top half of all sales representatives based on total sales.

Grouping is based on the values in the selected vertical (BY) field, and data is apportioned as equally as possible into the number of tile groups you specify.

The following occurs when you group data into tiles:

- A new column, labeled TILE by default, is added to the report output and displays

the tile number assigned to each instance of the tile field. You can change the column heading with an AS phrase. For details on the AS phrase, see Using Headings, Footings, Titles, and Labels.

- Tiling is calculated within all of the higher-level sort fields in the request, and restarts whenever a sort field at a higher level than the tile field value changes.
- Instances are counted using the tile field. If the request prints fields from lower level segments, there may be multiple report lines that correspond to one instance of the tile field.
- Instances with the same tile field value are placed in the same tile. For example, consider the following data, which is to be apportioned into three tiles:

  1 5 5 5 8 9

  In this case, dividing the instances into groups containing an equal number of records produces the following:

| Group | Data Values |
|---|---|
| 1 | 1,5 |
| 2 | 5,5 |
| 3 | 8,9 |

However, because all of the same data values must be in the same tile, the fives (5) that are in group 2 are moved to group 1. Group 2 remains empty. The final tiles are:

| Tile Number | Data Values |
|---|---|
| 1 | 1,5,5,5 |
| 2 | |
| 3 | 8,9 |

# Group Numeric Data Into Tiles

```
BY [ {HIGHEST|LOWEST} [k] ] tilefield [AS 'head1']
         IN-GROUPS-OF n TILES [TOP m] [AS 'head2']
```

where:

**HIGHEST**

Sorts the data in descending order so that the highest data values are placed in tile 1.

**LOWEST**

Sorts the data in ascending order so that the lowest data values are placed in tile 1. This is the default sort order.

**k**

Is a positive integer representing the number of tile groups to display in the report. For example, BY HIGHEST 2 displays the two non-empty tiles with the highest data values.

**tilefield**

Is the field whose values are used to assign the tile numbers.

**head1**

Is a heading for the column that displays the values of the tile sort field.

**n**

Is a positive integer not greater than 32,767, specifying the number of tiles to be used in grouping the data. For example, 100 tiles produces percentiles, while 10 tiles produces deciles.

**m**

Is a positive integer indicating the highest tile value to display in the report. For example, TOP 3 does not display any data row that is assigned a tile number greater than 3.

**head2**

Is a new heading for the column that displays the tile numbers.

**Note:**

- The syntax accepts numbers that are not integers for *k*, *n*, and *m*. On z/OS, values with decimals are rounded to integers; on UNIX and Windows they are truncated. If the numbers supplied are negative or zero, an error message is generated.
- Both *k* and *m* limit the number of rows displayed within each sort break in the report. If you specify both, the more restrictive value controls the display. If *k* and *m* are both greater than *n* (the number of tiles), *n* is used.

# Grouping Data Into Five Tiles

The following illustrates how to group data into five tiles.

```
TABLE FILE EMPLOYEE
PRINT LAST_NAME FIRST_NAME
BY DEPARTMENT
BY CURR_SAL IN-GROUPS-OF 5 TILES
END
```

The output is:

| DEPARTMENT | CURR_SAL | TILE | LAST_NAME | FIRST_NAME |
|---|---|---|---|---|
| MIS | $9,000.00 | 1 | GREENSPAN | MARY |
| | $13,200.00 | 1 | SMITH | MARY |
| | $18,480.00 | 2 | JONES | DIANE |
| | | | MCCOY | JOHN |
| | $21,780.00 | 4 | BLACKWOOD | ROSEMARIE |
| | $27,062.00 | 5 | CROSS | BARBARA |
| PRODUCTION | $9,500.00 | 1 | SMITH | RICHARD |
| | $11,000.00 | 1 | STEVENS | ALFRED |
| | $16,100.00 | 2 | MCKNIGHT | ROGER |
| | $21,120.00 | 3 | ROMANS | ANTHONY |
| | $26,862.00 | 4 | IRVING | JOAN |
| | $29,700.00 | 5 | BANNING | JOHN |

Note that the tiles are assigned within the higher-level sort field DEPARTMENT. The MIS category does not have any data assigned to tile 3. The PRODUCTION category has all five tiles.

# Displaying the First Three Tile Groups

In this example, the employees with the three lowest salaries are grouped into five tiles.

```
TABLE FILE EMPLOYEE
PRINT LAST_NAME FIRST_NAME
BY DEPARTMENT
BY LOWEST 3 CURR_SAL IN-GROUPS-OF 5 TILES
END
```

The output is:

| DEPARTMENT | CURR_SAL | TILE | LAST_NAME | FIRST_NAME |
|---|---|---|---|---|
| MIS | $9,000.00 | 1 | GREENSPAN | MARY |
| | $13,200.00 | 1 | SMITH | MARY |
| | $18,480.00 | 2 | JONES | DIANE |
| | | | MCCOY | JOHN |
| | $21,780.00 | 4 | BLACKWOOD | ROSEMARIE |
| PRODUCTION | $9,500.00 | 1 | SMITH | RICHARD |
| | $11,000.00 | 1 | STEVENS | ALFRED |
| | $16,100.00 | 2 | MCKNIGHT | ROGER |
| | $21,120.00 | 3 | ROMANS | ANTHONY |

Note that the request displays three tile groups in each category. Because no data was assigned to tile 3 in the MIS category, tiles 1, 2, and 4 display for that category.

# Displaying Tiles With a Value of Three or Less

In this example, the employees with the three lowest salaries are listed and grouped into five tiles, but only the tiles that are in the top 3 (tiles 1, 2, or 3) are displayed in the report. Also, the heading for the TILES field has been renamed (using the AS phrase) to DECILES.

```
TABLE FILE EMPLOYEE
PRINT LAST_NAME FIRST_NAME
BY DEPARTMENT
BY LOWEST 3 CURR_SAL IN-GROUPS-OF 5 TILES TOP 3 AS DECILES
END
```

The output is:

| DEPARTMENT | CURR_SAL | DECILE | LAST_NAME | FIRST_NAME |
|---|---|---|---|---|
| MIS | $9,000.00 | 1 | GREENSPAN | MARY |
| | $13,200.00 | 1 | SMITH | MARY |
| | $18,480.00 | 2 | JONES | DIANE |
| | | | MCCOY | JOHN |
| PRODUCTION | $9,500.00 | 1 | SMITH | RICHARD |
| | $11,000.00 | 1 | STEVENS | ALFRED |
| | $16,100.00 | 2 | MCKNIGHT | ROGER |
| | $21,120.00 | 3 | ROMANS | ANTHONY |

Because no data was assigned to tile 3 in the MIS category, only tiles 1 and 2 display for that category.

# Usage Notes for Tiles

- If a request retrieves data from segments that are descendants of the segment containing the tile field, multiple report rows may correspond to one instance of the tile field. These additional report rows do not affect the number of instances used to assign the tile values. However, if you retrieve fields from multiple segments and create a single-segment output file, this flat file will have multiple instances of the tile field, and this increased number of instances may affect the tile values assigned. Therefore, when you run the same request against the multi-level file and the single-segment file, different tile assignments may result.
- Tiles are always calculated on a BY sort field in the request.
- Only one tiles calculation is supported per request. However, the request can contain up to five (the maximum allowed) non-tile IN-GROUP-OF phrases in addition to the TILES phrase.
- Comparisons for the purpose of assigning tile numbers use exact data values regardless of their display format. Therefore, if you display a floating-point value as D7, you may not be showing enough significant digits to indicate why values are placed in separate tiles.
- The tile field can be a real field or a virtual field created with a DEFINE command or a DEFINE in the Master File. The COMPUTE command cannot be used to create a tile field.
- Empty tiles do not display in the report output.
- In requests with multiple sort fields, tiles are supported only at the lowest level and

only with the BY LOWEST phrase.

- Tiles are supported with output files. However, the field used to calculate the tiles propagates three fields to a HOLD file (the actual field value, the tile, and a ranking field) unless you set HOLDLIST to PRINTONLY.
- Tiles are not supported with BY TOTAL, TABLEF, FML, and GRAPH.

# Restricting Sort Field Values by Highest/Lowest Rank

When you sort report rows using the BY phrase, you can restrict the sort field values to a group of high or low values. You choose the number of fields to include in the report. For example, you can choose to display only the 10 highest (or lowest) sort field values in your report by using BY HIGHEST (or LOWEST).

You can have up to five sort fields with BY HIGHEST or BY LOWEST.

# Restrict Sort Field Values by Highest/Lowest Rank

```
BY {HIGHEST n|LOWEST n} sortfield
```

where:

**HIGHEST n**

Specifies that only the highest *n* sort field values are included in the report. TOP is a synonym for HIGHEST.

**LOWEST n**

Specifies that only the lowest *n* sort field values are included in the report.

**sortfield**

Is the name of the sort field. The sort field can be numeric or alphanumeric.

**Note:** HIGHEST/LOWEST *n* refers to the number of sort field values, not the number of report rows. If several records have the same sort field value that satisfies the HIGHEST/LOWEST *n* criteria, all of them are included in the report.

# Restricting Sort Field Values to a Group

The following request displays the names of the employees earning the five highest salaries.

```
TABLE FILE EMPLOYEE
PRINT LAST_NAME
BY HIGHEST 5 CURR_SAL
END
```

The output is:

| CURR_SAL | LAST_NAME |
|---|---|
| $29,700.00 | BANNING |
| $27,062.00 | CROSS |
| $26,862.00 | IRVING |
| $21,780.00 | BLACKWOOD |
| $21,120.00 | ROMANS |

# Sorting and Aggregating Report Columns

Using the BY TOTAL phrase, you can apply aggregation and sorting simultaneously to numeric columns in your report in one pass of the data. For BY TOTAL to work correctly, you must have an aggregating display command such as SUM. A non-aggregating display command, such as PRINT, simply retrieves the data without aggregating it. Records are sorted in either ascending or descending sequence, based on your query. Ascending order is the default.

You can also use the BY TOTAL phrase to sort based on temporary values calculated by the COMPUTE command.

**Note:** On z/OS, the sort on the aggregated value is calculated using an external sort package, even if EXTSORT = OFF.

# Sort and Aggregate a Report Column

```
[RANKED] BY [HIGHEST|LOWEST [n] ]
         TOTAL {display_field|COMPUTE name/format=expression;}
```

or

```
[RANKED] BY TOTAL {[HIGHEST|LOWEST [n] ]
        display_field|COMPUTE name/format=expression;}
```

where:

**RANKED**

Adds a column to the report in which a rank number is assigned to each aggregated sort value in the report output. If multiple rows have the same ranking, the rank number only appears in the first row.

**n**

Is the number of sort field values you wish to display in the report. If *n* is omitted, all values of the calculated sort field are displayed. The default order is from lowest to highest.

**display_field**

Can be a field name, a field name preceded by an operator (that is, prefixoperator.fieldname), or a calculated value.

A BY TOTAL field is treated as a display field when the internal matrix is created. After the matrix is created, the output lines are aggregated and re-sorted based on all of the sort fields.

# Sorting and Aggregating Report Columns

In this example, the salary average is calculated and used as a sort field. The two highest salaries are displayed in the report.

```
TABLE FILE EMPLOYEE
SUM SALARY CNT.SALARY
```

```
BY DEPARTMENT
BY HIGHEST 2 TOTAL AVE.SALARY AS 'HIGHEST,AVERAGE,SALARIES'
BY CURR_JOBCODE
END
```

The output is:

| DEPARTMENT | HIGHEST AVERAGE SALARIES | CURR_JOBCODE | SALARY | SALARY COUNT |
|---|---|---|---|---|
| MIS | $26,418.50 | A17 | $52,837.00 | 2 |
| | $21,780.00 | B04 | $21,780.00 | 1 |
| PRODUCTION | $29,700.00 | A17 | $29,700.00 | 1 |
| | $25,641.00 | A15 | $51,282.00 | 2 |

# Sorting, Aggregating, and Ranking Report Columns

In this example, the salary average is calculated and used as a sort field. The two highest salaries are displayed and ranked.

```
TABLE FILE EMPLOYEE
SUM SALARY CNT.SALARY
BY DEPARTMENT
RANKED BY HIGHEST 2 TOTAL AVE.SALARY AS 'HIGHEST,AVERAGE,SALARIES'
BY CURR_JOBCODE
END
```

The output is:

| DEPARTMENT | RANK | HIGHEST AVERAGE SALARIES | CURR_JOBCODE | SALARY | SALARY COUNT |
|---|---|---|---|---|---|
| MIS | 1 | $26,418.50 | A17 | $52,837.00 | 2 |
| | 2 | $21,780.00 | B04 | $21,780.00 | 1 |
| PRODUCTION | 1 | $29,700.00 | A17 | $29,700.00 | 1 |
| | 2 | $25,641.00 | A15 | $51,282.00 | 2 |

# Sorting and Aggregating Report Columns With COMPUTE

In this example, the monthly salary is calculated using a COMPUTE within a sort field. The two highest monthly salaries are displayed.

```
TABLE FILE EMPLOYEE
SUM SALARY CNT.SALARY
BY DEPARTMENT
BY HIGHEST 2 TOTAL COMPUTE MONTHLY_SALARY/D12.2M=SALARY/12;
AS 'HIGHEST,MONTHLY,SALARIES'
BY CURR_JOBCODE
END
```

The output is:

| DEPARTMENT | HIGHEST MONTHLY SALARIES | CURR_JOBCODE | SALARY | SALARY COUNT |
|---|---|---|---|---|
| MIS | $4,403.08 | A17 | $52,837.00 | 2 |
| | $3,019.17 | B03 | $36,230.00 | 2 |
| PRODUCTION | $4,273.50 | A15 | $51,282.00 | 2 |
| | $2,591.67 | B02 | $31,100.00 | 2 |

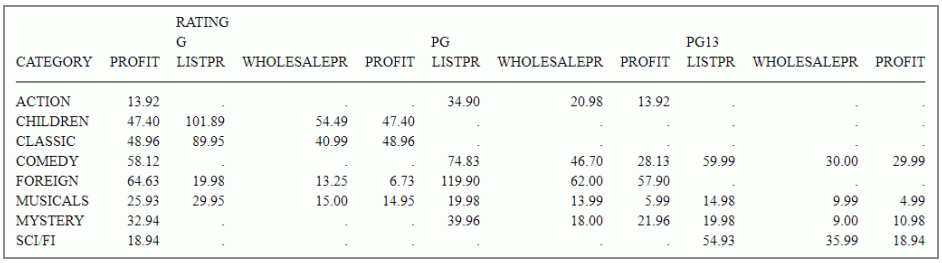
# Using BY TOTAL on a Calculated Value With an ACROSS Phrase

The following request creates the calculated value PROFIT and uses it in the BY TOTAL phrase. The request also has an ACROSS RATING phrase.

```
TABLE FILE MOVIES
SUM LISTPR WHOLESALEPR
COMPUTE
PROFIT = LISTPR - WHOLESALEPR;
BY CATEGORY
BY TOTAL PROFIT
ACROSS RATING
WHERE  RATING NE 'NR' OR 'R'
ON TABLE SET PAGE NOLEAD
```

```
ON TABLE SET STYLE *GRID = OFF,$
ENDSTYLE
END
```

The output is shown in the following image.



| | | RATING G | | | PG | | | PG13 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| CATEGORY | PROFIT | LISTPR | WHOLESALEPR | PROFIT | LISTPR | WHOLESALEPR | PROFIT | LISTPR | WHOLESALEPR | PROFIT |
| ACTION | 13.92 | . | . | . | 34.90 | 20.98 | 13.92 | . | . | . |
| CHILDREN | 47.40 | 101.89 | 54.49 | 47.40 | . | . | . | . | . | . |
| CLASSIC | 48.96 | 89.95 | 40.99 | 48.96 | . | . | . | . | . | . |
| COMEDY | 58.12 | . | . | . | 74.83 | 46.70 | 28.13 | 59.99 | 30.00 | 29.99 |
| FOREIGN | 64.63 | 19.98 | 13.25 | 6.73 | 119.90 | 62.00 | 57.90 | . | . | . |
| MUSICALS | 25.93 | 29.95 | 15.00 | 14.95 | 19.98 | 13.99 | 5.99 | 14.98 | 9.99 | 4.99 |
| MYSTERY | 32.94 | . | . | . | 39.96 | 18.00 | 21.96 | 19.98 | 9.00 | 10.98 |
| SCI/FI | 18.94 | . | . | . | . | . | . | 54.93 | 35.99 | 18.94 |

# Usage Notes for BY TOTAL

- When you use BY HIGHEST/LOWEST *n* with BY TOTAL HIGHEST/LOWEST *n*, the BY TOTAL phrase works on the result of the BY phrase (that is, on the *n* rows that result from the BY phrase).

# Restricting the Number of Columns in a Report

The number of columns created by ACROSS depends on the number of:

- Fields displayed in the report, since the maximum width of a report is 32K bytes.
- Values for each of these fields.
- ACROSS and ACROSS-TOTAL phrases in the request.

Row totals, BY columns, SUBHEADs, SUBFOOTs, and fields used in headings and footings do not count in calculating the number of ACROSS columns.

# Hiding Sort Values

When you sort a report, you can omit the sort field value itself from the report by using the phrase NOPRINT. This can be helpful in several situations; for instance, when you use the

same field as a sort field and a display field, or when you want to sort by a field but not display its values in the report output.

# Hide Sort Values

```
{BY|ACROSS} sortfield {NOPRINT|SUP-PRINT}
```

where:

**sortfield**

Is the name of the sort field.

You can use SUP-PRINT as a synonym for NOPRINT.

# Hiding Sort Values

If you want to display a list of employees sorted by the date on which they were hired, but you want the report to contain last name, first name, and then the hire date in the third column, the following request is insufficient.

```
TABLE FILE EMPLOYEE
PRINT LAST_NAME FIRST_NAME HIRE_DATE
END
```

The output is:

| LAST_NAME | FIRST_NAME | HIRE_DATE |
|---|---|---|
| STEVENS | ALFRED | 80/06/02 |
| SMITH | MARY | 81/07/01 |
| JONES | DIANE | 82/05/01 |
| SMITH | RICHARD | 82/01/04 |
| BANNING | JOHN | 82/08/01 |
| IRVING | JOAN | 82/01/04 |
| ROMANS | ANTHONY | 82/07/01 |
| MCCOY | JOHN | 81/07/01 |
| BLACKWOOD | ROSEMARIE | 82/04/01 |
| MCKNIGHT | ROGER | 82/02/02 |
| GREENSPAN | MARY | 82/04/01 |
| CROSS | BARBARA | 81/11/02 |

To list the employees in the order in which they were hired, you would sort the report by the HIRE_DATE field and hide the sort field occurrence using the NOPRINT phrase.

```
TABLE FILE EMPLOYEE
PRINT LAST_NAME FIRST_NAME HIRE_DATE
BY HIRE_DATE NOPRINT
END
```

The output is:

| LAST_NAME | FIRST_NAME | HIRE_DATE |
|---|---|---|
| STEVENS | ALFRED | 80/06/02 |
| SMITH | MARY | 81/07/01 |
| MCCOY | JOHN | 81/07/01 |
| CROSS | BARBARA | 81/11/02 |
| SMITH | RICHARD | 82/01/04 |
| IRVING | JOAN | 82/01/04 |
| MCKNIGHT | ROGER | 82/02/02 |
| BLACKWOOD | ROSEMARIE | 82/04/01 |
| GREENSPAN | MARY | 82/04/01 |
| JONES | DIANE | 82/05/01 |
| ROMANS | ANTHONY | 82/07/01 |
| BANNING | JOHN | 82/08/01 |

# Sort Performance Considerations

The sorting procedure analyzes the request being processed and the amount of sort memory available in order reduce the amount of disk I/O. The sort strategy is controlled by

the specifics of the request and the values of the SORTMATRIX and SORTMEMORY parameters.

**SORTMATRIX**

The SORTMATRIX parameter controls whether to employ in-memory sorting with decreased use of external memory. The syntax is

```
SET SORTMATRIX = {SMALL|LARGE}
```

where:

**SMALL**

Creates a single sort matrix of up to 2048 rows, and uses a binary search based insertion sort with aggregation during retrieval. The maximum number of rows in this matrix has been determined to provide the best performance for this type of sort. If the sort matrix becomes full, it is written to a file called FOCSORT on disk, the in-memory matrix is emptied, and retrieval continues, writing to FOCSORT as many times as necessary. When the end of data is detected, the remaining rows are written to FOCSORT and the merge routine merges all of the sort strings in FOCSORT (which, in extreme cases, may require multiple merge phases), while also completing the aggregation.

**LARGE**

Creates a large matrix or multiple small matrices in memory, when adequate memory is available as determined by the SORTMEMORY parameter. LARGE is the default value. The goal of this strategy is to do as much sorting as possible in internal memory before writing any records to disk. Whether disk I/O is necessary at all in the sorting process depends on the amount of memory allocated for sorting and the size of the request output. If the amount of SORTMEMORY is not large enough to meaningfully make use of the LARGE strategy, the sort will default to the SMALL strategy. The LARGE strategy greatly reduces the need for disk I/O and, if disk I/O is required after all (for very large output), it virtually eliminates the need for multiple merge phases.

**SORTMEMORY**

The SORTMEMORY parameter controls the amount of internal memory available for sorting. The syntax is

```
SET SORTMEMORY = {n|512}
```

where:

**n**

Is the positive number of megabytes of memory available for sorting. The default value is 512.

# Sorting With Multiple Display Commands

A request can consist of up to 64 sets of separate display commands (also known as verb phrases), each with its own sort conditions. In order to display all of the information, a meaningful relationship has to exist among the separate sort condition sets. The following rules apply:

- Up to 64 display commands and their associated sort conditions can be used. The first display command does not have to have any sort condition. Only the last display command may be a detail command, such as PRINT or LIST. Other preceding display commands must be aggregating commands.
- WHERE and IF criteria apply to the records selected for the report as a whole. WHERE and IF criteria are explained in Selecting Records for Your Report.
- When a sort phrase is used with a display command, the display commands following it must use the same sorting condition in the same order. For example:

```
TABLE FILE EMPLOYEE
SUM ED_HRS
SUM CURR_SAL CNT.CURR_SAL
BY DEPARTMENT
PRINT FIRST_NAME
BY DEPARTMENT
BY LAST_NAME
END
```

The first SUM does not have a sort condition. The second SUM has a sort condition: BY DEPARTMENT. Because of this sort condition, the PRINT command must have BY DEPARTMENT as the first sort condition, and other sort conditions may be added as needed.

# Using Multiple Display and Sort Fields

The following request summarizes several levels of detail in the data source.

```
TABLE FILE EMPLOYEE
SUM CURR_SAL
SUM CURR_SAL BY DEPARTMENT
SUM CURR_SAL BY DEPARTMENT BY LAST_NAME
END
```

The command SUM CURR_SAL calculates the total amount of current salaries; SUM CURR_SAL BY DEPARTMENT calculates the total amounts of current salaries in each department; SUM CURR_SAL BY DEPARTMENT BY LAST_NAME calculates the total amounts of current salaries for each employee name.

The output is:

| CURR_SAL | DEPARTMENT | CURR_SAL | LAST_NAME | CURR_SAL |
|---|---|---|---|---|
| $222,284.00 | MIS | $108,002.00 | BLACKWOOD | $21,780.00 |
| | | | CROSS | $27,062.00 |
| | | | GREENSPAN | $9,000.00 |
| | | | JONES | $18,480.00 |
| | | | MCCOY | $18,480.00 |
| | | | SMITH | $13,200.00 |
| | PRODUCTION | $114,282.00 | BANNING | $29,700.00 |
| | | | IRVING | $26,862.00 |
| | | | MCKNIGHT | $16,100.00 |
| | | | ROMANS | $21,120.00 |
| | | | SMITH | $9,500.00 |
| | | | STEVENS | $11,000.00 |

# Controlling Formatting of Reports With Multiple Display Commands

You can use the SET DUPLICATECOL command to reformat report requests that use multiple display commands, placing aggregated fields in the same column above the displayed field.

By default, each new display command in a request generates additional sort field and display field columns. With DUPLICATECOL set to OFF, each field occupies only one column in the request, with the values from each display command stacked under the values for the previous display command.

# Control the Format of Reports With Multiple Display Commands

```
SET DUPLICATECOL={ON|OFF}
```

where:

**ON**

Displays the report with each field as a column. This is the default value.

**OFF**

Displays the report with common fields as a row.

# Displaying Reports With Multiple Display Commands

The following request sums current salaries and education hours for the entire EMPLOYEE data source and for each department:

```
TABLE FILE EMPLOYEE
SUM CURR_SAL ED_HRS
SUM CURR_SAL ED_HRS BY DEPARTMENT
END
```

With DUPLICATECOL=ON, the output has separate columns for the grand totals and for the departmental totals:

```
   CURR_SAL  ED_HRS  DEPARTMENT         CURR_SAL  ED_HRS
   --------  ------  ----------         --------  ------
$222,284.00  351.00  MIS             $108,002.00  231.00
                     PRODUCTION      $114,282.00  120.00
```

With DUPLICATECOL=OFF, the output has one column for each field. The grand totals are on the top row of the report, and the departmental totals are on additional rows below the grand totals:

```
DEPARTMENT         CURR_SAL  ED_HRS
----------         --------  ------
```

```
                $222,284.00  351.00
MIS             $108,002.00  231.00
PRODUCTION      $114,282.00  120.00
```

The following request adds a PRINT command sorted by department and by last name to the previous request:

```
SET SPACES = 1
TABLE FILE EMPLOYEE
SUM CURR_SAL ED_HRS
SUM CURR_SAL ED_HRS BY DEPARTMENT AS 'DEPT'
PRINT FIRST_NAME CURR_SAL ED_HRS BY DEPARTMENT BY LAST_NAME
END
```

With DUPLICATECOL=ON, the output has separate columns for the grand totals, for the departmental totals, and for each last name:

| CURR_SAL | ED_HRS | DEPT | CURR_SAL | ED_HRS | LAST_NAME | FIRST_NAME | CURR_SAL | ED_HRS |
|---|---|---|---|---|---|---|---|---|
| $222,284.00 | 351.00 | MIS | $108,002.00 | 231.00 | BLACKWOOD | ROSEMARIE | $21,780.00 | 75.00 |
| | | | | | CROSS | BARBARA | $27,062.00 | 45.00 |
| | | | | | GREENSPAN | MARY | $9,000.00 | 25.00 |
| | | | | | JONES | DIANE | $18,480.00 | 50.00 |
| | | | | | MCCOY | JOHN | $18,480.00 | .00 |
| | | | | | SMITH | MARY | $13,200.00 | 36.00 |
| | | PRODUCTION | $114,282.00 | 120.00 | BANNING | JOHN | $29,700.00 | .00 |
| | | | | | IRVING | JOAN | $26,862.00 | 30.00 |
| | | | | | MCKNIGHT | ROGER | $16,100.00 | 50.00 |
| | | | | | ROMANS | ANTHONY | $21,120.00 | 5.00 |
| | | | | | SMITH | RICHARD | $9,500.00 | 10.00 |
| | | | | | STEVENS | ALFRED | $11,000.00 | 25.00 |

With DUPLICATECOL=OFF, the output has one column for each field. The grand totals are on the top row of the report, the departmental totals are on additional rows below the grand totals, and the values for each last name are on additional rows below their departmental totals:

```
DEPT       LAST_NAME       FIRST_NAME         CURR_SAL ED_HRS
----       ---------       ----------         -------- ------
                                           $222,284.00 351.00
MIS                                        $108,002.00 231.00
           BLACKWOOD       ROSEMARIE        $21,780.00  75.00
           CROSS           BARBARA          $27,062.00  45.00
           GREENSPAN       MARY              $9,000.00  25.00
           JONES           DIANE            $18,480.00  50.00
           MCCOY           JOHN             $18,480.00    .00
           SMITH           MARY             $13,200.00  36.00
PRODUCTION                                 $114,282.00 120.00
           BANNING         JOHN             $29,700.00    .00
           IRVING          JOAN             $26,862.00  30.00
```

```
MCKNIGHT        ROGER           $16,100.00  50.00
ROMANS          ANTHONY         $21,120.00   5.00
SMITH           RICHARD          $9,500.00  10.00
STEVENS         ALFRED          $11,000.00  25.00
```

# Style a Report With SET DUPLICATECOL=ON

In a StyleSheet, you can identify the rows you want to style by specifying which display command created those rows:

```
VERBSET = n
```

where:

**n**

Is the ordinal number of the display command in the report request.

# Styling Rows Associated With a Specific Display Command

The following request has two display commands:

1. SUM CURR_SAL ED_HRS BY DEPARTMENT (totals by department).
2. PRINT FIRST_NAME CURR_SAL ED_HRS BY DEPARTMENT BY LAST_NAME (values by employee by department).

```
SET DUPLICATECOL = OFF
TABLE FILE EMPLOYEE
SUM CURR_SAL ED_HRS BY DEPARTMENT
PRINT FIRST_NAME CURR_SAL ED_HRS BY DEPARTMENT BY LAST_NAME

ON TABLE SET STYLE *
TYPE = REPORT, COLUMN= P4, VERBSET = 1, STYLE = ITALIC,    COLOR=BLUE,$
TYPE = REPORT, COLUMN= B2, VERBSET = 2, STYLE = UNDERLINE, COLOR = RED,$
ENDSTYLE
END
```

On the output:

- The fourth displayed column (P4, department total of CURR_SAL) for the SUM command is italic and blue.
- The second BY field (LAST_NAME) for the PRINT command is underlined and red.

When you style specific columns, using P notation means that you count every column that displays on the report output, including BY columns. Therefore, P1 is the DEPARTMENT column, P2 is the LAST_NAME column (this is also B2, the second BY field column), P3 is the FIRST_NAME column, P4 is the displayed version of the CURR_SAL column (the internal matrix has multiple CURR_SAL columns), and P5 is the displayed ED_HRS column (the internal matrix has multiple ED_HRS columns).

The output is:

PAGE 1

| DEPARTMENT | LAST_NAME | FIRST_NAME | CURR_SAL | ED_HRS |
|---|---|---|---|---|
| MIS | | | *$108,002.00* | 231.00 |
| | BLACKWOOD | ROSEMARIE | $21,780.00 | 75.00 |
| | CROSS | BARBARA | $27,062.00 | 45.00 |
| | GREENSPAN | MARY | $9,000.00 | 25.00 |
| | JONES | DIANE | $18,480.00 | 50.00 |
| | MCCOY | JOHN | $18,480.00 | .00 |
| | SMITH | MARY | $13,200.00 | 36.00 |
| PRODUCTION | | | *$114,282.00* | 120.00 |
| | BANNING | JOHN | $29,700.00 | .00 |
| | IRVING | JOAN | $26,862.00 | 30.00 |
| | MCKNIGHT | ROGER | $16,100.00 | 50.00 |
| | ROMANS | ANTHONY | $21,120.00 | 5.00 |
| | SMITH | RICHARD | $9,500.00 | 10.00 |
| | STEVENS | ALFRED | $11,000.00 | 25.00 |

# Stacking Duplicate Columns in Multi-Verb Requests Based on AS Names

You can use the SET DUPLICATECOL command to reformat report requests that use multiple display commands, placing aggregated fields in the same column above the displayed field.

By default, each new display command in a request generates additional sort field and display field columns. With DUPLICATECOL set to OFF, each field occupies only one column in the request, with the values from each display command stacked under the values for the previous display command.

In prior releases, the duplicate columns were matched based on field names. Now, fields can also be matched based on AS names. An AS name will not be matched to a field name. When a field has an AS name, it will only be matched to other fields that have the same AS name.

# Stacking Duplicate Columns in Multi-Verb Requests Based on AS Names

The following request has three display commands. The first sums the CURR_SAL field. The second sums the SALARY field by department. The third prints the GROSS field by department and last name. Each field is assigned the same AS name, even the CURR_SAL field.

```
TABLE FILE EMPLOYEE
SUM CURR_SAL AS CURR_SAL  ED_HRS
SUM SALARY AS CURR_SAL ED_HRS BY DEPARTMENT AS 'DEPT'
PRINT FIRST_NAME GROSS AS CURR_SAL ED_HRS BY DEPARTMENT BY LAST_NAME
ON TABLE SET DUPLICATECOL OFF
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF, SIZE=10, $
VERBSET=1, COLOR=RED,$
VERBSET=2, COLOR=BLUE,$
VERBSET=3,COLOR=BLACK,$
ENDSTYLE
END
```

The partial output is shown in the following image.

| DEPT | LAST_NAME | FIRST_NAME | CURR_SAL | ED_HRS |
|---|---|---|---|---|
| | | | $222,284.00 | 351.00 |
| MIS | | | $160,177.00 | 231.00 |
| | BLACKWOOD | ROSEMARIE | $1,815.00 | 75.00 |
| | | ROSEMARIE | $1,815.00 | 75.00 |
| | | ROSEMARIE | $1,815.00 | 75.00 |
| | | ROSEMARIE | $1,815.00 | 75.00 |
| | | ROSEMARIE | $1,815.00 | 75.00 |
| | CROSS | BARBARA | $2,255.00 | 45.00 |
| | | BARBARA | $2,255.00 | 45.00 |
| | | BARBARA | $2,255.00 | 45.00 |
| | | BARBARA | $2,255.00 | 45.00 |
| | | BARBARA | $2,255.00 | 45.00 |
| | | BARBARA | $2,147.75 | 45.00 |
| | | BARBARA | $2,147.75 | 45.00 |
| | | BARBARA | $2,147.75 | 45.00 |
| | | BARBARA | $2,147.75 | 45.00 |
| | | BARBARA | $2,147.75 | 45.00 |
| | GREENSPAN | MARY | $750.00 | 25.00 |
| | | MARY | $750.00 | 25.00 |
| | | MARY | $750.00 | 25.00 |
| | | MARY | $720.84 | 25.00 |
| | JONES | DIANE | $1,540.00 | 50.00 |
| | | DIANE | $1,540.00 | 50.00 |
| | | DIANE | $1,540.00 | 50.00 |
| | | DIANE | $1,479.50 | 50.00 |
| | MCCOY | JOHN | $1,540.00 | .00 |
| | SMITH | MARY | $1,100.00 | 36.00 |
| | | MARY | $1,100.00 | 36.00 |
| | | MARY | $1,100.00 | 36.00 |
| | | MARY | $1,100.00 | 36.00 |
| | | MARY | $1,100.00 | 36.00 |
| | | MARY | $1,100.00 | 36.00 |
| | | MARY | $1,100.00 | 36.00 |
| | | MARY | $1,100.00 | 36.00 |

# Improving Efficiency With External Sorts

When a report is generated, by default it is sorted using an internal sorting procedure. This sorting procedure is optimized for reports of up to approximately 180 to 200K, although many factors affect the size of the data that can be handled by the internal sort.

The FOCSORT file used for the internal sort can grow to any size allowed by the operating system running and the available disk space. The user does not have to break a request up to accommodate massive files. In previous releases, the FOCSORT file was limited to 2 GB and the user received a FOC298 message when the WebFOCUS limit was exceeded. With no limit enforced by WebFOCUS, the operating system provides whatever warning and error handling it has for the management of a FOCSORT file that exceeds its limits.

You can generate larger reports somewhat faster by using dedicated sorting products, such as SyncSort, DFSORT, or, in non-Mainframe environments, the WebFOCUS external sort routines.

To use an external sort, the EXTSORT parameter must be ON. Use of a StyleSheet turns off external sorting.

Note that in Mainframe environments, external sorting is supported with the French, Spanish, German, and Scandinavian National Languages (Swedish, Danish, Finnish, and Norwegian). To specify the National Language Support Environment, use the LANG parameter as described in the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

# Requirements for External Sorting

You can use the DFSORT and SyncSort external sort products with any TABLE, FML, GRAPH, or MATCH request in all WebFOCUS Mainframe environments. In other operating environments, WebFOCUS has its own external sort routines.

# Usage Notes for External Sorting in Non-Mainframe Environments

It is probably best not to use external sort if:

- Your request requires a matrix (cannot be converted to a TABLEF request). If your request needs a matrix and uses external sort, it will go through two sorts, both external and internal, and it will be hard to realize any performance gains.

  To tell if your report is convertible to TABLEF, use ? STAT (as described in Query the Sort Type) or run an abbreviated version of the request with a low record limit and external sort on. If the report statistics are printed after the TABLE output, it was performed as TABLEF; if the statistics are printed before the first screen of TABLE output, it went through TABLE processing because it was not convertible to TABLEF.
- Your input is sorted or almost sorted.
- Your system cannot support a large number of work files (for information, see Sort Work Files and Return Codes). In this case the internal sort may do a better job since internally it implements about 60 logical work files, all sharing space in FOCSORT.

# Determine the Type of Sort Used

To determine which sort is used, the following criteria are evaluated, in this sequence:

**Procedure**

1. **BINS.** If an entire report can be sorted within the work area (BINS), the external sort is not invoked, even if EXTSORT is set ON.
2. **EXTERNAL.** If BINS is not large enough to sort the entire report and EXTSORT is set ON, the external sort utility will be invoked.

# Control External Sorting

You can turn the external sorting feature on and off using the SET EXTSORT command.

```
SET EXTSORT = {ON|OFF}
```

where:

**ON**

Enables the selective use of a dedicated external sorting product to sort reports. This value is the default in all Mainframe environments.

**OFF**

Uses the internal sorting procedure to sort all reports. This value is the default in all non-Mainframe environments.

# Query the Sort Type

To determine which sort is being used for a given report, issue the following command after the report request:

```
? STAT
```

The command displays the following values for the SORT USED parameter:

**FOCUS**

The internal sorting procedure was used to sort the entire report.

**SQL**

You are using a relational data source and the RDBMS supplied data already in order.

**EXTERNAL**

An external sorting product sorted the report.

**NONE**

The report did not require sorting.

# Providing an Estimate of Input Records or Report Size for Sorting

There are two advantages to providing an estimate for the input size (ESTRECORDS) or the report size (ESTLINES):

- If the request cannot be converted to a TABLEF request and the file size estimate shows that the external sort will be needed, FOCUS® initiates the external sort immediately, which makes a FOCUS merge unnecessary. Without the estimate, such a request always performs this merge.
- In Mainframe environments, FOCUS passes the file size to the external sort, which enables it to allocate work files of the appropriate size.

# Provide an Estimate of Input Records or Report Size for Sorting

```
ON TABLE SET ESTRECORDS nON TABLE SET ESTLINES n
```

where:

**n**

Is the estimated number of records or lines to be sorted.

# Sort Work Files and Return Codes

In non-Mainframe environments, external sorts use temporary work files to hold intermediate sorting results. For each type of external sort, you must be aware of how sort work files are created and used.

# Sort Work Files on UNIX, Windows, and OpenVMS

While internal sorting uses only one work file, FOCSORT (allocated in the EDATEMP directory), external sort allows up to 31 work files, allocated on one or more disk drives (spindles) or directories.

**Warning:** Any one or more of these work files may become very large. Count on using many times the total disk space required by FOCSORT.

By default, five work files are allocated in the /tmp directory on UNIX, or in the directory pointed to by the TMP environment variable in Windows. This may not be enough sort work space and, even if the files fit in the directory, five files are probably not enough for optimal performance. Also, having all of the sort work files on the same disk may further degrade performance.

You have two other options:

- Define the TMPDIR shell variable (UNIX) or TMP environment variable (Windows) to point to some suitable writable directory. For best results, this directory should be on a disk with a lot of available space, and not the same disk as the data source or the EDATEMP directory. Again, you will get five temporary work files allocated on the same spindle, with consequent performance degradation.
- Define 1 to 31 shell variables of the form IBITMPDIR01 ... IBITMPDIR31 to point to one or more writable directories.

  If the UNIX TMPDIR or Windows TMP variable is set, it must be "unset" in order to make use of the IBITMPDIR*nn* variables. The UNIX command for unsetting the TMPDIR variable is:

  ```
  unset TMPDIR
  ```

  The Windows command for unsetting the TMP variable is:

  ```
  SET TMP=
  ```

  Different variables may point to the same directory, if desired. If you wish to allocate *n* work files, you must define variables 01 through *n*. The first variable missing from the environment determines the number of work files that will be used. (If you define fewer than five, additional files will be allocated using the system default location to make up the difference.) The more work files you allocate, and the more separated they are across different spindles, the better performance you should achieve. The major constraint is the total disk space available.

The work file names are generated by the ANSI tempnam function, however, the names all begin with the characters *srtwk*. If the sorting process ends normally or terminates because of a detectable error (typically, disk space overflow), all of the allocated work files are deleted. There is no explicit way to save them. If there is another type of abnormal termination, srtwk files may be left on the disk. You can and should erase them.

# Sort Work Files on IBM i

On IBM i (formerly i5/OS), the number of work files is fixed at 9. They are virtual files.

# ibi™ WebFOCUS® External Sort Return Codes

The WebFOCUS error message FOC909 is issued for all errors from external sort. An additional three-digit code is supplied, of which the last two digits are of interest. If you get an error number ending in:

- 16, external sort did not have enough memory allocated. You can try reducing the number of work files.
- 20, an I/O error occurred; in most cases, this means that one of the disks is not writable or has overflowed. Allocate the work files differently or reduce their number.
- 28, one of the work files could not be opened. Check to make sure the pathname was specified correctly and that protections allow writing and reading.
- 32, an internal logical error was detected in the sort processing. Report this problem to Technical Support Services.

# Mainframe External Sort Utilities and Message Options

By default, error messages created by a Mainframe external sort product are not displayed. However, you may wish to display these messages on your screen for diagnostic purposes.

# Select a Sort Utility and Message Options

You use the SET SORTLIB command to both specify the sort utility used at your site and, for DFSORT and SYNCSORT on z/OS, to display sort messages.

**Procedure**

1. Issue the SET SORTLIB command to specify the sort utility being used:

   ```
   SET SORTLIB = {sortutility|DEFAULT}
   ```

   where:

   **sortutility**

   Can be one of the following:

   - **DFSORT** for DFSORT without messages.
   - **MVSMSGDF** for DFSORT with messages.
   - **SYNCSORT** for SyncSort without messages.
   - **MVSMSGSS** for SyncSort with standard messages.
   - **MVSMSGSD** for SyncSort with debug (verbose) messages.
   - **DEFAULT** for DFSORT. However, It is more efficient and highly recommended that you explicitly specify the sort utility using one of the other values.

2. If you specified a sort option that produces sort messages on z/OS, you must direct the sort messages to the batch output stream or a file.

   Allocate DDNAME SYSOUT to the batch output stream or a file on z/OS by inserting the appropriate following DD card into your server batch JCL, if it is not already there. For example, the following DD card allocates DDNAME SYSOUT to the batch output stream:

   ```
   //SYSOUT DD SYSOUT=*
   ```

# Diagnosing External Sort Errors

When an external sort generates an error, you can generate a trace of sort processing and examine the FOCUS return codes and messages to diagnose the problem.

# Trace Sort Processing

When an external sort problem occurs, one of the following messages is generated:

```
(FOC909)  CRITICAL ERROR IN EXTERNAL SORT.  RETURN CODE IS: xxxx
(FOC1810) External sort not found
(FOC1899) Load of %1 (external-sort module) under %2 failed
```

In response to these messages, as well as for any other problem with sorting, it is useful to trace sort processing. For information on diagnosing external sort problems, see Diagnosing External Sort Errors.

**Procedure**

1. Allocate DDNAME FSTRACE to the terminal or a file. The following example sends trace output to the terminal:

   ```
   //FSTRACE  DD  SYSOUT=*,DCB=(RECFM=FA,LRECL=133,BLKSIZE=133)
   ```

2. Activate the trace by adding the following commands in any supported profile or a FOCEXEC:

   ```
   SET TRACEUSER = ON
   SET TRACEON   = SORT/1/FSTRACE
   ```

# External Sort Messages and Return Codes

When you receive a FOC909 message, it includes a return code:

```
(FOC909)  CRITICAL ERROR IN EXTERNAL SORT.  RETURN CODE IS: xxxx
```

You may also receive one of the following messages:

```
(FOC1810) External sort not found
(FOC1899) Load of %1 (external-sort module) under %2 failed
```

The following notes apply when this message or a FOC1800 or FOC1899 message is generated by a TABLE request:

- The most common value for xxxx is 16. However, return code 16 is issued for a number of problems, including but not limited to the following:
  - Syntax errors.
  - Memory shortage.
  - I/O errors (depending on installation options).
  - Space problems with output.
  - Space problems with work files.

  In order to diagnose the error, you must generate external sort messages (using the instructions in Select a Sort Utility and Message Options and Trace Sort Processing) and then reproduce the failure.

  For return codes not described below, follow the same procedure described for return code 16.
- Return code 20 is issued by DFSORT under z/OS if messages were requested (using the MVSMSGDJ option of the SET SORTLIB command), but the SYSOUT DD card is missing. DFSORT terminates after issuing the return code. Under the same conditions, SyncSort attempts to open SYSOUT, producing the following message, and then continues with messages written to the operator or terminal:

  ```
  IEC130I SYSOUT DD STATEMENT MISSING.
  ```
- Return code 36 or a FOC1899 message under z/OS means that the external sort module could not be found; check the STEPLIBs allocated.

When REBUILD INDEX invokes an external sort that fails, it generates a message similar to the following:

```
ERROR OCCURRED IN THE SORT yyyyyyyyzzzzzzzz
```

In this case, the return code is *yyyyyyyy* and it is expressed in hex. The final eight digits (*zzzzzzzz*) should be ignored.

Translate the return code into decimal and follow the instructions for return codes in a TABLE request.

Note also that when a TABLE request generates a non-zero return code from an external sort, FOCUS is terminated. By contrast, when REBUILD INDEX gets a non-zero return code from an external sort, the REBUILD command is terminated but FOCUS continues.

# Responding to an Indication of Inadequate Sort Work Space

Before following these instructions, make sure that external sort messages were generated (for information, see Select a Sort Utility and Message Options) and that they clearly show that the reason for failure was inadequate sort work space.

1. Make an estimate of the number of lines of output the request will produce.
2. Set the ESTLINES parameter in the request or FOCEXEC. For information, see Provide an Estimate of Input Records or Report Size for Sorting.

   WebFOCUS will pass this estimate to the external sort utility through the parameter list.

   Do not override the DD cards for SORTWKnn, S001WKnn, DFSPARM, or $SORTPARM without direct instructions from technical support. The instructions in Select a Sort Utility and Message Options, Trace Sort Processing, and Providing an Estimate of Input Records or Report Size for Sorting should provide equivalent capabilities.

# Aggregation by External Sort (Mainframe Environments Only)

External sorts can be used to perform aggregation with a significant decrease in processing time in comparison to using the internal sort facility. The gains are most notable with relatively simple requests against large data sources.

When aggregation is performed by an external sort, the statistical variables &RECORDS and &LINES are equal because the external sort products do not return a line count for the answer set. This is a behavior change, and affects any code that checks the value of &LINES. (If you must test &LINES, do not use this feature.)

# Use Aggregation in Your External Sort

```
SET EXTAGGR = aggropt
```

where:

**aggropt**

Can be one of the following:

`OFF` disallows aggregation by an external sort.

`NOFLOAT` allows aggregation if there are no floating point data fields present.

`ON` allows aggregation by an external sort. This value is the default.

# Usage Notes for Aggregating With an External Sort

- You must use SyncSort or DFSORT.
- Your query should be simple (that is, it should be able to take advantage of the TABLEF facility). For related information, see Data Retrieval Using TABLEF.
- The PRINT display command may not be used in the query.
- SET ALL must be equal to OFF.
- Only the following column prefixes are allowed: SUM, AVG, CNT, FST.
- Columns can be calculated values or have a row total.
- When SET EXTAGGR = NOFLOAT and your query aggregates numeric data, the external sort is not called, and aggregation is performed through the internal sorting procedure.

# Changing Output by Using an External Sort for Aggregation

If you use SUM on an alphanumeric field in your report request without using an external sort, the last instance of the sorted fields is displayed in the output, by default. Turning on aggregation in the external sort displays the first record instead. However, you can control the order of display using the SUMPREFIX parameter. For information about the SUMPREFIX parameter, see Improving Efficiency With External Sorts.

The following command turns aggregation ON and leaves SUMPREFIX set to LST (the default) and, therefore, displays the last record:

```
SET EXTAGGR = ON
SET SUMPREFIX = LST
TABLE FILE CAR
SUM CAR BY COUNTRY
END
```

The output is:

```
COUNTRY     CAR
-------     ---
ENGLAND     TRIUMPH
FRANCE      PEUGEOT
ITALY       MASERATI
JAPAN       TOYOTA
W GERMANY   BMW
```

**Note:** SUMPREFIX is described in Changing Retrieval Order With Aggregation (Mainframe Environments Only).

With SUMPREFIX = FST, the output is:

```
COUNTRY     CAR
-------     ---
ENGLAND     JAGUAR
FRANCE      PEUGEOT
ITALY       ALFA ROMEO
JAPAN       DATSUN
W GERMANY   AUDI
```

# Changing Retrieval Order With Aggregation

The SUMPREFIX parameter allows you to specify which value will be displayed when aggregating an alphanumeric or smart date field in the absence of any prefix operator. The default value is LST, which will return the physical last value within the sort group. FST will return the first physical value in the sort group. MIN and MAX return either the minimum value or maximum value within the sort group.

The SUMPREFIX command allows users to choose the answer set display order.

# Set Retrieval Order

```
SET SUMPREFIX = {FST|LST|MIN|MAX}
```

where:

**FST**

Displays the first value when alphanumeric or smart date data types are aggregated.

**LST**

Displays the last value when alphanumeric or smart date data types are aggregated. LST is the default value.

**MIN**

Displays the minimum value in the sort order set by your server code page and configuration when alphanumeric or smart date data types are aggregated.

**MAX**

Displays the maximum value in the sort order set by your server code page and configuration when alphanumeric or smart date data types are aggregated.

# Displaying the Minimum Value for an Aggregated Alphanumeric Field

The following request sets SUMPREFIX to MIN and displays the aggregated PRODUCT_CATEGORY and DAYSDELAYED values as well as the minimum, maximum, first, and last PRODUCT_CATEGORY values. In each row, the aggregated PRODUCT_CATEGORY value matches the MIN.PRODUCT_CATEGORY value. The DAYSDELAYED numeric field is not affected by the SUMPREFIX value and is aggregated.

```
SET SUMPREFIX = MIN
TABLE FILE WF_RETAIL_LITE
SUM PRODUCT_CATEGORY DAYSDELAYED MIN.PRODUCT_CATEGORY MAX.PRODUCT_
CATEGORY
     FST.PRODUCT_CATEGORY LST.PRODUCT_CATEGORY
BY BRAND
WHERE BRAND GT 'K' AND BRAND LT 'U'
```

```
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image.

| Brand | Product Category | Days Delayed | MIN Product Category | MAX Product Category | FST Product Category | LST Product Category |
|---|---|---|---|---|---|---|
| LG | Media Player | 339 | Media Player | Televisions | Media Player | Televisions |
| Logitech | Accessories | 114 | Accessories | Accessories | Accessories | Accessories |
| Niles Audio | Accessories | 150 | Accessories | Accessories | Accessories | Accessories |
| Onkyo | Stereo Systems | 140 | Stereo Systems | Stereo Systems | Stereo Systems | Stereo Systems |
| Panasonic | Camcorder | 422 | Camcorder | Televisions | Camcorder | Televisions |
| Philips | Stereo Systems | 229 | Stereo Systems | Stereo Systems | Stereo Systems | Stereo Systems |
| Pioneer | Accessories | 339 | Accessories | Stereo Systems | Accessories | Stereo Systems |
| Polk Audio | Stereo Systems | 93 | Stereo Systems | Stereo Systems | Stereo Systems | Stereo Systems |
| Roku | Media Player | 85 | Media Player | Media Player | Media Player | Media Player |
| Samsung | Accessories | 525 | Accessories | Stereo Systems | Accessories | Stereo Systems |
| Sanyo | Camcorder | 298 | Camcorder | Stereo Systems | Camcorder | Stereo Systems |
| Sennheiser | Accessories | 128 | Accessories | Accessories | Accessories | Accessories |
| Sharp | Media Player | 252 | Media Player | Stereo Systems | Media Player | Stereo Systems |
| Sony | Accessories | 1,100 | Accessories | Televisions | Accessories | Televisions |
| Thomson Grass Valley | Video Production | 166 | Video Production | Video Production | Video Production | Video Production |
| Toshiba | Media Player | 7 | Media Player | Media Player | Media Player | Media Player |

# Creating a HOLD File With an External Sort (Mainframe Environments Only)

You can use Mainframe external sort packages to create HOLD files, producing substantial savings in processing time. The gains are most notable with relatively simple requests against large data sources.

# Create HOLD Files With an External Sort

```
SET EXTHOLD = {OFF|ON}
```

where:

**OFF**

Disables HOLD files by an external sort.

**ON**

Enables HOLD files by an external sort. This value is the default.

# Usage Notes for Creating a HOLD File With an External Sort

- The default setting of EXTSORT=ON must be in effect.
- EXTHOLD must be ON.
- The request must contain a BY field.
- The type of HOLD file created must be a FOCUS, XFOCUS, ALPHA, or BINARY file.
- Your query should be simple. AUTOTABLEF analyzes a query and determines whether the combination of display commands and formatting options requires the internal matrix. In cases where it is determined that a matrix is not necessary to satisfy the query, you may avoid the extra internal costs associated with creating the matrix. The internal matrix is stored in a file or data set named FOCSORT. The AUTOTABLEF default is ON, in order to realize performance gains.
- SET ALL must be OFF.
- There cannot be an IF/WHERE TOTAL or BY TOTAL in the request.
- If a request contains a SUM command, EXTAGGR must be set ON, and the only column prefixes allowed are SUM. and FST.

# Hierarchical Reporting: BY HIERARCHY

Cube data sources such as Essbase or SAP BW are organized into dimensions and facts. Dimensions are often organized into hierarchies. The synonyms for cube data sources have attributes that describe the dimension hierarchies, and WebFOCUS has hierarchical reporting syntax that can automatically report against these hierarchies and display the results indented to show the hierarchical relationships.

WebFOCUS also supports defining dimension hierarchies in synonyms for non-cube data sources that have hierarchical data. Once hierarchical dimensions are defined in a synonym, you can issue hierarchical reporting requests against them. Non-cube synonyms with hierarchical attributes are called *virtual cubes*.

Dimensions are categories of data, such as Region or Time, that you use to analyze and compare business performance. Dimensions consist of data elements that are called members. For example, a Region dimension could have members England and France.

Dimension members are usually organized into hierarchies. Hierarchies can be viewed as tree-like structures where members are the nodes. For example, the Region dimension may have the element World at its top level (the root node). The World element may have children nodes (members) representing continents. Continents, in turn, can have children nodes that represent countries, and countries can have children nodes representing states or cities. Nodes with no children are called leaf nodes.

Measures are numeric values, such as Sales Volume or Net Income, that are used to quantify how your business is performing.

A cube consists of data derived from facts, which are records about individual business transactions. For example, an individual fact record reflects a sales transaction of a certain number of items of a certain product at a certain price, which occurred in a certain store at a certain moment in time. The cube contains summarized fact values for all combinations of measures and members of different dimensions.

A synonym describes a hierarchy using a set of fields that define the hierarchical structure and the relationships between the hierarchy members. WebFOCUS has special hierarchical reporting syntax for reporting on hierarchies.

Hierarchical reporting requests have several phases:

- **Phase 1, selecting hierarchy members to display.**

  The hierarchical reporting phrase BY or ON HIERARCHY automatically sorts and formats a hierarchy with appropriate indentations that show the parent/child relationships. It also automatically rolls up the measure values for child members to generate the measure values for the parent members.

  If you do not want to see the entire hierarchy, you can use the WHEN phrase to select hierarchy members for display. The expression in this WHEN phrase must reference only hierarchy fields, not dimension properties or measures.

- **Phase 2, screening the retrieved dimension data.**

  WHERE criteria are applied to the leaf nodes of the members selected during phase 1.

Therefore, dimension properties can be used in WHERE tests. These tests can also reference hierarchy fields. However, since the selection criteria are always applied to the values at the leaf nodes, they cannot select data based on values that occur at higher levels. For example, in a dimension with Continents, Countries, and Cities, your request will not display any rows if you use WHERE to select at the Country level, but it may if you use it to select at the City level. WHERE tests can also reference measures.

- **Phase 3, screening based on aggregated values.**

  Measures, being summarized values, can be referenced in WHERE TOTAL tests and COMPUTE commands because those commands are processed after the hierarchy selection and aggregation phases of the request.

# Specify a Hierarchy in a Master File

The data source must have at least one dimension that is organized hierarchically. The declaration for a dimension is:

```
DIMENSION=dimname,CAPTION=dimcaption, $
```

where:

**dimname**

Is a name for the dimension.

**dimcaption**

Is a label for the dimension.

The declaration for a hierarchy within the dimension is:

```
HIERARCHY=hname,CAPTION='hcaption',HRY_DIMENSION=dimname,
HRY_STRUCTURE=RECURSIVE, $
```

where:

**hname**

Is a name for the hierarchy.

**hcaption**

Is a label for the hierarchy.

**dimname**

Is the name of the dimension for which this hierarchy is defined.

Several fields are used to define a parent/child hierarchy. Each has a PROPERTY attribute that describes which hierarchy property it represents. Each hierarchy must have a unique identifier field. This field is called the hierarchy field. If the synonym represents a FOCUS data source, this field must be indexed (FIELDTYPE=I). The declaration for the hierarchy field is:

```
FIELD=hfield,ALIAS=halias,USAGE= An, [ACTUAL=Am,]
WITHIN='*hierarchy',PROPERTY=UID, [TITLE='title1',] [FIELDTYPE=I,] $
```

where:

**hfield**

Is the field name for the hierarchy field.

**halias**

Is the alias for the hierarchy field. If the data source is relational, this must be the name of the column in the Relational DBMS.

**hierarchy**

Is the name of the hierarchy to which this field belongs.

**USAGE= An, [ACTUAL=Am,]**

Are the USAGE format and, if the data source is not a FOCUS data source, the ACTUAL format of the field.

**title1**

Is an optional title for the field.

Other fields defined for the hierarchy include the parent field and the caption field. Each of these fields has the same name as the hierarchy field with a suffix added. Each has a PROPERTY attribute that specifies its role in the hierarchy and a REFERENCE attribute that points to the corresponding hierarchy field.

The following is the declaration for the parent field. The parent field is needed to define the parent/child relationships in the hierarchy:

```
FIELD=hfield_PARENT,ALIAS=parentalias,USAGE=An,[ACTUAL=Am,]
[TITLE=ptitle,]
      PROPERTY=PARENT_OF, REFERENCE=hfield, $
```

where:

**hfield**

Is the hierarchy field.

**parentalias**

Is the alias for the parent field. If the data source is relational, this must be the name of the column in the relational DBMS.

**USAGE= An, [ACTUAL=Am,]**

Are the USAGE format and, if the data source is not a FOCUS data source, the ACTUAL format of the field.

**ptitle**

Is a column title for the parent field.

The following is the declaration for the caption field. A caption is a descriptive title for each value of the hierarchy field. It is part of the data and, therefore, is different from a TITLE attribute in the Master File, which is a literal title for the column on the report output.

```
FIELD=hfield_CAPTION,ALIAS=capalias,USAGE=Ann,[ACTUAL=Amm,]
[TITLE=captitle,]
        PROPERTY=CAPTION, REFERENCE=hfield, $
```

where:

**hfield**

Is the hierarchy field.

**capalias**

Is the alias for the caption field. If the data source is relational, this must be the name of the column in the relational DBMS.

**USAGE= Ann, [ACTUAL=Amm,]**

Are the USAGE format and, if the data source is not a FOCUS data source, the ACTUAL format of the field.

**captitle**

Is a column title for the caption field.

# Sample Master File With a Dimension Hierarchy

The following Master File is based on the CENTGL Master File, which has an FML hierarchy defined. This version is named NEWGL and it has a dimension hierarchy of accounts in which GL_ACCOUNT is the hierarchy field, GL_ACCOUNT_PARENT is the parent field, and GL_ACCOUNT_CAPTION is the caption field. There are other fields based on the hierarchy (GL_ACCOUNT_LEVEL, GL_ROLLUP_OP, and GL_ACCOUNT_TYPE). In addition, there is a measure field (GL_ACCOUNT_AMOUNT):

```
FILE=NEWGL       ,SUFFIX=FOC,$
SEGNAME=ACCOUNTS   ,SEGTYPE=S01
DIMENSION=Accnt,CAPTION=Accnt, $
HIERARCHY=Accnt,CAPTION='Accnt',HRY_DIMENSION=Accnt,
HRY_STRUCTURE=RECURSIVE, $
FIELD=GL_ACCOUNT,GLACCT,A7,WITHIN='*Accnt',PROPERTY=UID,
            TITLE='Ledger,Account', FIELDTYPE=I, $
FIELD=GL_ACCOUNT_PARENT,GLPAR,A7, TITLE=Parent,
            PROPERTY=PARENT_OF, REFERENCE=GL_ACCOUNT, $
FIELD=GL_ACCOUNT_TYPE,GLTYPE,A1, TITLE=Type,$
FIELD=GL_ROLLUP_OP,ROLL,A1, TITLE=Op, $
FIELD=GL_ACCOUNT_LEVEL,GLLEVEL,I3, TITLE=Lev, $
FIELDNAME=GL_ACCOUNT_AMOUNT,GLAMT,D12.2, TITLE=Amount, $
FIELD=GL_ACCOUNT_CAPTION,GLCAP,A30, TITLE=Caption,
            PROPERTY=CAPTION, REFERENCE=GL_ACCOUNT, $
FIELD=SYS_ACCOUNT,ALINE,A6, TITLE='System,Account,Line', MISSING=ON, $
```

The following procedure loads data into this data source, as long as the Master File is available to WebFOCUS (on the path or allocated):

```
CREATE FILE NEWGL NOMSG
-RUN
MODIFY FILE NEWGL
COMPUTE TGL_ACCOUNT_LEVEL/A3=;
COMPUTE TGL_ACCOUNT_AMOUNT/A12=;
```

```
FIXFORM GL_ACCOUNT/A4B X3 GL_ACCOUNT_PARENT/A4B X3 GL_ACCOUNT_TYPE/A1B
FIXFORM SYS_ACCOUNT/A4B GL_ROLLUP_OP/A1B
FIXFORM TGL_ACCOUNT_LEVEL/A3B GL_ACCOUNT_CAPTION/A30B
FIXFORM TGL_ACCOUNT_AMOUNT/A12B
COMPUTE GL_ACCOUNT_LEVEL = EDIT(TGL_ACCOUNT_LEVEL);
COMPUTE GL_ACCOUNT_AMOUNT = ATODBL(TGL_ACCOUNT_AMOUNT , '12', GL_
ACCOUNT_AMOUNT);

MATCH GL_ACCOUNT
   ON MATCH REJECT
   ON NOMATCH INCLUDE
```

```
DATA
1000          R.   +  1Profit Before Tax
2000   1000   R.   +  2Gross Margin
2100   2000   R.   +  3Sales Revenue
2200   2100   R.   +  4Retail Sales
2210   2200   R7001+  5Retail - Television                505.00
2220   2200   R7002+  5Retail - Stereo                    505.00
2230   2200   R7003+  5Retail - Video Player              505.00
2240   2200   R7004+  5Retail - Computer                  505.00
2250   2200   R7005+  5Retail - Video Camera              505.00
2300   2100   R.   +  4Mail Order Sales
2310   2300   R7011+  5Mail Order - Television           505.00
2320   2300   R7012+  5Mail Order - Stereo               505.00
2330   2300   R7013+  5Mail Order - Video Player         505.00
2340   2300   R7014+  5Mail Order - Computer             505.00
2350   2300   R7015+  5Mail Order - Video Camera         505.00
2400   2100   R.   +  4Internet Sales
2410   2400   R7021+  5Internet - Television           505.00
2420   2400   R7022+  5Internet - Stereo               505.00
2430   2400   R7023+  5Internet - Video Player         505.00
2440   2400   R7024+  5Internet - Computer             505.00
2450   2400   R7025+  5Internet - Video Camera         505.00
2500   2000   E.   -  3Cost Of Goods Sold
2600   2500   E.   +  4Variable Material Costs
2610   2600   E7101+  5Television COGS                  505.00
2620   2600   E7102+  5Stereo COGS                      505.00
2630   2600   E7103+  5Video COGS                       505.00
2640   2600   E7104+  5Computer COGS                    505.00
2650   2600   E7105+  5Video Camera COGS                505.00
2700   2500   E7111+  4Direct Labor                     404.00
2800   2500   E7112+  4Fixed Costs                      404.00
3000   1000   E.   -  2Total Operating Expenses
3100   3000   E.   +  3Selling Expenses
3110   3100   E.   +  4Advertising
```

```
3112   3110   E7202+  5TV/Radio                              505.00
3114   3110   E7203+  5Print Media                           505.00
3116   3110   E7206+  5Internet Advertising                 505.00
3120   3100   E7212+  4Promotional Expenses                  404.00
3130   3100   E7213+  4Joint Marketing                       404.00
3140   3100   E7214+  4Bonuses/Commisions                    404.00
3200   3000   E.   +  3General + Admin Expenses
3300   3200   E.   +  4Salaries-Corporate
```

```
3310   3300   E7301+  5Salaries-Corp Mgmt                    505.00
3320   3300   E7302+  5Salaries-Administration              505.00
3330   3300   E7303+  5IT Contractors                       505.00
3400   3200   E.   +  4Company Benefits
3410   3400   E7311+  5Social Security                       505.00
3420   3400   E7312+  5Unemployment                          505.00
3430   3400   E7313+  5Vacation Pay                          505.00
3440   3400   E7314+  5Sick Pay                              505.00
3450   3400   E.   +  5Insurances
3451   3450   E7321+  6Medical Insurance                     606.00
3452   3450   E7322+  6Dental Insurance                      606.00
3453   3450   E7323+  6Pharmacy Insurance                    606.00
3454   3450   E7324+  6Disability Insurance                  606.00
3455   3450   E7325+  6Life Insurance                        606.00
3500   3200   E.   +  4Depreciation Expenses
3510   3500   E7411+  5Equipment                             505.00
3520   3500   E7412+  5Building                              505.00
3530   3500   E7413+  5Vehicles                              505.00
3600   3200   R7414-  4Gain/(Loss) Sale of Equipment        404.00
3700   3200   E.   +  4Leasehold Expenses
3710   3700   E7421+  5Equipment                             505.00
3720   3700   E7422+  5Buildings                             505.00
3730   3700   R7429-  5Sub-Lease Income                      505.00
3800   3200   E7440+  4Interest Expenses                     404.00
3900   3200   E.   +  4Utilities
3910   3900   E7451+  5Electric                              505.00
3920   3900   E7452+  5Gas                                   505.00
3930   3900   E7453+  5Telephone                             505.00
3940   3900   E7454+  5Water                                 505.00
3950   3900   E7455+  5Internet Access                       505.00
5000   1000   E.   -  2Total R+D Costs
5100   5000   E7511+  3Salaries                              303.00
5200   5000   E7521+  3Misc. Equipment                       303.00
END
```

# Report on a Hierarchy

In hierarchical reporting, measure values for child dimension members will be rolled up to generate the parent values. In the data source, the parent members should not have values for the measures.

```
SUM measure_field ...
BY hierarchy_field [HIERARCHY [WHEN expression_using_hierarchy_fields;]
[SHOW [TOP|UP n] [TO {BOTTOM|DOWN m}] [byoption [WHEN condition] ...] ]
[WHERE expression_using_dimension_data]
[ON hierarchy_field HIERARCHY [WHEN expression_using_hierarchy_fields;]
[SHOW [TOP|UP n] [TO BOTTOM|DOWN m] [byoption [WHEN condition] ...]]
```

where:

**measure_field**

Is the field name of a measure.

**BY hierarchy_field HIERARCHY**

Identifies the hierarchy used for sorting. The field must be a hierarchy field.

**ON hierarchy_field HIERARCHY**

Identifies the hierarchy used for sorting. The field must be a hierarchy field. The request must include either a BY phrase or a BY HIERARCHY phrase for this field name.

**WHEN expression_using_hierarchy_fields;**

Selects hierarchy members. The WHEN phrase must immediately follow the word HIERARCHY to distinguish it from a WHEN phrase associated with a BY option (such as SUBFOOT). Any expression using only hierarchy fields is supported. The WHEN phrase can be on the BY HIERARCHY command or the ON HIERARCHY command, but not both.

**SHOW**

Specifies which levels to show on the report output relative to the levels selected by the WHEN phrase. If there is no WHEN phrase, the SHOW option is applied to the root node of the hierarchy. The SHOW option can be specified on the BY HIERARCHY phrase or the ON HIERARCHY phrase, but not both.

**n**

Is the number of ascendants above the set of selected members that will have measure values. All ascendants appear on the report to show the hierarchical context of the selected members. However, ascendants that are not included in the SHOW phrase appear on the report with missing data symbols in the report columns that display measures. The default for *n* is 0.

**TOP**

Specifies that ascendant levels to the root node of the hierarchy will be populated with measure values.

**TO**

Is required when specifying a SHOW option for descendant levels.

**BOTTOM**

Specifies all descendants to the leaf nodes of the hierarchy will be populated with measure values. This is the default value.

**m**

Is the number of descendants of each selected level that will display. The default for *m* is BOTTOM, which displays all descendants.

**byoption**

Is one of the following sort-based options: PAGE-BREAK, REPAGE, RECAP, RECOMPUTE, SKIP-LINE, SUBFOOT, SUBHEAD, SUBTOTAL, SUB-TOTAL, SUMMARIZE, UNDER-LINE. If you specify SUBHEAD or SUBFOOT, you must place the WHEN phrase on the line following the heading or footing text.

**condition**

Is a logical expression.

**expression_using_dimension_data**

Screens the rows selected in the BY/ON HIERARCHY and WHEN phrases based on dimension data. The expression can use dimension properties and hierarchy fields. However, the selection criteria are always applied to the values at the leaf nodes. Therefore, you cannot use WHERE to select rows based on hierarchy field values that occur at higher levels. For example, in a dimension with Continents, Countries, and Cities, your request will not display any rows if you use WHERE to select a Country

name, but it may if you use it to select a City name.

# Reporting on a Dimension HIerarchy

The following request reports on the entire GL_ACCOUNT hierarchy for the CENTGL2 data source created in the *Describing Data With ibi™ WebFOCUS® Language* manual.

```
TABLE FILE NEWGL
SUM GL_ACCOUNT_AMOUNT
BY GL_ACCOUNT HIERARCHY
ON TABLE SET PAGE NOPAGE
ON TABLE SET STYLE *
TYPE=REPORT,GRID=OFF,$
ENDSTYLE
END
```

Partial output is shown in the following image. The accounts are indented to show the hierarchical relationships:

| Ledger Account | Amount |
|---|---|
| 1000 | 27,169.00 |
| 2000 | 10,908.00 |
| 2100 | 7,575.00 |
| 2200 | 2,525.00 |
| 2210 | 505.00 |
| 2220 | 505.00 |
| 2230 | 505.00 |
| 2240 | 505.00 |
| 2250 | 505.00 |
| 2300 | 2,525.00 |
| 2310 | 505.00 |
| 2320 | 505.00 |
| 2330 | 505.00 |
| 2340 | 505.00 |
| 2350 | 505.00 |
| 2400 | 2,525.00 |
| 2410 | 505.00 |
| 2420 | 505.00 |
| 2430 | 505.00 |
| 2440 | 505.00 |
| 2450 | 505.00 |
| 2500 | 3,333.00 |
| 2600 | 2,525.00 |
| 2610 | 505.00 |
| 2620 | 505.00 |
| 2630 | 505.00 |
| 2640 | 505.00 |
| 2650 | 505.00 |

The following is the same request using the GL_ACCOUNT_CAPTION field:

```
TABLE FILE NEWGL
SUM GL_ACCOUNT_AMOUNT
BY GL_ACCOUNT_CAPTION HIERARCHY
ON TABLE SET PAGE NOPAGE
ON TABLE SET STYLE *
TYPE=REPORT,GRID=OFF,$
```

```
ENDSTYLE
END
```

Partial output is shown in the following image:

| Caption | Amount |
|---|---|
| Profit Before Tax | 27,169.00 |
| Gross Margin | 10,908.00 |
| Sales Revenue | 7,575.00 |
| Retail Sales | 2,525.00 |
| Retail - Television | 505.00 |
| Retail - Stereo | 505.00 |
| Retail - Video Player | 505.00 |
| Retail - Computer | 505.00 |
| Retail - Video Camera | 505.00 |
| Mail Order Sales | 2,525.00 |
| Mail Order - Television | 505.00 |
| Mail Order - Stereo | 505.00 |
| Mail Order - Video Player | 505.00 |
| Mail Order - Computer | 505.00 |
| Mail Order - Video Camera | 505.00 |
| Internet Sales | 2,525.00 |
| Internet - Television | 505.00 |
| Internet - Stereo | 505.00 |
| Internet - Video Player | 505.00 |
| Internet - Computer | 505.00 |
| Internet - Video Camera | 505.00 |
| Cost Of Goods Sold | 3,333.00 |
| Variable Material Costs | 2,525.00 |
| Television COGS | 505.00 |
| Stereo COGS | 505.00 |
| Video COGS | 505.00 |
| Computer COGS | 505.00 |
| Video Camera COGS | 505.00 |

# Using WHEN to Select Hierarchy Members

The following request selects certain accounts using the WHEN phrase and populates one level up and one level down from the selected nodes with values. Note that all levels to the root node display on the output for context, but if they are not in the members selected, they are not populated with measure values:

```
TABLE FILE NEWGL
SUM GL_ACCOUNT_AMOUNT
BY GL_ACCOUNT_CAPTION HIERARCHY
WHEN GL_ACCOUNT GT '2000' AND GL_ACCOUNT LT '3000';
 SHOW UP 1 TO DOWN 1
ON TABLE SET PAGE NOPAGE
ON TABLE SET STYLE *
TYPE=REPORT,GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image:

| Caption | Amount |
|---|---|
| Profit Before Tax | . |
| Gross Margin | 10,908.00 |
| Sales Revenue | 7,575.00 |
| Retail Sales | 2,525.00 |
| Retail - Television | 505.00 |
| Retail - Stereo | 505.00 |
| Retail - Video Player | 505.00 |
| Retail - Computer | 505.00 |
| Retail - Video Camera | 505.00 |
| Mail Order Sales | 2,525.00 |
| Mail Order - Television | 505.00 |
| Mail Order - Stereo | 505.00 |
| Mail Order - Video Player | 505.00 |
| Mail Order - Computer | 505.00 |
| Mail Order - Video Camera | 505.00 |
| Internet Sales | 2,525.00 |
| Internet - Television | 505.00 |
| Internet - Stereo | 505.00 |
| Internet - Video Player | 505.00 |
| Internet - Computer | 505.00 |
| Internet - Video Camera | 505.00 |
| Cost Of Goods Sold | 3,333.00 |
| Variable Material Costs | 2,525.00 |
| Television COGS | 505.00 |
| Stereo COGS | 505.00 |
| Video COGS | 505.00 |
| Computer COGS | 505.00 |
| Video Camera COGS | 505.00 |
| Direct Labor | 404.00 |
| Fixed Costs | 404.00 |

# Using WHERE to Screen Selected Hierarchy Members

The following request selects members using the WHEN phrase and then screens the output by applying a WHERE phrase to the selected members:

```
TABLE FILE NEWGL
SUM GL_ACCOUNT_AMOUNT GL_ACCOUNT_TYPE
BY GL_ACCOUNT HIERARCHY
WHEN GL_ACCOUNT NE '3000';
 SHOW UP 0 TO DOWN 0
WHERE GL_ACCOUNT_TYPE NE 'E'   ;
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image:

| Ledger Account | Amount | Type |
|---|---|---|
| 1000 | 8,484.00 | R |
| 2000 | 7,575.00 | R |
| 2100 | 7,575.00 | R |
| 2200 | 2,525.00 | R |
| 2210 | 505.00 | R |
| 2220 | 505.00 | R |
| 2230 | 505.00 | R |
| 2240 | 505.00 | R |
| 2250 | 505.00 | R |
| 2300 | 2,525.00 | R |
| 2310 | 505.00 | R |
| 2320 | 505.00 | R |
| 2330 | 505.00 | R |
| 2340 | 505.00 | R |
| 2350 | 505.00 | R |
| 2400 | 2,525.00 | R |
| 2410 | 505.00 | R |
| 2420 | 505.00 | R |
| 2430 | 505.00 | R |
| 2440 | 505.00 | R |
| 2450 | 505.00 | R |
| 3000 | . | . |
| 3200 | 909.00 | R |
| 3600 | 404.00 | R |
| 3700 | 505.00 | R |
| 3730 | 505.00 | R |

# Selecting Records for Your Report

When generating a report and selecting fields, you may not want to include every instance of a field. By including selection criteria, you can display only those field values that meet your needs. In effect, you can select a subset of data that you can easily redefine each time you issue the report request.

## Selecting Records Overview

When developing a report request, you can define criteria that select records based on a variety of factors:

- The values of an individual field. See Selections Based on Individual Values.
- The aggregate value of a field (for example, the sum or average of field values). See Selection Based on Aggregate Values.
- The existence of missing values for a field, whether field values fall within a range, or whether a field does not contain a certain value. See Types of Record Selection Tests.
- The number of records that exist for a field (for example, the first 50 records), rather than on the field values. See Setting Limits on the Number of Records Read.
- For non-FOCUS data sources that have group keys, you can select records based on group key values. See Selections Based on Group Key Values.

In addition, you can take advantage of a variety of record selection efficiencies, including assigning filtering criteria to a data source and reading selection values from a file.

## Choosing a Filtering Method

There are two phrases for selecting records: WHERE and IF. It is recommended that you use WHERE to select records. IF offers a subset of the functionality of WHERE. Everything that you can accomplish with IF, you can also accomplish with WHERE. WHERE can accomplish things that IF cannot.

If you used IF to select records in the past, remember that WHERE and IF are two different phrases, and may require different syntax to achieve the same result.

WHERE syntax is described and illustrated throughout this topic. For details on IF syntax, see Selecting Records Using IF Phrases.

# Selections Based on Individual Values

The WHERE phrase selects records from the data source to be included in a report. The data is evaluated according to the selection criteria before it is retrieved from the data source.

You can use as many WHERE phrases as necessary to define your selection criteria. For an illustration, see Using Multiple WHERE Phrases. For additional information, see Using Compound Expressions for Record Selection.

**Note:** Multiple selection tests on fields that reside on separate paths of a multi-path data source are processed as though connected by either AND or OR operators, based on the setting of a parameter called MULTIPATH. For details, see Controlling Record Selection in Multi-path Data Sources.

# Select Records With WHERE

```
WHERE criteria [;]
```

where:

**criteria**

Are the criteria for selecting records to include in the report. The criteria must be defined in a valid expression that evaluates as true or false (that is, a Boolean expression). Expressions are described in detail in Using Expressions. Operators that can be used in WHERE expressions (such as, CONTAINS, IS, and GT), are described in Operators Supported for WHERE and IF Tests.

**;**

Is an optional semicolon that can be used to enhance the readability of the request. It does not affect the report.

# Usage Notes for WHERE Phrases

The WHERE phrase can include:

- Most expressions that would be valid on the right-hand side of a DEFINE expression. However, the logical expression IF ... THEN ... ELSE cannot be used.
- Real fields, temporary fields, and fields in joined files. If a field name is enclosed in single or double quotation marks, it is treated as a literal string, not a field reference.
- The operators EQ, NE, GE, GT, LT, LE, CONTAINS, OMITS, FROM ... TO, NOT-FROM ... TO, INCLUDES, EXCLUDES, LIKE, and NOT LIKE.
- All arithmetic operators (+, -, *, /, **), as well as, functions (MIN, MAX, ABS, and SQRT).
- An alphanumeric expression, which can be a literal, or a function yielding an alphanumeric or numeric result using EDIT or DECODE.

  Note that files used with DECODE expressions can contain two columns, one for field values and one for numeric decode values.
- Alphanumeric and date literals enclosed in single quotation marks and date-time literals in the form DT (*date-time literal*).
- A date literal used in a selection test against a date field cannot contain the day of the week value.
- Text fields. However, the only operators supported for use with text fields are CONTAINS and OMITS.
- All functions.

You can build complex selection criteria by joining simple expressions with AND and OR logical operators and, optionally, adding parentheses to specify explicitly the order of evaluation. This is easier than trying to achieve the same effect with the IF phrase, which may require the use of a separate DEFINE command. For details, see Using Compound Expressions for Record Selection.

# Using a Simple WHERE Test

To show only the names and salaries of employees earning more than $20,000 a year, issue the following request:

```
TABLE FILE EMPLOYEE
PRINT LAST_NAME AND FIRST_NAME AND CURR_SAL
BY LAST_NAME NOPRINT
WHERE CURR_SAL GT 20000
END
```

In this example, CURR_SAL is a selected field, and CURR_SAL GT 20000 is the selection criterion. Only those records with a current salary greater than $20,000 are retrieved. All other records are ignored.

The output is:

| LAST_NAME | FIRST_NAME | CURR_SAL |
|---|---|---|
| BANNING | JOHN | $29,700.00 |
| BLACKWOOD | ROSEMARIE | $21,780.00 |
| CROSS | BARBARA | $27,062.00 |
| IRVING | JOAN | $26,862.00 |
| ROMANS | ANTHONY | $21,120.00 |

# Using Multiple WHERE Phrases

You can use as many WHERE phrases as necessary to define your selection criteria. This request uses multiple WHERE phrases so that only those employees in the MIS or Production departments with the last name of Cross or Banning are included in the report.

```
TABLE FILE EMPLOYEE
PRINT EMP_ID LAST_NAME
WHERE SALARY GT 20000
WHERE DEPARTMENT IS 'MIS' OR 'PRODUCTION'
WHERE LAST_NAME IS 'CROSS' OR 'BANNING'
END
```

The output is:

| EMP_ID | LAST_NAME |
|---|---|
| 119329144 | BANNING |
| 818692173 | CROSS |

For related information, see Using Compound Expressions for Record Selection.

# Selecting Records for Partitioned FOCUS Data Sources

When you are reporting from a partitioned FOCUS data source, if your selection criteria are based on the same fields used to place data in the partitions, only those partitions with relevant data are opened for retrieval. For details on partitioned FOCUS data sources, see the *Describing Data With ibi™ WebFOCUS® Language* manual.  data sources" /> data sources" />

# Controlling Record Selection in Multi-path Data Sources

When you report from a multi-path data source, a parent segment may have children down some paths, but not others. The MULTIPATH parameter allows you to control whether such a parent segment is omitted from the report output.

The MULTIPATH setting also affects the processing of selection tests on independent paths. If MULTIPATH is set to:

- COMPOUND, WHERE or IF tests on separate paths are treated as if they are connected by an AND operator. That is, *all* paths must pass the screening tests in order for the parent to be included in the report output.
- SIMPLE, WHERE or IF tests on separate paths are considered independently, as if an OR operator connected them. Therefore, a parent instance is included in the report if at least one of the paths passes its screening test. A warning message is produced, indicating that if the request contains a test on one path, data is also retrieved from another, independent path. Records on the independent path are retrieved regardless of whether the condition is satisfied on the tested path.

The MULTIPATH settings apply in all types of data sources and in all reporting environments (TABLE, TABLEF, MATCH, GRAPH, and requests with multiple display commands). MULTIPATH also works with alternate views, indexed views, filters, DBA, and joined structures.

# Control Record Selection in Multi-path Data Sources

To set MULTIPATH from the command level or in a stored procedure, use

```
SET MULTIPATH = {SIMPLE|COMPOUND}
```

To set MULTIPATH in a report request, use

```
ON TABLE SET MULTIPATH {SIMPLE|COMPOUND}
```

where:

**SIMPLE**

Includes a parent segment in the report output if:

- It has at least one child that passes its screening conditions.

  **Note:** A unique segment is considered a part of its parent segment, and therefore does not invoke independent path processing.

- It lacks any referenced child on a path, but the child is optional.

  The (FOC144) warning message is generated when a request screens data in a multi-path report:

  ```
  (FOC144) WARNING. TESTING IN INDEPENDENT SETS OF DATA
  ```

**COMPOUND**

Includes a parent in the report output if it has *all* of its required children. WHERE or IF tests on separate paths are treated as if they are connected by an AND operator. That is, *all* paths must pass the screening tests in order for the parent to be included in the report output. COMPOUND is the default value.

For related information, see MULTIPATH and SET ALL Combinations and Rules for Determining If a Segment Is Required.

# Requirements and Usage Notes for MULTIPATH = COMPOUND

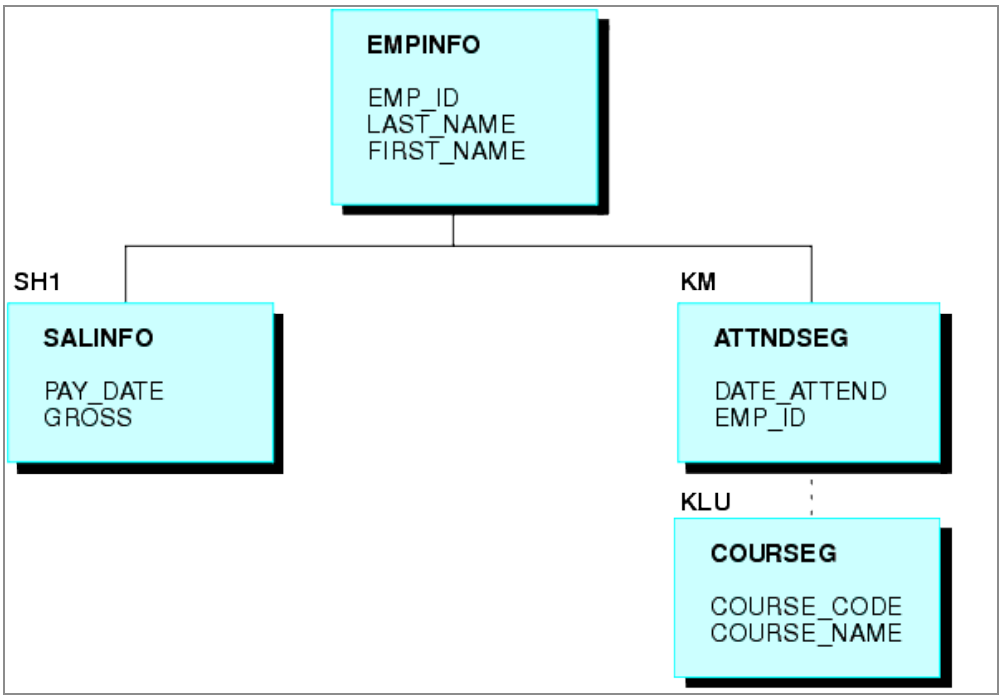
- The minimum memory requirement for the MULTIPATH = COMPOUND setting is 4K per active segment. If there is insufficient memory, the SIMPLE setting is implemented and a message is returned.

  There is no limit to the number of segment instances (rows). However, no single segment instance can have more than 4K of active fields (referenced fields or fields needed for retrieving referenced fields). If this limit is exceeded, the SIMPLE setting is implemented and a message is returned.

- WHERE criteria that screen on more than one path with the OR operator are not supported.

## Retrieving Data From Multiple Paths

This example uses the following segments from the EMPLOYEE data source:




The request that follows retrieves data from both paths with MULTIPATH = SIMPLE, and displays data if either criterion is met:

```
SET ALL = OFF
SET MULTIPATH = SIMPLE
TABLE FILE EMPLOYEE
PRINT GROSS DATE_ATTEND COURSE_NAME
BY LAST_NAME BY FIRST_NAME
WHERE PAY_DATE EQ 820730
WHERE COURSE_CODE EQ '103'
END
```

The following warning message is generated:

```
(FOC144) WARNING. TESTING IN INDEPENDENT SETS OF DATA
```

Although several employees have not taken any courses, they are included in the report output since they have instances on one of the two paths.

The output is:

| LAST_NAME | FIRST_NAME | GROSS | DATE_ATTEND | COURSE_NAME |
|---|---|---|---|---|
| BANNING | JOHN | $2,475.00 | . | . |
| BLACKWOOD | ROSEMARIE | $1,815.00 | . | . |
| CROSS | BARBARA | $2,255.00 | . | . |
| GREENSPAN | MARY | $750.00 | . | . |
| IRVING | JOAN | $2,238.50 | . | . |
| JONES | DIANE | $1,540.00 | 82/05/26 | BASIC REPORT PREP FOR PROG |
| MCCOY | JOHN | $1,540.00 | . | . |
| MCKNIGHT | ROGER | $1,342.00 | . | . |
| ROMANS | ANTHONY | $1,760.00 | . | . |
| SMITH | MARY | $1,100.00 | 81/11/16 | BASIC REPORT PREP FOR PROG |
| | RICHARD | $791.67 | . | . |
| STEVENS | ALFRED | $916.67 | . | . |

If you run the same request with MULTIPATH = COMPOUND, the employees without instances for COURSE_NAME are omitted from the report output, and the warning message is not generated.

The output is:

```
LAST_NAME       FIRST_NAME            GROSS  DATE_ATTEND  COURSE_NAME

---------       ----------            -----  -----------  -----------

JONES           DIANE             $1,540.00     82/05/26  BASIC REPORT
PREP FOR PROG
```

```
SMITH           MARY             $1,100.00     81/11/16  BASIC REPORT
PREP FOR PROG
```

# MULTIPATH and SET ALL Combinations

The ALL parameter affects independent path processing. The following table uses examples from the EMPLOYEE data source to explain the interaction of ALL and MULTIPATH.

| Request | MULTIPATH=SIMPLE | MULTIPATH=COMPOUND |
|---|---|---|
| `SET ALL = OFF`<br>`PRINT EMP_ID`<br>`PAY_DATE DATE_`<br>`ATTEND` | Shows employees who have *either* SALINFO data *or* ATTNDSEG data. | Shows employees who have *both* SALINFO *and* ATTNDSEG data. |
| `SET ALL = ON`<br>`PRINT EMP_ID`<br>`PAY_DATE DATE_`<br>`ATTEND` | Shows employees who have SALINFO data *or* ATTNDSEG data *or* no child data at all. | Same as SIMPLE. |
| `SET ALL = OFF`<br>`PRINT EMP_ID`<br>`PAY_DATE DATE_`<br>`ATTEND`<br>`WHERE PAY_DATE`<br>`EQ 980115` | Shows employees who have *either* SALINFO data for 980115 *or* any ATTNDSEG data.<br>Produces (FOC144) message. | Shows employees who have *both* SALINFO data for 980115 *and* ATTNDSEG data. |
| `SET ALL = ON`<br>`PRINT EMP_ID`<br>`PAY_DATE DATE_`<br>`ATTEND`<br>`WHERE PAY_DATE` | Shows employees who have *either* SALINFO data for 980115 *or* any ATTNDSEG data.<br>Produces (FOC144) message. | Shows employees who have SALINFO data for 980115. Any DATE_ATTEND data is also shown. |

| Request | MULTIPATH=SIMPLE | MULTIPATH=COMPOUND |
|---|---|---|
| `EQ 980115` | | |
| `SET ALL = OFF`<br>`PRINT ALL.EMP_ID DATE_ATTEND`<br>`WHERE PAY_DATE EQ 980115` | Shows employees who have *either* SALINFO data for 980115 *or* any ATTNDSEG data.<br><br>Produces (FOC144) message. | Shows employees who have SALINFO data for 980115. Any DATE_ATTEND data is also shown. |
| `SET ALL = ON or OFF`<br>`PRINT EMP_ID PAY_DATE DATE_ATTEND`<br>`WHERE PAY_DATE EQ 980115 AND COURSE_CODE EQ '103'` | Shows employees who have *either* SALINFO data for 980115 *or* COURSE 103.<br><br>**Note:** SIMPLE treats AND in the WHERE clause as OR.<br><br>Produces (FOC144) message. | Shows employees who have *both* SALINFO data for 980115 *and* COURSE 103. |

**Note:** SET ALL = PASS is not supported with MULTIPATH = COMPOUND.

For related information about the ALL parameter, see Handling Records With Missing Field Values.

# Rules for Determining If a Segment Is Required

The segment rule is applied level by level, descending through the data source/view hierarchy. That is, a parent segment existence depends on the child segment existence, and the child segment depends on the grandchild existence, and so on, for the full data source tree.

The following rules are used to determine if a segment is required or optional:

- When SET ALL is ON or OFF, a segment with WHERE or IF criteria is required for its parent, and all segments up to the root segment are required for their parents.

When SET ALL = PASS, a segment with WHERE or IF criteria is optional.

- IF SET ALL = ON or PASS, all referenced segments with no WHERE or IF criteria are optional for their parents (outer join).
- IF SET ALL = OFF, all referenced segments are required (inner join).
- A referenced segment can become optional if its parent segment uses the ALL. field prefix operator.

**Note:** ALL = PASS is not supported for all data adapters and, if it is supported, it may behave slightly differently. Check your specific data adapter documentation for detailed information.

For related information about the ALL parameter, see Handling Records With Missing Field Values, and the *Describing Data With ibi™ WebFOCUS® Language* manual.

# Selection Based on Aggregate Values

You can select records based on the aggregate value of a field. For example, on the sum of field values, or on the average of field values, by using the WHERE TOTAL phrase. WHERE TOTAL is very helpful when you employ the aggregate display commands SUM and COUNT, and is required for fields with a prefix operator, such as AVE. and PCT.

In WHERE tests, data is evaluated before it is retrieved. In WHERE TOTAL tests, however, data is selected after all the data has been retrieved and processed. For an example, see Using WHERE TOTAL for Record Selection.

# Select Records With WHERE TOTAL

```
WHERE TOTAL criteria[;]
```

where:

**criteria**

Are the criteria for selecting records to include in the report. The criteria must be defined in a valid expression that evaluates as true or false (that is, a Boolean expression). Expressions are described in detail in Using Expressions. Operators that can

be used in WHERE expressions (such as, IS and GT) are described in Operators Supported for WHERE and IF Tests.

**;**

Is an optional semicolon that can be used to enhance the readability of the request. It does not affect the report.

# Usage Notes for WHERE TOTAL

- Any reference to a calculated value, or use of a feature that aggregates values, such as TOT.field, AVE.field, requires the use of WHERE TOTAL.
- Fields with prefix operators require the use of WHERE TOTAL.
- WHERE TOTAL tests are performed at the lowest sort level.
- Alphanumeric and date literals must be enclosed in single quotation marks. Date-time literals must be in the form DT (*date-time literal*).
- When you use ACROSS with WHERE TOTAL, data that does not satisfy the selection criteria is represented in the report with the NODATA character.
- If you save the output from your report request in a HOLD file, the WHERE TOTAL test creates a field called WH$$$T1, which contains its internal computations. If there is more than one WHERE TOTAL test, each TOTAL test creates a corresponding WH$$$T field and the fields are numbered consecutively.

# Using WHERE TOTAL for Record Selection

The following example sums current salaries by department.

```
TABLE FILE EMPLOYEE
SUM CURR_SAL
BY DEPARTMENT
END
```

The output is:

```
DEPARTMENT         CURR_SAL
----------         --------
MIS             $108,002.00
PRODUCTION      $114,282.00
```

Now, add a WHERE TOTAL phrase to the request in order to generate a report that lists only the departments where the total of the salaries is more than $110,000.

```
TABLE FILE EMPLOYEE
SUM CURR_SAL
BY DEPARTMENT
WHERE TOTAL CURR_SAL EXCEEDS 110000
END
```

The values for each department are calculated and then each final value is compared to $110,000. The output is:

```
DEPARTMENT         CURR_SAL
----------         --------
PRODUCTION      $114,282.00
```

# Combining WHERE TOTAL and WHERE for Record Selection

The following request extracts records for the MIS department. Then, CURR_SAL is summed for each employee. If the total salary for an employee is greater than $20,000, the values of CURR_SAL are processed for the report. In other words, WHERE TOTAL screens data after records are selected.

```
TABLE FILE EMPLOYEE
SUM CURR_SAL
BY LAST_NAME AND BY FIRST_NAME
WHERE TOTAL CURR_SAL EXCEEDS 20000
WHERE DEPARTMENT IS 'MIS'
END
```

The output is:

```
LAST_NAME       FIRST_NAME        CURR_SAL
---------       ----------        --------
BLACKWOOD       ROSEMARIE       $21,780.00
CROSS           BARBARA         $27,062.00
```

# Applying Selection Criteria to the Internal Matrix Prior to COMPUTE Processing

WHERE TOTAL tests are applied to the rows of the internal matrix after COMPUTE calculations are processed in the output phase of the report. WHERE_GROUPED tests are applied to the internal matrix values prior to COMPUTE calculations. The processing then continues with COMPUTE calculations, and then WHERE TOTAL tests. This allows the developer to control the evaluation, and is particularly useful in recursive calculations.

# Apply WHERE_GROUPED Selection Criteria

```
WHERE_GROUPED expression
```

where:

**expression**

Is an expression that does not refer to more than one row in the internal matrix. For example, it cannot use the LAST operator to refer to or retrieve a value from a prior record.

# Using a WHERE_GROUPED Test

The following request has two COMPUTE commands. The first COMPUTE checks to see if the business region value has changed, incrementing a counter if it has. This allows us to sequence the records in the matrix. The second COMPUTE creates a rolling total of the days delayed within the business region.

```
TABLE FILE WF_RETAIL_LITE
SUM  DAYSDELAYED AS DAYS
COMPUTE CTR/I3 = IF BUSINESS_REGION EQ LAST BUSINESS_REGION THEN CTR+1
ELSE 1;
COMPUTE NEWDAYS = IF BUSINESS_REGION EQ LAST BUSINESS_REGION THEN
NEWDAYS+DAYSDELAYED ELSE DAYSDELAYED;
BY BUSINESS_REGION AS Region
BY TIME_MTH
WHERE BUSINESS_REGION NE 'Oceania'
ON TABLE SET PAGE NOPAGE
END
```

The output is shown in the following image.

| Region | Sale Month | DAYS | CTR | NEWDAYS |
|---|---|---|---|---|
| EMEA | 1 | 191 | 1.00 | 191.00 |
| | 2 | 205 | 2.00 | 396.00 |
| | 3 | 224 | 3.00 | 620.00 |
| | 4 | 213 | 4.00 | 833.00 |
| | 5 | 185 | 5.00 | 1,018.00 |
| | 6 | 234 | 6.00 | 1,252.00 |
| | 7 | 223 | 7.00 | 1,475.00 |
| | 8 | 234 | 8.00 | 1,709.00 |
| | 9 | 249 | 9.00 | 1,958.00 |
| | 10 | 290 | 10.00 | 2,248.00 |
| | 11 | 1 | 11.00 | 2,249.00 |
| North America | 1 | 253 | 1.00 | 253.00 |
| | 2 | 205 | 2.00 | 458.00 |
| | 3 | 293 | 3.00 | 751.00 |
| | 4 | 319 | 4.00 | 1,070.00 |
| | 5 | 273 | 5.00 | 1,343.00 |
| | 6 | 268 | 6.00 | 1,611.00 |
| | 7 | 219 | 7.00 | 1,830.00 |
| | 8 | 248 | 8.00 | 2,078.00 |
| | 9 | 220 | 9.00 | 2,298.00 |
| | 10 | 326 | 10.00 | 2,624.00 |
| | 11 | 8 | 11.00 | 2,632.00 |
| South America | 1 | 64 | 1.00 | 64.00 |
| | 2 | 87 | 2.00 | 151.00 |
| | 3 | 29 | 3.00 | 180.00 |
| | 4 | 39 | 4.00 | 219.00 |
| | 5 | 29 | 5.00 | 248.00 |
| | 6 | 49 | 6.00 | 297.00 |
| | 7 | 16 | 7.00 | 313.00 |
| | 8 | 26 | 8.00 | 339.00 |
| | 9 | 54 | 9.00 | 393.00 |
| | 10 | 54 | 10.00 | 447.00 |

The following version of the request adds a WHERE TOTAL test to select only those months where DAYSDELAYED exceeded 200 days.

```
TABLE FILE WF_RETAIL_LITE
SUM  DAYSDELAYED AS DAYS
COMPUTE CTR/I3 = IF BUSINESS_REGION EQ LAST BUSINESS_REGION THEN CTR+1
```

```
ELSE 1;
COMPUTE NEWDAYS= IF BUSINESS_REGION EQ LAST BUSINESS_REGION THEN
NEWDAYS+DAYSDELAYED ELSE DAYSDELAYED;
BY BUSINESS_REGION AS Region
BY TIME_MTH
WHERE BUSINESS_REGION NE 'Oceania'
WHERE TOTAL DAYSDELAYED GT 200
ON TABLE SET PAGE NOPAGE
END
```

The output is shown in the following image. The COMPUTE calculations for CTR and NEWDAYS were processed prior to eliminating the rows in which TOTAL DAYSDELAYED were 200 or less, so their values are the same as in the original output. This does not correctly reflect the sequence of records and the rolling total of the values that are actually displayed on the output. To do this, we need to select the appropriate months (DAYSDELAYED GT 200) before the COMPUTE expressions are evaluated. This requires WHERE_GROUPED.

| Region | Sale Month | DAYS | CTR | NEWDAYS |
|---|---|---|---|---|
| EMEA | 2 | 205 | 2.00 | 396.00 |
| | 3 | 224 | 3.00 | 620.00 |
| | 4 | 213 | 4.00 | 833.00 |
| | 6 | 234 | 6.00 | 1,252.00 |
| | 7 | 223 | 7.00 | 1,475.00 |
| | 8 | 234 | 8.00 | 1,709.00 |
| | 9 | 249 | 9.00 | 1,958.00 |
| | 10 | 290 | 10.00 | 2,248.00 |
| North America | 1 | 253 | 1.00 | 253.00 |
| | 2 | 205 | 2.00 | 458.00 |
| | 3 | 293 | 3.00 | 751.00 |
| | 4 | 319 | 4.00 | 1,070.00 |
| | 5 | 273 | 5.00 | 1,343.00 |
| | 6 | 268 | 6.00 | 1,611.00 |
| | 7 | 219 | 7.00 | 1,830.00 |
| | 8 | 248 | 8.00 | 2,078.00 |
| | 9 | 220 | 9.00 | 2,298.00 |
| | 10 | 326 | 10.00 | 2,624.00 |

The following version of the request replaces the WHERE TOTAL test with a WHERE_GROUPED test.

```
TABLE FILE WF_RETAIL_LITE
SUM  DAYSDELAYED AS DAYS
COMPUTE CTR/I3 = IF BUSINESS_REGION EQ LAST BUSINESS_REGION THEN CTR+1
ELSE 1;
COMPUTE NEWDAYS= IF BUSINESS_REGION EQ LAST BUSINESS_REGION THEN
NEWDAYS+DAYSDELAYED ELSE DAYSDELAYED;
BY BUSINESS_REGION AS Region
BY TIME_MTH
WHERE BUSINESS_REGION NE 'Oceania'
WHERE_GROUPED DAYSDELAYED GT 200
ON TABLE SET PAGE NOPAGE
END
```

The output is shown in the following image. The COMPUTE calculation for NEWDAYS was processed after eliminating the rows in which TOTAL DAYSDELAYED were 200 or less, so its values are based on fewer rows than the calculations in the original request. This is verified by the CTR values, which are now in a continuous sequence. The rolling total now reflects the values that are actually displayed on the report output.

| Region | Sale Month | DAYS | CTR | NEWDAYS |
|---|---|---|---|---|
| EMEA | 2 | 205 | 1.00 | 205.00 |
| | 3 | 224 | 2.00 | 429.00 |
| | 4 | 213 | 3.00 | 642.00 |
| | 6 | 234 | 4.00 | 876.00 |
| | 7 | 223 | 5.00 | 1,099.00 |
| | 8 | 234 | 6.00 | 1,333.00 |
| | 9 | 249 | 7.00 | 1,582.00 |
| | 10 | 290 | 8.00 | 1,872.00 |
| North America | 1 | 253 | 1.00 | 253.00 |
| | 2 | 205 | 2.00 | 458.00 |
| | 3 | 293 | 3.00 | 751.00 |
| | 4 | 319 | 4.00 | 1,070.00 |
| | 5 | 273 | 5.00 | 1,343.00 |
| | 6 | 268 | 6.00 | 1,611.00 |
| | 7 | 219 | 7.00 | 1,830.00 |
| | 8 | 248 | 8.00 | 2,078.00 |
| | 9 | 220 | 9.00 | 2,298.00 |
| | 10 | 326 | 10.00 | 2,624.00 |

# Usage Notes for WHERE_GROUPED

- If the expression refers to multiple rows in the internal matrix, the following message is generated and processing stops.

  ```
  (FOC32692) WHERE_GROUPED CANNOT REFER TO OTHER LINES OF REPORT
  ```

- A COMPUTE that does not reference multiple lines will be evaluated prior to WHERE_GROUPED tests, and may, therefore, be used in an expression and evaluated as part of a WHERE_GROUPED test.
- WHERE_GROUPED can be optimized for SQL data sources by creating a GROUP BY *fieldname* HAVING *expression* clause, where the expression is the WHERE_GROUPED selection criteria.

# Using Compound Expressions for Record Selection

You can combine two or more simple WHERE expressions, connected by AND and/or OR operators, to create a compound expression.

By default, when multiple WHERE phrases are evaluated, logical ANDs are processed before logical ORs. In compound expressions, you can use parentheses to change the order of evaluation. All AND and OR operators enclosed in parentheses are evaluated first, followed by AND and OR operators outside of parentheses.

You should always use parentheses in complex expressions to ensure that the expression is evaluated correctly. For example:

```
WHERE (SEATS EQ 2) AND (SEATS NOT-FROM 3 TO 4)
```

This is especially useful when mixing literal OR tests with logical AND and OR tests:

- In a logical AND or OR test, all field names, test relations, and test values are explicitly referenced and connected by the words OR or AND. For example:

  ```
  WHERE (LAST_NAME EQ 'CROSS') OR (LAST_NAME EQ 'JONES')
  ```

or

```
WHERE (CURR_SAL GT 20000) AND (DEPARTMENT IS 'MIS')
       AND (CURR_JOBCODE CONTAINS 'A')
```

- In a literal OR test, the word OR is repeated between test values of a field name, but the field name itself and the connecting relational operator are not repeated. For example:

```
WHERE (LAST_NAME EQ 'CROSS' OR 'JONES')
```

# Mixing AND and OR Record Selection Tests

This example illustrates the impact of parentheses on the evaluation of literal ORs and logical ANDs.

In this request, each expression enclosed in parentheses is evaluated first in the order in which it appears. Notice that the first expression contains a literal OR. The result of each expression is then evaluated using the logical AND.

If parentheses are excluded, the logical AND is evaluated before the literal OR.

```
TABLE FILE EMPLOYEE
PRINT CURR_SAL BY LAST_NAME
WHERE (LAST_NAME EQ 'CROSS' OR 'JONES')
AND (CURR_SAL GT 22000)
END
```

The output is:

```
LAST_NAME              CURR_SAL
---------              --------
CROSS                $27,062.00
```

# Using Operators in Record Selection Tests

You can include a variety of operators in your WHERE and IF selection tests. Many of the operators are common for WHERE and IF. However, several are supported only for WHERE

tests.

# Operators Supported for WHERE and IF Tests

You can define WHERE and IF selection criteria using the following operators.

| WHERE Operator | IF Operator | Meaning |
|---|---|---|
| `EQ`<br>`IS` | `EQ`<br>`IS` | Tests for and selects values equal to the test expression. |
| `NE`<br>`IS-NOT` | `NE`<br>`IS-NOT` | Tests for and selects values not equal to the test expression. |
| `GE` | `GE`<br>`FROM`<br>`IS-FROM` | Tests for and selects values greater than or equal to the test value (based on the characters 0 to 9 for numeric values, A to Z and a to z for alphanumeric values).<br>The test value can be a field value or the result of an expression. |
| `GT`<br>`EXCEEDS`<br>`IS-MORE-THAN` | `GT`<br>`EXCEEDS`<br>`IS-MORE-THAN` | Tests for and selects values greater than the test value. |
| `LT`<br>`IS-LESS-THAN` | `LT`<br>`IS-LESS-THAN` | Tests for and selects values less than the test value. |
| `LE` | `LE`<br>`TO` | Tests for and selects values less than or equal to the test value. |

| WHERE Operator | IF Operator | Meaning |
|---|---|---|
| `GE lower AND ... LE upper` | | Tests for and selects values within a range of values. |
| `LT lower OR ... GT upper` | | Tests for and selects values outside of a range of values. |
| `FROM lower TO upper` | | Tests for and selects values within a range of values. |
| `IS-FROM lower TO upper` | `IS-FROM lower TO upper` | Tests for and selects values within a range of values. For WHERE, this is alternate syntax for FROM lower to UPPER. Both operators produce identical results. |
| `NOT-FROM lower TO upper` | `NOT-FROM lower TO upper` | Tests for and selects values that are outside a range of values. |
| `IS MISSING IS-NOT MISSING NE MISSING` | `IS MISSING IS-NOT MISSING NE MISSING` | Tests whether a field contains missing values. If some instances of the field contain no data, they have missing data. For information on missing data, see Handling Records With Missing Field Values. |
| `CONTAINS LIKE` | `CONTAINS LIKE` | Tests for and selects values that include a character string matching test value. The string can occur in any position in the value being tested. When used with WHERE, CONTAINS can test alphanumeric fields. When used with IF, it can test |

| WHERE Operator | IF Operator | Meaning |
|---|---|---|
| | | both alphanumeric and text fields. |
| `OMITS`<br>`NOT LIKE` | `OMITS`<br>`UNLIKE` | Tests for and selects values that do not include a character string matching test value. The string cannot occur in any position in the value being tested. When used with WHERE, OMITS can test alphanumeric fields. When used with IF, it can test both alphanumeric and text fields. |
| `INCLUDES` | `INCLUDES` | Tests whether a chain of values of a given field in a child segment includes all of a list of literals. |
| `EXCLUDES` | `EXCLUDES` | Tests whether a chain of values of a given field in a child segment excludes all of a list of literals. |
| `IN (z,x,y)` | | Selects records based on values found in an unordered list. |
| `NOT ... IN`<br>`(z,x,y)` | | Selects records based on values not found in an unordered list. |
| `IN FILE` | | Selects records based on values stored in a sequential file. |
| `NOT ... IN FILE` | | Selects records with field values not found in a sequential file. |
| `IF-THEN-ELSE` | | Selects records based on the logical conditions listed in the IF-THEN-ELSE phrase. |

# Using Operators to Compare a Field to One or More Values

The following examples illustrate field selection criteria that use one or more values. You may use the operators: EQ, IS, IS-NOT, EXCEEDS, IS-LESS-THAN, and IN.

**Example 1:** The field LAST_NAME must equal the value JONES:

```
WHERE LAST_NAME EQ 'JONES'
```

**Example 2:** The field LAST_NAME begins with 'CR' or 'MC:'

```
WHERE EDIT (LAST_NAME, '99') EQ 'CR' OR 'MC'
```

**Example 3:** The field AREA must not equal the value EAST or WEST:

```
WHERE AREA IS-NOT 'EAST' OR 'WEST'
```

**Example 4:** The value of the field AREA must equal the value of the field REGION:

```
WHERE AREA EQ REGION
```

Note that you cannot compare one field to another in an IF test.

**Example 5:** The ratio between retail cost and dealer cost must be greater than 1.25:

```
WHERE RETAIL_COST/DEALER_COST GT 1.25
```

**Example 6:** The field UNITS must be equal to or less than the value 50, and AREA must not be equal to either NORTH EAST or WEST. Note the use of single quotation marks around NORTH EAST. All alphanumeric strings must be enclosed within single quotation marks.

```
WHERE UNITS LE 50 WHERE AREA IS-NOT 'NORTH EAST' OR 'WEST'
```

**Example 7:** The value of AMOUNT must be greater than 40:

```
WHERE AMOUNT EXCEEDS 40
```

**Example 8:** The value of AMOUNT must be less than 50:

```
WHERE AMOUNT IS-LESS-THAN 50
```

**Example 9:** The value of SALES must be equal to one of the numeric values in the unordered list. Use commas or blanks to separate the list values.

```
WHERE SALES IN (43000,12000,13000)
```

**Example 10:** The value of CAR must be equal to one of the alphanumeric values in the unordered list. Single quotation marks must enclose alphanumeric list values.

```
WHERE CAR IN ('JENSEN','JAGUAR')
```

# Using IF-THEN-ELSE Logic in a WHERE Clause

The following request uses IF-THEN-ELSE logic in a WHERE clause to select records based on values of WHOLESALEPR where the values used for selection vary depending on the value of LISTPR in that record.

```
TABLE FILE MOVIES
PRINT COPIES
LISTPR
WHOLESALEPR
BY CATEGORY
WHERE WHOLESALEPR GT (IF LISTPR GT 20.00 THEN 15.00 ELSE 11.00)
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image. In the selected records, WHOLESALEPR is greater than $15.00 if LISTPR is greater than $20.00. WHOLESALEPR is greater than $11.00 if LISTPR is less than or equal to $20.00.

| CATEGORY | COPIES | LISTPR | WHOLESALEPR |
|---|---|---|---|
| ACTION | 3 | 19.98 | 11.50 |
| | 4 | 19.99 | 11.99 |
| CHILDREN | 2 | 44.95 | 29.99 |
| | 1 | 29.95 | 15.99 |
| CLASSIC | 3 | 39.99 | 20.00 |
| | 1 | 29.95 | 15.99 |
| | 3 | 89.95 | 40.99 |
| | 2 | 89.99 | 40.99 |
| COMEDY | 4 | 19.95 | 12.55 |
| | 2 | 19.95 | 12.55 |
| | 3 | 59.99 | 30.00 |
| | 4 | 19.98 | 13.75 |
| | 4 | 19.98 | 13.75 |
| FOREIGN | 1 | 19.98 | 13.25 |
| | 1 | 59.95 | 30.00 |
| | 1 | 29.95 | 15.99 |
| | 1 | 39.98 | 25.00 |
| | 1 | 59.95 | 32.00 |
| | 1 | 59.95 | 30.00 |
| MUSICALS | 1 | 19.98 | 13.99 |
| | 1 | 19.98 | 13.99 |
| MYSTERY | 4 | 29.98 | 15.99 |
| | 2 | 25.99 | 15.99 |
| | 4 | 59.99 | 30.00 |
| SCI/FI | 1 | 19.98 | 14.99 |
| | 1 | 19.98 | 14.55 |
| | 1 | 19.95 | 13.99 |
| | 1 | 24.95 | 16.00 |
| | 3 | 29.98 | 19.99 |

# Using Variables in Record Selection Tests

In this example, the field REGION is used in the WHERE test as a variable so that when the report is executed, the user is prompted to select one of the listed values (CE, CORP, NE, SE or WE) of the REGION field. The text that appears after the values is what appears before the drop-down list in the output.

```
TABLE FILE EMPDATA
SUM SALARY
BY DIV
```

```
BY DEPT
HEADING
"Current Salary Report"
"for the &REGION Division"
" "
WHERE ( DIV EQ
'&REGION.(CE,CORP,NE,SE,WE).Please select a Region.');
END
```

The output is:

Select a region from the drop-down list and click **Submit**. The output for the NE region is:

Current Salary Report
for the NE Division

| DIV | DEPT | SALARY |
|---|---|---|
| NE | CUSTOMER SUPPORT | $81,800.00 |
| | MARKETING | $139,800.00 |
| | SALES | $82,600.00 |

# Types of Record Selection Tests

You can select records for your reports using a variety of tests that are implemented using the operators described in Operators Supported for WHERE and IF Tests. You can test for:

- Values that lie within or outside of a range. See Range Tests With FROM and TO and Range Tests With GE and LE or GT and LT.
- Missing or existing data. See Missing Data Tests.

- The existence or absence of a character string. See Character String Screening With CONTAINS and OMITS.
- Partially defined character strings in a data field. See Screening on Masked Fields.
- Literals in a parent segment. See Qualifying Parent Segments Using INCLUDES and EXCLUDES.

# Range Tests With FROM and TO

Use the operators FROM ... TO and NOT-FROM ... TO in order to determine whether field values fall within or outside of a given range. You can use either values or expressions to specify the lower and upper boundaries. Range tests can also be applied on the sort control fields. The range test is specified immediately after the sort phrase.

You can also test whether an expression falls within or outside the boundaries.

# Specify a Range Test (FROM and TO)

```
WHERE [TOTAL] {fieldname|expression} {FROM|IS-FROM} lower TO upper
WHERE [TOTAL] fieldname  NOT-FROM      lower TO upper
```

where:

**fieldname**

Is any valid field name or alias.

**expression**

Is any valid expression.

**lower**

Are numeric or alphanumeric values or expressions that indicate lower boundaries. You may add parentheses around expressions for readability.

**upper**

Are numeric or alphanumeric values or expressions that indicate upper boundaries. You may add parentheses around expressions for readability.

# Range Test With FROM ... TO

An example of a range test using expressions as boundaries follows:

```
WHERE SALES FROM (DEALER_COST * 1.4) TO (DEALER_COST * 2.0)
```

The following is an example of a range test using expressions as the comparison value and the boundaries:

```
WHERE SALES * 1.5 FROM (DEALER_COST * 1.4) TO (DEALER_COST * 2.0)
```

# Range Test With NOT-FROM ... TO

The following illustrates how you can use the range test NOT-FROM ... TO to display only those records that fall outside of the specified range. In this example, it is all employees whose salaries do not fall in the range between $12,000 and $22,000.

```
TABLE FILE EMPLOYEE
PRINT CURR_SAL
BY LAST_NAME
WHERE CURR_SAL NOT-FROM 12000 TO 22000
END
```

The output is:

```
LAST_NAME              CURR_SAL
---------              --------
BANNING               $29,700.00
CROSS                 $27,062.00
GREENSPAN              $9,000.00
IRVING                $26,862.00
SMITH                  $9,500.00
STEVENS               $11,000.00
```

# Range Tests on Sort Fields With FROM ... TO

The following examples demonstrate how to perform range tests when sorting a field using the BY or ACROSS sort phrases:

```
BY MONTH FROM 4 TO 8
```

or

```
ACROSS MONTH FROM 6 TO 10
```

# Range Tests With GE and LE or GT and LT

The operators GE (greater than or equal to), LE (less than or equal to), GT (greater than), and LT (less than) can be used to specify a range.

GE ... LE enable you to specify values within the range test boundaries.

LT ...GT enable you to specify values outside the range test boundaries.

# Specify Range Tests (GE and LE)

To select values that fall within a range, use

```
WHERE fieldname GE lower AND fieldname LE upper
```

To find records whose values do not fall in a specified range, use

```
WHERE fieldname LT lower OR fieldname GT upper
```

where:

**fieldname**

Is any valid field name or alias.

**lower**

Are numeric or alphanumeric values or expressions that indicate lower boundaries. You may add parentheses around expressions for readability.

**upper**

Are numeric or alphanumeric values or expressions that indicate upper boundaries. You may add parentheses around expressions for readability.

# Selecting Values Inside a Range

This WHERE phrase selects records in which the UNIT value is between 10,000 and 14,000.

```
WHERE UNITS GE 10000 AND UNITS LE 14000
```

This example is equivalent to:

```
WHERE UNITS GE 10000
WHERE UNITS LE 14000
```

# Selecting Values Outside a Range

The following illustrates how you can select values that are outside a range of values using the LT and GT operators. In this example, only those employees whose salaries are less than $12,000 and greater than $22,000 are included in the output.

```
TABLE FILE EMPLOYEE
PRINT CURR_SAL
BY LAST_NAME
WHERE CURR_SAL LT 12000 OR CURR_SAL GT 22000
END
```

The output is:

```
LAST_NAME              CURR_SAL
---------              --------
BANNING              $29,700.00
CROSS                $27,062.00
GREENSPAN             $9,000.00
IRVING               $26,862.00
SMITH                 $9,500.00
STEVENS              $11,000.00
```

# Missing Data Tests

When creating report requests, you may want to test for missing data. This type of test is most useful when fields that have missing data also have the MISSING attribute set to ON in the Master File. For information on missing data, see Handling Records With Missing Field Values, and the *Describing Data With ibi™ WebFOCUS® Language* manual.

**Note:** If a test value to screen on an alphanumeric field is a variable and you want to look for missing instances, you must use _FOC_MISSING, instead of MISSING, as an alphanumeric literal value in a test must be in single quotation marks, and 'MISSING' is the literal value MISSING, not the MISSING value. The value _FOC_MISSING represents the MISSING value whether it is in single quotation marks or not.

# Test for Missing Data

```
{WHERE|IF} fieldname {EQ|IS} MISSING
```

where:

**fieldname**

Is any valid field name or alias.

**EQ|IS**

Are record selection operators. EQ and IS are synonyms.

# Test for Existing Data

```
{WHERE|IF} fieldname {NE|IS-NOT} MISSING
```

where:

**fieldname**

Is any valid field name or alias.

**NE|IS-NOT**

Are record selection operators. NE and IS-NOT are synonyms.

# Character String Screening With CONTAINS and OMITS

The CONTAINS and OMITS operators test alphanumeric fields when used with WHERE, and both alphanumeric and text fields when used with IF. With CONTAINS, if the characters in the given literal or literals appear anywhere within the characters of the field value, the test is passed.

OMITS is the opposite of CONTAINS; if the characters of the given literal or literals appear anywhere within the characters of the field's value, the test fails.

CONTAINS and OMITS tests are useful when you do not know the exact spelling of a value. As long as you know that a specific string appears within the value, you can retrieve the desired data.

## Selecting Records With CONTAINS and OMITS

The following examples illustrate several ways to use the CONTAINS and OMITS operators. The field name that is being tested must appear on the left side of the CONTAINS or OMITS operator.

- In this example, the characters JOHN are contained in JOHNSON, and are selected by the following phrase:

  ```
  WHERE LAST_NAME CONTAINS 'JOHN'
  ```

  The LAST_NAME field may contain the characters JOHN anywhere in the field.

- In this example, any last name without the string JOHN is selected:

  ```
  WHERE LAST_NAME OMITS 'JOHN'
  ```

- In this example, all names that contain the letters ING are retrieved.

```
TABLE FILE EMPLOYEE
LIST LAST_NAME AND FIRST_NAME
WHERE LAST_NAME CONTAINS 'ING'
END
```

The output is:

```
LIST  LAST_NAME        FIRST_NAME
----  ---------        ----------
   1  BANNING          JOHN
   2  IRVING           JOAN
```

# Screening on Masked Fields

A mask is an alphanumeric pattern that you supply for comparison to characters in a data field. The data field must have an alphanumeric format (A). You can use the LIKE and NOT LIKE or the IS and IS-NOT operators to perform screening on masked fields.

The wildcard characters for screening on masked fields with:

- LIKE and NOT LIKE operators are % and _. The percent allows any following sequence of zero or more characters. The underscore indicates that any character in that position is acceptable. The LIKE operator is supported in expressions that are used to derive temporary fields with either the DEFINE or COMPUTE command.
- IS (or EQ) and IS-NOT (or NE) operators are $ and $*. The dollar sign indicates that any character in that position is acceptable. The $* is shorthand for writing a sequence of dollar signs to fill the end of the mask without specifying a length. This combination can only be used at the end of the mask.

  In IF clauses and those WHERE clauses that can be translated into one or more IF clauses, you can treat the $ and $* characters as normal characters rather than wildcards by issuing the SET EQTEST=EXACT command.

**Note:** The IS (or EQ) and IS-NOT (or NE) operators support screening based on a mask for fixed length formats only. If the format is a variable length format, for example, A*n*V, use the LIKE or NOT LIKE operator to screen based on a mask.

# Screen Fields Based on a Mask (Using LIKE and NOT LIKE)

To search for records with the LIKE operator, use

```
WHERE field LIKE 'mask'
```

To reject records based on the mask value, use either

```
WHERE field NOT LIKE 'mask'
```

or

```
WHERE NOT field LIKE 'mask'
```

where:

**field**

Is any valid field name or alias.

**mask**

Is an alphanumeric or text character string you supply. There are two wildcard characters that you can use in the mask. The underscore (_) indicates that any character in that position is acceptable, and the percent sign (%) allows any following sequence of zero or more characters.

For related information, see Types of Record Selection Tests.

# Screen Using LIKE and UNLIKE in an IF Phrase

To search for records with the LIKE operator, use

```
IF field LIKE 'mask1' [OR 'mask2'...]
```

To reject records based on the mask value, use

```
IF field UNLIKE 'mask1' [OR 'mask2' ...]
```

where:

**field**

Is any valid field name or alias.

**mask1, mask2**

Are the alphanumeric patterns you want to use for comparison. The single quotation marks are required if the mask contains blanks. There are two wildcard characters that you can use in a mask. The underscore (_) indicates that any character in that position is acceptable, and the percent sign (%) allows any following sequence of zero or more characters. Every other character in the mask accepts only itself in that position as a match to the pattern.

# Screen Fields Based on a Mask (Using IS and IS-NOT)

To search for records with the IS operator, use

```
{WHERE|IF} field {IS|EQ} 'mask'
```

To reject records based on the mask value, use

```
{WHERE|IF} field {IS-NOT|NE} 'mask'
```

where:

**field**

Is any valid field name or alias.

**IS|IS-NOT**

Are record selection operators. EQ is a synonym for IS. NE is a synonym for IS-NOT.

**mask**

Is an alphanumeric or text character string you supply. The wildcard characters that you can use in the mask are the dollar sign ($) and the combination $*. The dollar sign indicates that any character in that position is acceptable. The $* combination allows any sequence of zero or more characters. The $* is shorthand for writing a sequence of dollar signs to fill the end of the mask without specifying a specific length. This combination can only be used at the end of the mask.

For related information, see Restrictions on Masking Characters.

# Restrictions on Masking Characters

- The wildcard characters dollar sign ($) and dollar sign with an asterisk ($*), which are used with IS operators, are treated as literals with LIKE operators.
- Masking with the characters $ and $* is not supported for compound WHERE phrases that use the AND or OR logical operators.

# Screening on Initial Characters

To list all employees who have taken basic-level courses, where every basic course begins with the word BASIC, issue the following request:

```
TABLE FILE EMPLOYEE
PRINT COURSE_NAME COURSE_CODE
BY LAST_NAME BY FIRST_NAME
WHERE COURSE_NAME LIKE 'BASIC%'
END
```

The output is:

| LAST_NAME | FIRST_NAME | COURSE_NAME | COURSE_CODE |
|---|---|---|---|
| BLACKWOOD | ROSEMARIE | BASIC REPORT PREP NON-PROG | 102 |
| CROSS | BARBARA | BASIC REPORT PREP DP MGRS | 107 |
| JONES | DIANE | BASIC REPORT PREP FOR PROG | 103 |
| SMITH | MARY | BASIC REPORT PREP FOR PROG | 103 |
| SMITH | RICHARD | BASIC RPT NON-DP MGRS | 108 |

# Screening on Characters Anywhere in a Field

If you want to see which employees have taken a FOCUS course, but you do not know where the word FOCUS appears in the title, bracket the word FOCUS with wildcards (which is equivalent to using the CONTAINS operator):

```
TABLE FILE EMPLOYEE
PRINT COURSE_NAME COURSE_CODE
BY LAST_NAME BY FIRST_NAME
WHERE COURSE_NAME LIKE '%FOCUS%'
END
```

The output is:

```
LAST_NAME        FIRST_NAME  COURSE_NAME                    COURSE_CODE
---------        ----------  -----------                    -----------
BLACKWOOD        ROSEMARIE   WHAT'S NEW IN FOCUS            202
JONES            DIANE       FOCUS INTERNALS                203
```

If you want to list all employees who have taken a 20x-series course, and you know that all of these courses have the same code except for the final character, issue the following request:

```
TABLE FILE EMPLOYEE
PRINT COURSE_NAME COURSE_CODE
BY LAST_NAME BY FIRST_NAME
WHERE COURSE_CODE LIKE '20_'
END
```

The output is:

```
LAST_NAME        FIRST_NAME  COURSE_NAME                    COURSE_CODE
---------        ----------  -----------                    -----------
BLACKWOOD        ROSEMARIE   WHAT'S NEW IN FOCUS            202
JONES            DIANE       FOCUS INTERNALS                203
                             ADVANCED TECHNIQUES            201
```

# Screening on Initial Characters and Specific Length

The following example illustrates how to screen on initial characters and specify the length of the field value you are searching for. In this example, the WHERE phrase states that the last name must begin with BAN and be seven characters in length (the three initial characters BAN and the four placeholders, in this case, the dollar sign). The remaining characters in the field (positions 8 through 15) must be blank.

```
TABLE FILE EMPLOYEE
PRINT LAST_NAME
WHERE LAST_NAME IS 'BAN$$$$'
END
```

The output is:

```
LAST_NAME
---------
BANNING
```

# Screening on Records of Unspecified Length

To retrieve records with unspecified lengths, use the dollar sign followed by an asterisk ($*):

```
WHERE LAST_NAME IS 'BAN$*'
```

This phrase searches for last names that start with the letters BAN, regardless of the name length. The characters $* reduce typing, and enable you to define a screen mask without knowing the exact length of the field you wish to retrieve.

# Deactivate Wildcard Characters

```
SET EQTEST = {WILDCARD|EXACT}
```

where:

**WILDCARD**

Treats the $ and $* characters as wildcard characters. WILDCARD is the default value.

**EXACT**

Treats the $ and $* characters as normal characters, not wildcards, in IF tests and in WHERE tests that can be translated to IF tests.

# Selecting Records With SET EQTEST

The following request against the VIDEOTR2 data source creates two similar email addresses:

- handy$man@usa.com, which has a dollar sign.
- handyiman@usa.com, which has the letter i in the same position as the $ character in the other email address.

```
DEFINE FILE VIDEOTR2
SMAIL/A18= IF EMAIL EQ 'handyman@usa.com'
           THEN 'handyiman@usa.com'
           ELSE EMAIL;
SMAIL/A18 = STRREP(18,SMAIL,1,'_',1,'$',18,SMAIL);
END
TABLE FILE VIDEOTR2
PRINT SMAIL
BY LASTNAME BY FIRSTNAME
WHERE SMAIL EQ 'handy$man@usa.com'
ON TABLE SET EQTEST WILDCARD
END
```

With SET EQTEST=WILDCARD (the default), the WHERE test **WHERE SMAIL IS 'handy$man@usa.com'** returns both the record with the $ in the address and the record with the letter i in the address because the $ is treated as a wildcard character, and any character in that position causes the record to pass the screening test:

```
LASTNAME         FIRSTNAME   SMAIL
--------         ---------   -----
HANDLER          EVAN        handy$man@usa.com
                             handyiman@usa.com
```

Changing the ON TABLE SET command to ON TABLE SET EQTEST EXACT returns just the ONE email address with the $ character because the dollar sign is now treated as a normal character and only passes the test if there is an exact match:

```
LASTNAME        FIRSTNAME   SMAIL
--------        ---------   -----
HANDLER         EVAN        handy$man@usa.com
```

# Using an Escape Character for LIKE

You can use an escape character in the LIKE syntax to treat the masking characters (% and _) as literals within the search pattern, rather than as wildcards. This technique enables you to search for these characters in the data. For related information, see Types of Record Selection Tests.

# Use an Escape Character in a WHERE Phrase

Any single character can be used as an escape character, if prefaced with the word ESCAPE

```
WHERE fieldname LIKE 'mask' ESCAPE 'c'
```

where:

**fieldname**

Is any valid field name or alias to be evaluated in the selection test.

**mask**

Is the search pattern that you supply. The single quotation marks are required.

**c**

Is any single character that you identify as the escape character. If you embed the escape character in the mask, before a % or _, the % or _ character is treated as a literal, rather than as a wildcard. The single quotation marks are required.

# Specify an Escape Character for a Mask in an IF Phrase

You can assign any single character as an escape character by prefacing it with the word ESCAPE in the LIKE or UNLIKE syntax

```
IF field {LIKE|UNLIKE} 'mask1' ESCAPE 'a' [OR 'mask2' ESCAPE 'b' ...
```

where:

**field**

Is any valid field name or alias to be evaluated in the selection test.

**mask1, mask2**

Are search patterns that you supply. The single quotation marks are required.

**a, b ...**

Are single characters that you identify as escape characters. Each mask can specify its own escape character or use the same character as other masks. If you embed the escape character in the mask, before a % or _, the % or _ character is treated as a literal, rather than as a wildcard. The single quotation marks are required if the mask contains blanks.

# Usage Notes for Escape Characters

- The use of an escape character in front of any character other than %, _, and itself is ignored.
- The escape character itself can be escaped, thus becoming a normal character in a string (for example, '*abc*\%\\').
- Only one escape character can be used per LIKE phrase in a WHERE phrase.
- The escape character is only in effect when the ESCAPE syntax is included in the LIKE phrase.
- Every LIKE phrase can provide its own escape character.

- If a WHERE criterion is used with literal OR phrases, the ESCAPE must be on the first OR phrase, and applies to all subsequent phrases in that WHERE expression. For example:

```
WHERE field LIKE 'ABCg_' ESCAPE 'g' OR 'ABCg%' OR 'g%ABC'
```

# Using the Escape Character in a WHERE Phrase

The VIDEOTR2 data source contains an email address field. To search for the email address with the characters 'handy_' you can issue the following request:

```
TABLE FILE VIDEOTR2
PRINT CUSTID LASTNAME FIRSTNAME EMAIL
WHERE EMAIL LIKE 'handy_%'
END
```

Because the underscore character functions as a wildcard character, this request returns two instances, only one of which contains the underscore character.

The output is:

```
CUSTID  LASTNAME         FIRSTNAME   EMAIL
------  --------         ---------   -----
0944    HANDLER          EVAN        handy_man@usa.com
0944    HANDLER          EVAN        handyman@usa.com
```

To retrieve only the instance that contains the underscore character, you must indicate that the underscore should be treated as a normal character, not a wildcard. The following request retrieves only the instance with the underscore character in the email field:

```
TABLE FILE VIDEOTR2
PRINT CUSTID LASTNAME FIRSTNAME EMAIL
WHERE EMAIL LIKE 'handy\_%' ESCAPE '\'
END
```

The output is:

```
CUSTID  LASTNAME         FIRSTNAME   EMAIL
------  --------         ---------   -----
0944    HANDLER          EVAN        handy_man@usa.com
```

# Using an Escape Character in an IF Phrase

The VIDEOTR2 data source contains an email address field. To search for email addresses with the characters 'handy_' you can issue the following request:

```
TABLE FILE VIDEOTR2
PRINT CUSTID LASTNAME FIRSTNAME EMAI
IF EMAIL LIKE 'handy_%'
END
```

Because the underscore character functions as a wildcard character, this request returns two instances, only one of which contains the underscore character.

The output is:

```
CUSTID  LASTNAME         FIRSTNAME   EMAIL
------  --------         ---------   -----
0944    HANDLER          EVAN        handy_man@usa.com
0944    HANDLER          EVAN        handyman@usa.com
```

To retrieve only the instance that contains the underscore character, you must indicate that the underscore should be treated as a normal character, not a wildcard. The following request retrieves only the instance with the underscore character in the email field:

```
TABLE FILE VIDEOTR2
PRINT CUSTID LASTNAME FIRSTNAME EMAI
IF EMAIL LIKE 'handy\_%' ESCAPE '\'
END
```

The output is:

```
CUSTID  LASTNAME         FIRSTNAME   EMAIL
------  --------         ---------   -----
0944    HANDLER          EVAN        handy_man@usa.com
```

# Qualifying Parent Segments Using INCLUDES and EXCLUDES

You can test whether instances of a given field in a child segment include or exclude all literals in a list using the INCLUDES and EXCLUDES operators. INCLUDES and EXCLUDES retrieve only parent records. You cannot print or list any field in the same segment as the field specified for the INCLUDES or EXCLUDES test.

**Note:** INCLUDES and EXCLUDES work only with multi-segment FOCUS data sources.

# Usage Notes for INCLUDES and EXCLUDES

- Literals containing embedded blanks must be enclosed in single quotation marks.
- The total number of literals must be 31 or less.
- To use more than one INCLUDES or EXCLUDES phrase in a request, begin each phrase on a separate line.
- You can connect the literals you are testing for with ANDs and ORs; however, the ORs are changed to ANDs.

# Selecting Records With INCLUDES and EXCLUDES

A request that contains the phrase

```
WHERE JOBCODE INCLUDES A01 OR B01
```

returns employee records with JOBCODE instances for both A01 and B01, as if you had used AND.

In the following example, for a record to be selected, its JOBCODE field must have values of both A01 and B01:

```
WHERE JOBCODE INCLUDES A01 AND B01
```

If either one is missing, the record is not selected for the report.

If the selection criterion is

```
WHERE JOBCODE EXCLUDES A01 AND B01
```

every record that does not have both values is selected for the report.

In the CAR data source, only England produces Jaguars and Jensens, and so the request

```
TABLE FILE CAR
PRINT COUNTRY
WHERE CAR INCLUDES JAGUAR AND JENSEN
END
```

generates this output:

```
COUNTRY
-------
ENGLAND
```

# Selections Based on Group Key Values

Some data sources use group keys. A group key is a single key composed of several fields. You can use a group name to refer to group key fields.

To select records based on a group key value, you need to supply the value of each field. The values must be separated by the slash character (/).

Note that a WHERE phrase that refers to a group field cannot be used in conjunction with AND or OR. For related information, see Using Compound Expressions for Record Selection.

# Selecting Records Using Group Keys

Suppose that a data source has a group key named PRODNO, which contains three separate fields. The first is stored in alphanumeric format, the second as a packed decimal, and the third as an integer. A screening phrase on this group might be:

```
WHERE PRODNO EQ 'RS/62/83'
```

# Setting Limits on the Number of Records Read

For some reports, a limited number of records is satisfactory. When the specified number of records is retrieved, record retrieval can stop. This is useful when:

- You are designing a new report, and you need only a few records from the actual data source to test your design.
- The database administrator needs to limit the size of reports by placing an upper limit on retrieval from very large data sources. This limit is attached to the user password.
- You know the number of records that meet the test criteria. You can specify that number so that the search does not continue beyond the last record that meets the criteria. For example, suppose only ten employees use electronic transfer of funds, and you want to retrieve only those records. The record limit would be ten, and retrieval would stop when the tenth record is retrieved. The data source would not be searched any further.

# Limit the Number of Records Read

There are two ways to limit the number of records retrieved. You can use

```
WHERE RECORDLIMIT EQ n
```

where:

**n**

Is a number greater than 0, and indicates the number of records to be retrieved. This syntax can be used with FOCUS and non-FOCUS data sources.

For all non-FOCUS data sources, you can also use

```
WHERE READLIMIT EQ n
```

where:

**n**

Is a number greater than 0, and indicates the number of read operations (not records) to be performed. For details, see the appropriate data adapter manual.

**Tip:** If an attempt is made to apply the READLIMIT test to a FOCUS data source, the request is processed correctly, but the READLIMIT phrase is ignored.

**Note:** Using SET RECORDLIMIT disables AUTOINDEX.

# Limiting the Number of Records Read

The following request retrieves four records, generating a four-line report:

```
TABLE FILE EMPLOYEE
PRINT LAST_NAME AND FIRST_NAME AND EMP_ID
WHERE RECORDLIMIT EQ 4
END
```

The output is:

```
LAST_NAME        FIRST_NAME  EMP_ID
---------        ----------  ------
STEVENS          ALFRED      071382660
SMITH            MARY        112847612
JONES            DIANE       117593129
SMITH            RICHARD     119265415
```

# Selecting Records Using IF Phrases

The IF phrase selects records to be included in a report, and offers a subset of the functionality of WHERE. For a list of supported IF operators, see Using Operators in Record Selection Tests.

**Tip:** Unless you specifically require IF syntax (for example, to support legacy applications), we recommend using WHERE.

# Select Records Using the IF Phrase

```
IF fieldname operator literal [OR literal]
```

where:

**fieldname**

Is the field you want to test (the test value).

**operator**

Is the type of selection operator you want. Valid operators are described in Using Operators in Record Selection Tests.

**literal**

Can be the MISSING keyword (as described in Types of Record Selection Tests) or alphanumeric or numeric values that are in your data source, with the word OR between values.

Note that all literals that contain blanks (for example, New York City) and all date and date-time literals must be enclosed within single quotation marks.

**Note:** The IF phrase alone cannot be used to create compound expressions by connecting simple expressions with AND and OR logical operators. Compound logic requires that the IF phrase be used with the DEFINE command, as described in Using Expressions. You can accomplish this more easily with WHERE. See Using Compound Expressions for Record Selection.

# Using Multiple IF Phrases

You can use as many IF phrases as necessary to define all your selection criteria, as illustrated in the following example:

```
TABLE FILE EMPLOYEE
PRINT EMP_ID LAST_NAME
IF SALARY GT 20000
IF DEPARTMENT IS MIS
IF LAST_NAME IS CROSS OR BANNING
END
```

All of these criteria must be satisfied in order for a record to be included in a report. The output is:

```
EMP_ID     LAST_NAME
------     ---------
818692173  CROSS
```

# Reading Selection Values From a File

Instead of typing literal test values in a WHERE or IF phrase, you can store them in a file and refer to the file in the report request. You can then select records based on equality or inequality tests on values stored in the file.

This method has the following advantages:

- You can save time by coding a large set of selection values once, then using these values as a set in as many report requests as you wish. You also ensure consistency by maintaining the criteria in just one location.
- If the selection values already exist in a data source, you can quickly create a file of selection values by generating a report and saving the output in a HOLD or SAVE file. You can then read selection values from that file.

  Values from a HOLD file (with a data description) can be in either BINARY format (the default) or ALPHA (simple character) format. If you use a SAVE file, it must be in ALPHA format (the default). Using a SAVB file is only valid for alphanumeric values. For information on HOLD and SAVE files, see Saving and Reusing Your Report Output.

  Note that in z/OS, a HOLD file in BINARY format that is used for selection values must be allocated to ddname HOLD (the default). The other extract files used for this purpose can be allocated to any ddname.
- You can include entries with mixed-case and special characters.

# Read Selection Values From a File: WHERE field IN file

```
WHERE [NOT] fieldname IN FILE file
```

where:

**fieldname**

Is the name of the selection field. It can be any real or temporary field in the data source.

**file**

Is the name of the file.

Two-part names (app/file) are not supported. The file name is the ddname assigned by a DYNAM or TSO ALLOCATE command for z/OS, or a FILEDEF command for other environments.

For related information, see Reading Selection Values From a File.

# Read Selection Values From a File: WHERE field operator (file)

```
WHERE field1 operator1 (file1) [{OR|AND} field2 operator2 (file2) ... ]
```

where:

**field1, field2**

Are any valid field names or aliases.

**operator1, operator2**

Can be the EQ, IS, NE, or IS-NOT operator.

**file1, file1**

Are the names of the files.

Two-part names (app/file) are not supported. The file name is the ddname assigned by a DYNAM or TSO ALLOCATE command for z/OS, or a FILEDEF command for other environments.

# Read Selection Values From a File: IF

```
IF fieldname operator (file) [OR (file) ... ]
```

where:

**fieldname**

Is any valid field name or alias.

**operator**

Is the EQ, IS, NE, or IS-NOT operator (see Using Operators in Record Selection Tests).

**file**

Is the name of the file.

Two-part names (app/file) are not supported. The file name is the ddname assigned by a DYNAM or TSO ALLOCATE command for z/OS, or a FILEDEF command for other environments.

# Usage Notes for Reading Values From a File

In order to read selection criteria from a file, the file must comply with the following rules:

- Each value in the file must be on a separate line.

  For IF, more information can appear on a line, but only the first data value encountered on the line is used.

- The selection value must start in column one.
- The values are assumed to be in character format, unless the file name is HOLD, and numeric digits are converted to internal computational numbers where needed (for example, binary integer).
- The maximum number of values is 32,767.
- For WHERE, alphanumeric values with embedded blanks or any mathematical operator (-, +, *, /) must be enclosed in single quotation marks.
- For WHERE, when a compound WHERE phrase uses IN FILE more than once, the

specified files must have the same record formats.

If your list of literals is too large, an error is displayed.

- For IF, sets of file names may be used, separated by the word OR, and with WHERE, AND. The file names cannot be prefaced with app names. Actual literals may also be mixed with the file names. For example:

```
IF fieldname operator (filename) OR literal...etc...
```

# Reading Selection Values From a File (WHERE field IN file)

Create a file named EXPER, which contains the values B141 and B142.

This request uses selection criteria from the file EXPER. You must allocate or FILEDEF the EXPER file prior to running the request. For example, if the file is named exper.ftm and it is in the baseapp application, you can issue the following FILEDEF command:

```
FILEDEF EXPER DISK baseapp/exper.ftm
```

All records for which PRODUCT_ID has a value of B141 or B142 are selected:

```
TABLE FILE GGPRODS
SUM UNIT_PRICE
BY PRODUCT_DESCRIPTION
WHERE PRODUCT_ID IN FILE EXPER
END
```

If you include the selection criteria directly in the request, the WHERE phrase specifies the values explicitly:

```
WHERE PRODUCT_DESCRIPTION EQ 'B141' or 'B142'
```

The output is:

```
                    Unit
Product             Price
```

```
-------              -----
French Roast         81.00
Hazelnut             58.00
```

# Reading Selection Values From a File With WHERE field operator (file)

The following request against the GGPRODS data source creates a HOLD file named EXPER1 that contains product IDs B141, B142, B143, and B144.

```
TABLE FILE GGPRODS
BY PRODUCT_ID BY PRODUCT_DESCRIPTION
WHERE PRODUCT_ID EQ 'B141' OR 'B142' OR 'B143' OR 'B144'
ON TABLE HOLD AS EXPER1 FORMAT ALPHA
END
```

The following request against the GGPRODS data source creates a HOLD file named EXPER2 that contains product IDs B144, F101, and F102.

```
TABLE FILE GGPRODS
BY PRODUCT_ID BY PRODUCT_DESCRIPTION
WHERE PRODUCT_ID EQ 'B144' OR 'F101' OR 'F102'
ON TABLE HOLD AS EXPER2 FORMAT ALPHA
END
```

The following request selects the values that exist in both EXPER1 AND EXPER2.

```
TABLE FILE GGPRODS
SUM PRODUCT_DESCRIPTION
BY PRODUCT_ID
WHERE PRODUCT_ID EQ (EXPER1) AND PRODUCT_ID IS (EXPER2)
ON TABLE SET PAGE NOPAGE
END
```

The output is:

```
Product
Code     Product
```

```
-------  -------
B144     Kona
```

# Reading Selection Values From a File (IF)

Create a file named EXPER, which contains the values B141 and B142.

This request uses selection criteria from the file EXPER. All records for which PRODUCT_ID has a value of B141 or B142 are selected:

```
TABLE FILE GGPRODS
SUM UNIT_PRICE
BY PRODUCT_DESCRIPTION
IF PRODUCT_ID IS (EXPER)
END
```

If you include the selection criteria directly in the request, the IF phrase specifies the values explicitly:

```
IF PRODUCT_DESCRIPTION EQ 'B141' or 'B142'
```

The output is:

```
                    Unit
Product             Price
-------             -----
French Roast        81.00
Hazelnut            58.00
```

# Assigning Screening Conditions to a File

You can assign screening conditions to a data source, independent of a request, and activate these screening conditions for use in report requests against the data source.

A filter is a packet of definitions that resides at the file level, containing WHERE and/or IF criteria. Whenever a report request is issued against a data source, all filters that have been activated for that data source are in effect. WHERE or IF syntax that is valid in a report request is also valid in a filter.

A filter can be declared at any time before the report request is run. The filters are available to subsequent requests during the session in which the filters have been run. For details, see Declare a Filter.

Filters allow you to:

- Declare a common set of screening conditions that apply each time you retrieve data from a data source. You can declare one or more filters for a data source.
- Declare a set of screening conditions and dynamically turn them on and off.
- Limit access to data without specifying rules in the Master File.

In an interactive environment, filters also reduce repetitive ad hoc typing.

**Note:** Simply declaring a filter for a data source does *not* make it active. A filter must be activated with a SET command. For details, see Activate or Deactivate Filters.

# Declare a Filter

A filter can be described by the following declaration

```
FILTER FILE filename [CLEAR|ADD]
   [filter-defines;]
   NAME=filtername1 [,DESC=text]
   where-if phrases    .
   .
   .
   NAME=filternamen [,DESC=text]
   where-if phrases END
```

where:

**filename**

Is the name of the Master File to which the filters apply.

**CLEAR**

Deletes any existing filter phrases, including any previously defined virtual fields.

**ADD**

Enables you to add new filter phrases to an existing filter declaration without clearing previously defined filters.

**filter-defines**

Are virtual fields declared for use in filters. For more information, see Usage Notes for Virtual Fields Used in Filters.

**filtername1...filternamen**

Is the name by which the filter is referenced in subsequent SET FILTER commands. This name may be up to 66 characters long and must be unique for a particular file name.

**text**

Describes the filter for documentation purposes. Text must fit on one line.

**where-if phrases**

Are screening conditions that can include all valid syntax. They may refer to data source fields and virtual fields in the Master File. They may not refer to virtual fields declared using a DEFINE command, or to other filter names.

# Usage Notes for Virtual Fields Used in Filters

Virtual fields used in filters:

- Are exclusively local to (or usable by) filters in a specific filter declaration.
- Cannot be referenced in a DEFINE or TABLE command.
- Support any syntax valid for virtual fields in a DEFINE command.
- Cannot reference virtual fields in a DEFINE command, but can reference virtual fields in the Master File.
- Do not count toward the display field limit, unlike virtual fields in DEFINE commands.
- Must all be declared before the first named filter.
- Must each end with a semi-colon.
- Cannot be enclosed between the DEFINE FILE and END commands.
- Cannot reuse a virtual field name for a the same file.

# Declaring Filters

The first example creates the filter named UK, which consists of one WHERE condition. It also adds a definition for the virtual field MARK_UP to the set of virtual fields already being used in filters for the CAR data source.

When a report request is issued for CAR, with UK activated, the condition WHERE MARK_UP is greater than 1000 is automatically added to the request.

**Note:** The virtual field MARK_UP cannot be explicitly displayed or referenced in the TABLE request.

```
FILTER FILE CAR ADD
MARK_UP/D7=RCOST-DCOST;
NAME=UK
WHERE MARK_UP GT 1000
END
```

The second example declares three named filters for the CAR data source: ASIA, UK, and LUXURY. The filter ASIA contains a textual description, for documentation purposes only. CLEAR, on the first line, erases any previously existing filters for CAR, as well any previously defined virtual fields used in filters for CAR, before it processes the new definitions.

```
FILTER FILE CAR CLEAR
NAME=ASIA,DESC=Asian cars only
IF COUNTRY EQ JAPAN
NAME=UK
IF COUNTRY EQ ENGLAND
NAME=LUXURY
IF RETAIL_COST GT 50000
END
```

# Activate or Deactivate Filters

Filters can be activated and deactivated with the command

```
SET FILTER= {*|xx[yy zz]} IN {file|*} {ON|OFF}
```

where:

*****

Denotes all declared filters. This is the default value.

**xx, yy, zz**

Are the names of filters as declared in the NAME = syntax of the FILTER FILE command.

**file**

Is the name of the data source to which you are assigning screening conditions. * denotes all data sources.

**ON**

Activates all (*) or specifically named filters for the data source or all data sources (*). The maximum number of filters you can activate for a data source is limited by the number of WHERE/IF phrases that the filters contain, not to exceed the limit of WHERE/IF criteria in any single report request.

**OFF**

Deactivates all (*) or specifically named filters for the data source or all data sources (*). OFF is the default value.

**Note:** The SET FILTER command is limited to one line. To activate more filters than fit on one line, issue additional SET FILTER commands. As long as you specify ON, the effect is cumulative.

# Activating and Deactivating Filters

The following commands activate A, B, C, D, E, F, and deactivate G (assuming that it was set ON, previously):

```
SET FILTER = A B C IN CAR ON
SET FILTER = D E F IN CAR ON
SET FILTER = G IN CAR OFF
```

The following commands activate some filters and deactivate others:

```
SET FILTER = UK LUXURY IN CAR ON
...
TABLE FILE CAR
```

```
PRINT COUNTRY MODEL RETAIL_COST
END
...
SET FILTER = LUXURY IN CAR OFF
TABLE FILE CAR
PRINT COUNTRY MODEL RETAIL_COST
END
```

The first SET FILTER command activates the filters UK and LUXURY, assigned to the CAR data source, and applies their screening conditions to any subsequent report request against the CAR data source.

The second SET FILTER command deactivates the filter LUXURY for the CAR data source. Unless LUXURY is reactivated, any subsequent report request against CAR will not apply the conditions in LUXURY, but will continue to apply UK.

# Query the Status of Filters

To determine the status of existing filters, use

```
? FILTER [{file|*}] [SET] [ALL]]
```

where:

**file**

Is the name of a Master File.

*****

Displays filters for all Master Files for which filters have been declared.

**SET**

Displays only active filters.

**ALL**

Displays all information about the filter, including its description and the exact WHERE/IF definition.

# Querying Filters

To query filters, issue the following command:

```
FILTER FILE CAR CLEAR
NAME=BOTH, DESC=Asian and British cars only
IF COUNTRY EQ JAPAN AND ENGLAND
END
SET FILTER =BOTH IN CAR ON
TABLE FILE CAR
PRINT CAR RETAIL_COST
BY COUNTRY
END
```

The output is:

```
COUNTRY     CAR               RETAIL_COST
-------     ---               -----------
ENGLAND     JAGUAR                  8,878
            JAGUAR                 13,491
            JENSEN                 17,850
            TRIUMPH                 5,100
JAPAN       DATSUN                  3,139
            TOYOTA                  3,339
```

The following example queries filters for all data sources:

```
? FILTER
```

If no filters are defined, the following message displays:

```
NO FILTERS DEFINED
```

If filters are defined, the following screen displays:

```
Set File     Filter name Description
--- -------- ----------- -----------------------------------
    CAR      ROB         Rob's selections
*   CAR      PETER       Peter's selections for CAR
```

```
*   EMPLOYEE DAVE        Dave's tests
    EMPLOYEE BRAD        Brad's tests
```

To query filters for the CAR data source, issue:

```
? FILTER CAR
```

If no filters are defined for the CAR data source, the following message displays:

```
NO FILTERS DEFINED FOR FILE NAMED CAR
```

If filters are defined for the CAR data source, the following screen displays:

```
Set File     Filter name Description
--- -------- ----------- ----------------------------------
    CAR      ROB         Rob's selections
*   CAR      PETER       Peter's selections for CAR
```

To see all active filters, issue the following command:

```
? FILTER * SET
```

The output is:

```
Set File     Filter name Description
--- -------- ----------- ----------------------------------
*   CAR      PETER       Peter's selections for CAR
*   EMPLOYEE DAVE        Dave's tests
```

The asterisk in the first column indicates that a filter is activated.

# Preserving Filters Across Joins

By default, filters defined on the host data source are cleared by a JOIN command. However, filters can be maintained when a JOIN command is issued, by issuing the SET KEEPFILTERS=ON command.

Setting KEEPFILTERS to ON reinstates filter definitions and their individual declared status after a JOIN command. The set of filters and virtual fields defined prior to each join is

called a context (see your documentation on SET KEEPDEFINES and on DEFINE FILE SAVE for information about contexts as they relate to virtual fields). Each new JOIN or DEFINE FILE command creates a new context.

If a new filter is defined after a JOIN command, it cannot have the same name as any previously defined filter unless you issue the FILTER FILE command with the CLEAR option. The CLEAR option clears all filter definitions for that data source in all contexts.

When a JOIN is cleared, each filter definition that was in effect prior to the JOIN command and that was not cleared, is reinstated with its original status. Clearing a join by issuing the JOIN CLEAR join_name command removes all of the contexts and filter definitions that were created after the JOIN join_name command was issued.

**Note:** When an error occurs because of a reference to field that does not exist in the original FILTER FILE, the filter is disabled even though KEEPFILTERs is set to ON.

# Preserve Filter Definitions With KEEPFILTERS

```
SET KEEPFILTERS = {OFF|ON}
```

where:

**OFF**

Does not preserve filters issued prior to a join. OFF is the default value.

**ON**

Preserves filters across joins.

# Preserving Filters With KEEPFILTERS

The first filter, UNITPR, is defined prior to issuing any joins, but after setting KEEPFILTERS to ON:

```
SET KEEPFILTERS = ON
FILTER FILE VIDEOTRK
PERUNIT/F5 = TRANSTOT/QUANTITY;
NAME=UNITPR
```

```
WHERE PERUNIT GT 2
WHERE LASTNAME LE 'CRUZ'
END
```

The ? FILTER command shows that the filter named UNITPR was created but not activated (activation is indicated by an asterisk in the SET column of the display:

```
? FILTER

SET FILE     FILTER NAME DESCRIPTION
--- -------- ----------- ---------------------------------
    VIDEOTRK UNITPR
```

Next, the filter is activated:

```
SET FILTER= UNITPR IN VIDEOTRK ON
```

The ? FILTER query shows that the filter is now activated:

```
? FILTER

SET FILE     FILTER NAME DESCRIPTION
--- -------- ----------- ---------------------------------
*   VIDEOTRK UNITPR
```

The following TABLE request is issued against the filtered data source:

```
TABLE FILE VIDEOTRK
SUM QUANTITY TRANSTOT BY LASTNAME
END
```

The output shows that the TABLE request retrieved only the data that satisfies the UNITPR filter:

```
NUMBER OF RECORDS IN TABLE=        6  LINES=      3
ACCESS LIMITED BY FILTERS

PAUSE.. PLEASE ISSUE CARRIAGE RETURN WHEN READY

LASTNAME         QUANTITY  TRANSTOT
--------         --------  --------
```

```
CHANG                    3     31.00
COLE                     2     18.98
CRUZ                     2     16.00
```

Now, the VIDEOTRK data source is joined to the MOVIES data source. The ? FILTER query shows that the join did not clear the UNITPR filter:

```
JOIN MOVIECODE IN VIDEOTRK TO ALL MOVIECODE IN MOVIES AS J1
```

The ? FILTER command shows that the UNITPR filter still exists and is still activated:

```
? FILTER

SET FILE     FILTER NAME DESCRIPTION
--- -------- ----------- --------------------------------
*   VIDEOTRK UNITPR
```

Next a new filter, YEARS1, is created and activated for the join between VIDEOTRK and MOVIES:

```
FILTER FILE VIDEOTRK
YEARS/I5 = (EXPDATE - TRANSDATE)/365;
NAME=YEARS1
WHERE YEARS GT 1
END
SET FILTER= YEARS1 IN VIDEOTRK ON
```

The ? FILTER query shows that both the UNITPR and YEARS1 filters exist and are activated:

```
? FILTER

SET FILE     FILTER NAME DESCRIPTION
--- -------- ----------- --------------------------------
*   VIDEOTRK UNITPR
*   VIDEOTRK YEARS1
```

Now, J1 is cleared. The output of the ? FILTER command shows that the YEARS1 filter that was created after the JOIN command was issued no longer exists. The UNITPR filter created prior to the JOIN command still exists with its original status:

```
JOIN CLEAR J1
? FILTER

SET FILE     FILTER NAME DESCRIPTION
--- -------- ----------- --------------------------------
*   VIDEOTRK UNITPR
```

# VSAM Record Selection Efficiencies

The most efficient way to retrieve selected records from a VSAM KSDS data source is by applying an IF screening test against the primary key. This results in a direct reading of the data using the data source's index. Only those records that you request are retrieved from the file. The alternative method of retrieval, the sequential read, forces the data adapter to retrieve all the records into storage.

Selection criteria that are based on the entire primary key, or on a subset of the primary key, cause direct reads using the index. A partial key is any contiguous part of the primary key beginning with the first byte.

IF selection tests performed against virtual fields can take advantage of these efficiencies as well, if the full or partial key is embedded in the virtual field.

The EQ and IS relations realize the greatest performance improvement over sequential reads. When testing on a partial key, equality logic is used to retrieve only the first segment instance of the screening value. To retrieve subsequent instances, NEXT logic is used.

Screening relations GE, FROM, FROM-TO, GT, EXCEEDS, IS-MORE-THAN, and NOT-FROM-TO all obtain some benefit from direct reads. The following example uses the index to find the record containing primary key value 66:

```
IF keyfield GE 66
```

It then continues to retrieve records by sequential processing, because VSAM stores records in ascending key sequence. The direct read is not attempted when the IF screening conditions NE, IS-NOT, CONTAINS, OMITS, LT, IS-LESS-THAN, LE, and NOT-FROM are used in the report request.

# Reporting From Files With Alternate Indexes

Similar performance improvement is available for ESDS and KSDS files that use alternate indexes. An alternate index provides access to records in a key sequenced data set based on a key other than the primary key.

All benefits and limitations inherent with screening on the primary or partial key are applicable to screening on the alternate index or partial alternate index.

**Note:** It is not necessary to take an explicit indexed view to use the index.

# Creating Temporary Fields

When you create a report, you are not restricted to the fields that exist in your data source. If you can generate the information you want from the existing data, you can create a temporary field to evaluate and display it. A temporary field takes up no storage space in the data source. It is created only when needed.

# What Is a Temporary Field?

A temporary field is a field whose value is not stored in the data source, but can be calculated from the data that is there, or assigned an absolute value. A temporary field takes up no storage space in the data source, and is created only when needed.

When you create a temporary field, you determine its value by writing an expression. You can combine fields, constants, and operators in an expression to produce a single value. For example, if your data contains salary and deduction amounts, you can calculate the ratio of deductions to salaries using the following expression:

```
deduction / salary
```

You can specify the expression yourself, or you can use one of the many supplied functions that perform specific calculations or manipulations. In addition, you can use expressions and functions as building blocks for more complex expressions, as well as use one temporary field to evaluate another.

# Types of Temporary Fields

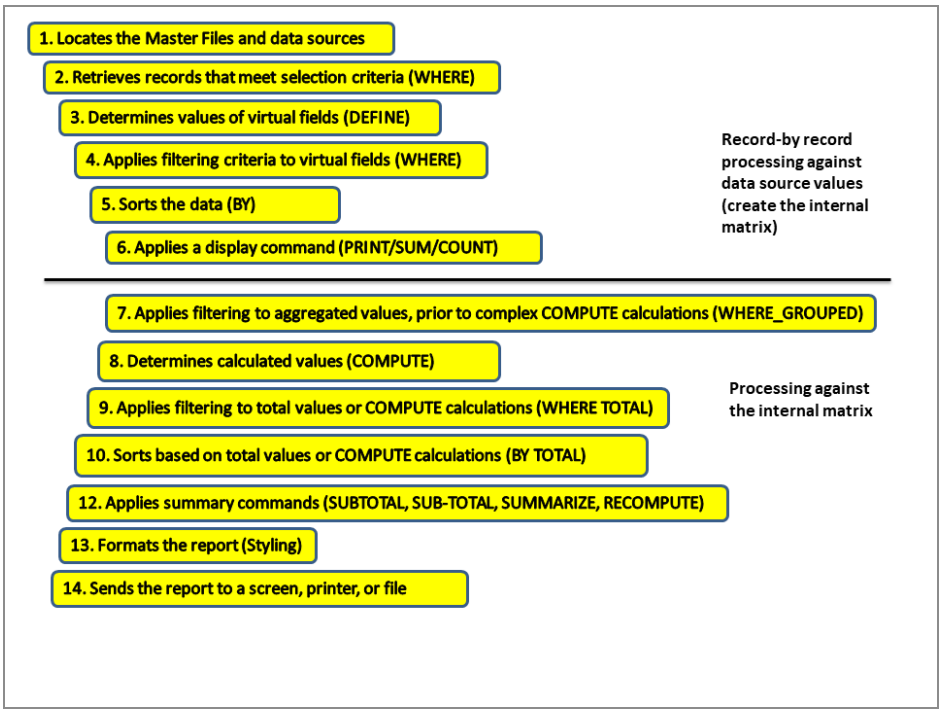
You can use two types of temporary fields (a *virtual field* and a *calculated value*), which differ in how they are evaluated:

A virtual field (DEFINE) is evaluated as each record that meets the selection criteria is retrieved from the data source. The result of the expression is treated as though it were a real field stored in the data source.

A calculated value (COMPUTE) is evaluated after all the data that meets the selection criteria is retrieved, sorted, and summed. Therefore, the calculation is performed using the aggregated values of the fields.

# Evaluation of Temporary Fields

The following illustration shows how a request processes, and when each type of temporary field is evaluated:




# Distinguishing Between Virtual Fields and Calculated Values

In the following example, both the DRATIO field (virtual field) and the CRATIO (calculated value) use the same expression DELIVER_AMT/OPENING_AMT, but do not return the same result. The value for CRATIO is calculated after all records have been selected, sorted, and aggregated. The virtual field DRATIO is calculated for each retrieved record.

```
DEFINE FILE SALES
DRATIO = DELIVER_AMT/OPENING_AMT;
END
TABLE FILE SALES
SUM DELIVER_AMT AND OPENING_AMT AND DRATIO
COMPUTE CRATIO = DELIVER_AMT/OPENING_AMT;
END
```

The output is:

| DELIVER_AMT | OPENING_AMT | DRATIO | CRATIO |
|---|---|---|---|
| 760 | 724 | 28.41 | 1.05 |

# Selecting a Temporary Field

The following is to help you choose the kind of temporary field you need.

**Choose a virtual field** when you want to:

- Use the temporary field to select data for your report. You cannot use a calculated value, since it is evaluated after data selection takes place.
- Use the temporary field to sort on data values. A calculated value is evaluated after the data is sorted. With the BY TOTAL phrase, you can sort on this type of field.

**Choose a calculated value** when you want to:

- Evaluate the temporary field using total values or prefix operators (which operate on total values). You cannot use a virtual field, since it is evaluated before any totaling takes place.
- Evaluate the temporary field using fields from different paths in the data structure. You cannot use a virtual field, since it is evaluated before the relationship between data in the different paths is established.

# Defining a Virtual Field

A virtual field can be used in a request as though it is a real data source field. The calculation that determines the value of a virtual field is performed on each retrieved

record that passes any screening conditions on real fields. The result of the expression is treated as though it were a real field stored in the data source.

You can define a virtual field in the following ways:

- **In a Master File.** These virtual fields are available whenever the data source is used for reporting. These fields cannot be cleared by JOIN or DEFINE FILE commands.

  For more information, see the *Describing Data With ibi™ WebFOCUS® Language* manual.

- **In a procedure.**A virtual field created in a procedure lasts only for that procedure.

**Tip:** If your environment supports the KEEPDEFINES parameter, you can set KEEPDEFINES to ON or ALL to protect virtual fields from being cleared by a subsequent JOIN command. For details, see Joining Data Sources.

# Usage Notes for Creating Virtual Fields

- If you do not use the KEEPDEFINES parameter, when a JOIN is issued, all pre-existing virtual fields for that data source are cleared except those defined in the Master File.
- To join structures using a virtual field with the source, make sure the DEFINE follows the JOIN command. Otherwise, the JOIN command clears the temporary field. For an explanation of reporting on joined data sources, see Joining Data Sources.
- If no field in the expression is in the Master File or has been defined, use the WITH command to identify the logical home of the defined calculation. See Establishing a Segment Location for a Virtual Field.
- WITH can be used to move the logical home for the virtual field to a segment lower than that to which it would otherwise be assigned (for example, to count instances in a lower segment).
- You may define fields simultaneously (in addition to fields defined in the Master File) for as many data sources as desired. The total length of all virtual fields and real fields cannot exceed 32,000 characters.
- When you specify virtual fields in a request, they count toward the display field limit. For details on determining the maximum number of display fields that can be used in a request, see Displaying Report Data.
- Virtual fields are only available when the data source is used for reporting. Virtual

fields cannot be used with MODIFY.

- A DEFINE command may not contain qualified field names on the left-hand side of the expression. If the same field name exists in more than one segment, and that field must be redefined or recomputed, use the REDEFINES command.
- Using a self-referencing DEFINE such as x=x+1 disables AUTOPATH (see the *ibi™ WebFOCUS® Developing Reporting Applications* manual).
- Field names used in the expression that defines the virtual field cannot be enclosed in single or double quotation marks. Any character string enclosed in quotation marks is treated as a literal string, not a field reference.
- A DEFINE FILE command overwrites a DEFINE in the Master File with same name as long as you do not redefine the format (which is not allowed).

# Create a Virtual Field

Before you begin a report request, include

```
DEFINE FILE filename[.view_fieldname] [CLEAR|ADD]
fieldname[/format] [(GEOGRAPHIC_ROLE = georole]
         [,TITLE = 'line1[,line2 ...']]
         [,DESCRIPTION = 'description'])] = expression;
fieldname[/format][WITH realfield] = expression;
fieldname[/format] REDEFINES qualifier.fieldname = expression;
.
.
.
END
```

where:

**filename**

Is the name of the data source for which you are defining the virtual field.

If the report request specifies an alternate view, use *filename* in conjunction with *view_fieldname*.

All fields used to define the virtual field must lie on a single path in the data source. If they do not, you can use an alternate view, which requires alternate view DEFINE

commands. For an alternate view, virtual fields cannot have qualified field names. For information on alternate views, see Rotating a Data Structure for Enhanced Retrieval.

The DEFINE FILE command line must be on a separate line from its virtual field definitions.

**view_fieldname**

Is the field on which an alternate view is based in the corresponding request. You may need to use an alternate view if the fields used do not lie on a single path in the normal view.

**CLEAR**

Clears previously defined virtual fields associated with the specified data source. CLEAR is the default value.

**ADD**

Enables you to specify additional virtual fields for a data source without releasing any existing virtual fields. Omitting ADD produces the same results as the CLEAR option.

**fieldname**

Is a name that complies with WebFOCUS field naming rules. Indexed field names in FOCUS data sources must be less than or equal to 12 characters. It can be the name of a new virtual field that you are defining, or an existing field declared in the Master File, which you want to redefine.

The name can include any combination of letters, digits, and underscores (_), and should begin with a letter.

Do not use field names of the type C*n*, E*n*, or X*n* (where *n* is any sequence of one or two digits), because they are reserved for other uses.

**format**

Is the format of the field. The default value is D12.2. For information on field formats, see the *Describing Data With ibi™ WebFOCUS® Language* manual.

**georole**

Is a valid geographic role. The following is a list of default geographic roles.

- **ADDRESS_FULL.** Full address.
- **ADDRESS_LINE.** Number and street name.

- **CITY.** City name.
- **CONTINENT.** Continent name.
- **COUNTY.** County name.
- **COUNTRY.** Country name.
- **GEOMETRY_AREA.** Geometry area.
- **GEOMETRY_LINE.** Geometry line.
- **GEOMETRY_POINT.** Geometry point.
- **LATITUDE.** Latitude.
- **LONGITUDE.** Longitude.
- **POSTAL_CODE.** Postal code.
- **STATE.** State name.

**WITH realfield**

Associates a virtual field with a data source segment containing a real field. For more information, see Usage Notes for Creating Virtual Fields.

**line1, line2...**

Are the lines of default column title to be displayed for the virtual field unless overridden by an AS phrase.

**description**

Is the description to be associated with the virtual field, enclosed in single quotation marks. The description displays in the tools that browse Master Files.

**REDEFINES qualifier.fieldname**

Enables you to redefine or recompute a field whose name exists in more than one segment. If you change the format of the field when redefining it, the length in the new format must be the same as or shorter than the original. In addition, conversion between alphanumeric and numeric data types is not supported.

**expression**

Can be an arithmetic or logical expression or function, evaluated to establish the value of *fieldname* (see Using Expressions). You must end each expression with a semicolon except for the last one, where the semicolon is optional.

Fields in the expression can be real data fields, data fields in data sources that are cross-referenced or joined, or previously defined virtual fields. For related information, see Usage Notes for Creating Virtual Fields.

**END**

Is required to end the DEFINE FILE command. END must be on its own line in the procedure.

**Note:** For information about missing attributes for virtual fields, see Missing Field Values.

# Defining a Virtual Field

In the following request, the value of RATIO is calculated by dividing the value of DELIVER_AMT by OPENING_AMT. The DEFINE command creates RATIO as a virtual field, which is used in the request as though it were a real field in the data source.

```
DEFINE FILE SALES
RATIO = DELIVER_AMT/OPENING_AMT;
END
TABLE FILE SALES
PRINT DELIVER_AMT AND OPENING_AMT AND RATIO
WHERE DELIVER_AMT GT 50
END
```

The output is:

```
DELIVER_AMT  OPENING_AMT          RATIO
-----------  -----------          -----
         80           65           1.23
        100          100           1.00
         80           90            .89
```

# Redefining a Field

The following request redefines the salary field in the EMPDATA data source to print asterisks for job titles that contain the word EXECUTIVE:

```
SET EXTENDNUM=OFF
DEFINE FILE EMPDATA
SALARY REDEFINES EMPDATA.SALARY =
 IF TITLE CONTAINS 'EXECUTIVE' THEN  ELSE
 EMPDATA.SALARY;
END
TABLE FILE EMPDATA
SUM SALARY BY TITLE
WHERE TITLE CONTAINS 'MANAGER' OR 'MARKETING' OR 'SALES'
ON TABLE SET PAGE OFF
END
```

The output is:

```
TITLE                          SALARY
-----                          ------
EXEC MANAGER                 $54,100.00
EXECUTIVE MANAGER     ***************
MANAGER                     $270,500.00
MARKETING DIRECTOR          $176,800.00
MARKETING EXECUTIVE   ***************
MARKETING SUPERVISOR         $50,500.00
SALES EXECUTIVE       ***************
SALES MANAGER                $70,000.00
SALES SPECIALIST             $82,000.00
SENIOR SALES EXEC.           $43,400.00
```

# Redefining a Field That Has the Same Name in Multiple Segments

The following request joins the EMPDATA data source to itself. This creates a two-segment structure in which the names are the same in both segments. The request then redefines the salary field in the top segment (tag name ORIG) so that all names starting with the letter L are replaced by asterisks, and redefines the salary field in the child segment (tag name NEW) so that all names starting with the letter M are replace by asterisks:

```
SET EXTENDNUM=OFF
JOIN PIN IN EMPDATA TAG ORIG TO PIN IN EMPDATA TAG NEW AS AJ
DEFINE FILE EMPDATA
SALARY/D12.2M REDEFINES ORIG.SALARY = IF LASTNAME LIKE 'L%'  THEN
```

```
                                        999999999999 ELSE ORIG.SALARY;
SALARY/D12.2M REDEFINES NEW.SALARY = IF LASTNAME LIKE 'M%' THEN
                                       999999999999 ELSE NEW.SALARY * 1.2;
END
TABLE FILE EMPDATA
PRINT ORIG.SALARY AS 'ORIGINAL' NEW.SALARY AS 'NEW'
BY LASTNAME
WHERE LASTNAME FROM 'HIRSCHMAN' TO 'OLSON'
ON TABLE SET PAGE NOPAGE
END
```

The output is:

```
LASTNAME                ORIGINAL              NEW
--------                --------              ---
HIRSCHMAN             $62,500.00       $75,000.00
KASHMAN               $33,300.00       $39,960.00
LASTRA           ***************      $138,000.00
LEWIS            ***************       $60,600.00
LIEBER           ***************       $62,400.00
LOPEZ            ***************       $31,680.00
MARTIN                $49,000.00  ***************
MEDINA                $39,000.00  ***************
MORAN                 $30,800.00  ***************
NOZAWA                $80,500.00       $96,600.00
OLSON                 $30,500.00       $36,600.00
```

# Defining Multiple Virtual Fields

You may wish to have more than one set of virtual fields for the same data source, and to use some or all of the virtual fields in the request. The ADD option enables you to specify additional virtual fields without clearing existing ones. If you omit the ADD option, previously defined virtual fields in that data source are cleared.

If you want to clear a virtual field for a particular data source, use the CLEAR option.

# Add a Virtual Field to Existing Virtual Fields

```
DEFINE FILE filename ADD
```

where:

**filename**

Is the data source.

# Adding Virtual Fields

The following annotated example illustrates the use of the ADD and CLEAR options for virtual fields:

```
1. DEFINE FILE CAR
   ETYPE/A2=DECODE STANDARD (OHV O OHC O ELSE L);
   END
2. DEFINE FILE CAR ADD
   TAX/D8.2=IF MPG LT 15 THEN .06*RCOST
      ELSE .04*RCOST;
   FCOST = RCOST+TAX;
   END
```

1. The first DEFINE command creates the TYPE virtual field for the CAR data source. For information about the DECODE function, see the ibi™ WebFOCUS® Using Functions manual.
2. Two or more virtual fields, TAX and FCOST, are created for the CAR data source. The ADD option allows you to reference ETYPE, TAX, and FCOST in future requests.

# Displaying Virtual Fields

You can display all virtual fields with the ? DEFINE command.

# Display Virtual Fields

```
? DEFINE
```

For more information, see the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

# Display Virtual Fields

Click the **Defined Fields** tab in the Define tool.

# Clearing a Virtual Field

The following can clear a virtual field created in a procedure:

- A DEFINE FILE *filename* CLEAR command.
- A subsequent DEFINE command (without the ADD option), against the same data source.
- A join. When a join is created for a data source, all pre-existing virtual fields for that data source are cleared except those defined in the Master File. This may affect virtual fields used in an expression.
- A change in the value of the FIELDNAME SET parameter.

Unlike fields created in a procedure, virtual fields in the Master File are not cleared in the above ways.

To clear all virtual fields for all data sources, issue the following command:

```
DEFINE FILE * CLEAR
END
```

# Clearing Virtual Fields

The following annotated example illustrates the use of the CLEAR options for virtual fields:

```
1. DEFINE FILE CAR
   ETYPE/A2=DECODE STANDARD (OHV O OHC O ELSE L);
   END
2. DEFINE FILE CAR CLEAR
   COST = RCOST-DCOST;
   END
```

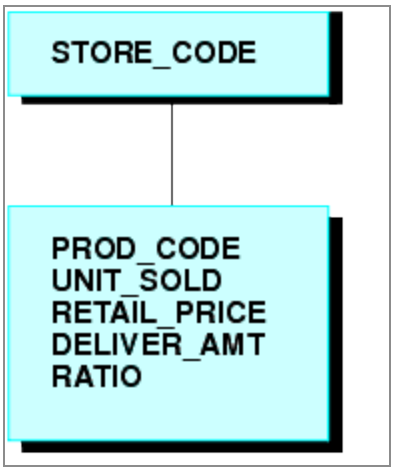
1. The first DEFINE command creates the TYPE virtual field for the CAR data source. For

information about the DECODE function, see the *ibi™ WebFOCUS® Using Functions* manual.

2. The CLEAR option clears the previously defined virtual fields, and only the COST virtual field in the last DEFINE is available for further requests.

# Establishing a Segment Location for a Virtual Field

Virtual fields have a logical location in the data source structure, just like permanent data source fields. The logical home of a virtual field is on the lowest segment that has to be accessed in order to evaluate the expression, and determines the time of execution for that field. Consider the following data source structure and DEFINE command:




```
DEFINE RATIO = DELIVER_AMT/RETAIL_PRICE ;
```

The expression for RATIO includes at least one real data source field. As far as report capabilities are concerned, the field RATIO is just like a real field in the Master File, and is located in the lowest segment.

In some applications, you can have a virtual field evaluated by an expression that contains no real data source fields. Such an expression might refer only to temporary fields or literals. For example,

```
NCOUNT/I5 = NCOUNT+1;
```

or

```
DATE/YMD = '19990101';
```

Since neither expression contains a data source field (NCOUNT and the literal do not exist in the Master File), their logical positions in the data source cannot be determined. You have to specify in which segment you want the expression to be placed. To associate a virtual field with a specific segment, use the WITH phrase. The field name following WITH may be any real field in the Master File.

For FOCUS data sources, you may be able to increase the retrieval speed with an external index on the virtual field. In this case, you can associate the index with a target segment outside of the segment containing the virtual field. See the *ibi™ WebFOCUS® Developing Reporting Applications* manual for more information on external indexes.

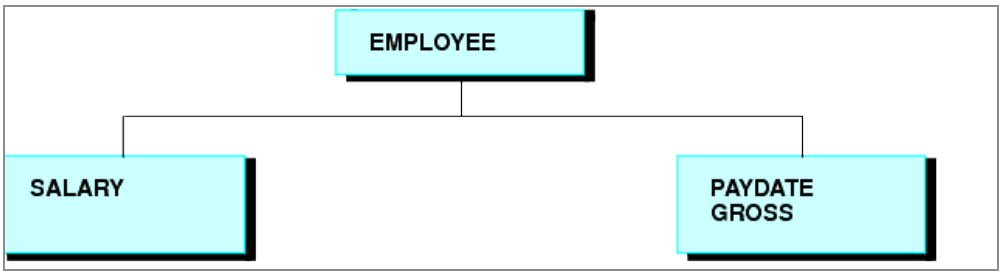
## Establishing a Segment Location

The field NCOUNT is placed in the same segment as the UNITS field. NCOUNT is calculated each time a new segment instance is retrieved.

```
DEFINE FILE GGSALES
NCOUNT/I5 WITH UNITS = NCOUNT+1;
END
```

# Defining Virtual Fields Using a Multi-Path Data Source

Calculations of a virtual field may include fields from all segments of a data source, but they must lie in a unique top-to-bottom path. Different virtual fields may, of course, lie along different paths. For example, consider the following data source structure:




This data source structure does not permit you to write the following expression:

```
NEWAMT = SALARY+GROSS;
```

The expression is invalid because the structure implies that there can be several SALARY segments for a given EMPLOYEE, and it is not clear which SALARY to associate with which GROSS.

To accomplish such an operation, you can use the alternate view option explained in Improving Report Processing.

# Increasing the Speed of Calculations in Virtual Fields

Virtual fields are compiled into machine code in order to increase the speed of calculations.

# Preserving Virtual Fields Using DEFINE FILE SAVE and RETURN

Occasionally, new code needs to be added to an existing application. When adding code, there is always the possibility of over-writing existing virtual fields by reusing their names inadvertently.

The DEFINE FILE SAVE command forms a new context for virtual fields. Each new context creates a new layer or command environment. When you first enter the new environment, all of the virtual fields defined in the previous layer are available in the new layer. Overwriting or clearing a virtual field definition affects only the current layer. You can

return to the default context with the DEFINE FILE RETURN command, and the virtual field definitions remain intact.

Therefore, all the virtual fields that are created in the new application can be removed before returning to the calling application, without affecting existing virtual fields in that application.

For an example of DEFINE FILE SAVE and DEFINE FILE RETURN, see Joining Data Sources.

**Note:** A JOIN command can be issued after a DEFINE FILE SAVE command. However, in order to clear the join context, you must issue a JOIN CLEAR command if the join is still in effect. If only virtual fields and DEFINE FILE ADD were issued after a DEFINE FILE SAVE command, you can clear them by issuing a DEFINE FILE RETURN command.

# Protect Virtual Fields From Being Overwritten

```
DEFINE FILE filename SAVE
fld1/format1=expression1;
fld2/format2=expression2;
END
TABLE FILE filename ...
MODIFY FILE filename ...
DEFINE FILE filename RETURN
END
```

where:

**SAVE**

Creates a new context for virtual fields.

**filename**

Is the name of the Master File that gets a new context and has the subsequent virtual fields applied before the DEFINE FILE RETURN command is issued.

**RETURN**

Clears the current context if it was created by DEFINE FILE SAVE, and restores the previous context.

# Applying Dynamically Formatted Virtual Fields to Report Columns

Dynamic formatting enables you to apply different formats to specific data in a column by using a temporary field that contains dynamic data settings.

Before you can format a report column using the dynamic format, you must create the report, then apply the temporary field to a column in the report. For example, you can create a temporary field that contains different decimal currency formats for countries like Japan (which uses no decimal places) and England (which uses 2 decimal places). These currency formats are considered dynamic formats. You can then apply the temporary field containing the dynamic formatting to a Sales column. In a report, the Sales column reflects the different currency formats for each country.

The field that contains the format specifications can be:

- A real field in the data source.
- A temporary field created with a DEFINE command.
- A DEFINE in the Master File.
- A COMPUTE command. If the field is created with a COMPUTE command, the command must appear in the request prior to using the calculated field for reformatting.

The field that contains the formats must be alphanumeric, and at least eight characters in length. Only the first eight characters are used for formatting.

The field-based format may specify a length longer than the length of the original field. However, if the new length is more than one-third larger than the original length, the report column width may not be large enough to hold the value (indicated by asterisks in the field).

You can apply a field-based format to any type of field. However, the new format must be compatible with the original format:

- A numeric field can be reformatted to any other numeric format with any edit format options.
- An alphanumeric field can be reformatted to a different length.
- Any date field can be reformatted to any other date format type.

- Any date-time field can be reformatted to any other date-time format.

If the field-based format is invalid or specifies an impermissible type of conversion, the field displays with plus signs (++++) on the report output.

# Define and Apply a Format Field

- With a DEFINE command:

```
DEFINE FILE filename
format_field/A8 = expression;
END
```

- In a Master File:

```
DEFINE format_field/A8 = expression; $
```

- In a request:

```
COMPUTE format_field/A8 = expression;
```

where:

**format_field**

Is the name of the field that contains the format for each row.

**expression**

Is the expression that assigns the format values to the format field.

After the format field is defined, you can apply it in a report request:

```
TABLE FILE filename
display fieldname/format_field[/just]
END
```

where:

**display**

Is any valid display command.

**fieldname**

Is a field in the request to be reformatted.

**format_field**

Is the name of the field that contains the formats. If the name of the format field is the same as an explicit format, the explicit format is used. For example, a field named I8 cannot be used for field-based reformatting, because it is interpreted as the explicit format I8.

**just**

Is a justification option: L, R, or C. The justification option can be placed before or after the format field, separated from the format by a slash.

# Usage Notes for Field-Based Reformatting

- Field-based reformatting is supported for TABLE and TABLEF. It works with StyleSheets, joins, and any type of data source.
- Field-based reformatting is not supported for MODIFY, Maintain, MATCH, GRAPH, RECAP, FOOTING, HEADING, or text fields.
- Although you can use a DEFINE or COMPUTE command to create the format field, you *cannot* apply a field-based format to a calculated or virtual field.
- Field-based reformatting cannot be used on a BY sort field. It does work with an ACROSS field.
- If a report column is produced using field-based reformatting, the format used for a total or subtotal of the column is taken from the previous detail line.
- Explicit reformatting creates two display fields internally for each field that is reformatted. Field-based reformatting creates three display fields.
- Field-based formats are applied at the final output phase of report processing, while specific formats are applied at the final output phase of report processing, while specific formats are applied prior to performing calculations. Therefore, the dynamically reformatted field will perform calculations, including summation, using the original format, while a field reformatted using a specific format will use the new format for calculations. Thus, there may be numeric differences in the final output because of rounding when using packed fields that reduce the precision.

- Field-based reformatting works for alphanumeric fields in a HOLD file, although three fields are stored in the file for each field that is reformatted. To prevent the extra fields from being propagated to the HOLD file, specify SET HOLDLIST=PRINTONLY.
- If the number of decimal places varies between rows, the decimal points are not aligned in the report output.

# Creating Dynamically Formatted Fields

The following request formats the DOLLARS2 field according to the value of the CATEGORY field and shows the numeric differences in sums using dynamic and static reformatting:

```
DEFINE FILE GGSALES
MYFORMAT/A8=DECODE CATEGORY ('Coffee' 'P15.3' 'Gifts' 'P15.0' ELSE
'P15.2');
DOLLARS2/P15.2 = DOLLARS + .5;
END
```

```
TABLE FILE GGSALES
SUM DOLLARS2/MYFORMAT AS 'Dynamic' DOLLARS2/P10.2 AS 'Specific'
BY CATEGORY
ON TABLE SUBTOTAL
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
END
```

The output is shown in the following image:

| Category | Dynamic | Specific |
|---|---|---|
| Coffee | 17232175.000 | 17232175.00 |
| Food | 17230053.00 | 17230053.00 |
| Gifts | 11696221. | 11696220.50 |
| | | |
| TOTAL | 46158449. | 46158448.50 |

# Passing Function Calls Directly to a Relational Engine Using SQL.Function Syntax

The SQL adapters can pass virtual fields that call certain SQL scalar functions to the relational engine for processing. This enables you to use SQL functions in a request even when they have no equivalent in the WebFOCUS language. The function must be row-based and have a parameter list that consists of a comma-delimited list of column names or constants. In order to reference the function in an expression, prefix the function name with **SQL**.

If the virtual field is in the Master File, both TABLE requests and those SQL requests that qualify for Automatic Passthru (APT) can access the field. If the virtual field is created by a DEFINE FILE command, TABLE requests can access the field. The function name and parameters are passed without translation to the relational engine. Therefore, the expression that creates the DEFINE field must be optimized, or the request will fail.

# Usage Notes for Direct SQL Function Calls

- The expression containing the SQL.**function** call must be optimized or the request will fail with the following message:

  ```
  (FOC32605) NON OPTIMIZABLE EXPRESSION WITH SQL. SYNTAX
  ```

- The function must be a row-based scalar function and have a parameter list that consists of a comma-delimited list of column names or constants. If the function uses anything other than a list of comma separated values, the SQL. syntax cannot be used to pass it.
- Constant DEFINE fields must be assigned a segment location using the WITH phrase.
- Expressions should be declared as DEFINE fields, which are supported as parameters to an SQL function.
- Data types are not supported as parameters to an SQL function. Examples of data type arguments are CHAR and INT for the CONVERT function and ISO, EUR, JIS, and USA for the CHAR function.

# Calling the SQL CONCAT Function in a Request

This example uses the WebFOCUS Retail demo sample. You can create this sample data source for a relational adapter by right-clicking the application in which you want to place this sample, and selecting **New** and then **Samples** from the context menu. Then, select **WebFOCUS - Retail Demo** from the **Sample procedures and data for** drop-down list and click **Create**.

The following request against the WebFOCUS Retail demo data source uses the SQL CONCAT function to concatenate the product category with the product subcategory.

```
SET TRACEUSER = ON
SET TRACEOFF = ALL
SET TRACEON = STMTRACE//CLIENT
SET TRACESTAMP=OFF
SET XRETRIEVAL = OFF

DEFINE FILE WF_RETAIL
CAT_SUBCAT/A50 = SQL.CONCAT(PRODUCT_CATEGORY, PRODUCT_SUBCATEG);
END

TABLE FILE WF_RETAIL
PRINT CAT_SUBCAT
BY PRODUCT_CATEGORY NOPRINT
END
```

The trace output shows that the SQL function call was passed to the RDBMS.

```
SELECT
CONCAT(T2."PRODUCT_CATEGORY",T2."PRODUCT_SUBCATEG"),
T2."PRODUCT_CATEGORY",
T2."PRODUCT_SUBCATEG"
FROM
wfr_product T2
ORDER BY
T2."PRODUCT_CATEGORY"
FOR FETCH ONLY;
```

# Creating a Calculated Value

A calculated value is a temporary field that is evaluated after all the data that meets the selection criteria is retrieved, sorted, and summed. Calculated values are available only for

the specified report request.

You specify the COMPUTE command in the body of the report request, following the display command and optionally introduced by AND. You can compute more than one field with a single COMPUTE command.

# Usage Notes for Calculated Field Values

The following apply to the use of calculated values:

- If you specify any optional COMPUTE phrases (such as, AS, IN, or NORPINT), and you compute additional fields following these phrases, you must repeat the commands COMPUTE or AND COMPUTE before specifying the additional fields.
- You can rename and justify column totals and row totals. For information, see the examples in Including Totals and Subtotals.
- Expressions in a COMPUTE command can include fields with prefix operators (see Manipulating Display Fields With Prefix Operators). For more information on valid expressions, see Using Expressions.
- Fields referred to in a COMPUTE command are counted toward the display field limit, and appear in the internal matrix. For details on determining the maximum number of display fields that can be used in a request, see Displaying Report Data.
- Field names used in the expression that defines the calculated field cannot be enclosed in single or double quotation marks. Any character string enclosed in quotation marks is treated as a literal string, not a field reference.
- When using a COMPUTE with an ACROSS COLUMNS phrase, the COLUMNS should be specified last:

```
ACROSS acrossfield [AND] COMPUTE compute_expression; COLUMNS values
```

# Create a Calculated Value

```
COMPUTE fld [/format] [(GEOGRAPHIC_ROLE = georole)] = expression;
  [AS 'title'] [NOPRINT] [IN [+n]]
```

where:

**fld**

Is the name of the calculated value.

The name can be any name that complies with WebFOCUS field naming rules.

Do not use field names of the type C*n*, E*n*, and X*n* (where *n* is any sequence of one or two digits), because they are reserved for other uses.

**format**

Is the format of the field. The default is D12.2. For information on formats, see the *Describing Data With ibi™ WebFOCUS® Language* manual.

**georole**

Is a valid geographic role. The following is a list of default geographic roles.

- **ADDRESS_FULL.** Full address.
- **ADDRESS_LINE.** Number and street name.
- **CITY.** City name.
- **CONTINENT.** Continent name.
- **COUNTY.** County name.
- **COUNTRY.** Country name.
- **GEOMETRY_AREA.** Geometry area.
- **GEOMETRY_LINE.** Geometry line.
- **GEOMETRY_POINT.** Geometry point.
- **LATITUDE.** Latitude.
- **LONGITUDE.** Longitude.
- **POSTAL_CODE.** Postal code.
- **STATE.** State name.

**expression**

Can be an arithmetic and/or logical expression or function (see Using Expressions). Each field used in the expression must be part of the request. Each expression must end with a semicolon (;).

**NOPRINT**

Suppresses printing of the field. For more information, see Laying Out the Report Page.

**AS 'title'**

Changes the name of the calculated value. For more information, see Using Headings, Footings, Titles, and Labels.

**IN [+n]**

Specifies the location of the column. For more information, see Using Headings, Footings, Titles, and Labels. IN only works in an HTML report when the STYLEMODE SET parameter is set to FIXED or OFF.

# Create a Calculated Value Without a Calculation

```
COMPUTE fld [/format]= ;
```

where:

**fld**

Is the name of the calculated value.

The name can be any name that complies with WebFOCUS field naming rules.

Do not use field names of the type C*n*, E*n*, and X*n* (where *n* is any sequence of one or two digits), because they are reserved for other uses.

**format**

Is the format of the field. The default is D12.2. For information on formats, see the *Describing Data With ibi™ WebFOCUS® Language* manual.

# Calculating a Field Value

In the following example, the COMPUTE command creates a temporary field REVENUE based on the product of UNIT_SOLD and RETAIL_PRICE, and displays this information for New York City. The format D12.2M indicates the field format for REVENUE and the AS command changes the default column headings for UNIT_SOLD and RETAIL_PRICE. REVENUE is only available for this report request.

```
TABLE FILE SALES
HEADING CENTER
"NEW YORK PROFIT REPORT"
" "
SUM UNIT_SOLD AS 'UNITS,SOLD' RETAIL_PRICE AS 'RETAIL,PRICE'
COMPUTE REVENUE/D12.2M = UNIT_SOLD * RETAIL_PRICE;
BY PROD_CODE AS 'PROD,CODE'
WHERE CITY EQ 'NEW YORK'
END
```

The output is:

```
       NEW YORK PROFIT REPORT

PROD  UNITS  RETAIL
CODE  SOLD   PRICE           REVENUE
----  -----  ------          -------
B10      30    $.85           $25.50
B17      20   $1.89           $37.80
B20      15   $1.99           $29.85
C13      15   $1.99           $29.85
C14      18   $2.05           $36.90
C17      12   $2.09           $25.08
D12      20   $2.09           $41.80
E1       30    $.89           $26.70
E2       33    $.99           $32.67
E3       35   $1.09           $38.15
```

# Using Positional Column Referencing With Calculated Values

In a COMPUTE command, it is sometimes convenient to refer to a field by its report column position, rather than its name. This option is especially useful when the same field is specified for several report columns.

Column referencing becomes essential when you are using the same field name in a variety of ways. The following image shows that columns produced by display commands (whether displayed or not) can be referred to as C1 for the first column, C2 for the second column, and so forth. The BY field columns are not counted.

For additional information about column reference numbers, see Assigning Column Reference Numbers.

# Using Positional Column Referencing

The following example demonstrates positional field references in a COMPUTE command:

```
TABLE FILE CAR
SUM AVE.DEALER_COST
SUM AVE.DEALER_COST AND COMPUTE RATIO=C1/C2;
BY COUNTRY
END
```

The columns produced by display commands can be referred to as C1 for the first column (AVE.DEALER_COST), C2 for the second column (AVE.DEALER_COST BY COUNTRY), and so forth. The BY field columns are not counted.

The output is:

```
AVE                     AVE
DEALER_COST  COUNTRY    DEALER_COST          RATIO
-----------  -------    -----------          -----
      7,989  ENGLAND          9,463            .84
             FRANCE           4,631           1.73
             ITALY           10,309            .77
             JAPAN            2,756           2.90
             W GERMANY        7,795           1.02
```

# Using ACROSS With Calculated Values

If the COMPUTE command is issued immediately following an ACROSS phrase, only a recap type of the calculation is performed once for all columns. COMPUTE is used as part of a display command, so a new column is calculated for each set of values.

# Using COMPUTE as Part of a Display Command

```
TABLE FILE SALES
SUM UNIT_SOLD
COMPUTE NEWVAL = UNIT_SOLD * RETAIL_PRICE;
ACROSS CITY
END
```

The first page of output is:

```
CITY
NEW YORK            NEWARK              STAMFORD            UNIONDALE
UNIT_SOLD    NEWVAL UNIT_SOLD    NEWVAL UNIT_SOLD    NEWVAL UNIT_SOLD
NEWVAL
-------------------------------------------------------------------------
--------
      162  1,764.18        42    104.16       376  4,805.28        65
297.70
```

# Using ACROSS With Calculated Values

In the following COMPUTE command, C1, C2, C3, C4, C5, and C6 are positional column references, and the COMPUTE command follows the ACROSS phrase. The COMPUTE is performed once for the report, and the results are displayed to the right of all sort groups.

```
TABLE FILE SALES
SUM UNIT_SOLD AND RETURNS
WHERE DATE GE '010' AND DATE LE '1031'
ACROSS DATE
COMPUTE
TOT_UNITS/D5=C1 + C3 + C5;
TOT_RETURNS = C2 + C4 + C6;
END
```

The output is:

```
DATE

10/17       10/18     10/19       TOT_UNITS   TOT_RETURNS
TOT_UNITS   TOT_RETURNS
```

```
UNIT_SOLD   RETURNS   UNIT_SOLD   RETURNS     UNIT_SOLD     RETURNS
-------------------------------------------------------------------------
----------------------
162         15        78          2           29            1
269         18.00
```

# Sorting Calculated Values

You can sort a report by a virtual field or a calculated value. To sort by a calculated value, you must use the BY TOTAL phrase in your request. For details, see Sorting andAggregating Report Columns.

# Screening on Calculated Values

You can screen on values produced by COMPUTE commands by using the WHERE TOTAL or WHERE_GROUPED test, as described in Selecting Records for Your Report.

# Assigning Column Reference Numbers

Column notation assigns a sequential column number to each column in the internal matrix created for a report request. If you want to control the creation of column reference numbers for the columns that are used in your report, use the CNOTATION column notation command.

Because column numbers refer to columns in the internal matrix, they are assigned after retrieval and aggregation of data are completed. Columns created and displayed in a report are stored in the internal matrix, and columns that are not displayed in a report may also be generated and stored in the internal matrix. Columns stored in the internal matrix include calculated values, reformatted field values, BY fields, fields with the NOPRINT option, and certain RECAP calculations such as FORECAST and REGRESS. Every other column in the internal matrix is assigned a column number by default which means you have to account for all internally generated columns if you want to refer to the appropriate column value in your request.

You can change the default assignment of column reference numbers by using the SET CNOTATION command which can assign column numbers only to columns that display in the report output or to all fields referenced in the report request. You can use column notation in COMPUTE and RECAP commands to refer to these columns in your request.

# Control the Creation of Column Reference Numbers

```
SET CNOTATION={ALL|PRINTONLY|EXPLICIT}
```

where:

**ALL**

Assigns column reference numbers to every column in the internal matrix. ALL is the default value.

**PRINTONLY**

Assigns column reference numbers only to columns that display in the report output.

**EXPLICIT**

Assigns column reference numbers to all fields referenced in the request, whether displayed or not.

# Using Column Notation in a Report Request

To create a column reference in a request, you can:

- Preface the column number with a C in a non-FML request.
- Use the column number as an index in conjunction with a row label in an FML request. With this type of notation, you can specify a specific column, a relative column number, or a sequence or series of columns.
- Refer to a particular cell in an FML request using the notation E(*r*,*c*), where *r* is a row number and *c* is a column number.

# Using Column Notation in a Non-FML Request With CNOTATION=ALL

In the following request with CNOTATION=ALL, the product of C1 and C2 *does not* calculate TRANSTOT times QUANTITY because the reformatting generates additional columns.

```
SET CNOTATION = ALL
TABLE FILE VIDEOTRK
SUM TRANSTOT/D12.2 QUANTITY/D12.2
AND COMPUTE
PRODUCT = C1 * C2;
BY TRANSDATE
END
```

The output is:

```
TRANSDATE        TRANSTOT        QUANTITY         PRODUCT
---------        --------        --------         -------
 91/06/17           57.03           12.00        3,252.42
 91/06/18           21.25            2.00          451.56
 91/06/19           38.17            5.00        1,456.95
 91/06/20           14.23            3.00          202.49
 91/06/21           44.72            7.00        1,999.88
 91/06/24          126.28           12.00       15,946.63
 91/06/25           47.74            8.00        2,279.11
 91/06/26           40.97            2.00        1,678.54
 91/06/27           60.24            9.00        3,628.85
 91/06/28           31.00            3.00          961.00
```

BY fields do not get a column reference, so the first column reference is for TRANSTOT with its original format, then the reformatted version. Next is QUANTITY with its original format and then the reformatted version. Last is the calculated value, PRODUCT.

# Using Column Notation in a Non-FML Request With CNOTATION=PRINTONLY

Setting CNOTATION=PRINTONLY assigns column references to the output columns only. In this case, the product of C1 and C2 *does* calculate TRANSTOT times QUANTITY.

```
SET CNOTATION = PRINTONLY

TABLE FILE VIDEOTRK
SUM TRANSTOT/D12.2 QUANTITY/D12.2
AND COMPUTE
PRODUCT = C1 * C2;
BY TRANSDATE
END
```

The output is:

```
TRANSDATE        TRANSTOT        QUANTITY         PRODUCT
---------        --------        --------         -------
 91/06/17           57.03           12.00          684.36
 91/06/18           21.25            2.00           42.50
 91/06/19           38.17            5.00          190.85
 91/06/20           14.23            3.00           42.69
 91/06/21           44.72            7.00          313.04
 91/06/24          126.28           12.00        1,515.36
 91/06/25           47.74            8.00          381.92
 91/06/26           40.97            2.00           81.94
 91/06/27           60.24            9.00          542.16
 91/06/28           31.00            3.00           93.00
```

# Using CNOTATION=PRINTONLY With Column Numbers in an FML Request

In the following request, the reformatting of fields generates additional columns in the internal matrix. In the second RECAP expression, note that because of the CNOTATION setting:

- TOTCASH(1) refers to total cash in displayed column 1.
- TOTCASH(2) refers to total cash in displayed column 2.
- The resulting calculation is displayed in column 2 of the row labeled CASH GROWTH (%).
- The RECAP value is only calculated for the column specified.

```
SET CNOTATION=PRINTONLY
DEFINE FILE LEDGER
CUR_YR/I5C=AMOUNT;
LAST_YR/I5C=.87*CUR_YR - 142;
END
TABLE FILE LEDGER
SUM CUR_YR/F9.2 AS 'CURRENT,YEAR'
LAST_YR/F9.2 AS 'LAST,YEAR'

FOR ACCOUNT
1010 AS 'CASH ON HAND'                                  OVER
1020 AS 'DEMAND DEPOSITS'                               OVER
1030 AS 'TIME DEPOSITS'                                 OVER
BAR                                                     OVER
RECAP TOTCASH/F9.2C= R1 + R2 + R3; AS 'TOTAL CASH' OVER
" "                                                     OVER
RECAP GROCASH(2)/F9.2C=100*TOTCASH(1)/TOTCASH(2) - 100;
AS 'CASH GROWTH(%)'
END
```

The output is:

| | CURRENT YEAR | LAST YEAR |
|---|---|---|
| CASH ON HAND | 8784.00 | 7216.00 |
| DEMAND DEPOSITS | 4494.00 | 3483.00 |
| TIME DEPOSITS | 7961.00 | 6499.00 |
| | -------- | -------- |

| | | |
|---|---|---|
| TOTAL CASH | 21239.00 | 17198.00 |
| | | |
| CASH GROWTH (%) | | 23.50 |

# Using CNOTATION=PRINTONLY to RECAP Over Contiguous Columns in an FML Request

In this example, the RECAP calculation for ATOT occurs only for displayed columns 2 and 3, as specified in the request. No calculation is performed for displayed column 1.

```
SET CNOTATION=PRINTONLY
DEFINE FILE LEDGER
CUR_YR/I5C=AMOUNT;
LAST_YR/I5C=.87*CUR_YR - 142;
NEXT_YR/I5C=1.13*CUR_YR + 222;
END
TABLE FILE LEDGER
SUM NEXT_YR/F9.2 CUR_YR/F9.2 LAST_YR/F9.2
FOR ACCOUNT
10$$ AS 'CASH'                       OVER
1100 AS 'ACCOUNTS RECEIVABLE'        OVER
1200 AS 'INVENTORY'                  OVER
BAR                                  OVER
RECAP ATOT(2,3)/I5C = R1 + R2 + R3;
AS 'ASSETS  ACTUAL'
END
```

The output is:

| | NEXT_YR | CUR_YR | LAST_YR |
|---|---|---|---|
| CASH | 25992.00 | 21239.00 | 17198.00 |
| ACCOUNTS RECEIVABLE | 21941.00 | 18829.00 | 15954.00 |
| INVENTORY | 31522.00 | 27307.00 | 23329.00 |
| | -------- | -------- | -------- |
| ASSETS ACTUAL | | 67,375 | 56,478 |

# Using CNOTATION=PRINTONLY With Relative Column Addressing in an FML Request

This example computes the change in cash (CHGCASH) for displayed columns 1 and 2.

```
SET CNOTATION=PRINTONLY
DEFINE FILE LEDGER
CUR_YR/I5C=AMOUNT;
LAST_YR/I5C=.87*CUR_YR - 142;
NEXT_YR/I5C=1.13*CUR_YR + 222;
END
TABLE FILE LEDGER
SUM NEXT_YR/F9.2 CUR_YR/F9.2 LAST_YR/F9.2
FOR ACCOUNT
10$$ AS 'TOTAL CASH' LABEL TOTCASH           OVER
" "                                          OVER
```

```
RECAP CHGCASH(1,2)/I5SC = TOTCASH(*) - TOTCASH(*+1); AS 'CHANGE IN CASH'
END
```

The output is:

| | NEXT_YR | CUR_YR | LAST_YR |
|---|---|---|---|
| TOTAL CASH | 25992.00 | 21239.00 | 17198.00 |
| | | | |
| CHANGE IN CASH | 4,752 | 4,044 | |

# Using CNOTATION=PRINTONLY With Cell Notation in an FML Request

In this request, two RECAP expressions derive VARIANCEs (EVAR and WVAR) by subtracting values in four displayed columns (1, 2, 3, 4) in row three (PROFIT); these values are identified using cell notation (r,c).

```
SET CNOTATION=PRINTONLY
TABLE FILE REGION
SUM E_ACTUAL/F9.2 E_BUDGET/F9.2 W_ACTUAL/F9.2 W_BUDGET/F9.2
FOR ACCOUNT
3000 AS 'SALES'                          OVER
3100 AS 'COST'                           OVER
BAR                                      OVER
RECAP PROFIT/I5C = R1 - R2;              OVER
" "                                      OVER
RECAP EVAR(1)/I5C = E(3,1) - E(3,2);
AS 'EAST  VARIANCE'                      OVER
```

```
RECAP WVAR(3)/I5C = E(3,3) - E(3,4);
AS 'WEST  VARIANCE'
END
```

The output is:

| | E ACTUAL | E BUDGET | W ACTUAL | W BUDGET |
|---|---|---|---|---|
| SALES | 6000.00 | 4934.00 | 7222.00 | 7056.00 |
| COST | 4650.00 | 3760.00 | 5697.00 | 5410.00 |
| PROFIT | 1,350 | 1,174 | 1,525 | 1,646 |
| EAST VARIANCE | 176 | | | |
| WEST VARIANCE | | | -121 | |

# Using NOPRINT, Field Reformatting, and COMPUTE With Column Notation

The following request has a field that is not printed, several reformatted fields and three calculated values. With SET CNOTATION=PRINTONLY, the column references result in correct output.

```
SET CNOTATION = PRINTONLY
DEFINE FILE LEDGER
CUR_YR/I5C=AMOUNT;
LAST_YR/I5C=.87*CUR_YR - 142;
NEXT_YR/I5C=1.13*CUR_YR + 222;
END
TABLE FILE LEDGER
SUM NEXT_YR NOPRINT CUR_YR
COMPUTE AMT2/D6 = AMOUNT *2;
LAST_YR/D5   AMOUNT NEXT_YR
COMPUTE AMT3/D6  = AMOUNT*3;
COMPUTE AMT4/D6  = AMOUNT*4;
FOR ACCOUNT
10$$ AS 'CASH'                                    OVER
1100 AS 'ACCTS. REC.'                             OVER
1200 AS 'INVENTORY'                               OVER
BAR                                               OVER
RECAP ATOT/I8C = R1 + R2 + R3; AS 'TOTAL'         OVER
```

```
RECAP DIFF(2,10,2)/D8  = ATOT(*) - ATOT(*-1);
END
```

The output is:

| | CUR_YR | AMT2 | LAST_YR | AMOUNT | NEXT_YR | AMT3 | AMT4 |
|---|---|---|---|---|---|---|---|
| CASH | 21,239 | 42,478 | 17,198 | 21,239 | 25,992 | 63,717 | 84,956 |
| ACCTS. REC. | 18,829 | 37,658 | 15,954 | 18,829 | 21,941 | 56,487 | 75,316 |
| INVENTORY | 27,307 | 54,614 | 23,329 | 27,307 | 31,522 | 81,921 | 109,228 |
| TOTAL | 67,375 | 134,750 | 56,481 | 67,375 | 79,455 | 202,125 | 269,500 |
| DIFF | | 67,375 | | 10,894 | | 122,670 | |

# Using Column Notation With NOPRINT in a non-FML Request

The following request, sums TRANSTOT, QUANTITY, and TRANSCODE by TRANSDATE. TRANSTOT has the NOPRINT option, so it is not displayed on the report output. The request also calculates the following fields using COMPUTE commands:

- TTOT2, which has the same value as TRANSTOT and displays on the report output.
- UNIT_COST1, which is calculated by dividing column1 by column2.
- UNIT_COST2, which is calculated by dividing column1 by QUANTITY.

```
SET CNOTATION = ALL
TABLE FILE VIDEOTRK
SUM TRANSTOT/D7.2 NOPRINT QUANTITY/D7.2 TRANSCODE
  COMPUTE TTOT2/D7.2 = C1;
  COMPUTE UNIT_COST1/D7.2 = C1/C2;
  COMPUTE UNIT_COST2/D7.2 = C1/QUANTITY;
BY TRANSDATE
END
```

With this request, only CNOTATION=EXPLICIT produces the correct output. The following discussion illustrates why the EXPLICIT setting is needed.

With CNOTATION=ALL, all fields in the internal matrix are assigned column numbers. In particular, the request creates the following column references:

- C1 is TRANSTOT with its original format.
- C2 is TRANSTOT with format D7.2.
- C3 is QUANTITY with its original format.
- C4 is QUANTITY with format D7.2.
- C5 is TRANSCODE.

UNIT_COST1 is C1/C2. These column numbers have both been assigned to TRANSTOT, so UNIT_COST1 always equals 1. UNIT_COST2 is C1 (TRANSTOT) divided by QUANTITY. The output is:

```
TRANSDATE  QUANTITY  TRANSCODE     TTOT2  UNIT_COST1  UNIT_COST2
---------  --------  ---------     -----  ----------  ----------
 91/06/17     12.00         10     57.03        1.00        4.75
 91/06/18      2.00          2     21.25        1.00       10.63
 91/06/19      5.00          4     38.17        1.00        7.63
 91/06/20      3.00          3     14.23        1.00        4.74
 91/06/21      7.00          6     44.72        1.00        6.39
 91/06/24     12.00          9    126.28        1.00       10.52
 91/06/25      8.00          7     47.74        1.00        5.97
 91/06/26      2.00          2     40.97        1.00       20.48
 91/06/27      9.00          7     60.24        1.00        6.69
 91/06/28      3.00          3     31.00        1.00       10.33
```

With CNOTATION = PRINTONLY, the field TRANSTOT, which has the NOPRINT option, is not assigned any column numbers. QUANTITY with its original format is not assigned a column number because it is not displayed on the report output. The reformatted QUANTITY field is displayed and is assigned a column number. Therefore, the request creates the following column references:

- C1 is QUANTITY with format D7.2.
- C2 is TRANSCODE.

UNIT_COST1 is C1/C2, QUANTITY/TRANSCODE. UNIT_COST2 is C1 (QUANTITY) divided by QUANTITY. Therefore, UNIT_COST2 always equals 1. The output is:

```
TRANSDATE  QUANTITY  TRANSCODE     TTOT2  UNIT_COST1  UNIT_COST2
---------  --------  ---------     -----  ----------  ----------
 91/06/17     12.00         10     12.00        1.20        1.00
 91/06/18      2.00          2      2.00        1.00        1.00
 91/06/19      5.00          4      5.00        1.25        1.00
 91/06/20      3.00          3      3.00        1.00        1.00
```

```
 91/06/21      7.00          6      7.00        1.17        1.00
 91/06/24     12.00          9     12.00        1.33        1.00
 91/06/25      8.00          7      8.00        1.14        1.00
 91/06/26      2.00          2      2.00        1.00        1.00
 91/06/27      9.00          7      9.00        1.29        1.00
 91/06/28      3.00          3      3.00        1.00        1.00
```

With CNOTATION = EXPLICIT, the reformatted TRANSTOT field is explicitly referenced in the request, so it is assigned a column number even though it is not displayed. However, the TRANSTOT field with its original format is not assigned a column number. The QUANTITY field with its original format is not assigned a column number because it is not explicitly referenced in the request. The reformatted QUANTITY field is assigned a column number. Therefore, the request creates the following column references:

- C1 is TRANSTOT with format D7.2.
- C2 is QUANTITY with format D7.2.
- C3 is TRANSCODE.

UNIT_COST1 is C1/C2, TRANSTOT/QUANTITY. UNIT_COST2 is C1 (TRANSTOT) divided by QUANTITY. Therefore, UNIT_COST2 always equals UNIT_COST1. The output is:

```
TRANSDATE  QUANTITY  TRANSCODE     TTOT2  UNIT_COST1  UNIT_COST2
---------  --------  ---------     -----  ----------  ----------
 91/06/17     12.00         10     57.03        4.75        4.75
 91/06/18      2.00          2     21.25       10.63       10.63
 91/06/19      5.00          4     38.17        7.63        7.63
 91/06/20      3.00          3     14.23        4.74        4.74
 91/06/21      7.00          6     44.72        6.39        6.39
 91/06/24     12.00          9    126.28       10.52       10.52
 91/06/25      8.00          7     47.74        5.97        5.97
 91/06/26      2.00          2     40.97       20.48       20.48
 91/06/27      9.00          7     60.24        6.69        6.69
 91/06/28      3.00          3     31.00       10.33       10.33
```

# Using Cell Notation in an FML Request

In the following request, CUR_YR has the NOPRINT option. The CHGCASH RECAP expression is supposed to subtract CUR_YR from LAST_YR and NEXT_YR.

```
SET CNOTATION = ALL
DEFINE FILE LEDGER
CUR_YR/I7C = AMOUNT;
LAST_YR/I5C = .87*CUR_YR - 142;
NEXT_YR/I5C = 1.13*CUR_YR + 222;
END
TABLE FILE LEDGER
SUM CUR_YR/I5C NOPRINT LAST_YR NEXT_YR
FOR ACCOUNT
10$$ AS 'TOTAL CASH ' LABEL TOTCASH OVER
" " OVER
RECAP CHGCASH(1,3)/I5SC=(TOTCASH(*) - TOTCASH(1));
  AS 'CHANGE FROM CURRENT'
END
```

When CNOTATION = ALL, C1 refers to the CUR_YR field with its original format, C2 refers to the reformatted value, C3 is LAST_YR, and C4 is NEXT_YR. Since there is an extra column and the RECAP only refers to columns 1 and 3, the calculation for NEXT_YR - CUR_YR is not performed. The output is:

```
                    LAST_YR  NEXT_YR
                    -------  -------
TOTAL CASH           17,195   25,991

CHANGE FROM CURRENT   -4,044
```

When CNOTATION = PRINTONLY, the CUR_YR field is not assigned any column number, so there is no column 3. Therefore, no calculations are performed. The output is:

```
                    LAST_YR  NEXT_YR
                    -------  -------
TOTAL CASH           17,195   25,991

CHANGE FROM CURRENT
```

When CNOTATION = EXPLICIT, the reformatted version of the CUR_YR field is C1 because it is referenced in the request even though it is not displayed. Both calculations are performed correctly. The output is:

```
                    LAST_YR  NEXT_YR
                    -------  -------
TOTAL CASH           17,195   25,991
```

```
CHANGE FROM CURRENT   -4,044    4,752
```

# Usage Notes for Column Numbers

- BY fields are not assigned column numbers.
- ACROSS columns are assigned column numbers.
- Calculated fields are assigned column numbers.
- Column numbers outside the range of the columns created in the request are allowed under the following circumstances (and are treated as containing the value zero):
  - When specified in a COMPUTE command issued after an ACROSS phrase.
  - In a cell reference in an FML RECAP command.

  In those cases, it is not possible to know in advance how many columns will be generated by the syntax. Using a column number outside of the range in any other context generates the following message:

  ```
  (FOC258) FIELDNAME OR COMPUTATIONAL ELEMENT NOT RECOGNIZED: column
  ```

# Using FORECAST in a COMPUTE Command

A version of the FORECAST feature was implemented for use in a RECAP command. However, the use of RECAP imposes limitations on placement of the FORECAST field in the output and use of sort fields.

Using FORECAST in a COMPUTE command eliminates these limitations and enables you to place the FORECAST calculation in a Master File. For the COMPUTE version of FORECAST, each type of calculation has its own version of the FORECAST function.

# Calculating Trends and Predicting Values With FORECAST

You can calculate trends in numeric data and predict values beyond the range of those stored in the data source by using the FORECAST feature. FORECAST can be used in a report or graph request.

The calculations you can make to identify trends and forecast values are:

- **Simple moving average (FORECAST_MOVAVE).** Calculates a series of arithmetic means using a specified number of values from a field. For details, see Using FORECAST in a COMPUTE Command.
- **Exponential moving average.** Calculates a weighted average between the previously calculated value of the average and the next data point. There are three methods for using an exponential moving average:
  - **Single exponential smoothing (FORECAST_EXPAVE).** Calculates an average that allows you to choose weights to apply to newer and older values. For details, see Using FORECAST in a COMPUTE Command.
  - **Double exponential smoothing (FORECAST_DOUBLEXP).** Accounts for the tendency of data to either increase or decrease over time without repeating. For details, see Using FORECAST in a COMPUTE Command.
  - **Triple exponential smoothing (FORECAST_SEASONAL).** Accounts for the tendency of data to repeat itself in intervals over time. For details, see Using FORECAST in a COMPUTE Command.
- **Linear regression analysis (FORECAST_LINEAR).** Derives the coefficients of a straight line that best fits the data points and uses this linear equation to estimate values. For details, see Using FORECAST in a COMPUTE Command.

When predicting values in addition to calculating trends, FORECAST continues the same calculations beyond the data points by using the generated trend values as new data points. For the linear regression technique, the calculated regression equation is used to derive trend and predicted values.

FORECAST performs the calculations based on the data provided, but decisions about their use and reliability are the responsibility of the user. Therefore, the user is responsible for determining the reliability of the FORECAST predictions, based on the many factors that determine how accurate a prediction will be.

# FORECAST Processing

You invoke FORECAST processing by including one of the FORECAST functions in a COMPUTE command. FORECAST performs the specified calculation for all the existing data points and then continues them to generate the number of predicted values that you request. The parameters needed for FORECAST include the field to use in the calculations, the number of predictions to generate, and whether to display the input field values or the calculated values on the report output for the rows that represent existing data points.

FORECAST operates on the lowest sort field in the request. This is either the last ACROSS field in the request or, if the request does not contain an ACROSS field, it is the last BY field. The FORECAST calculations start over when the highest-level sort field changes its value. In a request with multiple display commands, FORECAST operates on the last ACROSS field (or if there are no ACROSS fields, the last BY field) of the last display command. When using an ACROSS field with FORECAST, the display command must be SUM or COUNT.

# Usage Notes for FORECAST

- The sort field used for FORECAST must be in a numeric or date format.
- When using simple moving average and exponential moving average methods, data values should be spaced evenly in order to get meaningful results.
- The use of column notation is not supported in the FORECAST expression. Column notation continues to be supported as before outside of this expression. The process of generating the FORECAST values creates extra columns that are not printed in the report output. The number and placement of these additional columns varies depending on the specific request.
- Missing values may lead to unexpected or unusable results and are not recommended for use with FORECAST_LINEAR.
- If you use the ESTRECORDS parameter to enable the external sort to better estimate the amount of sort work space needed, you must take into account that FORECAST with predictions creates additional records in the output.
- In a styled report, you can assign specific attributes to values predicted by FORECAST with the StyleSheet attribute WHEN=FORECAST. For example, to make the predicted values display with the color red, use the following syntax in the TABLE request:

```
ON TABLE SET STYLE *
TYPE=DATA,COLUMN=MYFORECASTSORTFIELD,WHEN=FORECAST,COLOR=RED,$
ENDSTYLE
```

# FORECAST Limits

The following are not supported with a COMPUTE command that uses FORECAST:

- BY TOTAL command.
- MORE, MATCH, FOR, and OVER phrases.

# Distinguishing Data Rows From Predicted Rows

To make the report output easier to interpret, you can create a field that indicates whether the FORECAST value in each row is a predicted value. To do this, define a virtual field whose value is a constant other than zero. Rows in the report output that represent actual records in the data source will appear with a value that is not zero. Rows that represent predicted values will display zero. You can also propagate this field to a HOLD file.

# Distinguishing Data Rows From Predicted Rows

In the following example, the DATA_ROW virtual field has the value 1 for each row in the data source. It has the value zero for the predicted rows. The PREDICT field is calculated as YES for predicted rows, and NO for rows containing data. In addition, the StyleSheet attribute WHEN=FORECAST is used to display the predicted values for the FORTOT field in red.

```
DEFINE FILE VIDEOTRK
DATA_ROW/I1 = 1;
END
TABLE FILE VIDEOTRK
SUM TRANSTOT DATA_ROW
COMPUTE
PREDICT/A3 = IF DATA_ROW NE 0 THEN 'NO' ELSE 'YES' ;
FORTOT/D12.2=FORECAST_LINEAR(MODEL_DATA,TRANSTOT,1,3);
BY TRANSDATE
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
TYPE=DATA, COLUMN=FORTOT, WHEN=FORECAST, COLOR=RED,$
ENDSTYLE
END
```

The output is shown in the following image:

| TRANSDATE | TRANSTOT | DATA_ROW | PREDICT | FORTOT |
|---|---|---|---|---|
| 06/17/91 | 57.03 | 10 | NO | 38.58 |
| 06/18/91 | 21.25 | 2 | NO | 40.32 |
| 06/19/91 | 38.17 | 4 | NO | 42.07 |
| 06/20/91 | 14.23 | 3 | NO | 43.81 |
| 06/21/91 | 44.72 | 6 | NO | 45.55 |
| 06/24/91 | 126.28 | 9 | NO | 50.78 |
| 06/25/91 | 47.74 | 7 | NO | 52.52 |
| 06/26/91 | 40.97 | 2 | NO | 54.26 |
| 06/27/91 | 60.24 | 7 | NO | 56.00 |
| 06/28/91 | 31.00 | 3 | NO | 57.74 |
| 06/29/91 | | 0 | YES | 59.48 |
| 06/30/91 | | 0 | YES | 61.23 |
| 07/01/91 | | 0 | YES | 62.97 |

# Calculating Trends and Predicting Values With FORECAST

You can calculate trends in numeric data and predict values beyond the range of those stored in the data source by using the FORECAST feature. FORECAST can be used in a report or graph request.

The calculations you can make to identify trends and forecast values are:

- Simple moving average (MOVAVE). Calculates a series of arithmetic means using a specified number of values from a field. For details, see Using a Simple Moving Average.
- **Exponential moving average.** Calculates a weighted average between the previously calculated value of the average and the next data point. There are three methods for using an exponential moving average:
  - **Single exponential smoothing (EXPAVE).** Calculates an average that allows you to choose weights to apply to newer and older values. For details, see Using Single Exponential Smoothing.
  - **Double exponential smoothing (DOUBLEXP).** Accounts for the tendency of data to either increase or decrease over time without repeating. For details, see

Using Double Exponential Smoothing.

- **Triple exponential smoothing (SEASONAL).** Accounts for the tendency of data to repeat itself in intervals over time. For details, see Using Triple Exponential Smoothing.

- **Linear regression analysis (REGRESS).** Derives the coefficients of a straight line that best fits the data points and uses this linear equation to estimate values. For details, see Usage Notes for Creating Virtual Fields.

When predicting values in addition to calculating trends, FORECAST continues the same calculations beyond the data points by using the generated trend values as new data points. For the linear regression technique, the calculated regression equation is used to derive trend and predicted values.

FORECAST performs the calculations based on the data provided, but decisions about their use and reliability are the responsibility of the user. Therefore, FORECAST predictions are not always reliable, and many factors determine how accurate a prediction will be.

# FORECAST Processing

You invoke FORECAST processing by including FORECAST in a RECAP command. In this command, you specify the parameters needed for generating estimated values, including the field to use in the calculations, the type of calculation to use, and the number of predictions to generate. The RECAP field that contains the result of FORECAST can be a new field (non-recursive) or the same field used in the FORECAST calculations (recursive):

- In a recursive FORECAST, the RECAP field that contains the results is also the field used to generate the FORECAST calculations. In this case, the original field is not printed even if it was referenced in the display command, and the RECAP column contains the original field values followed by the number of predicted values specified in the FORECAST syntax. No trend values display in the report. However, the original column is stored in an output file unless you set HOLDLIST to PRINTONLY.

- In a non-recursive FORECAST, a new field contains the results of FORECAST calculations. The new field is displayed in the report along with the original field when it is referenced in the display command. The new field contains trend values and forecast values when specified.

FORECAST operates on the last ACROSS field in the request. If the request does not contain an ACROSS field, it operates on the last BY field. The FORECAST calculations start over when the highest-level sort field changes its value. In a request with multiple display

commands, FORECAST operates on the last ACROSS field (or if there are no ACROSS fields, the last BY field) of the last display command. When using an ACROSS field with FORECAST, the display command must be SUM or COUNT.

**Note:** Although you pass parameters to FORECAST using an argument list in parentheses, FORECAST is not a function. It can coexist with a function of the same name, as long as the function is not specified in a RECAP command.

# Calculate Trends and Predict Values

MOVAVE calculation

```
ON sortfield RECAP result_field[/fmt] = FORECAST(infield, interval,
 npredict, 'MOVAVE',npoint1)sendstyle
```

EXPAVE calculation

```
ON sortfield RECAP result_field[/fmt] = FORECAST(infield, interval,
 npredict, 'EXPAVE',npoint1);
```

DOUBLEXP calculation

```
ON sortfield RECAP fld1[/fmt] = FORECAST(infield,
interval, npredict, 'DOUBLEXP',npoint1, npoint2);
```

SEASONAL calculation

```
ON sortfield RECAP fld1[/fmt] = FORECAST(infield,
interval, npredict, 'SEASONAL', nperiod, npoint1, npoint2, npoint3);
```

REGRESS calculation

```
ON sortfield RECAP result_field[/fmt] = FORECAST(infield, interval,
 npredict, 'REGRESS');
```

where:

**sortfield**

Is the last ACROSS field in the request. This field must be in numeric or date format. If the request does not contain an ACROSS field, FORECAST works on the last BY field.

**result_field**

Is the field containing the result of FORECAST. It can be a new field, or the same as *infield*. This must be a numeric field; either a real field, a virtual field, or a calculated field.

**Note:** The word FORECAST and the opening parenthesis must be on the same line as the syntax *sortfield*=.

**fmt**

Is the display format for *result_field*. The default format is D12.2. If *result_field* was previously reformatted using a DEFINE or COMPUTE command, the format specified in the RECAP command is respected.

**infield**

Is any numeric field. It can be the same field as *result_field*, or a different field. It cannot be a date-time field or a numeric field with date display options.

**interval**

Is the increment to add to each *sortfield* value (after the last data point) to create the next value. This must be a positive integer. To sort in descending order, use the BY HIGHEST phrase. The result of adding this number to the *sortfield* values is converted to the same format as *sortfield*.

For date fields, the minimal component in the format determines how the number is interpreted. For example, if the format is YMD, MDY, or DMY, an interval value of 2 is interpreted as meaning two days; if the format is YM, the 2 is interpreted as meaning two months.

**npredict**

Is the number of predictions for FORECAST to calculate. It must be an integer greater than or equal to zero. Zero indicates that you do not want predictions, and is only supported with a non-recursive FORECAST. For the SEASONAL method, npredict is the number of *periods* to calculate. The number of *points* generated is:

```
nperiod * npredict
```

**nperiod**

For the SEASONAL method, is a positive whole number that specifies the number of data points in a period.

**npoint1**

Is the number of values to average for the MOVAVE method. For EXPAVE, DOUBLEXP, and SEASONAL, this number is used to calculate the weights for each component in the average. This value must be a positive whole number. The weight, k, is calculated by the following formula:

```
k=2/(1+npoint1)
```

**npoint2**

For DOUBLEXP and SEASONAL, this positive whole number is used to calculate the weights for each term in the trend. The weight, g, is calculated by the following formula:

```
g=2/(1+npoint2)
```

**npoint3**

For SEASONAL, this positive whole number is used to calculate the weights for each term in the seasonal adjustment. The weight, p, is calculated by the following formula:

```
p=2/(1+npoint3)
```

# Usage Notes for FORECAST

- The sort field used for FORECAST must be in a numeric or date format.
- When using simple moving average and exponential moving average methods, data values should be spaced evenly in order to get meaningful results.
- When using a RECAP command with FORECAST, the command can contain only the FORECAST syntax. FORECAST does not recognize any syntax after the closing

semicolon (;). To specify options such as AS or IN:

  - In a non-recursive FORECAST request, use an empty COMPUTE command prior to the RECAP.
  - In a recursive FORECAST request, specify the options when the field is first referenced in the report request.

- The use of column notation is not supported in a request that includes FORECAST. The process of generating the FORECAST values creates extra columns that are not printed in the report output. The number and placement of these additional columns varies depending on the specific request.
- A request can contain up to seven non-FORECAST RECAP commands and up to seven additional FORECAST RECAP commands.
- The left side of a RECAP command used for FORECAST supports the CURR attribute for creating a currency-denominated field.
- Recursive and non-recursive REGRESS are not supported in the same request when the display command is SUM, ADD, or WRITE.
- Missing values are not supported with REGRESS.
- If you use the ESTRECORDS parameter to enable the external sort to estimate better the amount of sort work space needed, you must take into account that FORECAST with predictions creates additional records in the output.
- In a styled report, you can assign specific attributes to values predicted by FORECAST with the StyleSheet attribute WHEN=FORECAST. For example, to make the predicted values display with the color red, use the following syntax in the TABLE request:

```
ON TABLE SET STYLE
*TYPE=DATA,COLUMN=MYFORECASTSORTFIELD,WHEN=FORECAST,COLOR=RED,
$ENDSTYLE
```

# FORECAST Limits

The following are not supported with a RECAP command that uses FORECAST:

- BY TOTAL command.
- MORE, MATCH, FOR, and OVER phrases.

- SUMMARIZE and RECOMPUTE are not supported for the same sort field used for FORECAST.
- MISSING attribute.

# Using a Simple Moving Average

A simple moving average is a series of arithmetic means calculated with a specified number of values from a field. Each new mean in the series is calculated by dropping the first value used in the prior calculation, and adding the next data value to the calculation.

Simple moving averages are sometimes used to analyze trends in stock prices over time. In this scenario, the average is calculated using a specified number of periods of stock prices. A disadvantage to this indicator is that because it drops the oldest values from the calculation as it moves on, it loses its memory over time. Also, mean values are distorted by extreme highs and lows, since this method gives equal weight to each point.

Predicted values beyond the range of the data values are calculated using a moving average that treats the calculated trend values as new data points.

The first complete moving average occurs at the $n^{th}$ data point because the calculation requires *n* values. This is called the lag. The moving average values for the lag rows are calculated as follows: the first value in the moving average column is equal to the first data value, the second value in the moving average column is the average of the first two data values, and so on until the $n^{th}$ row, at which point there are enough values to calculate the moving average with the number of values specified.

# Calculating a New Simple Moving Average Column

This request defines an integer value named PERIOD to use as the independent variable for the moving average. It predicts three periods of values beyond the range of the retrieved data.

```
DEFINE FILE GGSALES
 SDATE/YYM = DATE;
 SYEAR/Y = SDATE;
 SMONTH/M = SDATE;
 PERIOD/I2 = SMONTH;
END
```

```
TABLE FILE GGSALES
  SUM UNITS DOLLARS
  BY  CATEGORY BY PERIOD
  WHERE SYEAR EQ 97 AND CATEGORY NE 'Gifts'
  ON PERIOD RECAP MOVAVE/D10.1= FORECAST(DOLLARS,1,3,'MOVAVE',3);
END
```

The output is:

| Category | PERIOD | Unit Sales | Dollar Sales | MOVAVE |
|---|---|---|---|---|
| Coffee | 1 | 61666 | 801123 | 801,123.0 |
| | 2 | 54870 | 682340 | 741,731.5 |
| | 3 | 61608 | 765078 | 749,513.7 |
| | 4 | 57050 | 691274 | 712,897.3 |
| | 5 | 59229 | 720444 | 725,598.7 |
| | 6 | 58466 | 742457 | 718,058.3 |
| | 7 | 60771 | 747253 | 736,718.0 |
| | 8 | 54633 | 655896 | 715,202.0 |
| | 9 | 57829 | 730317 | 711,155.3 |
| | 10 | 57012 | 724412 | 703,541.7 |
| | 11 | 51110 | 620264 | 691,664.3 |
| | 12 | 58981 | 762328 | 702,334.7 |
| | 13 | 0 | 0 | 694,975.6 |
| | 14 | 0 | 0 | 719,879.4 |
| | 15 | 0 | 0 | 705,729.9 |
| Food | 1 | 54394 | 672727 | 672,727.0 |
| | 2 | 54894 | 699073 | 685,900.0 |
| | 3 | 52713 | 642802 | 671,534.0 |
| | 4 | 58026 | 718514 | 686,796.3 |
| | 5 | 53289 | 660740 | 674,018.7 |
| | 6 | 58742 | 734705 | 704,653.0 |
| | 7 | 60127 | 760586 | 718,677.0 |
| | 8 | 55622 | 695235 | 730,175.3 |
| | 9 | 55787 | 683140 | 712,987.0 |
| | 10 | 57340 | 713768 | 697,381.0 |
| | 11 | 57459 | 710138 | 702,348.7 |
| | 12 | 57290 | 705315 | 709,740.3 |
| | 13 | 0 | 0 | 708,397.8 |
| | 14 | 0 | 0 | 707,817.7 |
| | 15 | 0 | 0 | 708,651.9 |

In the report, the number of values to use in the average is 3 and there are no UNITS or DOLLARS values for the generated PERIOD values.

Each average (MOVAVE value) is computed using DOLLARS values where they exist. The calculation of the moving average begins in the following way:

- The first MOVAVE value (801,123.0) is equal to the first DOLLARS value.
- The second MOVAVE value (741,731.5) is the mean of DOLLARS values one and two: (801,123 + 682,340) /2.
- The third MOVAVE value (749,513.7) is the mean of DOLLARS values one through three: (801,123 + 682,340 + 765,078) / 3.
- The fourth MOVAVE value (712,897.3) is the mean of DOLLARS values two through four: (682,340 + 765,078 + 691,274) /3.

For predicted values beyond the supplied values, the calculated MOVAVE values are used as new data points to continue the moving average. The predicted MOVAVE values (starting with 694,975.6 for PERIOD 13) are calculated using the previous MOVAVE values as new data points. For example, the first predicted value (694,975.6) is the average of the data points from periods 11 and 12 (620,264 and 762,328) and the moving average for period 12 (702,334.7). The calculation is: 694,975 = (620,264 + 762,328 + 702,334.7)/3.

# Using an Existing Field as a Simple Moving Average Column

This request defines an integer value named PERIOD to use as the independent variable for the moving average. It predicts three periods of values beyond the range of the retrieved data. It uses the same name for the RECAP field as the first argument in the FORECAST parameter list. The trend values do not display in the report. The actual data values for DOLLARS are followed by the predicted values in the report column.

```
DEFINE FILE GGSALES
 SDATE/YYM = DATE;
 SYEAR/Y = SDATE;
 SMONTH/M = SDATE;
 PERIOD/I2 = SMONTH;
END
TABLE FILE GGSALES
  SUM UNITS DOLLARS
  BY  CATEGORY BY PERIOD
  WHERE SYEAR EQ 97 AND CATEGORY NE 'Gifts'
  ON PERIOD RECAP DOLLARS/D10.1 = FORECAST(DOLLARS,1,3,'MOVAVE',3);
END
```

The output is:

| Category | PERIOD | Unit Sales | DOLLARS |
|---|---|---|---|
| Coffee | 1 | 61666 | 801,123.0 |
| | 2 | 54870 | 682,340.0 |
| | 3 | 61608 | 765,078.0 |
| | 4 | 57050 | 691,274.0 |
| | 5 | 59229 | 720,444.0 |
| | 6 | 58466 | 742,457.0 |
| | 7 | 60771 | 747,253.0 |
| | 8 | 54633 | 655,896.0 |
| | 9 | 57829 | 730,317.0 |
| | 10 | 57012 | 724,412.0 |
| | 11 | 51110 | 620,264.0 |
| | 12 | 58981 | 762,328.0 |
| | 13 | 0 | 694,975.0 |
| | 14 | 0 | 719,879.0 |
| | 15 | 0 | 705,729.0 |
| Food | 1 | 54394 | 672,727.0 |
| | 2 | 54894 | 699,073.0 |
| | 3 | 52713 | 642,802.0 |
| | 4 | 58026 | 718,514.0 |
| | 5 | 53289 | 660,740.0 |
| | 6 | 58742 | 734,705.0 |
| | 7 | 60127 | 760,586.0 |
| | 8 | 55622 | 695,235.0 |
| | 9 | 55787 | 683,140.0 |
| | 10 | 57340 | 713,768.0 |
| | 11 | 57459 | 710,138.0 |
| | 12 | 57290 | 705,315.0 |
| | 13 | 0 | 708,397.0 |
| | 14 | 0 | 707,817.0 |
| | 15 | 0 | 708,651.0 |

# Using Single Exponential Smoothing

The single exponential smoothing method calculates an average that allows you to choose weights to apply to newer and older values.

The following formula determines the weight given to the newest value.

```
k = 2/(1+n)
```

where:

**k**

Is the newest value.

**n**

Is an integer greater than one. Increasing *n* increases the weight assigned to the earlier observations (or data instances), as compared to the later ones.

The next calculation of the exponential moving average (EMA) value is derived by the following formula:

```
EMA = (EMA * (1-k)) + (datavalue * k)
```

This means that the newest value from the data source is multiplied by the factor *k* and the current moving average is multiplied by the factor (1-*k*). These quantities are then summed to generate the new EMA.

**Note:** When the data values are exhausted, the last data value in the sort group is used as the next data value.

# Calculating a Single Exponential Smoothing Column

The following defines an integer value named PERIOD to use as the independent variable for the moving average. It predicts three periods of values beyond the range of retrieved data.

```
DEFINE FILE GGSALES
 SDATE/YYM = DATE;
 SYEAR/Y = SDATE;
 SMONTH/M = SDATE;
 PERIOD/I2 = SMONTH;
END
TABLE FILE GGSALES
  SUM UNITS DOLLARS
  BY  CATEGORY BY PERIOD
  WHERE SYEAR EQ 97 AND CATEGORY NE 'Gifts'
  ON PERIOD RECAP EXPAVE/D10.1= FORECAST(DOLLARS,1,3,'EXPAVE',3);
END
```

The output is:

| Category | PERIOD | Unit Sales | Dollar Sales | EXPAVE |
|---|---|---|---|---|
| Coffee | 1 | 61666 | 801123 | 801,123.0 |
| | 2 | 54870 | 682340 | 741,731.5 |
| | 3 | 61608 | 765078 | 753,404.8 |
| | 4 | 57050 | 691274 | 722,339.4 |
| | 5 | 59229 | 720444 | 721,391.7 |
| | 6 | 58466 | 742457 | 731,924.3 |
| | 7 | 60771 | 747253 | 739,588.7 |
| | 8 | 54633 | 655896 | 697,742.3 |
| | 9 | 57829 | 730317 | 714,029.7 |
| | 10 | 57012 | 724412 | 719,220.8 |
| | 11 | 51110 | 620264 | 669,742.4 |
| | 12 | 58981 | 762328 | 716,035.2 |
| | 13 | 0 | 0 | 716,035.2 |
| | 14 | 0 | 0 | 716,035.2 |
| | 15 | 0 | 0 | 716,035.2 |
| Food | 1 | 54394 | 672727 | 672,727.0 |
| | 2 | 54894 | 699073 | 685,900.0 |
| | 3 | 52713 | 642802 | 664,351.0 |
| | 4 | 58026 | 718514 | 691,432.5 |
| | 5 | 53289 | 660740 | 676,086.3 |
| | 6 | 58742 | 734705 | 705,395.6 |
| | 7 | 60127 | 760586 | 732,990.8 |
| | 8 | 55622 | 695235 | 714,112.9 |
| | 9 | 55787 | 683140 | 698,626.5 |
| | 10 | 57340 | 713768 | 706,197.2 |
| | 11 | 57459 | 710138 | 708,167.6 |
| | 12 | 57290 | 705315 | 706,741.3 |
| | 13 | 0 | 0 | 706,028.3 |
| | 14 | 0 | 0 | 705,671.6 |
| | 15 | 0 | 0 | 705,493.3 |

In the report, three predicted values of EXPAVE are calculated within each value of CATEGORY. For values outside the range of the data, new PERIOD values are generated by adding the interval value (1) to the prior PERIOD value.

Each average (EXPAVE value) is computed using DOLLARS values where they exist. The calculation of the moving average begins in the following way:

- The first EXPAVE value (801,123.0) is the same as the first DOLLARS value.
- The second EXPAVE value (741,731.5) is calculated as follows. Note that because of rounding and the number of decimal places used, the value derived in this sample calculation varies slightly from the one displayed in the report output:

```
n=3 (number used to calculate weights)
```

```
k = 2/(1+n) = 2/4 = 0.5
```

```
EXPAVE = (EXPAVE*(1-k))+(new-DOLLARS*k) = (801123*0.5) +
(682340*0.50) = 400561.5 + 341170 = 741731.5
```

- The third EXPAVE value (753,404.8) is calculated as follows:

```
EXPAVE = (EXPAVE*(1-k))+(new-DOLLARS*k) = (741731.5*0.5)+
(765078*0.50) = 370865.75 + 382539 = 753404.75
```

For predicted values beyond those supplied, the last EXPAVE value is used as the new data point in the exponential smoothing calculation. The predicted EXPAVE values (starting with 706,741.6) are calculated using the previous average and the new data point. Because the previous average is also used as the new data point, the predicted values are always equal to the last trend value. For example, the previous average for period 13 is 706,741.6, and this is also used as the next data point. Therefore, the average is calculated as follows: (706,741.6 * 0.5) + (706,741.6 * 0.5) = 706,741.6

```
EXPAVE = (EXPAVE * (1-k)) + (new-DOLLARS * k) = (706741.6*0.5) +
         (706741.6*0.50) =  353370.8 + 353370.8 = 706741.6
```

# Using Double Exponential Smoothing

Double exponential smoothing produces an exponential moving average that takes into account the tendency of data to either increase or decrease over time without repeating. This is accomplished by using two equations with two constants.

- The first equation accounts for the current time period and is a weighted average of the current data value and the prior average, with an added component (b) that represents the trend for the previous period. The weight constant is k:

```
DOUBLEXP(t) = k * datavalue(t) + (1-k) * ((DOUBLEXP(t-1) + b(t-1))
```

- The second equation is the calculated trend value, and is a weighted average of the difference between the current and previous average and the trend for the previous time period. b(*t*) represents the average trend. The weight constant is g:

```
b(t) = g * (DOUBLEXP(t)-DOUBLEXP(t-1)) + (1 - g) * (b(t-1))
```

These two equations are solved to derive the smoothed average. The first smoothed average is set to the first data value. The first trend component is set to zero. For choosing the two constants, the best results are usually obtained by minimizing the mean-squared error (MSE) between the data values and the calculated averages. You may need to use nonlinear optimization techniques to find the optimal constants.

The equation used for forecasting beyond the data points with double exponential smoothing is

```
forecast(t+m) = DOUBLEXP(t) + m * b(t)
```

where:

**m**

Is the number of time periods ahead for the forecast.

# Calculating a Double Exponential Smoothing Column

The following defines an integer value named PERIOD to use as the independent variable for the moving average. The double exponential smoothing method estimates the trend in the data points better than the single smoothing method:

```
SET HISTOGRAM = OFF
TABLE FILE CENTSTMT
SUM ACTUAL_YTD
  BY PERIOD
  ON PERIOD RECAP EXP/D15.1 = FORECAST(ACTUAL_YTD,1,0,'EXPAVE',3);
  ON PERIOD RECAP DOUBLEXP/D15.1 = FORECAST(ACTUAL_YTD,1,0,
     'DOUBLEXP',3,3);
WHERE GL_ACCOUNT LIKE '3%%%'
END
```

The output is:

| PERIOD | YTD Actual | EXP | DOUBLEXP |
|---|---|---|---|
| 2002/01 | 12,957,681. | 12,957,681.0 | 12,957,681.0 |
| 2002/02 | 25,441,971. | 19,199,826.0 | 22,439,246.3 |
| 2002/03 | 39,164,321. | 29,182,073.5 | 34,791,885.1 |
| 2002/04 | 52,733,326. | 40,957,699.8 | 48,845,816.0 |
| 2002/05 | 66,765,920. | 53,861,809.9 | 63,860,955.9 |
| 2002/06 | 80,952,492. | 67,407,150.9 | 79,188,052.9 |

# Using Triple Exponential Smoothing

Triple exponential smoothing produces an exponential moving average that takes into account the tendency of data to repeat itself in intervals over time. For example, sales data that is growing and in which 25% of sales always occur during December contains both trend and seasonality. Triple exponential smoothing takes both the trend and seasonality into account by using three equations with three constants.

For triple exponential smoothing you, need to know the number of data points in each time period (designated as L in the following equations). To account for the seasonality, a seasonal index is calculated. The data is divided by the prior season index and then used in calculating the smoothed average.

- The first equation accounts for the current time period, and is a weighted average of the current data value divided by the seasonal factor and the prior average adjusted for the trend for the previous period. The weight constant is k:

  ```
  SEASONAL(t) = k * (datavalue(t)/I(t-L)) + (1-k) * (SEASONAL(t-1) +
  b(t-1))
  ```

- The second equation is the calculated trend value, and is a weighted average of the difference between the current and previous average and the trend for the previous time period. b(*t*) represents the average trend. The weight constant is g:

  ```
  b(t) = g * (SEASONAL(t)-SEASONAL(t-1)) + (1-g) * (b(t-1))
  ```

- The third equation is the calculated seasonal index, and is a weighted average of the current data value divided by the current average and the seasonal index for the previous season. I(*t*) represents the average seasonal coefficient. The weight constant

is p:

```
I(t) = p * (datavalue(t)/SEASONAL(t)) + (1 - p) * I(t-L)
```

These equations are solved to derive the triple smoothed average. The first smoothed average is set to the first data value. Initial values for the seasonality factors are calculated based on the maximum number of full periods of data in the data source, while the initial trend is calculated based on two periods of data. These values are calculated with the following steps:

1. The initial trend factor is calculated by the following formula:

   ```
   b(0) = (1/L) ((y(L+1)-y(1))/L + (y(L+2)-y(2))/L + ... + (y(2L) -
   y(L))/L )
   ```

2. The calculation of the initial seasonality factor is based on the average of the data values within each period, A(j) (1<=j<=N):

   ```
   A(j) = ( y((j-1)L+1) + y((j-1)L+2) + ... + y(jL) ) / L
   ```

3. Then, the initial periodicity factor is given by the following formula, where N is the number of full periods available in the data, L is the number of points per period and n is a point within the period (1<= n <= L):

   ```
   I(n) = ( y(n)/A(1) + y(L+n)/A(2) + ... + y((N-1)L+n)/A(N) ) / N
   ```

The three constants must be chosen carefully. The best results are usually obtained by choosing the constants to minimize the mean-squared error (MSE) between the data values and the calculated averages. Varying the values of npoint1 and npoint2 affect the results, and some values may produce a better approximation. To search for a better approximation, you may want to find values that minimize the MSE.

The equation used to forecast beyond the last data point with triple exponential smoothing is:

```
forecast(t+m) = (SEASONAL(t) + m * b(t)) / I(t-L+MOD(m/L))
```

where:

**m**

Is the number of periods ahead for the forecast.

# Calculating a Triple Exponential Smoothing Column

In the following, the data has seasonality but no trend. Therefore, *npoint2* is set high (1000) to make the trend factor negligible in the calculation:

```
SET HISTOGRAM = OFF
TABLE FILE VIDEOTRK
SUM TRANSTOT
BY  TRANSDATE
ON TRANSDATE RECAP SEASONAL/D10.1 = FORECAST(TRANSTOT,1,3,'SEASONAL',
   3,3,1000,1);
WHERE TRANSDATE NE '19910617'
END
```

In the output, *npredict* is 3. Therefore, three periods (nine points, *nperiod* * *npredict*) are generated.

| TRANSDATE | TRANSTOT | SEASONAL |
|---|---|---|
| 91/06/18 | 21.25 | 21.3 |
| 91/06/19 | 38.17 | 31.0 |
| 91/06/20 | 14.23 | 34.6 |
| 91/06/21 | 44.72 | 53.2 |
| 91/06/24 | 126.28 | 75.3 |
| 91/06/25 | 47.74 | 82.7 |
| 91/06/26 | 40.97 | 73.7 |
| 91/06/27 | 60.24 | 62.9 |
| 91/06/28 | 31.00 | 66.3 |
| 91/06/29 | | 45.7 |
| 91/06/30 | | 94.1 |
| 91/07/01 | | 53.4 |
| 91/07/02 | | 72.3 |
| 91/07/03 | | 140.0 |
| 91/07/04 | | 75.8 |
| 91/07/05 | | 98.9 |
| 91/07/06 | | 185.8 |
| 91/07/07 | | 98.2 |

# Using a Linear Regression Equation

The Linear Regression Equation estimates values by assuming that the dependent variable (the new calculated values) and the independent variable (the sort field values) are related by a function that represents a straight line:

```
y = mx + b
```

where:

**y**

Is the dependent variable.

**x**

Is the independent variable.

**m**

Is the slope of the line.

**b**

Is the y-intercept.

REGRESS uses a technique called Ordinary Least Squares to calculate values for *m* and *b* that minimize the sum of the squared differences between the data and the resulting line.

The following formulas show how *m* and *b* are calculated.

$$m = \frac{(\sum xy - (\sum x \bullet \sum y)/n)}{(\sum x^2 - (\sum x)^2/n)}$$

$$b = (\sum y)/n - (m \bullet (\sum x)/n)$$

where:

**n**

Is the number of data points.

**y**

Is the data values (dependent variables).

**x**

Is the sort field values (independent variables).

Trend values, as well as predicted values, are calculated using the regression line equation.

# Calculating a New Linear Regression Field

```
TABLE FILE CAR
PRINT MPG
BY DEALER_COST
WHERE MPG NE 0.0
  ON DEALER_COST RECAP FORMPG=FORECAST(MPG,1000,3,'REGRESS');
END
```

The output is:

```
DEALER_COSTMPGFORMPG
      2,886       27           25.51
      4,292       25           23.65
      4,631       21           23.20
      4,915       21           22.82
      5,063       23           22.63
      5,660       21           21.83
                  21           21.83
      5,800       24           21.65
      6,000       24           21.38
      7,427       16           19.49
      8,300       18           18.33
      8,400       18           18.20
     10,000       18           16.08
     11,000       18           14.75
     11,194        9           14.50
     14,940       11            9.53
     15,940        0            8.21
     16,940        0            6.88
     17,940        0            5.55
```

**Note:**

- Three predicted values of FORMPG are calculated. For values outside the range of the data, new DEALER_COST values are generated by adding the interval value (1,000) to the prior DEALER_COST value.
- There are no MPG values for the generated DEALER_COST values.
- Each FORMPG value is computed using a regression line, calculated using all of the actual data values for MPG.

  DEALER_COST is the independent variable (x) and MPG is the dependent variable (y). The equation is used to calculate MPGFORECAST trend and predicted values.

  In this case, the equation is approximately as follows:

  ```
  FORMPG = (-0.001323 * DEALER_COST) + 29.32
  ```

  The predicted values are (the values are not exactly as calculated by FORECAST because of rounding, but they show the calculation process).

| DEALER_COST | Calculation | FORMPG |
|---|---|---|
| 15,940 | (-0.001323 * 15,940) + 29.32 | 8.23 |
| 16,940 | (-0.001323 * 16,940) + 29.32 | 6.91 |
| 17,940 | (-0.001323 * 17,940) + 29.32 | 5.59 |

# FORECAST Reporting Techniques

You can use FORECAST multiple times in one request. However, all FORECAST requests must specify the same sort field, interval, and number of predictions. The only things that can change are the RECAP field, method, field used to calculate the FORECAST values, and number of points to average. If you change any of the other parameters, the new parameters are ignored.

If you want to move a FORECAST column in the report output, use an empty COMPUTE command for the FORECAST field as a placeholder. The data type (I, F, P, D) must be the same in the COMPUTE command and the RECAP command.

To make the report output easier to interpret, you can create a field that indicates whether the FORECAST value in each row is a predicted value. To do this, define a virtual field whose value is a constant other than zero. Rows in the report output that represent actual records in the data source will appear with this constant. Rows that represent predicted values will display zero. You can also propagate this field to a HOLD file.

# Generating Multiple FORECAST Columns in a Request

This example calculates moving averages and exponential averages for both the DOLLARS and BUDDOLLARS fields in the GGSALES data source. The sort field, interval, and number of predictions are the same for all of the calculations.

```
DEFINE FILE GGSALES
 SDATE/YYM = DATE;
 SYEAR/Y = SDATE;
```

```
 SMONTH/M = SDATE;
 PERIOD/I2 = SMONTH;
END
TABLE FILE GGSALES
  SUM DOLLARS AS 'DOLLARS' BUDDOLLARS AS 'BUDGET'
  BY CATEGORY NOPRINT BY PERIOD AS 'PER'
  WHERE SYEAR EQ 97 AND CATEGORY EQ 'Coffee'
  ON PERIOD RECAP DOLMOVAVE/D10.1= FORECAST(DOLLARS,1,0,'MOVAVE',3);
  ON PERIOD RECAP DOLEXPAVE/D10.1= FORECAST(DOLLARS,1,0,'EXPAVE',4);
  ON PERIOD RECAP BUDMOVAVE/D10.1 = FORECAST(BUDDOLLARS,1,0,'MOVAVE',3);
  ON PERIOD RECAP BUDEXPAVE/D10.1 = FORECAST(BUDDOLLARS,1,0,'EXPAVE',4);
END
```

The output is shown in the following image.

| PER | DOLLARS | BUDGET | DOLMOVAVE | DOLEXPAVE | BUDMOVAVE | BUDEXPAVE |
|---|---|---|---|---|---|---|
| 1 | 801123 | 801375 | 801,123.0 | 801,123.0 | 801,375.0 | 801,375.0 |
| 2 | 682340 | 725117 | 741,731.5 | 753,609.8 | 763,246.0 | 770,871.8 |
| 3 | 765078 | 810367 | 749,513.7 | 758,197.1 | 778,953.0 | 786,669.9 |
| 4 | 691274 | 717688 | 712,897.3 | 731,427.8 | 751,057.3 | 759,077.1 |
| 5 | 720444 | 739999 | 725,598.7 | 727,034.3 | 756,018.0 | 751,445.9 |
| 6 | 742457 | 742586 | 718,058.3 | 733,203.4 | 733,424.3 | 747,901.9 |
| 7 | 747253 | 773136 | 736,718.0 | 738,823.2 | 751,907.0 | 757,995.6 |
| 8 | 655896 | 685170 | 715,202.0 | 705,652.3 | 733,630.7 | 728,865.3 |
| 9 | 730317 | 753760 | 711,155.3 | 715,518.2 | 737,355.3 | 738,823.2 |
| 10 | 724412 | 709397 | 703,541.7 | 719,075.7 | 716,109.0 | 727,052.7 |
| 11 | 620264 | 630452 | 691,664.3 | 679,551.0 | 697,869.7 | 688,412.4 |
| 12 | 762328 | 718837 | 702,334.7 | 712,661.8 | 686,228.7 | 700,582.3 |

# Moving the FORECAST Column

The following example places the DOLLARS field after the MOVAVE field by using an empty COMPUTE command as a placeholder for the MOVAVE field. Both the COMPUTE command and the RECAP command specify formats for MOVAVE (of the same data type), but the format of the RECAP command takes precedence.

```
DEFINE FILE GGSALES
 SDATE/YYM = DATE;
 SYEAR/Y = SDATE;
 SMONTH/M = SDATE;
 PERIOD/I2 = SMONTH;
END
TABLE FILE GGSALES
SUM   UNITS
COMPUTE MOVAVE/D10.2 = ;
DOLLARS
```

```
  BY CATEGORY BY PERIOD
  WHERE SYEAR EQ 97 AND CATEGORY EQ 'Coffee'
  ON PERIOD RECAP MOVAVE/D10.1= FORECAST(DOLLARS,1,3,'MOVAVE',3);
END
```

The output is shown in the following image.

```
CategoryPERIODUnit SalesMOVAVEDollar Sales
Coffee             1       61666     801,123.0        801123
                   2       54870     741,731.5        682340
                   3       61608     749,513.7        765078
                   4       57050     712,897.3        691274
                   5       59229     725,598.7        720444
                   6       58466     718,058.3        742457
                   7       60771     736,718.0        747253
                   8       54633     715,202.0        655896
                   9       57829     711,155.3        730317
                  10       57012     703,541.7        724412
                  11       51110     691,664.3        620264
                  12       58981     702,334.7        762328
                  13           0     694,975.6             0
                  14           0     719,879.4             0
                  15           0     705,729.9             0
```

# Distinguishing Data Rows From Predicted Rows

In the following example, the DATA_ROW virtual field has the value 1 for each row in the data source. It has the value zero for the predicted rows. The PREDICT field is calculated as YES for predicted rows, and NO for rows containing data.

```
DEFINE FILE CAR
DATA_ROW/I1 = 1;
END
TABLE FILE CAR
  PRINT DATA_ROW
COMPUTE PREDICT/A3 = IF DATA_ROW EQ 1 THEN 'NO' ELSE 'YES' ;
MPG
BY DEALER_COST
WHERE MPG GE 20
  ON DEALER_COST RECAP FORMPG/D12.2=FORECAST(MPG,1000,3,'REGRESS');
  ON DEALER_COST RECAP MPG         =FORECAST(MPG,1000,3,'REGRESS');
END
```

The output is:

```
DEALER_COSTDATA_ROWPREDICTMPGFORMPG
      2,886          1  NO                 27.00           25.65
      4,292          1  NO                 25.00           23.91
      4,631          1  NO                 21.00           23.49
      4,915          1  NO                 21.00           23.14
      5,063          1  NO                 23.00           22.95
      5,660          1  NO                 21.00           22.21
                     1  NO                 21.00           22.21
      5,800          1  NO                 24.20           22.04
      6,000          1  NO                 24.20           21.79
      7,000          0  YES                20.56           20.56
      8,000          0  YES                19.32           19.32
      9,000          0  YES                18.08           18.08
```

# Calculating Trends and Predicting Values With Multivariate REGRESS

The REGRESS method derives a linear equation that best fits a set of numeric data points, and uses this equation to create a new column in the report output. The equation can be based on one to three independent variables.

This method estimates values by assuming that the dependent variable (*y*, the new calculated values) and the independent variables (*x1*, *x2*, *x3*) are related by the following linear equation:

```
y = a1*x1 [+ a2*x2 [+ a3*x3]] + b
```

When there is one independent variable, the equation represents a straight line. This produces the same values as FORECAST using the REGRESS method. When there are two independent variables, the equation represents a plane, and with three independent variables, it represents a hyperplane. You should use this technique when you have reason to believe that the dependent variable can be approximated by a linear combination of the independent variables.

REGRESS uses a technique called Ordinary Least Squares to calculate values for the coefficients (*a1*, *a2*, *a3*, and *b*) that minimize the sum of the squared differences between the data and the resulting line, plane, or hyperplane.

# Create a Multivariate Linear Regression Column

```
ON {sortfield} RECAP y[/fmt] = REGRESS(n, x1, [x2, [x3,]] z);
```

where:

**sortfield**

Is a field in the data source. It cannot be the same field as any of the parameters to REGRESS. A new linear regression equation is derived each time the sort field value changes.

**y**

Is the new numeric column calculated by applying the regression equation. You cannot DEFINE or COMPUTE a field with this name.

**fmt**

Is the display format for y. If it is omitted, the default format is D12.2.

**n**

Is a whole number from 1 to 3 indicating the number of independent variables.

**x1, x2, x3**

Are the field names to be used as the independent variables. All of these variables must be numeric and be independent of each other.

**z**

Is an existing numeric field that is assumed to be approximately linearly dependent on the independent variables and is used to derive the regression equation.

# Usage Notes for REGRESS

- The (By) sort field used with REGRESS must be in a numeric or date format.
- REGRESS cannot operate on an ACROSS field.
- If any of the independent variables are also sort fields, they cannot be referenced in

the request prior to the REGRESS sort field.

- FORECAST and REGRESS cannot be used in the same request, and only one REGRESS is supported in a request. Non-REGRESS RECAP commands are supported.
- The RECAP command used with REGRESS can contain only the REGRESS syntax. REGRESS does not recognize any syntax after the closing semicolon (;).
- Although you pass parameters to REGRESS using an argument list in parentheses, REGRESS is not a function. It can coexist with a user-written subroutine of the same name, as long as the user-written subroutine is not specified in a RECAP command.
- BY TOTAL is not supported.
- MORE, MATCH, FOR, and OVER are not supported.
- The process of generating the REGRESS values creates extra columns that are not printed in the report output. The number and placement of these additional columns varies depending on the specific request. Therefore, use of column notation is not supported in a request that includes REGRESS.
- SUMMARIZE and RECOMPUTE are not supported for the same sort field used for REGRESS.
- REGRESS is not supported for the FOCUS GRAPH facility.
- The left side of a RECAP command used for REGRESS supports the CURR attribute for creating a currency-denominated field.
- Fields with missing values cannot be used in the regression.
- Larger amounts of data produce more useful results.

# Creating a Multivariate Linear Regression Column

The following request uses the GGSALES data source to calculate an estimated DOLLARS column. The BUDUNITS, UNITS, and BUDDOLLARS fields are the independent variables. The DOLLARS field provides the actual values to be estimated:

```
DEFINE FILE GGSALES
 YEAR/Y = DATE;
 MONTH/M = DATE;
 PERIOD/I2 = MONTH;
END
```

```
TABLE FILE GGSALES
PRINT BUDUNITS UNITS BUDDOLLARS DOLLARS
BY PERIOD
ON PERIOD
RECAP EST_DOLLARS/F8 = REGRESS(3, BUDUNITS, UNITS, BUDDOLLARS, DOLLARS);
WHERE CATEGORY EQ 'Coffee'
WHERE REGION EQ 'West'
WHERE UNITS GT 1600 AND UNITS LT 1700
END
```

The output is:

| PERIOD | Budget Units | Unit Sales | Budget Dollars | Dollar Sales | EST_DOLLARS |
|---|---|---|---|---|---|
| 1 | 1665 | 1678 | 21645 | 23492 | 0 |
| | 1725 | 1669 | 22425 | 21697 | 0 |
| 2 | 1613 | 1685 | 22582 | 18535 | 19065 |
| | 1568 | 1682 | 23520 | 25230 | 19089 |
| | 1847 | 1668 | 18470 | 25020 | 19725 |
| 3 | 1646 | 1656 | 23044 | 19872 | 19871 |
| | 1759 | 1615 | 17590 | 17765 | 17765 |
| | 1498 | 1637 | 16478 | 21281 | 21280 |
| | 1653 | 1694 | 21489 | 16940 | 16940 |
| 4 | 1457 | 1671 | 21855 | 20052 | 0 |
| 5 | 1662 | 1674 | 24930 | 18414 | 0 |
| 6 | 1825 | 1695 | 23725 | 25425 | 32228 |
| | 1870 | 1620 | 24310 | 24300 | 30866 |
| | 1712 | 1640 | 22256 | 16400 | 31859 |
| 7 | 1727 | 1623 | 24178 | 17853 | -26821 |
| | 1733 | 1647 | 17330 | 24705 | -13637 |
| 8 | 1830 | 1652 | 20130 | 23128 | 51170 |
| | 1451 | 1660 | 17412 | 19920 | 15755 |
| | 1556 | 1643 | 18672 | 18073 | 20517 |
| 9 | 1464 | 1663 | 14640 | 23282 | 18249 |
| | 1463 | 1663 | 21945 | 19956 | 23005 |
| 10 | 1464 | 1667 | 17568 | 25005 | 25005 |
| | 1711 | 1623 | 20532 | 22722 | 22722 |
| | 1701 | 1626 | 18711 | 21138 | 21138 |
| | 1473 | 1616 | 14730 | 16160 | 16160 |
| 11 | 1403 | 1601 | 21045 | 17611 | 0 |
| 12 | 1796 | 1696 | 17960 | 25440 | 0 |

# Using Text Fields in DEFINE and COMPUTE

Text fields can be assigned to alphanumeric fields and receive assignment from alphanumeric fields. If an alphanumeric field is assigned the value of a text field that is too long for the alphanumeric field, the value is truncated before being assigned to the alphanumeric field.

**Note:** COMPUTE commands in Maintain do not support text fields.

# Assigning the Result of an Alphanumeric Expression to a Text Field

This example uses the COURSES data source, which contains a text field, to create an alphanumeric field named ADESC, which truncates the text field at 36 characters, and a new text field named NEWDESC, which is a text version of ADESC:

```
DEFINE FILE COURSES
ADESC/A36   = DESCRIPTION;
NEWDESC/TX36 = ADESC;
END

TABLE FILE COURSES
PRINT ADESC NEWDESC
END
```

The output is:

```
ADESC                                NEWDESC
-----                                -------
This course provides the DP professi  This course provides the DP
professi
Anyone responsible for designing FOC  Anyone responsible for designing
FOC
This is a course in FOCUS efficienci  This is a course in FOCUS
efficienci
```

# Creating Temporary Fields Independent of a Master File

The temporary fields you create with the DEFINE and COMPUTE commands are tied to a specific Master File, and in the case of values calculated with the COMPUTE command, to a specific request. However, you can create temporary fields that are independent of either a Master File or a request using the DEFINE FUNCTION command.

A DEFINE function is a named group of calculations that use any number of input values and produce a return value. When calling a DEFINE function, you must first define the function.

A DEFINE function can be called in most of the same situations that are valid for WebFOCUSFOCUS-supplied functions. Data types are defined with each argument. When substituting values for these arguments, the format must match the defined format. Alphanumeric arguments shorter than the specified format are padded with blanks, while longer alphanumeric arguments are truncated.

All calculations within the function are done in double precision. Format conversions occur only across equal signs (=) in the assignments that define temporary fields.

# Define a Function

```
DEFINE FUNCTION name (argument1/format1,..., argumentn/formatn)
[tempvariablea/formata [TITLE 'line1[,line2 ...']
 [DESCRiption 'description'] = expressiona;]
   .
   .
   .
[tempvariablex/formatx = expressionx;]
name/format = [result_expression];
END
```

where:

**name**

Is the name of the function, up to 64 characters. This must be the last field calculated in the function, and is used to return the value of the function to the calling procedure.

**argument1...argumentn**

Are the argument names. They can be any names that comply with WebFOCUS field naming rules.

**format1...formatn**

Are the formats of the function arguments.

If the format of an argument is alphanumeric, the argument value must also be alphanumeric. Shorter arguments are padded on the right with blanks, and longer arguments are truncated.

If the format of an argument is numeric, the argument value must also be numeric. To prevent unexpected results, you must be consistent in your use of data types.

**tempvariablea...tempvariablex**

Are temporary fields. Temporary fields hold intermediate values used in the function. You can define as many temporary fields as you need.

**tempformata...tempformatx**

Are the formats of the temporary fields.

**line1,line2 ...**

Are the lines of default column title to be displayed for the virtual field unless overridden by an AS phrase.

**description**

Is the description to be associated with the virtual field, enclosed in single quotation marks. The description displays in the tools that browse Master Files.

**expressiona...expressionx**

Are the expressions that calculate the temporary field values. The expressions can use parameters, constants, and other temporary fields defined in the same function.

**format**

Is the format of the value the function returns.

**result_expression**

Is the expression that calculates the value returned by the function. The expression can use parameters, constants, and temporary fields defined in the same function.

All names defined in the body of the function are local to the function. The last field defined before the END command in the function definition must have the same name as the function, and represents the return value for the function.

# DEFINE Function Limits and Restrictions

- The number of functions you can define and use in a session is virtually unlimited.
- A DEFINE function is cleared with the DEFINE FUNCTION CLEAR command. It is not cleared by issuing a join, or by any WebFOCUS command.
- When an expression tries to use a cleared function, an error appears.
- DEFINE functions can call other DEFINE functions, but cannot call themselves.
- If you overwrite or clear a DEFINE function, a subsequent attempt to use a temporary field that refers to the function generates the following warning:

```
(FOC03665) Error loading external function '%1'
```

# Defining a Function

The following example creates and calls the SUBTRACT function. SUBTRACT performs a calculation with the arguments VAL1 and VAL2.

```
DEFINE FUNCTION SUBTRACT (VAL1/D8, VAL2/D8)
 SUBTRACT/D8.2 = VAL1 - VAL2;
END
```

```
TABLE FILE MOVIES
 PRINT TITLE LISTPR IN 35 WHOLESALEPR AND
 COMPUTE PROFIT/D8.2 = SUBTRACT(LISTPR,WHOLESALEPR);
 BY CATEGORY
```

```
   WHERE CATEGORY EQ 'MYSTERY' OR 'ACTION'
END
```

The output is:

| CATEGORY | TITLE | LISTPR | WHOLESALEPR | PROFIT |
|---|---|---|---|---|
| ACTION | JAWS | 19.95 | 10.99 | 8.96 |
| | ROBOCOP | 19.98 | 11.50 | 8.48 |
| | TOTAL RECALL | 19.99 | 11.99 | 8.00 |
| | TOP GUN | 14.95 | 9.99 | 4.96 |
| | RAMBO III | 19.95 | 10.99 | 8.96 |
| MYSTERY | REAR WINDOW | 19.98 | 9.00 | 10.98 |
| | VERTIGO | 19.98 | 9.00 | 10.98 |
| | FATAL ATTRACTION | 29.98 | 15.99 | 13.99 |
| | NORTH BY NORTHWEST | 19.98 | 9.00 | 10.98 |

| | | | | |
|---|---|---|---|---|
| | DEAD RINGERS | 25.99 | 15.99 | 10.00 |
| | MORNING AFTER, THE | 19.95 | 9.99 | 9.96 |
| | PSYCHO | 19.98 | 9.00 | 10.98 |
| | BIRDS, THE | 19.98 | 9.00 | 10.98 |
| | SEA OF LOVE | 59.99 | 30.00 | 29.99 |

# Display DEFINE Functions

Issue the following command from the Command Console:

```
? FUNCTION
```

# Displaying DEFINE Functions

Issuing the command

```
? FUNCTION
```

displays information similar to the following:

| | | | |
|---|---|---|---|
| FUNCTIONS | CURRENTLY | ACTIVE | |
| | | | |
| NAME | FORMAT | PARAMETER | FORMAT |
| ---------- | --------- | --------- | ------- |
| SUBTRACT | D8.2 | VAL1 | D8 |
| | | VAL2 | D8 |

If you issue the ? FUNCTION command when no functions are defined, the following appears:

```
NO FUNCTIONS CURRENTLY IN EFFECT
```

# Clear DEFINE Functions

```
DEFINE FUNCTION {name|*} CLEAR
```

where:

**name**

Is the name of the function name to clear.

*****

Clears all active DEFINE functions.

# Including Totals and Subtotals

To help interpret detailed information in a report, you can summarize the information using row and column totals, grand totals, and subtotals. You can use these summary lines in a report to clarify or highlight information.

# Calculating Row and Column Totals

You can produce totals for rows or columns of numbers in a report. Use:

- ROW-TOTAL to display a new column containing the sum of all numbers in each row.
- COLUMN-TOTAL to display a final row on the report, which contains the totals for each column of numbers.

You can use row totals and column totals in matrix reports (created by using a BY and an ACROSS in your report request), rename row and column total titles, and include calculated values in your row or column totals. You can also create row totals using ACROSS-TOTAL.

Note that when producing totals in a report, if one field is summed, the format of the row total is the same as the format of the field. For example, if the format of the CURR_SAL field is D12.2M, the format of the row total for CURR_SAL is also D12.2M. When you are summing fields with different formats, the default format of D12.2 is used for the total.

You can rename the default column titles using the AS phrase and align the labels for row and column totals. For details, see Using Headings, Footings, Titles, and Labels.

# Calculate Row and Column Totals

```
display_command fieldname AND ROW-TOTAL [alignment][/format] [AS 'name']
display_command fieldname AND COLUMN-TOTAL [alignment][AS 'name']
```

where:

**display_command**

Is one of the following commands: PRINT, LIST, SUM, or COUNT.

**fieldname**

Is the name of the field for which to calculate row and/or column totals.

**alignment**

Specifies the alignment of the ROW-TOTAL or COLUMN-TOTAL label. Possible values are:

`/R` right justifies the label.

`/L` left justifies the label.

`/C` centers the label.

Note that these alignment settings are ignored in HTML output. If you are working in WebFOCUS, to take advantage of column alignment features, you can include the command SET STYLE=OFF in the report request or generate your output in PDF, or in another format that supports these features.

**format**

Reformats the ROW-TOTAL.

**name**

Is the label for the ROW-TOTAL or COLUMN-TOTAL.

You may also specify row or column totals with the ON TABLE command. Field names are optional with COLUMN-TOTAL, and cannot be listed with ROW-TOTAL. Use the following syntax:

```
ON TABLE COLUMN-TOTAL [alignment][AS 'name'][field field field]
ON TABLE ROW-TOTAL [alignment][/format] [AS 'name']
```

# Calculating Row and Column Totals

The following request illustrates the use of ROW-TOTAL and COLUMN-TOTAL. The column and row total labels are "TOTAL" by default. You can change them using an AS phrase.

```
TABLE FILE SALES
SUM RETURNS DAMAGED AND ROW-TOTAL AND COLUMN-TOTAL
BY PROD_CODE
END
```

The output is:

```
PROD_CODE  RETURNS  DAMAGED      TOTAL
---------  -------  -------  ---------
B10             13       10         23
B12              4        3          7
B17              4        2          6
B20              1        2          3
C13              3        0          3
C17              0        0          0
C7               5        4          9
D12              3        2          5
E1               4        7         11
E2               9        4         13
E3              12       11         23

TOTAL           58       45        103
```

# Specifying Column Totals With ON TABLE

The following request illustrates the use of COLUMN-TOTAL with the ON TABLE command.

```
TABLE FILE EMPLOYEE
PRINT CURR_SAL
BY LAST_NAME
ON TABLE COLUMN-TOTAL
END
```

The output is:

```
LAST_NAME               CURR_SAL
---------               --------
BANNING               $29,700.00
BLACKWOOD             $21,780.00
CROSS                 $27,062.00
GREENSPAN              $9,000.00
```

```
IRVING                $26,862.00
JONES                 $18,480.00
MCCOY                 $18,480.00
MCKNIGHT              $16,100.00
ROMANS                $21,120.00
SMITH                 $13,200.00
                       $9,500.00
STEVENS               $11,000.00

TOTAL                $222,284.00
```

# Using Row and Column Totals in a Matrix Report

The following request illustrates the use of ROW-TOTAL and COLUMN-TOTAL in a matrix report (created by using the BY and ACROSS phrases together).

```
TABLE FILE EMPLOYEE
SUM CURR_SAL AND ROW-TOTAL AND COLUMN-TOTAL
BY BANK_NAME
ACROSS DEPARTMENT
END
```

The output is:

```
                          DEPARTMENT

BANK_NAME                 MIS              PRODUCTION       TOTAL

-------------------------------------------------------------------------
                          $40,680.00       $41,620.00       $82,300.00
ASSOCIATED                $21,780.00       $42,962.00       $64,742.00
BANK ASSOCIATION          $27,062.00                .       $27,062.00
BEST BANK                          .       $29,700.00       $29,700.00
STATE                     $18,480.00                .       $18,480.00

TOTAL                    $108,002.00      $114,282.00      $222,284.00
```

# Including Calculated Values in Row and Column Totals

The following request illustrates the inclusion of the calculated value, PROFIT, in row and column totals.

```
TABLE FILE CAR
SUM DCOST RCOST
COMPUTE PROFIT/D12=RCOST-DCOST;
ROW-TOTAL/L/D12 AS 'TOTAL_COST'
BY COUNTRY
ON TABLE COLUMN-TOTAL/L AS 'FINAL_TOTAL'
END
```

The output is:

```
COUNTRY     DEALER_COST  RETAIL_COST          PROFIT       TOTAL_COST

-------     -----------  -----------          ------  ---------------
ENGLAND          37,853       45,319           7,466           90,638
FRANCE            4,631        5,610             979           11,220
ITALY            41,235       51,065           9,830          102,130
JAPAN             5,512        6,478             966           12,956
W GERMANY        54,563       64,732          10,169          129,464

FINAL_TOTAL     143,794      173,204          29,410          346,408
```

# Using ROW-TOTAL With ACROSS and Multiple Display Commands

When a request has an ACROSS sort field, each ACROSS value displays a column for each field displayed on the report output. For example, the following request, each state has a column for units and a column for dollars:

```
TABLE FILE GGSALES
SUM UNITS AS 'U' DOLLARS AS 'D' BY CITY
ACROSS ST
IF ST EQ 'CA'
```

```
IF BUDUNITS NE MISSING
END
```

The output is:

```
                      State
                      CA
City                       U        D
----------------------------------------
Los Angeles             298070  3772014
San Francisco           312500  3870258
```

When you specify a row total with ACROSS, the row total is calculated separately for each column in each ACROSS group. For example, in the following request the row total has a column for units and a column for dollars:

```
TABLE FILE GGSALES
SUM UNITS AS 'U' DOLLARS AS 'D' BY CITY
ACROSS ST
IF ST EQ 'CA'
IF BUDUNITS NE MISSING
  ON TABLE ROW-TOTAL
END
```

The output is:

```
                      State
                      CA                          TOTAL
City                         U        D         U        D
-------------------------------------------------------------
Los Angeles             298070  3772014    298070  3772014
San Francisco           312500  3870258    312500  3870258
```

When the request also has multiple display commands, each additional command adds additional columns to each ACROSS group on the report output.

The first column of the row total group is calculated by adding the first column from each display command under each ACROSS value, the second column adds the second column from each display command, and so on.

For example, the following request has a SUM command for units and dollars and another SUM command for budgeted units and budgeted dollars. The row total has a column for

the sum of units and budgeted units and another column for the sum of dollars and budgeted dollars:

```
TABLE FILE GGSALES
SUM UNITS AS 'U' DOLLARS AS 'D'         BY CITY
SUM BUDUNITS AS 'BU' BUDDOLLARS AS 'BD' BY CITY
ACROSS ST
IF ST EQ 'CA'
IF BUDUNITS NE MISSING
ON TABLE ROW-TOTAL
END
```

The output is:

```
                   State
                   CA                                          TOTAL

City                    U         D        BU       BD       BU       BD
-----------------------------------------------------------------------
Los Angeles        298070   3772014    295637  3669484   593707  7441498
San Francisco      312500   3870258    314725  3916863   627225  7787121
```

If the different display commands do not all specify the same number of fields, some columns will not be represented in the row total. For example, in the following request, the second SUM command has a column for budgeted units but not for budgeted dollars. Therefore, the row total group has no column for dollars:

```
TABLE FILE GGSALES
SUM UNITS AS 'U' DOLLARS AS 'D' BY CITY
SUM BUDUNITS AS 'BU'            BY CITY
ACROSS ST
IF ST EQ 'CA'
IF BUDUNITS NE MISSING
ON TABLE ROW-TOTAL
END
```

The output is:

```
                        State
                        CA                              TOTAL
City                         U         D        BU        BU
-------------------------------------------------------------
```

```
Los Angeles             298070   3772014    295637    593707
San Francisco           312500   3870258    314725    627225
```

In this case, you can use column notation to calculate the row total properly. For example, the following request calculates the row total column by adding the units, dollars, and budgeted units columns together:

```
TABLE FILE GGSALES
SUM UNITS AS 'U' DOLLARS AS 'D' BY CITY
SUM BUDUNITS AS 'BU'            BY CITY
ACROSS ST
COMPUTE TOTAL/I10 = C1 + C2 +C3; AS 'ROW-TOTAL'
IF ST EQ 'CA'
IF BUDUNITS NE MISSING
END
```

The output is:

```
                        State
                        CA                              ROW-TOTAL
City                         U         D        BU
-------------------------------------------------------------------
Los Angeles             298070   3772014    295637      4365721
San Francisco           312500   3870258    314725      4497483
```

# Producing Row Totals for Horizontal (ACROSS) Sort Field Values

You can produce row totals for horizontal (ACROSS) sort field values. Row totals for horizontal sort fields, referenced by ACROSS-TOTAL, are different from standard row totals because only horizontal sort field values, referenced by ACROSS, are included in the total. Integer, single precision floating point, double precision floating point, packed, and long packed fields can all be totaled.

# Produce Row Totals for Horizontal (ACROSS) Sort Field Values

```
ACROSS sortfield ACROSS-TOTAL [AS 'name'] [COLUMNS col1 AND col2 ...]
```

where:

**sortfield**

Is the name of the field being sorted across.

**name**

Is the new name for the ACROSS-TOTAL column title.

**col1, col2**

Are the titles of the ACROSS columns you want to include in the total.

# Producing Row Totals for Horizontal (ACROSS) Sort Field Values

The following illustrates how to generate a row total for horizontal (ACROSS) sort field values. Notice that the summed values in the TOTAL TITLE COUNT column only reflect the values in the (RATING) PG and R columns. The values in the COPIES column are not included since they are not horizontal (ACROSS) sort field values.

```
TABLE FILE MOVIES
SUM COPIES BY CATEGORY
COUNT TITLE BY CATEGORY
ACROSS RATING ACROSS-TOTAL
COLUMNS PG AND R
END
```

The output is:

```
                    RATING
                    PG     R      TOTAL
  CATEGORY  COPIES
```

```
---------------------------------------
ACTION         14      2      3      5
COMEDY         16      4      1      5
DRAMA           2      0      1      1
FOREIGN         5      2      3      5
MUSICALS        2      1      1      2
MYSTERY        17      2      5      7
SCI/FI          3      0      3      3
```

# Usage Notes for ACROSS-TOTAL

- Stacking headings in ACROSS-TOTAL is not supported.
- Attempting to use ACROSS-TOTAL with other types of fields (alphanumeric, text, and dates) produces blank columns.
- In cases of multiple ACROSS columns with ACROSS-TOTAL, there are additional columns with subtotaled values.
- The results of ROW-TOTAL and ACROSS-TOTAL are the same if there is only a single display field or single display command in the procedure.
- The maximum number of ACROSS-TOTAL components is five.
- ACROSS-TOTAL populates the ACROSSVALUE component in a StyleSheet. For an example of styling an ACROSS-TOTAL component, see Identifying Row Totals (ACROSS-TOTAL) for Horizontal Sort Data.

# Including Section Totals and a Grand Total

Frequently, reports contain detailed information that is broken down into subsections, for which simple column and row totals may not provide adequate summaries. In these instances, it is more useful to look at subtotals for particular sections, and a grand total.

You can add the following commands to your requests to create section subtotals and grand totals:

- SUB-TOTAL and SUBTOTAL
- SUMMARIZE and RECOMPUTE (used with calculated values)

- RECAP and COMPUTE

Each command produces grand totals and/or subtotals by using different information. Subtotals produce totals every time a specified sort field value changes, and are independent of record selection criteria. You can further control when subtotals are produced by specifying WHEN criteria (see Conditionally Displaying Summary Lines and Text). You can control whether subtotals display above or below the data. For information, see Control Placement of Summary Lines. You can also suppress grand totals using the NOTOTAL command. For details, see Suppressing Grand Totals.

By default, a blank line is generated before a subtotal on the report output. You can eliminate these automatic blank lines by issuing the SET DROPBLNKLINE=ON command.

**Note:** When the request has a PAGE-BREAK command, the GRANDTOTAL is on a page by itself.

You can use prefix operators with SUBTOTAL, SUB-TOTAL, SUMMARIZE, and RECOMPUTE. For details, see Manipulating Summary Values With Prefix Operators. In addition, you can combine different summary operations in a single request. For information, see Combinations of Summary Commands.

# Using Section Totals and Grand Totals

The following request illustrates how to create a subtotal every time the department value changes. The grand total is automatically produced when you use the SUBTOTAL command.

```
TABLE FILE EMPLOYEE
SUM DED_AMT BY DED_CODE BY DEPARTMENT
BY BANK_ACCT
WHERE BANK_ACCT NE 0
WHERE DED_CODE EQ 'CITY' OR 'FED'
ON DEPARTMENT SUBTOTAL
END
```

The first and last portions of the output are:

```
DED_CODE  DEPARTMENT  BANK_ACCT          DED_AMT
--------  ----------  ---------          -------
CITY      MIS          40950036           $14.00
                      122850108           $31.75
                      163800144           $82.70
```

```
*TOTAL DEPARTMENT MIS                    $128.45

          PRODUCTION     160633            $7.42
                       136500120           $18.25
                       819000702           $60.20

*TOTAL DEPARTMENT PRODUCTION               $85.87

FED       MIS           40950036         $1,190.77
                       122850108         $2,699.80
                       163800144         $7,028.30

*TOTAL DEPARTMENT MIS                    $10,918.87

          PRODUCTION     160633           $631.12
                       136500120         $1,552.10
                       819000702         $5,120.04

*TOTAL DEPARTMENT PRODUCTION              $7,303.26


TOTAL                                    $18,436.45
```

# Including Subtotals

You can use the SUBTOTAL and SUB-TOTAL commands to sum individual values, such as columns of numbers, each time a named sort field changes value.

- SUB-TOTAL displays a subtotal when the sort field changes value, and for any higher-level sort fields when their values change.
- SUBTOTAL displays a subtotal only when the specified sort field changes value. It does not give subtotals for higher-level fields.

Both SUB-TOTAL and SUBTOTAL produce grand totals. You can suppress grand totals using the NOTOTAL command. See Suppressing Grand Totals.

The subtotal is calculated every time the sort field value changes or, if WHEN criteria are applied to the sort field, every time the WHEN conditions are met.

A BY, ACROSS, or ON phrase is required to initialize the syntax.

# Create Subtotals

```
{BY|ON} fieldname {SUB-TOTAL|SUBTOTAL} [MULTILINES]
      [field1 [AND] field2...] [AS 'text'][WHEN expression;]
```

where:

**fieldname**

Must be the name of a field in a sort phrase. A BY phrase can include a summary command. The number of fields to subtotal multiplied by the number of levels of subtotals counts in the number of display fields permitted for the request. For details on determining the maximum number of display fields that can be used in a request, see Displaying Report Data.

**SUB-TOTAL|SUBTOTAL**

SUB-TOTAL displays subtotals for numeric values when the BY|ON field changes value, and for any higher-level sort fields when their values change.

SUBTOTAL displays a subtotal only when the specified sort field changes value.

**MULTILINES**

Suppresses the printing of a subtotal line for every sort break that has only one detail line, since the subtotal value is equal to this one value. Note that MULTI-LINES is a synonym for MULTILINES. MULTILINES is not supported with horizontal (ACROSS) sort fields.

**field1, field2, ...**

Denotes a list of specific fields to subtotal. This list overrides the default, which includes all numeric display fields. The list can included numeric and alphanumeric fields.

You can use the asterisk (*) wildcard character instead of a field list to indicate that all fields, numeric and alphanumeric, should be included on the summary lines.

**AS 'text'**

Enables you to specify a different label. For related information, see Using Headings, Footings, Titles, and Labels.

**WHEN expression**

Specifies the conditional display of subtotals as determined by a Boolean expression. You must end the expression with a semicolon.

# Control Placement of Summary Lines

```
SET SUBTOTALS = {ABOVE|BELOW}
```

where:

**ABOVE**

Places summary lines above the detail lines and displays the sort field values on every detail line of the report output.

**BELOW**

Places summary lines below the detail lines. BELOW is the default value.

**Note:** SET SUBTOTALS = ABOVE is not supported with format XLSX, EXL07, or EXL2K FORMULA.

# Placing Subtotals Above the Data

The following request against the EMPLOYEE data source sums deduction amounts and gross salaries by department, deduction code, and last name. It then subtotals the deduction amounts and gross salaries for each department. The following request places the subtotals below the detail lines (the default):

```
TABLE FILE EMPLOYEE
SUM DED_AMT GROSS
BY DEPARTMENT
BY DED_CODE
  BY LAST_NAME
WHERE BANK_ACCT NE 0
WHERE DED_CODE EQ 'FICA' OR 'CITY'
  ON DEPARTMENT SUBTOTAL
  ON TABLE SET SUBTOTALS BELOW
```

```
  ON TABLE SET PAGE NOPAGE
END
```

The output is:

```
 DEPARTMENT  DED_CODE  LAST_NAME                DED_AMT            GROSS
 ----------  --------  ---------                -------            -----
 MIS         CITY      BLACKWOOD                  $31.76        $9,075.00
                       CROSS                      $82.69       $22,013.77
                       JONES                      $14.01        $6,099.50
             FICA      BLACKWOOD               $2,223.37        $9,075.00
                       CROSS                   $5,788.01       $22,013.77
                       JONES                     $980.64        $6,099.50

 *TOTAL DEPARTMENT MIS                         $9,120.47       $74,376.54

 PRODUCTION  CITY      BANNING                    $7.42        $2,475.00
                       IRVING                    $60.24       $17,094.00
                       MCKNIGHT                  $18.26        $9,129.99
             FICA      BANNING                  $519.75        $2,475.00
                       IRVING                  $4,216.53       $17,094.00
                       MCKNIGHT                $1,278.21        $9,129.99

 *TOTAL DEPARTMENT PRODUCTION                  $6,100.40       $57,397.98


 TOTAL                                        $15,220.88      $131,774.52
```

The following is the same request, but with the subtotals placed above the detail lines:

```
 TABLE FILE EMPLOYEE
 SUM DED_AMT GROSS
 BY DEPARTMENT
 BY DED_CODE
   BY LAST_NAME
 WHERE BANK_ACCT NE 0
 WHERE DED_CODE EQ 'FICA' OR 'CITY'
   ON DEPARTMENT SUBTOTAL
   ON TABLE SET SUBTOTALS ABOVE
   ON TABLE SET PAGE NOPAGE
 END
```

On the output, the grand total line comes first, then the subtotal for the MIS department followed by the detail lines for the MIS department, followed by the subtotal for the

PRODUCTION department and its detail lines. Note that all sort field values display on each line of the report output:

```
DEPARTMENT  DED_CODE  LAST_NAME              DED_AMT           GROSS
----------  --------  ---------              -------           -----
TOTAL                                     $15,220.88      $131,774.52
*TOTAL DEPARTMENT MIS                      $9,120.47       $74,376.54

MIS         CITY      BLACKWOOD               $31.76        $9,075.00
MIS         CITY      CROSS                   $82.69       $22,013.77
MIS         CITY      JONES                   $14.01        $6,099.50
MIS         FICA      BLACKWOOD            $2,223.37        $9,075.00
MIS         FICA      CROSS                $5,788.01       $22,013.77
MIS         FICA      JONES                  $980.64        $6,099.50

*TOTAL DEPARTMENT PRODUCTION               $6,100.40       $57,397.98

PRODUCTION  CITY      BANNING                  $7.42        $2,475.00
PRODUCTION  CITY      IRVING                  $60.24       $17,094.00
PRODUCTION  CITY      MCKNIGHT                $18.26        $9,129.99
PRODUCTION  FICA      BANNING                $519.75        $2,475.00
PRODUCTION  FICA      IRVING               $4,216.53       $17,094.00
PRODUCTION  FICA      MCKNIGHT             $1,278.21        $9,129.99
```

# Usage Notes for Subtotals

- When using a SUM or COUNT command with only one sort phrase in the request, SUB-TOTAL and SUBTOTAL produce the same result as the value of the SUM or COUNT command. However, when using a PRINT command with one sort phrase, SUBTOTAL is useful because there can be many values within a sort break.
- All SUB-TOTALs display up to and including the point where the sort break occurs, so only the innermost point of subtotaling should be requested. For instance, if the BY fields are

  ```
  BY AREA
  BY PROD_CODE
  BY DATE SUB-TOTAL
  ```

  then, when AREA changes, subtotals are displayed for DATE, PROD_CODE, and AREA on three lines (one under the other).

- If you use a WHERE TOTAL or IF TOTAL test, the display of the sort field value for the subtotal line is suppressed unless PRINTPLUS is ON. For details about using PRINTPLUS in WebFOCUS, see Positioning Headings, Footings, or Items Within Them.
- Subtotals display on the next line if the subtotal text does not fit on the line prior to the displayed field columns.
- If a report request has multiple BY phrases, with SUBTOTAL/SUMMARIZE/RECOMPUTE/SUB-TOTAL at several levels, and MULTILINES or MULTI-LINES is specified at any one of those levels, it applies to all levels.

  **Note:** ON BYfield SUBFOOT applies only to the level specified.

# Generating Subtotals

The following request illustrates how to create a subtotal for SALES every time the country value changes.

```
TABLE FILE CAR
SUM AVE.MPG AND SALES AND AVE.RETAIL_COST
BY COUNTRY SUB-TOTAL SALES
BY BODYTYPE
END
```

The output is:

```
                          AVE           AVE
COUNTRY     BODYTYPE      MPG    SALES  RETAIL_COST
-------     --------      ----   -----  -----------
ENGLAND     CONVERTIBLE     16       0        8,878
            HARDTOP         25       0        5,100
            SEDAN           10   12000       15,671

*TOTAL ENGLAND                   12000

FRANCE      SEDAN           21       0        5,610

*TOTAL FRANCE                        0

ITALY       COUPE           11   12400       19,160
            ROADSTER        21   13000        6,820
            SEDAN           21    4800        5,925
*TOTAL ITALY
```

```
JAPAN       SEDAN              14   78030        3,239

*TOTAL JAPAN                        78030

W GERMANY   SEDAN              20   88190        9,247

*TOTAL W GERMANY                    88190


TOTAL                             208420
```

# Comparing SUB-TOTAL and SUBTOTAL

The following request illustrates how to create a subtotal for the numeric fields DED_AMT and GROSS when the department value changes, and for the higher-level sort field (DED_CODE) when its value changes.

```
TABLE FILE EMPLOYEE
SUM DED_AMT GROSS BY DED_CODE BY DEPARTMENT
BY BANK_ACCT
WHERE BANK_ACCT NE 0
ON DEPARTMENT SUB-TOTAL
END
```

If you use SUBTOTAL instead of SUB-TOTAL, the totals for DED_AMT and GROSS display only when the DEPARTMENT value changes.

The first portion of the output is:

```
DED_CODE  DEPARTMENT  BANK_ACCT          DED_AMT            GROSS
--------  ----------  ---------          -------            -----
CITY      MIS          40950036           $14.00        $6,099.50
                      122850108           $31.75        $9,075.00
                      163800144           $82.70       $22,013.75

*TOTAL DEPARTMENT MIS                     $128.45       $37,188.25

          PRODUCTION     160633            $7.42        $2,475.00
                      136500120           $18.25        $9,130.00
                      819000702           $60.20       $17,094.00
```

```
*TOTAL DEPARTMENT PRODUCTION              $85.87       $28,699.00
*TOTAL DED_CODE CITY                     $214.32       $65,887.25
```

The last portion of the output is:

```
DED_CODE  DEPARTMENT  BANK_ACCT          DED_AMT            GROSS
--------  ----------  ---------          -------            -----
STAT      MIS          40950036          $196.13         $6,099.50
                      122850108          $444.65         $9,075.00
                      163800144        $1,157.60        $22,013.75

*TOTAL DEPARTMENT MIS                  $1,798.38        $37,188.25

          PRODUCTION     160633          $103.95         $2,475.00
                      136500120          $255.65         $9,130.00
                      819000702          $843.32        $17,094.00

*TOTAL DEPARTMENT PRODUCTION           $1,202.92        $28,699.00
*TOTAL DED_CODE STAT                   $3,001.30        $65,887.25


TOTAL                                 $41,521.18       $461,210.75
```

# Recalculating Values for Subtotal Rows

You can use the SUMMARIZE and RECOMPUTE commands instead of SUB-TOTAL and SUBTOTAL to recalculate the result of a COMPUTE command. SUMMARIZE is similar to SUB-TOTAL in that it recomputes values at every sort break. RECOMPUTE is similar to SUBTOTAL in that it recalculates only at the specified sort break.

SUMMARIZE recomputes grand totals for the entire report. If you wish to suppress grand totals, you can include the NOTOTAL command in your request. See Suppressing Grand Totals.

# Subtotal Calculated Values

```
{BY|ON} fieldname {SUMMARIZE|RECOMPUTE} [MULTILINES]
      [field1 [AND] field2...] [AS 'text'][WHEN expression;]
```

where:

**fieldname**

Must be the name of a field in a sort phrase. A BY phrase can include a summary command. The number of fields to summarize multiplied by the number of levels of summary commands counts in the number of display fields for the request. For details on determining the maximum number of display fields that can be used in a request, see Displaying Report Data.

**SUMMARIZE**

Recomputes values at every sort break.

**RECOMPUTE**

Recalculates values only at the specified sort break.

**MULTILINES**

Suppresses the printing of a subtotal line for every sort break that has only one detail line, since the subtotal value is equal to this one value. Note that MULTI-LINES is a synonym for MULTILINES. MULTILINES is not supported with horizontal (ACROSS) sort fields.

You can also suppress grand totals using the NOTOTAL command, as described in Suppressing Grand Totals.

**AS 'text'**

Enables you to specify a different label. For related information, see Using Headings, Footings, Titles, and Labels.

**field1, field2, ...**

Denotes a list of specific fields to be subtotaled after the RECOMPUTE or SUMMARIZE. This list overrides the default, which includes all numeric display fields.

You can use the asterisk (*) wildcard character instead of a field list to indicate that all fields, numeric and alphanumeric, should be included on the summary lines. You can

either use the asterisk to display all columns or reference the specific columns, numeric and alphanumeric, you want to display.

**WHEN expression**

Specifies the conditional display of subtotals based on a Boolean expression. You must end the expression with a semicolon.

You may also generate subtotals for the recalculated values with the ON TABLE command. Use the following syntax:

```
ON TABLE SUMMARIZE
```

# Using SUMMARIZE

The following request illustrates the use of SUMMARIZE to recalculate DG_RATIO at the specified sort break, DEPARTMENT, and for the higher-level sort break, PAY_DATE:

```
TABLE FILE EMPLOYEE
SUM GROSS DED_AMT AND COMPUTE
DG_RATIO/F4.2=DED_AMT/GROSS;
BY HIGHEST PAY_DATE BY DEPARTMENT
BY BANK_ACCT
WHERE BANK_ACCT NE 0
ON DEPARTMENT SUMMARIZE
END
```

The first portion of the output is:

```
PAY_DATE  DEPARTMENT  BANK_ACCT          GROSS          DED_AMT  DG_
RATIO
--------  ----------  ---------          -----          -------  -------
_
82/08/31  MIS          40950036      $1,540.00          $725.34
.47
                      122850108      $1,815.00        $1,261.40
.69
                      163800144      $2,255.00        $1,668.69
.74

*TOTAL DEPARTMENT MIS                $5,610.00        $3,655.43
.65
```

```
          PRODUCTION     160633      $2,475.00        $1,427.24
.58
                       136500120      $1,342.00          $522.28
.39
                       819000702      $2,238.50        $1,746.03
.78

*TOTAL DEPARTMENT PRODUCTION         $6,055.50        $3,695.55
.61
*TOTAL PAY_DATE 82/08/31            $11,665.50        $7,350.98
.63
```

The last portion of the output is:

```
PAY_DATE  DEPARTMENT  BANK_ACCT          GROSS          DED_AMT  DG_
RATIO
--------  ----------  ---------          -----          -------  -------
-
82/01/29  PRODUCTION  819000702      $2,035.00        $1,241.33
.61

*TOTAL DEPARTMENT PRODUCTION         $2,035.00        $1,241.33
.61
*TOTAL PAY_DATE 82/01/29             $4,182.75        $2,648.12
.63

81/12/31  MIS         163800144      $2,147.75        $1,406.79
.66

*TOTAL DEPARTMENT MIS                $2,147.75        $1,406.79
.66
*TOTAL PAY_DATE 81/12/31             $2,147.75        $1,406.79
.66

81/11/30  MIS         163800144      $2,147.75        $1,406.79
.66

*TOTAL DEPARTMENT MIS                $2,147.75        $1,406.79
.66
*TOTAL PAY_DATE 81/11/30             $2,147.75        $1,406.79
.66


TOTAL                               $65,887.25       $41,521.18
.63
```

**Tip:** If you use SUB-TOTAL or SUBTOTAL rather than SUMMARIZE, the values of DG_RATIO are added.

# Using RECOMPUTE

The following request illustrates the use of RECOMPUTE to recalculate DG_RATIO only at the specified sort break, DEPARTMENT.

```
TABLE FILE EMPLOYEE
SUM GROSS DED_AMT AND COMPUTE
DG_RATIO/F4.2=DED_AMT/GROSS;
BY HIGHEST PAY_DATE BY DEPARTMENT
BY BANK_ACCT
WHERE BANK_ACCT NE 0
ON DEPARTMENT RECOMPUTE
END
```

The first portion of the output is:

```
PAY_DATE  DEPARTMENT  BANK_ACCT          GROSS          DED_AMT  DG_
RATIO
--------  ----------  ---------          -----          -------  -------
_
82/08/31  MIS          40950036      $1,540.00          $725.34
.47
                      122850108      $1,815.00        $1,261.40
.69
                      163800144      $2,255.00        $1,668.69
.74

*TOTAL DEPARTMENT MIS                $5,610.00        $3,655.43
.65

          PRODUCTION     160633      $2,475.00        $1,427.24
.58
                      136500120      $1,342.00          $522.28
.39
                      819000702      $2,238.50        $1,746.03
.78

*TOTAL DEPARTMENT PRODUCTION         $6,055.50        $3,695.55
.61

82/07/30  MIS          40950036      $1,540.00          $725.34
```

```
.47
                     122850108      $1,815.00        $1,261.40
.69
```

The last portion of the output is:

```
PAY_DATE  DEPARTMENT  BANK_ACCT          GROSS          DED_AMT  DG_
RATIO
--------  ----------  ---------          -----          -------  -------
_
82/01/29  MIS         163800144      $2,147.75        $1,406.79
.66

*TOTAL DEPARTMENT MIS                $2,147.75        $1,406.79
.66

          PRODUCTION  819000702      $2,035.00        $1,241.33
.61

*TOTAL DEPARTMENT PRODUCTION         $2,035.00        $1,241.33
.61

81/12/31  MIS         163800144      $2,147.75        $1,406.79
.66

*TOTAL DEPARTMENT MIS                $2,147.75        $1,406.79
.66

81/11/30  MIS         163800144      $2,147.75        $1,406.79
.66

*TOTAL DEPARTMENT MIS                $2,147.75        $1,406.79
.66


TOTAL                               $65,887.25       $41,521.18
.63
```

# Summarizing Alphanumeric Columns

By default, subtotals (using the SUBTOTAL and SUB-TOTAL commands) and recalculations (using the RECOMPUTE and SUMMARIZE commands) only display values for numeric report columns. However, you can include alphanumeric columns on these summary lines by

either specifying the columns you want to display on the summary lines or by using the asterisk wildcard character to display all fields on the summary lines.

The alphanumeric value displayed on a SUBTOTAL or SUB-TOTAL line is either the first, minimum, maximum, or last alphanumeric value within the sort group, depending on the value of the SUMPREFIX parameter. On a RECOMPUTE or SUMMARIZE line, alphanumeric values are recalculated using the summary values for that line.

# Include All Columns on Summary Lines

```
ON sortfieldsummarycommand *
```

where:

**sortfield**

Is the sort field for which a change in value triggers the summary line.

**summarycommand**

Is SUBTOTAL, SUB-TOTAL, RECOMPUTE, or SUMMARIZE.

*****

Indicates that all fields, numeric and alphanumeric, should be included on the summary lines. You can either use the asterisk to display all columns or reference the specific columns you want to display.

# Including Alphanumeric Fields on Summary Lines

The following request against the GGSALES data source computes the alphanumeric equivalents of the DOLLARS and UNITS fields, creates an alphanumeric version of the formula for the ratio between DOLLARS and UNITS, and computes the numeric ratio between DOLLARS and UNITS. The RECOMPUTE * command recomputes all values on a change of value for the state sort field:

```
SET SUMPREFIX=FST
TABLE FILE GGSALES
SUM PRODUCT DOLLARS/I8M AS 'Dollars' IN 22 UNITS AS 'Units'
```

```
COMPUTE Formula/A19 = EDIT(DOLLARS)|'/'|EDIT(UNITS)|'=';
COMPUTE Ratio/F8    = DOLLARS/UNITS;
BY ST
BY CATEGORY NOPRINT
WHERE ST EQ 'CA' OR 'IL'
ON ST RECOMPUTE *
ON TABLE SET PAGE NOPAGE
END
```

On the output, the alphanumeric formula is recomputed using the summed numeric fields. However, the product value is taken from the first product within each sort value, as that field is not recomputed and SUMPREFIX=FST:

```
State  Product           Dollars     Units  Formula                        ----
Ratio
-----  -------           -------     -----  -------
-
CA     Capuccino      $2,957,852    237246  02957852/00237246=
12
       Biscotti       $2,770,508    222844  02770508/00222844=
12
       Coffee Grinder $1,935,863    152276  01935863/00152276=
13

*TOTAL CA
       Capuccino      $7,664,223    612366  07664223/00612366=
13

IL     Espresso       $1,398,779    109581  01398779/00109581=
13
       Biscotti       $1,561,904    120976  01561904/00120976=
13
       Coffee Grinder $1,050,243     83541  01050243/00083541=
13

*TOTAL IL
       Espresso       $4,010,926    314098  04010926/00314098=
13


TOTAL  Capuccino     $11,675,149    926464  11675149/00926464=
13
```

Note that if the SUBTOTAL summary command had been used, the formula would not have been recomputed and would have displayed the values from the first line within each sort group.

# Usage Notes for Summarizing Alphanumeric Columns

- Date fields and numeric and alphanumeric fields with date formatting options are not included on summary lines.
- Column total lines follow the same rules as summary lines.
- Summary values for ACROSS sort fields are supported.

# Manipulating Summary Values With Prefix Operators

You can use the SUBTOTAL, SUB-TOTAL, RECOMPUTE, and SUMMARIZE commands at the ON TABLE level to specify the type of summary operation to use to produce the grand total line on the report.

In addition, prefix operators can be used with the summary options SUBTOTAL, SUB-TOTAL, RECOMPUTE, and SUMMARIZE at both the sort break and grand total levels. If the same field was aggregated using multiple prefix operators in the SUM command, you can use the prefix operator along with the field name to differentiate between the fields with multiple operators in the summary command.

Prefix operations on summary lines are performed on the retrieved, selected, and summed values that become the detail lines in the report. Unlike field-based prefix operations, they are not performed on each incoming record.

Each type of summary has its own purpose, and handles the prefix operators appropriately for the type of summary information to be displayed. For example, using AVE. at a sort field break produces the average within the sort group.

Alphanumeric fields can also be displayed on summary lines. In order to do this, you must either explicitly list the alphanumeric field name on the summary command, or use the asterisk (*) wildcard to display all fields.

Different operations from two ON phrases for the same sort break display on the same summary line, and allow a mixture of operations on summary lines. The grand total line populates all fields populated by any summary command, even fields that are not specified in the grand total command.

If the same field is referenced in more than one ON phrase for the same sort break, the last function specified is applied.

The following prefix operators are supported for numeric fields:

- ASQ.
- AVE.
- CNT.
- FST.
- LST.
- MAX.
- MIN.
- SUM.

The following prefix operators are supported for alphanumeric fields:

- FST.
- LST.
- MAX.
- MIN.
- SUM. (means LST. if SUMPREFIX=LST or FST. if SUMPREFIX=FST)

# Use Prefix Operators With Summary Values

```
{BY|ON} breakfield [AS 'text1'] sumoption [MULTILINES]
        [pref. ] [*|[field1 [[pref2. ] field2 ...]]]
        [AS 'text2'] [WHEN expression;]
```

To replace the default grand total, use the following syntax

```
ON TABLE sumoption [pref. ][field1 [[pref2. ]field2 ...]] [AS 'text2']
```

where:

**breakfield**

Is the sort field whose change in value triggers the summary operation. A BY phrase can include a summary command. When the value of the sort field changes, it triggers the summary operation.

**sumoption**

Can be one of the following: SUBTOTAL, SUB-TOTAL, RECOMPUTE, or SUMMARIZE.

**'text1'**

Is the column heading to use for the break field on the report output.

**MULTILINES**

Suppresses the printing of a summary line for every sort break that has only one detail line. Note that MULTILINES suppresses the summary line even if a prefix operator is used to specify a different operation for the summary line. MULTI-LINES is a synonym for MULTILINES. MULTILINES is not supported with horizontal (ACROSS) sort fields.

**pref.**

Is a prefix operator. When specified without a field list, the prefix operator is applied to every numeric column in the report output and every numeric column is populated with values on the summary row.

*****

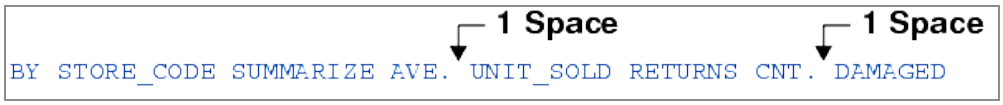
Includes all display fields on the summary line. If a prefix operator is specified, it is applied to all fields. If the prefix operator is not supported with alphanumeric fields, alphanumeric fields are not included on the summary line.

**[field1 [field2 ... fieldn]]**

Produces the type of summary specified by *sumoption* for the listed fields. If no field names are listed, the summary is produced for every numeric column in the report output.

**pref. field1 [field2 ... fieldn] [pref2. fieldm ...]**

The first prefix operator is applied to field1 through fieldn. The second prefix operator is applied to fieldm. Only the fields specified are populated with values on the summary row. Each prefix operator must be separated by a blank space from the following field name. For example:




**'text2'**

Is the text that prints on the left of the summary row.

**expression**

Is an expression that determines whether the summary operation is performed at each break.

# Usage Notes for Summary Prefix Operators

- COLUMN-TOTAL does not support prefix operators.
- Prefix operators PCT., RPCT., AND TOT. are not supported.
- Double prefix operators (such as PCT.CNT.) are not supported.
- When an ACROSS field is used in the request, the same field name displays over multiple columns (ACROSS groups) in the report output. A prefix operator applied to such a field on a summary line is applied to all of those columns.
- The SUM. prefix operator produces the same summary values as a summary phrase with no prefix operator.
- SUMMARIZE and RECOMPUTE apply the calculations defined in the associated COMPUTE command to the summary values. Therefore, in order to perform the necessary calculations, the SUMMARIZE or RECOMPUTE command must calculate all of the fields referenced in the COMPUTE command.
- If the same field is referenced by more than one summary operation with different prefix operators at each level, the default grand total (one produced without an ON TABLE *summaryoption* command) applies the operation specified by the first operator used in the report request (the left-most sort field in the output).

# Using Prefix Operators With SUBTOTAL

The following example uses prefix operators to calculate the:

- Average list price by rating.
- Sum copies by category within the rating field.

Notice that the subtotal row for each rating contains a value only in the LISTPR column, and the subtotal row for each category contains a value only in the COPIES column. The grand total line contains values only for the columns that were subtotaled. Note the blank space between each prefix operator and the field name that follows it:

```
TABLE FILE MOVIES
PRINT COPIES LISTPR WHOLESALEPR TITLE/A23
  BY RATING
  BY CATEGORY
  WHERE CATEGORY EQ 'CHILDREN' OR 'CLASSIC'
  WHERE RATING   EQ 'G' OR 'NR'
  ON RATING    SUBTOTAL AVE. LISTPR AS '*Ave:  '
  ON CATEGORY  SUBTOTAL SUM. COPIES AS '*Sum:  '
END
```

The output is:

```
RATING  CATEGORY  COPIES  LISTPR  WHOLESALEPR  TITLE
------  --------  ------  ------  -----------  -----
G       CHILDREN       2   44.95        29.99  SHAGGY DOG, THE
                       2   29.95        12.50  ALICE IN WONDERLAND
                       3   26.99        12.00  BAMBI

*Sum:   CHILDREN       7

        CLASSIC        3   89.95        40.99  GONE WITH THE WIND

*Sum:   CLASSIC        3
*Ave:   G                  47.96

NR      CHILDREN       1   19.95        10.00  SMURFS, THE
                       1   19.95         9.75  SCOOBY-DOO-A DOG IN THE
                       1   14.95         7.65  SESAME STREET-BEDTIME S
                       1   14.98         7.99  ROMPER ROOM-ASK MISS MO
                       1   29.95        15.99  SLEEPING BEAUTY

*Sum:   CHILDREN       5

        CLASSIC        1   24.98        14.99  EAST OF EDEN
                       3   39.99        20.00  CITIZEN KANE
                       1   29.95        15.99  CYRANO DE BERGERAC
                       1   19.99        10.95  MARTY
```

```
                         2   19.99        10.95  MALTESE FALCON, THE
                         2   19.95         9.99  ON THE WATERFRONT
                         2   89.99        40.99  MUTINY ON THE BOUNTY
                         2   19.99        10.95  PHILADELPHIA STORY, THE
                         2   19.98        10.99  CAT ON A HOT TIN ROOF
                         2   29.95        15.00  CASABLANCA

*Sum:    CLASSIC        18
*Ave:    NR                 27.64


TOTAL                   33   31.91
```

# Using SUBTOTAL at the Sort Break and Grand Total Levels

The following example adds the ON TABLE SUBTOTAL command to the request in the previous example (Using Prefix Operators With SUBTOTAL) at the sort break level to calculate the minimum number of copies and maximum list price on the grand total line for the entire report:

```
TABLE FILE MOVIES
PRINT COPIES LISTPR WHOLESALEPR TITLE/A23
  BY RATING
  BY CATEGORY
  WHERE CATEGORY EQ 'CHILDREN' OR 'CLASSIC'
  WHERE RATING   EQ 'G' OR 'NR'
  ON RATING    SUBTOTAL AVE. LISTPR AS '*Ave:  '
  ON CATEGORY  SUBTOTAL SUM. COPIES AS '*Sum:  '
  ON TABLE SUBTOTAL MIN. COPIES MAX. LISTPR
END
```

The output is exactly the same as in the previous request, except for the grand total line:

```
RATING  CATEGORY  COPIES  LISTPR  WHOLESALEPR  TITLE
------  --------  ------  ------  -----------  -----
G       CHILDREN       2   44.95        29.99  SHAGGY DOG, THE
                       2   29.95        12.50  ALICE IN WONDERLAND
                       3   26.99        12.00  BAMBI
```

```
*Sum:   CHILDREN       7

        CLASSIC        3   89.95        40.99  GONE WITH THE WIND

*Sum:   CLASSIC        3
*Ave:   G                  47.96

NR      CHILDREN       1   19.95        10.00  SMURFS, THE
                       1   19.95         9.75  SCOOBY-DOO-A DOG IN THE
                       1   14.95         7.65  SESAME STREET-BEDTIME S
                       1   14.98         7.99  ROMPER ROOM-ASK MISS MO
                       1   29.95        15.99  SLEEPING BEAUTY

*Sum:   CHILDREN       5

        CLASSIC        1   24.98        14.99  EAST OF EDEN
                       3   39.99        20.00  CITIZEN KANE
                       1   29.95        15.99  CYRANO DE BERGERAC
                       1   19.99        10.95  MARTY
                       2   19.99        10.95  MALTESE FALCON, THE
                       2   19.95         9.99  ON THE WATERFRONT
                       2   89.99        40.99  MUTINY ON THE BOUNTY
                       2   19.99        10.95  PHILADELPHIA STORY, THE
                       2   19.98        10.99  CAT ON A HOT TIN ROOF
                       2   29.95        15.00  CASABLANCA

*Sum:   CLASSIC       18
*Ave:   NR                 27.64


TOTAL                  1   89.99
```

# Differentiating Between Fields With Multiple Prefix Operators

The following request uses both the MAX. and MIN. prefix operators with the UNITS field. On the summary commands, these are differentiated by referencing them as MAX.UNITS and MIN.UNITS.

```
TABLE FILE GGSALES
   SUM MAX.UNITS MIN.UNITS
     BY REGION
```

```
BY ST
ON REGION RECOMPUTE MAX.  MAX.UNITS MIN. MIN.UNITS
WHERE DATE GE 19971001
WHERE REGION EQ 'West' OR 'Northeast'
ON TABLE RECOMPUTE MIN. MAX.UNITS MAX. MIN.UNITS
ON TABLE SET PAGE NOPAGE
END
```

On the report output, the summary for each region displays the maximum of the state maximum values and the minimum of the state minimum values. The summary for the entire report displays the minimum of the state maximum values and the maximum of the state minimum values. The report output is shown in the following image:

| Region | State | MAX Unit Sales | MIN Unit Sales |
|---|---|---|---|
| Northeast | CT | 1770 | 101 |
| | MA | 1780 | 146 |
| | NY | 1797 | 73 |
| *TOTAL Northeast | | 1797 | 73 |
| West | CA | 1794 | 72 |
| | WA | 1787 | 257 |
| *TOTAL West | | 1794 | 72 |
| TOTAL | | 1770 | 257 |

# Displaying an Alphanumeric Field on a Summary Line

The following request displays the sum of the list price field and the minimum value of the director field by rating:

```
TABLE FILE MOVIES
PRINT COPIES LISTPR WHOLESALEPR DIRECTOR
BY RATING
BY CATEGORY
WHERE CATEGORY EQ 'CHILDREN' OR 'CLASSIC'
WHERE RATING   EQ 'G' OR 'NR'
WHERE DIRECTOR NE ' '
ON RATING SUBTOTAL SUM. LISTPR MIN. DIRECTOR AS '*A/N:'
END
```

The output is:

```
RATING  CATEGORY  COPIES  LISTPR  WHOLESALEPR  DIRECTOR
------  --------  ------  ------  -----------  --------
G       CHILDREN       2   44.95        29.99  BARTON C.
                       2   29.95        12.50  GEROMINI
                       3   26.99        12.00  DISNEY W.
        CLASSIC        3   89.95        40.99  FLEMING V

*A/N: G                   191.84               BARTON C.

NR      CHILDREN       1   29.95        15.99  DISNEY W.
        CLASSIC        1   24.98        14.99  KAZAN E.
                       3   39.99        20.00  WELLES O.
                       1   29.95        15.99  GORDON M.
                       1   19.99        10.95  MANN D.
                       2   19.99        10.95  HUSTON J.
                       2   19.95         9.99  KAZAN E.
                       2   89.99        40.99  MILESTONE L.
                       2   19.99        10.95  CUKOR G.
                       2   19.98        10.99  BROOKS R.
                       2   29.95        15.00  CURTIZ M.

*A/N: NR                  344.71               BROOKS R.


TOTAL                     536.55               BARTON C.
```

# Displaying All Fields on a Summary Line

The following request displays the sum of every display field on the subtotal line. The director field is alphanumeric, so the last value displays:

```
TABLE FILE MOVIES
PRINT COPIES LISTPR WHOLESALEPR DIRECTOR
BY RATING
BY CATEGORY
WHERE CATEGORY EQ 'CHILDREN' OR 'CLASSIC'
WHERE RATING   EQ 'G' OR 'NR'
WHERE DIRECTOR NE ' '
ON RATING SUBTOTAL SUM. * AS '*All:  '
END
```

The output is:

```
RATING  CATEGORY  COPIES  LISTPR  WHOLESALEPR  DIRECTOR
------  --------  ------  ------  -----------  --------
G       CHILDREN       2   44.95        29.99  BARTON C.
                       2   29.95        12.50  GEROMINI
                       3   26.99        12.00  DISNEY W.
        CLASSIC        3   89.95        40.99  FLEMING V

*All:   G             10  191.84        95.48  FLEMING V

NR      CHILDREN       1   29.95        15.99  DISNEY W.
        CLASSIC        1   24.98        14.99  KAZAN E.
                       3   39.99        20.00  WELLES O.
                       1   29.95        15.99  GORDON M.
                       1   19.99        10.95  MANN D.
                       2   19.99        10.95  HUSTON J.
                       2   19.95         9.99  KAZAN E.
                       2   89.99        40.99  MILESTONE L.
                       2   19.99        10.95  CUKOR G.
                       2   19.98        10.99  BROOKS R.
                       2   29.95        15.00  CURTIZ M.

*All:   NR            19  344.71       176.79  CURTIZ M.


TOTAL                 29  536.55       272.27  CURTIZ M.
```

# Controlling Summary Line Processing

When processing summary lines, you can control whether SUBTOTAL and RECOMPUTE commands are propagated to the grand total row of a report.

If the summary line contains fields with and without prefix operators, those fields without prefix operators are processed as though they were specified with the operator SUM.

The function of the SET SUMMARYLINES command is to make the processing of SUBTOTAL, SUB-TOTAL, SUMMARIZE, and RECOMPUTE on the grand total line consistent with how they work for sort field breaks. The setting that invokes this type of processing is SET SUMMARYLINES=EXPLICIT.

When SUBTOTAL and RECOMPUTE are used at a sort break level, they do not propagate to other sort breaks. SUB-TOTAL and SUMMARIZE propagate to all higher level sort breaks.

The grand total can be considered the highest level sort field in a request. However, by default, all of the summary options, not just SUB-TOTAL and SUMMARIZE, propagate to the grand total level.

The SET SUMMARYLINES=EXPLICIT command prevents the propagation of SUBTOTAL and RECOMPUTE to the grand total. In addition, if all summary commands in the request specify field lists, only the specified fields are aggregated and displayed on the grand total line.

When SUBTOTAL and RECOMPUTE are the only summary commands used in the request, a grand total line is produced only if it is explicitly specified in the request using the ON TABLE SUBTOTAL/SUB-TOTAL/RECOMPUTE/SUMMARIZE phrase. If the ON TABLE phrase specifies a field list, only those fields are aggregated and displayed.

Note that you can always suppress the grand total line using the ON TABLE NOTOTAL command in the request.

# Control Summary Line Processing

```
SET SUMMARYLINES = {NEW|OLD|EXPLICIT}
```

where:

**NEW**

Propagates all summary operations to the grand total line. Fields listed in a summary command are populated only on summary lines created by that summary command and on summary lines created by propagation of that summary command. NEW is the default value.

The alphanumeric value displayed on a SUBTOTAL or SUB-TOTAL line is either the first or last alphanumeric value within the sort group, depending on the value of the SUMPREFIX parameter. On a RECOMPUTE or SUMMARIZE line, alphanumeric values are recalculated using the summary values for that line.

**OLD**

This value is no longer supported and is processed as NEW.

**EXPLICIT**

Does not propagate SUBTOTAL and RECOMPUTE to the grand total line. Fields listed in a summary command are populated only on summary lines created by that summary command and on summary lines created by propagation of that summary command.

**Note:** This command is not supported in a request using the ON TABLE SET syntax.

# Usage Notes for SET SUMMARYLINES

- SET SUMMARYLINES is not supported within a TABLE request (ON TABLE).
- If COLUMN-TOTAL is specified in the request, all numeric fields are totaled on the grand total line unless the COLUMN-TOTAL phrase lists specific fields. If the COLUMN-TOTAL phrase lists specific fields, those fields and any fields propagated by SUB-TOTAL or SUMMARIZE commands are totaled.
- A summary command with a list of field names populates only those columns on the associated summary line.

For example:

```
TABLE FILE MOVIES
PRINT COPIES LISTPR WHOLESALEPR
 BY RATING
 BY CATEGORY
 WHERE CATEGORY EQ 'CHILDREN'
 WHERE RATING   EQ 'G'
 ON RATING    SUBTOTAL LISTPR AS '*LIST'
 ON CATEGORY  SUBTOTAL  COPIES AS '*COPY'
END
```

The output has subtotals for COPIES on the CATEGORY sort break and for LISTPR on the RATING sort break. Both columns are populated on the grand total line. WHOLESALEPR is not referenced in either SUBTOTAL command and, therefore, is not on any summary line:

```
RATING  CATEGORY  COPIES  LISTPR  WHOLESALEPR
------  --------  ------  ------  -----------
G       CHILDREN       2   44.95        29.99
                       2   29.95        12.50
                       3   26.99        12.00

*COPY CHILDREN         7
*LIST G                   101.89


TOTAL                  7  101.89
```

# Using SET SUMMARYLINES With SUBTOTAL

The following request using the MOVIES data source has a sort break for CATEGORY that subtotals the COPIES field and a sort break for RATING that subtotals the LISTPR field:

```
TABLE FILE MOVIES
SUM COPIES LISTPR WHOLESALEPR
BY RATING
BY CATEGORY
WHERE CATEGORY EQ 'CHILDREN'
WHERE RATING   EQ 'G'
ON RATING SUBTOTAL COPIES
ON CATEGORY SUBTOTAL LISTPR
END
```

Running the request with SUMMARYLINES=NEW subtotals COPIES only for the RATING sort break and subtotals LISTPR only for the CATEGORY sort break but propagates both to the grand total line:

```
RATING  CATEGORY  COPIES  LISTPR  WHOLESALEPR
------  --------  ------  ------  -----------
G       CHILDREN       7  101.89        54.49

*TOTAL CHILDREN           101.89
*TOTAL G               7
```

```
TOTAL                  7  101.89
```

Running the request with SUMMARYLINES=EXPLICIT subtotals COPIES only for the RATING sort break and subtotals LISTPR only for the CATEGORY sort break. It does not produce a grand total line:

```
RATING  CATEGORY  COPIES  LISTPR  WHOLESALEPR
------  --------  ------  ------  -----------
G       CHILDREN       7  101.89        54.49

*TOTAL CHILDREN           101.89
*TOTAL G               7
```

Adding the phrase ON TABLE SUBTOTAL WHOLESALEPR with SUMMARYLINES=EXPLICIT produces a grand total line with the WHOLESALEPR field subtotaled:

```
RATING  CATEGORY  COPIES  LISTPR  WHOLESALEPR
------  --------  ------  ------  -----------
G       CHILDREN       7  101.89        54.49

*TOTAL CHILDREN           101.89
*TOTAL G               7


TOTAL                                    54.49
```

# Using COLUMN-TOTAL With SET SUMMARYLINES=EXPLICIT

The following request using the MOVIES data source has a sort break for CATEGORY for which subtotals the COPIES field and a sort break for RATING that subtotals the LISTPR field. It also has an ON TABLE COLUMN-TOTAL phrase:

```
SET SUMMARYLINES=EXPLICIT
TABLE FILE MOVIES
SUM COPIES LISTPR WHOLESALEPR
BY RATING
```

```
BY CATEGORY
WHERE CATEGORY EQ 'CHILDREN'
WHERE RATING   EQ 'G'
ON RATING SUBTOTAL COPIES
ON CATEGORY SUBTOTAL LISTPR
ON TABLE COLUMN-TOTAL
END
```

The grand total line displays a column total for all numeric columns because of the ON TABLE COLUMN-TOTAL phrase:

```
RATING  CATEGORY  COPIES  LISTPR  WHOLESALEPR
------  --------  ------  ------  -----------
G       CHILDREN       7  101.89        54.49

*TOTAL CHILDREN           101.89
*TOTAL G               7


TOTAL                  7  101.89        54.49
```

The following request has an ON TABLE SUBTOTAL WHOLESALEPR command. It also has an ON TABLE COLUMN-TOTAL phrase:

```
SET SUMMARYLINES=EXPLICIT
TABLE FILE MOVIES
SUM COPIES LISTPR WHOLESALEPR
BY RATING
BY CATEGORY
WHERE CATEGORY EQ 'CHILDREN'
WHERE RATING   EQ 'G'
ON RATING SUBTOTAL COPIES
ON CATEGORY SUBTOTAL LISTPR
ON TABLE SUBTOTAL WHOLESALEPR
ON TABLE COLUMN-TOTAL
END
```

The grand total line displays a column total only for the WHOLESALEPR column because of the ON TABLE SUBTOTAL command:

```
RATING  CATEGORY  COPIES  LISTPR  WHOLESALEPR
------  --------  ------  ------  -----------
G       CHILDREN       7  101.89        54.49
```

```
*TOTAL CHILDREN           101.89
*TOTAL G               7


TOTAL                                  54.49
```

Using SUB-TOTAL instead of SUBTOTAL causes COPIES and LISTPR to be aggregated on the grand total line. WHOLESALEPR is totaled because it is listed in the COLUMN-TOTAL phrase. The subtotal for LISTPR propagates to the RATING sort break as well as to the grand total:

```
SET SUMMARYLINES=EXPLICIT
TABLE FILE MOVIES
SUM COPIES LISTPR WHOLESALEPR
BY RATING
BY CATEGORY
WHERE CATEGORY EQ 'CHILDREN'
WHERE RATING   EQ 'G'
ON RATING SUB-TOTAL COPIES
ON CATEGORY SUB-TOTAL LISTPR
ON TABLE COLUMN-TOTAL WHOLESALEPR
END
```

The output is:

```
RATING  CATEGORY  COPIES  LISTPR  WHOLESALEPR
------  --------  ------  ------  -----------
G       CHILDREN       7  101.89        54.49

*TOTAL CHILDREN           101.89
*TOTAL G               7  101.89


TOTAL                  7  101.89        54.49
```

# Using Prefix Operators With Calculated Values

If a request includes the RECOMPUTE or SUMMARIZE command, the expression specified in the associated COMPUTE command is applied using values from the summary line. The columns used to recompute the expression can have prefix operators. The recomputed column, regardless of the prefix operator specified for it, applies these input values to the

expression specified in the COMPUTE command. Therefore, any supported prefix operator can be specified for the recomputed report column without affecting the calculated value.

All fields used in the COMPUTE command must be displayed by the RECOMPUTE or SUMMARIZE command in order to be populated. If any field used in the expression is not populated, the calculated value returned for the expression is unpredictable.

# Using Prefix Operators With RECOMPUTE

The first request creates a calculated field named DIFF, which is the difference between DOLLARS and BUDDOLLARS. This value is then recomputed for each region, without using prefix operators.

```
TABLE FILE GGSALES
SUM UNITS DOLLARS BUDDOLLARS
AND COMPUTE DIFF/I10 = DOLLARS-BUDDOLLARS;
  BY REGION
  BY CATEGORY
  WHERE CATEGORY EQ 'Food' OR 'Coffee'
  WHERE REGION EQ 'West' OR 'Midwest'
  ON REGION  RECOMPUTE
END
```

The recomputed value is the difference between the totals for DOLLARS and BUDDOLLARS.

```
Region      Category    Unit Sales Dollar Sales Budget Dollars
DIFF
------      --------    ---------- ------------ --------------       ---
-
Midwest     Coffee          332777      4178513        4086032
92481
            Food            341414      4338271        4220721
117550

*TOTAL Midwest              674191      8516784        8306753
210031

West        Coffee          356763      4473517        4523963     -
50446
            Food            340234      4202337        4183244
19093

*TOTAL West                 696997      8675854        8707207     -
```

```
31353


TOTAL                       1371188     17192638       17013960
178678
```

The following request uses prefix operators in the RECOMPUTE command to calculate the maximum DOLLARS and the minimum BUDDOLLARS and then recompute DIFF. No matter which prefix operator we specify for DIFF, it is calculated as the difference between the values in the DOLLARS and BUDDOLLARS columns. If any of the fields used in the calculation (DOLLARS, BUDDOLLARS, and DIFF) do not display on the summary row, the calculation cannot be performed.

```
TABLE FILE GGSALES
SUM UNITS DOLLARS BUDDOLLARS
AND COMPUTE DIFF/I10 = DOLLARS-BUDDOLLARS;
  BY REGION
  BY CATEGORY
  WHERE CATEGORY EQ 'Food' OR 'Coffee'
  WHERE REGION EQ 'West' OR 'Midwest'
  ON REGION RECOMPUTE MAX. DOLLARS MIN. BUDDOLLARS AVE. DIFF
END
```

The output is:

```
Region      Category    Unit Sales Dollar Sales Budget Dollars
DIFF
------      --------    ---------- ------------ --------------       ---
-
Midwest     Coffee          332777      4178513        4086032
92481
            Food            341414      4338271        4220721
117550

*TOTAL Midwest                          4338271        4086032
252239

West        Coffee          356763      4473517        4523963     -
50446
            Food            340234      4202337        4183244
19093

*TOTAL West                             4473517        4183244
290273
```

# Using RECOMPUTE at the Sort Break and Grand Total Levels

The following example adds the ON TABLE RECOMPUTE command to the previous request (Using Prefix Operators With RECOMPUTE) to calculate the average values for each column. Notice that the value of DIFF is calculated as the difference between the values in the Dollar Sales and the Budget Dollars columns on the grand total line:

```
TABLE FILE GGSALES
SUM UNITS DOLLARS BUDDOLLARS
AND COMPUTE DIFF/I10 = DOLLARS-BUDDOLLARS;
  BY REGION
  BY CATEGORY
  WHERE CATEGORY EQ 'Food' OR 'Coffee'
  WHERE REGION EQ 'West' OR 'Midwest'
  ON REGION  RECOMPUTE MAX. DOLLARS MIN. BUDDOLLARS DIFF
 ON TABLE RECOMPUTE AVE.
END
```

The output is:

```
Region      Category    Unit Sales Dollar Sales Budget Dollars
DIFF
------      --------    ---------- ------------ --------------       ---
-
Midwest     Coffee          332777      4178513        4086032
92481
            Food            341414      4338271        4220721
117550

*TOTAL Midwest                          4338271        4086032
252239

West        Coffee          356763      4473527        4523963     -
50436
            Food            340234      4202338        4183244
19094

*TOTAL West                             4473527        4183244
290283
```

```
TOTAL                          342797      4298162        4253490
44672
```

# Using Multiple SUB-TOTAL or SUMMARIZE Commands With Prefix Operators

SUB-TOTAL and SUMMARIZE propagate their operations to all higher-level sort fields. If a request uses SUB-TOTAL or SUMMARIZE at multiple sort levels, more than one prefix operator may apply to the same field.

When a SUB-TOTAL or SUMMARIZE command on a lower-level sort field propagates up to the higher levels, it applies its prefix operators only to those fields that did not already have different prefix operators specified at the higher level. For any field that had a prefix operator specified at a higher level, the original prefix operator is applied at the level at which it was first specified and to the grand total line, unless a different operator is specified for the grand total line.

# Using Multiple SUB-TOTAL Commands With Prefix Operators

The following illustrates prefix operators work in a request that has multiple SUB-TOTAL commands, each with a different prefix operator.

```
DEFINE FILE GGSALES
YEAR/YY = DATE;
END

TABLE FILE GGSALES
SUM   UNITS DOLLARS/D10.2 BUDDOLLARS
  BY YEAR
  BY ST
  BY REGION
  BY CATEGORY
WHERE REGION EQ 'West' OR 'Midwest'
WHERE ST     EQ 'CA' OR 'IL'
```

```
WHERE YEAR EQ '1996' OR '1997'
  ON YEAR SUB-TOTAL CNT. UNITS AS '*CNT. UNITS:'
  ON ST SUB-TOTAL AVE. DOLLARS AS '*AVE. $:'
  ON REGION SUB-TOTAL MIN. AS '*MIN.:'
END
```

In the following report output, some of the values have been manually italicized or bolded for clarity:

- Outlined rows are the rows generated by the SUB-TOTAL commands.
- Subtotal values in the normal typeface are the count of unit sales generated by the command ON YEAR SUB-TOTAL CNT. UNITS. This is the topmost summary command, and therefore does not propagate to any other summary lines.
- Subtotal values in italic are average dollar sales generated by the command ON ST SUB-TOTAL AVE. DOLLARS. This is the second summary command, and therefore propagates to the DOLLARS column of summary lines for the YEAR sort field.
- Subtotal values in boldface are minimums within their sort groups generated by the command ON REGION SUB-TOTAL MIN. This is the last summary command, and therefore propagates to all other summary lines, but only calculates minimum values for those columns not already populated with a count or an average.

| YEAR | State | Region | Category | Unit Sales | Dollar Sales | Budget Dollars |
|---|---|---|---|---|---|---|
| 1996 | CA | West | Coffee | 117539 | 1,484,873.00 | 1453548 |
| | | | Food | 116389 | 1,443,083.00 | 1414902 |
| | | | Gifts | 74948 | 947,783.00 | 946382 |
| *MIN.: West | | | | **74948** | **947,783.00** | **946382** |
| *AVE. $: CA | | | | **74948** | *1,291,913.00* | **946382** |
| | IL | Midwest | Coffee | 52348 | 683,559.00 | 628333 |
| | | | Food | 58777 | 768,715.00 | 742943 |
| | | | Gifts | 38405 | 481,515.00 | 487090 |
| *MIN.: Midwest | | | | **38405** | **481,515.00** | 487090 |
| *AVE. $: IL | | | | **38405** | *644,596.33* | 487090 |
| *CNT. UNITS: 1996 | | | | 6 | *968,254.67* | **487090** |
| 1997 | CA | West | Coffee | 118044 | 1,453,013.00 | 1507092 |
| | | | Food | 106322 | 1,325,429.00 | 1302582 |
| | | | Gifts | 77328 | 988,080.00 | 961841 |
| *MIN.: West | | | | **77328** | **988,080.00** | **961841** |
| *AVE. $: CA | | | | **77328** | *1,255,507.33* | **961841** |
| | IL | Midwest | Coffee | 57233 | 715,220.00 | 737931 |
| | | | Food | 59293 | 754,132.00 | 737912 |
| | | | Gifts | 41527 | 521,260.00 | 532647 |
| *MIN.: Midwest | | | | **41527** | **521,260.00** | **532647** |
| *AVE. $: IL | | | | **41527** | *663,537.33* | **532647** |
| *CNT. UNITS: 1997 | | | | 6 | *959,522.33* | **532647** |
| TOTAL | | | | 12 | *963,888.50* | **487090** |

# Combinations of Summary Commands

You can specify a different summary operation for each sort break (BY or ACROSS field).

If you have multiple summary commands for the same sort field, the following message displays and the last summary command specified in the request is used:

```
(FOC36359)  MORE THAN 1 SUBTOTAL/SUB-TOTAL/RECOMPUTE/SUMMARIZE
```

There is more than one SUBTOTAL/SUB-TOTAL/RECOMPUTE/SUMMARIZE on the same key field which is not allowed. The last one specified will override the rest.

SUMMARIZE and SUB-TOTAL, which propagate their summary operations to higher level sort breaks, skip those fields at higher level sort breaks that have their own summary commands. The propagation of summary operations depends on whether prefix operator processing is used for summary lines. If prefix operators are:

- Not used on summary lines, if any summary command specifies a field list, only the fields specified on the summary line field lists are populated on the report.
- Used on summary lines, SUB-TOTAL and SUMMARIZE propagate to:
  - All fields at higher level sort breaks that do not have their own summary command.
  - Fields not specified in the field list at higher level sort breaks that do have their own summary commands (columns that would have been empty). Note that this is the only technique that allows different fields at the same sort break to have different summary options.

Prefix operators on summary lines result in the same values whether the command is RECOMPUTE/SUMMARIZE or SUBTOTAL/SUB-TOTAL. For a computed field, the prefix operator is not applied, and the value is recalculated using the expression in the COMPUTE command and the values from the summary line.

When you use different summary commands for different sort fields, the default grand total row inherits the summary command associated with the first sort field in the request. You can change the operation performed at the grand total level by using the ON TABLE phrase to specify a specific summary command.

**Note:** The grand total is considered the highest sort level. Therefore, although you can use the SUMMARIZE or SUB-TOTAL command at the grand total level, these commands apply only to the grand total and are not propagated to any other line on the report. On the grand total level SUMMARIZE operates as a RECOMPUTE command, and SUB-TOTAL operates as a SUBTOTAL command.

# Using SUBTOTAL and RECOMPUTE in a Request

In the following request, the first sort field specified is COPIES, which is associated with the RECOMPUTE command. Therefore, on the grand total line, the value of RATIO is correctly recomputed and the values of LISTPR and WHOLESALEPR are summed (because this is the default operation when the field is not calculated by a COMPUTE command).

```
TABLE FILE MOVIES
PRINT DIRECTOR LISTPR WHOLESALEPR
COMPUTE RATIO = LISTPR/WHOLESALEPR;
BY COPIES
BY RATING
WHERE COPIES LT 3
```

```
WHERE DIRECTOR EQ 'DISNEY W.' OR 'HITCHCOCK A.'
ON COPIES RECOMPUTE AS '*REC: '
ON RATING SUBTOTAL AS '*SUB:  '
END
```

The output is:

```
COPIES  RATING  DIRECTOR          LISTPR  WHOLESALEPR          RATIO
------  ------  --------          ------  -----------          -----
     1  NR      DISNEY W.          29.95        15.99           1.87

*SUB:   NR                         29.95        15.99           1.87
*REC:    1                         29.95        15.99           1.87

     2  NR      HITCHCOCK A.       19.98         9.00           2.22

*SUB:   NR                         19.98         9.00           2.22

        PG      HITCHCOCK A.       19.98         9.00           2.22
                HITCHCOCK A.       19.98         9.00           2.22

*SUB:   PG                         39.96        18.00           4.44
     2  PG13    HITCHCOCK A.       19.98         9.00           2.22

*SUB:   PG13                       19.98         9.00           2.22

        R       HITCHCOCK A.       19.98         9.00           2.22

*SUB:   R                          19.98         9.00           2.22
*REC:    2                         99.90        45.00           2.22


TOTAL                            129.85        60.99           2.13
```

If you reverse the BY fields, the grand total line sums the RATIO values as well as the LISTPR and WHOLESALEPR values because the SUBTOTAL command controls the grand total line:

```
TOTAL                            129.85        60.99          12.97
```

You can change the operation performed at the grand total level by adding the following command to the request:

```
ON TABLE RECOMPUTE
```

The grand total line then displays the recomputed values:

```
TOTAL                                129.85        60.99            2.13
```

# Using SUB-TOTAL With Multiple Summary Commands

In the following request, the SUB-TOTAL command propagates its operation to the DIRECTOR sort field (see the total line for HITCHCOCK, on which the RATIO values are subtotaled, not recomputed).

SUB-TOTAL is not propagated to the RATING sort field which has its own RECOMPUTE command, and for this sort field the RATIO value is recomputed. The grand total line is recomputed because RECOMPUTE is performed on a higher level sort field than SUB-TOTAL.

```
TABLE FILE MOVIES
PRINT LISTPR WHOLESALEPR
COMPUTE RATIO = LISTPR/WHOLESALEPR;
BY DIRECTOR
BY RATING
BY COPIES
WHERE COPIES LT 3
WHERE DIRECTOR EQ 'HITCHCOCK A.'
ON COPIES SUB-TOTAL AS '*SUB: '
ON RATING RECOMPUTE AS '*REC:  '
END
```

The output is:

```
DIRECTOR           RATING  COPIES  LISTPR  WHOLESALEPR          RATIO
--------           ------  ------  ------  -----------          -----
HITCHCOCK A.       NR           2   19.98         9.00           2.22

*SUB:    2                         19.98         9.00           2.22
*REC:   NR                         19.98         9.00           2.22

                   PG           2   19.98         9.00           2.22
                                    19.98         9.00           2.22
```

```
*SUB:    2                          39.96        18.00            4.44
*REC:   PG                          39.96        18.00            2.22

                   PG13         2   19.98         9.00            2.22
*SUB:    2                          19.98         9.00            2.2
*REC:   PG13                        19.98         9.00            2.2

HITCHCOCK A.       R            2   19.98         9.00            2.2

*SUB:    2                          19.98         9.00            2.2
*REC:   R                           19.98         9.00            2.2
*TOTAL DIRECTOR HITCHCOCK A.        99.90        45.00           11.1


TOTAL                               99.90        45.00            2.2
```

# Using Multiple Summary Commands With Prefix Operators

The following request prints the average value of LISTPR and the recomputed value of RATIO on the lines associated with sort field RATING. The SUB-TOTAL command associated with sort field COPIES is propagated to all fields on the DIRECTOR sort field lines and to the WHOLESALEPR and RATIO1 columns associated with the RATING sort field. The grand total line is suppressed for this request.

```
TABLE FILE MOVIES
PRINT LISTPR WHOLESALEPR
COMPUTE RATIO/D6.2 = LISTPR/WHOLESALEPR;
COMPUTE RATIO1/D6.2 = LISTPR/WHOLESALEPR;
BY DIRECTOR
BY RATING
BY COPIES
WHERE COPIES LT 3
  WHERE DIRECTOR EQ 'KAZAN E.'
  ON RATING  RECOMPUTE  AVE. LISTPR  RATIO AS '*REC:  '
  ON COPIES  SUB-TOTAL                AS '*SUB:  '
  ON TABLE NOTOTAL
END
```

On the output:

- The values of WHOLESALEPR and RATIO1 on the row labeled *REC are subtotals because of propagation of the SUB-TOTAL command to the fields not specified in the RECOMPUTE command.
- The LISTPR value is an average and the value of RATIO (which has the same definition as RATIO1) is recomputed because these two fields are specified in the RECOMPUTE command.
- The SUB-TOTAL command is propagated to the DIRECTOR row.

The output is:

```
DIRECTOR           RATING  COPIES  LISTPR  WHOLESALEPR   RATIO  RATIO1
--------           ------  ------  ------  -----------   -----  ------
KAZAN E.           NR           1   24.98        14.99    1.67    1.67

*SUB:    1                          24.98        14.99    1.67    1.67

                                2   19.95         9.99    2.00    2.00

*SUB:    2                          19.95         9.99    2.00    2.00
*REC:   NR                          22.46        24.98     .90    3.66
*TOTAL DIRECTOR KAZAN E.            44.93        24.98    3.66    3.66
```

# Propagation of Summary Commands With Field Lists

In the following request, the RECOMPUTE command has a field list.

```
TABLE FILE MOVIES
PRINT LISTPR WHOLESALEPR
COMPUTE RATIO/D6.2 = LISTPR/WHOLESALEPR;
COMPUTE RATIO1/D6.2 = LISTPR/WHOLESALEPR;
BY DIRECTOR
BY RATING
BY COPIES
WHERE COPIES LT 3
  WHERE DIRECTOR EQ 'KAZAN E.'
  ON RATING RECOMPUTE LISTPR RATIO AS '*REC:  '
  ON COPIES SUB-TOTAL AS '*SUB:  '
END
```

SUB-TOTAL propagates to all of the columns that would otherwise be unpopulated. The grand total line inherits the RECOMPUTE command for the fields listed in its field list, and the SUB-TOTAL command propagates to the other columns:

```
DIRECTOR           RATING  COPIES  LISTPR  WHOLESALEPR   RATIO  RATIO1
--------           ------  ------  ------  -----------   -----  ------
KAZAN E.           NR           1   24.98        14.99    1.67    1.67

*SUB:     1                         24.98        14.99    1.67    1.67

                                 2   19.95         9.99    2.00    2.00

*SUB:     2                         19.95         9.99    2.00    2.00
*REC:   NR                          44.93        24.98    1.80    3.66
*TOTAL DIRECTOR KAZAN E.            44.93        24.98    3.66    3.66


TOTAL                               44.93        24.98    1.80    3.66
```

# Usage Notes for Combinations of Summary Commands

- SET SUMMARYLINES=EXPLICIT affects propagation of summary commands to the grand total line by making it consistent with the behavior for any sort break. Therefore, with this setting in effect, SUB-TOTAL and SUMMARIZE propagate to the grand total line but SUBTOTAL and RECOMPUTE do not.

# Producing Summary Columns for Horizontal Sort Fields

The summary commands SUBTOTAL, SUB-TOTAL, SUMMARIZE, and RECOMPUTE can be used with horizontal sort breaks.

When a request has multiple display fields and an ACROSS sort field, the report output has multiple columns under each ACROSS value. If you want to apply a summary field to some of the columns for each ACROSS value, but not others, you can specify the field names you

want summarized. This technique is most useful for report requests that use the OVER phrase to place the fields on separate rows

# Produce a Summary Operation on a Horizontal Sort Field

```
{ACROSS|ON} acrossfield [AS 'text1'] sumoption [AS 'text2']
             [COLUMNS c1 [AND c2 ...]]
```

or

```
ACROSS acrossfieldsumoption [field1field2 ... fieldn]
```

or

```
ACROSS acrossfield
```

```
ON acrossfieldsumoption [field1field2 ... fieldn]
```

where:

**acrossfield**

Is the ACROSS field whose for which you want to generate the summary option. The end of the values for the ACROSS field triggers the summary operation.

**sumoption**

Can be one of the following: SUBTOTAL, SUB-TOTAL, RECOMPUTE, or SUMMARIZE.

**'text1'**

Is the column heading to use for the break field on the report output.

**'text2'**

Is the text that prints on the top of the summary column.

**COLUMNSc1, c2 ...**

Lists the specific ACROSS values that you want to display on the report output in the order in which you want them. This list of values cannot be specified in an ON phrase. If it is specified in an ACROSS phrase, it must be the last option specified in the ACROSS phrase.

**field1field2 ... fieldn**

Are the fields that will have the summary command applied. If no fields are listed, all fields will be summarized.

# Usage Notes for Summaries on ACROSS Fields

- SUMMARIZE and SUB-TOTAL operate on the ACROSS field for which they are specified and for all higher level ACROSS fields. They do not operate on BY fields. SUBTOTAL and RECOMPUTE operate only on the ACROSS field for which they are specified. However, the summary is not produced until the higher level ACROSS field changes value.
- SUMMARIZE and SUB-TOTAL commands specified for a BY field operate on that BY and all higher level BY fields. They do not operate on ACROSS fields.
- ROW-TOTAL, ACROSS-TOTAL, SUBTOTAL, and SUB-TOTAL sum the values in the columns. Unlike SUMMARIZE and RECOMPUTE, they do not reapply calculations other than sums.
- Summary commands specified in an ON TABLE phrase operate on columns, not rows.
- With ACROSS, summary columns only display at the end of the ACROSS group (when the higher-level ACROSS field changes value).
- Different operations from two ON phrases for the same sort break display in the same summary column, and allow a mixture of operations on summary columns.
- If the same field is referenced in more than one ON phrase for the same sort break, the last summary command specified is applied.
- You can specify a different summary operation for each sort break.
- The SUMMARYLINES parameter does not affect processing for ACROSS fields.
- When used with OVERs, the rows containing fields not to be summarized will be

blank.

- Prefix operators are supported on summary lines:
  - The following prefix operators are supported for numeric fields: ASQ., AVE., CNT., FST., LST., MAX., MIN., SUM.
  - Prefix operators PCT., RPCT., AND TOT. are not supported.
  - Double prefix operators (such as PCT.CNT.) are not supported.
  - The SUM. prefix operator produces the same summary values as a summary phrase with no prefix operator.
  - SUMMARIZE and RECOMPUTE apply the calculations defined in the associated COMPUTE command to the summary values. Therefore, in order to perform the necessary calculations, the SUMMARIZE or RECOMPUTE command must specify all of the fields referenced in the COMPUTE command.
  - If the same field has summary operations with different prefix operators at each level, the appropriate calculation is done at each level for the prefix operator specified.
  - SUB-TOTAL and SUMMARIZE propagate their operations to all higher-level sort fields. If a request uses SUB-TOTAL or SUMMARIZE at multiple sort levels, more than one prefix operator may apply to the same field. When a SUB-TOTAL or SUMMARIZE command on a lower-level sort field propagates up to the higher levels, it applies its prefix operators only to those fields that did not already have a prefix operator specified at the higher level. For any field that had a prefix operator specified at a higher level, the original prefix operator is applied at the level at which it was first specified.
  - Prefix operators on summary lines result in the same values whether the command is RECOMPUTE/SUMMARIZE or SUBTOTAL/SUB-TOTAL. For a computed field, the prefix operator is not applied, and the value is recalculated using the expression in the COMPUTE command and the values from the summary line.
  - If an ACROSS field has an ACROSS-TOTAL phrase and a summary command with a prefix operator, the prefix operator is applied, not the ACROSS-TOTAL.

# Using Summary Commands With ACROSS

The following request sums units and dollars and calculates the unit cost by product and across region and month. The ACROSS MNTH RECOMPUTE command creates totals of units and dollars, and recomputes the calculated value for the selected months within regions. The ACROSS REGION RECOMPUTE command does the same for the selected regions. The ON TABLE SUMMARIZE command creates summary rows. It has no effect on columns:

```
DEFINE FILE GGSALES
MNTH/MTr   = DATE;
END
TABLE FILE GGSALES
SUM
 UNITS/I5 AS 'UNITS'                   OVER
 DOLLARS/I6 AS 'DOLLARS'               OVER
 COMPUTE DOLLPER/I6 = DOLLARS/UNITS; AS 'UNIT COST'
BY PRODUCT
ACROSS REGION RECOMPUTE AS 'Region Sum' COLUMNS 'Northeast' AND 'West'
ACROSS MNTH   RECOMPUTE AS 'Month Sum' COLUMNS 'November' AND 'December'
WHERE DATE FROM '19971101' TO '19971231';
WHERE PRODUCT EQ 'Capuccino' OR 'Espresso';
ON TABLE SUMMARIZE AS 'Grand Total'

END
```

The output is:

| PAGE 1 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Region | | | | | | |
| | | Northeast | | | West | | | Region Sum |
| | | MNTH | | | | | | |
| | | NOVEMBER | DECEMBER | Month Sum | NOVEMBER | DECEMBER | Month Sum | |
| Product | | | | | | | | |
| Capuccino | UNITS | 2282 | 1188 | 3470 | 2535 | 4051 | 6586 | 10056 |
| | DOLLARS | 25994 | 13668 | 39662 | 31153 | 57421 | 88574 | 128236 |
| | UNIT COST | 11 | 11 | 11 | 12 | 14 | 13 | 12 |
| Espresso | UNITS | 1947 | 2403 | 4350 | 3088 | 3732 | 6820 | 11170 |
| | DOLLARS | 23629 | 30605 | 54234 | 36123 | 51400 | 87523 | 141757 |
| | UNIT COST | 12 | 12 | 12 | 11 | 13 | 12 | 12 |
| Grand Total | UNITS | 4229 | 3591 | 7820 | 5623 | 7783 | 13406 | 21226 |
| | DOLLARS | 49623 | 44273 | 93896 | 67276 | 108821 | 176097 | 269993 |
| | UNIT COST | 11 | 12 | 12 | 11 | 13 | 13 | 12 |

# Subtotaling One Field Within an ACROSS Group

The following request against the GGSALES data source sums the DOLLARS and UNITS fields by CATEGORY and across REGION, but subtotals only the UNITS field.

```
TABLE FILE GGSALES
SUM DOLLARS AS 'Dollars' OVER
UNITS AS 'Units'
  BY CATEGORY
  ACROSS REGION SUBTOTAL UNITS
WHERE REGION EQ 'Midwest' OR 'West'
ON TABLE SET PAGE NOPAGE
END
```

The output shows that only the rows with the UNITS values are subtotaled.

```
                     Region
                     Midwest      West         TOTAL
Category
---------------------------------------------------------------
Coffee       Dollars   4178513      4473517
             Units      332777       356763       689540
Food         Dollars   4338271      4202337
             Units      341414       340234       681648
```

```
Gifts        Dollars   2883881      2977092
             Units      230854       235042       465896
```

# Summarizing a Calculated Value in an ACROSS Group

The following request against the GGSALES data source sums the DOLLARS and UNITS fields and calculates DOLLARS PER UNIT across REGION. The request also has a higher-level ACROSS field, CATEGORY, so the SUMMARIZE command propagates to both ACROSS fields.

```
SET BYPANEL = ON
TABLE FILE GGSALES
SUM DOLLARS AS 'Dollars' OVER
UNITS AS 'Units'         OVER
AND COMPUTE DPERU/D9.2 = DOLLARS/UNITS;
  ACROSS CATEGORY
  ACROSS REGION
  ON REGION SUMMARIZE DPERU
  WHERE REGION EQ 'Midwest' OR 'West'
  WHERE CATEGORY EQ 'Food' OR 'Gifts'
  ON TABLE PCHOLD FORMAT PDF
END
```

The first panel of output shows:

- The values of DOLLARS, UNITS, and DPERU for the Midwest and West regions under the Food category.
- The summary column, which has a value just for the DPERU row. Note that for ACROSS, the summary column for REGION appears only after the higher-level ACROSS field, CATEGORY, changes value.
- The values of DOLLARS, UNITS, and DPERU for the Midwest and West regions under the Gifts category.

```
PAGE   1.1


         Category
         Food                                    Gifts
```

```
         Region
         Midwest      West         TOTAL        Midwest      West
-------------------------------------------------------------------------
-
Dollars      4338271      4202337                   2883881      2977092
Units         341414       340234                    230854       235042
DPERU          12.71        12.35        12.53        12.49        12.67
```

The second panel has the total column for the Gifts category and the grand total column. Each of those only has a value in the DPERU row.

```
 PAGE   1.2


         Category
                       TOTAL
         Region
          TOTAL
 ---------------------------------
 Dollars
 Units
 DPERU          12.58        12.55
```

# Using Prefix Operators in a Summary Command With ACROSS

The following request against the GGSALES data source sums the DOLLARS and UNITS fields ACROSS CATEGORY and ACROSS REGION, with a SUMMARIZE command on the REGION field. The request also has a higher-level ACROSS field, CATEGORY, so the SUMMARIZE command propagates to both ACROSS fields. The SUMMARIZE command specifies the AVE. prefix operator for the DOLLARS field.

```
SET BYPANEL = ON
TABLE FILE GGSALES
SUM DOLLARS AS 'Dollars' OVER
UNITS AS 'Units'
  ACROSS CATEGORY
  ACROSS REGION
  ON REGION SUMMARIZE AVE. DOLLARS
  WHERE REGION EQ 'Midwest' OR 'West'
```

```
  WHERE CATEGORY EQ 'Food' OR 'Gifts'
  ON TABLE PCHOLD FORMAT PDF
END
```

The first panel of output shows:

- The values of DOLLARS and UNITS for the Midwest and West regions under the Food category.
- The summary column, which has a value just for the DOLLARS row. Note that for ACROSS, the summary column for REGION appears only after the higher-level ACROSS field, CATEGORY, changes value.
- The values of DOLLARS and UNITS for the Midwest and West regions under the Gifts category.

```
PAGE   1.1


         Category
         Food                                    Gifts
         Region
         Midwest      West         TOTAL        Midwest      West
---------------------------------------------------------------------------
-
Dollars    4338271      4202337      4270304      2883881      2977092
Units       341414       340234                    230854       235042
```

The second panel has the total column for the Gifts category and the grand total column. Each of those only has a value in the DOLLARS row.

```
PAGE   1.2


        Category
                     TOTAL
        Region
         TOTAL
----------------------------------
Dollars    2930486      3600395
Units
```

# Using Combinations of ACROSS Summary Commands

The following request against the GGSALES data source sums the DOLLARS and UNITS fields ACROSS CATEGORY and ACROSS REGION, with a SUMMARIZE command on the REGION field and a SUBTOTAL command on the CATEGORY field. The SUMMARIZE command specifies average DOLLARS and minimum UNITS. The SUBTOTAL command specifies minimum DOLLARS.

```
SET BYPANEL = ON
TABLE FILE GGSALES
SUM DOLLARS AS 'Dollars' OVER
UNITS AS 'Units'
  ACROSS CATEGORY
  ACROSS REGION
    ON CATEGORY SUBTOTAL MIN. DOLLARS
    ON REGION SUMMARIZE AVE. DOLLARS MIN. UNITS
  WHERE REGION EQ 'Midwest' OR 'West'
  WHERE CATEGORY EQ 'Food' OR 'Gifts'
  ON TABLE PCHOLD FORMAT PDF
END
```

On the output, all of the TOTAL columns have the minimum UNITS. The TOTAL columns associated with the REGION sort field have the average DOLLARS, but the TOTAL column associated with the CATEGORY sort field has the minimum DOLLARS because SUMMARIZE does not change the prefix operator associated with a higher-level sort field.

```
PAGE   1.1


         Category
         Food                                    Gifts
         Region
         Midwest      West         TOTAL        Midwest      West
---------------------------------------------------------------------
-
Dollars    4338271      4202337      4270304      2883881      2977092
Units       341414       340234       340234       230854       235042
```

```
PAGE   1.2


        Category
                       TOTAL
        Region
         TOTAL
---------------------------------
Dollars    2930486      2883881
Units       230854       230854
```

# Performing Calculations at Sort Field Breaks

You can use the RECAP and COMPUTE commands to create subtotal values in a calculation. The subtotal values are not displayed. Only the result of the calculation is shown on the report.

# Use Subtotals in Calculations

Both the RECAP and COMPUTE commands have similar syntax to other total and subtotal commands.

```
{BY|ON} fieldname1 {RECAP|COMPUTE} fieldname2[/format] = expression;
                                        [WHEN expression;]
```

where:

**fieldname1**

Is the field in the BY phrase. Each time the BY field changes value, a new recap value is calculated.

**fieldname2**

Is the field name that contains the result of the expression.

**/format**

Can be any valid format. The default is D12.2.

**expression**

Can be any valid expression, as described in Using Expressions. You must end the expression with a semicolon.

**WHEN expression**

Is for use with RECAP only. It specifies the conditional display of RECAP lines as determined by a Boolean expression (see Conditionally Displaying Summary Lines and Text). You must end the expression with a semicolon.

# Usage Notes for RECAP and COMPUTE

- RECAP uses the current value of the named sort field, the current subtotal values of any computational fields that appear as display fields, or the last value for alphanumeric fields.
- RECAP reserves space at the bottom of the page to ensure that a RECAP will not be alone at the top of the next page while the data it is recapping is on the previous page. The same technique is used for subtotals and grand totals, but not for subfootings or COMPUTEs.
- The field names in the expression must be fields that appear on the report. That is, they must be display fields or sort control fields.
- Each RECAP value displays on a separate line. However, if the request contains a RECAP command and SUBFOOT text, the RECAP value displays only in the SUBFOOT text and must be specified in the text using a spot marker. (For details, see Using Headings, Footings, Titles, and Labels.)
- The calculations in a RECAP or COMPUTE can appear anywhere under the control break, along with any text. (For details, see Using Headings, Footings, Titles, and Labels.)
- In an ON phrase, a COMPUTE command is the same as a RECAP command.
- The limit for ON *sortfield* RECAP phrases is 64 for each sort field.
- You can specify multiple recap calculations in one RECAP phrase. Use the following syntax:

```
ON sortfield RECAP field1/format= ... ;field2/format= ... ;
.
.
.
```

# Using RECAP

The following request illustrates the use of RECAP (DEPT_NET) to determine net earnings for each department:

```
TABLE FILE EMPLOYEE
SUM DED_AMT AND GROSS
BY DEPARTMENT BY PAY_DATE
ON DEPARTMENT RECAP DEPT_NET/D8.2M = GROSS-DED_AMT;
WHEN PAY_DATE GT 820101
END
```

The output is:

```
DEPARTMENT  PAY_DATE          DED_AMT            GROSS
----------  --------          -------            -----
MIS         81/11/30        $1,406.79        $2,147.75
            81/12/31        $1,406.79        $2,147.75
            82/01/29        $1,740.89        $3,247.75
            82/02/26        $1,740.89        $3,247.75
            82/03/31        $1,740.89        $3,247.75
            82/04/30        $3,386.73        $5,890.84
            82/05/28        $3,954.35        $6,649.50
            82/06/30        $4,117.03        $7,460.00
            82/07/30        $4,117.03        $7,460.00
            82/08/31        $4,575.72        $9,000.00

** DEPT_NET           $22,311.98

PRODUCTION  81/11/30          $141.66          $833.33
            81/12/31          $141.66          $833.33
            82/01/29        $1,560.09        $3,705.84
            82/02/26        $2,061.69        $4,959.84
            82/03/31        $2,061.69        $4,959.84
            82/04/30        $2,061.69        $4,959.84
            82/05/28        $3,483.88        $7,048.84
            82/06/30        $3,483.88        $7,048.84
```

```
            82/07/30        $3,483.88        $7,048.84
            82/08/31        $4,911.12        $9,523.84

** DEPT_NET           $27,531.14
```

# Using Multiple RECAP Commands

You can include multiple RECAP or COMPUTE commands in a request. This option enables you to perform different calculations at different control breaks.

The following request illustrates the use of multiple RECAP commands.

```
TABLE FILE SALES
SUM UNIT_SOLD AND RETURNS
WHERE AREA EQ 'U'
BY DATE BY AREA BY PROD_CODE
ON DATE RECAP
DATE_RATIO=RETURNS/UNIT_SOLD;
ON AREA UNDER-LINE RECAP
AREA_RATIO=RETURNS/UNIT_SOLD;
END
```

The output is:

```
DATE   AREA  PROD_CODE  UNIT_SOLD  RETURNS
----   ----  ---------  ---------  -------
10/17  U     B10               30        2
             B17               20        2
             B20               15        0
             C17               12        0
             D12               20        3
             E1                30        4
             E3                35        4

** AREA_RATIO                        .09

** DATE_RATIO                        .09

----------------------------------------
10/18  U     B10               13        1

** AREA_RATIO                        .08
```

```
** DATE_RATIO                      .08

----------------------------------------
10/19  U     B12               29        1

** AREA_RATIO                      .03

** DATE_RATIO                      .03

----------------------------------------
```

# Suppressing Grand Totals

You can use the NOTOTAL command to suppress grand totals in a report.

Suppressing the grand total is useful when there is only one value at a sort break, since the grand total value is equal to that one value. Using the NOTOTAL command prevents the report from displaying a grand total line for every sort break that has only one detail line. You can also suppress subtotals using the MULTILINES command. For details, see Create Subtotals.

# Suppress Grand Totals

To suppress grand totals, add the following syntax to your request:

```
ON TABLE NOTOTAL
```

# Suppressing Grand Totals

The following request includes the NOTOTAL phrase to suppress grand totals for CURR_SAL, GROSS, and DED_AMT.

```
TABLE FILE EMPLOYEE
SUM CURR_SAL AND GROSS AND DED_AMT
```

```
BY EMP_ID
BY BANK_ACCT
WHERE BANK_ACCT NE 0
ON BANK_ACCT SUB-TOTAL
ON TABLE NOTOTAL
END
```

The output is:

| EMP_ID | BANK_ACCT | CURR_SAL | GROSS | DED_AMT |
|---|---|---|---|---|
| 117593129 | 40950036 | $18,480.00 | $6,099.50 | $2,866.18 |
| *TOTAL | 40950036 | $18,480.00 | $6,099.50 | $2,866.18 |
| *TOTAL | 117593129 | $18,480.00 | $6,099.50 | $2,866.18 |
| 119329144 | 160633 | $29,700.00 | $2,475.00 | $1,427.24 |
| *TOTAL | 160633 | $29,700.00 | $2,475.00 | $1,427.24 |
| *TOTAL | 119329144 | $29,700.00 | $2,475.00 | $1,427.24 |
| 123764317 | 819000702 | $26,862.00 | $17,094.00 | $11,949.44 |
| *TOTAL | 819000702 | $26,862.00 | $17,094.00 | $11,949.44 |
| *TOTAL | 123764317 | $26,862.00 | $17,094.00 | $11,949.44 |
| 326179357 | 122850108 | $21,780.00 | $9,075.00 | $6,307.00 |
| *TOTAL | 122850108 | $21,780.00 | $9,075.00 | $6,307.00 |
| *TOTAL | 326179357 | $21,780.00 | $9,075.00 | $6,307.00 |
| 451123478 | 136500120 | $16,100.00 | $9,130.00 | $3,593.92 |
| *TOTAL | 136500120 | $16,100.00 | $9,130.00 | $3,593.92 |
| *TOTAL | 451123478 | $16,100.00 | $9,130.00 | $3,593.92 |
| 818692173 | 163800144 | $27,062.00 | $22,013.75 | $15,377.40 |
| *TOTAL | 163800144 | $27,062.00 | $22,013.75 | $15,377.40 |
| *TOTAL | 818692173 | $27,062.00 | $22,013.75 | $15,377.40 |

# Conditionally Displaying Summary Lines and Text

In addition to using summary lines to control the look and content of your report, you can specify WHEN criteria to control the conditions under which summary lines appear for each vertical (BY) sort field value. WHEN is supported with SUBFOOT, SUBHEAD, SUBTOTAL, SUB-TOTAL, SUMMARIZE, RECOMPUTE, and RECAP.

## Conditionally Displaying Summary Lines and Text

In a sales report that covers four regions (Midwest, Northeast, Southeast, and West), you may only want to display a subtotal when total dollar sales are greater than $11,500,000. The following request accomplishes this by including criteria that trigger the display of a subtotal when dollar sales exceed $11,500,000 and subfooting text when dollar sales are less than $11,500,000.

```
TABLE FILE GGSALES
SUM UNITS DOLLARS
BY REGION
BY CATEGORY
ON REGION SUBTOTAL
WHEN DOLLARS GT 11500000
SUBFOOT
"The total for the <REGION region is less than 11500000."
WHEN DOLLARS LT 11500000
END
```

The output is:

```
Region       Category     Unit Sales  Dollar Sales
------       --------     ----------  ------------
Midwest      Coffee           332777       4178513
             Food             341414       4338271
             Gifts            230854       2883881

The total for the Midwest region is less than 11500000.
Northeast    Coffee           335778       4164017
             Food             353368       4379994
             Gifts            227529       2848289
```

```
The total for the Northeast region is less than 11500000.
Southeast    Coffee           350948       4415408
             Food             349829       4308731
             Gifts            234455       2986240

*TOTAL Southeast              935232      11710379

West         Coffee           356763       4473517
             Food             340234       4202337
             Gifts            235042       2977092

*TOTAL West                   932039      11652946


TOTAL                        3688991      46156290
```

# Using Expressions

An expression combines field names, constants, and operators in a calculation that returns a single value. You can use an expression in a variety of commands to assign a value to a temporary field or Dialogue Manager amper variable, or use it in screening. You can combine simpler ones to build increasingly complex expressions.

When you write an expression, you can specify the operation yourself, or you can use one of the many supplied functions that perform specific calculations or data manipulation. These functions operate on one or more arguments, and return a single value as a result. To use a function, you simply call it. For details about functions, see the *ibi™ FOCUS® Describing Data* manual.

IF-THEN-ELSE logic is supported as part of an expression, including arithmetic, character, and logical expressions. It is also supported in WHERE clauses.

# Using Expressions in Commands and Phrases

You can use an expression in various commands and phrases. An expression may not exceed 40 lines and must end with a semicolon, except in WHERE and WHEN phrases, in which the semicolon is optional.

The commands that support expressions, and their basic syntax, are summarized here. For complete syntax with an explanation, see the applicable documentation.

You can use an expression when you:

- Create a temporary field, and assign a value to that field. The field can be created in a Master File using the DEFINE attribute, or using a DEFINE or COMPUTE command:
    - DEFINE command preceding a report request:

```
DEFINE FILE filename
 fieldname  [/format] = expression;
   .
   .
```

```
   .
END
```

- DEFINE attribute in a Master File:

```
DEFINE fieldname [/format] = expression;$
```

- COMPUTE command in a report request:

```
COMPUTE fieldname  [/format] = expression;
```

- Define record selection criteria and criteria that control report formatting.

```
{WHERE|IF} logical_expression[;]
      WHEN logical_expression[;]
```

- Determine branching in Dialogue Manager, or assign a value to a Dialogue Manager amper variable.

```
-IF logical_expression [THEN] GOTO label1 [ELSE GOTO label2];
```

```
-SET &name = expression;
```

- Perform a calculation with the RECAP command in the Financial Modeling Language (FML).

```
RECAP name [(n)] [/format] = expression;
```

# Types of Expressions

An expression can be one of the following:

- **Numeric.** Use numeric expressions to perform calculations that use numeric constants (integer or decimal) and fields. For example, you can write an expression to compute the bonus for each employee by multiplying the current salary by the desired percentage as follows:

```
COMPUTE BONUS/D12.2 = CURR_SAL * 0.05 ;
```

A numeric expression returns a numeric value. For details, see Creating a Numeric Expression.

- **Date.** Use date expressions to perform numeric calculations on dates. For example, you can write an expression to determine when a customer can expect to receive an order by adding the number of days in transit to the date on which you shipped the order as follows:

  ```
  COMPUTE DELIVERY/MDY = SHIPDATE + 5 ;
  ```

  There are two types of date expressions:

  - Date expressions, which return a date, a component of a date, or an integer that represents the number of days, months, quarters, or years between two dates. For details, see Creating a Date Expression.
  - Date-time expressions, which you can create using a variety of specialized date-time functions, each of which returns a different kind of value. For details on these functions, see the *ibi™ WebFOCUS® Using Functions* manual.

- **Character.** Use character expressions to manipulate alphanumeric constants or fields. For example, you can write an expression to extract the first initial from an alphanumeric field as follows:

  ```
  COMPUTE FIRST_INIT/A1 = EDIT (FIRST_NAME, '9$$$$$$$$$') ;
  ```

  A character expression returns an alphanumeric value. For details, see Creating a Character Expression.

  **Note:** Text fields can be assigned to alphanumeric fields and receive assignment from alphanumeric fields. Text fields can also participate in expressions using the operators CONTAINS and OMITS.

- **Logical.** Use logical expressions to evaluate the relationship between two values. A logical expression returns TRUE or FALSE. For details, see Creating a Logical Expression.

- **Conditional.** Use conditional expressions to assign values based on the result of logical expressions. A conditional expression (IF ... THEN ... ELSE) returns a numeric or alphanumeric value. For details, see Creating a Conditional Expression.

# Expressions and Field Formats

When you use an expression to assign a value to a field, make sure that you give the field a format that is consistent with the value returned by the expression. For example, if you use a character expression to concatenate a first name and last name and assign it to the field FULL_NAME, make sure you define the field as character.

## Assigning a Field Format of Sufficient Length

The following example contains a character expression that concatenates a first name and last name to derive the full name. It assigns the field FULL_NAME an alphanumeric format of sufficient length to accommodate the concatenated name:

```
DEFINE FILE EMPLOYEE
FULL_NAME/A25 = FIRST_NAME | LAST_NAME;
END
TABLE FILE EMPLOYEE
PRINT FULL_NAME
WHERE LAST_NAME IS 'BLACKWOOD'
END
```

The output is:

```
FULL_NAME
---------
ROSEMARIE BLACKWOOD
```

# Creating a Numeric Expression

A numeric expression performs a calculation that uses numeric constants, fields, operators, and functions to return a numeric value. When you use a numeric expression to assign a value to a field, that field must have a numeric format. The default format is D12.2.

A numeric expression can consist of the following components, shown below in bold:

- A numeric constant. For example:

```
COMPUTE COUNT/I2 = 1 ;
```

- A numeric constant in scientific notation. For example:

  ```
  COMPUTE COST/D12.2 = EXPN(8E+3);
  ```

  For syntax usage, see Creating a Numeric Expression.

- A numeric field. For example:

  ```
  COMPUTE RECOUNT/I2 = COUNT ;
  ```

- Two numeric constants or fields joined by an arithmetic operator. For example:

  ```
  COMPUTE BONUS/D12.2 = CURR_SAL * 0.05 ;
  ```

  For a list of arithmetic operators, see Creating a Numeric Expression.

- A numeric function. For example:

  ```
  COMPUTE LONGEST_SIDE/D12.2 = MAX (WIDTH, HEIGHT) ;
  ```

- Two or more numeric expressions joined by an arithmetic operator. For example:

  ```
  COMPUTE PROFIT/D12.2 = (RETAIL_PRICE - UNIT_COST) * UNIT_SOLD ;
  ```

  Note the use of parentheses to change the order of evaluation of the expression. For information on the order in which numeric operations are performed, see Creating a Numeric Expression.

Before they are used in calculations, numeric values are generally converted to double-precision floating-point format. The result is then converted to the specified field format. In some cases the conversion may result in a difference in rounding. Note that environments that support native-mode arithmetic handle rounding differently. For details, see Evaluating Numeric Expressions With Native-Mode Arithmetic.

If a number is too large (greater than $10^{75}$) or too small (less than $10^{-75}$), you receive an Overflow or Underflow warning, and asterisks display for the field value.

**Note:** You can change the overflow character by issuing the SET OVERFLOWCHAR command.

For detailed information on rounding behavior for numeric data formats, see the *Describing Data With ibi™ WebFOCUS® Language* manual.

IF-THEN-ELSE logic is supported in numeric expressions.

# Express a Number in Scientific Notation

In an IF clause, use the following:

```
IF fieldopn[.nn]{E|D|e|d}[+|-]p
```

In a WHERE clause, use the following:

```
WHERE fieldop EXPN(n[.nn{E|D|e|d}[+|-]p);
```

In a COMPUTE command, use the following:

```
COMPUTE field[/format] = EXPN(n[.nn]{{E|D|e|d}[+|-]p);
```

In a DEFINE command, use the following:

```
DEFINE FILE filename
field[/format] = EXPN(n[.nn]{E|D|e|d}[+|-]p);
END
```

In a DEFINE in the Master File, use the following:

```
DEFINE field[/format] = EXPN(n[.nn]{{E|D|e|d}[+|-]p);
```

where:

**field**

Is a field in a request.

**/format**

Is the optional format of the field. For information on formats, see the *Describing Data With ibi™ WebFOCUS® Language* manual.

**op**

Is a relational operator in a request.

**n.nn**

Is a numeric constant that consists of a whole number component, followed by a decimal point, followed by a fractional component.

**E, D, e, d**

Denotes scientific notation. E, e, d, and D are interchangeable.

**+, -**

Indicates if *p* is positive or negative. Positive is the default.

**p**

Is the power of 10 to which to raise the number. The range of values for p is between -78 and +78 on z/OS, -99 to +99 elsewhere.

**Note:** EXPN is useful for calculations on fields with F and D formats. It is generally not useful for calculations on fields with P or I formats.

# Evaluating a Number in Scientific Notation

You can use scientific notation in an IF or WHERE clause to express 8000 as 8E+03:

```
IF RCOST LT 8E+03
```

```
WHERE RCOST LT EXPN(8E+03)
```

# Arithmetic Operators

The following list shows the arithmetic operators you can use in an expression:

| | |
|---|---|
| Addition | + |

| | |
|---|---|
| Subtraction | - |
| Multiplication | * |
| Division | / |
| Exponentiation | ** |

**Note:** If you attempt to divide by 0, the value of the expression is 0. Multiplication and exponentiation are not supported for date expressions of any type. To isolate part of a date, use a simple assignment command.

# Order of Evaluation

Numeric expressions are evaluated in the following order:

1. Exponentiation.
2. Division and multiplication.
3. Addition and subtraction.

When operators are at the same level, they are evaluated from left to right. Because expressions in parentheses are evaluated before any other expression, you can use parentheses to change this predefined order. For example, the following expressions yield different results because of parentheses:

```
COMPUTE PROFIT/D12.2  =  RETAIL_PRICE  -  UNIT_COST  *  UNIT_SOLD ;
COMPUTE PROFIT/D12.2  = (RETAIL_PRICE  -  UNIT_COST) *  UNIT_SOLD ;
```

In the first expression, UNIT_SOLD is first multiplied by UNIT_COST, and the result is subtracted from RETAIL_PRICE. In the second expression, UNIT_COST is first subtracted from RETAIL_PRICE, and that result is multiplied by UNIT_SOLD.

**Note:**Two operators cannot appear consecutively. The following expression is invalid:

```
a * -1
```

To make it valid, you must add parentheses:

```
a* (-1)
```

# Controlling the Order of Evaluation

The order of evaluation can affect the result of an expression. Suppose you want to determine the dollar loss in retail sales attributed to the return of damaged items. You could issue the following request:

```
TABLE FILE SALES
PRINT RETAIL_PRICE RETURNS DAMAGED
COMPUTE RETAIL_LOSS/D12.2 = RETAIL_PRICE * RETURNS + DAMAGED;
BY PROD_CODE
WHERE PROD_CODE IS 'E1';
END
```

The calculation

```
COMPUTE RETAIL_LOSS/D12.2 = RETAIL_PRICE * RETURNS + DAMAGED;
```

gives an incorrect result because RETAIL_PRICE is first multiplied by RETURNS, and then the result is added to DAMAGED. The correct result is achieved by adding RETURNS to DAMAGED, then multiplying the result by RETAIL_PRICE.

You can change the order of evaluation by enclosing expressions in parentheses. An expression in parentheses is evaluated before any other expression. You may also use parentheses to improve readability.

Using parentheses, the correct syntax for the preceding calculation is:

```
COMPUTE RETAIL_LOSS/D12.2 = RETAIL_PRICE * (RETURNS + DAMAGED);
```

The output is:

```
PROD_CODE  RETAIL_PRICE  RETURNS  DAMAGED     RETAIL_LOSS
---------  ------------  -------  -------     -----------
E1                $.89        4        7            9.79
```

# Using IF-THEN-ELSE Logic in an Arithmetic Expression

The following request uses IF-THEN-ELSE logic in an arithmetic expression to determine how much to add to LISTPR to calculate NEWPRICE.

```
TABLE FILE MOVIES
SUM COPIES
LISTPR
COMPUTE
NEWPRICE = LISTPR + (IF COPIES GT 10 THEN 0.00 ELSE 25.00);
BY CATEGORY
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image. Where there are more than 10 copies, the NEWPRICE equals LISTPR, otherwise NEWPRICE is $25.00 greater than LISTPR.

| CATEGORY | COPIES | LISTPR | WHOLESALEPR | NEWPRICE |
|---|---|---|---|---|
| ACTION | 14 | 94.82 | 55.46 | 94.82 |
| CHILDREN | 12 | 201.67 | 105.87 | 201.67 |
| CLASSIC | 21 | 404.71 | 201.79 | 404.71 |
| COMEDY | 19 | 154.80 | 90.45 | 154.80 |
| DRAMA | 2 | 19.98 | 10.00 | 44.98 |
| FOREIGN | 6 | 269.76 | 146.24 | 294.76 |
| MUSICALS | 5 | 84.89 | 52.97 | 109.89 |
| MYSTERY | 21 | 235.81 | 116.97 | 235.81 |
| SCI/FI | 7 | 114.84 | 79.52 | 139.84 |
| TRAIN/EX | 10 | 119.87 | 60.98 | 144.87 |

# Evaluating Numeric Expressions With Native-Mode Arithmetic

When native-mode arithmetic is used, a specific evaluation path is followed for each numeric expression based on the format of the operands and the operators. If the operands all have the same format, most operations are carried out in that format. If the operands have different formats, the operands are converted to a common format in a specific order of format precedence. Regardless of operand formats, some operators require conversion to specific formats so that all operands are in the appropriate format.

# Using Identical Operand Formats With Native-Mode Arithmetic

If all operands of a numeric operator are of the same format, you can use the following table to determine whether or not the operations are performed in that native format or if the operands are converted before and after executing the operation. In each case requiring conversion, operands are converted to the operational format and the intermediate result is returned in the operational format. If the format of the result differs from the format of the target variable, the result is converted to the format of the target variable.

| Operation | | Operational Format |
|---|---|---|
| Addition | + | Native |
| Subtraction | - | Native |
| Multiplication | * | Native |
| Full Division | / | Accepts single or double-precision floating point, converts all others to double-precision floating point |
| Exponentiation | ** | Double-precision floating point |

# Using Identical Operand Formats (Native-mode Arithmetic)

The following variables are defined as integers in Maintain Data:

```
COMPUTE OPERANDONE/I4  ;
        OPERANDTWO/I4  ;
        RESULT/I4  ;
```

The required multiplication is done in native-mode arithmetic (integer arithmetic):

```
COMPUTE RESULT/I4 = OPERANDONE * OPERANDTWO  ;
```

# Using Different Operand Formats With Native-Mode Arithmetic

If operands of a numeric operator have different formats, you can use the following table to determine what the common format is after they are converted. The lower operand is converted to the format of the higher operand before performing the operation.

| Order | Format |
|---|---|
| 1 | 16-byte packed decimal |
| 2 | Double-precision floating point |
| 3 | 8-byte packed-decimal |
| 4 | Single-precision floating point |
| 5 | Integer |
| 6 | Character (alphanumeric and text) |

For example, if a 16-byte packed-decimal operand is used in an expression, all other operands are converted to 16-byte packed-decimal format for evaluation. On the other

hand, if an expression includes only integer and alphanumeric operands, all alphanumeric operands are converted to integer format.

A character (that is, alphanumeric or text) value can be used in a computation if it is a numeric string. An attempt is made to convert the character operand to the format of the other operand in the expression. If both operands are character, an attempt is made to convert them to double-precision. If the conversion is not possible, an error message is generated.

If you assign a decimal value to an integer, the fractional value is truncated.

# Creating a Date Expression

A date expression performs a numeric calculation that involves dates.

A date expression returns a date, a date component, or an integer that represents the number of days, months, quarters, or years between two dates. You can write a date expression directly that consists of:

- A date constant. For example:

  ```
  COMPUTE END_DATE/MDYY = 'FEB 29 2000';
  ```

  This requires single quotation marks around the date constant.

- A date field. For example:

  ```
  COMPUTE NEWDATE/YMD = START_DATE;
  ```

- An alphanumeric, integer, or packed decimal format field, with date edit options. For example, in the second COMPUTE command, OLDDATE is a date expression:

  ```
  COMPUTE OLDDATE/I6YMD = 980307;
  COMPUTE NEWDATE/YMD DFC 19 YRT 10 = OLDDATE;
  ```

- A calculation that uses an arithmetic operator or date function to return a date. Use a numeric operator only with date formats (formerly called Smart dates). The following example first converts the integer date HIRE_DATE (format I6YMD) to the date format CONVERTED_HDT (format YMD). It then adds 30 days to CONVERTED_HDT:

```
COMPUTE CONVERTED_HDT/YMD = HIRE_DATE;
HIRE_DATE_PLUS_THIRTY/YMD = CONVERTED_HDT + 30;
```

- A calculation that uses a numeric operator or date function to return an integer that represents the number of days, months, quarters, or years between two dates. The following example uses the date function YMD to calculate the difference (number of days) between an employee hire date and the date of his first salary increase:

```
COMPUTE DIFF/I4 = YMD (HIRE_DATE,FST.DAT_INC);
```

# Formats for Date Values

You can work with dates in one of two ways:

- **In date format.** The value is treated as an integer that represents the number of days between the date value and a base date. There are two base dates for date formats:
  - YMD and YYMD formats have a base date of December 31, 1900.
  - YM and YYM formats have a base date of January, 1901 on z/OS and a base date of December 31, 1900 on Windows and UNIX.

  When displayed, the integer value is converted to the corresponding date in the format specified for the field. The format can be specified in either the Master File or in the command that uses an expression to assign a value to the field. These were previously referred to as smart date formatted fields.
- **In integer, packed decimal, or alphanumeric format with date edit options.** The value is treated as an integer, a packed decimal, or an alphanumeric string. When displayed, the value is formatted as a date. These were previously referred to as old date formatted fields.

You can convert a date in one format to a date in another format simply by assigning one to the other. For example, the following assignments take a date stored as an alphanumeric field, formatted with date edit options, and convert it to a date stored as a temporary date field:

```
COMPUTE ALPHADATE/A6MDY = '120599' ;
        REALDATE/MDY = ALPHADATE;
```

# Base Dates for Date Formats

The following table shows the base date for each supported date format:

| Format | Base Date |
|---|---|
| `YMD, YYMD, MDYY, DMYY, MDY, and DMY` | 1900/12/31 |
| `YM, YYM, MYY, and MY` | 1901/01 on z/OS<br>1900/12/31 on Windows and UNIX |
| `YQ, YYQ, QYY, and QY` | 1901 Q1 |
| `JUL and YYJUL` | 1900/365 |
| `D`<br>`M`<br>`Y, YY`<br>`Q`<br>`W` | There is no base date for these formats; these are just numbers, not dates. |

Note that the base date used for the functions DA and DT is December 31, 1899. For details on date functions, see the *ibi™ WebFOCUS® Using Functions* manual.

# Impact of Date Formats on Storage and Display

The following table illustrates how the field format affects storage and display:

| | Date Format (For example: MDYY) | | Integer, Packed, Decimal, or Alphanumeric Format (For example: A8MDYY) | |
|---|---|---|---|---|
| **Value** | **Stored** | **Displayed** | **Stored** | **Displayed** |
| February 28, 1999 | 35853 | 02/28/1999 | 02281999 | 02/28/1999 |
| March 1, 1999 | 35854 | 03/01/1999 | 03011999 | 03/01/1999 |

# Performing Calculations on Dates

The format of a field determines how you can use it in a date expression. Calculations on dates in date format can incorporate numeric operators as well as numeric functions. Calculations on dates in integer, packed, decimal, or alphanumeric format require the use of date functions. Numeric operators return an error message or an incorrect result.

A full set of functions is supplied with your software, enabling you to manipulate dates in integer, packed decimal, and alphanumeric format. For details on date functions, see the ibi™ WebFOCUS® Using Functions manual.

# Calculating Dates

Assume that your company maintains a SHIPPING database. The following example calculates how many days it takes the shipping department to fill an order by subtracting the date on which an item is ordered, the ORDER_DATE, from the date on which it is shipped, the SHIPDATE:

```
COMPUTE TURNAROUND/I4 = SHIP_DATE - ORDER_DATE;
```

An item ordered on February 28, 1999, and shipped on March 1, 1999, results in a difference of one day. However, if the SHIP_DATE and ORDER_DATE fields have an integer format, the result of the calculation (730000) is incorrect, since you cannot use the numeric operator minus (-) with that format.

The following table shows how the field format affects the result:

| | Value in Date Format | Value in Integer Format |
|---|---|---|
| SHIP_DATE = March 1, 1999 | 35854 | 03011999 |
| ORDER_DATE = February 28, 1999 | 35853 | 02281999 |
| TURNAROUND | 1 | 730000 |

To obtain the correct result using fields in integer, packed, decimal, or alphanumeric format, use the date function MDY, which returns the difference between two dates in the form month-day-year. Using the function MDY, you can calculate TURNAROUND as follows:

```
COMPUTE TURNAROUND/I4 = MDY(ORDER_DATE, SHIP_DATE);
```

# Cross-Century Dates With DEFINE and COMPUTE

You can use an expression in a DEFINE or COMPUTE command, or in a DEFINE attribute in a Master File, that implements the sliding window technique for cross-century date processing. The parameters DEFCENT and YRTHRESH provide a means of interpreting the century if the first two digits of the year are not provided elsewhere. If the first two digits are provided, they are simply accepted.

# Returned Field Format Selection

A date expression always returns a number. That number may represent a date, or the number of days, months, quarters, or years between two dates. When you use a date expression to assign a value to a field, the format selected for the field determines how the result is returned.

# Selecting the Format of a Returned Field

Consider the following commands, assuming that SHIP_DATE and ORDER_DATE are date-formatted fields. The first command calculates how many days it takes a shipping department to fill an order by subtracting the date on which an item is ordered, ORDER_DATE, from the date on which it is shipped, SHIP_DATE. The second command calculates a delivery date by adding five days to the date on which the order is shipped.

```
COMPUTE TURNAROUND/I4 = SHIP_DATE - ORDER_DATE;
COMPUTE DELIVERY/MDY = SHIP_DATE + 5;
```

In the first command, the date expression returns the number of days it takes to fill an order; therefore, the associated field, TURNAROUND, must have an integer format. In the second command, the date expression returns the date on which the item will be delivered; therefore, the associated field, DELIVERY, must have a date format.

# Using a Date Constant in an Expression

When you use a date constant in a calculation with a field in date format, you must enclose it in single quotation marks; otherwise, it is interpreted as the number of days between the constant and the base date (December 31, 1900, or January 1, 1901). For example, if 022899 were not enclosed in quotation marks, the value would be interpreted as the 22,899th day after 12/31/1900, rather than as February 28, 1999.

# Initializing a Field With a Date Constant

The following command initializes START_DATE with the date constant 02/28/99:

```
COMPUTE START_DATE/MDY = '022899';
```

The following command calculates the number of days elapsed since January 1, 1999:

```
COMPUTE YEAR_TO_DATE/I4 = CURR_DATE - 'JAN 1 1999' ;
```

# Extracting a Date Component

Date components include days, months, quarters, or years. You can write an expression that extracts a component from a field in date format. However, you cannot write an expression that extracts days, months, or quarters from a date that does not have these components. For example, you cannot extract a month from a date in YY format, which represents only the number of years.

## Extracting the Month Component From a Date

The following example extracts the month component from SHIP_DATE, which has the format MDYY:

```
COMPUTE SHIP_MONTH/M = SHIP_DATE;
```

If SHIP_DATE has the value March 1, 1999, the above expression returns the value 03 for SHIP_MONTH.

A calculation on a date component automatically produces a valid value for the desired component. For example, if the current value of SHIP_MONTH is 03, the following expression correctly returns the value 06:

```
COMPUTE ADD_THREE/M = SHIPMONTH + 3;
```

If the addition of months results in an answer greater than 12, the months are adjusted correctly (for example, 11 + 3 is 2, not 14).

# Combining Fields With Different Formats in an Expression

When using fields in date format, you can combine fields with a different order of components within the same expression. In addition, you can assign the result of a date expression to a field with a different order of components from the fields in the expression.

You cannot, however, write an expression that combines dates in date format with dates in integer, packed, decimal or character format.

# Combining Fields With Format YYMD and MDY

Consider the two fields DATE_PAID and DUE_DATE. DATE_PAID has the format YYMD, and DUE_DATE has the format MDY. You can combine these two fields in an expression to calculate the number of days that a payment is late:

```
COMPUTE DAYS_LATE/I4 = DATE_PAID - DUE_DATE;
```

# Assigning a Different Order of Components to a Returned Field

Consider the field DATE_SOLD. This field contains the date on which an item is sold, in YYMD format. The following expression adds seven days to DATE_SOLD to determine the last date on which the item can be returned. It then assigns the result to a field with DMY format:

```
COMPUTE RETURN_BY/DMY = DATE_SOLD + 7;
```

# Creating a Date-Time Expression

A *date-time* expression returns date and time components. You can create these expressions using a variety of supplied date-time functions. For details about date-time functions, see the *ibi™ FOCUS® Describing Data* manual.

# Automatic Conversion Between Date and Date-Time Formats

In early releases of date-time fields, you were required to use date-time functions for all conversions between date and date-time formats. While these functions are still supported for conversions, the requirement to use them has been eliminated in certain operations.

The following automatic direct operations are supported between date and date-time formats:

- **Assignment.**

  **Assignment of a date field or a date constant to a date-time field.** The time component is set to zero (midnight). The date can be a full component date such as YYMD or a partial component date such as YYM. It cannot be a single component date such as Q, as this type of date, although displayed as a date in reports, is stored as an integer value and is used as an integer value in expressions.

  **Assignment of a date-time field or date-time constant to a date field.** The time components are removed.

- **Comparison and Subtraction.**

  When a date-time value is compared with or subtracted from a date value, or a date value is compared with or subtracted from a date-time value, the date is converted to date-time with the time component set to midnight. They are then compared or subtracted as date-time values.

- **Function parameters.**

  Simplified date functions can use either date or date-time values as their date parameters. Legacy user functions do not support this new functionality. The date-time functions (H functions) use date-time parameters and the new date functions use new dates, which are stored as offsets from a base date.

**Recognition and use of date or date-time constants.**

- Constants can be expressed as strings, without the DT operator.
- Constants are converted to or from date or date-time values in accordance with the field format they are compared with, subtracted from, or assigned to.
- Unless it is expressed in a non-ambiguous translated or formatted string format with proper delimiters (not as a numeric string or number), the recognition of a constant as a date depends on the format of its field counterpart.

  In this case, the size in terms of number of digits is strictly limited to at least six for a full component date or date-time value, (eight for a four-digit year), three for a partial component date, and one for a single component date.

- When numeric constants are used as function parameters and, therefore, do not have a field counterpart, they are recognized according to YYMD or YMD format. The only exception is a string with a single blank or the number zero which, in reports, will be

presented as a blank. Date offset constants are no longer allowed. Blank separators between digits in a string are also not supported.

For additional information about date and date-time formats, see the *Describing Data With ibi™ WebFOCUS® Language* manual.

# Assigning Date and Date-Time Values

The following request generates a date-time value using the DT_CURRENT_DATETIME function. It then assigns this value to a date field and assigns that date field to a date-time field.

```
TABLE FILE WF_RETAIL_LITE
PRINT QUANTITY_SOLD NOPRINT AND COMPUTE
 DATETIME1/HYYMDm =  DT_CURRENT_DATETIME(MILLISECOND);
     AS 'Date-Time 1'
COMPUTE
 DATE1/YYMD   = DATETIME1;
     AS 'Date'
COMPUTE
DATETIME2/HYYMDm = DATE1;
     AS 'Date-Time 2'
WHERE RECORDLIMIT EQ 20
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image. The original date-time field has a non-zero time component. When assigned to the date field, the time component is removed. When that date is assigned to the second date-time field, a zero time component is added.

| Date-Time 1 | Date | Date-Time 2 |
|---|---|---|
| 2017/08/25 09:10:06.855000 | 2017/08/25 | 2017/08/25 00:00:00.000000 |
| 2017/08/25 09:10:06.855000 | 2017/08/25 | 2017/08/25 00:00:00.000000 |
| 2017/08/25 09:10:06.855000 | 2017/08/25 | 2017/08/25 00:00:00.000000 |
| 2017/08/25 09:10:06.855000 | 2017/08/25 | 2017/08/25 00:00:00.000000 |
| 2017/08/25 09:10:06.855000 | 2017/08/25 | 2017/08/25 00:00:00.000000 |
| 2017/08/25 09:10:06.855000 | 2017/08/25 | 2017/08/25 00:00:00.000000 |
| 2017/08/25 09:10:06.855000 | 2017/08/25 | 2017/08/25 00:00:00.000000 |
| 2017/08/25 09:10:06.855000 | 2017/08/25 | 2017/08/25 00:00:00.000000 |
| 2017/08/25 09:10:06.855000 | 2017/08/25 | 2017/08/25 00:00:00.000000 |
| 2017/08/25 09:10:06.855000 | 2017/08/25 | 2017/08/25 00:00:00.000000 |
| 2017/08/25 09:10:06.855000 | 2017/08/25 | 2017/08/25 00:00:00.000000 |
| 2017/08/25 09:10:06.855000 | 2017/08/25 | 2017/08/25 00:00:00.000000 |
| 2017/08/25 09:10:06.855000 | 2017/08/25 | 2017/08/25 00:00:00.000000 |
| 2017/08/25 09:10:06.855000 | 2017/08/25 | 2017/08/25 00:00:00.000000 |
| 2017/08/25 09:10:06.855000 | 2017/08/25 | 2017/08/25 00:00:00.000000 |
| 2017/08/25 09:10:06.856000 | 2017/08/25 | 2017/08/25 00:00:00.000000 |
| 2017/08/25 09:10:06.856000 | 2017/08/25 | 2017/08/25 00:00:00.000000 |
| 2017/08/25 09:10:06.856000 | 2017/08/25 | 2017/08/25 00:00:00.000000 |
| 2017/08/25 09:10:06.856000 | 2017/08/25 | 2017/08/25 00:00:00.000000 |
| 2017/08/25 09:10:06.856000 | 2017/08/25 | 2017/08/25 00:00:00.000000 |

# Comparing Date and Date-Time Values

The following request creates one date-time field and one date field. When QUANTITY_SOLD is 1, they have the same date value and the date-time field has a zero time component. When QUANTITY_SOLD is 2, they have different date values, and the date-time field has a zero time component. In all other cases, the date-time field has the current date with a non-zero time component, and the date field has the current date. The EQUAL1 field compares them to see if they compare as equal.

```
TABLE FILE WF_RETAIL_LITE
PRINT QUANTITY_SOLD AS Quantity AND COMPUTE
 DATETIME1/HYYMDm = IF QUANTITY_SOLD EQ 1 THEN '2017/06/05'
        ELSE IF QUANTITY_SOLD EQ 2 THEN '2016/02/29'
        ELSE DT_CURRENT_DATETIME(MILLISECOND);
        AS 'Date-Time'
```

```
COMPUTE
  DATE1/YYMD   = IF QUANTITY_SOLD EQ 1 THEN '2017/06/05'
        ELSE IF QUANTITY_SOLD EQ 2 THEN '2015/12/30'
        ELSE DT_CURRENT_DATE();
        AS 'Date'
COMPUTE
  EQUAL1/A1 = IF DATETIME1 EQ DATE1 THEN 'Y' ELSE 'N';
        AS 'Equal?'
WHERE RECORDLIMIT EQ 12
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image. When a date value is compared to a date-time value, the date is converted to a date-time value with the time component set to zero, and then the values are compared. Therefore, when QUANTITY_SOLD is 1, both the date components are equal and the time component of the date-time field is set to zero, so when the date is converted to a date-time value, they are equal. When QUANTITY_SOLD is 2, the date components are different, so they are not equal. When QUANTITY_SOLD is 3, the date components are the same, but the date-time field has a non-zero time component. Therefore, when the date field is converted to a date-time value with a zero time component and they are compared, they are not equal.

| Quantity | Date-Time | Date | Equal? |
|---|---|---|---|
| 1 | 2017/06/05 00:00:00.000000 | 2017/06/05 | Y |
| 1 | 2017/06/05 00:00:00.000000 | 2017/06/05 | Y |
| 1 | 2017/06/05 00:00:00.000000 | 2017/06/05 | Y |
| 2 | 2016/02/29 00:00:00.000000 | 2015/12/30 | N |
| 1 | 2017/06/05 00:00:00.000000 | 2017/06/05 | Y |
| 1 | 2017/06/05 00:00:00.000000 | 2017/06/05 | Y |
| 2 | 2016/02/29 00:00:00.000000 | 2015/12/30 | N |
| 1 | 2017/06/05 00:00:00.000000 | 2017/06/05 | Y |
| 1 | 2017/06/05 00:00:00.000000 | 2017/06/05 | Y |
| 1 | 2017/06/05 00:00:00.000000 | 2017/06/05 | Y |
| 3 | 2017/08/25 09:24:45.203000 | 2017/08/25 | N |
| 1 | 2017/06/05 00:00:00.000000 | 2017/06/05 | Y |

# Specify the Order of Date Components in a Date-Time Field

```
SET DATEFORMAT = option
```

where:

**option**

Can be one of the following: MDY, DMY, YMD, or MYD. MDY is the default value for the U.S. English format.

# Specifying a Date-Time Value

An external date-time value is a constant in character format from one of the following sources:

- A sequential data source.
- Used in an expression in a WHERE, IF, DEFINE, or a COMPUTE.

A date-time constant or a date-time value as it appears in a character file has one of the following formats:

```
time_string  [date_string]
date_string  [time_string]
```

A date-time constant in a COMPUTE, DEFINE, or WHERE expression must have one of the following formats:

```
DT(time_string  [date_string])
DT(date_string  [time_string])
```

A date-time constant in an IF expression has one of the following formats:

```
'time_string  [date_string]'
'date_string  [time_string]'
```

If the value contains no blanks or special characters, the single quotation marks are not necessary. Note that the DT prefix is not supported in IF criteria.

where:

**time_string**

Cannot contain blanks. Time components are separated by colons, and may be followed by AM, PM, am, or pm. For example:

```
14:30:20:99       (99 milliseconds)
14:30
14:30:20.99       (99/100 seconds)
14:30:20.999999   (999999 microseconds)
02:30:20:500pm
```

Note that the second can be expressed with a decimal point or be followed by a colon:

- If there is a colon after the second, the value following it represents the millisecond. There is no way to express the microsecond or nanosecond using this notation.
- A decimal point in the second value indicates the decimal fraction of a second. A microsecond can be represented using six decimal digits. A nanosecond can be represented using nine decimal digits.

**date_string**

Can have one of the following three formats:

- **Numeric string format.** Is exactly four, six, or eight digits. Four-digit strings are considered to be a year (century must be specified). The month and day are set to January 1. Six and eight-digit strings contain two or four digits for the year, followed by two for the month, and then two for the day. Because the component order is fixed with this format, the DATEFORMAT setting described in Specify the Order of Date Components in a Date-Time Field is ignored.

  If a numeric-string format longer than eight digits is encountered, it is treated as a combined date-time string in the H*n* format. The following are examples of numeric string date constants:

  ```
  99
  1999
  ```

```
19990201
```

- **Formatted-string format.** Contains a one or two-digit day, a one or two-digit month, and a two or four-digit year separated by spaces, slashes, hyphens, or periods. All three parts must be present and follow the DATEFORMAT setting described in Specify the Order of Date Components in a Date-Time Field. If any of the three fields is four digits, it is interpreted as the year, and the other two fields must follow the order given by the DATEFORMAT setting. The following are examples of formatted-string date constants:

  ```
  1999/05/20
  5 20 1999
  99.05.20
  1999-05-20
  ```

- **Translated-string format.** Contains the full or abbreviated month name. The year must also be present in four-digit or two-digit form. If the day is missing, day 1 of the month is assumed; if present, it can have one or two digits. If the string contains both a two-digit year and a two-digit day, they must be in the order given by the DATEFORMAT setting. For example:

  ```
  January 6 2000
  ```

**Note:**

- The date and time strings must be separated by at least one blank space. Blank spaces are also permitted at the beginning and end of the date-time string or immediately before an am/pm indicator.
- In each date format, two-digit years are interpreted using the [F]DEFCENT and [F]YRTHRESH settings.

# Assigning Date-Time Literals

The DT prefix can be used, although it is no longer required, in a COMPUTE, DEFINE, or WHERE expression to assign a date-time literal to a date-time field. For example:

```
DT2/HYYMDS = DT(20051226 05:45);
```

```
DT3/HYYMDS = DT(2005 DEC 26 05:45);
```

```
DT4/HYYMDS = DT(December 26 2005 05:45);
```

# Specifying the Order of Date Components for a Date-Time Field

The following request sets DATEFORMAT to MYD:

```
SET DATEFORMAT = MYD
DEFINE FILE EMPLOYEE
DTFLDYYMD/HYYMDI =  DT(APR 04 05);
END

TABLE FILE EMPLOYEE
PRINT CURR_SAL DTFLDYYMD
END
```

The output shows that the natural date literal 'APR 04 05' is interpreted as April 5, 1904:

```
  CURR_SAL  DTFLDYYMD
  --------  ---------
$11,000.00  1904/04/05 00:00
$13,200.00  1904/04/05 00:00
$18,480.00  1904/04/05 00:00
 $9,500.00  1904/04/05 00:00
$29,700.00  1904/04/05 00:00
$26,862.00  1904/04/05 00:00
$21,120.00  1904/04/05 00:00
$18,480.00  1904/04/05 00:00
$21,780.00  1904/04/05 00:00
$16,100.00  1904/04/05 00:00
 $9,000.00  1904/04/05 00:00
$27,062.00  1904/04/05 00:00
```

# Reading Date-Time Values From a Transaction File

The DTTRANS comma-delimited transaction file has an ID field and a date-time field that contains both the date (as eight characters) and time (in the format hour:minute:second):

```
01, 20000101 02:57:25,$
02, 19991231 14:05:35,$
```

Because the transaction file contains the dates in numeric string format, the DATEFORMAT setting is not used, and the dates are entered in YMD order.

The following transaction file is also valid. It contains formatted string dates that comply with the default DATEFORMAT setting, MDY:

```
01, 01/01/2000 02:57:25,$
02, 12/31/1999 14:05:35,$
```

The following Master File describes the FOCUS data source named DATETIME, which receives these values:

```
FILE=DATETIME,    SUFFIX=FOC   ,$
SEGNAME=DATETIME, SEGTYPE=S0   ,$
FIELD=ID,  ID,    USAGE = I2   ,$
FIELD=DT1, DT1,   USAGE=HYYMDS ,$
```

# Using a Date-Time Value in a COMPUTE Command

```
TABLE FILE EMPLOYEE
PRINT LAST_NAME FIRST_NAME AND COMPUTE
NEWSAL/D12.2M = CURR_SAL + (0.1 * CURR_SAL);
RAISETIME/HYYMDIA = DT(20000101 09:00AM);
WHERE CURR_JOBCODE LIKE 'B%'
END
```

The output is:

```
LAST_NAME        FIRST_NAME           NEWSAL  RAISETIME
---------        ----------           ------  ---------
SMITH            MARY             $14,520.00  2000/01/01  9:00AM
```

```
JONES           DIANE           $20,328.00  2000/01/01  9:00AM
ROMANS          ANTHONY         $23,232.00  2000/01/01  9:00AM
MCCOY           JOHN            $20,328.00  2000/01/01  9:00AM
BLACKWOOD       ROSEMARIE       $23,958.00  2000/01/01  9:00AM
MCKNIGHT        ROGER           $17,710.00  2000/01/01  9:00AM
```

# Using a Date-Time Value in WHERE Criteria

In a WHERE clause, a date-time constant must use the DT( ) format:

```
TABLE FILE VIDEOTR2
PRINT CUSTID TRANSDATE
WHERE TRANSDATE GT DT(2000/01/01 02:57:25)
END
```

The output is:

```
CUSTID  TRANSDATE
------  ---------
1118    2000/06/26 05:45
1237    2000/02/05 03:30
```

# Using a Date-Time Value in IF Criteria

In an IF clause, a date-time constant must be enclosed in single quotation marks if it contains any blanks:

```
TABLE FILE VIDEOTR2
PRINT CUSTID TRANSDATE
IF TRANSDATE GT '2000/01/01 02:57:25'
END
```

**Note:** The DT prefix for a date-time constant is not supported in an IF clause.

The output is:

```
CUSTID  TRANSDATE
------  ---------
1118    2000/06/26 05:45
1237    2000/02/05 03:30
```

# Specifying Universal Date-Time Input Values

With DTSTANDARD settings of STANDARD and STANDARDU, the following date-time values can be read as input:

| Input Value | Description |
|---|---|
| `14:30[:20,99]` | Comma separates time components instead of period |
| `14:30[:20.99]Z` | Universal time |
| `15:30[:20,99]+01`<br>`15:30[:20,99]+0100`<br>`15:30[:20,99]+01:00` | Each of these is the same as above in Central European Time |
| `09:30[:20.99]-05` | Same as above in Eastern Standard Time |

Note that these values are stored identically internally with the STANDARDU setting. With the STANDARD setting, everything following the Z, +, or - is ignored.

# Manipulating Date-Time Values

Any two date-time values can be compared, even if their lengths do not match.

If a date-time field supports missing values, fields that contain the missing value have a greater value than any date-time field can have. Therefore, in order to exclude missing

values from the report output when using a GT or GE operator in a selection test, it is recommended that you add the additional constraint field NE MISSING to the selection test:

```
date_time_field {GT|GE} date_time_value AND date_time_field NE MISSING
```

Assignments are permitted between date-time formats of equal or different lengths. Assigning a 10-byte date-time value to an 8-byte date-time value truncates the microsecond portion (no rounding takes place). Assigning a short value to a long one sets the low-order three digits of the microseconds to zero.

Other operations, including concatenation, EDIT, and LIKE on date-time operands are not supported. Prefix operators that work with alphanumeric fields are supported.

# Testing for Missing Date-Time Values

Consider the DATETIM2 Master File:

```
FILE=DATETIM2,  SUFFIX=FOC                ,$
SEGNAME=DATETIME, SEGTYPE=S0              ,$
FIELD=ID, ID, USAGE = I2                  ,$
FIELD=DT1, DT1,   USAGE=HYYMDS, MISSING=ON,$
```

Field DT1 supports missing values. Consider the following request:

```
TABLE FILE DATETIM2
PRINT ID DT1
END
```

The resulting report output shows that in the instance with ID=3, the field DT1 has a missing value:

```
ID  DT1
--  ---
 1  2000/01/01 02:57:25
 2  1999/12/31 00:00:00
 3  .
```

The following request selects values of DT1 that are greater than 2000/01/01 00:00:00 and are not missing:

```
TABLE FILE DATETIM2
PRINT ID DT1
  WHERE DT1 NE MISSING AND DT1 GT DT(2000/01/01 00:00:00);
END
```

The missing value is not included in the report output:

```
ID  DT1
--  ---
 1  2000/01/01 02:57:25
```

# Assigning a Different Usage Format to a Date-Time Column

Consider the following request using the VIDEOTR2 data source:

```
TABLE FILE VIDEOTR2
 PRINT CUSTID TRANSDATE AND COMPUTE
  DT2/HYYMDH = TRANSDATE;
  T1/HHIS = TRANSDATE;
 WHERE DATE EQ 2000
 END
```

The output is:

```
CUSTID  TRANSDATE         DT2            T1
------  ---------         ---            --
1118    2000/06/26 05:45  2000/06/26 05  05:45:00
1237    2000/02/05 03:30  2000/02/05 03  03:30:00
```

# Creating a Character Expression

A character expression uses alphanumeric constants, fields, concatenation operators, IF-THEN-ELSE logic, or functions to derive an alphanumeric value.

Both text and alphanumeric fields can be assigned values stored in text fields or alphanumeric expressions in TABLE COMPUTE, MODIFY COMPUTE, and DEFINE commands.

If an alphanumeric field is assigned the value of a text field that is too long for the alphanumeric field, the value is truncated before being assigned to the alphanumeric field.

A character expression can consist of:

- An alphanumeric constant (character string) enclosed in single quotation marks. For example:

```
COMPUTE STATE/A2 = 'NY';
```

- A combination of alphanumeric fields and/or constants joined by the concatenation operator. For example:

```
DEFINE FILE EMPLOYEE TITLE/A19 = 'DR. ' | LAST_NAME;
END
```

- An alphanumeric function. For example:

```
DEFINE FILE EMPLOYEE INITIAL/A1 = EDIT(FIRST_NAME, '9$$$$$$$$$$');
END
```

- A text field.

**Note:**

- Non-printable characters are not supported in an alphanumeric constant.
- Two consecutive single quotation marks represent a null value with format A1V and an actual length of 0 (zero), when the field has MISSING ON.

# Embedding a Quotation Mark in a Quote-Delimited Literal String

Under certain conditions, you can use quote-delimited strings containing embedded quotation marks. Within the string, you can use either one single quotation mark or two contiguous single quotation marks to represent the single quotation mark. Both are interpreted as a single quotation mark.

You can use quote-delimited strings in the following instances:

- WHERE and IF criteria containing multiple quotes.
- WHERE criteria containing: *fieldname* {IS, IS-NOT, IN, IN FILE, or NOT IN FILE}.
- EDIT.
- WHEN *fieldname* EQ an embedded quote in a literal.
- DEFINE commands.
- DEFINE attributes in Master Files.
- Database Administrator (DBA) attributes in Master Files (for example, VALUE = *fieldname* EQ an embedded quote in a literal).
- ACCEPT=, DESCRIPTION=, TITLE= attributes in Master Files.
- AS.
- DECODE.

## Specifying the Data Value O'BRIEN in a Quote-Delimited Literal String

The following example illustrates the use of quotation marks for the correct interpretation of the data value O'BRIEN:

```
TABLE FILE VIDEOTRK
PRINT LASTNAME
WHERE LASTNAME IS 'O'BRIEN'
END
```

# Concatenating Character Strings

You can write an expression that concatenates two or more alphanumeric constants and/or fields into a single character string. This concatenation operator has two forms, as shown in the following table:

| Symbol | Represents | Description |
|---|---|---|
| `\|` | Weak concatenation | Preserves trailing blanks. |
| `\|\|` | Strong concatenation | Moves trailing blanks to the end of a concatenated string. |

# Concatenating Character Strings

The following example uses the EDIT function to extract the first initial from a first name. It then uses both strong and weak concatenation to produce the last name, followed by a comma, followed by the first initial, followed by a period:

```
DEFINE FILE EMPLOYEE
FIRST_INIT/A1 = EDIT(FIRST_NAME, '9$$$$$$$$$');
NAME/A19 = LAST_NAME ||(', '| FIRST_INIT |'.');
END
```

```
TABLE FILE EMPLOYEE
PRINT NAME WHERE LAST_NAME IS 'BANNING'
END
```

The output is:

```
NAME
----
BANNING, J.
```

The request evaluates the expressions as follows:

1. The EDIT function extracts the initial J from FIRST_NAME.
2. The expression in parentheses returns the value:

   ```
   , J.
   ```

3. LAST_NAME is concatenated to the string derived in step 2 to produce:

   ```
   Banning, J.
   ```

   While LAST_NAME has the format A15 in the EMPLOYEE Master File, strong concatenation suppresses the trailing blanks. Regardless of the suppression or inclusion of blanks, the resulting field name, NAME, has a length of 19 characters (A19).

# Using IF-THEN-ELSE Logic in a Character Expression

The following request uses IF-THEN-ELSE logic to determine what characters to concatenate to MOVIECODE in order to compute NEWCODE.

```
TABLE FILE MOVIES
PRINT COPIES
MOVIECODE
COMPUTE
NEWCODE/A20 =  MOVIECODE |(IF MOVIECODE CONTAINS 'DIS' THEN  'NEY;' ELSE
';');
BY CATEGORY
WHERE CATEGORY EQ 'CHILDREN'
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image. If MOVIECODE contains the characters 'DIS', NEWCODE is generated by concatenating the characters 'NEY;', otherwise NEWCODE is generated by concatenating the character ';'.

| CATEGORY | COPIES | MOVIECODE | NEWCODE |
|---|---|---|---|
| CHILDREN | 1 | 031KKV | 031KKV; |
| | 2 | 043DIS | 043DISNEY; |
| | 1 | 093WOR | 093WOR; |
| | 2 | 306DIS | 306DISNEY; |
| | 1 | 309RAN | 309RAN; |
| | 1 | 387PLA | 387PLA; |
| | 1 | 476DIS | 476DISNEY; |
| | 3 | 732DIS | 732DISNEY; |

# Creating a Variable Length Character Expression

As an alphanumeric type, an A*n*V field can be used in arithmetic and logical expressions in the same way that the A*n* type is used.

- An expression that contains A*n*V type fields can be of either the A*n*V or A*n* type.
- The type that results from the expression depends on the specific type of operation, as described in subsequent sections.

**Note:** Because A*n*V fields have two bytes of overhead and there is additional processing required to strip them, A*n*V format is not recommended for use in non-relational data sources.

# Using Concatenation With A*n*V Fields

If either of the operands in a concatenation between two fields is an A*n*V field, variable length alphanumeric rules are used to perform the concatenation:

- The size of the concatenated string is the sum of the sizes of the operands.
- For weak concatenation, the actual length of the concatenated string is the sum of the two actual lengths of the input strings.
- For strong concatenation, the actual length stored in an A*n*V field of the concatenated string is the sum of the actual length of the first input string minus its

number of trailing blanks plus the actual length of the second string.

- For any A*n* field in the concatenation, the size and length are equal.
- Two consecutive single quotation marks represent a null value with format A1V and an actual length of 0 (zero), when the field has MISSING ON.

# Using the EDIT Function With A*n*V Fields

The following expression results in an A*n*V format only when *x* has A*n*V format.

```
EDIT(x,mask)
```

The actual length of the result is the number of characters in *mask* other than '$'.

Note that an actual length of zero may result.

EDIT(*x*) can be used to convert an A*n*V field to an integer value when x has A*n*V format.

# Using CONTAINS and OMITS With A*n*V Fields

The only difference in evaluation of the CONTAINS and OMITS operators with A*n*V fields occurs when one of the operands has an actual length of zero.

In the following examples, the field Z has an actual length of zero, but X and Y do not:

| Expression | Result |
|---|---|
| `Z CONTAINS Y` | FALSE |
| `X CONTAINS Z` | TRUE |
| `Z CONTAINS Z` | TRUE |

| Expression | Result |
| --- | --- |
| `Z OMITS Y` | TRUE |
| `X OMITS Z` | FALSE |
| `Z OMITS Z` | FALSE |

# Using LIKE With A*n*V Fields

The only difference in evaluation of the following expression occurs when *x* has an actual length of zero:

```
x LIKE mask ...
```

In the following example, the field instance Z has an actual length of zero:

```
Z LIKE mask ...
```

This expression evaluates to TRUE only when the mask consists exclusively of percent ('%') signs.

Note that no other mask can evaluate to an empty string. Even the mask in the following expression has a length of one, and therefore the expression evaluates as FALSE:

```
Z LIKE ''
```

# Using the EQ, NE, LT, GT, LE, and GE Operators With A*n*V Fields

As with A*n* type fields, operations are evaluated on the assumption that the shorter operand is padded with blanks.

Therefore, even an empty A*n*V field, Z, is compared as a field consisting of all blanks.

In the following examples, Z is an empty A*n*V field instance and X is an A*n*V field instance that is not empty and contains non-blank characters:

| Expression | Result |
|---|---|
| `Z EQ Z`<br>`Z GE Z`<br>`Z LE Z` | TRUE |
| `Z NE Z`<br>`Z LT Z`<br>`Z GT Z` | FALSE |
| `Z EQ X` | FALSE |
| `Z NE X` | TRUE |
| `Z LT X` | TRUE |
| `Z GT X` | FALSE |
| `Z LE X` | TRUE |

| Expression | Result |
|---|---|
| `Z GE X` | FALSE |
| `X EQ Z` | FALSE |
| `X NE Z` | TRUE |
| `X LT Z` | FALSE |
| `X GT Z` | TRUE |
| `X LE Z` | FALSE |
| `X GE Z` | TRUE |

# Using the DECODE Function With A*n*V Fields

```
DECODE alphafield (value 'result'...
```

The use of either an A*n* or A*n*V field with DECODE causes a result of type A*n* as long as the *result* part of the value-result pairs is provided as a constant. (Constants are type A*n*.)

# Using the Assignment Operator With A*n*V Fields

There are three situations to consider when using the assignment operator with the A*n*V format: A*n*V data type on the right hand side only, AnV data type on both sides, and A*n*V

data type on the left side only.

```
fld/An = AnV_type_expression;
```

- The actual length of the evaluated expression is lost on assignment to the A*n* field.
- The size of the A*n*V result does not prevent assignment to a shorter A*n* format field:
  - If the result of the expression has an actual length that is shorter than the length of the field on the left side of the assignment operator, the result is padded with blanks.
  - If the result of the expression has an actual length that is longer than the length of the field on the left side of the assignment operator, the result is truncated.

    ```
    fld/AnV = AnV_type_expression;
    ```

- The length of the result is assigned as the length of the field on the left of the assignment operator unless it exceeds the field's declared size. In this case, the length assigned is the declared size (*n*).
- The size of the A*n*V evaluation result does not prevent assignment to a shorter A*n*V field:
  - If the length of the result of the expression is shorter than the size of the field on the left side of the assignment operator, the result is padded with blanks.
  - If the result of the expression has an actual length that is longer than the size of the field on the left side of the assignment operator, the result is truncated.

    ```
    fld/AnV = An_type_expression;
    ```

- The length of the field on the left side of the assignment operator is assigned equal to its size (*n*).
- The actual length of the result is verified against the size *n* declared for the AnV field. An error is generated if the result is longer than *n*.

# Creating a Logical Expression

A logical expression determines whether a particular condition is true. There are two kinds of logical expressions: relational and Boolean. The entities to be compared determine the kind of expression used:

- A relational expression returns TRUE or FALSE based on a comparison of two individual values (either field values or constants).
- A Boolean expression returns TRUE or FALSE based on the outcome of two or more relational expressions.

You can use a logical expression to assign a value to a numeric field. If the expression is true, the field receives the value 1. If the expression is false, the field receives the value 0.

# Logical Operators

The following is a list of common operators used in logical expressions. For information on relational operators and additional operators available for record selection using WHERE and IF, see Selecting Records for Your Report.

| Operator | Description |
|---|---|
| `EQ` | Returns the value TRUE if the value on the left is equal to the value on the right. |
| `NE` | Returns the value TRUE if the value on the left is not equal to the value on the right. |
| `GE` | Returns the value TRUE if the value on the left is greater than or equal to the value on the right. |
| `GT` | Returns the value TRUE if the value on the left is greater than the value on the right. |
| `LE` | Returns the value TRUE if the value on the left is less than or equal to the value on the right. |

| Operator | Description |
|---|---|
| `LT` | Returns the value TRUE if the value on the left is less than the value on the right. |
| `AND` | Returns the value TRUE if both operands are true. |
| `OR` | Returns the value TRUE if either operand is true. |
| `NOT` | Returns the value TRUE if the operand is false. |
| `CONTAINS` | Contains the specified character strings. |
| `OMITS` | Omits the specified character strings. |
| `IS MISSING` | Returns the value TRUE if the field is missing. |
| `IS-NOT MISSING` | Returns the value TRUE if the field is not missing. |

# Write a Relational Expression

Any of the following are valid for a relational expression:

```
value {EQ|NE} valuevalue {LE|LT} valuevalue {GE|GT} valuecharacter_value
{CONTAINS|OMITS} character_value
```

where:

**value**

Is a field value or constant.

**character_value**

Is a character string. If it contains blanks, the string must be enclosed in single quotation marks.

# Write a Boolean Expression

Either of the following is valid for a Boolean expression:

```
(relational_expression) {AND|OR} (relational_expression)
NOT (logical_expression)
```

where:

**relational_expression**

Is an expression based on a comparison of two individual values (either field values or constants).

**logical_expression**

Is an expression that evaluates to the value TRUE or FALSE. If the expression is true, the field receives the value 1. If the expression is false, the field receives the value 0. The expression must be enclosed in parentheses.

# Creating a Conditional Expression

A conditional expression assigns a value based on the result of a logical expression. The assigned value can be numeric or alphanumeric.

**Note:** Unlike selection criteria using IF, all alphanumeric values in conditional expressions must be enclosed in single quotation marks. For example, IF COUNTRY EQ 'ENGLAND'.

# Write a Conditional Expression

```
IF expression1 THEN expression2 [ELSE expression3]
```

where:

**expression1**

Is the expression that is evaluated to determine whether the field is assigned the value of *expression2* or of *expression3*.

**expression2**

Is an expression that results in a format compatible with the format assigned to the field. It may be a conditional expression, in which case you must enclose it in parentheses.

**expression3**

Is an expression that results in a format compatible with the format assigned to the field. Enclosure of the expression in parentheses is optional.

**ELSE**

Is optional, along with *expression3*. However, if you do not specify an ELSE condition and the IF condition is not met, the value is taken from the last evaluated condition. Therefore, the results may not be what you expect if you do not include an ELSE condition.

Note that the final sorted report may display mixed values. This depends on whether a DEFINE or a COMPUTE is used, and if a data record is evaluated before or after aggregation.

The expressions following THEN and ELSE must result in a format that is compatible with the format assigned to the field. Each of these expressions may itself be a conditional expression. However, the expression following IF may not be an IF ... THEN ... ELSE expression (for example, IF ... IF ...).

# Supplying a Value With a Conditional Expression

The following example uses a conditional expression to assign the value NONE to the field BANK_NAME when it is missing a data value (that is, when the field has no data in the data

source):

```
DEFINE FILE EMPLOYEE
BANK_NAME/A20 = IF BANK_NAME EQ ' ' THEN 'NONE'
ELSE BANK_NAME;
END

TABLE FILE EMPLOYEE
PRINT CURR_SAL AND BANK_NAME
BY EMP_ID BY BANK_ACCT
END
```

The output is:

```
EMP_ID     BANK_ACCT         CURR_SAL  BANK_NAME
------     ---------         --------  ---------
071382660                  $11,000.00  NONE
112847612                  $13,200.00  NONE
117593129   40950036       $18,480.00  STATE
119265415                   $9,500.00  NONE
119329144     160633       $29,700.00  BEST BANK
123764317  819000702       $26,862.00  ASSOCIATED
126724188                  $21,120.00  NONE
219984371                  $18,480.00  NONE
326179357  122850108       $21,780.00  ASSOCIATED
451123478  136500120       $16,100.00  ASSOCIATED
543729165                   $9,000.00  NONE
818692173  163800144       $27,062.00  BANK ASSOCIATION
```

# Defining a True or False Condition

You can define a true or false condition and then test it to control report output. The following example assigns the value TRUE to the field MYTEST if either of the relational expressions in parentheses is true. It then tests the value of MYTEST:

```
DEFINE FILE EMPLOYEE
MYTEST= (CURR_SAL GE 11000) OR (DEPARTMENT EQ 'MIS');
END

TABLE FILE EMPLOYEE
PRINT CURR_SAL AND DEPARTMENT
BY EMP_ID
```

```
IF MYTEST IS TRUE
END
```

The output is:

```
EMP_ID            CURR_SAL  DEPARTMENT
------            --------  ----------
071382660       $11,000.00  PRODUCTION
112847612       $13,200.00  MIS
117593129       $18,480.00  MIS
119329144       $29,700.00  PRODUCTION
123764317       $26,862.00  PRODUCTION
126724188       $21,120.00  PRODUCTION
219984371       $18,480.00  MIS
326179357       $21,780.00  MIS
451123478       $16,100.00  PRODUCTION
543729165        $9,000.00  MIS
818692173       $27,062.00  MIS
```

**Note:** Testing for a TRUE or FALSE condition is valid only with the IF command. It is not valid with WHERE.

# Saving and Reusing Your Report Output

When you run a report request, by default the data values are collected and presented in a viewable form, complete with column titles and formatting features. Instead of viewing the data values, you can save them to a special data file to:

- Display as a webpage, as a printed document, or in a text document.
- Process in another application, such as a spreadsheet, a database, a word processor, or a 3GL program.
- Send to another location, such as a browser or PC.
- Extract a subset of the original data source in order to generate multi-step reports.
- Extract a data source to a structured extract file that retains information about the segment relationships in order to facilitate migration of data sources and reports between operating environments.

# Saving Your Report Output

The following commands extract and save report output in a variety of file formats:

- **HOLD.** The HOLD command creates a data source containing the output of a report request. By default, the data is stored in binary format, but you can specify a different format, such as FOCUS, HTML, or Excel. For some formats, the HOLD command also creates a corresponding Master File. You can then write other report requests that in turn extract or save data from the HOLD file. See Creating a HOLD File.
- **SAVE and SAVB.** The SAVE command is identical to a HOLD command, except that it does not create a Master File, and ALPHA is the default format. If you wish to create a SAVE file in BINARY format, use a variation of the SAVE command called SAVB.

  As with a HOLD file, you can specify a variety of formats suitable for use with other software products. See Creating SAVE and SAVB Files.
- **PCHOLD.** The PCHOLD command creates a data source containing the output of a

report request, and downloads the HOLD data source and the optional Master File to a client computer or browser. As with a HOLD file, you can specify a variety of file formats. See Creating a PCHOLD File.

**Tip:** When saving or holding output files, it is recommended to have an Allocation in place for the file. This is not applicable for PCHOLD files.

# Naming and Storing Report Output Files

During a session, a report output file remains usable until it is erased or overwritten. A subsequent output file created during the same session replaces the initial version, unless you give it another name by using the AS phrase.

A FILEDEF command is automatically issued when you create an output file. The ddname used to identify the file is the same as the name of the report output file (HOLD, SAVE, or SAVB, or the name in the AS phrase), if not already allocated.

By default, report output files created with HOLD, SAVE, or SAVB are written to temporary space. When the session ends, these files are no longer available unless you save the output to a specific location.

To save report output files to a specific location, use an ALLOCATE or FILEDEF command. For details, see Saving and Retrieving HOLD Files. You can dynamically allocate an output file using the DYNAM ALLOCATE or TSO ALLOCATE command in z/OS.

For details, see the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

When you create a HOLD file using the syntax ON TABLE HOLD AS *name*, the name can contain up to the maximum number of characters supported by your operating system. For information, see the section *Naming a Master File* in the *Describing Data With ibi™ WebFOCUS®® Languageibi™ FOCUS®® Describing Data* manual.

While a numeric name or a name beginning with a number is valid on many operating systems, such names are discouraged because they:

- Cause errors (FOC14069) when a request attempts to access data using a SUFFIX=EDA synonym that points to a file starting with a number. (Note that a SUFFIX=EDA synonym is created by the Adapter for Remote Servers.)
- May cause problems when an external application (such as an API application) that does not accept files starting with numbers interacts with a SUFFIX=EDA synonym that points to a file starting with a number.

- May be problematic to a third party application that does not work with numeric file names or with file names that begin with numbers.

# Creating a HOLD File

You can use the HOLD command to create report output files for a range of purposes:

- As a tool for data extraction, the HOLD command enables you to retrieve and process data, then extract the results for further processing. Your report request can create a new data source, complete with a corresponding Master File, from which you can generate new reports.

  The output Master File contains only the fields in the report request. The fields in a HOLD file have the original names specified in the Master File that are retrieved if the report is displayed or printed. You can alter the field names in the output Master File using the AS phrase in conjunction with the command SET ASNAMES. See Controlling Field Names in a HOLD Master File.
- The HOLD command enables you to specify the appropriate formats for displaying or processing report output files in other software applications. See Choosing Output File Formats.
- When an application requires a data format that is not among the HOLD options, you can use a subroutine to process each output record as it is written to the HOLD data source.

If your environment supports the SET parameter SAVEMATRIX, you can preserve the internal matrix of your last report in order to keep it available for subsequent HOLD, SAVE, and SAVB commands when the request is followed by Dialogue Manager commands. For details on SAVEMATRIX, see the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

# Create a HOLD File

From a report request, use

```
ON TABLE HOLD [AS filename] [FORMAT fmt] [DATASET dataset]
       [MISSING {ON|OFF}]
       [PERSISTENCE {STAGE|PERMANENT}]
```

or

```
hold_field HOLD [AS filename] [FORMAT fmt] [DATASET dataset]
       [MISSING {ON|OFF}]
       [PERSISTENCE {STAGE|PERMANENT}]
```

where:

**HOLD**

Extracts and saves report output. BINARY is the default format used when the HOLD command is issued without an explicit format. The output is saved with an associated Master File.

**Note:** Change the default output format to ALPHA by issuing the SET HOLDFORMAT command.

**hold_field**

Is the name of the last display field in the request.

**AS filename**

Specifies a name for the HOLD file. If you do not specify a file name, HOLD becomes the default. Since each subsequent HOLD command overwrites the previous HOLD file, it is advisable to code a distinct file name in each request to direct the extracted data to a separate file, thereby preventing it from being overwritten by the next HOLD command.

The name can contain up to the maximum number of characters supported by your operating system. For information, see the section *Naming a Master* File in the *Describing Data With ibi™ WebFOCUS® Language* manual.

**FORMAT fmt**

Specifies the format of the HOLD output file. BINARY is the default format for reporting servers.

- To display as a webpage, choose: HTML, HTMTABLE, DHTML
- To display as a printed document, choose: PDF, PS
- To use in a text document, choose: ALPHA, DOC, WP
- To use in a spreadsheet application, choose: DIF, EXCEL, EXL97, EXL2K [PIVOT], LOTUS, SYLK

- To use in a database application, choose: COMMA, COM, COMT, DB2, DATREC, DFIX, FOCUS, INGRES, REDBRICK, SQL, SQLDBC, SQLORA, SQLINF, SQLMSS, SQLSYB, SQLODBC, TAB, TABT, XFOCUS
- To use with a 3-GL program, choose: INTERNAL
- To use for additional reporting, choose: ALPHA, BINARY, FOCUS
- To use as a transaction file for modifying a data source, choose: ALPHA, BINARY
- To use for interactive analysis without connection to a server, choose: AHTML, APDF, FLEX

For details about all available formats, see Choosing Output File Formats.

**dataset**

Can be a fully-qualified data set or file name or an n-part name (app/.../filename.ext).

You can specify a data set or file to contain the report output within the request itself, rather than relying on an external or default specification. This allows you to place a permanent hold file in any folder, directory or data set that you can write to, whether or not that location is included in your APP PATH. The accompanying HOLD Master File will have the DATASET attribute pointing to the file that was generated.

The case in which the data set name is added in the Master File depends on the value of the FILECASE parameter. By default, lowercase is used. The actual data set is created with its name in the case that conforms to the standards of your operating environment.

**Note:**

- On z/OS, the file cannot already exist or be allocated when the HOLD command is issued. Therefore, If the file already exists you must free the allocation and then delete the file before running the request.
- You can use a USS naming convention for the DATASET attribute to store the file in the USS environment (for text output types).

**MISSING**

Controls whether fields with the attribute MISSING=ON in the Master File are carried over into the HOLD file. MISSING ON is the default attribute. If the HOLD command specifies MISSING OFF, fields with the MISSING attribute are not carried over. For related information, see Handling Records With Missing Field Values. Also see the *ibi™ WebFOCUS® Developing Reporting Applications* manual for the SET HOLDMISS, SET NULL,

and SET HNODATA parameters, which control how missing values are propagated to alphanumeric and comma-delimited files.

**PERSISTENCE**

Applies only to Relational HOLD files (FORMAT *sqlengine*). Specifies how to create intermediate tables that will be used only during UPLOAD and EBL requests to accelerate performance by keeping all processing on the DBMS server instead of downloading data into a HOLD file. The actual type of the intermediate table will be determined at run time, based on specific DBMS-supported features and the data-populating mechanisms being used. Valid values are:

- **STAGE.** Will create either a Volatile or GLOBAL TEMPORARY table, for a DBMS that supports that functionality. For a DBMS that does not support that functionality, a message will display and the table will not be created.
- **PERMANENT.** Will create a regular SQL table with a uniquely-generated name that will be used in the request and will be available for further use after the request ends, but will be dropped at the end of the session. This is the default value for PERSISTENCE for HOLD FORMAT *sqlengine*.

# Create HOLD Files From Hot Screen

From the FOCUS command line or from Hot Screen, use the following after the report is executed

```
HOLD [AS filename][FORMAT fmt][MISSING {ON|OFF}][VIAprogram]
```

where:

**fmt**

Can be ALPHA, BINARY, DIF, SYLK, WP, INTERNAL, or FOCUS. If you omit the format, the default HOLD format (BINARY) is used.

You can issue HOLD from the Hot Screen command line at any time while a report is displayed and on any page of the report. Regardless of the page from which you issue the command, the entire report is saved, and a data source and Master File are created for that report (just as when you issue the HOLD command from within a TABLE request, or after exiting Hot Screen).

You can issue multiple HOLD commands for a single TABLE request; however, once you specify the FOCUS format with a HOLD command from Hot Screen, you cannot issue another HOLD command during that Hot Screen session.

Note that you cannot use the SAVE or SAVB commands from Hot Screen. You must include these commands in a report request, or issue them from the FOCUS command level after exiting Hot Screen.

# Using DATASET for HOLD

The following request generates the file ggsum.ftm in the application named test1.

```
APP HOLD test1
TABLE FILE GGSALES
SUM UNITS DOLLARS
BY CATEGORY
BY PRODUCT
ON TABLE HOLD AS GGCOMT FORMAT COMT
DATASET test1/ggsum.ftm
END
```

The generated Master File includes the DATASET attribute.

```
FILENAME=GGCOMT  , SUFFIX=COMT    ,
 DATASET=test1/ggsum.ftm (LRECL 80 RECFM V, $
  SEGMENT=GGCOMT, SEGTYPE=S2, $
    FIELDNAME=CATEGORY, ALIAS=E01, USAGE=A11, ACTUAL=A11, $
    FIELDNAME=PRODUCT, ALIAS=E02, USAGE=A16, ACTUAL=A16, $
    FIELDNAME=UNITS, ALIAS=E03, USAGE=I08, ACTUAL=A08, $
    FIELDNAME=DOLLARS, ALIAS=E04, USAGE=I08, ACTUAL=A08, $
```

The following request generates the data set USER1.GGHOLD.FTM on z/OS.

```
TABLE FILE GGSALES
SUM UNITS DOLLARS
BY CATEGORY
BY PRODUCT
ON TABLE HOLD AS GGCOMT FORMAT COMT
DATASET user1.gghold.ftm
END
```

The generated Master File includes the DATASET attribute.

```
FILENAME=GGCOMT  , SUFFIX=COMT    ,
 DATASET=user1.gghold.ftm (LRECL 80 RECFM V, $
  SEGMENT=GGCOMT, SEGTYPE=S2, $
    FIELDNAME=CATEGORY, ALIAS=E01, USAGE=A11, ACTUAL=A11, $
    FIELDNAME=PRODUCT, ALIAS=E02, USAGE=A16, ACTUAL=A16, $
    FIELDNAME=UNITS, ALIAS=E03, USAGE=I08, ACTUAL=A08, $
    FIELDNAME=DOLLARS, ALIAS=E04, USAGE=I08, ACTUAL=A08, $
```

# Set the Default HOLD Format

```
SET HOLDFORMAT = {BINARY|ALPHA}
```

or

```
ON TABLE SET HOLDFORMAT {BINARY|ALPHA}
```

where:

**BINARY**

Sets the default HOLD file format to BINARY.

**ALPHA**

Sets the default HOLD file format to ALPHA.

# Extracting Data to a HOLD File

The following request extracts data from the EMPLOYEE data source and creates a HOLD file.

```
TABLE FILE EMPLOYEE
SUM CURR_SAL AND ED_HRS
BY DEPARTMENT
LIST CURR_SAL AND ED_HRS AND BANK_ACCT
BY DEPARTMENT
BY LAST_NAME BY FIRST_NAME
ON TABLE HOLD
END
```

The following message appears:

```
NUMBER OF RECORDS IN TABLE=  12 LINES=     12
```

To display the report generated by this request issue a report request against the HOLD file.

**Tip:** If you wish to view the information in the HOLD Master File before reporting against it, you can issue the query command ? HOLD.

# Query a HOLD Master File

If the HOLD format option you select creates a Master File, you can issue the following command to display the fields, aliases, and formats in the HOLD Master File:

```
? HOLD
```

This command shows field names up to 32 characters. If a field name exceeds 32 characters, a caret (>) in the 32nd position indicates a longer field name.

If you have renamed the HOLD file using AS *filename*, use the following syntax:

```
? HOLD filename
```

**Tip:** You must issue the ? HOLD query in the same session in which the HOLD file is created.

# Reporting Against a HOLD Master File

In the following HOLD file, the formats shown are the values of the FORMAT attribute. You can see the values of the ACTUAL attribute by displaying the HOLD Master File using TED or any text editor. USAGE and ACTUAL formats for text fields specify only the length of the first line of each logical record in the HOLD file. The USAGE format is the same as the field format in the original Master File. The ACTUAL format is rounded up to a full (internal) word boundary, as is done for alphanumeric fields.

The following request contains the query command ? HOLD, which displays the fields, aliases, and formats in the associated Master File and creates a HOLD file.

```
TABLE FILE EMPLOYEE
SUM CURR_SAL AND ED_HRS
BY DEPARTMENT
LIST CURR_SAL AND ED_HRS AND BANK_ACCT
BY DEPARTMENT
BY LAST_NAME BY FIRST_NAME
ON TABLE HOLD
END

? HOLD
```

The output is:

| | | |
|---|---|---|
| NUMBER OF RECORDS IN TABLE= 12 | LINES= | 12 |

DEFINITION OF HOLD FILE: HOLD

| FIELDNAME | | | ALIAS | FORMAT |
|---|---|---|---|---|
| | | | | |
| DEPARTMENT | | | E01 | A10 |
| CURR_SAL | | | E02 | D12.2M |
| ED_HRS | | | E03 | F6.2 |

| | | | | |
|---|---|---|---|---|
| LAST_NAME | | | E04 | A15 |
| FIRST_NAME | | | E05 | A10 |
| LIST | | | E06 | I5 |
| CURR_SAL | | | E07 | D12.2M |
| ED_HRS | | | E08 | F6.2 |
| BANK_ACCT | | | E09 | I9S |

You can now issue the following report request against the HOLD file:

```
TABLE FILE HOLD
PRINT E07 AS 'SALARY OF,EMPLOYEE' AND LAST_NAME AND FIRST_NAME
BY HIGHEST E03 AS 'TOTAL,DEPT,ED_HRS'
BY E01
BY HIGHEST E08 AS 'EMPLOYEE,ED_HRS'
END
```

The output is:

```
TOTAL

DEPT                EMPLOYEE        SALARY OF

ED_HRS  DEPARTMENT  ED_HRS          EMPLOYEE   LAST_NAME        FIRST_
NAME
------  ----------  --------        ---------  ---------        --------
--
231.00  MIS            75.00       $21,780.00  BLACKWOOD
ROSEMARIE
                       50.00       $18,480.00  JONES            DIANE
```

```
                          45.00       $27,062.00  CROSS           BARBARA
                          36.00       $13,200.00  SMITH           MARY
                          25.00        $9,000.00  GREENSPAN       MARY
                            .00       $18,480.00  MCCOY           JOHN
 120.00   PRODUCTION      50.00       $16,100.00  MCKNIGHT        ROGER
                          30.00       $26,862.00  IRVING          JOAN
                          25.00       $11,000.00  STEVENS         ALFRED
                          10.00        $9,500.00  SMITH           RICHARD
                           5.00       $21,120.00  ROMANS          ANTHONY
                            .00       $29,700.00  BANNING         JOHN
```

# Holding Report Output in ibi FOCUS Format

Whether issued within a request or after the request has been executed, the HOLD command can create a FOCUS data source and a corresponding Master File from the data extracted by the report request. This feature enables you to create:  data sources" /> file structure" /> data sources" />

- A FOCUS data source from any other supported data source type.
- A subset of an existing FOCUS data source.

**Tip:** If you are working in an environment that supports SCAN, FSCAN, MODIFY, or Maintain, and you create a HOLD file in FOCUS format, you can update, as well as report against, the HOLD file. See your documentation on these facilities for details.

**Note:** Holding a file in FOCUS format may generate the (FOC441) warning: `The file exists already. Create will write over it.` Issuing the SET WARNING=OFF command suppresses this message.

# Create HOLD Files in ibi FOCUS Format

In a report request, use

```
ON TABLE HOLD [AS filename] FORMAT FOCUS [INDEX field1 field2 ...]
```

where:

**AS filename**

Specifies a name for the HOLD file. If you do not specify a file name, HOLD becomes the default. Since each subsequent HOLD command overwrites the previous HOLD file, it is advisable to provide a distinct file name in each request to direct the extracted data to a separate file, thereby preventing it from being overwritten by the next HOLD command.

The name can be up to 64 characters long.

**Note:** If you use a name longer than eight characters on z/OS, an eight-character member name is generated as described in the *Describing Data With ibi™ WebFOCUS®® Language* manual. To relate the long name to the short member name, the $ VIRT attribute is generated on the top line in the Master File. The resulting HOLD file is a temporary data file. To allocate the long Master File name to a permanent data file, issue the DYNAM ALLOCATE command with the LONGNAME option prior to the HOLD request. The ddname in the command must refer to an existing member of the MASTER data set.

**INDEX field1...**

Enables you to index FOCUS fields. All fields specified after INDEX are specified as FIELDTYPE=I in the Master File. Up to four fields can be indexed.

**Note:** Since the number of index field names is variable, a command name that follows the HOLD command and starts with the same characters as a field name may be counted as another index field, generating an error. For example, if the command following HOLD starts with ON TABLE and a field name starts with the characters 'ON', the ON in the command will be considered a truncated field name to add to the index. To avoid this issue, either set the FIELDNAME parameter to NOTRUNC, so that command names will not be confused with truncated field names, or move the HOLD command to the end of the procedure right before the END command.

Note that once you use this format from Hot Screen, you cannot issue another HOLD command while in the same Hot Screen session.

# Operating System Notes for HOLD Files in ibi FOCUS Format

The HOLD file is dynamically allocated if it is not currently allocated in z/OS. This means the system may delete the file at the end of the session, even if you have not done so. Since HOLD files are usually deleted, this is the desired default. However, if you want to save the Master File, allocate it to ddname HOLDMAST as a permanent data set. The allocation can be performed in the standard FOCUS CLIST. For example:

```
ALLOC F(HOLDMAST)  DA('qualif.HOLDMAST') SHR REUSE
```

Note that ddname HOLDMAST must not refer to the same data set referred to by the MASTER and FOCEXEC ddnames.

# Controlling the ibi FOCUS File Structure

The structure of the FOCUS data source varies according to the report request. The rules are as follows:  file structure" />

- Each aggregation command (SUM, COUNT, WRITE) creates a segment, with each new BY field in the request becoming a key. In a request that uses multiple display commands, the key to any newly created segment does not contain keys that are in the parent segment.
- If a PRINT or LIST command is used to create a segment, all the BY fields, together with the internal FOCLIST field, form the key.
- All fields specified after INDEX are indexed; that is, FIELDTYPE=I is specified in the Master File. Up to four fields may be indexed.
- If the data in the HOLD file is longer than a page (4K for FOCUS data sources or 16K for XFOCUS data sources), it cannot be stored in a single segment. Data that is too long to become a single segment will become a parent segment with unique child segments. For a FOCUS data source, the fields will be grouped into normal FOCUS page size segments and added as unique segments up to the total maximum of 32K of data. For an XFOCUS data source, the root segment can hold the first 16K of data, and additional data up to the 32K total, will be placed in a single unique segment. BY fields must all occur in the portion of the data assigned to the root segment.

To control whether the ACCEPT and TITLE attributes are propagated to the Master File associated with the HOLD file, use the SET HOLDATTR command. To control the FIELDNAME attribute in the Master File of the HOLD file, use the SET ASNAMES command. For more information on how to control the TITLE, ACCEPT, and FIELDNAME attributes in a HOLD Master File, see Controlling Attributes in HOLD Master Files.

# Creating a HOLD File in FOCUS Format

The following example creates a subset of the CAR data source.

```
TABLE FILE CAR
SUM SALES BY COUNTRY BY CAR BY MODEL
ON TABLE HOLD AS X1 FORMAT FOCUS
END
```

This request creates a single-segment FOCUS data source with a SEGTYPE of S3 (because it has three BY fields) named X1.

The X1 Master File is created by the request:

```
FILE=X1, SUFFIX=FOC
 SEGMENT=SEG01 ,SEGTYPE=S03
  FIELDNAME=COUNTRY      ,ALIAS=E01    ,USAGE=A10   ,$
  FIELDNAME=CAR          ,ALIAS=E02    ,USAGE=A16   ,$
  FIELDNAME=MODEL        ,ALIAS=E03    ,USAGE=A24   ,$
  FIELDNAME=SALES        ,ALIAS=E04    ,USAGE=I6    ,$
```

# Using PRINT to Create a FOCUS Data Source With a FOCLIST Field

This example creates a single-segment FOCUS data source with a SEGTYPE of S4 because of the three BY fields and the FOCLIST FIELD.  data sources" />

```
TABLE FILE CAR
PRINT SALES BY COUNTRY BY CAR BY MODEL
ON TABLE HOLD AS X2 FORMAT FOCUS INDEX MODEL
END
```

The Master File created by this request is:

```
FILE=X2, SUFFIX=FOC
 SEGMENT=SEG01, SEGTYPE=S04
  FIELDNAME=COUNTRY      ,ALIAS=E01    ,USAGE=A10   ,$
  FIELDNAME=CAR          ,ALIAS=E02    ,USAGE=A16   ,$
  FIELDNAME=MODEL        ,ALIAS=E03    ,USAGE=A24   ,FIELDTYPE=I,$
  FIELDNAME=FOCLIST      ,ALIAS=E04    ,USAGE=I5    ,$
  FIELDNAME=SALES        ,ALIAS=E05    ,USAGE=I6    ,$
```

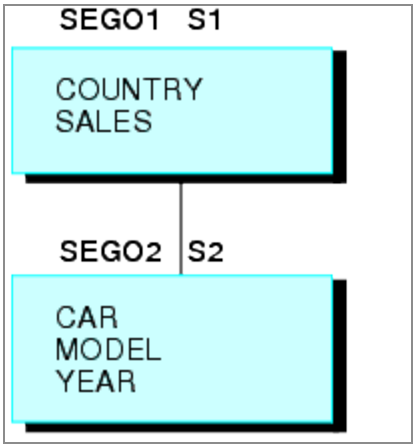
# Creating a Two-Segment FOCUS Data Source

The following request contains two SUM commands. The first, SUM SALES BY COUNTRY, creates a segment with COUNTRY as the key and the summed values of SALES as a data field. The second, SUM SALES BY COUNTRY BY CAR BY MODEL, creates a descendant segment, with CAR and MODEL as the keys and SALES as a non-key field.  data sources" />

The COUNTRY field does not form part of the key to the second segment. COUNTRY is a key in the path to the second segment. Any repetition of this value is redundant.

```
TABLE FILE CAR
SUM SALES BY COUNTRY
SUM SALES BY COUNTRY BY CAR BY MODEL
ON TABLE HOLD AS X3 FORMAT FOCUS
END
```

This creates a two-segment FOCUS data source:




The Master File for this newly-created FOCUS data source is:

```
FILE=X3, SUFFIX=FOC
 SEGMENT=SEG01, SEGTYPE=S01
  FIELDNAME=COUNTRY       ,ALIAS=E01    ,USAGE=A10    ,$
  FIELDNAME=SALES         ,ALIAS=E02    ,USAGE=I6     ,$
 SEGMENT=SEG02, SEGTYPE=S02,PARENT=SEG01
  FIELDNAME=CAR           ,ALIAS=E03    ,USAGE=A16    ,$
  FIELDNAME=MODEL         ,ALIAS=E04    ,USAGE=A24    ,$
  FIELDNAME=SALES         ,ALIAS=E05    ,USAGE=I6     ,$
```

# Creating a Three-Segment FOCUS Data Source

In this example, each display command creates one segment.  data sources" />

The key to the root segment is the BY field, COUNTRY, while the keys to the descendant segments are the new BY fields. The last segment uses the internal FOCLIST field as part of the key, since the display command is PRINT.

```
TABLE FILE CAR
SUM SALES BY COUNTRY BY CAR
SUM SALES BY COUNTRY BY CAR BY MODEL
PRINT SALES BY COUNTRY BY CAR BY MODEL BY BODY
ON TABLE HOLD AS X4 FORMAT FOCUS INDEX COUNTRY MODEL
END
```

The Master File is:

```
FILE=X4, SUFFIX=FOC
 SEGMENT=SEG01, SEGTYPE =S02
  FIELDNAME=COUNTRY   ,ALIAS=E01     ,USAGE=A10   ,FIELDTYPE=I,$
  FIELDNAME=CAR       ,ALIAS=E02     ,USAGE=A16   ,$
  FIELDNAME=SALES     ,ALIAS=E03     ,USAGE=I6    ,$
 SEGMENT=SEG02, SEGTYPE =S01 ,PARENT=SEG01
  FIELDNAME=MODEL     ,ALIAS=E04     ,USAGE=A24   ,FIELDTYPE=I,$
  FIELDNAME=SALES     ,ALIAS=E05     ,USAGE=I6    ,$
 SEGMENT=SEG03, SEGTYPE =S02 ,PARENT=SEG02
  FIELDNAME=BODYTYPE  ,ALIAS=E06     ,USAGE=A12   ,$
  FIELDNAME=FOCLIST   ,ALIAS=E07     ,USAGE=I5    ,$
  FIELDNAME=SALES     ,ALIAS=E08     ,USAGE=I6    ,$
```

# Controlling Attributes in HOLD Master Files

The commands SET ASNAMES, SET HOLDLIST, and SET HOLDATTR enable you to control the FIELDNAME, TITLE, and ACCEPT attributes in HOLD Master Files. These commands are issued prior to the report request and remain in effect for the duration of the session, unless you change them.

- The SET ASNAMES command designates text specified in an AS phrase as the field name in the HOLD Master File, and concatenates it to the beginning of the first field name specified in an ACROSS phrase. See Controlling Field Names in a HOLD Master File.
- The SET HOLDLIST command restricts fields in HOLD and PCHOLD files to those appearing in a request. That is, non-displaying fields in a request (those designated as NOPRINT fields) are not included in the HOLD file. You can also distinguish between implicitly and explicitly non-displaying fields. See Controlling Attributes in HOLD Master Files.
- The SET HOLDATTR command propagates TITLE and ACCEPT attributes used in the original Master File to the HOLD Master File. See Controlling Attributes in HOLD Master Files.

In addition, the SET HOLDSTAT command enables you to include comments and DBA information in the HOLD Master File. For more information about SET HOLDSTAT, see the *Describing Data With ibi™ WebFOCUS® Language* manual. For details about SET commands, see the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

# Controlling Field Names in a HOLD Master File

When SET ASNAMES is set to ON, MIXED or FOCUS, the literal specified in an AS phrase in a report request is used as the field name in a HOLD Master File. This command also controls how ACROSS fields are named in HOLD files.

# Control Field Names in a HOLD Master File

```
SET ASNAMES = [ON|OFF|MIXED|FOCUS|FLIP]
```

where:

**OFF**

Does not use the literal specified in an AS phrase as a field name in HOLD files, and does not affect the way ACROSS fields are named.

**ON**

Uppercases the literal specified in an AS phrase and propagates it as the field name in the HOLD Master File. Creates names for ACROSS fields that consist of the AS name value concatenated to the beginning of the ACROSS field value and controls the way ACROSS fields are named in HOLD files of any format.

**MIXED**

Uses the literal specified in an AS phrase for the field name, retaining the case of the AS name, and creates names for ACROSS fields that consist of the AS name value concatenated to the beginning of the ACROSS field value.

**FOCUS**

Uses the literal specified in an AS phrase as the field name and controls the way ACROSS fields are named only in HOLD files in FOCUS format. FOCUS is the default value.

**FLIP**

Propagates the field names in the original Master File to the alias names in the HOLD Master File and the alias names in the original Master File to the field names in the HOLD Master File.

# Usage Notes for Controlling Field Names in HOLD Files

- If no AS phrase is specified for a field, the field name from the original Master File is used. The TITLE attribute specified in the Master File is not used unless SET HOLDATTRS was previously issued.
- To ensure that fields referenced more than once in a request have unique names in the HOLD Master File, use SET ASNAMES.

- Special characters and blanks used in the AS phrase are preserved in the field name that is created when SET ASNAMES is used. Use single quotation marks around the non-standard field names when referring to them in the newly created Master File.
- Text specified in an AS phrase that contains more than 66 characters is truncated to 66 characters in the Master File.
- When generating field names and aliases for a HOLD file with the default setting for the ASNAMES parameter, if the HOLD file is a relational data source, the field names and aliases from the original Master File are propagated to the HOLD Master File. The alias names become the column names in the generated relational table. The AS name also becomes the TITLE attribute in the HOLD Master File.

  When you set the ASNAMES parameter to FLIP, for relational HOLD files, the field names from the original Master File or the AS names specified in the request become the alias names in the HOLD Master File as well as the column names in the generated relational table and the TITLE attributes in the HOLD Master File. The alias names in the original Master File become the field names in the HOLD Master File, except when there is an AS name, in which case the original field name becomes the HOLD field name.
- If the HOLD file is not relational, field names from the original Master File are propagated to the HOLD Master File, but alias name are not propagated, and default aliases of the form E01, E02, and so on, are generated in the HOLD Master File.
- For SET ASNAMES=FLIP, for non-relational HOLD files, the field names from the original Master File or the AS names from the request become the alias names in the HOLD Master File, and default field names are generated in the form F01, F02, and so on.
- Duplicate field names may occur in the newly created Master File as a result of truncation or the way AS phrases have been specified. In this case, refer to the fields by their aliases (E01, E02, and so forth).
- When commas are used as delimiters to break lines in the column heading, only the literal up to the first comma is used as the field name in the Master File. For example, the following produces the field name PLACE in the HOLD Master File:

  ```
  PRINT COUNTRY AS 'PLACE,OF,ORIGIN'
  ```

- When ACROSS is used in a report request and the results are extracted to a HOLD file, the columns generated by the ACROSS phrase all have the same field name in the

HOLD Master File. If SET ASNAMES is issued, each new column may have a unique field name. This unique field name consists of the ASNAME value specified in the request's display command, concatenated to the beginning of the value of the field used in the ACROSS phrase. If several field names have the same letters, this approach does not work.

If an AS phrase is used for the fields in the ACROSS phrase, each new column has a field name composed of the literal in the AS phrase concatenated to the beginning of the value of the first field used in the ACROSS phrase.

# Controlling Field Names in the HOLD Master File

In the following example, SET ASNAMES=ON causes the text in the AS phrase to be used as field names in the HOLD1 Master File. The two fields in the HOLD1 Master File, NATION and AUTOMOBILE, contain the data for COUNTRY and CAR.

```
SET ASNAMES=ON
TABLE FILE CAR
PRINT CAR AS 'AUTOMOBILE'
BY COUNTRY AS 'NATION'
ON TABLE HOLD AS HOLD1
END
```

The request produces the following Master File:

```
FILE=HOLD1, SUFFIX=FIX
 SEGMENT=HOLD1, SEGTYPE=S01,$
  FIELDNAME=NATION      ,ALIAS=E01   ,USAGE=A10  ,ACTUAL=A12     ,$
  FIELDNAME=AUTOMOBILE  ,ALIAS=E02   ,USAGE=A16  ,ACTUAL=A16     ,$
```

# Providing Unique Field Names With SET ASNAMES

The following request generates a HOLD Master File with one unique field name for SALES and one for AVE.SALES. Both SALES and AVE.SALES would be named SALES, if SET ASNAMES had not been used.

```
SET ASNAMES=ON
TABLE FILE CAR
```

```
SUM SALES AND AVE.SALES AS 'AVERAGESALES'
BY CAR
ON TABLE HOLD AS HOLD2
END
```

The request produces the following Master File:

```
FILE=HOLD2, SUFFIX=FIX
 SEGMENT=HOLD2, SEGTYPE=S01,$
  FIELDNAME=CAR             ,ALIAS=E01  ,USAGE=A16 ,ACTUAL=A16   ,$
  FIELDNAME=SALES           ,ALIAS=E02  ,USAGE=I6  ,ACTUAL=I04   ,$
  FIELDNAME=AVERAGESALES    ,ALIAS=E03  ,USAGE=I6  ,ACTUAL=I04   ,$
```

# Using SET ASNAMES With the ACROSS Phrase

The following request produces a HOLD Master File with the literal CASH concatenated to each value of COUNTRY.

```
SET ASNAMES=ON
TABLE FILE CAR
SUM SALES AS 'CASH'
ACROSS COUNTRY
ON TABLE HOLD AS HOLD3
END
```

The request produces the following Master File:

```
FILE=HOLD3, SUFFIX=FIX
 SEGMENT=HOLD3, SEGTYPE=S01,$
  FIELDNAME=CASHENGLAND     ,ALIAS=E01   ,USAGE=I6  ,ACTUAL=I04  ,$
  FIELDNAME=CASHFRANCE      ,ALIAS=E02   ,USAGE=I6  ,ACTUAL=I04  ,$
  FIELDNAME=CASHITALY       ,ALIAS=E03   ,USAGE=I6  ,ACTUAL=I04  ,$
  FIELDNAME=CASHJAPAN       ,ALIAS=E04   ,USAGE=I6  ,ACTUAL=I04  ,$
  FIELDNAME=CASHW GERMANY   ,ALIAS=E05   ,USAGE=I6  ,ACTUAL=I04  ,$
```

Without the SET ASNAMES command, every field in the HOLD FILE is named COUNTRY.

To generate field names for ACROSS values that include only the field value, use the AS phrase followed by two single quotation marks, as follows:

```
SET ASNAMES=ON
TABLE FILE CAR
SUM SALES AS ''
ACROSS COUNTRY
ON TABLE HOLD AS HOLD4
END
```

The resulting Master File looks like this:

```
FILE=HOLD4, SUFFIX=FIX
 SEGMENT=HOLD4, SEGTYPE=S0,$
  FIELDNAME=ENGLAND    ,ALIAS=E01   ,USAGE=I6  ,ACTUAL=I04    ,$
  FIELDNAME=FRANCE     ,ALIAS=E02   ,USAGE=I6  ,ACTUALI04     ,$
  FIELDNAME=ITALY      ,ALIAS=E03   ,USAGE=I6  ,ACTUALI04     ,$
  FIELDNAME=JAPAN      ,ALIAS=E04   ,USAGE=I6  ,ACTUALI04     ,$
  FIELDNAME=W GERMANY  ,ALIAS=E05   ,USAGE=I6  ,ACTUALI04     ,$
```

# Generating a HOLD File With SET ASNAMES=FLIP

The following request generates a HOLD file in ALPHA format using the OFF value for SET ASNAMES. The field CURR_SAL has the AS name SALARY in the request:

```
SET ASNAMES=OFF
TABLE FILE EMPLOYEE
SUM CURR_SAL AS SALARY PCT_INC
BY DEPARTMENT
ON TABLE HOLD FORMAT ALPHA
END
```

In the HOLD Master File, AS names have not been propagated, the field names are from the original Master File, and default alias names are generated:

```
FILENAME=HOLD    , SUFFIX=FIX     , IOTYPE=STREAM, $
  SEGMENT=HOLD, SEGTYPE=S1, $
    FIELDNAME=DEPARTMENT, ALIAS=E01, USAGE=A10, ACTUAL=A10, $
    FIELDNAME=CURR_SAL, ALIAS=E02, USAGE=D12.2M, ACTUAL=A12, $
    FIELDNAME=PCT_INC, ALIAS=E03, USAGE=F6.2, ACTUAL=A06, $
```

The following version of the request generates a relational table:

```
SET ASNAMES=OFF
TABLE FILE EMPLOYEE
SUM CURR_SAL AS SALARY PCT_INC
BY DEPARTMENT
ON TABLE HOLD FORMAT SQLMSS
END
```

The field names from the original Master File have been propagated to the field names in the HOLD Maser File, and the alias names from the original Master File have been propagated to the HOLD Master File. The AS name for CURR_SAL has become the TITLE in the HOLD Master File:

```
FILENAME=HOLD   , SUFFIX=SQLMSS  , $
  SEGMENT=SEG01, SEGTYPE=S0, $
    FIELDNAME=DEPARTMENT, ALIAS=DPT, USAGE=A10, ACTUAL=A10, $
    FIELDNAME=CURR_SAL, ALIAS=CSAL, USAGE=D12.2M, ACTUAL=D8,
      TITLE='SALARY', $
    FIELDNAME=PCT_INC, ALIAS=PI, USAGE=F6.2, ACTUAL=F4, $
```

Changing SET ASNAMES to ON propagates the AS name SALARY to the field name in the HOLD Master File. The following is the Master File for the HOLD file in ALPHA format:

```
FILENAME=HOLD    , SUFFIX=FIX     , IOTYPE=STREAM, $
  SEGMENT=HOLD, SEGTYPE=S1, $
    FIELDNAME=DEPARTMENT, ALIAS=E01, USAGE=A10, ACTUAL=A10, $
    FIELDNAME=SALARY, ALIAS=E02, USAGE=D12.2M, ACTUAL=A12, $
    FIELDNAME=PCT_INC, ALIAS=E03, USAGE=F6.2, ACTUAL=A06, $
```

The following is the Master File for the HOLD file in relational format:

```
FILENAME=HOLD   , SUFFIX=SQLMSS  , $
  SEGMENT=SEG01, SEGTYPE=S0, $
    FIELDNAME=DEPARTMENT, ALIAS=DPT, USAGE=A10, ACTUAL=A10, $
    FIELDNAME=SALARY, ALIAS=CURR_SAL, USAGE=D12.2M, ACTUAL=D8,
      TITLE='SALARY', $
    FIELDNAME=PCT_INC, ALIAS=PI, USAGE=F6.2, ACTUAL=F4, $
```

Changing SET ASNAMES to FLIP propagates the AS name SALARY to the alias name in the HOLD Master File. In the ALPHA HOLD file, the other field names have been propagated to the alias names in the HOLD Master File, and default field names have been generated:

```
FILENAME=HOLD    , SUFFIX=FIX     , IOTYPE=STREAM, $
  SEGMENT=HOLD, SEGTYPE=S1, $
    FIELDNAME=F01, ALIAS=DEPARTMENT, USAGE=A10, ACTUAL=A10, $
    FIELDNAME=F02, ALIAS=SALARY, USAGE=D12.2M, ACTUAL=A12, $
    FIELDNAME=F03, ALIAS=PCT_INC, USAGE=F6.2, ACTUAL=A06, $
```

In the relational HOLD file, changing SET ASNAMES to FLIP propagates the AS name SALARY to the alias name in the HOLD Master File. For that field, the field name from the original Master File becomes the field name in the HOLD Master File and the TITLE attribute. The other field names have been propagated to the alias names in the HOLD Master File, and the corresponding alias names from the original Master File have been propagated to the field names in the HOLD Master File:

```
FILENAME=HOLD   , SUFFIX=SQLMSS  , $
  SEGMENT=SEG01, SEGTYPE=S0, $
    FIELDNAME=DPT, ALIAS=DEPARTMENT, USAGE=A10, ACTUAL=A10, $
    FIELDNAME=CURR_SAL, ALIAS=SALARY, USAGE=D12.2M, ACTUAL=D8,
      TITLE='SALARY', $
    FIELDNAME=PI, ALIAS=PCT_INC, USAGE=F6.2, ACTUAL=F4, $
```

# Controlling Fields in a HOLD Master File

You can use the SET HOLDLIST command to restrict fields in HOLD Master Files to those appearing in a request.

# Control Fields in a HOLD File

```
SET HOLDLIST = {PRINTONLY|ALL|ALLKEYS|EXPLICIT}
```

where:

**PRINTONLY**

Specifies that only those fields that would appear in the report are included in the generated HOLD file. Non-displaying fields in a request (those designated as NOPRINT fields explicitly or implicitly) are not included in the HOLD file.

**ALL**

Specifies that all display fields referenced in a request appear in a HOLD file, including calculated values. ALL is the default value. OLD may be used as a synonym for ALL.

**Note:** Vertical sort (BY) fields specified in the request with the NOPRINT option are not included in the HOLD file even if HOLDLIST=ALL.

**ALLKEYS**

Propagates all fields, including NOPRINTed BY fields.

The ALLKEYS setting enables caching of all of the data necessary for manipulating an active report.

**EXPLICIT**

Includes fields in the HOLD or PCHOLD file that are explicitly omitted from the report output using the NOPRINT option in the request, but does not include fields that are implicitly NOPRINTed. For example, if a field is reformatted in the request, two versions of the field exist, the one with the new format and the one with the original format, which is implicitly NOPRINTed

Note that SET HOLDLIST may also be issued from within a TABLE request. When used with MATCH, SET HOLDLIST always behaves as if HOLDLIST is set to ALL.

# Using HOLDLIST=ALL

When HOLDLIST is set to ALL, the following TABLE request produces a HOLD file containing all specified fields, including NOPRINT fields and values calculated with the COMPUTE command.

```
SET HOLDLIST=ALL

TABLE FILE CAR
PRINT CAR MODEL NOPRINT
COMPUTE TEMPSEATS=SEATS+1;
BY COUNTRY
ON TABLE HOLD
END

? HOLD
```

The output is:

| | | | | |
|---|---|---|---|---|
| NUMBER OF RECORDS IN TABLE= 18 | | | LINE= | 18 |
| | | | | |
| DEFINITION OF HOLD FILE: HOLD | | | | |
| FIELDNAME | | | ALIAS | FORMAT |
| | | | | |
| COUNTRY | | | E01 | A10 |
| CAR | | | E02 | A16 |
| MODEL | | | E03 | A24 |
| SEATS | | | E04 | I3 |
| TEMPSEATS | | | E05 | D12.2 |

# Using HOLDLIST= PRINTONLY

When HOLDLIST is set to PRINTONLY, the following TABLE request produces a HOLD file containing only fields that would appear in report output:

```
SET HOLDLIST=PRINTONLY

TABLE FILE CAR
PRINT CAR MODEL NOPRINT
COMPUTE TEMPSEATS=SEATS+1;
BY COUNTRY
ON TABLE HOLD
END

? HOLD
```

The output is:

| | | | | |
|---|---|---|---|---|
| NUMBER OF RECORDS IN TABLE= 18 | | | LINES= | 18 |
| | | | | |

DEFINITION OF HOLD FILE: HOLD

| | | | | |
|---|---|---|---|---|
| FIELDNAME | | | ALIAS | FORMAT |
| | | | | |
| COUNTRY | | | E01 | A10 |
| CAR | | | E02 | A16 |
| TEMPSEATS | | | E03 | D12.2 |

# Comparing Master Files Created Using Different HOLDLIST Settings

The following request against the GGSALES data source has two reformatted display fields (DOLLARS, UNITS). The DOLLARS field is also an explicit NOPRINT field. The BY field named CATEGORY is also an explicit NOPRINT field:

```
SET HOLDLIST=ALL
TABLE FILE GGSALES
SUM UNITS/I5 DOLLARS/D12.2 NOPRINT
BY REGION BY CATEGORY NOPRINT
ON TABLE HOLD FORMAT FOCUS
END
```

Running the request with SET HOLDLIST=ALL generates the following HOLD Master File. Note that the DOLLARS and UNITS fields are included twice, once with the original format (which would have been implicitly NOPRINTed if the report had been printed rather than held) and once with the new format. However the NOPRINTed BY field (CATEGORY) is not included:

```
FILENAME=HOLD, SUFFIX=FOC     , $
  SEGMENT=SEG01, SEGTYPE=S1, $
    FIELDNAME=REGION, ALIAS=E01, USAGE=A11,
      TITLE='Region', DESCRIPTION='Region code', $
    FIELDNAME=UNITS, ALIAS=E02, USAGE=I08,
      TITLE='Unit Sales', DESCRIPTION='Number of units sold', $
    FIELDNAME=UNITS, ALIAS=E03, USAGE=I5,
      TITLE='Unit Sales', $
    FIELDNAME=DOLLARS, ALIAS=E04, USAGE=I08,
      TITLE='Dollar Sales', DESCRIPTION='Total dollar amount of reported
sales', $
    FIELDNAME=DOLLARS, ALIAS=E05, USAGE=D12.2,
      TITLE='Dollar Sales', $
```

Running the request with SET HOLDLIST=ALLKEYS generates the following HOLD Master File. Note that the DOLLARS and UNITS fields are included twice, once with the original format, which would have been implicitly NOPRINTed if the report had been printed rather than held, and once with the new format. The NOPRINTed BY field (CATEGORY) is included:

```
FILENAME=HOLD, SUFFIX=FOC     , $
  SEGMENT=SEG01, SEGTYPE=S2, $
    FIELDNAME=REGION, ALIAS=E01, USAGE=A11,
      TITLE='Region', DESCRIPTION='Region code', $
    FIELDNAME=CATEGORY, ALIAS=E02, USAGE=A11,
      TITLE='Category', DESCRIPTION='Product category', $
    FIELDNAME=UNITS, ALIAS=E03, USAGE=I08,
      TITLE='Unit Sales', DESCRIPTION='Number of units sold', $
    FIELDNAME=UNITS, ALIAS=E04, USAGE=I5,
      TITLE='Unit Sales', $
    FIELDNAME=DOLLARS, ALIAS=E05, USAGE=I08,
      TITLE='Dollar Sales', DESCRIPTION='Total dollar amount of reported
sales', $
    FIELDNAME=DOLLARS, ALIAS=E06, USAGE=D12.2,
      TITLE='Dollar Sales', $
```

Running the request with SET HOLDLIST=PRINTONLY generates the following HOLD Master File. Only the fields that would have actually printed on the report output are included: REGION and UNITS with the new format (I5). All explicitly and implicitly NOPRINTed fields are excluded, including the NOPRINTed BY field (CATEGORY):

```
FILENAME=HOLD , SUFFIX=FOC     , $
  SEGMENT=SEG01, SEGTYPE=S1, $
    FIELDNAME=REGION, ALIAS=E01, USAGE=A11,
      TITLE='Region', DESCRIPTION='Region code', $
    FIELDNAME=UNITS, ALIAS=E02, USAGE=I5,
      TITLE='Unit Sales', $
```

Running the request with SET HOLDLIST=EXPLICIT generates the following HOLD Master File. The fields that would have actually printed on the report output are included and so are the explicitly NOPRINTed fields (the display field DOLLARS and the BY field CATEGORY). The implicitly NOPRINTed fields (DOLLARS and UNITS with their original formats) are omitted:

```
FILENAME=HOLD, SUFFIX=FOC     , $
  SEGMENT=SEG01, SEGTYPE=S2, $
    FIELDNAME=REGION, ALIAS=E01, USAGE=A11,
      TITLE='Region', DESCRIPTION='Region code', $
    FIELDNAME=CATEGORY, ALIAS=E02, USAGE=A11,
      TITLE='Category', DESCRIPTION='Product category', $
    FIELDNAME=UNITS, ALIAS=E03, USAGE=I5,
      TITLE='Unit Sales', $
```

```
   FIELDNAME=DOLLARS, ALIAS=E04, USAGE=D12.2,
     TITLE='Dollar Sales', $
```

# Controlling Attributes in the HOLD Master File

The SET HOLDATTR command controls whether the TITLE and ACCEPT attributes, as well as other attributes in the original Master File, are propagated to the HOLD Master File. SET HOLDATTR does not affect the way fields are named in the HOLD Master File.

Note that if a field in a data source does not have the TITLE attribute specified in the Master File, but there is an AS phrase specified for the field in a report request, the corresponding field in the HOLD file is named according to the AS phrase.

# Control TITLE and ACCEPT Attributes

```
SET HOLDATTR =[ON|OFF|FOCUS|CUBE]
```

where:

**ON**

Uses the TITLE attribute as specified in the original Master File in HOLD files in any format. The ACCEPT attribute is propagated to the HOLD Master File only for HOLD files in FOCUS format. PROPERTY attributes are also propagated.

**OFF**

Does not use the TITLE or ACCEPT attributes from the original Master File in the HOLD Master File.

**FOCUS**

Uses the TITLE and ACCEPT attributes only for HOLD files in FOCUS format. PROPERTY attributes are also propagated. FOCUS is the default value.

**CUBE**

Propagates folders and DV_ROLE attributes, as well as TITLE attributes to the HOLD Master File. It also propagates the field name as the alias value.

# Controlling TITLE and ACCEPT Attributes in a HOLD Master File

In this example, the Master File for the CAR data source specifies TITLE and ACCEPT attributes:

```
FILENAME=CAR2, SUFFIX=FOC
SEGNAME=ORIGIN, SEGTYPE=S1
  FIELDNAME =COUNTRY, COUNTRY, A10, TITLE='COUNTRY OF ORIGIN',
             ACCEPT='CANADA' OR 'ENGLAND' OR 'FRANCE' OR 'ITALY' OR
                    'JAPAN' OR 'W GERMANY',
             FIELDTYPE=I,$
SEGNAME=COMP, SEGTYPE=S1, PARENT=ORIGIN
  FIELDNAME=CAR, CARS, A16, TITLE='NAME OF CAR',$
.
.
.
```

Using SET HOLDATTR=FOCUS, the following request

```
SET HOLDATTR = FOCUS
TABLE FILE CAR2
PRINT CAR
BY COUNTRY ON TABLE HOLD FORMAT FOCUS AS HOLD5
END
```

produces this HOLD Master File:

```
FILE=HOLD5, SUFFIX=FOC
 SEGMENT=SEG01, SEGTYPE=S02
  FIELDNAME=COUNTRY ,USAGE=E01   ,ACTUAL=A10
      TITLE='COUNTRY OF ORIGIN',
      ACCEPT=CANADA ENGLAND FRANCE ITALY JAPAN 'W GERMANY',$
  FIELDNAME=FOCLIST ,USAGE=E02   ,ACTUAL=I5     ,$
  FIELDNAME=CAR     ,USAGE=E03   ,ACTUAL=A16    ,
      TITLE='NAME OF CAR' ,$
```

# Keyed Retrieval From HOLD Files

Keyed retrieval is supported with any single-segment SUFFIX=FIX data source or HOLD file that is sorted based on the key. Keyed retrieval can reduce the IOs incurred in reading extract files, by using the SEGTYPE parameter in the Master File to identify which fields comprise the logical key for sequential files. When FIXRETRIEVE is:

- ON, the retrieval process stops when an equality or range test on the key holds true.
- OFF, all of the records from the sequential file are read and screening conditions are applied when creating the final report.

The ON TABLE HOLD command enables you to read one of the many supported data sources and create extract files. You can then join these fixed-format sequential files to other data sources to narrow your view of the data. The concept of a logical key in a fixed-format file enables qualified keyed searches for all records that match IF/WHERE tests for the first *n* KEY fields identified by the SEGTYPE attribute. Retrieval stops when the screening test detects values greater than those specified in the IF/WHERE test.

When a Master File is created for the extract file, a SEGTYPE of either S*n* or SH*n* is added, based on the BY fields in the request. For example, PRINT *field* BY *field* creates a HOLD Master File with SEGTYPE=S1. Using BY HIGHEST *field* creates a Master with SEGTYPE=SH1.

# Control Keyed Retrieval for a HOLD File

```
SET FIXRET[RIEVE] = {ON|OFF}
```

where:

**ON**

Enables keyed retrieval. ON is the default setting.

**OFF**

Disables keyed retrieval.

# Master File for Keyed Retrieval From a HOLD File

The following Master File describes a fixed-format sequential file with sorted values of SEQ_NO, in ascending order from 1 to 100,000.

```
FILE=SORTED,SUFFIX=FIX,$
SEGNAME=ONE,SEGTYPE=S1,$
 FIELD=MYKEY,MK,I8,I8,$
 FIELD=MFIELD,MF,A10,A10,$

TABLE FILE SORTED
 PRINT MFIELD
 WHERE MYKEY EQ 100
END
```

In this instance, with FIXRETRIEVE=ON, retrieval stops when MYKEY reaches 101, vastly reducing the potential number of IOs, as only 101 records are read out of a possible 100,000.

# Selection Criteria for Keyed Retrieval From an Extract File

Selection criteria that include lists of equality values use keyed retrieval. For example,

```
{IF|WHERE} MYKEY EQ x OR y OR z
```

IF and WHERE tests can also include range tests. For example,

```
{IF|WHERE} MYKEY IS-FROM x TO y
```

The maximum number of vertical (BY) sort fields remains 32.

In using this feature, keep in mind that when adding unsorted records to a sorted HOLD file, records that are out of sequence are not retrieved. For example, suppose that a sorted file contains the following three records:

```
Key
```

```
1 1200
```

```
2 2340
```

```
3 4875
```

and you add the following record at the bottom of the file:

```
1 1620
```

With FIXRETRIEVE=ON, the new record with a key value of 1 is omitted, as retrieval stops as soon as a key value of 2 is encountered.

# Saving and Retrieving HOLD Files

In WebFOCUS, HOLD files are saved to a temporary directory during processing and deleted after the connection to the server is broken. If you wish to retain these files for later use, you can save the HOLD data source and its associated Master File to a specific location using APP commands.

To report against the HOLD Master File at a later time, you can add the application to your APP path, if it is not already there, or you can use a two-part name (*appname*/*mastername*) in the TABLE FILE command.

To report against the saved HOLD data file, you can issue a FILEDEF command that specifies where to find the file before you issue the TABLE FILE command.

# Specify a Storage Location for a HOLD Master File (Windows, UNIX, OpenVMS)

```
APP MAP appnamepath_to_directory APP HOLDDATA appname APP HOLDMETA
appname
```

where:

**APP MAP**

Associates a directory location with an application name.

**APP HOLDDATA**

Specifies the application name for HOLD data files.

**APP HOLDMETA**

Specifies the application name for HOLD Master Files.

**path_to_directory**

Specifies the directory in which to store the files.

**appname**

Is an application name.

You should add the APP commands to a supported profile so that they will be available to all of your procedures rather than issuing them in every procedure that needs to access the application directory. In addition, you should add the application to your path so that it will be found by your procedures.

# Specifying a Storage Location for HOLD Data and Master Files

The following example for WebFOCUS on UNIX illustrates how to create an application named **holdapp** and store HOLD data files and Master Files in the \ggtmp directory that is mapped to that application.

Place the following commands in any supported profile:

```
APP MAP holdapp /ggtmp
APP HOLDDATA holdapp
APP HOLDMETA holdapp
```

The following request creates a HOLD Master file named sales.mas and a HOLD data file named sales.ftm that will be stored in the /ggtmp directory:

```
TABLE FILE GGSALES
PRINT SEQ_NO CATEGORY PRODUCT
```

```
ON TABLE HOLD AS SALES
END
```

To issue a TABLE request against the HOLD file, you must first issue a FILEDEF command that points to the HOLD data file. The DDNAME for the FILEDEF is the AS name specified in the HOLD command. If no AS name was specified, the DDNAME is HOLD:

```
FILEDEF SALES DIR \ggtmp\sales.ftm
```

You must also make sure that WebFOCUS can find the Master File. One way to do this is to make sure that the application is in your application path. You can add it to the path with the following command:

```
APP APPENDPATH holdapp
```

Then you can issue a request against the HOLD file:

```
TABLE FILE SALES
PRINT *
END
```

Alternatively, you can issue the TABLE request against the HOLD file using a two-part name (application name and Master File name):

```
TABLE FILE holdapp/sales
PRINT *
END
```

# Allocating HOLD Files on z/OS

The HOLD file is dynamically allocated if it is not currently allocated on z/OS. This means the system may delete the file at the end of the session, even if you have not. Since HOLD files are usually deleted, this is a desired default. However, if you want to save the file, we recommend that you allocate the HOLD Master File to the ddname HOLDMAST as a permanent data set, and allocate the HOLD data file to a permanent data set as well. The allocations can be performed within the standard WebFOCUS Reporting Server CLIST or

batch JCL or in a profile or procedure. For example, if your procedure had the following command:

```
ON TABLE HOLD AS SALES
```

you could use allocations similar to the following:

```
ALLOC F(HOLDMAST)  DA('qualif.HOLDMAST.DATA') SHR REUSE
ALLOC F(SALES)  DA('qualif.SALES.DATA') SHR REUSE
```

Note that ddname HOLDMAST must not refer to the same PDS referred to by the MASTER and FOCEXEC ddnames.

# Using DBMS Temporary Tables as HOLD Files

You can create a report output file (that is, a HOLD file), as a native DBMS temporary table. This increases performance by keeping the entire reporting operation on the DBMS server, instead of downloading data to your computer and then back to the DBMS server.

For example, if you temporarily store report output for immediate use by another procedure, storing it as a temporary table instead of creating a standard HOLD file avoids the overhead of transmitting the interim data to your computer.

The temporary table columns are created from the following report elements

- Display columns
- Sort (BY) columns
- COMPUTE columns

except for those for which NOPRINT is specified.

The temporary table that you create from your report will be the same data source type (that is, the same DBMS) as the data source from which you reported. If the data source from which you reported contains multiple tables, all must be of the same data source type and reside on the same instance of the DBMS server.

You can choose between several types of table persistence.

You can create extract files as native DBMS tables with the following adapters:

- Db2 (on z/OS, UNIX, and Windows)

- Informix
- Microsoft SQL Server
- MySQL
- Oracle
- Teradata

# Save Report Output as a Native Temporary Table Using Commands

The syntax to save report output as a native DBMS temporary table is

```
ON TABLE HOLD [AS filename] FORMAT SAME_DB [PERSISTENCE persistValue]
```

where:

**filename**

Specifies the name of the HOLD file. If you omit AS *filename*, the name of the temporary table defaults to "HOLD".

Because each subsequent HOLD command overwrites the previous HOLD file, it is recommended to specify a name in each request to direct the extracted data to a separate file, thereby preventing an earlier file from being overwritten by a later one.

**PERSISTENCE**

Specifies the type of table persistence and related table properties. This is optional for DBMSs that support volatile tables, and required otherwise. For information about support for volatile tables for a particular DBMS, see Using DBMS Temporary Tables as HOLD Files, and consult your DBMS vendor documentation.

**persistValue**

Is one of the following:

**VOLATILE**

Specifies that the table is local to the DBMS session. A temporary synonym (a Master File and Access File), is generated automatically. It expires when the server session ends.

This is the default persistence setting for all DBMSs that support volatile tables.

For information about support for the volatile setting, and about persistence and other table properties, for a particular DBMS, see Using DBMS Temporary Tables as HOLD Files, and consult your DBMS vendor documentation.

**GLOBAL_TEMPORARY**

Specifies that while the table exists, its definition will be visible to other database sessions and users though its data will not be. A permanent synonym (a Master File and Access File), is generated automatically.

For information about support for the global temporary setting, and about persistence and other table properties, for a particular DBMS, see Using DBMS Temporary Tables as HOLD Files, and consult your DBMS vendor documentation.

**PERMANENT**

Specifies that a regular permanent table will be created. A permanent synonym (a Master File and Access File), is generated automatically.

# Temporary Table Properties for SAME_DB Persistence Values

The following chart provides additional detail about persistence and other properties of temporary tables of different data source types that are supported for use with HOLD format SAME_DB.

| DBMS | VOLATILE | GLOBAL_TEMPORARY |
|---|---|---|
| Db2 | Db2 on Linux, UNIX, and Windows, and Db2 for z/OS: a volatile table is created using the DECLARE GLOBAL TEMPORARY TABLE command with the ON COMMIT PRESERVE ROWS option. Declared global temporary tables persist and are visible only within the current session (connection). SESSION is the schema name for all declared global temporary tables. | Db2 on Linux, UNIX, and Windows, and Db2 for z/OS: a global temporary table is created using the CREATE GLOBAL TEMPORARY TABLE command. The definition of a created global temporary table is visible to other sessions, but the data is not. The data is deleted at the end of each transaction (COMMIT or ROLLBACK command). The table definition persists after the session ends.<br>Global tables require the following setting to be in effect:<br>`ENGINE DB2 SET AUTOCOMMIT ON FIN`<br>For information on creating user-defined tablespaces on Linux, UNIX, and Windows for volatile and global temporary tables, see the ibi™ WebFOCUS® Adapter Administration manual. |
| Informix | A volatile table is created using the CREATE TEMP TABLE command with the WITH NO LOG option. The definition and the data persist, and are visible, only within the current session. | This type of table is not supported by Informix. |
| Microsoft SQL Server | A volatile table is created as a local temporary table whose name is prefixed with a single number sign (#). Therefore, the name of a volatile table used as a HOLD file is the | The name of a global temporary table is prefixed with two number signs (##). Therefore, the name of a global temporary table used as a HOLD file is the name specified by the HOLD phrase, prefixed with two number signs (##). The |

| DBMS | VOLATILE | GLOBAL_TEMPORARY |
|---|---|---|
| | name specified by the HOLD phrase, prefixed with a number sign (#). The table definition and the data persist, and are visible, only within the current session. | table is dropped automatically when the session that created the table ends and all other tasks have stopped referencing it. The table definition and data are visible to other sessions. |
| MySQL | A volatile table is created using the CREATE TEMPORARY TABLE command. A temporary table persists and is visible only within the current session (connection). If a temporary table has the same name as a permanent table, the permanent table becomes invisible. | This type of table is not supported by MySQL. |
| Oracle | This type of table is not supported by Oracle. | The table definition is visible to all sessions. Its data is visible only to the session that inserts data into it. The table definition persists for the same period as the definition of a regular table. |
| Teradata | A volatile table definition and data are visible only within the session that created the table and inserted the data. The volatile table is created with the ON COMMIT PRESERVE ROWS option. | A global temporary table persists for the same duration as a permanent table. The definition is visible to all sessions, but the data is visible only to the session that inserted the data. The global temporary table is created with the ON COMMIT PRESERVE ROWS option. |

# Column Names in the HOLD File

Each HOLD file column is assigned its name:

1. From the AS name specified for the column in the report request.

2. If there is no AS name specified, the name is assigned from the alias specified in the synonym. (The alias is identical to the column name in the original relational table.)
3. In all other cases, the name is assigned from the field name as it is specified in the synonym.

# Primary Keys and Indexes in the HOLD File

A primary key or an index is created for the HOLD table. The key or index definition is generated from the sort (BY) keys of the TABLE command, except for undisplayed sort keys (that is, sort keys for which NOPRINT is specified). To determine whether a primary key or an index will be created:

1. If these sort keys provide uniqueness and do not allow nulls (that is, if in the synonym, the MISSING attribute column is unselected or OFF), and if the DBMS supports primary keys on the type of table being created, a primary key is created.
2. If these sort keys provide uniqueness but either
    a. some of the columns allow nulls.
    b. the DBMS does not support primary keys on the type of table being created then a unique index is created.
3. If these sort keys do not provide uniqueness, a non-unique index is created.
4. If there are no displayed sort keys (that is, no sort keys for which NOPRINT has not been specified), no primary key or index is created.

# Creating SAVE and SAVB Files

The SAVE command, by default, captures report output in ALPHA format as a simple sequential data source, without headings or subtotals. However, you can specify a variety of other formats for SAVE files, which are compatible with many software products. For example, you can specify SAVE formats to display report output in a webpage, a text document, a spreadsheet or word processing application, or to be used as input to other programming languages. For a list of supported formats, see Choosing Output File Formats.

Regardless of format, the SAVE command does not create a Master File.

The SAVB command is a variation on the SAVE command. SAVB creates a data source without a Master File, but numeric fields are stored in BINARY format. You can use the SAVB file as input to a variety of applications. SAVB output is the same as the default output created by the HOLD command.

# Create a SAVE File

From a report request, use

```
ON TABLE SAVE [AS filename] [FORMAT fmt] [MISSING {ON|OFF}]
```

or

```
save_field SAVE [AS filename] [FORMAT fmt] [MISSING {ON|OFF}]
```

where:

**save_field**

Is the name of the last field in the request, excluding BY or ACROSS fields.

**AS filename**

Specifies a name for the SAVE file. If you do not specify a file name, SAVE is used as the default. Since each subsequent SAVE command overwrites the previous SAVE file, it is advisable to code a distinct file name in each request to direct the extracted data to a separate file, thereby preventing it from being overwritten by the next SAVE command.

You can also include a path, enclosed in single quotation marks, indicating where to store the SAVE file. For example:

```
ON TABLE SAVE FILENAME 'install_dir:\dir\filename.ext' FORMAT fmt
```

**FORMAT fmt**

Specifies the format of the SAVE file. ALPHA is the default format.

- To display as or in a webpage:

```
HTML, HTMTABLE, DHTML
```

- To use in a text document:

```
ALPHA, DOC, PDF, WP, Text
```

- To use in a spreadsheet application:

```
DIF, EXCEL, EXL2K, LOTUS, (WK1), SYLK
```

- To use in a database application:

```
COMMA, COM, COMT
```

For details about all available formats, see Choosing Output File Formats.

**MISSING**

Ensures that fields with the MISSING attribute set to ON are carried over into the SAVE file. MISSING OFF is the default attribute. See Handling Records With Missing Field Values.

# Creating a SAVE File

The following request extracts data from the EMPLOYEE data source and creates a SAVE file.

```
TABLE FILE EMPLOYEE
PRINT LAST_NAME AND FIRST_NAME
BY DEPARTMENT
ON TABLE SAVE
END
```

A description of the ALPHA (default SAVE format) file layout appears after the records are retrieved.

The output is:

```
 NUMBER OF RECORDS IN TABLE=       12  LINES=     12


ALPHANUMERIC RECORD NAMED  SAVE
FIELDNAME                       ALIAS          FORMAT        LENGTH

DEPARTMENT                      DPT            A10             10
LAST_NAME                       LN             A15             15
FIRST_NAME                      FN             A10             10

TOTAL                                                          35
```

# Create a SAVB File

From a request, use

```
ON TABLE SAVB [AS filename] [MISSING {ON|OFF}]
```

or

```
save_field SAVB [AS filename] [MISSING {ON|OFF}]
```

where:

**save_field**

Is the name of the last field in the request, excluding BY and ACROSS fields.

**AS filename**

Specifies a name for the SAVB file. If you do not specify a file name, SAVB is used as the default. Since each subsequent SAVB command overwrites the previous SAVB file, it is advisable to code a distinct file name in each request to direct the extracted data to a separate file, thereby preventing it from being overwritten by the next SAVB command.

You can also include a path, enclosed in single quotation marks, indicating where you wish to store the SAVB file. For example:

```
ON TABLE SAVB FILENAME 'c:\dir\filename.ext '
```

**MISSING**

Ensures that fields with the MISSING attribute set to ON are carried over into the SAVB file. The default is MISSING OFF. See Handling Records With Missing Field Values.

# Creating a SAVB File

The following request extracts data from the SALES data source and creates a SAVB file.

```
TABLE FILE SALES
PRINT PROD_CODE AND AREA
BY DATE
WHERE CITY IS 'STAMFORD' OR 'UNIONDALE'
ON TABLE SAVB
END
```

A description of the BINARY file is appears after the records are retrieved.

The output is:

```
 NUMBER OF RECORDS IN TABLE=       10  LINES=     10


INTERNAL RECORD NAMED  SAVB
FIELDNAME                       ALIAS          FORMAT        LENGTH

DATE                            DTE            A4MD             4
PROD_CODE                       PCODE          A3               4
AREA                            LOC            A1               4

TOTAL                                                           12
```

# Creating a PCHOLD File

The PCHOLD command enables you to extract datafrom the WebFOCUS Reporting Server by way of the WebFOCUS client, and automatically display the data in HTML format in your browser.

In addition, if you have established a helper application, you can use the command ON TABLE PCHOLD to display the data in the helper application's viewer. For example, if a procedure contains the ON TABLE PCHOLD FORMAT EXCEL command, data is not returned

to the browser in HTML format. Instead, data is returned and imported into an Excel spreadsheet, or other spreadsheet program you specify to your browser.

In contrast, when data access is handled directly by the WebFOCUS Reporting Server (without intervention by the WebFOCUS Client), the data is extracted to a PCHOLD file and automatically delivered to your PC for local reporting.

**Note:** If your environment supports the SET parameter SAVEMATRIX, you can preserve the internal matrix of your last report in order to keep it available for subsequent HOLD, SAVE, and SAVB commands when the request is followed by Dialogue Manager commands. For details on SAVEMATRIX, see the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

# Create a PCHOLD File

The syntax for PCHOLD in a report request is

```
ON TABLE PCHOLD [AS filename] [FORMAT fmt] [DATASET name.ext]
```

where:

**PCHOLD**

Enables you to extract and automatically display data in HTML format in your browser. HOLD AT CLIENT is a synonym for PCHOLD. The PCHOLD command does not have a default format. You must specify a format when using PCHOLD. The output is saved with a Master File. For details about the behavior of PCHOLD, see Creating a HOLD File.

If you specify an ON TABLE PCHOLD command without a FORMAT, XML/HTML code is returned to the browser.

**AS filename**

Specifies a name for the PCHOLD file. If you do not specify a file name, PCHOLD becomes the default. Since each subsequent PCHOLD command overwrites the previous PCHOLD file, it is advisable to code a distinct file name in each request to direct the extracted data to a separate file, thereby preventing it from being overwritten by the next PCHOLD command.

**FORMAT fmt**

Specifies the format of the PCHOLD file.

- To display as or in a webpage, choose:

```
HTML, HTMTABLE, DHTML, VISDIS
```

- To display as a printed document, choose:

```
PDF, PS
```

- To use in a text document, choose:

```
ALPHA, DOC, WP
```

- To use in a spreadsheet application, choose:

```
DIF, XLSX, EXL2K [PIVOT], LOTUS
```

- To use for additional reporting, choose:

```
ALPHA, DFIX, COM, COMT, TAB, TABT
```

- To use in another application choose:

```
XML
```

- To generate active output, choose:

```
AHTML, APDF, AFLEX
```

For details about all available formats, see Choosing Output File Formats.

**DATASET name.ext**

Is used with FORMAT ALPHA to specify a file name and extension for the report output. The result depends on the Redirection Settings in the WebFOCUS Administration Console for the specified extension. If the extension is defined in the WebFOCUS Administration Console, and the Save Report value is **yes**, the report output will be

saved in your Downloads directory with the specified file name and extension.

# Choosing Output File Formats

You can select from a wide range of output formats to preserve your report output for use in any of the following ways:

- To display as or in a webpage, as a printed document, or in a text document.
- To process in another application, such as a spreadsheet, a database, a word processor, or a 3GL program.
- To send to another location, such as a browser or PC.
- To extract a subset of the original data source in order to generate multi-step reports.

For details on each of the supported formats, including the commands that support them (HOLD, PCHOLD, SAVE) and the operating environments in which they are available, see the reference topics for the following formats.

| | | | | |
|---|---|---|---|---|
| AHTML | DFIX | GIF | POSTSCRIPT (PS) | SQLORA |
| AHTMLTAB | DHTML | HTML | PPT | SQLPSTGR |
| ALPHA | DIF | HTMTABLE | PPTX | SQLSYB |
| APDF | DOC | INGRES | REDBRICK | SYLK |
| BINARY | EXL2K | INTERNAL | SQL | TAB |
| COMMA | EXL2K FORMULA | JPEG | SQL_SCRIPT | TABT |
| COM | EXL2K PIVOT | JSCHART | SQLDBC | VISDIS |
| COMT | EXL97 | JSON | SQLINF | WK1 |
| DATREC | FLEX | LOTUS | SQLMAC | WP |
| DB2 | FOCUS | PDF | SQLMSS | XFOCUS |
| DBASE | | | SQLODBC | XLSX |
| | | | | XML |

# FORMAT AHTML

**Description:** Saves report output as an active report (HTML file that can be used for offline analysis and interactive functions without any connection to a server). All of the data and JavaScript code are stored within the HTML file, which also makes the output highly compressible for email and transparent to security systems. For more information about active reports, see the *Active Technologies User's Guide*.

**Use:** For offline analysis of data.

**Supported with the commands:** HOLD, PCHOLD, SAVE.

**Available in:** WebFOCUS, FOCUS.

# FORMAT AHTMLTAB

**Description:** Creates an output file that contains only data and parameters used in an HTML active report. The output produced is not a complete HTML active report. However, the file can be included in another HTML document using the Dialogue Manager command -HTMLFORM. For details, see the documentation on Dialogue Manager in the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

**Note:** When issuing HOLD AS *name* FORMAT AHTMLTAB to embed an HTML active report into another HTML document, you must include Active Technologies JavaScript code into the HTML BODY using:

```
<BODY>
!IBI.OBJ.ACTIVEREPORTJS;
```

**Use:** For embedding HTML active reports into an existing HTML document.

**Supported with the commands:** HOLD, SAVE.

**Available in:** WebFOCUS.

# FORMAT ALPHA

**Description:** Saves report output as fixed-format character data and can be created as a HOLD file.

ALPHA is the default SAVE format. The output file contains data only.

Text fields are supported in ALPHA-formatted files. See Using Text Fields in Output Files.

To control missing data characters that are propagated to fields with the MISSING=ON attribute, use the SET HNODATA command. For more information, see the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

**Use:** For display in a text document. For further reporting in FOCUS, WebFOCUS, or App Studio. As a transaction file for modifying a data source.

**Supported with the commands:** HOLD, PCHOLD, SAVE.

**Available in:** WebFOCUS, FOCUS.

# FORMAT APDF

**Description:** Saves report output as an Adobe® Flex® report (Adobe® Flash® file) embedded in a PDF file. The resulting PDF active report can be used for offline analysis and interactive functions without any connection to a server.

In order to run a report created using the APDF format, Adobe Reader 9 or higher is required so the Flash run-time code included in the Acrobat client can render the Flash content.

**Use:** For offline analysis of data.

**Supported with the command:** HOLD, PCHOLD, SAVE.

**Available in:** FOCUS, WebFOCUS.

# FORMAT BINARY

**Description:** Saves report data and stores numeric fields as binary numbers. When created as a HOLD file, also creates a Master File.

BINARY is the default format for HOLD files. When created in BINARY format:

- The HOLD file is a sequential single-segment data source. The HOLD Master File is a subset of the original Master File, and may also contain fields that have been created using the COMPUTE or DEFINE commands or generated in an ACROSS phrase.
- By default, fields with format I remain four-byte binary integers. Format F fields remain in four-byte floating-point format. Format D fields remain in eight-byte double-precision floating-point, and format P fields remain in packed decimal notation and occupy eight bytes (for fields less than or equal to eight bytes long) or 16 bytes (for packed decimal fields longer than eight bytes). Alphanumeric fields (format A) are stored in character format.

  Every data field in the sequential extract record is aligned on the start of a full four-byte word. Therefore, if the format is A1, the field is padded with three bytes of blanks on the right. This alignment makes it easier for user-coded subroutines to process these data fields. (Under some circumstances, you may wish to prevent the padding of integer and packed decimal fields. Do so with HOLD FORMAT INTERNAL. See Saving Report Output in INTERNAL Format.)

The output file contains data only.

**Use:** For further reporting in FOCUS, WebFOCUS, or App Studio. As a transaction file for modifying a data source.

**Supported with the commands:** HOLD

**Available in:** WebFOCUS, FOCUS.

# FORMAT COMMA

**Description:** Saves the data values as a variable-length text file, with fields separated by commas and with character values enclosed in double quotation marks. All blanks within fields are retained. This format is the industry standard comma-delimited format.

This format does not have the safety feature of the double quote added within a text field containing a double quote.

The extension for this format is PRN. This format type does not create a Master File.

**Note:**

- Smart date fields and dates formatted as I or P fields with date format options are

treated as numeric, and are not enclosed in double quotation marks in the output file. Dates formatted as alphanumeric fields with date format options are treated as alphanumeric, and enclosed in double quotation marks.

- Continental decimal notation (CDN=ON|SPACE|QUOTE|QUOTEP) is not supported. A comma within a number is interpreted as two separate columns by a destination application such as Microsoft Access.

The output file contains data only.

**Use:** For further processing in a database application. This format type can be imported into applications such as Excel or Lotus.

**Supported with the commands:** HOLD, SAVE.

**Available in:** WebFOCUS, FOCUS.

# FORMAT COM

**Description:** Saves the data values as a variable-length text file with fields separated by commas and with character values enclosed in double quotation marks. Leading blanks are removed from numeric fields, and trailing blanks are removed from character fields. To issue a request against this data source, the setting PCOMMA=ON is required.

This format also includes a built-in safety feature, which allows embedded quotes within character fields. A second double quote (") is inserted adjacent to the existing one. For example, if you input Joe "Smitty" Smith, the output is Joe ""Smitty"" Smith.

The extension for this format is CSV. A Master File is created for this format type when the command used to create the output file is HOLD. The SUFFIX in the generated Master File is COM.

**Note:**

- Smart date fields and dates formatted as I or P fields with date format options are treated as numeric, and are not enclosed in double quotation marks in the output file. Dates formatted as alphanumeric fields with date format options are treated as alphanumeric, and enclosed in double quotation marks.
- Continental decimal notation (CDN=ON|SPACE|QUOTE|QUOTEP) is not supported. A comma within a number is interpreted as two separate columns by a destination application such as Microsoft Access.

- To create a variable-length comma- or tab-delimited HOLD file that differentiates between a missing value and a blank string or zero value, use the SET NULL=ON command. For more information, see the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

**Use:** For further processing in a database application. This format type can be imported into applications such as Excel or Lotus.

**Supported with the commands:** HOLD, SAVE, PCHOLD.

**Available in:** WebFOCUS, FOCUS.

# FORMAT COMT

**Description:** Saves the column headings in the first row of the output file. It produces a variable-length text file with fields separated by commas, and with character values enclosed in double quotation marks. Leading blanks are removed from numeric fields, and trailing blanks are removed from character fields. This format is required by certain software packages such as Microsoft Access.

This format also includes a built-in safety feature, which allows embedded quotes within character fields. A second double quote (") is inserted adjacent to the existing one. For example, if you input Joe "Smitty" Smith, the output is Joe ""Smitty"" Smith.

The extension for this format is CSV. A Master File is created for this format type when the command used to create the output file is HOLD. The SUFFIX in the generated Master File is COMT.

**Note:**

- Smart date fields and dates formatted as I or P fields with date format options are treated as numeric, and are not enclosed in double quotation marks in the output file. Dates formatted as alphanumeric fields with date format options are treated as alphanumeric, and enclosed in double quotation marks.
- Continental decimal notation (CDN=ON|SPACE|QUOTE|QUOTEP) is not supported. A comma within a number is interpreted as two separate columns by a destination application such as Microsoft Access.
- To create a variable-length comma- or tab-delimited HOLD file that differentiates between a missing value and a blank string or zero value, use the SET NULL=ON command. For more information, see the *ibi™ WebFOCUS® Developing Reporting*

*Applications* manual.

**Use:** For further processing in a database application. This format type can be imported into applications such as Excel or Lotus.

**Supported with the commands:** HOLD, SAVE, PCHOLD.

**Available in:** FOCUS, WebFOCUS.

# FORMAT DATREC

**Description:** Saves report output as a sequential file with a Master File, and stores numeric fields as binary numbers without aligning them on fullword boundaries. The last field consists of one byte for each of the other fields in the Master File that indicates whether the corresponding field is missing.

**Use:** For further reporting in FOCUS, WebFOCUS, or App Studio. As a transaction file for modifying a data source.

**Supported with the command:** HOLD.

**Available in:** WebFOCUS, FOCUS.

# FORMAT DB2

**Description:** Creates a Db2 table, if you have the Adapter for Db2 and permission to create tables.

**Use:** For further processing in a database application.

**Supported with the command:** HOLD.

**Available in:** WebFOCUS, FOCUS.

# FORMAT DBASE

**Description:** Creates an extract file in dBase format that includes column headings in the first row.

**Note:** Blank field names display as blank column titles. This may result in an error when attempting to use the file as input to various applications.

**Use:** For importing data to Windows-based applications such as MS Access and Excel.

**Supported with the command:** HOLD.

**Available in:** App Studio.

# FORMAT DFIX

**Description:** Creates a delimited output file. You can specify the delimiter, whether alphanumeric fields should be enclosed within a special character such as a double quotation mark, and whether the file should be generated with a header record containing the field names.

For more information, see Creating a Delimited Sequential File.

**Use:** For importing data to Windows-based applications such as MS Access and Excel.

**Supported with the command:** HOLD, PCHOLD.

**Available in:** WebFOCUS, FOCUS.

# FORMAT DHTML

**Description:** Provides HTML output that has most of the features normally associated with output formatted for printing such as PDF or PostScript output. You can create an HTML file (.htm) or a Web Archive file (.mht). The type of output file produced is controlled by the value of the HTMLARCHIVE parameter. HTMLARCHIVE=ON creates a Web Archive file.

Some of the features supported by format DHTML are:

- **Absolute positioning.** DHTML precisely places text and images inside an HTML report, allowing you to use the same StyleSheet syntax to lay out HTML as you use for PDF or PS output.
- **On demand paging.** On demand paging is available with SET HTMLARCHIVE=OFF.
- **PDF StyleSheet features.** For example, the following features are supported: grids, background colors, OVER, bursting, coordinated compound reports.

**Note:**

- The font map file for DHTML reports is dhtml.fmp.
- Legacy compound reports are not supported.
- Drillthrough reports are not supported.

**Use:** For display as a webpage.

**Supported with the commands:** HOLD, PCHOLD, SAVE.

**Available in:** WebFOCUS, FOCUS.

# FORMAT DIF

**Description:** Captures the entire report output, excluding headings, footings, subheads, and subfoots, and creates a character file that can be easily incorporated into most spreadsheet packages.

For example, running a TABLE request with HEADING/FOOTING and ON TABLE PCHOLD FORMAT DIF does not display the report output with headings and footings. As a workaround, use another format (such as HTML, PDF, or EXL2K).

**Note:** Microsoft Excel SR-1 is no longer supported for HOLD FORMAT DIF. To open these reports, use either Microsoft Excel SR-2 or Microsoft Excel 2000.

**Use:** For display or processing in a spreadsheet application.

**Supported with the commands:** HOLD, PCHOLD, SAVE.

The PCHOLD variation transfers the data from a web server to a browser.

**Available in:** WebFOCUS, FOCUS.

# FORMAT DOC

**Description:** Captures the entire report output, including headings, footings, and subtotals, and creates a text file with layout and line breaks that can be easily incorporated into most word processing packages. DOC format uses a form-feed character to indicate page control information.

**Note:** A request that contains ON TABLE PCHOLD FORMAT DOC results in a blank first page in the report when displayed in Microsoft XP Office. To eliminate this, include SET PAGE=NOPAGE in your request.

**Use:** For display in a text document.

**Supported with the commands:** HOLD, PCHOLD, SAVE.

The PCHOLD variation transfers the data from a web server to a browser.

**Available in:** WebFOCUS, FOCUS.

# FORMAT XLSX

**Description:** Generates fully styled reports in Excel 2007 XML format. You must have Excel 2007 or higher installed to use this output format. For details, see Choosing a Styled Display Format.

An Excel 2007 worksheet can contain 1,048,576 rows by 16,384 columns. WebFOCUS will generate worksheets larger than these defined limits, but Excel 2007 will have difficulty opening the resulting workbook, and the data that exceeds the Excel 2007 limits will be truncated.

For information about creating overflow worksheets for the additional rows when the number of rows becomes too high for a single worksheet, see Overcoming the Excel 2007/2010 Row Limit Using Overflow Worksheets.

**Use:** For display or processing in a spreadsheet application.

**Supported with the commands:** HOLD, PCHOLD, SAVE.

For Internet Explorer, the PCHOLD variation launches Excel 2007 in the browser. For details, and for information about working with XLSX files, see Choosing a Styled Display Format.

**Available in:** WebFOCUS.

# FORMAT EXL2K

**Description:** Generates fully styled reports in Excel 2000 HTML format. You must have Excel 2000 installed to use this output format. For details, see Choosing a Styled Display Format.

ACROSS column titles are supported for EXL2K output format.

For EXL2K output format, a report can include 65,536 rows and/or 256 columns. Rows and columns in excess of these limits are truncated from the worksheet when opened in Excel.

For information about creating overflow worksheets for the additional rows when the number of rows becomes too high for a single worksheet, see Overcoming the Excel 2007/2010 Row Limit Using Overflow Worksheets.

**Use:** For display or processing in a spreadsheet application.

**Supported with the commands:** HOLD, PCHOLD, SAVE.

For Internet Explorer, the PCHOLD variation launches Excel 2000 in the browser. For details, and for information about working with EXL2K files, see Choosing a Styled Display Format.

**Available in:** WebFOCUS.

# FORMAT EXL2K FORMULA

**Description:** Specifies that the report will be displayed as an Excel 2000 spreadsheet, with WebFOCUS totals and other calculated values translated to active Excel formulas. For details, see Choosing a Styled Display Format.

**Use:** For display or processing in a spreadsheet application.

**Supported with the commands:** HOLD, PCHOLD, SAVE.

**Available in:** WebFOCUS, FOCUS.

# FORMAT EXL2K PIVOT

**Description:** Generates fully styled reports in Excel 2000 HTML format, with added pivoting capabilities. Requires Excel 2000 on your PC. For details, see Choosing a Styled Display Format.

**Use:** For display or processing in a spreadsheet application.

**Supported with the commands:** HOLD, PCHOLD, SAVE.

For Internet Explorer, the PCHOLD variation transfers the data from a web server to a browser, which launches Excel 2000.

**Available in:** WebFOCUS, FOCUS.

# FORMAT EXL97

**Description:** Enables you to view and save reports in Excel 97 that include full styling. For details on working with Excel formats, see Choosing a Styled Display Format.

Leading zeros do not display for FORMAT EXL97.

**Use:** For display or processing in a spreadsheet application.

**Supported with the command:** HOLD, PCHOLD, SAVE.

**Available in:** FOCUS, WebFOCUS.

# FORMAT FLEX

**Description:** Saves report output as an active report in an Adobe Flash player compatible (.swf) file that can be used for offline analysis and interactive functions without any connection to a server. Internet Explorer, Mozilla Firefox, and Opera internet browsers recognize an active report in the Adobe Flex format as a Shockwave Flash Object.

In order to run a report created using the Active Technologies for Adobe Flash player (FLEX) format, Adobe Flash Player 9.0.28 or higher is required.

**Use:** For offline analysis of data.

**Supported with the command:** HOLD, SAVE.

**Available in:** FOCUS, WebFOCUS.

# FORMAT FOCUS

**Description:** Creates a FOCUS data source. Four files result: a HOLD data file, a HOLD Master File, and two work files. See Holding Report Output in ibi FOCUS Format.  format" />" />" />

Text fields are supported for FOCUS output files. See Using Text Fields in Output Files.

**Use:** For further processing in a database application.

**Supported with the command:** HOLD.

**Available in:** WebFOCUS, FOCUS.

# FORMAT GIF

**Description:** Saves the output of a graph request as a GIF file.

**Use:** The resulting GIF file can be embedded in the heading/footing or body of a PDF or HTML report. This technique is useful when you want to create a single PDF or HTML report that contains multiple outputs, such as output from a TABLE request and a GRAPH request. You can distribute this type of report using ReportCaster.

When running graphs in GIF format on a UNIX platform with the HEADLESS configuration, the graph may not display properly. You may see a red X instead of your image. This is due to Sun's methodology of creating images without a head, which does not currently support GIF graphics.

**Supported with the commands:** HOLD.

**Available in:** WebFOCUS.

For details see Creating a Graph.

# FORMAT HTML

**Description:** Creates a complete HTML document that can be viewed in a web browser. The PCHOLD variation transfers the data from a web server to a browser.

The following StyleSheet features are supported with HTML: JAVASCRIPT (drill down to JavaScript), TARGET, COLSPAN, HEADALIGN, IMAGEALIGN, IMAGEBREAK, GUTTER, BACKIMAGE, BACKCOLOR, IMAGE, GRIDS.

**Use:** For display as a webpage.

**Supported with the commands:** HOLD, PCHOLD, SAVE.

**Available in:** WebFOCUS, FOCUS.

# FORMAT HTMTABLE

**Description:** Creates an output file that contains only an HTML table. The output produced is not a complete HTML document.

However, the file can be included in another HTML document using the Dialogue Manager command -HTMLFORM. For details see the documentation on Dialogue Manager in the *ibi™ WebFOCUS®Developing Reporting Applications* manual.

**Note:** When issuing HOLD AS *name* FORMAT HTMTABLE, you must specify a different name than the .htm filename used in the -HTMLFORM name.

The following StyleSheet features are supported with HTML: JAVASCRIPT (drill down to JavaScript), TARGET, COLSPAN, HEADALIGN, IMAGEALIGN, IMAGEBREAK, BACKCOLOR, IMAGE, GRIDS.

Internal cascading style sheets (CSS) are supported for FORMAT HTMTABLE. The CSS code is placed immediately before the TABLE command.

**Use:** For embedding reports and graphs in an existing HTML document.

**Supported with the commands:** HOLD, PCHOLD, SAVE.

The PCHOLD variation also transfers the data from a web server to a browser.

**Available in:** WebFOCUS, FOCUS.

# FORMAT INGRES

**Description:** Creates an Ingres table, if you have the Adapter for Ingres and permission to create tables.

**Use:** For further processing in a database application.

**Supported with the command:** HOLD.

**Available in:** WebFOCUS, FOCUS when used as a client to the WebFOCUS Reporting Server.

# FORMAT INTERNAL

**Description:** Saves report output without padding the values of integer and packed fields. See Saving Report Output in INTERNAL Format.

**Use:** For accurate processing by 3GL programs.

**Supported with the command:** HOLD, SAVB.

**Available in:** WebFOCUS, FOCUS.

# FORMAT JPEG

**Description:** Saves the output of a graph request as a JPEG file.

**Use:** The resulting JPEG file can be embedded in the heading/footing or body of a PDF or HTML report. This technique is useful when you want to create a single PDF or HTML report that contains multiple outputs, such as output from a TABLE request and a GRAPH request. You can distribute this type of report using ReportCaster. JPEG (.jpg) files behave the same as GIF files.

**Note:** For JPEG files, only the .jpg extension is supported. The .jpeg extension is not supported.

**Supported with the commands:** HOLD.

**Available in:** WebFOCUS.

For details, see Linking From a Graphic Image and Adding an Image to a Report.

# FORMAT JSCHART

**Description:** Saves the output of a graph request as an HTML5 graph.

**Use:** The charts are rendered in the browser as high quality interactive vector graphics using a built-in JavaScript engine. Note that older browsers do not support all of the features of the HTML5 standard. You must include the following command to create an HTML5 graph:

```
ON GRAPH PCHOLD FORMAT JSCHART
```

**Supported with the commands:** ON GRAPH PCHOLD, ON GRAPH HOLD.

**Available in:** WebFOCUS.

For details, see Creating an HTML5 Graph.

# FORMAT JSON

**Description:** JSON (JavaScript Object Notation) is a plain text format that consists of name: value pairs and is based on JavaScript. It can be parsed by many types of software and it often used for storing and exchanging data. The field names and values in a report request can be held in a FORMAT JSON file. Subtotals, headings, footings, and ACROSS fields are not propagated to the HOLD file. A synonym is generated for the HOLD file. Adding the syntax STRUCTURE HIERARCHY to the HOLD command generates a JSON output file that identifies the sort fields and display fields in the request.

**Use:** For data interchange between systems and applications.

**Supported with the commands:** HOLD, PCHOLD

**Available in:** WebFOCUS, FOCUS

# FORMAT LOTUS

**Description:** Captures all the columns of the report in a character file that LOTUS 1-2-3 can then import. All alphanumeric fields are enclosed in quotation marks. Columns are separated by commas.

**Use:** For display and processing in a spreadsheet application.

**Supported with the commands:** HOLD, PCHOLD, SAVE (WebFOCUS only).

**Available in:** WebFOCUS, FOCUS.

# FORMAT PDF

**Description:** Saves the report output in Adobe Portable Document Format (PDF), which enables precise placement of output (all formatting options such as headings, footings, and titles) correctly aligned on the physical page, so the report looks exactly as it does when printed.

In WebFOCUS, PDF format also supports StyleSheets that contain drill down parameters, links to arbitrary URLs, and embedded GIF or JPEG images in report, page, and sort headings and footings.

PDF format does not support OLAP reports since Java applets cannot be embedded inside PDF documents. However, an OLAP report can drill down to a PDF-formatted report. PDF does not support drill downs when sorting across column. When you drill down from one report to another report, do not use the following characters: + (plus sign); # (number sign); & (ampersand); \ (backslash).

A PDF object is a page, hyperlink, or image. The Portable Document Format (PDF) limits the number of objects that a PDF document can contain. WebFOCUS imposes the following object limits for each PDF report:

| Object | Limit |
|---|---|
| Pages | 10,000 |
| Images | 900 |
| Hyperlinks per page | 500 |
| Total pages with hyperlinks | 100 |
| Total hyperlinks | 44,500 |

PDF format retains all formatting options, such as a headings, footings, and titles.

The following fonts are supported: Courier (fixed width), Times (proportional width), and Helvetica (proportional width). PDF format maps all fonts to Courier, Helvetica, or Times. The font styles that can be used are Normal (default), Bold, Italic, Underline, and combinations of these.

The following StyleSheet features are supported with PDF: PAGESIZE, ORIENTATION, UNITS, TOPMARGIN, BOTTOMMARGIN, LEFTMARGIN, RIGHTMARGIN, POSITION, SQUEEZE, FOCEXEC (drill down to FOCEXEC), URL (drill down to URL), HGRID, VGRID, BACKCOLOR. Note when you use BACKCOLOR with PDF reports, extra space is added to the top, bottom, right, and left of each cell of data in the report. This is for readability and to prevent data truncation.

**Use:** For display as a printed document.

**Supported with the commands:** HOLD, PCHOLD, SAVE (WebFOCUS only).

**Available in:** WebFOCUS, FOCUS.

# FORMAT PDF OPEN/CLOSE

**Description:** Saves multiple reports into one PDF report.

**Use:** For combining multiple reports into a single PDF file, also known as a compound report. For complete details, see Laying Out the Report Page.

**Supported with the command:** PCHOLD.

**Available in:** WebFOCUS, FOCUS

# FORMAT POSTSCRIPT (PS)

**Description:** Creates an output file in PostScript format, which supports headings, footings, and totals.

PS is an abbreviation for POSTSCRIPT.

PostScript format supports headings, footings, and totals. PS supports ISO Latin font encoding.

**Use:** For display as a printed document.

**Supported with the command:** HOLD, PCHOLD.

**Available in:** WebFOCUS, FOCUS.

# FORMAT PPT

**Description:** Creates an output file in PowerPoint® format in which each page of report output becomes a separate slide in the file with all styling applied.

**Use:** For use in a slide presentation.

**Supported with the command:** HOLD, SAVE.

**Available in:** WebFOCUS, FOCUS.

# FORMAT PPTX

**Description:** Creates an output file in PowerPoint format in which each page of report output becomes a separate slide in the file with all styling applied.

**Use:** For use in a slide presentation.

**Supported with the command:** HOLD, SAVE.

**Available in:** WebFOCUS, FOCUS.

# FORMAT REDBRICK

**Description:** Creates a Red Brick table, if you have the Adapter for Red Brick and permission to create tables.

**Use:** For further processing in a database application.

**Supported with the command:** HOLD.

**Available in:** WebFOCUS, FOCUS when used as a client to the WebFOCUS Reporting Server.

# FORMAT SQL_SCRIPT

**Description:** Creates an SQL subquery file or a file of data values with a corresponding synonym.

When used in a request against a relational data source, the HOLD FORMAT SQL_SCRIPT command generates the SQL SELECT statement needed to execute the current query. It then stores it in the application folder as a file with a .sql extension, along with the Master and Access File pair that describes the SQL answer set.

When used in a request against any other type of data source, the HOLD FORMAT SQL_SCRIPT command executes the current query and stores the retrieved values in the application folder as a sequential file with a .ftm extension, along with the Master File that describes the retrieved data.

**Use:** You can use the output from HOLD FORMAT SQL_SCRIPT as the target file for the DB_INFILE function. For information about the DB_INFILE function, see the *ibi™ WebFOCUS® Using Functions* manual.

**Supported with the command:** HOLD.

**Available in:** WebFOCUS, FOCUS.

# FORMAT SQLDBC

**Description:** Creates a Teradata table, if you have the Adapter for Teradata and permission to create tables.

**Use:** For processing in a database application.

**Supported with the command:** HOLD.

**Available in:** WebFOCUS, FOCUS.

# FORMAT SQLINF

**Description:** Creates an Informix table, if you have the Adapter for Informix and permission to create tables.

**Use:** For processing in a database application.

**Supported with the command:** HOLD.

**Available in:** WebFOCUS, FOCUS when used as a client to the WebFOCUS Reporting Server.

# FORMAT SQLMAC

**Description:** Creates a Microsoft Access table, if you have the Adapter for Microsoft Access and permission to create tables.

**Use:** For processing in a database application.

**Supported with the command:** HOLD.

**Available in:** WebFOCUS.

# FORMAT SQLMSS

**Description:** Creates a Microsoft SQL Server table, if you have the Adapter for Microsoft SQL and permission to create tables.

**Use:** For processing in a database application.

**Supported with the command:** HOLD.

**Available in:** WebFOCUS, FOCUS when used as a client to the WebFOCUS Reporting Server.

# FORMAT SQLODBC

**Description:** Creates an SQLODBC table if you have the current Adapter for ODBC and permission to create tables.

**Use:** For processing in a database application.

**Supported with the command:** HOLD.

**Available in:** WebFOCUS, FOCUS when used as a client to the WebFOCUS Reporting Server.

# FORMAT SQLORA

**Description:** Creates an Oracle table, if you have the Adapter for Oracle and permission to create tables.

**Use:** For processing in a database application.

**Supported with the command:** HOLD.

**Available in:** WebFOCUS, FOCUS.

# FORMAT SQLPSTGR

**Description:** Creates a PostgreSQL table, if you have the Adapter for PostgreSQL and permission to create tables.

**Use:** For processing in a database application.

**Supported with the command:** HOLD.

**Available in:** WebFOCUS, FOCUS when used as a client to the WebFOCUS Reporting Server.

# FORMAT SQLSYB

**Description:** Creates a Sybase table, if you have the Adapter for Sybase and permission to create tables.

**Use:** For processing in a database application.

**Supported with the command:** HOLD.

**Available in:** WebFOCUS, FOCUS when used as a client to the WebFOCUS Reporting Server.

# FORMAT SYLK

**Description:** Captures all the columns of the report request in a character file for Microsoft's spreadsheet program Multiplan. The generated file cannot have more than 9,999 rows.

**Use:** For display and processing in a spreadsheet application.

**Supported with the command:** HOLD, SAVE.

**Available in:** WebFOCUS, FOCUS.

# FORMAT TAB

**Description:** Creates an output file in tab-delimited format. The TAB format includes a built-in safety feature, which allows embedded quotes within character fields. A second double quote (") is inserted adjacent to the existing one. For example, if you input Joe "Smitty" Smith, the output is Joe ""Smitty"" Smith. The TAB format also includes the following features:

- All trailing blanks are stripped from alpha [An] fields.
- All leading blanks are stripped from numeric [/Dx.y, /Fx.y, /Px.y, and /In] fields.
- There is a 32K record length limit in the output file.
- A Master File is created when the HOLD command is used to create the output file. The Master File behaves exactly as in FORMAT ALPHA, except for the inclusion of double quotes.

**Note:** To create a variable-length comma- or tab-delimited HOLD file that differentiates between a missing value and a blank string or zero value, use the SET NULL=ON command. For more information, see the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

**Use:** For importing data to Windows-based applications such as MS Access and Excel.

**Supported with the command:** HOLD, SAVE, PCHOLD.

**Available in:** WebFOCUS, FOCUS.

# FORMAT TABT

**Description:** Creates an output file in tab-delimited format that includes column headings in the first row. The TABT format includes a built-in safety feature, which allows embedded quotes within character fields. A second double quote (") is inserted adjacent to the existing one. For example, if you input Joe "Smitty" Smith, the output is Joe ""Smitty"" Smith. The TABT format also includes the following features:

- The first row contains field names.
- All trailing blanks are stripped from alpha [An] fields.
- All leading blanks are stripped from numeric [/Dx.y, /Fx.y, /Px.y, and /In] fields.
- There is a 32K record length limit in the output file.

- A Master File is created when the HOLD command is used to create the output file. The Master File behaves exactly as in FORMAT ALPHA, except for the inclusion of double quotes.

**Note:**

- Blank field names display as blank column titles. This may result in an error when attempting to use the file as input to various applications.
- To create a variable-length comma- or tab-delimited HOLD file that differentiates between a missing value and a blank string or zero value, use the SET NULL=ON command. For more information, see the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

**Use:** For importing data to Windows-based applications such as MS Access and Excel.

**Supported with the command:** HOLD, SAVE, PCHOLD.

**Available in:** WebFOCUS, FOCUS.

# FORMAT VISDIS

**Description:** WebFOCUS has a data visualization tool called Visual Discovery that creates graphs using a tab-delimited data file as input. The first record of the data file contains the column titles for the data values. The next record can contain the Visual Discovery field formats. If this record is not present, Visual Discovery attempts to determine the formats of the data fields by reading the first 50 records from the data file, a process that is not guaranteed to create accurate representations of the WebFOCUS formats.

The following table identifies format conversions for HOLD FORMAT VISDIS:

| FOCUS Format | Visual Discovery Format |
|---|---|
| Integer | I |
| Decimal/Packed | R |
| Alphanumeric | S |
| Date format (smart date) | D%format%format%format (for |

| FOCUS Format | Visual Discovery Format |
|---|---|
| | example, D%Y%M%D). If the year is not a four-digit year, the format returned is S. |
| Other | S |

**Note:** No Master File is created for format VISDIS.

**Use:** HOLD FORMAT VISDIS creates a tab-delimited output file with the extension .txt in which the first record has the column titles and the second record contains Visual Discovery formats based on the FOCUS field formats of the data.

**Supported with the command:** HOLD, SAVE, PCHOLD

**Available in:** WebFOCUS, FOCUS.

# FORMAT WK1

**Description:** Captures all the columns of the report in a character file that LOTUS 1-2-3 Release 2 can then import.

**Use:** For display and processing in a spreadsheet application.

**Supported with the commands:** HOLD, PCHOLD.

**Available in:** App Studio.

# FORMAT WP

**Description:** Captures the entire report output, including headings, footings, and subtotals, and creates a text file that can easily be incorporated into most word processing packages.

Text fields are supported in WP format. See Using Text Fields in Output Files.

To control whether a carriage control character is included in column 1 of each page of the report output, use:

```
[ON TABLE] HOLD AS filename FORMAT WP [CC|NOCC]
```

NOCC excludes carriage control characters. The position reserved for those characters remains in the file, but is blank. CC includes carriage control characters and, in z/OS, creates the HOLD file with RECFM VBA. To include page control information in the WP file, you can also specify the TABPAGENO option in a heading or the SET PAGE=OFF command. The character 1 in the column 1 indicates the start of a new page.

The following rules summarize FORMAT WP carriage control options:

- The CC option always inserts the carriage control character.
- The NOCC option always omits the carriage control character.
- When you issue HOLD FORMAT WP without the CC or NOCC option:
    - SET PAGE NUM=OFF and SET PAGE NUM=TOP always insert the carriage control character.
    - SET PAGE NUM=NOPAGE always omits the carriage control character.
    - SET PAGE NUM=ON inserts the carriage control character if TABPAGENO is included in the heading and omits the carriage control character if TABPAGENO is not included in the heading.

**Tip:** HOLD FORMAT WP does not change the number of lines per page. In order to do so, issue one or a combination of the commands SET PRINT=OFFLINE, SET SCREEN=PAPER, or SET SCREEN=OFF.

The WP file is created with a record format of VB in z/OS when the carriage control character is omitted and with a record format of VBA when the carriage control character is inserted.

The maximum record length for HOLD FORMAT WP is 358 characters, 356 of which can represent data. For larger output, use PCHOLD FORMAT WP.

If you need the report width to remain fixed across releases for later processing of the output file, you can set the width you need using the SET WPMINWIDTH command. This parameter specifies the minimum width of the output file. It will be automatically increased if the width you set cannot accommodate the fields propagated to the output file in the request. The LRECL of the output file will be four bytes more than the report width on z/OS because the file is variable length and needs an additional four bytes to hold the actual length of each record instance. In other operating environments, the length of the record is the value of WPMIDWIDTH.

FORMAT WP retains headings, footings, and subtotals.

**Use:** For display in a text document.

**Supported with the commands:** HOLD, PCHOLD, SAVE.

**Available in:** WebFOCUS, FOCUS.

# FORMAT XFOCUS

**Description:** Creates an XFOCUS data source.

**Use:** For further processing in a database application.

**Supported with the command:** HOLD.

**Available in:** WebFOCUS, FOCUS.

# FORMAT XML

**Description:** Creates an XML output file based on an internal DTD that includes the rows that are displayed in the final report output. It does not honor the HOLDLIST setting. It does not honor the ASNAMES setting. The parameter HOLDATTRS ON is automatically invoked. The XML file generated is based on the structure and layout of the report request. The metadata included in the DTD for each column is FIELDNAME, ALIAS, data type, width, FOCUS format, DESCRIPTION, ACCEPTS, HELP_MESSAGE, TITLE, WITHIN, PROPERTY, REFERENCE, VALIGN, and column title. FORMAT XML does not create a Master File.

**Note:** When using an HTML Autoprompt page (select Run in new Window option), BI Portal, or an HTML page created with HTML canvas, browsers running in Standards Mode displaying output in an iframe do not display XML. When running a WebFOCUS request with PCHOLD FORMAT XML, the result will display in a new window.

**Use:** For further processing.

**Supported with the command:** HOLD, PCHOLD.

**Available in:** WebFOCUS, FOCUS.

# Merging Data Into an Existing Data Source With ON TABLE MERGE

The ON TABLE MERGE clause in a TABLE or TABLEF command enables you to insert, update, and delete records in an existing single-segment data source.

Data sources that support insert, update, and delete operations, either for individual records or bulk load, can take advantage of the full set of options for ON TABLE MERGE. Relational data sources support all of these options. Other data sources, such as delimited and fixed format sequential data sources, can only have records appended to the existing data source.

# ON TABLE MERGE Processing

An ON TABLE MERGE request consists of two sections.

- A TABLE or TABLEF request that retrieves the data from the source file to be merged into the target file.

  All TABLE syntax is supported, from any type of data source that has an accompanying synonym. The request can include joins, DEFINEs, COMPUTEs, and any other supported syntax. The records retrieved are either passed directly to a Relational DBMS in an SQL request (when the request can be optimized), loaded using the SQL MERGE command (when the request cannot be optimized but the database supports the SQL MERGE command), or stored in an internally-generated HOLD file that is used as the input to a MODIFY request.

- An ON TABLE MERGE clause that specifies the existing target data source for the merge, the UPDATE, DELETE, or INSERT commands, and the calculations of the field values to be updated or inserted.

  The target must be a single-segment file with a corresponding synonym, and it must have a Write Adapter that enables WebFOCUS to update it.

**Supported Merge Phrases**

- **MATCHING expression.** Specifies the expression that selects the source and target records to be passed to the UPDATE, DELETE, or INSERT commands. If records are only to be appended, no MATCHING phrase is used.

- **WHEN MATCHED [AND expression] UPDATE.** Updates matching records. Optionally, provides an additional expression that can be used to perform different updates to different sets of target records. To perform multiple sets of updates, include multiple WHEN MATCHED UPDATE phrases.

  The new target field values are calculated using expressions specified following the WHEN MATCHED UPDATE phrase.

- **WHEN MATCHED [AND expression] DELETE.** Deletes matching records. Optionally, provides an additional expression that can be used to delete multiple sets of target records. To delete multiple sets of records, include multiple WHEN MATCHED DELETE phrases.

- **WHEN NOT MATCHED INSERT.** Is used to insert new records when no field values satisfy the MATCHING expression.

  The new target field values are calculated using expressions specified following the WHEN NOT MATCHED INSERT phrase.

- **INSERT.** When there is no MATCHING phrase and no WHEN NOT MATCHED phrase, INSERT is used to append new records.

  The new target field values are calculated using expressions specified following the INSERT phrase.

**Properties of the Generated MERGE Request**

The merge request can be generated in several ways.

- **Optimized request.** If the source and target are in the same database (have the same suffix and use the same connection), and MERGE (or INSERT from SELECT, for INSERT) is supported by the DBMS, the whole request passed to the DBMS in an SQL request.

  With an optimized request, the MATCHING expression can be any expression, and if any record fails in the merge request, the entire merge is rejected.

- **Non-Optimized request.** If for any reason, the request cannot be optimized, for example if the target and source are from different databases or use different connections, or, if the TABLE request contains syntax that cannot be optimized, one of the following methods is used to do the merge.

  - If the target database supports bulk load into a temporary table, and also supports MERGE, then the data is loaded using bulk load into the target database as a temporary table, and the target table is updated using the SQL

MERGE command with the temporary table as input.

- If the target database supports MERGE but not bulk load, then the data will be loaded on a record-by-record basis, one request per record. This is more efficient than using a MODIFY request (which happens if the target database does not support MERGE), as MODIFY uses two requests per record (SELECT+INSERT or SELECT+UPDATE).
- If the target database does not support MERGE, a HOLD file of the values retrieved by the TABLE request is generated in DATREC (fast binary) format.

  With a DATREC HOLD file, the processing is done by a simple MODIFY request. The MATCHING expression must match on all key fields, and processing is done on a record-by-record basis, so if a record fails the merge request, the request continues with the next record.

No logs are generated for an ON TABLE MERGE request. Therefore, when working with production files, creating a backup of the source file prior to running the request is recommended. At the end of the merge processing, messages are generated that indicate if the merge was successful and how many records were affected. The following image shows an example of the messages displayed for an optimized request.

```
(FOC2659) FULL OPTIMIZATION OF MERGE WITH SUBSELECT HAS BEEN DONE
(FOC2661) TARGET FILE ibisamp/dmrpts
(FOC2665) MERGE PROCESS STARTED AT 10.11.22
(FOC1796) ROWS AFFECTED BY MERGE STATEMENT: 19
```

The following image shows an example of the messages displayed for a non-optimized request.

```
(FOC2644) FULL OPTIMIZATION OF MERGE WITH SUBSELECT CANNOT BE DONE
(FOC2625) SOURCE AND TARGET RESIDE ON DIFFERENT CONNECTIONS
(FOC2664) PARAMETRIZED PER RECORD STATEMENT WILL BE GENERATED
(FOC2661) TARGET FILE ibisamp/dmrpts

(FOC2665) MERGE PROCESS STARTED AT 13.22.42
(FOC1796) ROWS AFFECTED BY MERGE STATEMENT: 182
(FOC2666) MERGE PROCESS ENDED AT 13.22.42, ELAPSED TIME = 00:00:00.037
```

If not all records were processed and you want to know which records were rejected, you must either enable traces or look in the Session Log.

# Merge Data Into an Existing Data Source With ON TABLE MERGE

In the following syntax, at least one UPDATE, DELETE, or INSERT command must be supplied. Multiple UPDATE and DELETE commands are supported, when multiple expressions provide separate update or delete conditions and target field values.

```
{TABLEF|TABLE} FILE
...
ON TABLE MERGE INTO FILE target_mf
[MATCHING matching_expression;]

[
   WHEN MATCHED [AND matching_expression2;] UPDATE
     target_field1=expression1;
     target_field2=expression2; ...
   ...
]

[
   WHEN MATCHED [AND matching_expression3;] DELETE
   ...
]



[
 [WHEN NOT MATCHED] INSERT
  target_field3=expression3;
  target_field4=expression4; ...
]
END
```

where:

**target_mf**

Is the name of the Master File for the target data source that is to be updated.

**MATCHING matching_expression**

Is the expression to match in order to apply the INSERT, UPDATE, and DELETE commands. The expression can be complex. For a non-optimized request, where the merge is performed by a MODIFY procedure, all key fields must be matched in the

expression. Omit this phrase when using the INSERT command to append records. If the field names are the same in the source and target files, use the prefix SRC. to reference fields in the source file, and the prefix TRG. to reference fields in the target file.

**matching_expression2**

Is an additional expression to match in order to apply the UPDATE command. If the field names are the same in the source and target files, use the prefix SRC. to reference fields in the source file, and the prefix TRG. to reference fields in the target file.

**target_field1, target_field2 ...**

Are one or more fields to be updated in the target data source.

**expression1, expression2**

Are expressions used to calculate the target field values to be used for updating the existing target field values. These expressions can use fields from the TABLE request and the target data source. If the field names are the same in the source and target files, use the prefix SRC. to reference fields in the source file, and the prefix TRG. to reference fields in the target file.

**matching_expression3**

Is an additional expression to match in order to apply the DELETE command. If the field names are the same in the source and target files, use the prefix SRC. to reference fields in the source file, and the prefix TRG. to reference fields in the target file.

**target_field3, target_field4 ...**

Are the target field values for the new record to be inserted when the value of *matching_expression* is not found in the target data source.

**expression3, expression4, expression5**

Are expressions used to calculate the target field values to be used for inserting the new record. These expressions can use fields from the TABLE request. Use the prefix SRC. to reference these fields.

# Updating and Inserting Records Using ON TABLE MERGE

This example uses source and target data sources from the **ibi™ Data Migrator - General** tutorial. To access the tutorial, click the New button (+) on the Applications page ribbon and click **Tutorials**, or right-click an application folder, point to **New**, and click **Tutorials**. Scroll down to the ibi Data Migrator - General tutorial. Select or enter values for the DBMS, Connection, prefix, and application, and click **Create**.

The following request updates records in the table dmrpts from records in the table dminv, when the field value PROD_NUM in dminv (SRC.PROD_NUM) matches the field value PROD_NUM in dmrpts (TRG.PROD_NUM). When the PROD_NUM fields do not match, records are inserted.

```
TABLE FILE dminv
PRINT
   PROD_NUM
 COMPUTE QUANTITY =  SUM.QTY_IN_STOCK;
 COMPUTE LINEPRICE =  SUM.PRICE;
 COMPUTE LINECOST = SUM.COST;
 COMPUTE LINECOGS = LINECOST * QUANTITY;

ON TABLE MERGE INTO FILE dmrpts
MATCHING TRG.PROD_NUM EQ SRC.PROD_NUM;WHEN MATCHED UPDATE
  QUANTITY=SRC.QUANTITY;
  YRMTH = TRG.YRMTH+1;
  LINEPRICE=SRC.LINEPRICE;
  LINECOGS=SRC.LINECOGS;
  PROFIT=SRC.LINECOGS - SRC.LINECOST;

WHEN NOT MATCHED INSERT
  STORE_CODE='1004NY';
  PROD_NUM=SRC.PROD_NUM;
  YRMTH=202101;
  QUANTITY=SRC.QUANTITY;
  LINEPRICE=SRC.LINEPRICE;
  LINECOGS=SRC.LINECOGS;
  PROFIT=SRC.LINECOGS - SRC.LINECOST;
END
```

The following TABLE request prints the values in the updated dmrpts target.

```
TABLE FILE DMRPTS
PRINT *
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The following image of the last page of the output shows the updated values in the existing records, and the inserted records (the last two rows).

| Product Number | Store Code | Year Month | Quantity | Line Total | Line Cost | Item Profit |
|---|---|---|---|---|---|---|
| 1034 | 1003GA | 200504 | 21,000 | $499.00 | 7,329,000.00 | 7,328,651.00 |
| 1034 | 1003MA | 200503 | 21,000 | $499.00 | 7,329,000.00 | 7,328,651.00 |
| 1034 | 1003MD | 200503 | 21,000 | $499.00 | 7,329,000.00 | 7,328,651.00 |
| 1034 | 1003MO | 200504 | 21,000 | $499.00 | 7,329,000.00 | 7,328,651.00 |
| 1034 | 1003SC | 200503 | 21,000 | $499.00 | 7,329,000.00 | 7,328,651.00 |
| 1034 | 2011MN | 200504 | 21,000 | $499.00 | 7,329,000.00 | 7,328,651.00 |
| 1034 | 2011TX | 200503 | 21,000 | $499.00 | 7,329,000.00 | 7,328,651.00 |
| 1034 | 2012CA | 200504 | 21,000 | $499.00 | 7,329,000.00 | 7,328,651.00 |
| 1034 | 2012MI | 200503 | 21,000 | $499.00 | 7,329,000.00 | 7,328,651.00 |
| 1034 | 2012MI | 200504 | 21,000 | $499.00 | 7,329,000.00 | 7,328,651.00 |
| 1034 | 2021DC | 200503 | 21,000 | $499.00 | 7,329,000.00 | 7,328,651.00 |
| 1034 | 3002FL | 200503 | 21,000 | $499.00 | 7,329,000.00 | 7,328,651.00 |
| 1034 | 3002GA | 200504 | 21,000 | $499.00 | 7,329,000.00 | 7,328,651.00 |
| 1034 | 3002IL | 200503 | 21,000 | $499.00 | 7,329,000.00 | 7,328,651.00 |
| 1034 | 4003NJ | 200503 | 21,000 | $499.00 | 7,329,000.00 | 7,328,651.00 |
| 1036 | 2012MI | 200503 | 33,000 | $299.00 | 8,217,000.00 | 8,216,751.00 |
| 1036 | 2012MI | 200504 | 33,000 | $299.00 | 8,217,000.00 | 8,216,751.00 |
| 1036 | 3002FL | 200503 | 33,000 | $299.00 | 8,217,000.00 | 8,216,751.00 |
| 1036 | 3002GA | 200504 | 33,000 | $299.00 | 8,217,000.00 | 8,216,751.00 |
| 1036 | 3002IL | 200503 | 33,000 | $299.00 | 8,217,000.00 | 8,216,751.00 |
| 1036 | 4003NJ | 200503 | 33,000 | $299.00 | 8,217,000.00 | 8,216,751.00 |
| 2002 | 1004NY | 202102 | 1,000 | $80.00 | 40,000.00 | 39,960.00 |
| 2003 | 1004NY | 202102 | 1,000 | $200.00 | 100,000.00 | 99,900.00 |

# Appending a Record With ON TABLE MERGE

This example uses GGSALES as the source and a DATREC version of GGPRODS, named GGDATREC, as the target. The following image shows GGDATREC in its original state.

| Product Code | Product | Vendor ID | Vendor Name | Package | Size | Unit Price |
|---|---|---|---|---|---|---|
| B141 | Hazelnut | V082 | Coffee Connection | Pounds | 16 | 58.00 |
| B142 | French Roast | V083 | European Specialities, | Pounds | 12 | 81.00 |
| B144 | Kona | V081 | Evelina Imports, Ltd | Pounds | 12 | 76.00 |
| F101 | Scone | V102 | Ridgewood Bakeries | Case | 20 | 13.00 |
| F102 | Biscotti | V100 | Delancey Bakeries | Case | 24 | 17.00 |
| F103 | Croissant | V103 | West Side Bakers | Case | 20 | 28.00 |
| G100 | Mug | V305 | NY Ceramic Supply | Case | 24 | 26.00 |
| G104 | Thermos | V305 | ThermoTech, Inc | Case | 16 | 96.00 |
| G110 | Coffee Grinder | V303 | Appliance Craft | Case | 12 | 125.00 |
| G121 | Coffee Pot | V304 | Appliance Craft | Case | 8 | 140.00 |

The following request appends one record to the GGDATREC target using ON TABLE MERGE. There is no MATCHING or WHEN NOT MATCHED phrase.

```
TABLE FILE ggsales
SUM
   FST.PCD
   FST.PRODUCT
   FST.UNITS
   FST.DOLLARS

ON TABLE MERGE INTO FILE GGDATREC
INSERT
  PRODUCT_ID=SRC.PCD;
  PRODUCT_DESCRIPTION=SRC.PRODUCT;
  VENDOR_CODE='V400';
  VENDOR_NAME='Acme Foods';
  PACKAGE_TYPE='Case';
  SIZE = 18;
  UNIT_PRICE = SRC.DOLLARS/SRC.UNITS;
END
```

The following TABLE request prints the values in the updated ggdatrec target.

```
TABLE FILE GGDATREC
PRINT *
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The following image shows the appended record (the last row).

| Product Code | Product | Vendor ID | Vendor Name | Package | Size | Unit Price |
|---|---|---|---|---|---|---|
| B141 | Hazelnut | V082 | Coffee Connection | Pounds | 16 | 58.00 |
| B142 | French Roast | V083 | European Specialities, | Pounds | 12 | 81.00 |
| B144 | Kona | V081 | Evelina Imports, Ltd | Pounds | 12 | 76.00 |
| F101 | Scone | V102 | Ridgewood Bakeries | Case | 20 | 13.00 |
| F102 | Biscotti | V100 | Delancey Bakeries | Case | 24 | 17.00 |
| F103 | Croissant | V103 | West Side Bakers | Case | 20 | 28.00 |
| G100 | Mug | V305 | NY Ceramic Supply | Case | 24 | 26.00 |
| G104 | Thermos | V305 | ThermoTech, Inc | Case | 16 | 96.00 |
| G110 | Coffee Grinder | V303 | Appliance Craft | Case | 12 | 125.00 |
| G121 | Coffee Pot | V304 | Appliance Craft | Case | 8 | 140.00 |
| C144 | Capuccino | V400 | Acme Foods | Case | 18 | 15.00 |

# Deleting Records Using ON TABLE MERGE

The following request uses the dminv table and a single-segment version of the dmord table generated by the **ibi Data Migrator - General** tutorial.

The following request displays all of the plant locations in the dmordsgl data source.

```
TABLE FILE DMORDSGL
SUM QUANTITY
BY PLANT
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
END
```

The output is shown in the following image.

| Plant Location | Quantity |
|---|---|
| BOS | 16,046 |
| DAL | 9,756 |
| LA | 3,605 |
| ORL | 11,970 |
| STL | 26,198 |

The following ON TABLE MERGE request deletes records where the source product number matches the target product number and the plant is 'LA'.

```
TABLE FILE dminv
PRINT
PROD_NUM
ON TABLE MERGE INTO FILE dmordsgl
MATCHING TRG.PROD_NUM EQ SRC.PROD_NUM;
WHEN MATCHED AND PLANT EQ 'LA'; DELETE
END
```

Running this request and then the request to display the plants shows that the records with the LA plant have been deleted, as shown in the following image.

| Plant Location | Quantity |
|---|---|
| BOS | 16,046 |
| DAL | 9,756 |
| ORL | 11,970 |
| STL | 26,198 |

# Best Practices for ON TABLE MERGE

- We strongly recommend that you make a backup copy of your target data source prior to using ON TABLE MERGE, in case you need to restore it to its original contents.
- Always use the SRC. and TRG. prefixes in the merge expressions, for safety and clarity.
- The TABLE commands prior to the ON TABLE MERGE clause internally generate a HOLD file, and the merge is done from the HOLD file into the target file. The HOLD file generates alias names for the source fields in the form E01, E02, and so on. These names are unique to each field, while field names in the TABLE request may generate duplicate field names in the HOLD file. Unique names must be used, so either use the alias names, or assign a new name to a duplicate field name using the AS phrase. For example, the following request generates three fields named DOLLARS:

  ```
  TABLE FILE GGSALES
  SUM DOLLARS MAX.DOLLARS MIN.DOLLARS
  BY UNITS
  ON TABLE HOLD
  ```

```
END
```

The generated Master File shows the duplicate field names and unique alias names.

```
FILENAME=HOLD, SUFFIX=FIX     , IOTYPE=BINARY, $
  SEGMENT=HOLD, SEGTYPE=S1, $
    FIELDNAME=UNITS, ALIAS=E01, USAGE=I08, ACTUAL=I04, $
    FIELDNAME=DOLLARS, ALIAS=E02, USAGE=I08, ACTUAL=I04, $
    FIELDNAME=DOLLARS, ALIAS=E03, USAGE=I08, ACTUAL=I04, $
    FIELDNAME=DOLLARS, ALIAS=E04, USAGE=I08, ACTUAL=I04, $
```

The following version of the request generates unique field names using the AS phrase.

```
TABLE FILE GGSALES
SUM DOLLARS AS TOTDOLL
MAX.DOLLARS AS MAXDOLL
MIN.DOLLARS AS MINDOLL
BY UNITS
ON TABLE SET ASNAMES ON
ON TABLE HOLD AS UNIQNAME
END
```

This request generates the following Master File.

```
FILENAME=UNIQNAME, SUFFIX=FIX     , IOTYPE=BINARY, $
  SEGMENT=UNIQNAME, SEGTYPE=S1, $
    FIELDNAME=UNITS, ALIAS=E01, USAGE=I08, ACTUAL=I04, $
    FIELDNAME=TOTDOLL, ALIAS=E02, USAGE=I08, ACTUAL=I04, $
    FIELDNAME=MAXDOLL, ALIAS=E03, USAGE=I08, ACTUAL=I04, $
    FIELDNAME=MINDOLL, ALIAS=E04, USAGE=I08, ACTUAL=I04, $
```

Using this Master File, you can use either field names or alias names. Also note that in an ON TABLE MERGE request, the ON TABLE SET ASNAMES ON command is not needed in order for the AS names to be propagated to the HOLD Master File.

- When an ON TABLE MERGE request is optimized, an SQL request is generated and passed to the DBMS. For example, the following request is optimized when the dminv and dmrpts tables use the same adapter and connection:

```
TABLE FILE dminv
```

```
PRINT
 PROD_NUM
 COMPUTE QUANTITY =  SUM.QTY_IN_STOCK;
 COMPUTE LINEPRICE =  SUM.PRICE;
 COMPUTE LINECOST = SUM.COST;
 COMPUTE LINECOGS = LINECOST * QUANTITY
ON TABLE MERGE INTO FILE dmrpts
MATCHING TRG.PROD_NUM EQ SRC.PROD_NUM;
 WHEN MATCHED UPDATE
  YRMTH=TRG.YRMTH + 1;
  QUANTITY=SRC.QUANTITY;
  LINEPRICE=SRC.LINEPRICE;
  LINECOGS=SRC.LINECOGS;
  PROFIT=SRC.LINECOGS - SRC.LINECOST;

 WHEN NOT MATCHED INSERT
  STORE_CODE='1004NY';
  PROD_NUM=SRC.PROD_NUM;
  YRMTH=202101;
  QUANTITY=SRC.QUANTITY;
  LINEPRICE=SRC.LINEPRICE;
  LINECOGS=SRC.LINECOGS;
  PROFIT=SRC.LINECOGS - SRC.LINECOST;
END
```

The following messages indicate that the request was optimized.

```
(FOC2659) FULL OPTIMIZATION OF MERGE WITH SUBSELECT HAS BEEN DONE
(FOC2661) TARGET FILE ibisamp/dmrpts

(FOC2665) MERGE PROCESS STARTED AT 15.33.19
(FOC1796) ROWS AFFECTED BY MERGE STATEMENT: 182
```

You can open the Session Log from the User Options menu on the Web Console title bar. The Session Log shows that the following SQL request was generated.

```
SELECT
  T1."PROD_NUM" AS "E01",
  T1."QTY_IN_STOCK" AS "E02",
  T1."PRICE" AS "E03",
  T1."COST" AS "E04",
  (T1."COST" * T1."QTY_IN_STOCK") AS "E05",
  '1004NY' AS "E06",
```

```
  202101 AS "E07",
  T1."QTY_IN_STOCK" AS "E08",
  ((T1."COST" * T1."QTY_IN_STOCK") - T1."COST") AS "E09"
   FROM
  dminv T1;
```

```
MERGE INTO dmrpts AS T3
  USING ( SELECT
  T1."PROD_NUM" AS "E01",
  T1."QTY_IN_STOCK" AS "E02",
  T1."PRICE" AS "E03",
  T1."COST" AS "E04",
  (T1."COST" * T1."QTY_IN_STOCK") AS "E05",
  '1004NY' AS "E06",
  202101 AS "E07",
  T1."QTY_IN_STOCK" AS "E08",
  ((T1."COST" * T1."QTY_IN_STOCK") - T1."COST") AS "E09"
   FROM
  dminv T1) T2
  ON
  (T3."PROD_NUM" =
  T2."E01")
```

```
 WHEN MATCHED THEN UPDATE SET
  "YRMTH" = ("YRMTH" + 1),
  "QUANTITY" =
  T2."E08",
  "LINEPRICE" =
  T2."E03",
  "LINECOGS" =
  T2."E05",
  "PROFIT" =
  T2."E09"
```

```
WHEN NOT MATCHED THEN INSERT (
  "PROD_NUM",
  "STORE_CODE",
  "YRMTH",
  "QUANTITY",
  "LINEPRICE",
  "LINECOGS",
```

```
   "PROFIT")
   VALUES (
   T2."E01",
   T2."E06",
   T2."E07",
   T2."E08",
   T2."E03",
   T2."E05",
   T2."E09");
```

# Using Alias Names With ON TABLE MERGE

The following request uses alias names from the source HOLD file in the expressions used to insert fields into the target file.

```
TABLE FILE dminv
PRINT
   PROD_NUM
   COMPUTE YM = 202102;
   COMPUTE QUANTITY = QTY_IN_STOCK;
   COMPUTE LINEPRICE = PRICE;
   COMPUTE LINECOGS = LINEPRICE * QUANTITY;
ON TABLE MERGE INTO FILE ibisamp/dmrpts
 INSERT
  STORE_CODE='AAAA';
  PROD_NUM=SRC.E01;
  YRMTH=SRC.E02;
  QUANTITY=SRC.E03;
  LINEPRICE=SRC.E04;
  LINECOGS=SRC.E05;
  PROFIT=SRC.E04 - SRC.E05;
END
```

# Using Text Fields in Output Files

Text fields can be propagated to HOLD and SAVE files that have the following formats: ALPHA, WP, and FOCUS or XFOCUS. However, although a Master File is generated for format ALPHA, you cannot issue a TABLE request against a HOLD file of format ALPHA that contains text fields.

# Rules for Text Fields in Output Files

- You can include as many text fields in the file as needed. However, you must specify text fields after non-text fields in the display list (PRINT..., SUM..., and so forth).
- You can specify only one text field in the display list, and no non-text fields, in a request that includes an ACROSS phrase.

The following rules apply to missing data for text fields in HOLD and SAVE files:

- A blank line is valid data. An end-of-text mark indicates the end of the field.
- If there is no text for a field, a single period (.) followed by blanks appears in the HOLD or SAVE file.
- If MISSING=ON during data extraction, a period (.) is written out to the HOLD or SAVE file.
- If MISSING=OFF during data extraction, a blank is written out to the HOLD or SAVE file.

See Handling Records With Missing Field Values.

In environments that support FIXFORM, due to limitations in the use of text fields with FIXFORM, the following restriction applies:

- When you use the command FIXFORM FROM HOLD, the HOLD file may not contain more than one text field, and the text field must be the last field in the Master File.

When HOLD files are read using FIXFORM, the interpretation of missing text depends on whether the field's designation is MISSING=ON in the Master File, conditional ©) in the FIXFORM format description, or some combination of the two.

# Applying Text Field Rules in HOLD Files

The following request extracts data to a HOLD file named CRSEHOLD:

```
TABLE FILE COURSE
PRINT COURSECODE DESCRIPTN1
ON TABLE HOLD AS CRSEHOLD
END
```

The following request prints the data from the HOLD file:

```
TABLE FILE CRSEHOLD
PRINT *
END
```

The partial output is:

| COURSECODE | DESCRIPTN1 |
|---|---|
| AMA130 | FOR PROJECT LEADERS AND SYS ANALYSTS. |
| AMA680 | FOR INDUSTRIAL MARKETERS. |
| AMA800 | FOR MANAGERS AND HUMAN RESOURCE STAFF. |
| BIT420 | FOR SENIOR MANAGERS. ANALYZE AND IMPROVE |
| BIT640 | FOR ADMINISTRATOR OF LABOR CONTRACTS. |
| BIT650 | FOR PROGRAMMERS, PROJECT LEADERS AND |
| EDP090 | FOR PRODUCTION MANAGERS. TO DELEGATE AND |
| EDP130 | FOR PROGRAMMERS, PROJECT LEADERS |

| | |
|---|---|
| | AND |
| EDP390 | FOR MANAGERS. HELP APPLY MANAGERIAL |
| EDP690 | FOR EXEC MANAGERS AND MKTG RESEARCH |
| EDP750 | FOR MARKETING MANAGERS. ENABLE TO |
| MC230 | FOR PROGRAMMERS, PROJECT LEADERS AND |
| MC90 | FOR VICE PRES OF SALES AND MARKETING. |
| NAMA40 | FOR MARKETING VICE PRES AND MANAGERS. |
| NAMA730 | FOR MANAGERS OF SALESPEOPLE. TO ENHANCE |
| NAMA930 | FOR FINANCIAL MANAGERS. EXPLORE CONCEPTS |
| PDR330 | FOR EXECUTIVE SECRETARIES. TO KNOW THE |

| | |
|---|---|
| PDR740 | FOR EXPERIENCED MARKETING MANAGERS. HELP |
| PDR870 | FOR DESIGNERS AND TRAINING COORDINATORS. |
| PU168 | FOR MARKETING, PRODUCT, ADVERTISING |
| PU440 | FOR GENERAL MANAGERS. TO EXPLORE |
| SFC280<br>.<br>.<br>. | FOR MANAGERS AND SECRETARIES. HELP |

# Creating a Delimited Sequential File

You can use the HOLD FORMAT DFIX command to create an alphanumeric sequential file delimited by any character or combination of characters. You can also specify whether to enclose alphanumeric values in quotation marks or some other enclosure, whether to include a header record that lists the names of the fields, whether to preserve leading and trailing blank spaces in alphanumeric data, and whether to insert a delimiter between records in the resulting file. (Note that when RDELIMITER is included, the RECFM is UB).

A Master File and an Access File are created to describe the delimited sequential file that is generated. The SUFFIX value in the Master File is DFIX. The Access File specifies the delimiter, the enclosure character (if any), whether to preserve leading and trailing blank spaces in alphanumeric data, whether there is a header record, and the record delimiter, if there is to be one. The Master and Access Files are useful if you will later read the sequential file using WebFOCUS.

# Create a Delimited Sequential File

```
ON TABLE {HOLD|PCHOLD} [AS filename] FORMAT DFIX
 DELIMITER delimiter
 [ENCLOSURE enclosure] [HEADER {YES|NO}]
 [PRESERVESPACE {YES|NO}]  [RDELIMITER rdelimiter]
```

where:

**filename**

Is the name of the file to be created. If you do not specify a name, the default name is HOLD.

**delimiter**

Is the delimiter sequence consisting of up to 30 printable or non-printable non-null characters. This represents character semantics. For example, if you are using DBCS characters, the delimiter can be up to 60 bytes. Characters may also be represented by their 0x hex values which is the required specification method for non-printable characters. If you use a mixture of printable and non-printable characters, you must enter them all as hexadecimal values. To create a tab delimited file, you can specify the DELIMITER value as **TAB** or as its hexadecimal equivalent (0x09 on ASCII platforms or 0x05 on EBCDIC platforms). To create a single-quote delimited file, you must specify the single quote DELIMITER value as its hexadecimal equivalent (0x27 on ASCII platforms or 0x7D on EBCDIC platforms), otherwise the request will be mis-interpreted and result in an unusable HOLD file.

**enclosure**

Is the enclosure sequence. It can be up to four printable or non-printable characters used to enclose each alphanumeric value in the file. This represents character semantics. For example, if you are using DBCS characters, the enclosure can be up to 8 bytes. Most alphanumeric characters can be used as all or part of the enclosure sequence. However, numeric digits and symbols used in numbers, such as a period (.), plus sign (+), or minus sign (-) cannot be used in the enclosure sequence. Also note that, in order to specify a single quotation mark as the enclosure character, you must enter four consecutive single quotation marks. The most common enclosure is one double quotation mark.

If you use a mixture of printable and non-printable characters, you must enter them all as hexadecimal values. For printable characters, you can either use the characters

themselves or their hexadecimal equivalents (for example, the ampersand character may be interpreted as the beginning of a variable name rather than as part of the enclosure.)

**HEADER {YES|NO}**

Specifies whether to include a header record that contains the names of the fields in the delimited sequential file generated by the request.

**PRESERVESPACE {YES|NO}**

Specifies whether to retain leading and trailing blanks in alphanumeric data. YES preserves leading and trailing blanks. NO only preserves leading and trailing blanks that are included within the enclosure characters. NO is the default value.

**Note:** PRESERVESPACE is overridden by the ENCLOSURE option. Therefore, exclude the enclosure option in order to have the PRESERVESPACE setting respected.

**rdelimiter**

Is the record delimiter sequence consisting of up to 30 printable or non-printable non-null characters. This represents character semantics. For example, if you are using DBCS characters, the delimiter can be up to 60 bytes. For a non-printable character, enter the hexadecimal value that represents the character. If you use a mixture of printable and non-printable characters, you must enter them all as hexadecimal values. For printable characters you can either use the characters themselves or their hexadecimal equivalents (for example, the ampersand character may be interpreted as the beginning of a variable name rather than as part of the delimiter). To use a tab character as the record delimiter, you can specify the delimiter value as **TAB** or as its hexadecimal equivalent (0x09 on ASCII platforms or 0x05 on EBCDIC platforms). The comma (,) is not supported as a record delimiter.

Note that numeric digits and symbols used in numbers, such as a period (.), plus sign (+), or minus sign (-) cannot be used in the delimiter sequence. When RDELIMITER is included, the RECFM is UB.

# Usage Notes for HOLD FORMAT DFIX

- Missing data is indicated by no data. So, with enclosure, a missing alphanumeric field is indicated by two enclosure characters, while a missing numeric field is indicated by

two delimiters.

- Text fields are not supported with HOLD FORMAT DFIX.
- While HOLD FORMAT DFIX creates a single segment file, you can manually add segments to the resulting Master and Access File. In the Access File, you can specify a separate delimiter and/or enclosure for each segment.
- The extension of the generated sequential file is ftm.
- HOLD FORMAT DFIX with the PRESERVESPACE YES option creates a file in which leading and trailing blank spaces are preserved in alphanumeric data. It also adds the attribute PRESERVESPACE=YES in the Access File. This attribute causes leading and trailing blank spaces to be preserved when reading a FORMAT DFIX file.

# Creating a Pipe-Delimited File

The following request against the CENTORD data source creates a sequential file named PIPE1 with fields separated by the pipe character (|). Alphanumeric values are not enclosed in quotation marks, and there is no header record:

```
TABLE FILE CENTORD
SUM QUANTITY LINEPRICE BY REGION BY YEAR
ON TABLE HOLD AS PIPE1 FORMAT DFIX DELIMITER |
END
```

The PIPE1 Master File specifies the SUFFIX value as DFIX:

```
FILENAME=PIPE1   , SUFFIX=DFIX    , $
  SEGMENT=PIPE1, SEGTYPE=S2, $
    FIELDNAME=REGION, ALIAS=E01, USAGE=A5, ACTUAL=A05, $
    FIELDNAME=YEAR, ALIAS=E02, USAGE=YY, ACTUAL=A04, $
    FIELDNAME=QUANTITY, ALIAS=E03, USAGE=I8C, ACTUAL=A08, $
    FIELDNAME=LINEPRICE, ALIAS=E04, USAGE=D12.2MC, ACTUAL=A12, $
```

The PIPE1 Access File specifies the delimiter:

```
SEGNAME=PIPE1, DELIMITER=|, HEADER=NO, $
```

The PIPE1 sequential file contains the following data. Each data value is separated from the next value by a pipe character:

```
EAST|2000|3907|1145655.77
EAST|2001|495922|127004359.88
EAST|2002|543678|137470917.05
NORTH|2001|337168|85750735.54
NORTH|2002|370031|92609802.80
SOUTH|2000|3141|852550.45
SOUTH|2001|393155|99822662.88
SOUTH|2002|431575|107858412.0
WEST|2001|155252|39167974.18
WEST|2002|170421|42339953.45
```

The following version of the HOLD command specifies both the delimiter and an enclosure character (“):

```
ON TABLE HOLD AS PIPE1 FORMAT DFIX DELIMITER | ENCLOSURE "
```

The Master File remains the same, but the Access File now specifies the enclosure character:

```
SEGNAME=PIPE1, DELIMITER=|, ENCLOSURE=", HEADER=NO, $
```

In the delimited file that is created, each data value is separated from the next by a pipe character, and alphanumeric values are enclosed within double quotation marks:

```
"EAST"|2000|3907|1145655.77
"EAST"|2001|495922|127004359.88
"EAST"|2002|543678|137470917.05
"NORTH"|2001|337168|85750735.54
"NORTH"|2002|370031|92609802.80
"SOUTH"|2000|3141|852550.45
"SOUTH"|2001|393155|99822662.88
"SOUTH"|2002|431575|107858412.01
"WEST"|2001|155252|39167974.18
"WEST"|2002|170421|42339953.45
```

This version of the HOLD command adds a header record to the generated file:

```
ON TABLE HOLD AS PIPE1 FORMAT DFIX DELIMITER |  ENCLOSURE "  HEADER YES
```

The Master File remains the same, but the Access File now specifies that the generated sequential file should contain a header record with column names as its first record:

```
SEGNAME=PIPE1, DELIMITER=|, ENCLOSURE=", HEADER=YES, $
```

In the delimited file that is created, each data value is separated from the next by a pipe character, and alphanumeric values are enclosed within double quotation marks. The first record contains the column names:

```
"REGION"|"YEAR"|"QUANTITY"|"LINEPRICE"
"EAST"|2000|3907|1145655.77
"EAST"|2001|495922|127004359.88
"EAST"|2002|543678|137470917.05
"NORTH"|2001|337168|85750735.54
"NORTH"|2002|370031|92609802.80
"SOUTH"|2000|3141|852550.45
"SOUTH"|2001|393155|99822662.88
"SOUTH"|2002|431575|107858412.01
"WEST"|2001|155252|39167974.18
"WEST"|2002|170421|42339953.45
```

# Creating a Tab-Delimited File

The following request against the CENTORD data source creates a sequential file named TAB1 with fields separated by a tab character:

```
TABLE FILE CENTORD
SUM QUANTITY LINEPRICE BY REGION BY YEAR
ON TABLE HOLD AS TAB1 FORMAT DFIX DELIMITER TAB
END
```

As the tab character is not printable, the TAB1 Access File specifies the delimiter using its hexadecimal value.

The following is the Access File in an EBCDIC environment:

```
SEGNAME=TAB1, DELIMITER=0x05, HEADER=NO, $
```

The following is the Access File in an ASCII environment:

```
SEGNAME=TAB1, DELIMITER=0x09, HEADER=NO, $
```

# Creating a Delimited File With Blank Spaces Preserved

The following request against the GGSALES data source creates a comma-delimited file. The original alphanumeric data has trailing blank spaces. The PRESERVESPACE YES option in the HOLD command preserves these trailing blank spaces:

```
APP HOLDDATA APP1
APP HOLDMETA APP1
TABLE FILE GGSALES
SUM DOLLARS UNITS
BY REGION
BY CATEGORY
BY PRODUCT
ON TABLE HOLD AS DFIX1 FORMAT DFIX DELIMITER , PRESERVESPACE YES
END
```

The following Master File is generated:

```
FILENAME=DFIX1   , SUFFIX=DFIX    , $
  SEGMENT=DFIX1, SEGTYPE=S3, $
    FIELDNAME=REGION, ALIAS=E01, USAGE=A11, ACTUAL=A11, $
    FIELDNAME=CATEGORY, ALIAS=E02, USAGE=A11, ACTUAL=A11, $
    FIELDNAME=PRODUCT, ALIAS=E03, USAGE=A16, ACTUAL=A16, $
    FIELDNAME=DOLLARS, ALIAS=E04, USAGE=I08, ACTUAL=A08, $
    FIELDNAME=UNITS, ALIAS=E05, USAGE=I08, ACTUAL=A08, $
```

The following Access File is generated:

```
SEGNAME=DFIX1, DELIMITER=',', HEADER=NO, PRESERVESPACE=YES, $
```

In the DFIX1 file, the alphanumeric fields contain all of the blank spaces that existed in the original file:

```
Midwest    ,Coffee     ,Espresso        ,1294947,101154
Midwest    ,Coffee     ,Latte           ,2883566,231623
Midwest    ,Food       ,Biscotti        ,1091727,86105
Midwest    ,Food       ,Croissant       ,1751124,139182
Midwest    ,Food       ,Scone           ,1495420,116127
```

```
Midwest    ,Gifts      ,Coffee Grinder  ,619154,50393
Midwest    ,Gifts      ,Coffee Pot      ,599878,47156
Midwest    ,Gifts      ,Mug             ,1086943,86718
Midwest    ,Gifts      ,Thermos         ,577906,46587
Northeast  ,Coffee     ,Capuccino       ,542095,44785
Northeast  ,Coffee     ,Espresso        ,850107,68127
Northeast  ,Coffee     ,Latte           ,2771815,222866
Northeast  ,Food       ,Biscotti        ,1802005,145242
Northeast  ,Food       ,Croissant       ,1670818,137394
Northeast  ,Food       ,Scone           ,907171,70732
Northeast  ,Gifts      ,Coffee Grinder  ,509200,40977
Northeast  ,Gifts      ,Coffee Pot      ,590780,46185
Northeast  ,Gifts      ,Mug             ,1144211,91497
Northeast  ,Gifts      ,Thermos         ,604098,48870
Southeast  ,Coffee     ,Capuccino       ,944000,73264
Southeast  ,Coffee     ,Espresso        ,853572,68030
Southeast  ,Coffee     ,Latte           ,2617836,209654
Southeast  ,Food       ,Biscotti        ,1505717,119594
Southeast  ,Food       ,Croissant       ,1902359,156456
Southeast  ,Food       ,Scone           ,900655,73779
Southeast  ,Gifts      ,Coffee Grinder  ,605777,47083
Southeast  ,Gifts      ,Coffee Pot      ,645303,49922
Southeast  ,Gifts      ,Mug             ,1102703,88474
Southeast  ,Gifts      ,Thermos         ,632457,48976
West       ,Coffee     ,Capuccino       ,895495,71168
West       ,Coffee     ,Espresso        ,907617,71675
West       ,Coffee     ,Latte           ,2670405,213920
West       ,Food       ,Biscotti        ,863868,70436
West       ,Food       ,Croissant       ,2425601,197022
West       ,Food       ,Scone           ,912868,72776
West       ,Gifts      ,Coffee Grinder  ,603436,48081
West       ,Gifts      ,Coffee Pot      ,613624,47432
West       ,Gifts      ,Mug             ,1188664,93881
West       ,Gifts      ,Thermos         ,571368,45648
```

Creating the same file with PRESERVESPACE NO removes the trailing blank spaces:

```
Midwest,Coffee,Espresso,1294947,101154
Midwest,Coffee,Latte,2883566,231623
Midwest,Food,Biscotti,1091727,86105
Midwest,Food,Croissant,1751124,139182
Midwest,Food,Scone,1495420,116127
Midwest,Gifts,Coffee Grinder,619154,50393
Midwest,Gifts,Coffee Pot,599878,47156
Midwest,Gifts,Mug,1086943,86718
Midwest,Gifts,Thermos,577906,46587
```

```
Northeast,Coffee,Capuccino,542095,44785
Northeast,Coffee,Espresso,850107,68127
Northeast,Coffee,Latte,2771815,222866
Northeast,Food,Biscotti,1802005,145242
Northeast,Food,Croissant,1670818,137394
Northeast,Food,Scone,907171,70732
Northeast,Gifts,Coffee Grinder,509200,40977
Northeast,Gifts,Coffee Pot,590780,46185
Northeast,Gifts,Mug,1144211,91497
Northeast,Gifts,Thermos,604098,48870
Southeast,Coffee,Capuccino,944000,73264
Southeast,Coffee,Espresso,853572,68030
Southeast,Coffee,Latte,2617836,209654
Southeast,Food,Biscotti,1505717,119594
Southeast,Food,Croissant,1902359,156456
Southeast,Food,Scone,900655,73779
Southeast,Gifts,Coffee Grinder,605777,47083
Southeast,Gifts,Coffee Pot,645303,49922
Southeast,Gifts,Mug,1102703,88474
Southeast,Gifts,Thermos,632457,48976
West,Coffee,Capuccino,895495,71168
West,Coffee,Espresso,907617,71675
West,Coffee,Latte,2670405,213920
West,Food,Biscotti,863868,70436
West,Food,Croissant,2425601,197022
West,Food,Scone,912868,72776
West,Gifts,Coffee Grinder,603436,48081
West,Gifts,Coffee Pot,613624,47432
West,Gifts,Mug,1188664,93881
West,Gifts,Thermos,571368,45648
```

# Specifying a Record Delimiter

The following request against the GGSALES data source, the field delimiter is a comma, the enclosure character is a single quotation mark, and the record delimiter consists of both printable and non-printable characters, so it is specified as the following hexadecimal sequence:

- 0x: character sequence identifying the delimiter as hexadecimal character codes.
- 2C: hexadecimal value for comma (,).
- 24: hexadecimal value for dollar sign ($).

- 0D: hexadecimal value for carriage return.
- 0A: hexadecimal value for new line.

```
TABLE FILE GGSALES
PRINT DOLLARS UNITS CATEGORY REGION
ON TABLE HOLD AS RDELIM1 FORMAT DFIX DELIMITER , ENCLOSURE ''''
HEADER NO RDELIMITER 0x2C240D0A
END
```

The generated Master File follows:

```
FILENAME=RDELIM1 , SUFFIX=DFIX    , $
  SEGMENT=RDELIM1, SEGTYPE=S0, $
    FIELDNAME=DOLLARS, ALIAS=E01, USAGE=I08, ACTUAL=A08, $
    FIELDNAME=UNITS, ALIAS=E02, USAGE=I08, ACTUAL=A08, $
    FIELDNAME=CATEGORY, ALIAS=E03, USAGE=A11, ACTUAL=A11, $
    FIELDNAME=REGION, ALIAS=E04, USAGE=A11, ACTUAL=A11, $
```

The Access File contains the delimiters and enclosure characters:

```
SEGNAME=RDELIM1,
  DELIMITER=',',
  ENCLOSURE='''',
  HEADER=NO,
  RDELIMITER=0x2C240D0A,
  PRESERVESPACE=NO, $
```

Each row of the resulting DFIX file ends with the comma-dollar combination and a carriage return and line space. a partial listing follows:

```
20805,1387,'Coffee','Northeast',$
20748,1729,'Coffee','Northeast',$
20376,1698,'Coffee','Northeast',$
20028,1669,'Coffee','Northeast',$
19905,1327,'Coffee','Northeast',$
19470,1770,'Coffee','Northeast',$
19118,1738,'Coffee','Northeast',$
18720,1560,'Coffee','Northeast',$
18432,1536,'Coffee','Northeast',$
17985,1199,'Coffee','Northeast',$
17630,1763,'Coffee','Northeast',$
16646,1189,'Coffee','Northeast',$
15650,1565,'Coffee','Northeast',$
```

```
15450,1545,'Coffee','Northeast',$
15435,1029,'Coffee','Northeast',$
14270,1427,'Coffee','Northeast',$
```

# Missing Data in the HOLD File

The following request against the CENTORD data source creates missing alphanumeric and numeric values in the resulting comma-delimited HOLD file:

```
DEFINE FILE CENTORD
AREA/A5 MISSING ON = IF REGION EQ 'EAST' THEN MISSING ELSE REGION;
MQUANTITY/I9 MISSING ON = IF REGION EQ 'WEST' THEN MISSING ELSE 200;
END

TABLE FILE CENTORD
SUM QUANTITY MQUANTITY LINEPRICE BY AREA BY YEAR
WHERE AREA NE 'NORTH' OR 'SOUTH'
  ON TABLE HOLD AS MISS1 FORMAT DFIX DELIMITER , ENCLOSURE "
END
```

In the MISS1 HOLD file, the missing alphanumeric values are indicated by two enclosure characters in a row ("") and the missing numeric values are indicated by two delimiters in a row (,,):

```
"",2000,3907,600,1145655.77
"",2001,495922,343000,127004359.88
"",2002,543678,343000,137470917.05
"WEST",2001,155252,,39167974.18
"WEST",2002,170421,,42339953.45
```

# Saving Report Output in INTERNAL Format

HOLD files pad binary integer and packed decimal data values to a full word boundary. For example, a three-digit integer field (I3), is stored as four bytes in a HOLD file. In order for third generation programs, such as COBOL, to be able to read HOLD files in an exact manner, you may need to save the fields in the HOLD file without any padding.

To suppress field padding in the HOLD file, you must reformat the fields in the request in order to override the default ACTUAL formats that correspond to the USAGE formats in the Master File:

- Reformat the integer and packed fields that you do not want to be padded in the HOLD file to the correct display lengths.
- Specify HOLD FORMAT INTERNAL for the report output.

# Suppress Field Padding in HOLD Files

```
SET HOLDLIST = PRINTONLY
TABLE FILE filename
display_command fieldname/[In|Pn.d]
.
.
ON TABLE HOLD AS name FORMAT INTERNAL
END
```

where:

**PRINTONLY**

Causes your report request to propagate the HOLD file with only the specified fields displaying in the report output. If you do not issue this setting, an extra field containing the padded field length is included in the HOLD file. See Controlling Attributes in HOLD Master Files.

**fieldname/[In|Pn.d]**

Specify correct lengths in the formats for integer and packed fields where you wish to suppress padding. These formats override the ACTUAL formats used for the display formats in the Master File. See Saving Report Output in INTERNAL Format.

Note that floating point double-precision (D) and floating point single-precision (F) are not affected by HOLD FORMAT INTERNAL.

**FORMAT INTERNAL**

Saves the HOLD file without padding for specified integer and packed decimal fields.

# Usage Notes for Suppressing Padded Fields in HOLD Files

- Integer fields (I) of one, two, three, or four bytes produce four-byte integers without HOLD FORMAT INTERNAL.
- For packed decimal fields (P*n.d*), *n* is the total number of digits and *d* is the number of digits to the right of the decimal point. The number of bytes is derived by dividing *n* by 2 and adding 1.

  The syntax is

  ```
  bytes = INT (n/2) + 1
  ```

  where:

  **INT (n/2)**

  Is the greatest integer after dividing by 2.
- HOLD FORMAT INTERNAL does not affect floating point double-precision (D) and floating point single-precision (F) fields. D remains at eight bytes, and F at four bytes.
- Alphanumeric fields automatically inherit their length from their source Master File, and are not padded to a full word boundary.
- If a format override is not large enough to contain the data values, the values are truncated. Truncation may cause the data in the HOLD file to be incorrect in the case of an integer. For packed data and integers, truncation occurs for the high order digits so the remaining low order digits resemble the digits from the correct values.

  To avoid incorrect results, be sure that the format you specify is large enough to contain the data values.
- If you use the HOLDMISS=ON setting to propagate missing values to the HOLD file, short packed fields and fields with formats I1, I2, and I3 are not large enough to hold the missing value.

# Creating a HOLD File Without HOLD FORMAT INTERNAL

In this example, the values of ACTUAL for RETAIL_COST, DEALER_COST, and SEATS are all padded to a full word. Alphanumeric fields also occupy full words.

```
TABLE FILE CAR
PRINT CAR COUNTRY RETAIL_COST DEALER_COST SEATS
ON TABLE HOLD AS DJG
END
```

The request creates the following Master File:

```
FILE=DJG, SUFFIX=FIX
 SEGMENT=DJG, SEGTYPE=S0
  FIELDNAME=CAR          ,ALIAS=E01  ,USAGE=A16  ,ACTUAL=A16    ,$
  FIELDNAME=COUNTRY      ,ALIAS=E02  ,USAGE=A10  ,ACTUAL=A12    ,$
  FIELDNAME=RETAIL_COST  ,ALIAS=E03  ,USAGE=D7   ,ACTUAL=D08    ,$
  FIELDNAME=DEALER_COST  ,ALIAS=E04  ,USAGE=D7   ,ACTUAL=D08    ,$
  FIELDNAME=SEATS        ,ALIAS=E05  ,USAGE=I3   ,ACTUAL=I04    ,$
```

# Creating a HOLD File With HOLD FORMAT INTERNAL

In this example, DEALER_COST and RETAIL_COST are defined in the Master File as D fields, but the request overrides RETAIL_COST as an I2 field and DEALER_COST as a P3 field.

```
SET HOLDLIST=PRINTONLY
TABLE FILE CAR
PRINT CAR COUNTRY RETAIL_COST/I2 DEALER_COST/P3 SEATS/I1
ON TABLE HOLD AS HINT3 FORMAT INTERNAL
END
```

This creates the following Master File:

```
FILE=HINT3, SUFFIX=FIX
 SEGMENT=HINT3, SEGTYPE=S0
  FIELDNAME=CAR          ,ALIAS=E01   ,USAGE=A16  ,ACTUAL=A16   ,$
  FIELDNAME=COUNTRY      ,ALIAS=E02   ,USAGE=A10  ,ACTUAL=A10   ,$
  FIELDNAME=RETAIL_COST  ,ALIAS=E03   ,USAGE=I6   ,ACTUAL=I02   ,$
```

```
FIELDNAME=DEALER_COST  ,ALIAS=E04   ,USAGE=P4   ,ACTUAL=P02   ,$
FIELDNAME=SEATS        ,ALIAS=E05   ,USAGE=I4   ,ACTUAL=I01   ,$
```

The ACTUAL formats for the overridden fields are I2, P2, and I1. DEALER_COST has an ACTUAL of P2 because P3, the format override, means 3 display digits that can be stored in 2 actual digits. Note that the alphanumeric field is also not padded.

# Creating A Subquery or Sequential File With HOLD FORMAT SQL_SCRIPT

When used in a request against a relational data source, the HOLD FORMAT SQL_SCRIPT command generates the SQL SELECT statement needed to execute the current query and stores it in the application folder as a file with a .sql extension along with the Master and Access File pair that describes the SQL answer set.

When used in a request against any other type of data source, the HOLD FORMAT SQL_SCRIPT command executes the current query and stores the retrieved values in the application folder as a sequential file with a .ftm extension along with the Master File that describes the retrieved data.

You can use the output from HOLD FORMAT SQL_SCRIPT as the target file for the DB_INFILE function. For information about the DB_INFILE function, see the *ibi™ FOCUS® Developing Applica* manual.

**Note:** Once you have the .sql file and its accompanying Master File, you can customize the .sql file using global Dialogue Manager variables. You must declare these global variables in the Master File. For information about parameterizing Master Files with global variables, see the *Describing Data With ibi™ WebFOCUS® Language* manual.

# Create an SQL Script or Sequential File Using HOLD FORMAT SQL_SCRIPT

```
ON TABLE HOLD AS script_name FORMAT SQL_SCRIPT
```

where:

**script_name**

Is the name of the .sql file or the .ftm file created as a result of the HOLD FORMAT SQL_SCRIPT command.

# Creating an SQL Script File Using HOLD FORMAT SQL_SCRIPT

The following request against the WF_RETAIL relational data source creates an SQL Script file in the baseapp application:

```
APP HOLD baseapp
TABLE FILE WF_RETAIL_LITE
SUM BUSINESS_REGION STATE_PROV_CODE_ISO_3166_2
BY BUSINESS_REGION NOPRINT BY STATE_PROV_CODE_ISO_3166_2 NOPRINT
WHERE BUSINESS_REGION EQ 'North America' OR 'EMEA'
WHERE STATE_PROV_CODE_ISO_3166_2 EQ 'AR' OR 'IA' OR 'KS' OR 'KY' OR 'WY'
OR 'CT' OR 'MA' OR '04' OR '11' OR '14'
OR 'NJ' OR 'NY' OR 'RI'
ON TABLE HOLD AS RETAIL_SCRIPT FORMAT SQL_SCRIPT
END
```

WF_RETAIL is a sample data source you can create by right-clicking an application on the Reporting Server Web Console and selecting **New** and then **Samples** from the context menu.

The result of this request is a script file named retail_script.sql and a corresponding Master and Access File.

The retail_script.sql file contains the following SQL SELECT statement:

```
 SELECT          MAX(T3."BUSINESS_REGION") AS "VB001_MAX_BUSINESS_REGION",       MAX
(T3."STATE_PROV_CODE_ISO_3166_2")
AS "VB002_MAX_STATE_PROV_CODE_ISO_"     FROM   wrd_wf_retail_geography T3
WHERE  (T3."STATE_PROV_CODE_ISO_3166_2" IN('AR', 'IA', 'KS', 'KY', 'WY',
'CT', 'MA', '04', '11', '14', 'NJ', 'NY', 'RI'))
AND    (T3."BUSINESS_REGION" IN('North America', 'EMEA'))       GROUP BY
T3."BUSINESS_REGION",   T3."STATE_PROV_CODE_ISO_3166_2"
```

The retail_script.mas Master File follows:

```
FILENAME=RETAIL_SCRIPT, SUFFIX=MSODBC  , $
  SEGMENT=RETAIL_SCRIPT, SEGTYPE=S0, $
    FIELDNAME=BUSINESS_REGION, ALIAS=VB001_MAX_BUSINESS_REGION,
USAGE=A15V, ACTUAL=A15V,
      MISSING=ON,
      TITLE='Customer,Business,Region', $
    FIELDNAME=STATE_PROV_CODE_ISO_3166_2, ALIAS=VB002_MAX_STATE_PROV_
CODE_ISO_, USAGE=A5V, ACTUAL=A5V,
      MISSING=ON,
      TITLE='Customer,State,Province,ISO-3166-2,Code', $
```

The retail_script.acx Access File follows:

```
SEGNAME=RETAIL_SCRIPT,
   CONNECTION=CON01,
   DATASET=RETAIL_SCRIPT.SQL,
   SUBQUERY=Y, $
```

# Creating a Sequential File Using HOLD FORMAT SQL_SCRIPT

The following request against the EMPLOYEE data source creates a sequential file containing the values retrieved by the request along with a corresponding Master File:

```
APP HOLD baseapp
TABLE FILE EMPLOYEE
PRINT LAST_NAME FIRST_NAME
WHERE DEPARTMENT EQ 'MIS'
ON TABLE HOLD AS EMPVALUES FORMAT SQL_SCRIPT
END
```

The sequential file empvalues.ftm contains the following data:

```
SMITH           MARY        JONES           DIANE       MCCOY
JOHN         BLACKWOOD      ROSEMARIE   GREENSPAN       MARY
CROSS           BARBARA
```

The empvalues.mas Master File follows:

```
FILENAME=EMPVALUES, SUFFIX=DATREC  , IOTYPE=BINARY, $
  SEGMENT=EMPVALUE, SEGTYPE=S0, $
    FIELDNAME=LAST_NAME, ALIAS=E01, USAGE=A15, ACTUAL=A15, $
    FIELDNAME=FIRST_NAME, ALIAS=E02, USAGE=A10, ACTUAL=A10, $
    FIELDNAME=NULLFLAG, ALIAS=__NULLFLAG__, USAGE=A2, ACTUAL=A2B,
ACCESS_PROPERTY=(INTERNAL), $
```

# Creating a Structured HOLD File

Structured HOLD Files facilitate migration of data sources and reports between operating environments.

Other HOLD formats capture data from the original sources and may retain some implicit structural elements from the request itself. However, they do not propagate most of the information about the original data sources accessed and their inter-relationships to the HOLD Master File or data source. Structured HOLD files, however, extract the data to a structure that parallels the original data sources. Subsequent requests against the HOLD file can use these retained data relationships to recreate the same types of relationships in other environments or in other types of data sources.

A Structured HOLD File can be created in ALPHA, BINARY, or FOCUS format:

- A Structured HOLD file created in either ALPHA or BINARY format is a flat file that saves the segment instances that contain the data that satisfy the conditions of the TABLE request. Multiple segments are generated based on the original structure read by the TABLE request. Segments are identified by assigning a RECTYPE for differentiation. Child segments in the original data source become a unique segment in the HOLD file
- A Structured HOLD file in FOCUS format uses normal FOCUS segments to retain the original structure.

In all cases the HOLD file contains all of the original segment instances required to provide the complete report based on the TABLE request itself. Regardless of the display command used in the original request (PRINT, LIST, SUM, COUNT), the Structured HOLD File is created as if the request used PRINT. Aggregation is ignored.

The HOLD file contains either all of the fields in the structure identified by the request that are used to satisfy the request, or all of the display fields and BY fields. The file does not contain DEFINE fields not specifically referenced in the request. It does contain all fields needed to evaluate any DEFINE fields referenced in the request.

Structured HOLD files are only supported for TABLE and TABLEF commands. They can be created anywhere a HOLD file is supported. You must activate Structured HOLD files in a specific request by issuing the ON TABLE SET EXTRACT command in the request prior to creating the Structured HOLD File.

# Activate Structured HOLD Files for a Request

```
ON TABLE SET EXTRACT {ON|*|OFF}
```

where:

**ON**

Activates Structured HOLD Files for this request and extracts all fields mentioned in the request.

*****

Activates Structured HOLD Files for this request and indicates that a block of extract options follows. For example, you can exclude specific fields from the Structured HOLD File. For information, see Creating a Structured HOLD File.

**OFF**

Deactivates Structured HOLD files for this request. OFF is the default value.

# Create a Structured HOLD File

Before issuing the HOLD command, activate Structured HOLD Files for the request by issuing the ON TABLE SET EXTRACT command described in Creating a Structured HOLD File. Then issue the HOLD command to create the Structured HOLD File:

```
[ON TABLE] {HOLD|PCHOLD} [AS name] FORMAT {ALPHA|BINARY|FOCUS}
```

where:

**name**

Is the name of the HOLD file. If omitted, the name becomes HOLD by default.

**FORMAT**

Is ALPHA, BINARY or FOCUS.

**Note:** You can issue a SET command to set the default HOLD format to either ALPHA or BINARY:

```
SET HOLDFORMAT=ALPHA
SET HOLDFORMAT=BINARY
```

# Specify Options for Generating Structured HOLD Files

To specify options for creating the extract, such excluding specific fields, use the * option of the SET EXTRACT command:

```
ON TABLE SET EXTRACT *
EXCLUDE = (fieldname1, fieldname2, fieldname3 , ..., fieldnamen),$
FIELDS={ALL|EXPLICIT},$
ENDEXTRACT
ON TABLE HOLD AS name FORMAT {ALPHA|BINARY|FOCUS}
```

where:

**EXCLUDE=(fieldname1, fieldname2, fieldname3,..., fieldnamen)**

Excludes the specified fields from the HOLD file.

**,$**

Is required syntax for delimiting elements in the extract block.

**ALL**

Includes all real fields and all DEFINE fields that are used in running the request.

**EXPLICIT**

Includes only those real fields and DEFINE fields that are in the display list or the BY sort field listing. DEFINE fields that are not explicitly referenced, and fields that are used to evaluate DEFINEs, are not included.

**ENDEXTRACT**

Ends the extract block.

# Creating a Structured HOLD File in ALPHA Format

```
TABLE FILE EMPLOYEE
PRINT LAST_NAME FIRST_NAME JOBCODE ED_HRS
BY DEPARTMENT
BY HIGHEST SALARY
ON TABLE SET EXTRACT ON
ON TABLE HOLD FORMAT ALPHA
END
```

This request produces the following HOLD Master File:

```
FILENAME=HOLD    , SUFFIX=FIX     , $
  SEGMENT=EMPINFO, SEGTYPE=S0, $
    FIELDNAME=RECTYPE, ALIAS=R, USAGE=A3, ACTUAL=A3, $
    FIELDNAME=LAST_NAME, ALIAS='LN', USAGE=A15, ACTUAL=A15, $
    FIELDNAME=FIRST_NAME, ALIAS='FN', USAGE=A10, ACTUAL=A10, $
    FIELDNAME=DEPARTMENT, ALIAS='DPT', USAGE=A10, ACTUAL=A10, $
    FIELDNAME=ED_HRS, ALIAS='OJT', USAGE=F6.2, ACTUAL=A06, $
  SEGMENT=PAYINFO, SEGTYPE=S0, PARENT=EMPINFO, $
    FIELDNAME=RECTYPE, ALIAS=1, USAGE=A3, ACTUAL=A3, $
    FIELDNAME=SALARY, ALIAS='SAL', USAGE=D12.2M, ACTUAL=A12, $
    FIELDNAME=JOBCODE, ALIAS='JBC', USAGE=A3, ACTUAL=A03, $
```

Note the RECTYPE field generated for ALPHA or BINARY Structured HOLD files. Each record in the HOLD file begins with the RECTYPE to indicate the segment to which it belonged in the original structure. The root segment has RECTYPE=R. The RECTYPEs for other segments are sequential numbers assigned in top to bottom, left to right order.

Following are the first several records in the HOLD file:

```
R  STEVENS        ALFRED    PRODUCTION 25.00
1      11000.00A07
1      10000.00A07
R  SMITH          MARY      MIS        36.00
1      13200.00B14
R  JONES          DIANE     MIS        50.00
1      18480.00B03
1      17750.00B02
R  SMITH          RICHARD   PRODUCTION 10.00
1       9500.00A01
1       9050.00B01
```

# Creating a Structured HOLD File in ibi FOCUS Format

```
TABLE FILE EMPLOYEE
PRINT LAST_NAME FIRST_NAME JOBCODE ED_HRS
BY DEPARTMENT
BY HIGHEST SALARY
ON TABLE SET EXTRACT ON
ON TABLE HOLD FORMAT FOCUS
END
```

This request produces the following HOLD Master File:

```
FILENAME=HOLD    , SUFFIX=FOC     , $
  SEGMENT=EMPINFO, SEGTYPE=S0, $
    FIELDNAME=LAST_NAME, ALIAS='LN', USAGE=A15, $
    FIELDNAME=FIRST_NAME, ALIAS='FN', USAGE=A10, $
    FIELDNAME=DEPARTMENT, ALIAS='DPT', USAGE=A10, $
    FIELDNAME=ED_HRS, ALIAS='OJT', USAGE=F6.2, $
  SEGMENT=PAYINFO, SEGTYPE=S0, PARENT=EMPINFO, $
    FIELDNAME=SALARY, ALIAS='SAL', USAGE=D12.2M, $
    FIELDNAME=JOBCODE, ALIAS='JBC', USAGE=A3, $
```

# Reconstituting a Structured HOLD File

The following request reconstitutes the original FOCUS data source from the Structured HOLD File created in the example named *Creating a Structured HOLD File in ALPHA Format*:

```
TABLE FILE HOLD
PRINT LAST_NAME FIRST_NAME JOBCODE ED_HRS
BY DEPARTMENT
BY HIGHEST SALARY
ON TABLE SET EXTRACT ON
ON TABLE HOLD AS RECONST FORMAT FOCUS
END
```

This request produces the following Master File:

```
FILENAME=RECONST    , SUFFIX=FOC     , $
  SEGMENT=EMPINFO, SEGTYPE=S0, $
    FIELDNAME=LAST_NAME, ALIAS='LN', USAGE=A15, $
    FIELDNAME=FIRST_NAME, ALIAS='FN', USAGE=A10, $
    FIELDNAME=DEPARTMENT, ALIAS='DPT', USAGE=A10,
    FIELDNAME=ED_HRS, ALIAS='OJT', USAGE=F6.2, $
  SEGMENT=PAYINFO, SEGTYPE=S0, PARENT=EMPINFO, $
    FIELDNAME=SALARY, ALIAS='SAL', USAGE=D12.2M, $
    FIELDNAME=JOBCODE, ALIAS='JBC', USAGE=A3, $
```

The following request prints the report output:

```
TABLE FILE RECONST
PRINT LAST_NAME FIRST_NAME JOBCODE ED_HRS
BY DEPARTMENT
BY HIGHEST SALARY
END
```

The output is:

```
DEPARTMENT           SALARY  LAST_NAME        FIRST_NAME  JOBCODE  ED_
HRS
----------           ------  ---------        ----------  -------  -----
-
MIS              $27,062.00  CROSS            BARBARA     A17
45.00
                 $25,775.00  CROSS            BARBARA     A16
45.00
                 $21,780.00  BLACKWOOD        ROSEMARIE   B04
75.00
                 $18,480.00  JONES            DIANE       B03
50.00
                             MCCOY            JOHN        B02
.00
```

```
                 $17,750.00  JONES           DIANE       B02
50.00
                 $13,200.00  SMITH           MARY        B14
36.00
                  $9,000.00  GREENSPAN       MARY        A07
25.00
                  $8,650.00  GREENSPAN       MARY        B01
25.00
PRODUCTION       $29,700.00  BANNING         JOHN        A17
.00
                 $26,862.00  IRVING          JOAN        A15
30.00
                 $24,420.00  IRVING          JOAN        A14
30.00
                 $21,120.00  ROMANS          ANTHONY     B04
5.00
                 $16,100.00  MCKNIGHT        ROGER       B02
50.00
                 $15,000.00  MCKNIGHT        ROGER       B02
50.00
                 $11,000.00  STEVENS         ALFRED      A07
25.00
                 $10,000.00  STEVENS         ALFRED      A07
25.00
                  $9,500.00  SMITH           RICHARD     A01
10.00
                  $9,050.00  SMITH           RICHARD     B01
10.00
```

# Excluding Fields From Structured HOLD Files

This request excludes the SALARY field used for sequencing.

```
TABLE FILE EMPLOYEE
PRINT LAST_NAME FIRST_NAME JOBCODE ED_HRS
BY DEPARTMENT
BY HIGHEST SALARY
ON TABLE SET EXTRACT *
EXCLUDE=(SALARY),$
ENDEXTRACT
ON TABLE HOLD FORMAT FOCUS
END
```

This request produces the following HOLD Master File:

```
FILENAME=HOLD   , SUFFIX=FOC     , $
  SEGMENT=EMPINFO, SEGTYPE=S0, $
    FIELDNAME=LAST_NAME, ALIAS='LN', USAGE=A15, $
    FIELDNAME=FIRST_NAME, ALIAS='FN', USAGE=A10, $
    FIELDNAME=DEPARTMENT, ALIAS='DPT', USAGE=A10, $
    FIELDNAME=ED_HRS, ALIAS='OJT', USAGE=F6.2, $
  SEGMENT=PAYINFO, SEGTYPE=S0, PARENT=EMPINFO, $
    FIELDNAME=JOBCODE, ALIAS='JBC', USAGE=A3, $
```

# Elements Included in a Structured HOLD File

Structured HOLD files contain all original segment instances required to complete the TABLE or TABLEF request. Regardless of the display command used in the original request (PRINT, LIST, SUM, or COUNT), the structured HOLD file will be created as if the command was PRINT.

Specifically, the extract file contains the following elements:

- All real fields named in the request such as display objects, sort fields, and fields used in selection criteria (WHERE/IF tests).

  Note that fields referenced multiple times in a request are included only once in the HOLD file.

- Fields used in FILTER FILE condition.
- Prefix operators are ignored except for ALL. (which just affects the amount of data collected and does not imply a calculation).
- Field based reformatting (FIELD1/FIELD2=) causes the original field and the format field to be included.
- A GROUP field if referenced explicitly or when all of its members are referenced in the request.

  **Note:** If a group member is specifically excluded (EXCLUDE) or not referenced, its GROUP is not added to the extract Master File (this applies to nested and overlapping groups, as well). If a GROUP and its elements are all named in a request, the GROUP is not added as a real field in the extract HOLD file.

- For FIELDS=ALL, all DEFINE fields used in the request become real fields in the structured HOLD File and are included along with other fields used in the DEFINE expression (including other DEFINE fields). Use EXCLUDE to reduce the number of

fields included in the EXTRACT output.

- For FIELDS=EXPLICIT, display objects and sort fields are included. DEFINE fields become real fields if referenced in the request, but fields used to create them will not be included unless referenced explicitly. This reduces the number of fields returned in the request.

# Elements Not Included in a Structured HOLD File

- Prefix operators on WHERE fields are evaluated in data selection but not included in the extract output.
- Prefix operators on display objects are ignored (except ALL).
- Using Structured HOLD File syntax in MATCH, MORE, and GRAPH requests produces error messages and exits the procedure.
- WHERE/IF TOTAL tests are not supported in Structured HOLD File requests and result in cancellation of the request.
- Reformatting of real fields is ignored (only the real field is included).
- Computed fields are not included, but fields used in COMPUTE expressions are included in the extract file.

# Structural and Behavioral Notes

- Structured HOLD File requests are subject to the same limitations on number and size of fields as any other TABLE request.

**Structural Notes**

- The following SET parameters are turned off or ignored in Structured HOLD File requests:
  - AUTOINDEX
  - AUTOPATH

  - AUTOSTRATEGY
  - EXTHOLD
  - EXTSORT
  - HOLDATTR
  - All SET and ON TABLE SET commands used to control output format are ignored in creating the extract file.
- Alternate views are respected and reflected in the structure of the extract file.
- Indexed views specified in the request are respected and reflected in the structure of the output file.
- If a request would generate a file containing two independent orphan segments because the parent segment is specifically excluded, a dummy system segment is created in the to act as parent of the two unrelated segments. There is only one instance of data for that segment. Both orphan segments refer to that system segment as parent. If the parent is missing because it was not mentioned in the request, it is activated during the request and included as the parent the segments.
- In the event that two unique (U) segments are included without the parent segment, the unique segments are converted to segments with SEGTYPE S0 that reference the system segment as parent.
- JOIN and JOIN WHERE structures are supported.

**SQL Optimization Notes**

- SQL optimization for aggregation must be turned off for EXTRACT requests.

**BY/ACROSS/FOR Notes**

- BY and ACROSS sort fields become additional display objects.
- BY. . .ROWS and ACROSS . . .COLUMNS function only as implicit WHEREs to limit field values included.
- FOR fields are included.
- RECAP fields are excluded (like COMPUTEs).
- Summarization fields referencing previously identified fields are ignored in creating Structured HOLD Files. These include: SUMMARIZE, RECOMPUTE, SUBTOTAL, SUB-TOTAL ACROSS-TOTAL, ROW-TOTAL and COLUMN-TOTAL.

### Formatting Notes

- Structured HOLD File processing ignores all formatting elements, including: IN, OVER, NOPRINT, SUP-PRINT, FOLD-LINE, SKIP-LINE, UNDER-LINE, PAGE-BREAK, TABPAGENO, AS, and column title justification. However, fields referenced within formatting commands, such as HEADING, FOOTING, SUBHEAD, and SUBFOOT, and any WHEN expressions associated with them, are included.
- All STYLE and STYLESHEET commands are ignored in producing extract output.
- AnV and AnW fields are supported. TX fields are exported in FOCUS files only.
- In the event that the FIELDNAME and ALIAS are the same for a real field and that field is redefined as itself (possibly with a different format), two fields are created in the HOLD Master File with identical field names and aliases. In this situation, the second version of the field can never be accessed if referenced by name. You can use FIELDS=EXPLICIT to include only the second version of the field. The following DEFINE illustrates and example of creating a duplicate field name and alias:

```
DEFINE FILE CAR
COUNTRY/A25=COUNTRY;
END
```

### DBA Notes

- DBA controls on source files are respected when running Structured HOLD File requests with the exception of RESTRICT=NOPRINT, where fields named in a request are not displayed (such fields cannot be exported and should be specifically EXCLUDED).
- DBA restrictions do not carry over to the HOLD Master File.

### Reconstituting Extract Files

- To reconstitute a FOCUS or flat file from a Structured HOLD file, you use the same syntax used to generate the Structured HOLD File. The ON TABLE SET EXTRACT syntax must be used to preserve multipath structures.
- All reconstituted FOCUS segments are SEGTYPE=S0, as neither KEY nor INDEX information is retained. An INDEX can be reinserted using REBUILD INDEX.

# Choosing a Display Format

You can choose from several different display formats when you display a report on the screen. Some display formats are best suited for particular kinds of uses. For example, you can choose to display the report as:

- An HTML page, which is optimized for display in a web browser.
- A PDF document, which is useful when you want the report to look the same whether displayed on a screen or printed.
- A DHTML file, which is HTML output that has most of the features normally associated with output formatted for printing, such as PDF or PostScript output.
- An Excel 2007 worksheet, where you can work with the data in Excel 2007 or higher.
- An Excel 2000 worksheet, where you can work with the data in Excel 2000 or 2003.

You can learn which display formats are available in Report Display Formats.

If you wish to send a report to a file instead of to the screen, you can learn about the file formats that are available in Saving and Reusing Your Report Output.

# Report Display Formats

You can choose from among several display formats for your report:

- **Web format:** HTML. For more information, see Using Web Display Format: HTML.
- **Print formats:** PDF (Adobe Acrobat Portable Document Format) and PostScript (PS). For more information, see Using Print Display Formats: PDF, PS.
- **Word-processing formats:** WP and DOC. For more information, see Using Word Processing Display Formats: DOC, WP.
- **Worksheet formats:** Excel 2007/2010 XML-based format, Excel 2000/2003 HTML-based format, with variations for Excel 2000 PivotTable and Excel 2000 FORMULA, Excel 97 HTML-based format, and Excel binary format. For more information, see Saving Report Output in Excel XLSX Format.

**A note about DHTML and HTML:** DHTML is the absolute positioning version of HTML. As architected, format HTML generates output in a table-based format that leaves the exact positioning to the browser that is presenting the report. Format DHTML on the other hand is designed to render with the user-defined positioning in the same way as PDF. This means things should position on the page precisely as defined in the report procedure. PDF, DHTML, PPT, PPTX, and PS are position-based. HTML and EXL2K are table or cell based. Therefore, DHTML output looks more like PDF rather than HTML.

For information about which file formats are available for saving and reusing (as opposed to displaying) report data, see Saving and Reusing Your Report Output.

**Note:** For styled output formats, setting the LINES parameter to 999 or higher generates continuous forms. When continuous forms are specified, but the output format has a physical page size (as is the case with PDF output), the column titles repeat at the top of the physical page, without page numbers.

# Choose a Display Format Using PCHOLD

You can display a report on screen using the ON TABLE PCHOLD command in a report request.

```
ON TABLE PCHOLD FORMAT formatname
```

where:

**formatname**

Can be one of the following:

| | |
|---|---|
| DOC | Specifies that the report will be displayed as a plain-text word processing document, with page breaks, in Microsoft Word within your web browser. See ○ k<br><br>Using Word Processing Display Formats: DOC, WP. |
| EXCEL | Specifies that the report will be displayed as an Excel spreadsheet. See Saving Report Output in Excel XLSX Format. |

| | |
|---|---|
| XLSX | Specifies that the report will be displayed as an Excel 2007/2010 worksheet. See Saving Report Output in Excel XLSX Format. |
| EXL2K | Specifies that the report will be displayed as an Excel 2000/2003 worksheet. |
| EXL2K FORMULA | Specifies that the report will be displayed as an Excel 2000/2003 worksheet, with WebFOCUS totals and other calculated values translated to active Excel formulas. (If your report does not contain any formulas, consider using EXL2K format since EXL2K FORMULA requires additional processing time.) |
| EXL2K PIVOT | Specifies that the report will be displayed as an Excel 2000/2003 PivotTable. |
| EXL97 | Specifies that the report will be displayed as an Excel 97 worksheet. |
| HTML | Specifies that the report will be displayed as an HTML page. See Using Web Display Format: HTML. |
| PDF | Specifies that the report will be displayed as a PDF document (Adobe Acrobat's Portable Document Format). See Using PDF Display Format. |
| PostScript<br>`(PS)` | Specifies that the report will be displayed as a PostScript document. You must have installed a third party tool capable of displaying PS. See Using PostScript (PS) Display Format. |
| WP | Specifies that the report will be displayed as a plain-text word processing document in the web browser. See Using Word Processing Display Formats: DOC, WP. |

# Choose a Display Format Using SET ONLINE-FMT

For a limited set of formats, you can display a report on screen using the SET command ONLINE-FMT parameter.

Outside of a report request, use the following syntax to specify a format for all report requests within the procedure

```
SET ONLINE-FMT = formatname
```

Within a report request, use the following syntax to specify a format for that request only

```
ON TABLE SET ONLINE-FMT formatname
```

where:

**formatname**

Can be one of the following:

| | |
|---|---|
| HTML (default) | Specifies that the report will be displayed as an HTML page. See Using Web Display Format: HTML. |
| PDF | Specifies that the report will be displayed as a PDF document (Adobe Acrobat Portable Document Format). See Using PDF Display Format. |
| XLSX | Specifies that the report will be displayed as an Excel 2007/2010 worksheet. See Saving Report Output in Excel XLSX Format. |
| EXL2K | Specifies that the report will be displayed as an Excel 2000/2003 worksheet. |
| EXL97 | Specifies that the report will be displayed as an Excel 97 worksheet. |

| | |
|---|---|
| PostScript (PS) | Specifies that the report will be displayed as a PostScript document. You must have installed a third party tool capable of displaying PS. See Using PostScript (PS) Display Format. |
| STANDARD | Specifies that the report will be displayed using a legacy character-based and line-based layout and a monospaced font. |

**Tip:** ONLINE-FMT syntax will be superseded by PCHOLD syntax in future releases of WebFOCUS (see Choose a Display Format Using PCHOLD). At present, they can be used interchangeably.

# Specifying MIME Types for WebFOCUS Reports

In addition to creating reports in HTML format for display in a web browser, you can generate reports that can be returned to the browser and opened in a desktop application or in a helper application. In order for the browser to recognize and call the correct desktop application, you must associate the MIME (Multipurpose Internet Mail Extension) type of the report with a specific application.

For details, see the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

# Preserving Leading and Internal Blanks in Report Output

By default, HTML browsers and Excel remove leading and trailing blanks from text and compress multiple internal blanks to a single blank.

If you want to preserve leading and internal blanks in HTML and EXL2K report output, you can issue the SET SHOWBLANKS=ON command.

Even if you issue this command, trailing blanks will not be preserved except in heading, subheading, footing, and subfooting lines that use the default heading or footing alignment.

# Preserve Leading and Internal Blanks in HTML and EXL2K Reports

In a FOCEXEC or in a profile, use the following syntax:

```
SET SHOWBLANKS = {OFF|ON}
```

In a request, use the following syntax

```
ON TABLE SET SHOWBLANKS {OFF|ON}
```

where:

**OFF**

Removes leading blanks and compresses internal blanks in HTML and EXL2K report output.

**ON**

Preserves leading blanks and internal blanks in HTML and EXL2K report output. Also preserves trailing blanks in heading, subheading, footing, and subfooting lines that use the default heading or footing alignment.

# Preserving Leading and Internal Blanks in HTML and EXL2K Report Output

The following request creates a virtual field that adds leading blanks to the value ACTION and both leading and internal blanks to the values TRAIN/EX and SCI/FI in the CATEGORY field. It also adds trailing blanks to the value COMEDY:

```
SET SHOWBLANKS = OFF
DEFINE FILE MOVIES
NEWCAT/A30 = IF CATEGORY EQ 'ACTION' THEN '  ACTION'
        ELSE IF CATEGORY EQ 'SCI/FI' THEN 'SCIENCE   FICTION'
        ELSE IF CATEGORY EQ 'TRAIN/EX' THEN '   TRAINING    EXERCISE'
        ELSE IF CATEGORY EQ 'COMEDY' THEN 'COMEDY     '
        ELSE                 'GENERAL';
```

```
END
TABLE FILE MOVIES
SUM CATEGORY LISTPR/D12.2 COPIES
BY NEWCAT

ON TABLE SET STYLE *
GRID=OFF,$
TYPE=REPORT, FONT=COURIER NEW,$
ENDSTYLE
END
```

With SHOWBLANKS OFF, these additional blanks are removed:

```
NEWCAT           CATEGORY   LISTPR COPIES
TRANING EXERCISE TRAIN/EX   119.87     10
ACTION           ACTION      94.82     14
COMEDY           COMEDY     154.80     19
GENERAL          MYSTERY  1,216.82     67
SCIENCE FICTION  SCI/FI     114.84      7
```

With SHOWBLANKS ON, the additional leading and internal blanks are preserved. Note that trailing blanks are not preserved:

```
NEWCAT                  CATEGORY   LISTPR COPIES
   TRANING     EXERCISE TRAIN/EX   119.87     10
  ACTION                ACTION      94.82     14
COMEDY                  COMEDY     154.80     19
GENERAL                 MYSTERY  1,216.82     67
SCIENCE    FICTION      SCI/FI     114.84      7
```

# Using Web Display Format: HTML

You can display a report as an HTML page. HTML supports most style sheet options (especially when used with an internal cascading style sheet), allowing for full report formatting.

By default, leading and internal blanks are compressed on the report output. For information on preserving them, see Preserving Leading and Internal Blanks in Report Output.

For more information, see Controlling Report Formatting.

HTML is the default display format when WebFOCUS is installed. An HTML report opens in your web browser.

If you do not wish to rely on the default, you can specify that a report display as an HTML page when you run the report. You can use either:

- **PCHOLD command.** For more information, see Choose a Display Format Using PCHOLD.
- **ONLINE-FMT parameter** of the SET command. For more information, see Choose a Display Format Using SET ONLINE-FMT.

HTML display format requires that the SET command's STYLESHEET parameter be set to any value *except* OFF. Appropriate values include ON (the default), the name of a StyleSheet file, or an inline StyleSheet (*).

Reporting and formatting options that are supported for HTML are described and illustrated extensively throughout the WebFOCUS language documentation.

You can additionally customize the display of HTML reports with any JavaScript or VBScript function using the JSURL SET parameter. For details, see the ibi™ WebFOCUS® Developing Reporting Applications manual.

# Customizing the Display of an HTML Report

The following example illustrates how you can customize the display of an HTML report by calling your own JavaScript function in addition to the WebFOCUS default JavaScript functions. Use the JSURL SET parameter to accomplish this.

The JavaScript function shown here disables the right-click menu when you run a report.

1. Create a js file and save it in a location accessible by the web server.

   For example, the following disables the right-click menu in an HTML report:

```
function setnocontextclick () {
   if (document.body != null) {
      document.body.oncontextmenu=new Function("return false");
   }
   else
```

```
      window.setTimeout("setnocontextclick()",100);
}
function killmenuOnLoadFunc(arrayofonloads,currentindex) {
     setnocontextclick();
}
```

This file is saved as killmenu.js in the ibi_apps/ibi_html directory.

**Note:** The onload function must be named in the format.

```
customfunctionnameOnLoadFunc
```

where:

**customfunctionname**

Is the name of the JavaScript file that contains the function code.

2. Add the JSURL parameter to your TABLE request. You can add the command to the edasprof.prf file if you want the js file to run with every HTML report that is run on that server.
3. Run the report.

```
SET JSURL=/ibi_apps/ibi_html/killmenu.js
TABLE FILE CENTORD
SUM QUANTITY
BY PLANTLNG
END
```

The right-click menu option is not available in the report output.

# Disabling Default WebFOCUS JavaScript Functions

You can disable or modify default WebFOCUS JavaScript functions using the JSURL SET parameter. The following example illustrates how all WebFOCUS default functions can be displayed in an alert box and disabled.

1. Create a js file and save it in a location accessible by the web server.

   This file is saved as disable.js in the ibi_apps/ibi_html directory. The arrayofonloads

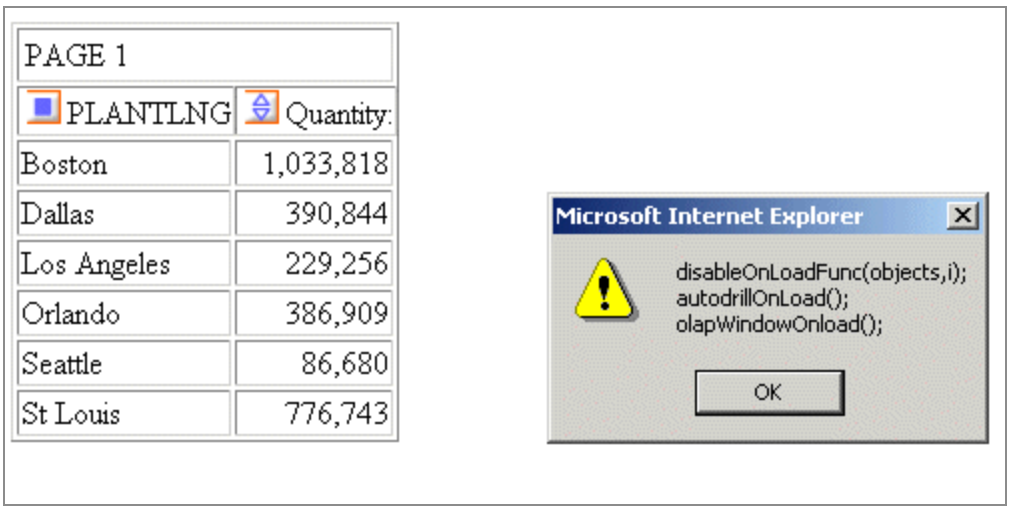
array consists of two string parameters, str1 and str2. str1 is the name of the function to call on load. str2 is a Boolean (true/false) that indicates whether or not to perform the action described by str1. The currentindex parameter is a sequence number that defines the order in which the function is loaded when the page is displayed.

```
function disableOnLoadFunc(arrayofonloads,currentindex) {
  buffer ="";
   for (var index=0;index<arrayofonloads.length;index++) {
      buffer += arrayofonloads[index].str1+"\n" ;
      arrayofonloads[index].str2=false;
   }
   alert(buffer);
}
```

2. Add the JSURL parameter to your TABLE request.
3. Run the report.

```
-OLAP ON
SET AUTODRILL = ON
SET JSURL=/ibi_apps/ibi_html/disable.js
TABLE FILE CENTORD
SUM QUANTITY
BY PLANTLNG
END
```

The output looks like this:



# Usage Notes for HTML Report Output

- The default behavior for HTML format when borders are turned on is to display column titles without the underline. To display column titles with underlines when borders are on, set GRID OFF.
- The AUTOFIT parameter automatically resizes HTML report output to fit the container (window or frame). For procedures that contain multiple report output, if AUTOFIT is set to ON in any of the report output procedures, the setting will apply to all report output on the page.

  AUTOFIT is supported using the Accordion, On Demand Paging, HTML TOC, and HFREEZE interactive reporting features.

  For more information on the AUTOFIT parameter, see the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

# Creating HTML Reports With Absolute Positioning

Format DHTML provides HTML output that has most of the features normally associated with output formatted for printing such as PDF or PostScript output. You can create an HTML file (.htm) or a Web Archive file (.mht). The type of output file produced is controlled by the value of the HTMLARCHIVE parameter.

Some of the features supported by format DHTML are:

- **Absolute positioning.** DHTML precisely places text and images inside an HTML report, allowing you to use the same StyleSheet syntax to lay out HTML as you use for PDF or PS output.
- **On demand paging.** On demand paging is available with SET HTMLARCHIVE=OFF.
- **PDF StyleSheet features.** For example, the following features are supported: grids, background colors, OVER.

# Create Web Archive Report Output

```
SET HTMLARCHIVE = {ON|OFF}
```

where:

**ON**

Creates output in Web Archive format. The file type of the output file is MHT.

**OFF**

Creates output in HTML format. The file type of the output file is HTM. OFF is the default value.

# Create a DHTML Report

```
[ON TABLE] HOLD [AS name] FORMAT DHTML
```

where:

**name**

Specifies the name of the output file. The extension will be HTML if SET HTMLARCHIVE is OFF or MHT if SET HTMLARCHIVE is ON.

# Usage Notes for Format DHTML

- The font map file for DHTML reports is member DHTML in the ERRORS data set.
- Legacy compound reports are not supported.

# Creating a DHTML Report

The following example creates a DHTML file that has an image with absolute positioning:

```
SET HTMLARCHIVE = OFF
TABLE FILE GGSALES
SUM UNITS BY CATEGORY BY PRODUCT
ON TABLE SUBHEAD
"Report on Units Sold"
" "
" "
" "
" "
" "
ON TABLE SET PAGE-NUM OFF
ON TABLE HOLD FORMAT DHTML
ON TABLE SET STYLE *
TYPE=TABHEADING,IMAGE=c:\images\GOTHAM.GIF, POSITION=(.25 .25),
 SIZE=(.5 .5), $
ENDSTYLE
END
```

The output shows that the look and positioning are the same as they would be for a PDF report:

Report on Units Sold

| Category | Product | Unit Sales |
|---|---|---|
| Coffee | Capuccino | 189217 |
| | Espresso | 308986 |
| | Latte | 878063 |
| Food | Biscotti | 421377 |
| | Croissant | 630054 |
| | Scone | 333414 |
| Gifts | Coffee Grinder | 186534 |
| | Coffee Pot | 190695 |
| | Mug | 360570 |
| | Thermos | 190081 |

# Using Print Display Formats: PDF, PS

PDF (Adobe Acrobat Portable Document Format) is most often used to distribute and share electronic documents through the web. It is especially useful if you want a report to

maintain its presentation and layout regardless of a browser or printer type. For details, see Using PDF Display Format.

PS (PostScript format), a print-oriented page description language, is most often used to send a report directly to a printer. While used less frequently as an online display format, you can display PS report output on your monitor before printing it. For details, see Using PostScript (PS) Display Format.

With the exception of drill-downs, all of the report formatting features that are supported for PDF are also supported for PostScript output.

You can specify that a report display as a PDF or PS document when you run the report. You can use either:

- **PCHOLD command.** For more information, see Choose a Display Format Using PCHOLD.
- **ONLINE-FMT parameter** of the SET command. For more information, see Choose a Display Format Using SET ONLINE-FMT.

You can combine multiple styled reports into a single PDF or PS file. For details, see Laying Out the Report Page.

PDF and PS reports, including compound reports, can be distributed using ReportCaster. See the *ibi™ WebFOCUS® ReportCaster Guide* for details.

# Required Files and DDNAMES

When you produce a PostScript or PDF report, you need the following files:

| Name | Purpose | z/OS |
|---|---|---|
| StyleSheet files. You can create them with a text editor (see Styling Reports). | Define the styles in reports. | Any member of the data set allocated to ddname FOCSTYLE. Alternatively, you can specify the StyleSheet in your report request and eliminate the need for a separate StyleSheet file. |

| Name | Purpose | z/OS |
|---|---|---|
| Adobe Font Metrics (AFM) files (supplied with FOCUS). | Define the measurements of characters for PostScript and PDF output. | Member names start with PS. Allocated to ddname ERRORS. |
| Font location file (supplied with FOCUS). | Maps font names to the Font Metrics files. | Members FONTMAP and FONTUSER in the data set allocated to ddname ERRORS. |
| Output files. You create these with a HOLD, SAVE, or SET command. | Contain the formatted output. | DDNAME is HOLD or the AS name assigned in the HOLD command. |

Note that if you add fonts, you also need PFA or PFB files for those fonts.

# Using PDF Display Format

You can display a report as a PDF document. PDF (Adobe Acrobat Portable Document Format) supports most StyleSheet attributes, allowing for full report formatting. The wide range of StyleSheet features supported for PDF are described throughout this documentation.

PDF prints and displays a document consistently, regardless of the application software, hardware, and operating system used to create or display the document.

The report opens in Adobe Acrobat or Acrobat Reader within a web browser. To display a PDF report, a computer must have Adobe Acrobat Reader installed. For free downloads of Acrobat Reader, go to http://www.adobe.com.

**Limit:** Adobe Acrobat PDF format limits the number of pages, hyperlinks, and images in a document. For information about what limits this creates for a WebFOCUS report in PDF format, see Saving and Reusing Your Report Output.

**Other print-oriented display formats.** You can also display a report as a PostScript document. For more information, see Using PostScript (PS) Display Format.

# Compress a PDF Output File

File compression can be used to minimize the physical size of the PDF output file. Using this PDF-specific feature, you can generate smaller PDF files, making them easier to store and distribute, while having no visible effect on the formatting or content of the reports they contain.

```
SET FILECOMPRESS = {ON|OFF}
```

where:

**ON**

Compresses PDF output files.

**OFF**

Does not compress PDF output files. OFF is the default value.

This command applies to PDF output only. It is ignored by all other output formats, such as HTML and Excel.

# Displaying Watermarks in PDF Output

Watermarks are images or text strings that are placed on the bottom layer of a document and displayed through the transparent layered content.

WebFOCUS backcolor does not support transparency. Therefore, standard images placed below it on the page may be obscured. To resolve this, in PDF reports, WebFOCUS mirrors the approach taken by standard printers, and places an opaque image on the top of the document layers. With this approach, the layers of the document will be visible beneath the transparent watermark image.

Watermark images are provided by the report developer. When creating a transparent image, the image needs to be created in GIF format with a transparent background.

# Inserting Images in PDF Reports With Backcolor

Watermarks are supported for PDF output in compound reports and in single TABLE requests. Each document supports a single active watermark image. This image is designated as the watermark image, by defining the placement order within the Z-INDEX attribute.

The first image with a Z-INDEX value will be considered the active watermark for the current document. Any subsequent images, defined with style sheet attributes for Z-INDEX or OPACITY, will be displayed as standard WebFOCUS images.

Watermark images are designated by defining the following attributes in the style sheet for the transparent GIF.

| | |
|---|---|
| Z-INDEX=TOP | Designates that the image is to be handled as a watermark image and should always be placed on top of all other objects on the page. This value will be respected as the topmost layer and will be supported with other layers in future releases. |
| OPACITY=*n* | Where *n* represents the percent (%) of OPACITY to be applied to the image. The greater the OPACITY, the less transparent the image. Less of the underlying report will be visible below the image. The value for *n* can be any number from 0 through 100. If a value is not specified, it defaults to 100%, presenting a fully opaque image. |

Within a single TABLE request:

```
TYPE=<REPORT|HEADING>, OBJECT=IMAGE, IMAGE=<image.gif>,
Z-INDEX=TOP, OPACITY=15, POSITION=(.25 .25), DIMENSION=(8 10.5),$
```

Within compound syntax:

**On Page Master**

```
PAGELAYOUT=ALL, NAME='Page Master', $
OBJECT=IMAGE, IMAGE= internalonlyport.GIF, Z-INDEX=TOP, OPACITY=15,
POSITION=(.25 .25), DIMENSION=(8 10.5),$
```

**On Page Layout**

```
PAGELAYOUT=1, NAME='Page Layout1', $
OBJECT=IMAGE, IMAGE= internalonlyport.GIF, Z-INDEX=TOP, OPACITY=15,
POSITION=(.25 .25), DIMENSION=(8 10.5),$
```

# Inserting Transparent Images Into a PDF Report

The following request against the GGSALES data source places the coffee image (coffee.gif) on the page and layers the watermark image (internalonlyport.gif) on top. These images are displayed on every page of the report.

```
TABLE FILE GGSALES
SUM
     GGSALES.SALES01.DOLLARS/D12CM
     GGSALES.SALES01.UNITS/D12C
     GGSALES.SALES01.BUDDOLLARS/D12CM
     GGSALES.SALES01.BUDUNITS/D12C
BY GGSALES.SALES01.REGION
BY GGSALES.SALES01.CATEGORY
BY GGSALES.SALES01.PRODUCT
HEADING
"Gotham Grinds"
"Product Sales By Region"
ON TABLE SET PAGE-NUM NOLEAD
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
   INCLUDE = endeflt,
   TOPMARGIN=.5,
   BOTTOMMARGIN=.5,
   LEFTMARGIN=1,
   RIGHTMARGIN=1,
$
TYPE=REPORT,
    OBJECT=IMAGE,
    IMAGE=internalonlyport.gif,
    POSITION=(+0.70000 +0.70000),
    SIZE=(7 7.5),
    Z-INDEX=TOP, OPACITY=15,
$
TYPE=REPORT,
    OBJECT=IMAGE,
    IMAGE=coffee.gif,
```

```
    POSITION=(+1.0 +0.5),
    SIZE=(.5 .5),
$ENDSTYLE
END
```

The output is:

**Gotham Grinds**
**Product Sales By Region**

| Region | Category | Product | Dollar Sales | Unit Sales | Budget Dollars | Budget Units |
|---|---|---|---|---|---|---|
| Midwest | Coffee | Espresso | $1,294,947 | 101,154 | $1,258,232 | 101,869 |
| | | Latte | $2,883,566 | 231,623 | $2,827,800 | 233,657 |
| | Food | Biscotti | $1,091,727 | 86,105 | $1,067,629 | 85,839 |
| | | Croissant | $1,751,124 | 139,182 | $1,708,733 | 139,648 |
| | | Scone | $1,495,420 | 116,127 | $1,444,359 | 113,776 |
| | Gifts | Coffee Grinder | $619,154 | 50,393 | $613,453 | 50,628 |
| | | Coffee Pot | $599,878 | 47,156 | $614,007 | 47,779 |
| | | Mug | $1,086,943 | 86,718 | $1,096,150 | 87,092 |
| | | Thermos | $577,906 | 46,587 | $564,010 | 46,819 |
| Northeast | Coffee | Capuccino | $542,095 | 44,785 | $561,491 | 44,432 |
| | | Espresso | $850,107 | 68,127 | $872,902 | 69,776 |
| | | Latte | $2,771,815 | 222,866 | $2,818,069 | 221,712 |
| | Food | Biscotti | $1,802,005 | 145,242 | $1,848,682 | 145,152 |
| | | Croissant | $1,670,818 | 137,394 | $1,739,522 | 137,864 |
| | | Scone | $907,171 | 70,732 | $865,703 | 68,415 |
| | Gifts | Coffee Grinder | $509,200 | 40,977 | $511,642 | 41,297 |
| | | Coffee Pot | $590,780 | 46,185 | $573,349 | 45,404 |
| | | Mug | $1,144,211 | 91,497 | $1,170,314 | 90,540 |
| | | Thermos | $604,098 | 48,870 | $615,247 | 49,767 |
| Southeast | Coffee | Capuccino | $944,000 | 73,264 | $956,661 | 75,353 |
| | | Espresso | $853,572 | 68,030 | $849,465 | 66,785 |
| | | Latte | $2,617,836 | 209,654 | $2,625,303 | 213,555 |
| | Food | Biscotti | $1,505,717 | 119,594 | $1,512,019 | 120,549 |
| | | Croissant | $1,902,359 | 156,456 | $1,969,906 | 157,148 |
| | | Scone | $900,655 | 73,779 | $927,363 | 73,812 |
| | Gifts | Coffee Grinder | $605,777 | 47,083 | $569,585 | 46,784 |
| | | Coffee Pot | $645,303 | 49,922 | $654,579 | 50,637 |
| | | Mug | $1,102,703 | 88,474 | $1,124,345 | 89,371 |
| | | Thermos | $632,457 | 48,976 | $618,745 | 48,253 |
| West | Coffee | Capuccino | $895,495 | 71,168 | $877,304 | 70,585 |
| | | Espresso | $907,617 | 71,675 | $923,941 | 72,927 |
| | | Latte | $2,670,405 | 213,920 | $2,722,718 | 215,272 |
| | Food | Biscotti | $863,868 | 70,436 | $861,804 | 67,780 |
| | | Croissant | $2,425,601 | 197,022 | $2,406,554 | 195,329 |
| | | Scone | $912,868 | 72,776 | $914,886 | 72,252 |
| | Gifts | Coffee Grinder | $603,436 | 48,081 | $571,316 | 47,397 |
| | | Coffee Pot | $613,624 | 47,432 | $630,196 | 49,208 |
| | | Mug | $1,188,664 | 93,881 | $1,156,976 | 93,629 |
| | | Thermos | $571,368 | 45,648 | $575,818 | 46,402 |

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# Features Supported

The following core PDF features are supported with watermarks:

- Standard TABLE requests, including reports with paneling
- Compound report (MERGE=OFF)
- Coordinated compound report (MERGE=ON)
- Old compound syntax (OPEN/CLOSE)
- Drilldown
- Drillthrough
- Bookmarks
- Borders/backcolor

# Limits

- OPACITY must be between 0 and 100, inclusive.
- A single watermark image is supported for a single document.

# Usage Notes

- For new compound syntax, the first watermark image found in the syntax will be used for the report. Any other watermark images found in the code will be ignored or displayed as standard WebFOCUS images.
- For old compound syntax, the watermark image must be in the first report. If it is not in the first report, a FOC3362 message is generated.
- The embedded PDF viewer for a browser may not display NLS characters correctly. If NLS characters do not display correctly, use font embedding, as described in Adding PostScript Type 1 Fonts for PS and PDF Formats, or configure your browser to use Adobe Reader.

# Scaling PDF Report Output to Fit the Page Width

By default, if PDF report output is too wide to fit on a single page, the report generates multiple panels of the same page for the columns that do not fit. The page numbers specify the page and panel numbers. For example, page numbers 1.1 and 1.2 represent page 1/panel 1 and page 1/panel 2.

You can scale the output to fit across the width of the page using the PAGE-SCALE StyleSheet attribute or the PAGE-SCALE SET parameter.

# Scale PDF Report Output to Fit the Page Width

In a StyleSheet, use the following syntax.

```
TYPE=REPORT, PAGE-SCALE={OFF|AUTO}, $
```

In a procedure or profile, use the following syntax.

```
SET PAGE-SCALE = {OFF|AUTO}
```

In a request, use the following syntax.

```
ON TABLE SET PAGE-SCALE {OFF|AUTO}
```

where:

**OFF**

Disables page scaling in PDF report output. This is the default value.

**AUTO**

Implements page scaling in PDF report output.

# Usage Notes for PAGE-SCALE

- PAGE-SCALE is supported for PDF report output only.
- When a page is scaled to fit more content on the page horizontally, fewer vertical pages may be generated, as well.

# Scaling PDF Report Output to Fit the Page Width

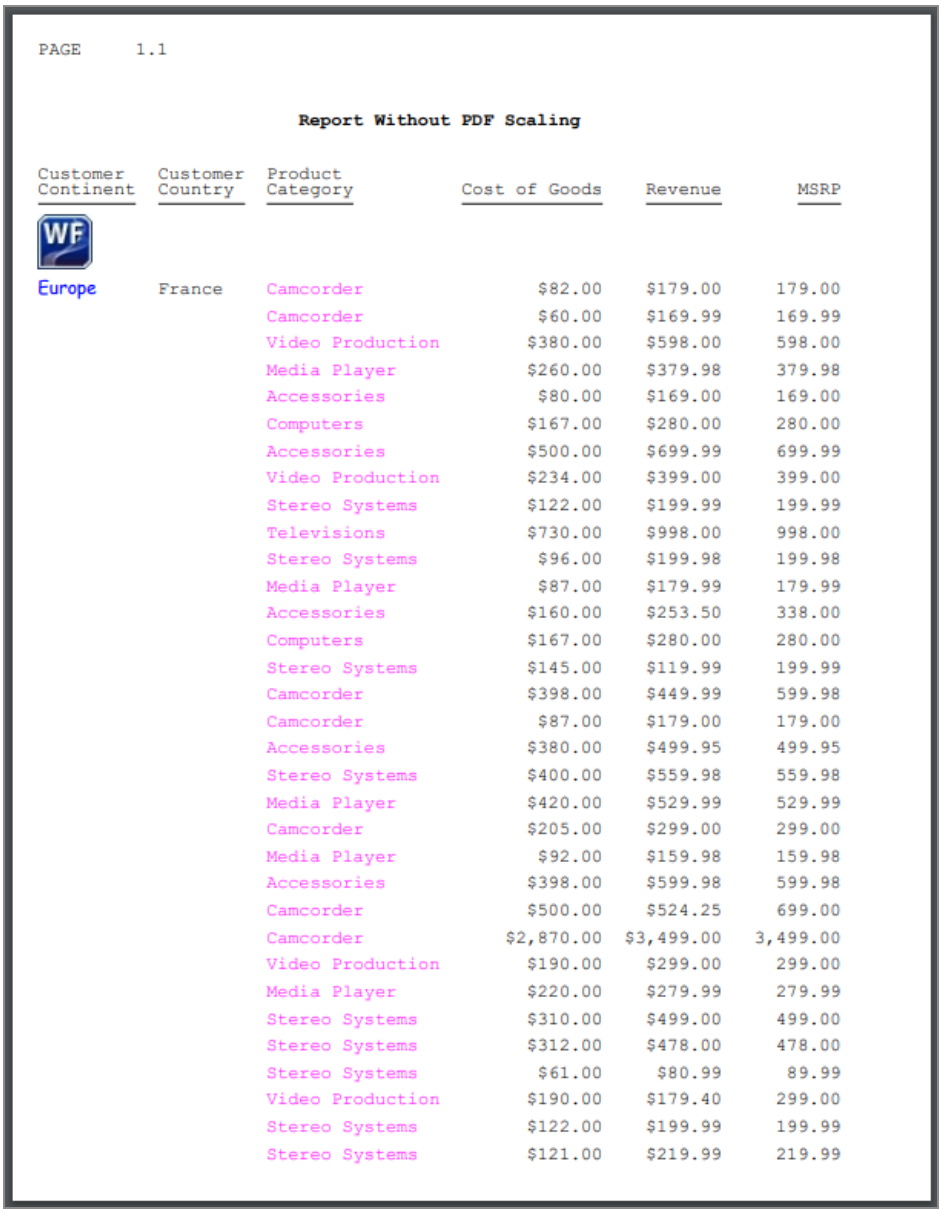
The following request generates PDF report output without using page scaling.

```
SET SQUEEZE=ON
DEFINE FILE WF_RETAIL_LITE
SHOWPIC/A100='C:\ibi\WebFOCUS82\samples\web_
resource\signin\images\favicon.jpg';
END

TABLE FILE WF_RETAIL_LITE
PRINT  PRODUCT_CATEGORY
COGS_US REVENUE_US MSRP_US DISCOUNT_US GROSS_PROFIT_US QUANTITY_SOLD
BY SHOWPIC NOPRINT
BY CONTINENT_NAME
BY COUNTRY_NAME
WHERE COUNTRY_NAME EQ 'FRANCE' OR 'ITALY'
WHERE RECORDLIMIT=3000;
ON TABLE SUBHEAD
" "
" "
" Report Without PDF Scaling "
" "
" "
ON COUNTRY_NAME SUBHEAD
" "
" "
ON TABLE PCHOLD FORMAT PDF

ON TABLE SET STYLE *
TYPE=DATA, COLUMN=CONTINENT_NAME, FONT=COMIC SANS MS,
  COLOR=BLUE, STYLE=BOLD+ITALIC, $
TYPE=DATA, COLUMN=PRODUCT_CATEGORY, COLOR=FUSCHIA, $
TYPE=HEADING, STYLE=BOLD, COLOR=RGB(0 35 95), SIZE=12, JUSTIFY=CENTER, $
TYPE=SUBHEAD, SIZE=18, STYLE=BOLD, COLOR=RED, $
TYPE=SUBHEAD, IMAGE=(SHOWPIC), SIZE=(.5 .5), $
```

```
TYPE=TABHEADING, SIZE=12, STYLE=BOLD, JUSTIFY=CENTER, $
ENDSTYLE
END
```

**Note:** The image displayed in the subheading is distributed with WebFOCUS. The path to the image is dependent on your platform and installation options. The path in the request uses the default installation directory on Windows.

The output is too wide for the page and is paneled. Page 1.1 has the columns that fit across the width of the page, as shown in the following image.



PAGE 1.1

**Report Without PDF Scaling**

| Customer Continent | Customer Country | Product Category | Cost of Goods | Revenue | MSRP |
|---|---|---|---|---|---|
| Europe | France | Camcorder | $82.00 | $179.00 | 179.00 |
| | | Camcorder | $60.00 | $169.99 | 169.99 |
| | | Video Production | $380.00 | $598.00 | 598.00 |
| | | Media Player | $260.00 | $379.98 | 379.98 |
| | | Accessories | $80.00 | $169.00 | 169.00 |
| | | Computers | $167.00 | $280.00 | 280.00 |
| | | Accessories | $500.00 | $699.99 | 699.99 |
| | | Video Production | $234.00 | $399.00 | 399.00 |
| | | Stereo Systems | $122.00 | $199.99 | 199.99 |
| | | Televisions | $730.00 | $998.00 | 998.00 |
| | | Stereo Systems | $96.00 | $199.98 | 199.98 |
| | | Media Player | $87.00 | $179.99 | 179.99 |
| | | Accessories | $160.00 | $253.50 | 338.00 |
| | | Computers | $167.00 | $280.00 | 280.00 |
| | | Stereo Systems | $145.00 | $119.99 | 199.99 |
| | | Camcorder | $398.00 | $449.99 | 599.98 |
| | | Camcorder | $87.00 | $179.00 | 179.00 |
| | | Accessories | $380.00 | $499.95 | 499.95 |
| | | Stereo Systems | $400.00 | $559.98 | 559.98 |
| | | Media Player | $420.00 | $529.99 | 529.99 |
| | | Camcorder | $205.00 | $299.00 | 299.00 |
| | | Media Player | $92.00 | $159.98 | 159.98 |
| | | Accessories | $398.00 | $599.98 | 599.98 |
| | | Camcorder | $500.00 | $524.25 | 699.00 |
| | | Camcorder | $2,870.00 | $3,499.00 | 3,499.00 |
| | | Video Production | $190.00 | $299.00 | 299.00 |
| | | Media Player | $220.00 | $279.99 | 279.99 |
| | | Stereo Systems | $310.00 | $499.00 | 499.00 |
| | | Stereo Systems | $312.00 | $478.00 | 478.00 |
| | | Stereo Systems | $61.00 | $80.99 | 89.99 |
| | | Video Production | $190.00 | $179.40 | 299.00 |
| | | Stereo Systems | $122.00 | $199.99 | 199.99 |
| | | Stereo Systems | $121.00 | $219.99 | 219.99 |

Page 1.2 has the remaining columns, as shown in the following image.

PAGE 1.2

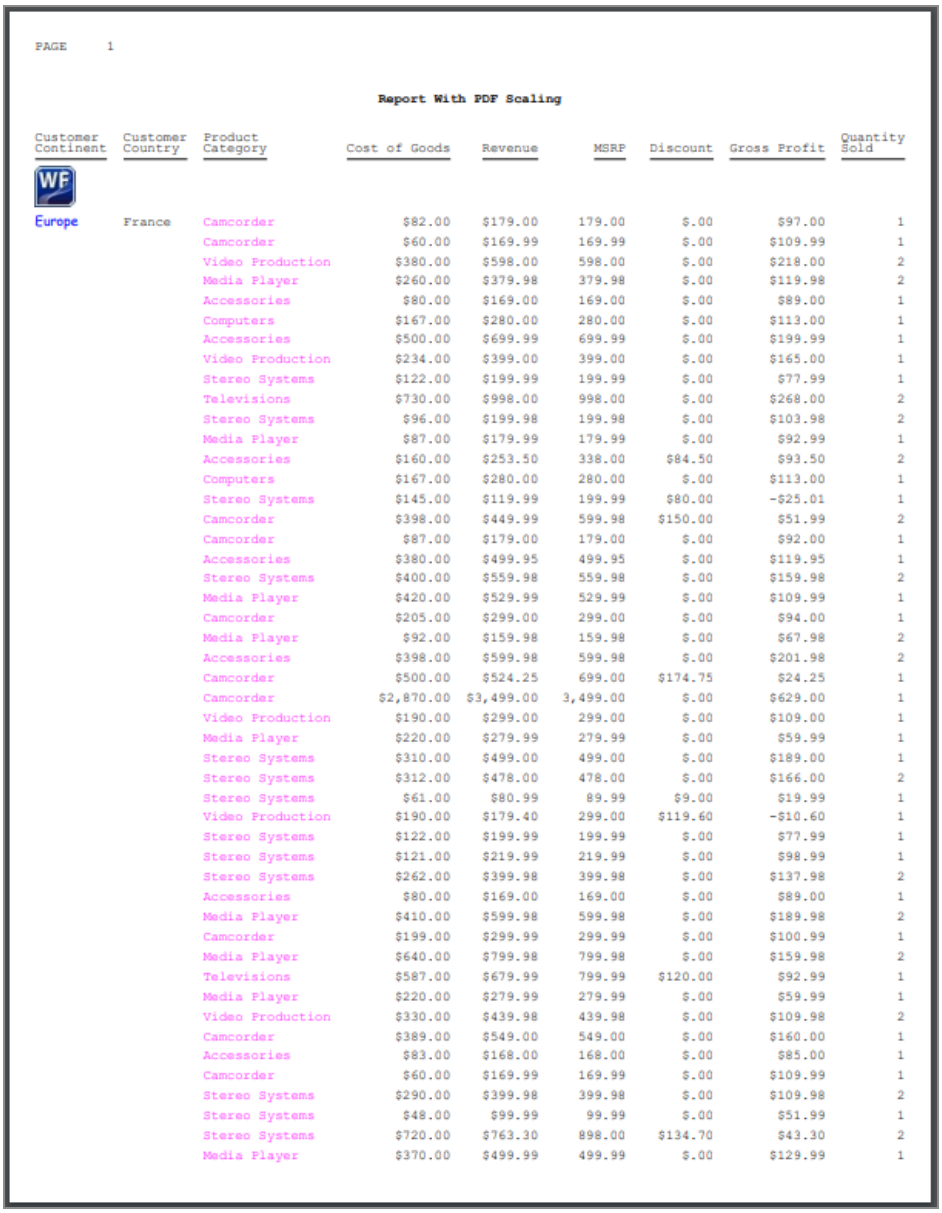
| Discount | Gross Profit | Quantity Sold |
|---|---|---|
| $.00 | $97.00 | 1 |
| $.00 | $109.99 | 1 |
| $.00 | $218.00 | 2 |
| $.00 | $119.98 | 2 |
| $.00 | $89.00 | 1 |
| $.00 | $113.00 | 1 |
| $.00 | $199.99 | 1 |
| $.00 | $165.00 | 1 |
| $.00 | $77.99 | 1 |
| $.00 | $268.00 | 2 |
| $.00 | $103.98 | 2 |
| $.00 | $92.99 | 1 |
| $84.50 | $93.50 | 2 |
| $.00 | $113.00 | 1 |
| $80.00 | -$25.01 | 1 |
| $150.00 | $51.99 | 2 |
| $.00 | $92.00 | 1 |
| $.00 | $119.95 | 1 |
| $.00 | $159.98 | 2 |
| $.00 | $109.99 | 1 |
| $.00 | $94.00 | 1 |
| $.00 | $67.98 | 2 |
| $.00 | $201.98 | 2 |
| $174.75 | $24.25 | 1 |
| $.00 | $629.00 | 1 |
| $.00 | $109.00 | 1 |
| $.00 | $59.99 | 1 |
| $.00 | $189.00 | 1 |
| $.00 | $166.00 | 2 |
| $9.00 | $19.99 | 1 |
| $119.60 | -$10.60 | 1 |
| $.00 | $77.99 | 1 |
| $.00 | $98.99 | 1 |

The following version of the request uses page scaling.

```
SET SQUEEZE=ON
DEFINE FILE WF_RETAIL_LITE
SHOWPIC/A100='C:\ibi\WebFOCUS82\samples\web_
resource\signin\images\favicon.jpg';
END
```

```
TABLE FILE WF_RETAIL_LITE
PRINT  PRODUCT_CATEGORY
COGS_US REVENUE_US MSRP_US DISCOUNT_US GROSS_PROFIT_US QUANTITY_SOLD
BY SHOWPIC NOPRINT
BY CONTINENT_NAME
BY COUNTRY_NAME
WHERE COUNTRY_NAME EQ 'FRANCE' OR 'ITALY'
WHERE RECORDLIMIT=3000;
ON TABLE SUBHEAD
" "
" "
" Report With PDF Scaling "
" "
" "
ON COUNTRY_NAME SUBHEAD
" "
" "
ON TABLE PCHOLD FORMAT PDF

ON TABLE SET STYLE *
TYPE=REPORT, PAGE-SCALE=AUTO, $
TYPE=DATA, COLUMN=CONTINENT_NAME, FONT=COMIC SANS MS,
  COLOR=BLUE, STYLE=BOLD+ITALIC, $
TYPE=DATA, COLUMN=PRODUCT_CATEGORY, COLOR=FUSCHIA, $
TYPE=HEADING, STYLE=BOLD, COLOR=RGB(0 35 95), SIZE=12, JUSTIFY=CENTER, $
TYPE=SUBHEAD, SIZE=18, STYLE=BOLD, COLOR=RED, $
TYPE=SUBHEAD, IMAGE=(SHOWPIC), SIZE=(.5 .5), $
TYPE=TABHEADING, SIZE=12, STYLE=BOLD, JUSTIFY=CENTER, $
ENDSTYLE
END
```

The output is shown in the following image. All of the columns fit across the width of the page, with no paneling.



PAGE 1

**Report With PDF Scaling**

| Customer Continent | Customer Country | Product Category | Cost of Goods | Revenue | MSRP | Discount | Gross Profit | Quantity Sold |
|---|---|---|---|---|---|---|---|---|
| Europe | France | Camcorder | $82.00 | $179.00 | 179.00 | $.00 | $97.00 | 1 |
| | | Camcorder | $60.00 | $169.99 | 169.99 | $.00 | $109.99 | 1 |
| | | Video Production | $380.00 | $598.00 | 598.00 | $.00 | $218.00 | 2 |
| | | Media Player | $260.00 | $379.98 | 379.98 | $.00 | $119.98 | 2 |
| | | Accessories | $80.00 | $169.00 | 169.00 | $.00 | $89.00 | 1 |
| | | Computers | $167.00 | $280.00 | 280.00 | $.00 | $113.00 | 1 |
| | | Accessories | $500.00 | $699.99 | 699.99 | $.00 | $199.99 | 1 |
| | | Video Production | $234.00 | $399.00 | 399.00 | $.00 | $165.00 | 1 |
| | | Stereo Systems | $122.00 | $199.99 | 199.99 | $.00 | $77.99 | 1 |
| | | Televisions | $730.00 | $998.00 | 998.00 | $.00 | $268.00 | 2 |
| | | Stereo Systems | $96.00 | $199.98 | 199.98 | $.00 | $103.98 | 2 |
| | | Media Player | $87.00 | $179.99 | 179.99 | $.00 | $92.99 | 1 |
| | | Accessories | $160.00 | $253.50 | 338.00 | $84.50 | $93.50 | 2 |
| | | Computers | $167.00 | $280.00 | 280.00 | $.00 | $113.00 | 1 |
| | | Stereo Systems | $145.00 | $119.99 | 199.99 | $80.00 | -$25.01 | 1 |
| | | Camcorder | $398.00 | $449.99 | 599.98 | $150.00 | $51.99 | 2 |
| | | Camcorder | $87.00 | $179.00 | 179.00 | $.00 | $92.00 | 1 |
| | | Accessories | $380.00 | $499.95 | 499.95 | $.00 | $119.95 | 1 |
| | | Stereo Systems | $400.00 | $559.98 | 559.98 | $.00 | $159.98 | 2 |
| | | Media Player | $420.00 | $529.99 | 529.99 | $.00 | $109.99 | 1 |
| | | Camcorder | $205.00 | $299.00 | 299.00 | $.00 | $94.00 | 1 |
| | | Media Player | $92.00 | $159.98 | 159.98 | $.00 | $67.98 | 2 |
| | | Accessories | $398.00 | $599.98 | 599.98 | $.00 | $201.98 | 2 |
| | | Camcorder | $500.00 | $524.25 | 699.00 | $174.75 | $24.25 | 1 |
| | | Camcorder | $2,870.00 | $3,499.00 | 3,499.00 | $.00 | $629.00 | 1 |
| | | Video Production | $190.00 | $299.00 | 299.00 | $.00 | $109.00 | 1 |
| | | Media Player | $220.00 | $279.99 | 279.99 | $.00 | $59.99 | 1 |
| | | Stereo Systems | $310.00 | $499.00 | 499.00 | $.00 | $189.00 | 1 |
| | | Stereo Systems | $312.00 | $478.00 | 478.00 | $.00 | $166.00 | 2 |
| | | Stereo Systems | $61.00 | $80.99 | 89.99 | $9.00 | $19.99 | 1 |
| | | Video Production | $190.00 | $179.40 | 299.00 | $119.60 | -$10.60 | 1 |
| | | Stereo Systems | $122.00 | $199.99 | 199.99 | $.00 | $77.99 | 1 |
| | | Stereo Systems | $121.00 | $219.99 | 219.99 | $.00 | $98.99 | 1 |
| | | Stereo Systems | $262.00 | $399.98 | 399.98 | $.00 | $137.98 | 2 |
| | | Accessories | $80.00 | $169.00 | 169.00 | $.00 | $89.00 | 1 |
| | | Media Player | $410.00 | $599.98 | 599.98 | $.00 | $189.98 | 2 |
| | | Camcorder | $199.00 | $299.99 | 299.99 | $.00 | $100.99 | 1 |
| | | Media Player | $640.00 | $799.98 | 799.98 | $.00 | $159.98 | 2 |
| | | Televisions | $587.00 | $679.99 | 799.99 | $120.00 | $92.99 | 1 |
| | | Media Player | $220.00 | $279.99 | 279.99 | $.00 | $59.99 | 1 |
| | | Video Production | $330.00 | $439.98 | 439.98 | $.00 | $109.98 | 2 |
| | | Camcorder | $389.00 | $549.00 | 549.00 | $.00 | $160.00 | 1 |
| | | Accessories | $83.00 | $168.00 | 168.00 | $.00 | $85.00 | 1 |
| | | Camcorder | $60.00 | $169.99 | 169.99 | $.00 | $109.99 | 1 |
| | | Stereo Systems | $290.00 | $399.98 | 399.98 | $.00 | $109.98 | 2 |
| | | Stereo Systems | $48.00 | $99.99 | 99.99 | $.00 | $51.99 | 1 |
| | | Stereo Systems | $720.00 | $763.30 | 898.00 | $134.70 | $43.30 | 2 |
| | | Media Player | $370.00 | $499.99 | 499.99 | $.00 | $129.99 | 1 |

# Aligning a PDF Report Within a Page

You can left-align, center, or right-align an entire PDF report within a page by using the JUSTIFYREPORT StyleSheet attribute.

To left-align, center, or right-align a PDF report, include the following syntax in your procedure.

```
TYPE=REPORT, JUSTIFYREPORT={LEFT|CENTER|RIGHT},$
```

# Left-Aligning a PDF Report Within a Page

To left-align a PDF report, include the TYPE=REPORT, JUSTIFYREPORT=LEFT attribute, as shown in the following procedure.

```
TABLE FILE GGSALES
SUM BUDDOLLARS
BY REGION
BY CATEGORY

HEADING
"Budget Dollars By Region and Product Category "
" "
FOOTING
"End of Report "
" "
ON TABLE SET PAGE-NUM NOLEAD
ON TABLE PCHOLD FORMAT PDF

ON TABLE SET STYLE *
SQUEEZE=ON, GRID=ON, $
TYPE=REPORT,
JUSTIFYREPORT=LEFT,$
ENDSTYLE

END
```

The output is:

Budget Dollars By Region and Category

| Region | Category | Budget Dollars |
|---|---|---|
| Midwest | Coffee | 4086032 |
| | Food | 4220721 |
| | Gifts | 2887620 |
| Northeast | Coffee | 4252462 |
| | Food | 4453907 |
| | Gifts | 2870552 |
| Southeast | Coffee | 4431429 |
| | Food | 4409288 |
| | Gifts | 2967254 |
| West | Coffee | 4523963 |
| | Food | 4183244 |
| | Gifts | 2934306 |

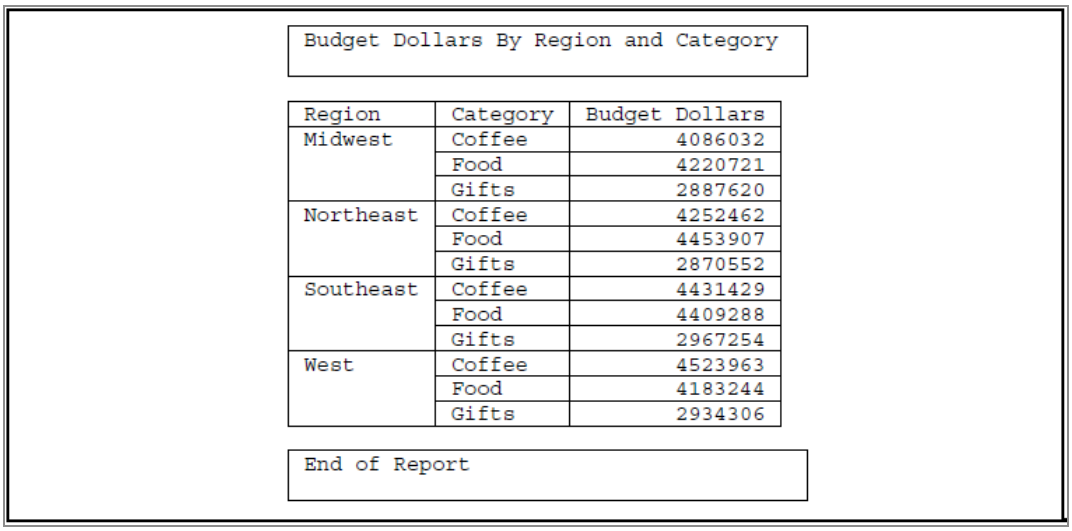
End of Report

# Centering a PDF Report Within a Page

To center a PDF report, include the TYPE=REPORT, JUSTIFYREPORT=CENTER attribute, as shown in the following procedure.

```
TABLE FILE GGSALES
SUM BUDDOLLARS
BY REGION
BY CATEGORY

HEADING
"Budget Dollars By Region and Product Category "
" "
FOOTING
"End of Report "
" "
ON TABLE SET PAGE-NUM NOLEAD
ON TABLE PCHOLD FORMAT PDF

ON TABLE SET STYLE *
SQUEEZE=ON, GRID=ON, $
TYPE=REPORT,
JUSTIFYREPORT=CENTER,$
ENDSTYLE

END
```

The output is:



Budget Dollars By Region and Category

| Region | Category | Budget Dollars |
|---|---|---|
| Midwest | Coffee | 4086032 |
| | Food | 4220721 |
| | Gifts | 2887620 |
| Northeast | Coffee | 4252462 |
| | Food | 4453907 |
| | Gifts | 2870552 |
| Southeast | Coffee | 4431429 |
| | Food | 4409288 |
| | Gifts | 2967254 |
| West | Coffee | 4523963 |
| | Food | 4183244 |
| | Gifts | 2934306 |

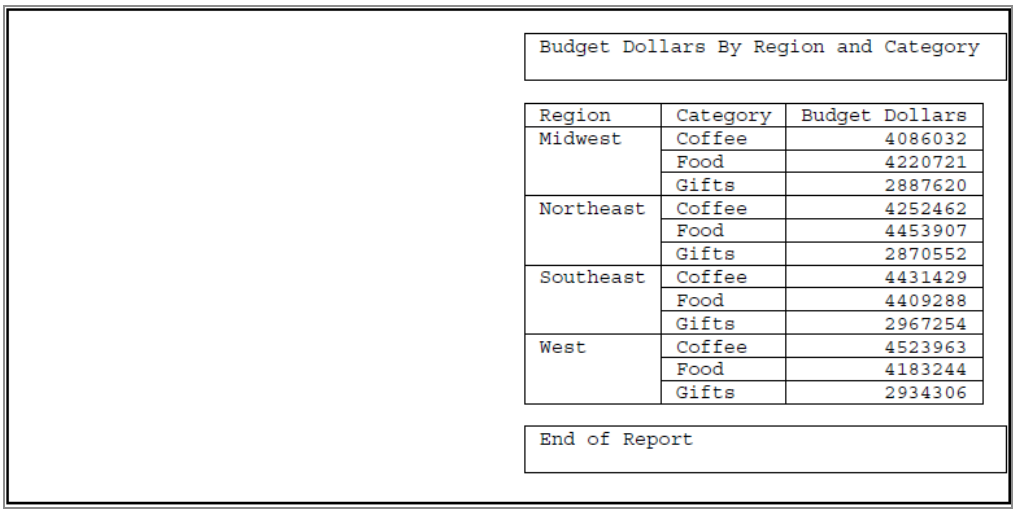
End of Report

# Right-Aligning a PDF Report Within a Page

To right-align a PDF report, include the TYPE=REPORT, JUSTIFYREPORT=RIGHT attribute, as shown in the following procedure.

```
TABLE FILE GGSALES
SUM BUDDOLLARS
BY REGION
BY CATEGORY

HEADING
"Budget Dollars By Region and Product Category "
" "
FOOTING
"End of Report "
" "
ON TABLE SET PAGE-NUM NOLEAD
ON TABLE PCHOLD FORMAT PDF

ON TABLE SET STYLE *
SQUEEZE=ON, GRID=ON, $
TYPE=REPORT,
JUSTIFYREPORT=RIGHT,$
ENDSTYLE

END
```

The output is:



Budget Dollars By Region and Category

| Region | Category | Budget Dollars |
|---|---|---|
| Midwest | Coffee | 4086032 |
| | Food | 4220721 |
| | Gifts | 2887620 |
| Northeast | Coffee | 4252462 |
| | Food | 4453907 |
| | Gifts | 2870552 |
| Southeast | Coffee | 4431429 |
| | Food | 4409288 |
| | Gifts | 2967254 |
| West | Coffee | 4523963 |
| | Food | 4183244 |
| | Gifts | 2934306 |

End of Report

# WebFOCUS PDF Report Accessibility Support

WebFOCUS PDF report accessibility provides support for assistive technologies, such as screen readers.

**Note:** For information on accessibility principles and font types and usage, see the WebAIM website at https://webaim.org/techniques/fonts/#intro.

WebFOCUS PDF report output complies with accessibility requirements as a result of the following features:

- A SET command that activates accessibility changes to WebFOCUS PDF output code.
- As of Release 8206, a DisplayOn=DOC-HEADING StyleSheet attribute that identifies the main document heading in a compound report.
    - In a single standalone report (non-compound document), the first ON TABLE SUBHEAD string is automatically tagged as <H1>. Other page headings and footings, as many as there are available, are tagged as <H2>.
    - In a compound report, the DisplayOn=DOC-HEADING attribute should be added to a single fixed-positioned component that will contain the ON TABLE SUBHEAD string. The DOC-HEADING attribute indicates that the ON TABLE SUBHEAD string entered in the fixed-positioned component will be tagged as <H1> and represent the main document heading, which will be displayed once on the first physical page of the document. Other page headings and footings, as many as there are available, are tagged as <H2>.

- A USEASTITLES StyleSheet attribute that places and aligns custom column titles in a heading.
- A BOOKMARK StyleSheet attribute that enables you to go directly to a destination in a document.
- An ALT StyleSheet attribute that describes an image embedded in a report.
- An ALT StyleSheet attribute that provides a description of a drill-down component.
- A LANG attribute that identifies the default language of the document.
- Report output, with the SET ACCESSPDF command enabled, is created with BYDISPLAY=ON, which produces a value in each cell for sort (BY) fields.

**Note:** It is the responsibility of the report developer to follow general accessibility standards in order for the report to be 508 compliant.

# Controlling PDF Code For Accessibility

The SET ACCESSPDF command enables accessibility for PDF reports.

# Control PDF Code Accessibility

- For all requests in a procedure or in a profile:

```
SET ACCESSPDF = {508|OFF}
```

- For a single request:

```
ON TABLE SET ACCESSPDF {508|OFF}
```

where:

**508**

Generates a PDF file compliant with Section 508 accessibility requirements.

**OFF**

Generates a PDF file that is non-compliant with Section 508 accessibility requirements. This value is the default.

# Controlling PDF Code for Accessibility

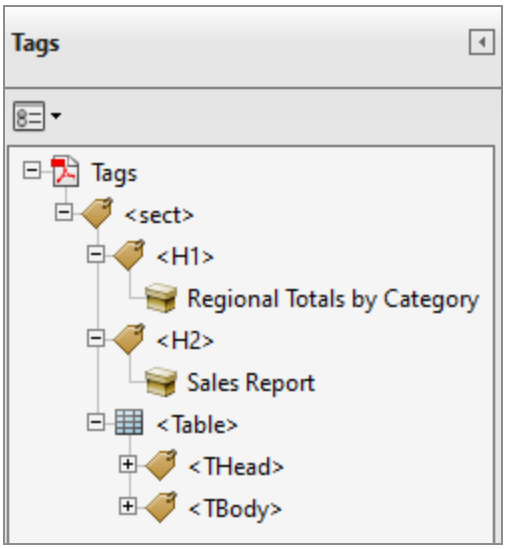
The following request generates accessible PDF report output. The SET and SUBHEAD commands that enable accessibility appear in boldface.

```
TABLE FILE GGSALES
SUM
   DOLLARS/D12M
BY REGION
BY CATEGORY
ON REGION SUBTOTAL AS 'Total for '
HEADING
" "
"Sales Report"
" "
ON TABLE SET ACCESSPDF 508
ON TABLE SET PAGE-NUM OFF
ON TABLE COLUMN-TOTAL AS 'Grand Total'
ON TABLE SUBHEAD "Regional Totals by Category"
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT, FONT='ARIAL',$
TYPE=TITLE,  COLUMN=N1, FONT='ARIAL', STYLE=BOLD,$
TYPE=TITLE,  COLUMN=N2, FONT='ARIAL', STYLE=BOLD,$
TYPE=TITLE,  COLUMN=N3, FONT='ARIAL', STYLE=BOLD,$
TYPE=HEADING, SIZE=14, STYLE=BOLD,$
TYPE=TABHEADING, SIZE=16, STYLE=BOLD,$
TYPE=SUBTOTAL, BY=1, STYLE=BOLD,$
TYPE=GRANDTOTAL, FONT='ARIAL', STYLE=BOLD,$
ENDSTYLE
END
```

WebFOCUS generates the following tags when SET ACCESSPDF is set to 508.

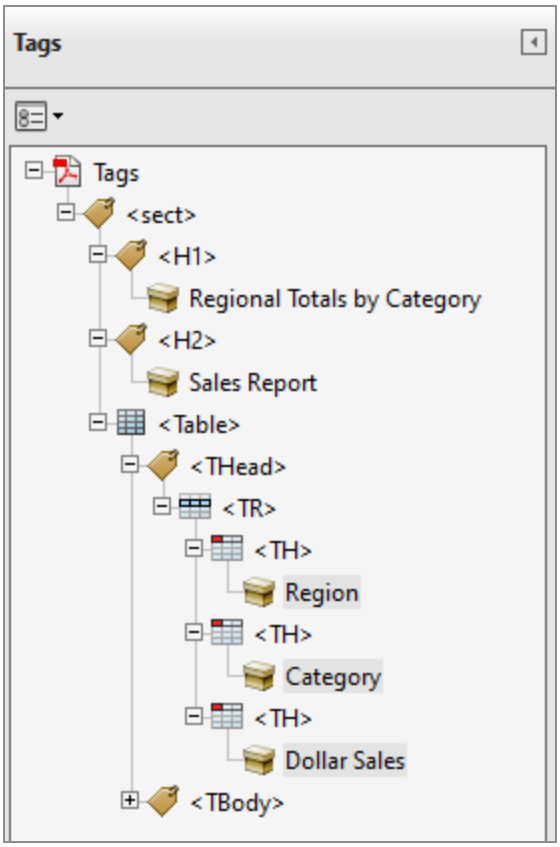
### Page Heading

Heading tags <H1> and <H2> and are automatically generated by WebFOCUS.



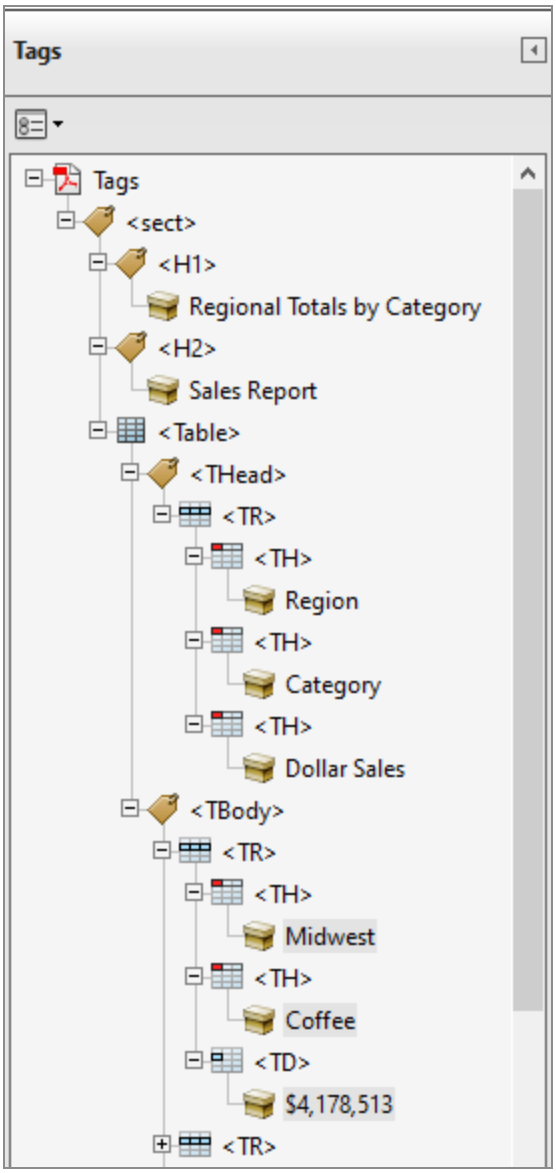

### Column Titles

Row tags <TR> and header cell tags <TH> are generated by WebFOCUS. The column title is aligned with the appropriate data columns.




### Data Cells

Row tags <TR> and header cell tags <TH> are generated by WebFOCUS.




The output is:

**Regional Totals by Category**

**Sales Report**

| Region | Category | Dollar Sales |
|---|---|---|
| Midwest | Coffee | $4,178,513 |
| Midwest | Food | $4,338,271 |
| Midwest | Gifts | $2,883,881 |
| **Total for Midwest** | | **$11,400,665** |
| Northeast | Coffee | $4,164,017 |
| Northeast | Food | $4,379,994 |
| Northeast | Gifts | $2,848,289 |
| **Total for Northeast** | | **$11,392,300** |
| Southeast | Coffee | $4,415,408 |
| Southeast | Food | $4,308,731 |
| Southeast | Gifts | $2,986,240 |
| **Total for Southeast** | | **$11,710,379** |
| West | Coffee | $4,473,517 |
| West | Food | $4,202,337 |
| West | Gifts | $2,977,092 |
| **Total for West** | | **$11,652,946** |
| **Grand Total** | | **$46,156,290** |

# Aligning Elements in a Page Heading With Column Data

The USEASTITLES StyleSheet attribute for PDF reports enables you to place and align custom column titles (AS='text') in the heading, rather than use the default column titles. The USEASTITLES attribute associates column titles in the heading with the appropriate data column.

# Align Elements in a Page Heading With Column Data

```
TYPE=HEADING, USEASTITLES=ON, HEADALIGN=BODY,$
```

USEASTITLES=ON can only be set for the entire HEADING. HEADALIGN=BODY must also be set for the HEADING.

To use this attribute in App Studio:

- The Report Output Format is PDF.
- The Alignment Grid is enabled for the Page Heading.
    - Add a Page Heading to the report.
    - Right-click the Page Heading and select **Alignment Grid**.
    - On the Insert Alignment Grid dialog box, select the **Align with Data** option and click **OK**.
    - In the Page Heading, right-click the alignment grid and select **Align column title (Section 508)**.

# Aligning Elements in a Page Heading to Column Data

The USEASTITLES attribute that enables the alignment of the heading elements is in bold. Note that the HEADALIGN=BODY attribute is also in bold.

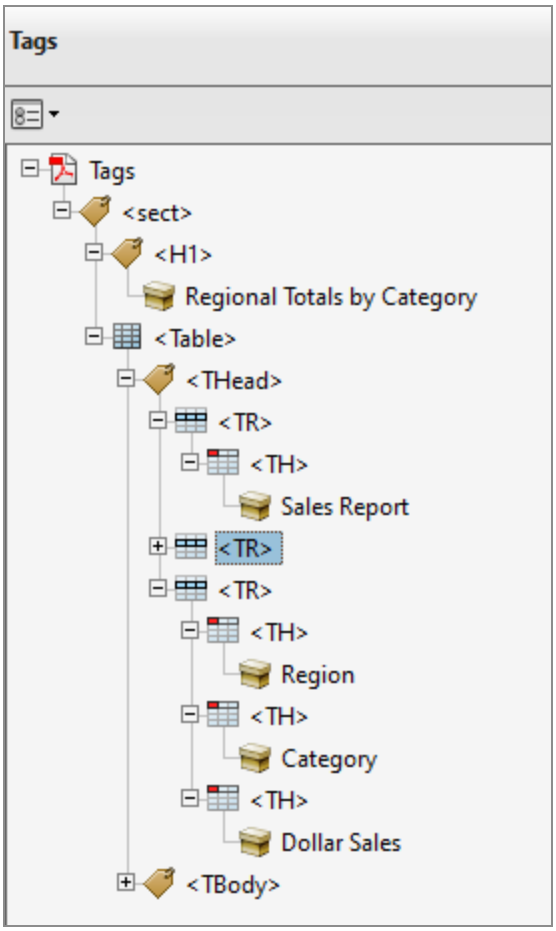
```
TABLE FILE GGSALES
SUM
   DOLLARS/D12M AS ''
BY REGION AS ''
BY CATEGORY AS ''
ON REGION SUBTOTAL AS 'Total for '
HEADING
" "
"Sales Report"
```

```
" <+0> <+0> "
"Region<+0>Category<+0>Dollar Sales"
ON TABLE SET ACCESSPDF 508
ON TABLE SET PAGE-NUM OFF
ON TABLE COLUMN-TOTAL AS 'Grand Total'
ON TABLE SUBHEAD "Regional Totals by Category <+1"
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET STYLE *
$
TYPE=REPORT, FONT='ARIAL',$
TYPE=TITLE, COLUMN=N1, FONT='ARIAL', STYLE=BOLD,$
TYPE=TITLE, COLUMN=N2, FONT='ARIAL', STYLE=BOLD,$
TYPE=TITLE, COLUMN=N3, FONT='ARIAL', STYLE=BOLD,$
TYPE=HEADING, SIZE=14, STYLE=BOLD,
HEADALIGN=BODY, USEASTITLES=ON,$
TYPE=HEADING, LINE=2, OBJECT=TEXT, ITEM=1, COLSPAN=3, JUSTIFY=LEFT,$
TYPE=HEADING, LINE=3, OBJECT=TEXT, ITEM=1, COLSPAN=1, JUSTIFY=LEFT,$
TYPE=HEADING, LINE=3, OBJECT=TEXT, ITEM=2, SIZE=10, COLSPAN=1,
     JUSTIFY=RIGHT,$
TYPE=HEADING, LINE=3, OBJECT=TEXT, ITEM=3, SIZE=10, COLSPAN=1,
     JUSTIFY=RIGHT,$
TYPE=HEADING, LINE=4, OBJECT=TEXT, ITEM=1, SIZE=11, COLSPAN=1,
     JUSTIFY=LEFT,$
TYPE=HEADING, LINE=4, OBJECT=TEXT, ITEM=2, SIZE=11, COLSPAN=1,
     JUSTIFY=LEFT,$
TYPE=HEADING, LINE=4, OBJECT=TEXT, ITEM=3, SIZE=11, COLSPAN=1,
     JUSTIFY=RIGHT,$
TYPE=TABHEADING, SIZE=16, STYLE=BOLD,$
TYPE=SUBTOTAL, BY=1, STYLE=BOLD,$
TYPE=GRANDTOTAL, FONT='ARIAL', STYLE=BOLD,$
ENDSTYLE
END
```

WebFOCUS generates the following tags when the USEASTITLES attribute is used.

### Page Heading and Column Titles

Row tags <TR> and header cell tags <TH> are generated by WebFOCUS. Along with the Page Heading, the column titles are also tagged as header cells <TH>.




The output is:

**Regional Totals by Category**

**Sales Report**

| Region | Category | Dollar Sales |
|---|---|---|
| Midwest | Coffee | $4,178,513 |
| Midwest | Food | $4,338,271 |
| Midwest | Gifts | $2,883,881 |
| **Total for Midwest** | | **$11,400,665** |
| Northeast | Coffee | $4,164,017 |
| Northeast | Food | $4,379,994 |
| Northeast | Gifts | $2,848,289 |
| **Total for Northeast** | | **$11,392,300** |
| Southeast | Coffee | $4,415,408 |
| Southeast | Food | $4,308,731 |
| Southeast | Gifts | $2,986,240 |
| **Total for Southeast** | | **$11,710,379** |
| West | Coffee | $4,473,517 |
| West | Food | $4,202,337 |
| West | Gifts | $2,977,092 |
| **Total for West** | | **$11,652,946** |
| **Grand Total** | | **$46,156,290** |

# Adding Bookmarks

Bookmarks are links in the navigation pane that enable you to go directly to a destination in the document. Using bookmarks enables you to jump from the tagged items in the navigation pane directly to the page where the item is located. The benefit of using bookmarks in conjunction with a screen reader is that you will be able to navigate a defined hierarchy without having to listen to the reading of the entire document. For more information about navigating PDF Bookmarks, see the Adobe documentation on the Adobe Web site, www.adobe.com.

**Note:**

- Since a PDF document is a complete file, you can use bookmarks and scrolling to navigate through the file. You can easily navigate through a document, especially documents that are two or more pages in length.

- You can generate bookmarks within WebFOCUS by including the BOOKMARKS and/or TOC object in the compound layout syntax. Then, in the component definitions, specify the Table of Contents level and description. You can also optionally specify the BYTOC levels.
- For 508 compliance, it is recommended that the Bookmark object be used.

# Adding Bookmarks to the Compound Layout

The BOOKMARK attribute that enables the alignment is in bold. The TOC-LEVEL=1 and BYTOC=2 attributes for both reports are also in bold. These attributes are explained below:

- TOC-LEVEL=*n*

  Defines *n* as the Table of Contents level for the report layout object. This option defines the hierarchical order of objects within the Table of Contents.

  0 = the object is not shown in the Table of Contents.

  1 = the object is shown as a first-level item in the Table of Contents.

  2 = the object is shown as a second-level item in the Table of Contents, and so on.

- BYTOC=*m*

  Specifies the number of BY fields to be included within the current component entry (*m*).

The following request adds bookmarks and specifies the main document heading for the compound report. The *report0* component uses the *DisplayOn=DOC-HEADING* attribute to indicate that the ON TABLE SUBHEAD string from the report0 component should be tagged as the main document heading in the PDF output.

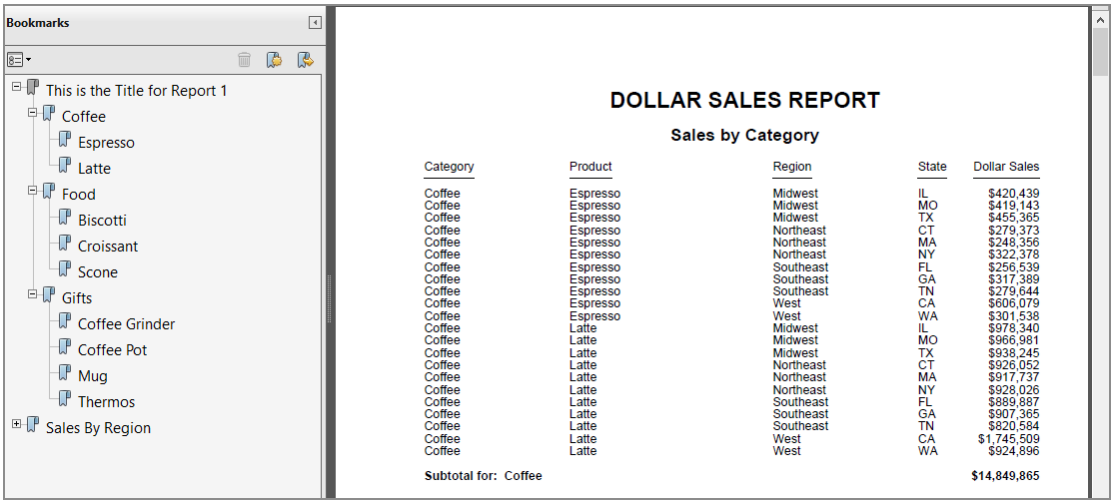
```
SET ACCESSPDF = 508
COMPOUND LAYOUT PCHOLD FORMAT PDF
OBJECT=BOOKMARKS,$
SECTION=S1, LAYOUT=ON, MERGE=OFF, ORIENTATION=PORTRAIT,$
PAGELAYOUT=1,$
COMPONENT=report0, position=(1 0.5), Dimension=(* *),
DisplayOn=DOC-HEADING,
$
COMPONENT=report1, TEXT='This is the Title for Report 1',
TOC-LEVEL=1,
BYTOC=2,
```

```
POSITION=(1 1), DIMENSION=(* *),$
COMPONENT=report2, TEXT='Sales By Region',
TOC-LEVEL=1,
BYTOC=2,
POSITION=(+0.00 +0.519), DIMENSION=(* *), RELATIVE-TO='report1',
REQUIRED-SPACE=(*3.5), RELATIVE-POINT=BOTTOM-LEFT, POSITION-POINT=TOP-
LEFT,$
END
```

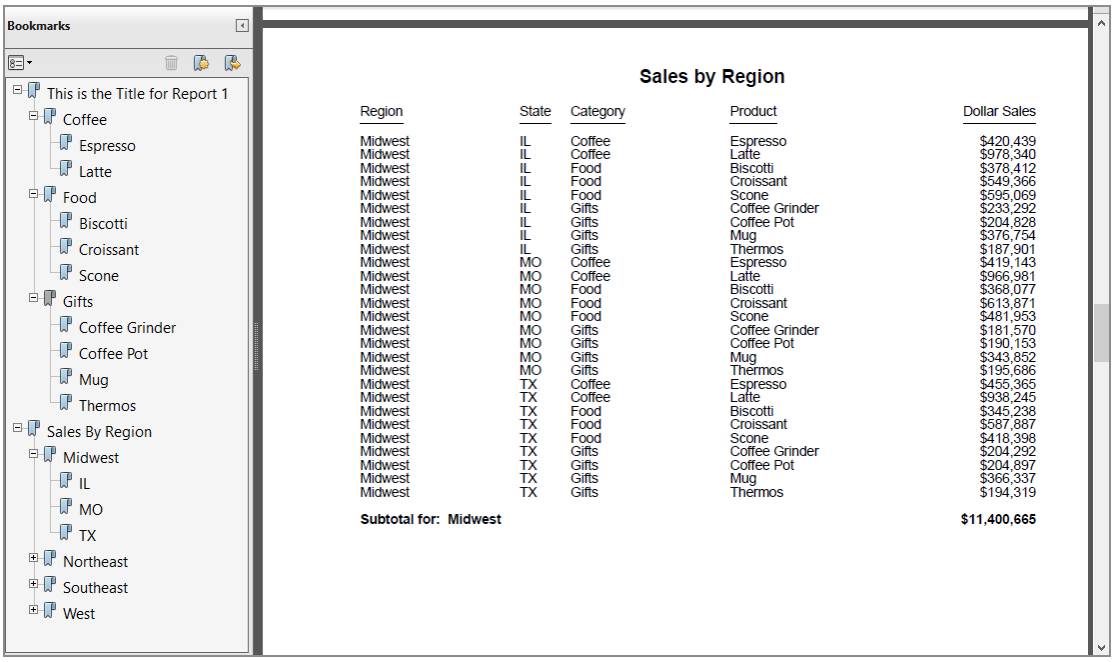
```
SET COMPONENT=report0
TABLE FILE GGSALES
BY CATEGORY NOPRINT
ON TABLE SUBHEAD
" "
"DOLLAR SALES REPORT"
" "
" "
ON TABLE SET PAGE-NUM OFF
ON TABLE HOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=TABHEADING , SIZE=18, FONT=ARIAL, STYLE=BOLD, JUSTIFY=CENTER,$
ENDSTYLE
END

SET COMPONENT=report1
TABLE FILE GGSALES
SUM DOLLARS/F8M
BY CATEGORY
BY PRODUCT
BY REGION
BY ST
ON CATEGORY PAGE-BREAK
WHERE PRODUCT NE 'Capuccino'
ON CATEGORY SUBTOTAL AS 'Subtotal for: '
HEADING
"Sales by Category"
" "
ON TABLE HOLD FORMAT PDF
ON TABLE SET PAGE-NUM OFF
ON TABLE NOTOTAL
ON TABLE SET STYLE *
TYPE=REPORT, SIZE=10, FONT=ARIAL,$
TYPE=HEADING, SIZE=14, FONT=ARIAL, STYLE=BOLD, JUSTIFY=CENTER,$
TYPE=SUBTOTAL, SIZE=10, STYLE=BOLD,$
ENDSTYLE
END
```

```
SET COMPONENT=report2
TABLE FILE GGSALES
SUM DOLLARS/F8M
BY REGION
BY ST
BY CATEGORY
BY PRODUCT
ON REGION PAGE-BREAK
WHERE PRODUCT NE 'Capuccino'
ON REGION SUBTOTAL AS 'Subtotal for: '
HEADING
"Sales by Region"
" "
ON TABLE HOLD FORMAT PDF
ON TABLE SET PAGE-NUM OFF
ON TABLE NOTOTAL
ON TABLE SET STYLE *
TYPE=REPORT, SIZE=10, FONT=ARIAL,$
TYPE=HEADING, SIZE=14, FONT=ARIAL, STYLE=BOLD, JUSTIFY=CENTER,$
TYPE=SUBTOTAL, SIZE=10, STYLE=BOLD,$
ENDSTYLE
END
COMPOUND END
```

The report output, with bookmarks, is shown below.

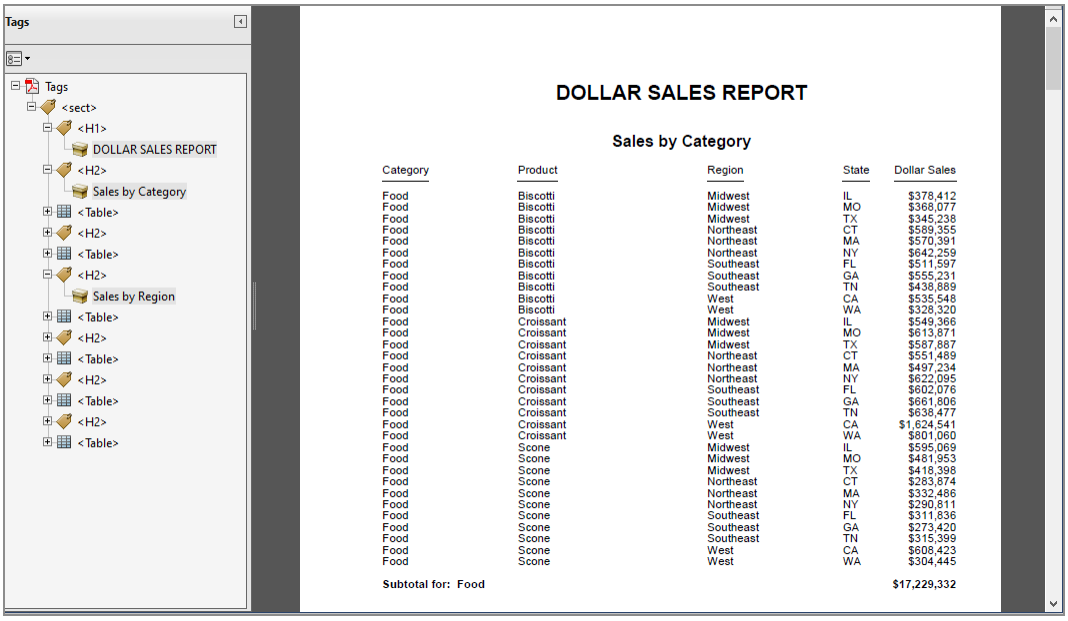



Notice that the hierarchy tree in the Bookmarks pane has two levels for each report and is determined with the BYTOC attribute. The title for each report in the Bookmarks tree is determined with the TEXT attribute, as shown in the following image.

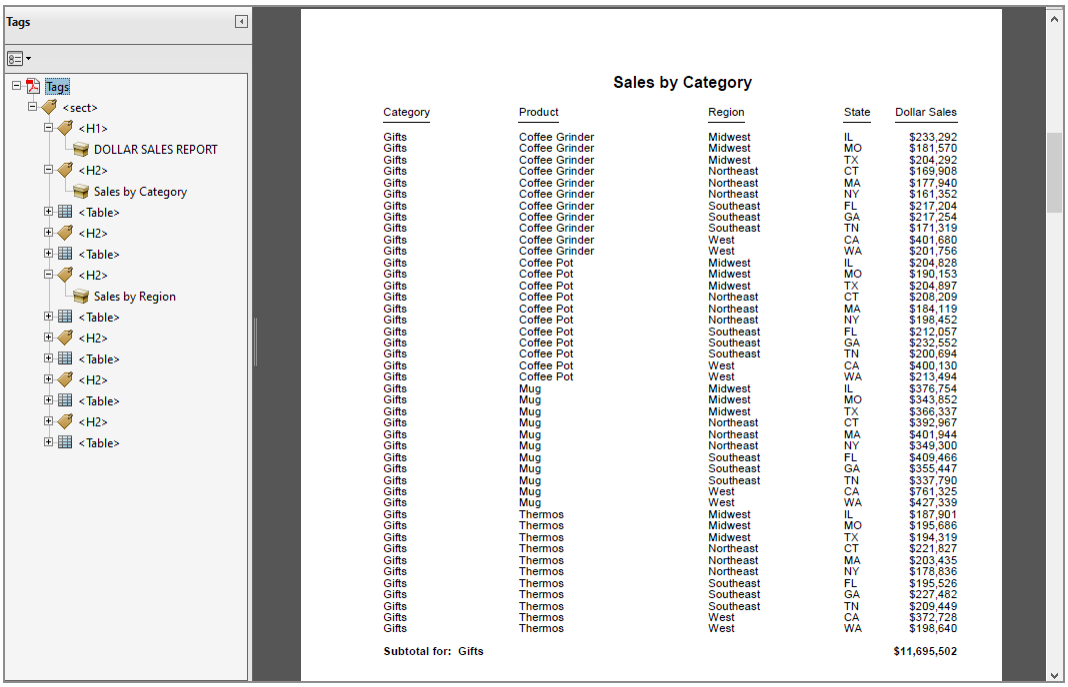



The first three pages of the PDF output, with the Tags panel, are shown in the following images. Note that only the first page of output contains the <H1> heading, DOLLAR SALES REPORT. The other headings are tagged as <H2>.

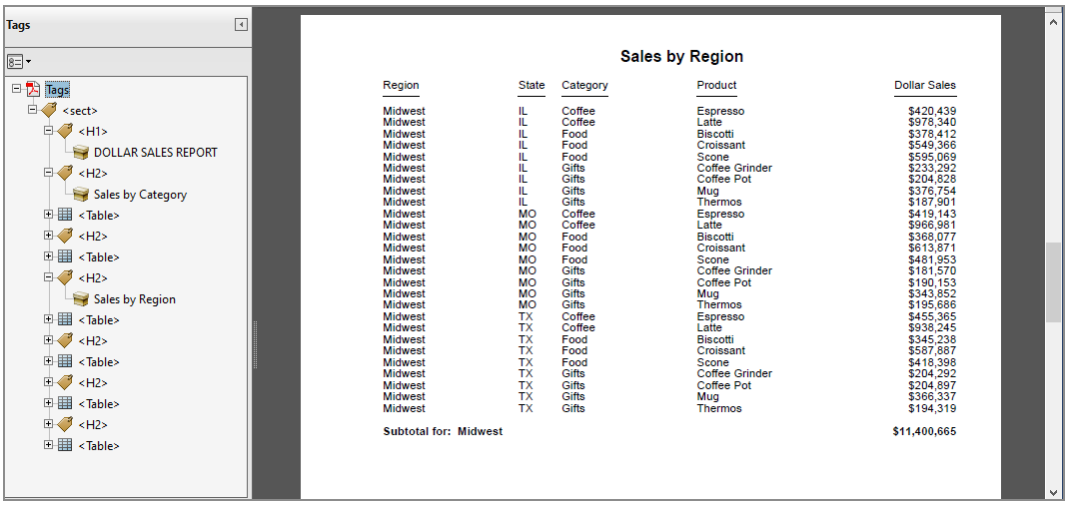
## Page 1




## Page 2




**Page 3**




# Adding Descriptive Text to an Image

The ALT attribute in a WebFOCUS StyleSheet adds descriptive text to an embedded image in a PDF report. The ALT attribute in the StyleSheet generates a PDF ALT attribute on the <IMG> tag.

The ALT tag is displayed in the PDF when you hover the mouse over the image.

# Add Descriptive Text to an Image

```
ALT='description'
```

where:

**description**

Is a brief description of the image, enclosed in single quotation marks (‘). The length can be a maximum of 256 characters.

For details on the StyleSheet syntax for adding an image, see Adding an Image to a Report.

# Adding Descriptive Text to an Image

This request adds the TIBCO® logo to a report heading. It uses the WebFOCUS StyleSheet ALT attribute to add descriptive text (TIBCO logo) that identifies the image.

```
TABLE FILE GGSALES
SUM
   DOLLARS/D12N
BY REGION
BY CATEGORY
ON REGION SUBTOTAL AS 'Total sales: '
ON REGION PAGE-BREAK
HEADING
"Sales Report"
" "
" "
" "
" "
" "
ON TABLE SET ACCESSPDF 508
ON TABLE SET PAGE-NUM OFF
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT PDF
ON TABLE SUBHEAD "Regional Totals by Category"
ON TABLE SET STYLE *
     UNITS=IN,
     SQUEEZE=ON,
     ORIENTATION=PORTRAIT,
$
TYPE=REPORT, GRID=OFF, FONT='ARIAL', SIZE=9,$
```

```
TYPE=TITLE, STYLE=BOLD,$
TYPE=HEADING, SIZE=12, STYLE=BOLD, JUSTIFY=CENTER,$
TYPE=TABHEADING, SIZE=14, STYLE=BOLD, JUSTIFY=CENTER,$
TYPE=SUBTOTAL, BACKCOLOR=RGB(210 210 210), STYLE=BOLD,$
TYPE=REPORT, IMAGE=tibco.png, ALT='TIBCO logo',
POSITION=(0 .5),$
ENDSTYLE
END
```

The report is:

When the request is run, hovering the mouse over the image displays the descriptive text. This text is read by accessibility tools, such as JAWS.

# Describing Drill Down Information

When ACCESSPDF is enabled, the developer can provide a description of the Drill Down using the ALT attribute in a WebFOCUS StyleSheet. In the PDF report, JAWS will read the value of the Drill Down component along with the ALT text.

Including a description of the detail component of a Drill Down report supports accessibility.

# Add Descriptive Drill Down Information

```
ALT='description'
```

where:

**description**

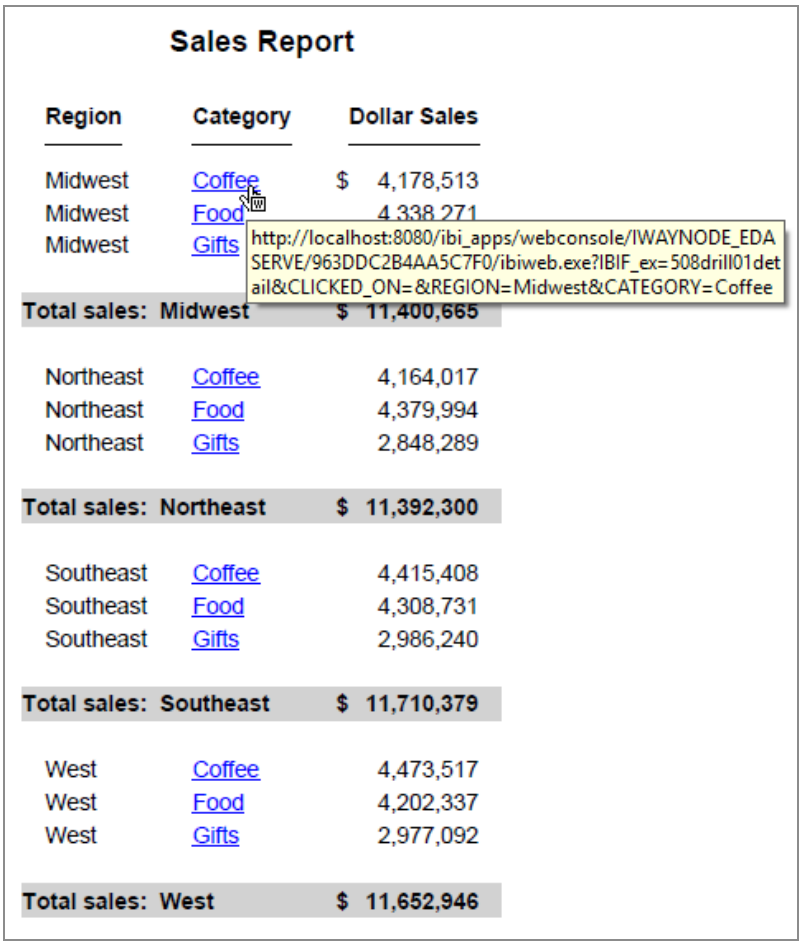
Is the description of the Drill Down information in a report, enclosed in single quotation marks (‘). The length can be a maximum of 256 characters.

For details on the StyleSheet syntax for Drill Down reports, see Linking a Report to Other Resources.

```
TABLE FILE GGSALES
SUM
   DOLLARS/D12N
BY REGION
BY CATEGORY
ON REGION SUBTOTAL AS 'Total sales: '
HEADING
" "
ON TABLE SET ACCESSPDF 508
ON TABLE SET PAGE-NUM OFF
ON TABLE NOTOTAL
ON TABLE SUBHEAD "Sales Report"
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET STYLE *
     UNITS=IN,
     SQUEEZE=ON,
     ORIENTATION=PORTRAIT,
     SUMMARY='508 Sales report example',
     TITLETEXT='508 Sales report example',
$
TYPE=REPORT, GRID=OFF, FONT='ARIAL', SIZE=9,$
TYPE=DATA, COLUMN=N2,
ALT='Drill Down to detail report.', \
     FOCEXEC=508drill01detail( REGION=N1 CATEGORY=N2 ),$
TYPE=TITLE, STYLE=BOLD,$
TYPE=TABHEADING, SIZE=12, STYLE=BOLD, JUSTIFY=CENTER,$
TYPE=HEADING, SIZE=12, STYLE=BOLD, JUSTIFY=CENTER,$
TYPE=SUBTOTAL, BACKCOLOR=RGB(210 210 210), STYLE=BOLD,$
ENDSTYLE
END
```

Note the ALT attribute and associated text in BOLD.

The report is:



Sales Report

| Region | Category | Dollar Sales |
|---|---|---|
| Midwest | Coffee | $ 4,178,513 |
| Midwest | Food | 4,338,271 |
| Midwest | Gifts | |
| **Total sales: Midwest** | | **$ 11,400,665** |
| Northeast | Coffee | 4,164,017 |
| Northeast | Food | 4,379,994 |
| Northeast | Gifts | 2,848,289 |
| **Total sales: Northeast** | | **$ 11,392,300** |
| Southeast | Coffee | 4,415,408 |
| Southeast | Food | 4,308,731 |
| Southeast | Gifts | 2,986,240 |
| **Total sales: Southeast** | | **$ 11,710,379** |
| West | Coffee | 4,473,517 |
| West | Food | 4,202,337 |
| West | Gifts | 2,977,092 |
| **Total sales: West** | | **$ 11,652,946** |



When you hover the mouse over Coffee for the Midwest region, the URL information for the Drill Down appears in the box. Screen readers, such as JAWS, will not read hover text. With ACCESSPDF enabled, the ALT text or 'Drill Down to detail report' is appended to the value for the Drill Down or 'Coffee' in this example. When you navigate to Coffee, the screen reader will respond with Coffee Drill Down to detail report.

**Note:**

- Users that use screen readers, such as JAWS, may need more information regarding the Drill Down link. In the above example, notice that there are multiple hyperlinks for the value Coffee. This functionality, along with the 'read current cell' command, allows the user to understand the difference in those values. The screen reader command to 'read current cell' in JAWS is the Ctrl+Alt+Num5 shortcut. In this

example, JAWS would respond to the 'read current cell' command with column two, row two, region Midwest, link Coffee Drill Down to detail report.

- If you are opening the output in Adobe Reader, make sure you specify the FOCEXURL setting to provide the URL context of the WebFOCUS environment the Drill Down is to call back to. In addition, the FOCEXURL value has to have the parameter to specify that the request is a Drill Down request. For example:

```
-SET &FOCEXURL='http://host:port/ibi_apps/WFServlet?IBIF_webapp=
   /ibi_apps' | '&';
-SET &FOCEXURL=&FOCEXURL | 'IBIMR_drill=IBFS,RUNFEX,IBIF_ex,true' |
'&';
-SET &FOCEXURL=&FOCEXURL | 'IBIC_server=EDASERVE' | '&';
-SET &FOCEXURL=&FOCEXURL | 'IBIAPP_app=ibisamp' | '&';
SET FOCEXURL='&FOCEXURL'
```

# Accessibility Limitations

Reports using the following elements are not accessible:

- If a procedure does not contain the SET PAGE-NUM=OFF or ON TABLE SET PAGE-NUM OFF command, the page number will be announced two times by the screen reader.
- ACROSS and OVER reports.
- Financial Modeling Language (FML).
- **FOLD-LINE.** Accessibility is disabled when FOLD-LINE is used in a report.
- **Fixed monetary edit options (N, !d, !e, !l and !y) including the Credit Negative (CR).** A unique cell is created for the noted monetary options or CR option.
- Text included or designed in FOOTING, SUBHEAD, SUBFOOT, RECAP, SUMMARIZE, and RECOMPUTE commands do not generate row header tags.

# Specifying the Main Document Heading

In a single standalone report (non-compound document), the first ON TABLE SUBHEAD string is automatically tagged as <H1>. Other page headings and footings, as many as there are available, are tagged as <H2>.

In a compound report, the DisplayOn=DOC-HEADING attribute should be added to a single fixed-positioned component that will contain the ON TABLE SUBHEAD string. The DOC-HEADING attribute indicates that the ON TABLE SUBHEAD string entered in the fixed-positioned component will be tagged as <H1> and represent the main document heading, which will be displayed once on the first physical page of the document. Other page headings and footings, as many as there are available, are tagged as <H2>.

# Specifying the Main Document Heading

In the following request, the *report0* component uses the *DisplayOn=DOC-HEADING* attribute to indicate that the ON TABLE SUBHEAD string from the report0 component should be tagged as the main document heading in the PDF output.

```
SET ACCESSPDF=508
COMPOUND LAYOUT PCHOLD FORMAT PDF
OBJECT=BOOKMARKS ,$
SECTION =S1, LAYOUT=ON, MERGE=OFF, ORIENTATION=PORTRAIT ,$
PAGELAYOUT=1 ,$
COMPONENT=report0, position=(1 0.5), Dimension=(* *),
DisplayOn=DOC-HEADING

,$
COMPONENT=report1, TEXT='Sales by Category Report',
TOC-LEVEL=1, BYTOC=2, POSITION=(1 1), DIMENSION=(* *) ,$
COMPONENT=report2, TEXT='Sales by Region Report',
TOC-LEVEL=1, BYTOC=2,
POSITION=(+0.0 +0.519), DIMENSION=(* *), RELATIVE-TO='report1',
REQUIRED-SPACE=(* 3.5), RELATIVE-POINT=BOTTOM-LEFT,
POSITION-POINT=TOP-LEFT ,$
END

SET COMPONENT=report0
TABLE FILE GGSALES
BY CATEGORY NOPRINT
ON TABLE SUBHEAD
" "
"DOLLAR SALES REPORT"
" "
" "
ON TABLE SET PAGE-NUM OFF
ON TABLE HOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=TABHEADING , SIZE=18, FONT=ARIAL, STYLE=BOLD, JUSTIFY=CENTER ,$
ENDSTYLE
```

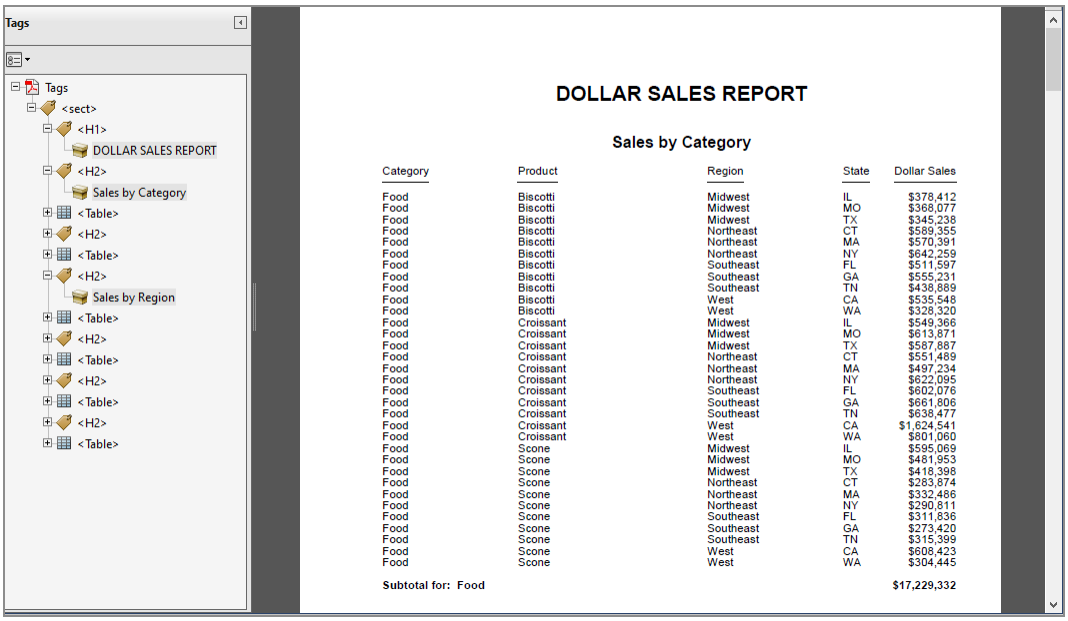
```
END

SET COMPONENT=report1
TABLE FILE GGSALES
SUM DOLLARS/F8M
BY CATEGORY
BY PRODUCT
BY REGION
BY ST
WHERE CATEGORY NE 'Coffee';
ON CATEGORY PAGE-BREAK
ON CATEGORY SUBTOTAL AS 'Subtotal for: '
HEADING
" "
" "
"Sales by Category"
" "
ON TABLE HOLD FORMAT PDF
ON TABLE SET PAGE-NUM OFF
ON TABLE NOTOTAL
ON TABLE SET STYLE *
TYPE=REPORT, SIZE=10, FONT=ARIAL ,$
TYPE=HEADING, SIZE=14, FONT=ARIAL, STYLE=BOLD, JUSTIFY=CENTER ,$
TYPE=SUBTOTAL, SIZE=10, STYLE=BOLD ,$
ENDSTYLE
END
```

```
SET COMPONENT=report2
TABLE FILE GGSALES
SUM DOLLARS/F8M
BY REGION
BY ST
BY CATEGORY
BY PRODUCT
ON REGION SUBTOTAL AS 'Subtotal for: '
ON REGION PAGE-BREAK
HEADING
"Sales by Region"
" "
ON TABLE HOLD FORMAT PDF
ON TABLE SET PAGE-NUM OFF
ON TABLE NOTOTAL
ON TABLE SET STYLE *
TYPE=REPORT, SIZE=10, FONT=ARIAL ,$
TYPE=HEADING, SIZE=14, FONT=ARIAL, STYLE=BOLD, JUSTIFY=CENTER ,$
TYPE=SUBTOTAL, SIZE=10, STYLE=BOLD ,$
```

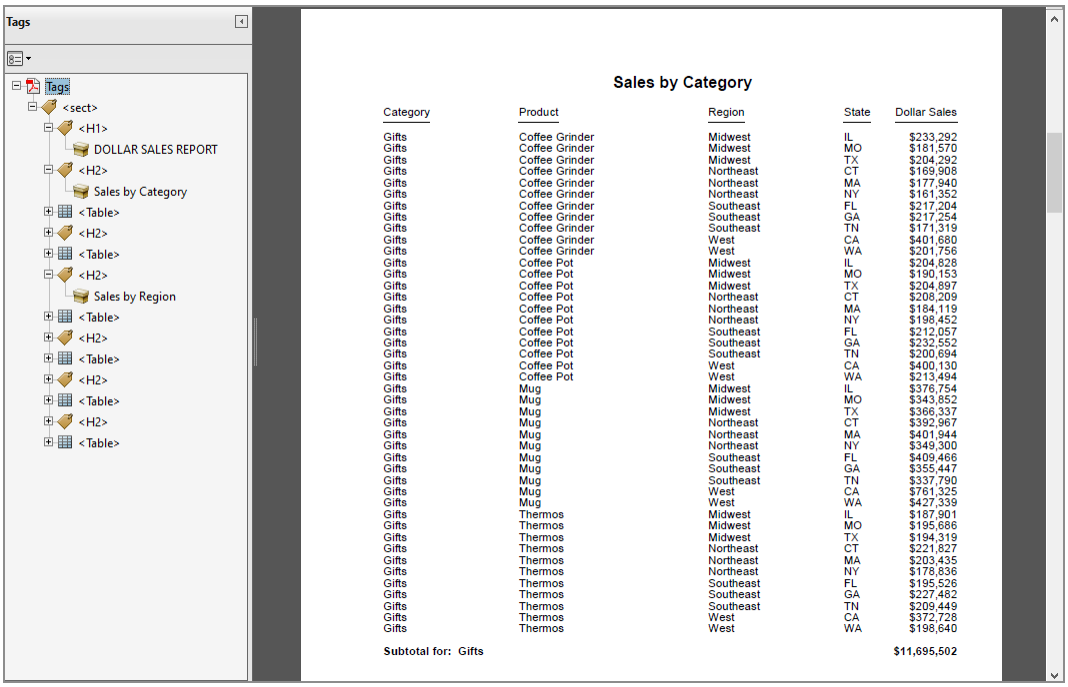
```
ENDSTYLE
END
COMPOUND END
```

The first three pages of the PDF output is shown in the following images. Note that only the first page of output contains the <H1> heading, DOLLAR SALES REPORT. The other headings are tagged as <H2>.

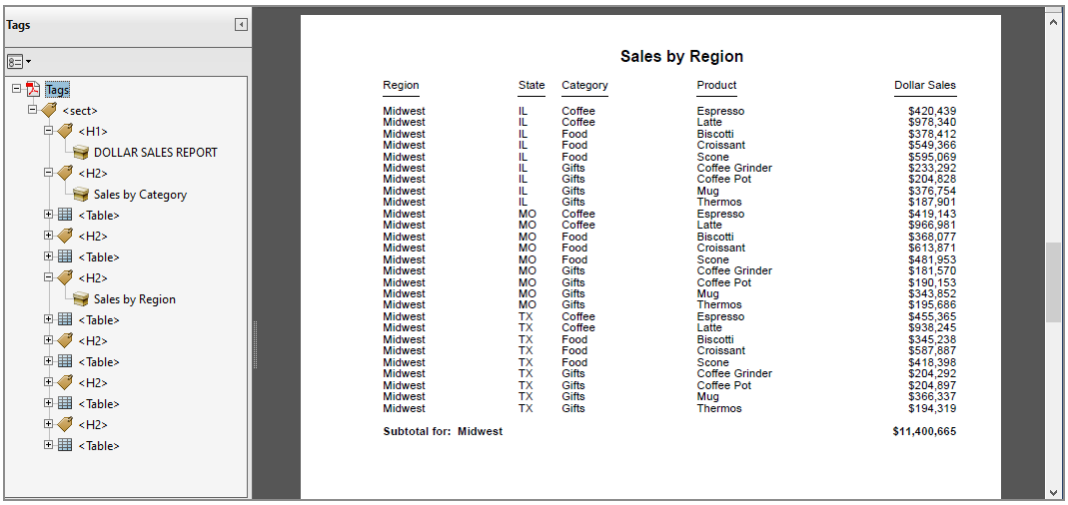
Page 1




Page 2




Page 3

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# Using PostScript (PS) Display Format

You can display a report as a PostScript document. PostScript (format PS) is a print-oriented page description language. As a display format, it may be helpful if you wish to see the report output on your monitor before printing it using PostScript.

To display a PostScript report, a computer must have a third-party PostScript application installed, such as GSview (a graphical interface for Ghostscript).

If you are sending a PS report to a printer from WebFOCUS or from ReportCaster, you can select the size of the paper on which to print the output. The PostScript code that is generated works on PS printers that support Language Level 2 or above. It is ignored, without harmful effects, on Level 1 printers. For details, see Select Paper Size in a PostScript (PS) Report. This capability is only supported for the PostScript format.

**Other print-oriented display formats.** You can also display a report as a PDF document. For more information, see Using PDF Display Format.

# Select Paper Size in a PostScript (PS) Report

PAGESIZE and ORIENTATION are two WebFOCUS StyleSheet options that are used to display a report. You can enable these features in printed documents using the SET parameter PSPAGESETUP. You can then select the size of the paper on which to print a PostScript report by selecting a PAGESIZE option.

Complete these steps:

### Procedure

1. Place the following SET parameter before or within your request

   ```
   SET PSPAGESETUP= ON
   ```

   or

   ```
   ON TABLE SET PSPAGESETUP ON
   ```

   OFF is the default setting.

2. Include your PAGESIZE specification in a SET command or StyleSheet declaration in the request

   ```
   SET PAGESIZE= option
   ```

   or

```
ON TABLE SET PAGESIZE option
```

or

```
PAGESIZE=option, $
```

where:

**option**

Can be any paper size supported for your printer. LETTER is the default setting.

**Result**

**Note:** If you send a job to a printer that does not have the requested paper size loaded, the printer may stop and instruct its operator to load the specified paper. To ensure control over your printing, it is best to set paper size in individual requests (rather than as an installation-wide default) so that you can load paper as required.

# Selecting Paper Size Using SET Command in a PostScript Report

This example automatically prints a document on legal paper as specified in the two SET commands that precede the report request. The referenced printer is a PostScript Level 2 or higher printer, which will automatically select legal paper and print the document in landscape mode.

```
SET PSPAGESETUP=ON
SET PAGESIZE=LEGAL
SET ORIENTATION=LANDSCAPE
SET PAGE-NUM=OFF
TABLE FILE CENTORD
HEADING
"Sales Report"
" "
SUM LINEPRICE
BY PRODCAT
ON TABLE SET STYLE *
TYPE=HEADING, SIZE=18, $
ENDSTYLE
```

```
ON TABLE HOLD FORMAT PS
END
```

```
-RUN
DOS COPY HOLD.PS \\IBIPRINTA\28C2
```

### Selecting Paper Size Using a SET Command and a StyleSheet

This request automatically prints a document on legal paper based on the paper size and orientation specifications in the StyleSheet declaration. The referenced printer is a PostScript Level 2 or higher printer, which will automatically select legal paper and print the document in landscape mode.

```
SET PSPAGESETUP=ON
TABLE FILE CAR
SUM RC DC SALES BY COUNTRY BY CAR BY MODEL
ON TABLE HOLD FORMAT PS
ON TABLE SET STYLE *
UNITS=IN,
     PAGESIZE='Legal',
     LEFTMARGIN=1.000000,
     RIGHTMARGIN=0.500000,
     TOPMARGIN=1.500000,
     BOTTOMMARGIN=0.500000,
     SQUEEZE=ON,
     ORIENTATION=LANDSCAPE,$
GRAPHTYPE=DATA, COLUMN=RC, GRAPHPATTERN=EMPTY, $
GRAPHTYPE=DATA, COLUMN=DC, GRAPHPATTERN=SLANT, $
GRAPHTYPE=DATA, COLUMN=SALES,
GRAPHPATTERN=HORIZONTAL, $
ENDSTYLE
END
-RUN
DOS COPY HOLD.PS \\IBIPRINTA\28C2
```

# WebFOCUS Font Support

You can add and configure PostScript Type 1 fonts to significantly expand your options for displaying and printing PS and PDF reports, beyond those provided by the basic set of fonts distributed with Adobe Reader. Thousands of PostScript fonts are available to make your reports more stylish and useful, including some that support symbols and bar codes.

The font map files for Type 1 fonts are stored as XML files (fontmap.xml and fontuser.xml). All font mappings in these files are used for both PDF and PostScript report output.

The font definitions for DHTML also cover PowerPoint (PPT and PPTX). For XLSX, you can define a new default font in the fontuser.xml file. This allows ease in customizing the look and feel of XLSX workbooks. WebFOCUS uses Arial as the default font. However, you can change the default font to match the Microsoft Office standard font, Calibri, or your corporate standard.

You can also add and configure a set of TrueType or OpenType fonts to be embedded in PDF output files.

**Note:** You can use OpenType font files (OTF) only with content in Compact Font Format (CFF).

# Support for the Symbol Font

To use the Symbol font, specify font=symbol in your WebFOCUS StyleSheet:

- Some versions of Firefox 3 do not support the Symbol font and will substitute it with another font. For information about Firefox support for the Symbol font, refer to Firefox sources.
- The Euro character displays in PDF output because the Adobe Symbol character set includes the Euro character.
- The Euro character does not display in DHTML, PPT, and PPTX report output because the Windows Symbol character set does not include the Euro character.
- The following style options can be rendered with the Symbol font:
    - DHTML, PPT, and PPTX support style=normal, bold, italic, and bold+italic.
    - PDF supports only style=normal. Any other style specified in the StyleSheet will be mapped to normal.

# How WebFOCUS Uses Type 1 Fonts

WebFOCUS generates a PDF or PS document from scratch. In order to do that, it must physically embed all the objects it displays or prints, including images and fonts, in the document itself.

When you execute a report and specify one of these formats as your display format, the WebFOCUS Reporting Server retrieves the data and begins to format the report. Fonts and images specified in the StyleSheet must be available to the WebFOCUS Reporting Server to create the output file. It reads the font information from the font files and embeds that information into the document. The font itself is stored on the WebFOCUS Reporting Server.

To ensure that the WebFOCUS Reporting Server can locate the required information, you must define and map it in the following files:

- **Font file, usually a PFB (Printer Font Binary) file.** This file contains the information about the shape to draw for each character of the font. The information in the font file is scalable, which means that a single font file can be used to generate characters of any size. Note, however, that bold and italic variations of the typeface are separate fonts. An alternative ASCII format, PFA, can also be used by WebFOCUS. In addition to PFB and PFA font files, you can use OTF font files to enable more flexibility in customizing PDF files, such as support for expanded character sets and layout features, and cross-platform compatibility.
- **Adobe Font Metrics (AFM) file.** This file is distributed with all Adobe fonts. It contains information about the size of each character in each font. WebFOCUS uses this information to lay out the report on the page. Note that the three built-in fonts also have AFM files, which are distributed with WebFOCUS. However, these fonts do not require font files, since the fonts are built in to Adobe Reader.

  **Note:** A Printer Font Metrics (PFM) file is also available. This file is used by applications such as Adobe Reader for laying out text, however it is not supported by WebFOCUS. You must use the AFM file.
- **WebFOCUS Font Map files.** These configuration files map the name of a font to the appropriate font metrics and font files (AFM, PFB (or PFA), or OTF). The mapping determines which actual font is used when you specify a font using the FONT attribute in a WebFOCUS StyleSheet. For example, if your StyleSheet contains the following declaration, WebFOCUS will search the font map for a font mapping with a matching name and style, and use the font specified by the mapping:

  ```
  TYPE=REPORT, FONT=HELVETICA, STYLE=ITALIC, $
  ```

There are two files WebFOCUS uses for mapping fonts, both in an XML-based format:

- The default font map file, *fontmap.xml*, contains the font definitions for all output formats that are supported with WebFOCUS, as originally installed. Users should not

modify this file.

- The user font map file, *fontuser.xml*, contains font definitions added by the user. The following sections describe how to add your fonts to this file.

The user font map is searched before the default font map, so font definitions in the user map will override definitions of the same font in the default map.

You can also use a variety of utilities to convert Windows True Type fonts (such as Arial and Tahoma) into Type 1 fonts. Then, after you convert them, you can define and map these fonts for use by WebFOCUS.

One such utility is TTF2PT1.

For information about the Windows version, go to:

http://gnuwin32.sourceforge.net/packages/ttf2pt1.htm

For information about UNIX versions, go to: http://ttf2pt1.sourceforge.net/download.html

# Adding PostScript Type 1 Fonts for PS and PDF Formats

This section describes how to add PostScript type 1 fonts to the *fontuser.xml* file.

# Configure Type 1 PostScript Fonts on the Windows and UNIX Platforms

Locate the necessary font files (AFM, PFB (or PFA), or OTF). These files should be available in the location where the fonts were originally installed. You will be copying these files to a location from which they can be accessed by the WebFOCUS Reporting Server.

**Tip:**

- You may need to run an installer program to install these in a directory on your Windows or UNIX machine. Note that the fonts do not have to be installed on a client machine in order to be used, since they will be embedded in the PDF or PostScript

files created by WebFOCUS. PDF files with these embedded fonts can be displayed on any machine that has Adobe Reader (or a similar PDF viewer), and PostScript files with these embedded fonts can be printed on any PostScript printer (or displayed in a PostScript viewer such as GhostView).

- Note that PFB files are binary, so if they are FTPed from another machine, they must be FTPed in BINARY mode.
- The maximum number of embedded fonts supported in a PDF report is 63.

After you have located the font files you wish to add, you can set up WebFOCUS to use one or more Type 1 fonts.

### Procedure

1. For each font you wish to add, copy the AFM, PFB (or PFA), and OTF files into the **etc** subdirectory of your WebFOCUS configuration directory. On a Windows machine, the location is usually:

   ```
   drive:\ibi\srv82\wfs\etc
   ```

   where:

   **wfs**

   Is your WebFOCUS configuration directory (it may have a different name depending on installation options, but should always be a directory directly under *drive*:\ibi\srv82). Note that *home* is the other directory directly under *drive*:\ibi\srv82.

   Under Unix, the location is /ibi/srv82/wfs/etc, assuming that the WebFOCUS Reporting Server was installed in /ibi/srv82.

   Keeping user font files in this directory allows user font files to remain separate from the default font files (under \ibi\srv82\home) so they can be easily preserved if WebFOCUS is updated to a new release.

   After you copy these files, you can rename them to any descriptive name.

2. The user font map file, *fontuser.xml*, is created by the installer in the same directory. Using a text editor, add your font definitions to this file using the syntax described in the following section, Add Fonts to the Font Map.

# Configure Type 1 PostScript Fonts on z/OS Under PDS Deployment

After you have located the font files you wish to add, you can configure WebFOCUS to use one or more Type 1 fonts.

### Procedure

1. Copy the AFM (font metrics) file into the PDS allocated to DDNAME EDACCFG in the WebFOCUS Reporting Server JCL. You can copy this file from another machine using FTP in standard ASCII (text) mode. The member name of the AFM file in this PDS will match the *metricsfile* value in the font map file.

   **Note:** If the Windows font file names contain underscore characters or are longer than eight characters, you must rename them, since these are not valid for z/OS member names.

2. You can use either PFB (binary) fonts or PFA (ASCII) fonts:

   - If you are using PFB (binary) fonts, create a partitioned data set, put the PFB file in it (for example, using FTP in BINARY mode), and concatenate this data set to the data set already allocated to DDNAME EDAHBIN in the WebFOCUS Reporting Server JCL.

     This PDS should be created with the following DCB attributes:

     ```
     RECFM: VB    LRECL: 1028    BLKSIZE: 27998
     ```

     The member name in this PDS should match the *fontfile* name in the font map file.

     If you copy the PFB font file into the PDS using FTP, you must use BINARY mode. The member name of the PFB file in this PDS will match the *fontfile* value in the font map file.

   - If you are using PFA (ASCII) font files, create a PDS (separate from the one you use for PFB fonts), put the PFA file in it (for example, using FTP in regular, ASCII mode), and concatenate this data set to the data set already allocated to DDNAME EDAHETC in the WebFOCUS Reporting Server JCL. This PDS should be created with the following DCB attributes:

```
RECFM: VB    LRECL: 2044    BLKSIZE: 27998
```

The member name in this PDS should match the *fontfile* value in the font map file. Note that you can use PFB and PFA files simultaneously. The *fonttype* attribute in the font map file (PFB or PFA) tells WebFOCUS which PDS to search for the specified member name.

3. The user font map file is in member FONTUSER in the data set allocated to DDNAME EDACCFG. Using a text editor, add your font definition to the user font map using the syntax described in Add Fonts to the Font Map.

# Add Fonts to the Font Map

The Type 1 PostScript fonts used with the PostScript and PDF output formats use separate font files for each variant of the font: normal, bold, italic, and bold-italic. This grouping of related fonts is called a *font family*.

The XML font map syntax uses two XML tags, <*family*> and <*font*>, to represent this structure. The example uses the family name *Garamond*. For example:

```
<family name="garamond">
  <font style="normal"
        metricsfile="gdrg" fontfile="gdrg" fonttype="PFB" />
  <font style="bold"
        metricsfile="gdb"  fontfile="gdb" fonttype="PFB" />
  <font style="italic"
        metricsfile="gdi"  fontfile="gdi" fonttype="PFB" />
  <font style="bold+italic"
        metricsfile="gdbi" fontfile="gdbi" fonttype="PFB" />
</family>
```

The following example uses the family name otf. For example:

```
<family name="otf">
  <font style="normal"
        metricsfile="otfn"  fontfile="otfn" fonttype="OTF" />
  <font style="bold"
        metricsfile="otfb"  fontfile="otfb" fonttype="OTF" />
  <font style="italic"
        metricsfile="otfi"  fontfile="otfi" fonttype="OTF" />
```

```
   <font style="bold+italic"
         metricsfile="otfbi" fontfile="otfbi" fonttype="OTF" />
 </family>
```

The basics of the XML syntax are:

- Tag names (such as *family* and *font*) and attribute names (such as *style* or *metricsfile*) must be in lowercase. Attribute values, such as font file names, are case-insensitive.
- Attribute values, which is the text after the equal sign (=), must be in double quotation marks (for example, *"bold"*)
- Elements that have no explicit end-tag must end with />. (For example, the family tag has the closing tag </family>, but the font tag has no closing tag, so it ends with />.)
- Comments are enclosed in special delimiters:

  ```
  <!-- This is a comment -->
  ```

- Line breaks may be placed between attribute-value pairs.

A more complete description of XML syntax can be found here:

http://en.wikipedia.org/wiki/Xml

**The family element**

The *family* element specifies the name of a font family. This family name, specified in the *name* attribute of the family element, is the name by which the font will be referenced in a StyleSheet. It corresponds to the value of the FONT attribute in the StyleSheet. The end-tag *</family>* closes the family element, and any number of additional family elements may follow.

Font family names should be composed of letters (A-Z, a-z), digits, and limited special characters, such as a minus sign (-), underscore (_), and blank. Font family names should have a maximum length of 40 characters. Since the font name is only a reference to a mapping in the font map, it does not need to be related to the actual name of the font (which WebFOCUS obtains from the mapped AFM file) or the file name of the font.

**Font elements**

Nested within each *family* element are one or more *font* elements that specify the font files for each font in the family. For example, there may be one font element for the font *Garamond Regular* (normal), one for *Garamond Italic* (italic). Since a font element has no child elements, it is closed with "/>".

The actual name of the font as used in the PDF or PostScript document is taken from the font metric file.

Fonts defined in the user font file (fontuser.xml) can override default font definitions in fontmap.xml. Thus, you should be careful to choose family names that do not conflict with existing definitions, unless you actually wish to override these definitions (which should generally not be done).

Each font element contains the following attributes:

- **style:** This attribute specifies the style of the font and corresponds to the STYLE attribute in the StyleSheet. The allowed values are "normal", "bold", "italic", and "bold+italic". For example, the font defined in the following bold italic font element:

  ```
  <font style="bold+italic" metricsfile="gdbi" fontfile="gdbi"
  fonttype="PFB" />
  ```

  could be referenced in the StyleSheet like this:

  ```
  TYPE=REPORT, FONT=GARAMOND, STYLE=BOLD+ITALIC, $
  ```

  Although most fonts have a font file for each of the four styles, some specialized fonts such as bar code fonts might only have a single style (usually "normal"). Only the styles that exist for a particular font need to be specified in the font map file.

  The actual names of the fonts may vary. Some fonts may be called "oblique" rather than "italic", or "heavy" rather than "bold". However, the font map and StyleSheet always use the keywords "normal", "bold", "italic" and "bold+italic".

- **metricsfile:** This attribute specifies the name of the Adobe Font Metrics (AFM) file that provides the measurements of the font. You should only use the base name of the file (for example, "gdrg", not "gdrg.afm"). On Windows and UNIX systems, the file is assumed to have the extension *.afm* and reside in the wfs/etc directory. On z/OS with PDS deployment, the name refers to a member in the PDS allocated to EDACCFG. For information about file locations, see Configure Type 1 PostScript Fonts on the Windows and UNIX Platforms orConfigure Type 1 PostScript Fonts on z/OS Under PDS Deployment.

  File names should be composed of letters and numbers, and should not contain blanks. On Windows and UNIX systems, the file names may also contain underscore characters. On UNIX systems, the file names should not contain uppercase letters. Since the files must be located in specific directories, no directory paths or drive

letters are allowed.

- **fonttype:** This attribute specifies the type of the font file. The allowed values are "PFA", "PFB", or "OTF".
- **fontfile:** This attribute specifies the name of the PFB or PFA file that contains the font itself. As with *metricsfile*, the value specifies only the base file name (the *fonttype* attribute specifies the type). On Windows and UNIX, the file is assumed to have the extension *.pfb* for binary (PFB) font files or *.pfa* for ASCII (PFA) font files, and should reside in the same directory as the AFM files (wfs/etc). On z/OS with PDS deployment, the name refers to a member in the appropriate PDS.

Additional items of XML syntax include the XML header on the first line of the file and the <fontmap> and <when> elements that enclose all of the family elements. The <when> tag allows the same font mappings to be used for both PDF and PostScript reports across output formats. These can include PDF, PS, and DHTML. PPT and PPTX formats will use fonts specified for DHTML. If no <when> is specified, the font will be available for all formats.

The following is a complete example of a user font map:

```
<?xml version="1.0" encoding="UTF-8" ?>
<!-- Example of a user font map file with two font families. -->
<fontmap version="1">
    <when format="PDF PS">
        <family name="garamond">
            <font style="normal"
                  metricsfile="gdrg" fontfile="gdrg" fonttype="PFB" />
            <font style="bold"
                  metricsfile="gdb"  fontfile="gdb"  fonttype="PFB" />
            <font style="italic"
                  metricsfile="gdi"  fontfile="gdi"  fonttype="PFB" />
            <font style="bold+italic"
                  metricsfile="gdbi" fontfile="gdbi" fonttype="PFB" />
        </family>
        <!-- This font only has a "normal" style, others omitted. -->
        <family name="ocra">
            <font style="normal"
                  metricsfile="ocra" fontfile="ocra" fonttype="PFB" />
        </family>
    </when>
</fontmap>
```

## WebFOCUS StyleSheet Declaration

Once the font map files have been set up, the newly mapped fonts can be used in a WebFOCUS StyleSheet. For example, to use the Garamond fonts:

```
ON TABLE SET STYLE *
type=report, font=garamond, size=12, $
type=title, font=garamond, style=bold, color=blue, $
ENDSTYLE
```

Since the *style* attribute has been omitted for the report font in the StyleSheet, it defaults to normal. Attributes such as *size* and *color* can also be applied.

# Editing the Font Map File

There is a byte order mark (BOM) at the beginning of the user font map file (fontuser.xml), which must be preserved for this file to be read correctly.

If you are using a Unicode-aware editor, such as Notepad on Windows, to edit the file, the BOM will not be visible, but you can preserve it by making sure that you select an encoding of UTF-8 in the Save-As dialog. In most other editors, such as **vi** on UNIX or the ISPF editor under z/OS, the BOM will display as three or four strange-looking characters at the beginning of the file. As long as you do not delete or modify these characters, the BOM will be preserved.

# The WebFOCUS Default Font Map

Since the user font map is searched before the WebFOCUS default font map, font definitions in the user font map file will override mappings of the same font in the default font map file. Since you usually would not want to override existing font mappings, you can check which font names are already used by WebFOCUS by examining the default font map file.

On Windows platforms, it can be found in

```
drive:\ibi\srv82\home\etc\style\fontmap.xml
```

On UNIX, it can be found in a similarly named directory.

On z/OS with PDS deployment, the default font map file is in the FONTMAP member of the *prefix*.P.HOME.ERR partitioned data set. Unlike the user font map file, this file has separate sections containing definitions for PS, PDF, and DHTML formats.

**Note:** The DHTML mappings are used for the DHTML and PowerPoint output formats, which do not support user-added fonts.

Since the font mappings in the default font map file are for fonts that are already assumed to exist on the user machines (for example, built-in Adobe Reader fonts, standard PostScript printer fonts, or standard Windows fonts), they do not reference font files, only font metrics files. Fonts provided by the user should reference both font files and metrics files.

AFM files for the default fonts can be found in *drive*:\ibi\srv82\home\etc\style (or members of *prefix*.P.HOME.ERR with z/OS under PDS deployment).

# Define a Default Font in the Font Map

An individual default font can be set for each output type and/or language setting within an output type. This setting should be defined in the fontuser.xml file rather than the fontmap.xml file. Fontmap.xml may be updated by a future release installation, so customizations may be lost. Additionally, the settings in fontuser.xml override settings in fontmap.xml.

**Note:**

- Fontmap.xml can be found in ..\ibi\srv**XX**\home\etc\style, where **XX** is your server release.
- Fontuser.xml can be found in ..\ibi\srv**XX**\wfs\etc, where **XX** is your server release.

To designate the default font use the following steps:

### Procedure

1. Copy the selected font entry from frontmap.xml to fontuser xml.
    a. Within fontmap.xml, find the entry for the font family within the desired output format to be designated as the default.

b. Copy the entire entry into the appropriate format area within fontuser.xml.

2. In fontuser.xml, within the entry for the font to be designated as the default font and style, add the following attribute:

```
default="yes"
```

For example, the following code defines the default fonts to be Helvetica bold for PDF, Calibri for XLSX, and Arial Italic for DHTML:

```
<fontmap version="1">
<when format="PDF PS">
  <family name="Helvetica" htmlfont="Arial">
     <font style="normal" metricsfile="pdhelv"   />
     <font style="bold"   metricsfile="pdhelvb"  default="yes"  />
     <font style="italic"  metricsfile="pdhelvi"  />
     <font style="bold+italic" metricsfile="pdhelvbi" />
  </family>
</when>
<when format="XLSX">
  <family name="Calibri" htmlfont="Calibri">
     <font style="normal"      metricsfile="ttcali"  default="yes"
/>
     <font style="bold"        metricsfile="ttcalib"  />
     <font style="italic"      metricsfile="ttcalii"  />
     <font style="bold+italic" metricsfile="ttcalibi" />
  </family>
</when>
<when format="DHTML">
  <family name="Arial">
     <font style="normal"  metricsfile="ttarial"  />
     <font style="bold"    metricsfile="ttarialb" />
     <font style="italic"  metricsfile="ttariali" default="yes"  />
     <font style="bold+italic" metricsfile="ttariabi" />
  </family>
</when>
</fontmap>
```

If multiple fonts in a font map family, such as PDF, have the default="yes" attribute, the last font with that attribute becomes the default font. Fonts in fontuser.xml are processed after those in fontmap.xml, so a default font set in fontuser.xml can override the one set in fontmap.xml.

A default font set in the PDF section of the font map does not affect a default in the

DHTML section, and a default for one specific language does not override the default for other languages.

# Embedding TrueType Fonts Into WebFOCUS PDF Reports Generated in Windows

You can have WebFOCUS embed the following TrueType fonts into PDF output files generated in Windows:

- Arial Unicode MS
- Courier New
- Lucida Sans Unicode
- Tahoma
- Times New Roman
- Trebuchet MS

**Note:**

- Custom TrueType font embedding is supported, as long as you provide the AFM and TTF files. Only TTF fonts that have format 4 layer with platform ID 3 and platform specific ID 1 are supported.
- The addition of the font file and font type attributes activates the embedding feature. To use any of these fonts and font styles without embedding, do not add the font file and font style attributes into the font map definition for each individual style.

# Add TrueType Fonts for Embedding Into PDF Output Files

**Procedure**

1. Make the fonts available to the WebFOCUS Reporting Server by copying the TrueType font files from the Windows font directory (C:\Windows\fonts) to the WebFOCUS

server configuration directory:

```
drive:\ibi\srv82\wfs\etc
```

where:

**drive**

Is the drive on which the WebFOCUS Reporting Server is installed.

**wfs**

Is your WebFOCUS configuration directory (it may have a different name depending on installation options, but should always be a directory directly under *drive*:\ibi\srv82). Note that **home** is the other directory directly under *drive*:\ibi\srv82.

For each of the supported fonts, you will need to copy the following font files. You will also need to know the metrics file name associated with each font file:

**Arial Unicode MS**

| Style | Metrics File Name | Font File Name |
|---|---|---|
| Normal | pdarum.afm | arialuni.ttf |
| Bold | pdarumb.afm | arialuni.ttf |
| Italic | pdarumi.afm | arialuni.ttf |
| Bold Italic | pdarumbi.afm | arialuni.ttf |

**Courier New**

| Style | Metrics File Name | Font File Name |
|---|---|---|
| Normal | pdconu.afm | cour.ttf |
| Bold | pdconub.afm | courbd.ttf |
| Italic | pdconui.afm | couri.ttf |
| Bold Italic | pdconubi.afm | courbi.ttf |

### Lucida Sans Unicode

| Style | Metrics File Name | Font File Name |
|---|---|---|
| Normal | pdlusu.afm | l_10646.ttf |
| Bold | pdlusub.afm | l_10646.ttf |
| Italic | pdlusui.afm | l_10646.ttf |
| Bold Italic | pdlusubi.afm | l_10646.ttf |

### Tahoma

| Style | Metrics File Name | Font File Name |
|---|---|---|
| Normal | pdtaho.afm | tahoma.ttf |
| Bold | pdtahob.afm | tahomabd.ttf |
| Italic | pdtahoi.afm | tahoma.ttf |

| Style | Metrics File Name | Font File Name |
|---|---|---|
| Bold italic | pdtahobi.afm | tahomabd.ttf |

**Times New Roman**

| Style | Metrics File Name | Font File Name |
|---|---|---|
| Normal | pdtimu.afm | times.ttf |
| Bold | pdtimub.afm | timesbd.ttf |
| Italic | pdtimui.afm | timesi.ttf |
| Bold Italic | pdtimubi.afm | timesbi.ttf |

**Trebuchet MS**

| Style | Metrics File Name | Font File Name |
|---|---|---|
| Normal | pdtrbu.afm | trebuc.ttf |
| Bold | pdtrbub.afm | trebucbd.ttf |
| Italic | pdtrbui.afm | trebucit.ttf |
| Bold Italic | pdtrbubi.afm | trebucbi.ttf |

2. Add the fonts to the user font map file, fontuser.xml. This file is also located in the WebFOCUS Reporting Server configuration directory **drive**:\ibi\srv82\wfs\etc.

   The fontuser.xml file has a sample family tag. Copy the sample family tag between <when format="PDF PS"> and </when>, then edit it for the font you are adding. For

more information on editing font map syntax, see Add Fonts to the Font Map.

The following shows a user font map file with the Arial Unicode MS font added:

```
<?xml version="1.0" encoding="UTF-8" ?>
<!-- Example of a user font map file defining Arial Unicode MS true
type fonts -->
<fontmap version="1">
<when format="PDF">
    <family name = "Arial Unicode MS">
       <font style="normal" metricsfile="pdarum"
          fontfile="arialuni" fonttype="TTF" />
       <font style="bold" metricsfile="pdarumb"
          fontfile="arialuni" fonttype="TTF" />
       <font style="bold+italic" metricsfile="pdarumbi"
          fontfile="arialuni" fonttype="TTF" />
       <font style="italic" metricsfile="pdarumi"
          fontfile="arialuni" fonttype="TTF" />
   </family>
 </when>
</fontmap>
```

Note that the font file name does not include the extension. The extension, TTF, is entered as the fonttype attribute.

3. In a report request, specify the font family names and the style attributes in the stylesheet, and hold the report output in PDF format.

### Result

An example follows of the contents of a fontuser.xml file with all of the supported embedded fonts defined. You can select only the ones you need for your environment:

```
<fontmap version="1">
  <when format="PDF PS">
```

```
<family name = "Arial Unicode MS">
    <font style="normal"
          metricsfile="pdarum"   fontfile="arialuni" fonttype="TTF" />
    <font style="bold"
          metricsfile="pdarumb"  fontfile="arialuni" fonttype="TTF" />
    <font style="bold+italic"
          metricsfile="pdarumbi" fontfile="arialuni" fonttype="TTF" />
    <font style="italic"
```

```
        metricsfile="pdarumi"  fontfile="arialuni" fonttype="TTF" />
</family>
```

```
<family name="Trebuchet MS">
    <font style="normal"
          metricsfile="pdtrbu"   fontfile="trebuc"   fonttype="TTF" />
    <font style="bold"
          metricsfile="pdtrbub"  fontfile="trebucbd"  fonttype="TTF" />
    <font style="italic"
          metricsfile="pdtrbui"  fontfile="trebucit"  fonttype="TTF" />
    <font style="bold+italic"
          metricsfile="pdtrbubi" fontfile="trebucbi" fonttype="TTF" />
  </family>
```

```
<family name="Times New Roman">
    <font style="normal"
          metricsfile="pdtimu"   fontfile="times"   fonttype="TTF" />
    <font style="bold"
          metricsfile="pdtimub"  fontfile="timesbd" fonttype="TTF" />
    <font style="italic"
          metricsfile="pdtimui"  fontfile="timesi"  fonttype="TTF" />
    <font style="bold+italic"
          metricsfile="pdtimubi" fontfile="timesbi" fonttype="TTF" />
  </family>
```

```
<family name="Lucida Sans Unicode">
    <font style="normal"
          metricsfile="pdlusu"   fontfile="L_10646"   fonttype="TTF" />
    <font style="bold"
          metricsfile="pdlusub"  fontfile="L_10646"  fonttype="TTF" />
    <font style="italic"
          metricsfile="pdlusui"  fontfile="L_10646"  fonttype="TTF" />
    <font style="bold+italic"
          metricsfile="pdlusubi" fontfile="L_10646"  fonttype="TTF" />
  </family>
```

```
<family name = "Courier New">
    <font style="normal"
          metricsfile="pdconu"   fontfile="cour" fonttype="TTF" />
    <font style="bold"
          metricsfile="pdconub"  fontfile="courbd" fonttype="TTF" />
    <font style="bold+italic"
```

```
          metricsfile="pdconubi" fontfile="courbi" fonttype="TTF" />
    <font style="italic"
          metricsfile="pdconui"  fontfile="couri" fonttype="TTF" />
  </family>
```

```
<family name = "Tahoma">
    <font style="normal"
          metricsfile="pdtaho" fontfile="tahoma" fonttype="TTF" />
    <font style="bold"
          metricsfile="pdtahob" fontfile="tahomabd" fonttype="TTF" />
    <font style="bold+italic"
          metricsfile="pdtahobi" fontfile="tahomabd" fonttype="TTF" />
    <font style="italic"
          metricsfile="pdtahoi" fontfile="tahoma" fonttype="TTF" />
  </family>
  </when>
</fontmap>
```

# Embedding TrueType Fonts in a PDF Output File

The font files trebuc.ttf, trebudbd.ttf, trebucit.ttf, trebucbi.ttf, tahoma.ttf, and tahomabd.ttf have been copied to the WebFOCUS Reporting Server configuration directory, *drive*:\ibi\srv82\wfs\etc. In addition, the Trebuchet MS and Tahoma fonts have been added to the fontuser.xml file:

```
<fontmap version="1">
  <when format="PDF PS">
    <!-- family/font tags should be added here -->
    <family name="Trebuchet MS">
      <font style="normal"
          metricsfile="pdtrbu"   fontfile="trebuc"   fonttype="TTF" />
      <font style="bold"
          metricsfile="pdtrbub"  fontfile="trebucbd"  fonttype="TTF" />
      <font style="italic"
          metricsfile="pdtrbui"  fontfile="trebucit"  fonttype="TTF" />
      <font style="bold+italic"
          metricsfile="pdtrbubi" fontfile="trebucbi" fonttype="TTF" />
    </family>
    <family name="Tahoma">
      <font style="normal"
          metricsfile="pdtaho"   fontfile="tahoma"   fonttype="TTF" />
```

```
      <font style="bold"
          metricsfile="pdtahob"  fontfile="tahomabd"  fonttype="TTF" />
    </family>
  </when>
</fontmap>
```

The following request against the GGSALES data source specifies the Trebuchet MS font for the column headings and the bold style of Tahoma for the data in the PDF report output:

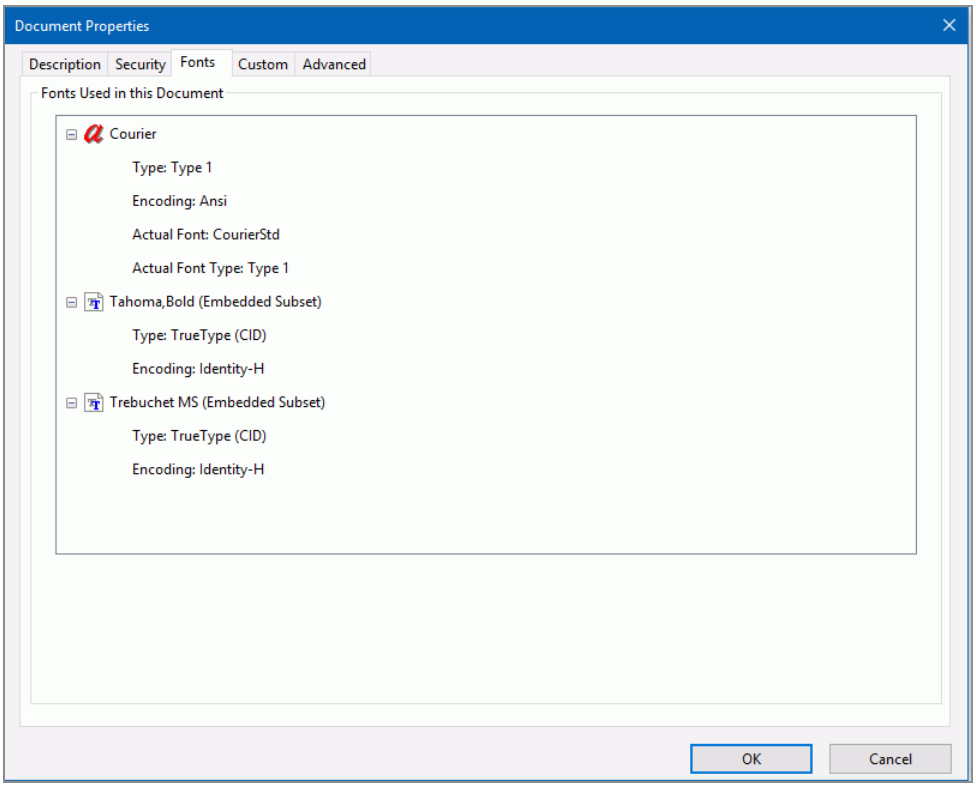
```
TABLE FILE GGSALES
SUM DOLLARS UNITS
BY REGION
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET PAGE NOPAGE
ON TABLE SET STYLE *
TYPE = TITLE, FONT='Trebuchet MS',$
TYPE = DATA, FONT='Tahoma', style=bold, size=10, color=blue, $
END
```

The output is:

| Region | Dollar Sales | Unit Sales |
|---|---|---|
| Midwest | 11400665 | 905045 |
| Northeast | 11392300 | 916675 |
| Southeast | 11710379 | 935232 |
| West | 11652946 | 932039 |

**Note:**Except for OpenType fonts, in order to reduce the size of a generated PDF document, only the subset of used characters of a font are included into the PDF document.

To confirm that a subset of the font is embedded, save a copy of the PDF file and open it in Adobe Reader. On the File menu, select **Properties**. In the Font tab, look for the words Embedded Subset next to the font name, as shown in the following image for the Tahoma and Trebuchet MS fonts.




# Creating a Compound PDF or PS Report

Compound reports combine multiple reports into a single PDF or PS file. The first PDF or PS report defines the format for the concatenated report, enabling you to intersperse intermediate reports of other formats into one encompassing report. Using compound reports, you can gather data from different data sources and combine reports into one governing report that runs each request and concatenates the output into a single PDF or PS file. You can also embed image files in a compound report.

You can then run or distribute the report with ReportCaster, which displays the compound PDF report in Adobe Reader or sends the compound PS report directly to a printer. See the ReportCaster documentation for details about this product.

This is supported with styled formats, such as PDF, PS, EXL2K, or XLSX.

# Create a Compound PDF or PS Report

For a compound report that may contain different report types, use the syntax

```
SET COMPOUND= {OPEN|CLOSE} [NOBREAK]
```

or

```
ON TABLE SET COMPOUND {OPEN|CLOSE}
```

Note that when you are using this syntax, you must also include the following code to identify the display format of each of the reports to be concatenated:

```
ON TABLE {PCHOLD|HOLD|SAVE} [AS name] FORMAT formatname
```

If all of the reports in the compound set are of the same type, either PDF or PS, you can use the following, more compact, syntax

```
ON TABLE {PCHOLD|HOLD|SAVE} [AS name] FORMAT {PDF|PS} {OPEN|CLOSE}
[NOBREAK]
```

where:

**name**

Is the name of the generated file. The name is taken from the first request in the compound report. If no name is specified in the first report, the name HOLD is used.

**OPEN**

Is specified with the first report, and begins the concatenation process. A report that contains the OPEN attribute must be PDF or PS format.

**CLOSE**

Is specified with the last report, and ends the concatenation process.

**NOBREAK**

Is an optional phrase that suppresses page breaks. By default, each report is displayed on a separate page.

You can use NOBREAK selectively in a request to control which reports are displayed on the same page.

**Note:**

- Compound reports cannot be nested.

- You can save or hold the output from a compound report. For details, see Saving and Reusing Your Report Output.
- Multi-Pane reports cannot be used in a Compound Report.

# Creating a Compound PDF Report

The following illustrates how to combine three separate PDF reports into one by creating a compound report. Notice that:

- Report 1 specifies ON TABLE PCHOLD FORMAT PDF OPEN. This defines the report as the first report and sets the format for the entire compound report as PDF.
- Report 2 species only the format, ON TABLE PCHOLD FORMAT PDF.
- Report 3 specifies ON TABLE PCHOLD FORMAT PDF CLOSE. This defines the report as the last report.

Note that in this example, all reports are set to PDF format. However, when you create a compound report, only the first report must be in either PDF or PS format. Subsequent reports can be in any styled format. For an illustration, see Embed Graphics in a Compound Report.

**Report 1:**

```
SET PAGE-NUM=OFF
TABLE FILE CENTORD
HEADING
"Sales Report"
" "
SUM LINEPRICE
BY PRODCAT
ON TABLE SET STYLE *
TYPE=HEADING, SIZE=18, $
ENDSTYLE
ON TABLE PCHOLD FORMAT PDF OPEN NOBREAK
END
```

**Report 2:**

```
TABLE FILE CENTORD
HEADING
"Inventory Report"
```

```
" "
SUM QUANTITY
BY PRODCAT
ON TABLE SET STYLE *
TYPE=HEADING, SIZE=18, $
ENDSTYLE
ON TABLE PCHOLD FORMAT PDF NOBREAK
END
```

**Report 3:**

```
TABLE FILE CENTORD
HEADING
"Cost of Goods Sold Report"
" "
SUM LINE_COGS
BY PRODCAT
ON TABLE SET STYLE *
TYPE=HEADING, SIZE=18, $
ENDSTYLE
ON TABLE PCHOLD FORMAT PDF CLOSE
END
```

The output displays as a PDF report. Because the syntax for reports 1 and 2 contain the NOBREAK command, the three reports appear on a single page. (Without NOBREAK, each report displays on a separate page.)

Sales Report

| PRODCAT | Line Total |
|---|---|
| CD Players | $40,694,863.53 |
| Camcorders | $333,884,927.52 |
| Cameras | $9,718,752.55 |
| DVD | $53,182,674.89 |
| Digital Tape Recorders | $38,773,229.69 |
| PDA Devices | $233,967,566.49 |
| VCRs | $23,801,009.34 |

Inventory Report

| PRODCAT | Quantity: |
|---|---|
| CD Players | 308,274 |
| Camcorders | 950,700 |
| Cameras | 98,141 |
| DVD | 241,287 |
| Digital Tape Recorders | 524,027 |
| PDA Devices | 610,844 |
| VCRs | 170,977 |

Cost of Goods Sold Report

| PRODCAT | Line Cost Of Goods Sold |
|---|---|
| CD Players | 30,519,126.00 |
| Camcorders | 299,487,742.00 |
| Cameras | 8,944,891.00 |
| DVD | 47,275,593.00 |
| Digital Tape Recorders | 36,157,863.00 |
| PDA Devices | 202,123,656.00 |
| VCRs | 22,056,033.00 |

# Displaying An and AnV Fields With Line Breaks

Using StyleSheet attributes, you can display An (character) and AnV (varchar) fields that contain line breaks on multiple lines in a PDF or PostScript report. Line breaks can be based on line feeds, carriage returns, or a combination of both. If you do not add these StyleSheet attributes, all line feed and carriage return formatting within these fields will be ignored.

# Display An and AnV Fields Containing Line Breaks on Multiple Lines

```
TYPE=REPORT,LINEBREAK='type',$
```

where:

**REPORT**

Is the required component for the LINEBREAK attribute.

**'type'**

Specifies that line breaks will be inserted in a report based on the following:

LF inserts a line break after each line-feed character found in all An and AnV fields.

CR inserts a line break after each carriage-return character found in all An and AnV fields.

LFCR inserts a line break after each combination of a line-feed character followed by a carriage-return character found in all An and AnV fields.

CRLF inserts a line break after each combination of a carriage-return character followed by a line-feed character found in all An and AnV fields.

**Note:** The report output must be formatted as PDF or PostScript.

# Displaying an Alphanumeric Field With Line Breaks in a PDF Report

The following request defines an alphanumeric named ANLB field with a semi-colon in the middle. The CTRAN function then replaces the semi-colon with a carriage return character and stores this string in a field named ANLBC. On the report output, this field displays on two lines:

```
DEFINE FILE EMPLOYEE
ANLB/A40 ='THIS IS AN An FIELD;WITH A LINE BREAK.';
ANLBC/A40 = CTRAN(40, ANLB, 094, 013  , ANLBC);
```

```
END
TABLE FILE EMPLOYEE
PRINT LAST_NAME ANLBC
WHERE LAST_NAME EQ 'BLACKWOOD'
ON TABLE HOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT,LINEBREAK='CR',$
ENDSTYLE
END
```

The output is:

| LAST_NAME | ANLBC |
|---|---|
| | |
| BLACKWOOD | THIS IS AN An<br>FIELD<br>WITH A LINE<br>BREAK. |

# Using an Alphanumeric Field With a Line Break in a Subfoot

The following request defines an alphanumeric named ANLB field with a semi-colon in the middle. The CTRAN function then replaces the semi-colon with a carriage return character and stores this string in a field named ANLBC. In the subfoot, this field displays on two lines:

```
DEFINE FILE EMPLOYEE
ANLB/A40 ='THIS IS AN An FIELD;WITH A LINE BREAK.';
ANLBC/A40 = CTRAN(40, ANLB, 094, 013  , ANLBC);
END
TABLE FILE EMPLOYEE
```

```
PRINT FIRST_NAME
BY LAST_NAME
WHERE LAST_NAME EQ 'BLACKWOOD'
ON LAST_NAME SUBFOOT
  " "
  " <ANLBC "
ON TABLE HOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT,LINEBREAK='CR',$
ENDSTYLE
END
```

The output is:

| LAST_NAME | FIRST_NAME |
|---|---|
| | |
| BLACKWOOD | ROSEMARIE |
| | |
| THIS IS AN An FIELD<br>WITH A LINE BREAK. | |

# Creating PDF Files on z/OS for Use With UNIX Systems

PDF files created with HOLD FORMAT PDF present a challenge if you work in a z/OS environment and use UNIX-based systems as the server for Adobe or as an intermediate transfer point.

The end of each PDF file has a table containing the byte offset, including line termination characters, of each PDF object in the file. The offsets indicate that each line is terminated by two characters, a carriage return and a line feed, which is the standard Windows text file format. However, records in a UNIX text file are terminated by one character, a line feed only. When using default settings, the offsets in a PDF file will be incorrect, causing an error when Acrobat attempts to open the file. If the file is then transferred in BINARY mode to Windows, it cannot be opened in Acrobat for Windows, as the carriage-return character was not inserted.

One solution has been to transfer the file to the UNIX system in text mode and then transfer in text mode to the Windows system, as the carriage return is added by the transfer facility when transferring to Windows.

If that is not possible or desirable, you can use the SET PDFLINETERM=SPACE command to facilitate binary transfer to Windows from an ASCII-based UNIX system. This command causes an extra space character to be appended to each record of the PDF output file. This extra space acts as a placeholder for the expected carriage return character and makes the object offsets in the file correct when it is transferred from z/OS to a UNIX system. This enables a UNIX server to open a PDF file in that environment.

**Note:** A text mode transfer is always required when transferring a text file from a mainframe to any other environment (Windows, ASCII Unix, or EBCDIC Unix).

# Specify Line Termination Characters When Creating a PDF File

In a profile, a FOCEXEC, or from the command line, issue the following command:

```
SET PDFLINETERM={STANDARD|SPACE}
```

In a TABLE request, issue the following command

```
ON TABLE SET PDFLINETERM {STANDARD|SPACE}
```

where:

**STANDARD**

Creates a PDF file without any extra characters. This file will be a valid PDF file if transferred in text mode to a Windows machine, but not to a UNIX machine. If subsequently transferred from a UNIX machine to a Windows machine in text mode, it will be a valid PDF file on the Windows machine.

**SPACE**

Creates a PDF file with an extra space character appended to each record. This file will be a valid PDF file if transferred in text mode to a UNIX machine, but not to a Windows machine. If subsequently transferred from an ASCII UNIX machine to a Windows machine in binary mode, it will be a valid PDF file on the Windows machine.

# Required PDFLINETERM Settings Based on Environment

The following chart will assist you in determining the correct setting to use, based on your environment:

| Transferring from z/OS to: | SET PDFLINETERM= |
|---|---|
| EBCDIC UNIX (text transfer) | SPACE |
| ASCII UNIX (text transfer) | SPACE |
| ASCII UNIX (text); then to Windows (binary) | SPACE |
| UNIX (text); then to Windows (text) | STANDARD |
| Directly to Windows (text) | STANDARD |

# Using Word Processing Display Formats: DOC, WP

You can display a report as a plain text word processing document using:

- **DOC format.** The report opens in Microsoft Word within your web browser. When Word opens the report, it may prompt you for information about converting text. If it does, accept the default selection. The computer on which the report is being displayed must have Word installed.

  DOC format includes page breaks, including an initial page break before the beginning of the report. If you wish to omit page breaks, issue the SET PAGE = NOPAGE command at the beginning of the procedure.

  DOC format does not support StyleSheets.

- **WP format.** The report opens as plain text within your web browser.

  If you issue the SET PAGE = OFF command, or include TABPAGENO in a heading or footing, WP will indicate page breaks by including the character "1" in the first column at each break, which is recognized as a page break control in the S/390 environment. WP format does not include page breaks that are recognized by most browsers or word processing programs.

  WP format does not support StyleSheets.

You can specify that a report display as a plain text word processing document via the PCHOLD command when you run the report in WebFOCUS. For more information, see Choose a Display Format Using PCHOLD.

# Saving Report Output in Excel XLSX Format

With Excel® 2007, Microsoft® introduced enhanced spreadsheet functionality in a new workbook file format. Using WebFOCUS, you can retrieve data from any WebFOCUS supported data source and generate a native XLSX format (Excel 2007, Excel 2010, and Excel 2013) workbook for data analysis and distribution. This section applies to Excel 2007, Excel 2010, and Excel 2013, unless otherwise indicated.

The WebFOCUS XLSX/EXL07 format supports the following Microsoft Office software products:

- Microsoft Office 2019/2016/2013/2010/2007, Office365, and Microsoft Office 2000/2003 with the Microsoft Office Compatibility Pack.
- Open Office Support (FORMAT EXL07/XLSX). Core Excel functionality generated by the EXL07/XLSX format is supported for Open Office as of WebFOCUS 8. For details on Open Office, see http://www.openoffice.org/.
- Mac Office 2008 and 2011. FORMAT EXL07/XLSX is certified with WebFOCUS 8.

WebFOCUS generates XLSX workbooks based on the Microsoft XLSX standard. These workbooks are accessible through all browsers and mobile applications that support native Microsoft XLSX files.

- Microsoft Office 365™. Microsoft Office 365 offers the local installation of Microsoft Excel 2013. It works with the Office 2010 release and provides limited functionality with Office 2007. Microsoft Office 365 also permits uploading Microsoft Excel files to the cloud, where they can be accessed on most devices using Office Online. For information on the Microsoft Office 365 plans and features, see Office 365 for business FAQ.

  You can use Microsoft Office 365 to access a WebFOCUS XLSX report. First, display the XSLX report on the screen using the PCHOLD command, and then save the report to OneDrive® for Business. Once the file is in the cloud, you can access the file using Office Online.

  For information on the differences in features available in Excel Online and in Microsoft Office 2013, see Office Online Service Description.

  For more information on working with Office Online and OneDrive for Business, see Using Office Online in OneDrive.

# Overview of EXL07/XLSX Format

FORMAT EXL07 and FORMAT XLSX are synonyms and can be used interchangeably. The FILE SAVED message will always display "XLSX FILE SAVED", regardless of the syntax specified.

The WebFOCUS procedure generates a new workbook containing a single worksheet with the report output containing your defined report elements (headings and subtotals), as well as StyleSheet syntax (such as conditional styling and drill downs):

- You can define a new default font for XLSX in the fontuser.xml file. This allows ease in customizing the look and feel of XLSX workbooks. WebFOCUS uses Arial as the

default font. However, you can change the default font to match the Microsoft Office standard font, Calibri, or your corporate standard.

- XLSX format accurately displays formatted numeric, character, and date formats.
- XLSX FORMULA enables you to convert summed information (such as column totals, row totals, and calculated values) into Excel formulas that will automatically update as you edit the Excel worksheet.
- ReportCaster supports distribution of XLSX workbooks and XLSX FORMULA workbooks.
- Within each generated worksheet, the columns in the report are automatically sized to fit the largest value in the column (SQUEEZE=ON). WebFOCUS calculates the width of each data column based on the font and size requirement of all cells in that column using font metrics developed for other styled formats, including PDF and DHTML. Calculations are based on the data and title elements of the report. Heading and footing elements are not used in the sizing calculation and will be sized based on the data column requirements.
- By default, there is a standard height for the data and Title rows. Heading, Footing, Subhead, and Subfoot rows are taller than the data rows to support wrapping and for a clearer distinction between headings and data.
- Using the TITLETEXT StyleSheet attribute, tab names within the workbook can be customized to provide better descriptions of the worksheet content.
- Unlike the HTML-based (EXL2K) format, which removes all blanks, XLSX, by default, retains leading, internal, and trailing blanks in cells within the worksheet. For more information on how to affect these blanks, see Preserving Leading and Internal Blanks in Report Output.
- An XLSX worksheet can contain 1,048,576 rows by 16,384 columns. WebFOCUS will generate worksheets larger than these defined limits, but Excel is not able to open the workbook. For more information on how to support overflow in worksheets, see Overcoming the Excel 2007/2010 Row Limit Using Overflow Worksheets.
- Because of the new format of the zipped XLSX files, native HTML symbols, such as a caret (<), cannot be supported as tag characters. For XLSX, unlike other output formats, HTMLENCODE defaults to ON. HTMLENCODE set to OFF will cause any data containing HTML tag characters to be omitted from the cell. For more information on the SET HTMLENCODE command, see the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

# Building the .xlsx Workbook File

Microsoft changed the format and structure of the Excel workbook in Excel 2007. The new .xlsx file is a binary compilation of a group of xml files. Generating this new file format using WebFOCUS is a two-step process that consists of generating the xml files containing the report output and zipping the xml documents into the binary .xlsx format. The WebFOCUS Reporting Server performs the xml generation process. The zipping process can be completed either by the client (WebFOCUS Servlet) or the server (JSCOM3):The zipping process can be completed by the client (WebFOCUS Servlet), the server (JSCOM3), or the C-based zip local mode:

- **WebFOCUS Servlet.** The WebFOCUS Client within the application server performs the zipping process. This can be done within the local client or through a remotely accessed client. The servlet method is the default approach defined for each WebFOCUS Client, with the client pointing to itself, by default.
- **JSCOM3.** The Java layer of the WebFOCUS Reporting Server performs the zipping operation. This option should be used when the WebFOCUS Servlet is configured on a secured web or application server. This is because JSCOM3 does not require URL access to a remote WebFOCUS Client.
- **C-Based Zip Local Mode.** The zipping and unzipping operation of .xlsx files is performed locally, without any communication to a server. Running in C-based zip local mode provides performance enhancements and will also work when called directly by the server or using a WebFOCUS Servlet URL.

# Select the Method for Zipping the .xlsx File Using EXCELSERVURL

You designate the method and location where the zipping will occur by setting EXCELSERVURL to a URL (for the WebFOCUS Servlet) or to a blank (for JSCOM3). You can set this value for a specific procedure or for the entire environment:

- **For a procedure.** Issue the SET EXCELSERVURL command within the procedure.
- **For the entire environment.** Edit the IBIF_excelservurl variable in the WebFOCUS Administration Console by selecting:

  Configuration/Client Settings/General/IBIF_excelservurl

For more information on accessing the WebFOCUS Administration Console and setting the IBIF_excelservurl variable, see the *ibi™ WebFOCUS® Security and Administration* manual.

The value you assign to EXCELSERVURL determines whether the WebFOCUS Servlet or JSCOM3 performs the zipping operation:

- **Specifying the Servlet.** To specify that the WebFOCUS Servlet should be used, set the EXCELSERVURL parameter or the IBIF_variable to the URL. For example,

  In a procedure:

  ```
  SET EXCELSERVURL = http://servername:8080/ibi_apps
  ```

  In the WebFOCUS Administration Console:

  ```
  IBIF_excelservurl = http://servername:8080/ibi_apps
  ```

- **Specifying JSCOM3.** To specify that JSCOM3 should be used within the current WebFOCUS Reporting Server, set EXCELSERVURL to a blank or an empty string.

  In a procedure:

  ```
  SET EXCELSERVURL = ''
  ```

  In the WebFOCUS Administration Console:

  ```
  IBIF_excelservurl = ''
  ```

By default, each WebFOCUS Client contains the following URL definition that points to itself:

```
&URL_PROTOCOL://&servername:&server_port&IBIF_webapp
```

# Designate C-Based Zip Local Mode for Zipping the .xlsx File

To designate C-based zip local mode for zipping a .xlsx file, issue the following command in a procedure:

```
SET XLSXLOCALZIP = ON
```

# Generate an Excel XLSX Workbook

You can specify that a report should be saved to an XLSX workbook, displayed in the browser, or displayed in the Excel application.

```
ON TABLE {PCHOLD|HOLD} AS name FORMAT XLSX
```

where:

**PCHOLD**

Displays the generated workbook in either the browser or the Excel application, based on your desktop settings. For information, see Viewing Excel Workbooks in the Browser vs. the Excel Application.

**HOLD**

Saves a workbook with an .xlsx extension to the designated location.

**name**

Specifies a file name for the generated workbook.

**Note:** To assign a file name to the generated workbook, set the **Save Report** option to **YES** for the .xlsx file extension in the WebFOCUS Client Redirection Settings. When opened in the Excel application, the generated workbook will retain the designated AS name. For more information, see the *TIBCO WebFOCUS® Security and Administration* manual.

# Opening XLSX Report Output

To open XLSX workbooks, Excel 2013, 2010, or 2007 must be installed on the desktop.

# Opening XLSX Report Output in Excel 2000/2003

Excel 2000 and Excel 2003 can be updated to read Excel XLSX workbooks using the Microsoft Office Compatibility Pack available from the Microsoft download site (http://www.microsoft.com/downloads/en/default.aspx). When the file extension of the file being opened is .xlsx (XLSX workbook), the Microsoft Office Compatibility Pack performs the necessary conversion to allow Excel 2000/2003 to read and open it.

In addition to the Microsoft Office Compatibility Pack, it is important to enable the WebFOCUS Client Redirection Settings **Save As** option so that Excel 2000/2003 will be able to open the XLSX report output without users first having to save it to their machine with the .xlxs file extension. The WebFOCUS Client processing Redirection Settings **Save As** option configures how the WebFOCUS Client sends each report output file type to the user machine. This option can be set as follows:

- **Save As Option disabled (NO).** The WebFOCUS Client Redirection Setting **Save As** is disabled by default. When the **Save As** option is disabled, the WebFOCUS Client sends report output to the user machine in memory with the application association specified for the report format in the WebFOCUS Client Redirection Settings configuration file (mime.wfs).

  A user machine that does not have Excel 2007/2010 installed will not recognize the application association for Excel 2007/2010 and Excel will display a message.

  The Excel 2000/2003 user can select **Save** and provide a file name with the .xlsx extension to save the report output to their machine. The user can then open the .xlsx file directly from Excel 2000/2003.

- **Save As Option enabled (YES).** When the WebFOCUS Redirection **Save As** option is enabled, the WebFOCUS Client sends the report output to the user as a file with the extension specified in the WebFOCUS Client Redirection Settings configuration file (mime.wfs).

  Upon receiving the file, Windows will display the File Download prompt asking the user to Open or Save the file with the identified application type. The File Download prompt displays the Name with the .xlsx file extension for the report output that is recognized as an Excel XLSX file type.

  **Note:** The download prompt will display for all users, including users who have Excel 2007/2010 installed on their machines.

If an Excel 2000/2003 user chooses to open the file, the Microsoft Office Compatibility Pack will recognize the .xlsx file extension and perform the necessary conversion to allow Excel 2000/2003 to read the Excel XLSX workbook.

If an Excel 2007/2010 user chooses to open the file, Excel will recognize the .xlsx file extension and read the Excel XLSX workbook.

For additional information on WebFOCUS Client Redirection Settings, see the *ibi™ WebFOCUS® Security and Administration* manual.

# Viewing Excel Workbooks in the Browser vs. the Excel Application

Your Operating System and desktop settings determine whether Excel output sent to the client is displayed in an Internet Browser window or within the Excel application. When Excel output has been defined within the Windows environment to **Browse in same window**, the workbook generated by a WebFOCUS request is opened within an Internet Explorer® browser window. When the **Browse in same window** option is unchecked for the .xls file type, the browser window created by WebFOCUS is blank because the report output is displayed in the stand-alone Excel application window.

- In Windows XP and earlier, file type specific settings are managed on the desktop within Windows Explorer by selecting **Tools**/**Folder Options**, clicking the **File Types** tab, selecting the extension (.xls or .xlsx), clicking the **Advanced** button, and checking the **Browse in same window** box.
- In Windows 7, Microsoft removed the desktop settings that support opening worksheets in the browser. This means that to change this behavior, you can no longer simply navigate to the Folder Options dialog box, but that you must change a registry setting.

**Note:** This works the same for both EXL2K and XLSX formats. The only difference is the selection of file type based on the version of Excel output you will be generating.

# Formatting Values Within Cells in XLSX Report Output

WebFOCUS formats defined in Master Files or within a FOCEXEC will be represented in the resulting cells in an Excel XLSX worksheet. Where possible, the WebFOCUS formats are translated to custom Excel formats and applied to values passed as raw data. Each data value passed to a cell in Excel is defined with a value and a format mask pair. The data format is associated with the cell rather than embedded in the value. This technique provides enhanced support for editing worksheets generated by WebFOCUS. New values entered into existing cells will retain the cell formats and continue to display in the style defined for the column within the report.

The following types of data can be passed to Excel:

- **Numeric.** Where corresponding Excel format masks can be defined, numeric values are passed as raw values with associated format masks. In instances where an equivalent format mask cannot be defined, the numeric value is passed as a text string.
- **Alphanumeric.** Alphanumeric formats are passed to Excel as text strings, with General format defined. By default, General format presents all text fields as left-justified. Alignment and other styling attributes can be applied to these cells to override the default.
- **Date formats.** Data that contain sufficient elements to define a valid Excel date format are passed as raw date values with the WebFOCUS formats translated to Excel date format masks. In WebFOCUS formats that do not contain sufficient information to create valid Excel date values, the dates are converted to text strings.
- **Date-Time formats.** Date-time values are passed as raw date-time values with WebFOCUS formats translated to Excel date-time format masks using Custom formats.
- **Text.** Text values are passed as strings with General Format defined (as with alphanumeric data).

**Note:** This behavior is a change from EXL2K format, where cells containing dates and more complex numeric formats were passed as formatted text.

# Displaying Formatted Numeric Values in XLSX Report Output

Each numeric WebFOCUS format is translated to a custom numeric Excel format. The numeric value is displayed in the Excel formula bar for the selected cell. Within the actual cell, the value with the format mask applied displays.

The WebFOCUS formats for the following numeric data types are translated into Excel XLSX format masks supporting full editing within the resulting workbook:

- Data types: E, F, D, I, P
- Comma edit option (C)
- Zero suppression (S)
- Leading zero (L)
- Floating currency symbol (M)
- Comma suppression (c)
- Right-side minus sign (-)
- Credit negative (CR)
- Bracket negative (B)
- Fixed extended currency symbol (!d, !e, !l, !y)
- Floating extended currency symbol (!D, !E, !L, !Y)
- Percent (%)

# Passing Numeric Formats to XLSX Report Output

In the following example, the DOLLARS field is assigned different numeric formats to demonstrate different available options. The column titles have been edited to display the WebFOCUS format options that have been applied:

```
TABLE FILE GGSALES
SUM DOLLARS/D12.2 AS 'D12.2'
    DOLLARS/D12C  AS 'D12C'
```

```
    DOLLARS/D12CM AS 'D12CM'
BY REGION
BY CATEGORY
ON TABLE PCHOLD FORMAT XLSX
ON TABLE SET BYDISPLAY ON
END
```

In the resulting worksheet, notice that cell C2 containing the DOLLAR value for **Midwest Coffee** presents the value with the WebFOCUS format D12.2, which presents the comma (,) and two decimal places. On the formula bar, the actual value is presented without any formatting. Examine each of the DOLLAR values in each row to see that the value as displayed in the formula bar remains the same, and only the display values presented in each cell change.

Also notice that with SET BYDISPLAY ON, the BY field values are repeated for every row on the worksheet. This creates fully qualified data rows that can be used with various data sorting, filtering, and table features in Excel without losing valuable information. This setting is recommended as a best practice for all worksheets.

A1 | Region

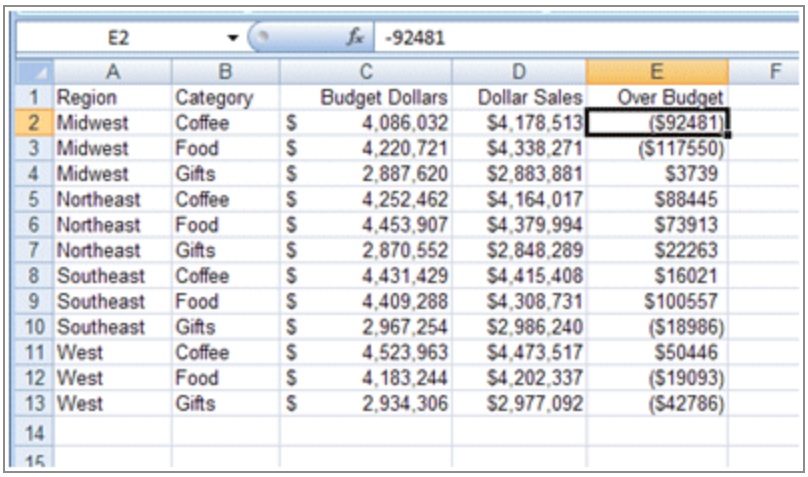
| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | Region | Category | D12.2 | D12C | D12CM | |
| 2 | Midwest | Coffee | 4,178,513.00 | 4,178,513 | $4,178,513 | |
| 3 | Midwest | Food | 4,338,271.00 | 4,338,271 | $4,338,271 | |
| 4 | Midwest | Gifts | 2,883,881.00 | 2,883,881 | $2,883,881 | |
| 5 | Northeast | Coffee | 4,164,017.00 | 4,164,017 | $4,164,017 | |
| 6 | Northeast | Food | 4,379,994.00 | 4,379,994 | $4,379,994 | |
| 7 | Northeast | Gifts | 2,848,289.00 | 2,848,289 | $2,848,289 | |
| 8 | Southeast | Coffee | 4,415,408.00 | 4,415,408 | $4,415,408 | |
| 9 | Southeast | Food | 4,308,731.00 | 4,308,731 | $4,308,731 | |
| 10 | Southeast | Gifts | 2,986,240.00 | 2,986,240 | $2,986,240 | |
| 11 | West | Coffee | 4,473,517.00 | 4,473,517 | $4,473,517 | |
| 12 | West | Food | 4,202,337.00 | 4,202,337 | $4,202,337 | |
| 13 | West | Gifts | 2,977,092.00 | 2,977,092 | $2,977,092 | |
| 14 | | | | | | |

The following example uses Fixed Dollar (N) format, as well as multiple combined format options. Each WebFOCUS format option is translated to the appropriate Excel XLSX format mask and applied to the cell value:

```
TABLE FILE GGSALES
SUM BUDDOLLARS/D12N
    DOLLARS/D12M
```

```
COMPUTE OVERBUDGET/D12BMc = BUDDOLLARS-DOLLARS; AS 'Over Budget'
BY REGION
BY CATEGORY
ON TABLE PCHOLD FORMAT XLSX
ON TABLE SET BYDISPLAY ON
END
```

Notice the fixed numeric format defined for the BUDDOLLARS column (Column C) presents the local currency symbol in a fixed position within each cell, regardless of the size of the data value. On the formula bar, the values in the **Over Budget** calculated field is passed as a negative value where appropriate. In the actual cells, the bracketed styling is applied to the negative values as part of the custom Excel XLSX format mask.



E2 -92481

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | Region | Category | Budget Dollars | Dollar Sales | Over Budget | |
| 2 | Midwest | Coffee | $ 4,086,032 | $4,178,513 | ($92481) | |
| 3 | Midwest | Food | $ 4,220,721 | $4,338,271 | ($117550) | |
| 4 | Midwest | Gifts | $ 2,887,620 | $2,883,881 | $3739 | |
| 5 | Northeast | Coffee | $ 4,252,462 | $4,164,017 | $88445 | |
| 6 | Northeast | Food | $ 4,453,907 | $4,379,994 | $73913 | |
| 7 | Northeast | Gifts | $ 2,870,552 | $2,848,289 | $22263 | |
| 8 | Southeast | Coffee | $ 4,431,429 | $4,415,408 | $16021 | |
| 9 | Southeast | Food | $ 4,409,288 | $4,308,731 | $100557 | |
| 10 | Southeast | Gifts | $ 2,967,254 | $2,986,240 | ($18986) | |
| 11 | West | Coffee | $ 4,523,963 | $4,473,517 | $50446 | |
| 12 | West | Food | $ 4,183,244 | $4,202,337 | ($19093) | |
| 13 | West | Gifts | $ 2,934,306 | $2,977,092 | ($42786) | |
| 14 | | | | | | |
| 15 | | | | | | |

# Using Numeric Formats in Report Headings and Footings

By default, headings and footings are passed to Excel as a single character string. Spot markers are not supported for positioning within each line. Numeric fields and dates passed in headings and footings are passed as text strings within the overall heading or footing contents.

To display numeric fields and dates within headings and footings as numeric or date values, use HEADALIGN=BODY in the StyleSheet to define each of the items in the heading as an individual cell. Each cell containing numeric or date values will then be passed as the appropriate value with the associated format mask.

# Using Numeric Format Punctuation in Headings and Footings

For data columns, all currency formats are translated using the Excel XLSX format masks that use the punctuation rules defined by the regional settings of the desktop.

In languages that use Continental Decimal Notation, the currency definitions designate that a comma (,) is used as the decimal separator, and a period (.) is used as the thousands separator, so D12.2CM may present the value as $ 9.999,99 rather than the English (United States) value $ 9,999.99. In headings and footings, you can designate that punctuation should be converted to Continental Decimal notation by issuing the SET CDN=ON command. With this setting in effect, the data embedded within heading and footing text strings will be formatted using the converted punctuation. Specify HEADALIGN=BODY to delineate items as individual cells and to retain the numeric formatting within the field, which will follow the same rules as the report data within the data columns.

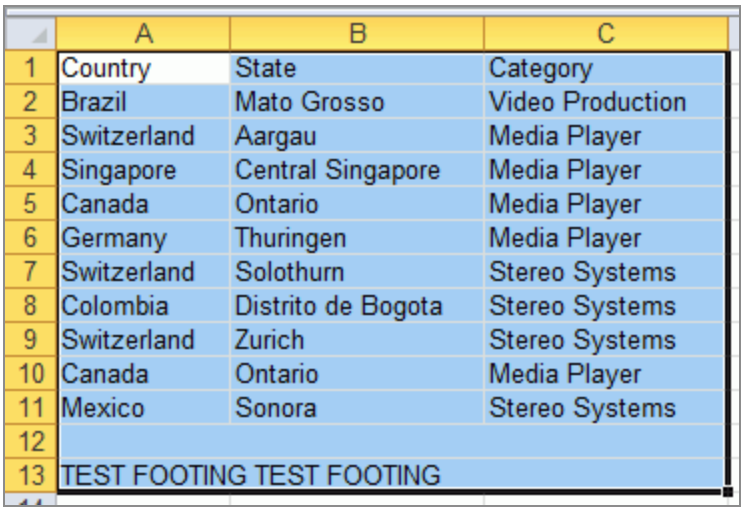
# Usage Note for Sorting an XSLX Report That Contains a Footing

In XLSX format, the report footer is included as a part of the data table in Excel. This is not the same behavior in EXL2K. In EXL2K format, the footer is not included as a part of the table.

For example, if you run the following procedure and sort the data table, the report footer is part of the data table, as shown in the image below the request:

```
TABLE FILE WF_RETAIL_LITE
PRINT COUNTRY_NAME AS Country
STATE_PROV_NAME AS State
PRODUCT_CATEGORY AS Category
WHERE RECORDLIMIT EQ 10
FOOTING
""
"TEST FOOTING TEST FOOTING"
ON TABLE PCHOLD FORMAT XLSX
ON TABLE SET STYLE *
ENDSTYLE
END
```

The output is:



| | A | B | C |
|---|---|---|---|
| 1 | Country | State | Category |
| 2 | Brazil | Mato Grosso | Video Production |
| 3 | Switzerland | Aargau | Media Player |
| 4 | Singapore | Central Singapore | Media Player |
| 5 | Canada | Ontario | Media Player |
| 6 | Germany | Thuringen | Media Player |
| 7 | Switzerland | Solothurn | Stereo Systems |
| 8 | Colombia | Distrito de Bogota | Stereo Systems |
| 9 | Switzerland | Zurich | Stereo Systems |
| 10 | Canada | Ontario | Media Player |
| 11 | Mexico | Sonora | Stereo Systems |
| 12 | | | |
| 13 | TEST FOOTING TEST FOOTING | | |

The workaround is to add a named data range to the procedure, as shown in the following procedure:

```
TABLE FILE WF_RETAIL_LITE
PRINT COUNTRY_NAME AS Country
STATE_PROV_NAME AS State
PRODUCT_CATEGORY AS Category
WHERE RECORDLIMIT EQ 10
FOOTING
""
"TEST FOOTING TEST FOOTING"
ON TABLE PCHOLD FORMAT XLSX
ON TABLE SET STYLE *
TYPE=DATA, IN-RANGES=DATA, $TYPE=TITLE, IN-RANGES=DATA, $
ENDSTYLE
END
```

The report footer is not part of the data table, as shown in the following image:

| | A | B | C |
|---|---|---|---|
| 1 | Country | State | Category |
| 2 | Brazil | Mato Grosso | Video Production |
| 3 | Switzerland | Aargau | Media Player |
| 4 | Singapore | Central Singapore | Media Player |
| 5 | Canada | Ontario | Media Player |
| 6 | Germany | Thuringen | Media Player |
| 7 | Switzerland | Solothurn | Stereo Systems |
| 8 | Colombia | Distrito de Bogota | Stereo Systems |
| 9 | Switzerland | Zurich | Stereo Systems |
| 10 | Canada | Ontario | Media Player |
| 11 | Mexico | Sonora | Stereo Systems |
| 12 | | | |
| 13 | TEST FOOTING TEST FOOTING | | |

# Passing Dates to XLSX Report Output

Most translated and smart dates can be sent to Excel as standard date values with format masks, enabling Excel to use them in functions, formulas, and sort sequences.

Excel 2007 only supports mixed-case date text strings so all month and day names are displayed in mixed-case, regardless of how the case has been specified in the WebFOCUS format. For example, the WebFOCUS date format WRYMTRD presents the date text information in uppercase in all non-Excel formats. Excel transforms this value to mixed-case automatically.

In HTML, the date format displays as:

In XLSX, the date format displays as:

# Translating WebFOCUS Dates to Excel XLSX Dates

The following request against the GGSALES data source creates the date January 1, 2010 and converts it to four date formats with translated text:

```
DEFINE FILE GGSALES
NEWDATE/MDYY = '01/01/2010';
WRMtrDY/WRMtrDY = NEWDATE;
wDMTY/wDMTY = NEWDATE;
wrDMTRY/wrDMTRY = NEWDATE;
wrYMtrD/wrYMtrD = NEWDATE;
END
TABLE FILE GGSALES
SUM DATE NOPRINT
NEWDATE WRMtrDY wDMTY wrDMTRY wrYMtrD
ON TABLE PCHOLD FORMAT XLSX
END
```

The following table shows how the dates should appear.

| WebFOCUS Format | WebFOCUS Display | XLSX Display | XLSX Value |
|---|---|---|---|
| WRMtrDY | FRIDAY, January 1 10 | Friday, January 1 10 | 1/1/2010 |
| wDMTY | Fri, 1 JAN 10 | Fri, 1 Jan 10 | 1/1/2010 |
| wrDMTY | Friday, 1 JANUARY 10 | Friday, 1 January 10 | 1/1/2010 |
| wrYMtrD | FRIDAY, 10 JANUARY 1 | Friday, 10 January 1 | 1/1/2010 |

In Excel 2007/2010, all of the cells have a date value with format masks, and all month and day names are in mixed-case, regardless of how the case has been specified in the WebFOCUS format. The output is:

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | NEWDATE | WRMtrDY | wDMTY | wrDMTRY | wrYMtrD |
| 2 | 01/01/2010 | Friday, January 1 10 | Fri, 1 Jan 10 | Friday, 1 January 10 | Friday, 10 January 1 |

# Passing Dates Without a Day Component

Date formats that do not specify the day value explicitly are defined as the date value of the first day of the month. Therefore, the value placed in the cell may be different from the day component value in the source data field and may produce unexpected results when used for sorting or date calculations in an Excel formula.

The following table shows how WebFOCUS date formats are represented in XLSX. The table shows how the value is preserved in the cell and how the display is generated using the format mask that corresponds to the WebFOCUS date format.

```
DATEFLD/MDYY = '01/02/2010'
```

| WebFOCUS Format | XLSX Display | XLSX Value |
|---|---|---|
| DMYY | 02/01/2010 | 1/2/2010 |
| MY | 01/10 | 1/1/2010 |
| MTY | Jan, 10 | 1/1/2010 |
| MTDY | Jan 2, 10 | 1/2/2010 |

# Passing WebFOCUS Dates With and Without a Day Component to XLSX Report Output

The following request against the GGSALES data source creates the date January 2, 2010 and passes it to Excel with formats MDYY, DMYY, MY, and MTDY:

```
DEFINE FILE GGSALES
NEWDATE/MDYY = '01/02/2010';
END
TABLE FILE GGSALES
SUM DATE NOPRINT
NEWDATE AS 'MDYY' NEWDATE/DMYY AS 'DMYY' NEWDATE/MY AS 'MY'
        NEWDATE/MTY AS 'MTY' NEWDATE/MTDY AS 'MTDY'
ON TABLE PCHOLD FORMAT XLSX
END
```

Columns D and E have actual date values with format masks, displayed by Excel 2007/2010 in mixed-case. Since the MTY format does not have a day component, the date value stored is the first of January 2010 (1/1/2010), not the second of January 2010 (1/2/2010):

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | MDYY | DMYY | MY | MTY | MTDY |
| 2 | 01/02/2010 | 02/01/2010 | 01/10 | Jan, 10 | Jan 2, 10 |

# Passing Date Components for Use in Excel Formulas

Dates formatted as individual components (for example, D, Y, M, W) are passed to Excel as numeric values that can be used as parameters to Excel date functions. The values are passed as General format that are recognized by Excel as numbers.

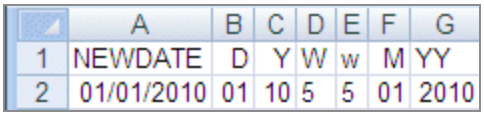
# Passing Numeric Date Components to XLSX Report Output

The following request against the GGSALES data source creates the date January 1, 2010 and extracts numeric date components, passing them to Excel 2007/2010:

```
DEFINE FILE GGSALES
NEWDATE/MDYY = '01/01/2010';
D/D = NEWDATE;
Y/Y = NEWDATE;
W/W = NEWDATE;
```

```
w/w = NEWDATE;
M/M = NEWDATE;
YY/YY = NEWDATE;
END
TABLE FILE GGSALES
SUM DATE NOPRINT
NEWDATE D Y W w M YY
ON TABLE PCHOLD FORMAT XLSX
END
```

The output is:



| | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 1 | NEWDATE | D | Y | W | w | M | YY |
| 2 | 01/01/2010 | 01 | 10 | 5 | 5 | 01 | 2010 |

# Passing Quarter Formats

Date formats that contain a Quarter component are always passed to Excel as text strings since Excel does not support Quarter formats.

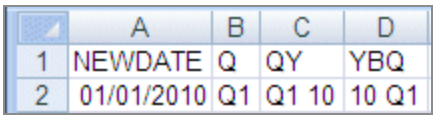
# Passing Dates With a Quarter Component to XLSX Report Output

The following request against the GGSALES data source creates the date January 1, 2010 and converts it to date formats that contain a Quarter component:

```
DEFINE FILE GGSALES
NEWDATE/MDYY = '01/01/2010';
Q/Q = NEWDATE;
QY/QY = NEWDATE;
YBQ/YBQ = NEWDATE;
END
TABLE FILE GGSALES
SUM DATE NOPRINT
NEWDATE Q QY YBQ
ON TABLE PCHOLD FORMAT XLSX
END
```

In XLSX, the cells containing dates with Quarter components have General format. To see this, open the Format Cells dialog box.

The output is:



| | A | B | C | D |
|---|---|---|---|---|
| 1 | NEWDATE | Q | QY | YBQ |
| 2 | 01/01/2010 | Q1 | Q1 10 | 10 Q1 |

# Passing Date Components Defined as Translated Text

Date formats that do not contain sufficient information to present a valid date result in Excel are not translated to a value, including formats that do not contain year and/or month information. These dates will be sent to Excel as text. In the absence of complete information, the year defaults to the current year, so the value sent would be incorrect if this type of format was passed as a date value. The following formats will not be sent as values:

- MT, MTR, Mt, Mtr
- W, w, WR, wr

When date formats are passed to XLSX with format masks, all month and day names are in mixed-case, regardless of how the case has been specified in the WebFOCUS format. However, since the values in this example are always sent as text, the casing defined in the WebFOCUS format is applied in the resulting cell.

# Passing Date Components Defined as Translated Text to XLSX Report Output

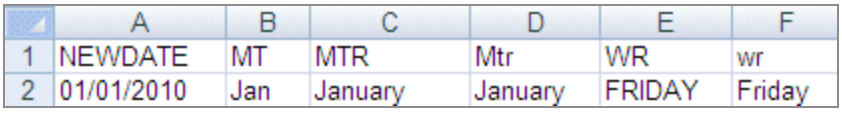
The following request against the GGSALES data source creates the date January 1, 2010 and converts it to date formats that are defined as either month name or day name:

```
DEFINE FILE GGSALES
NEWDATE/MDYY = '01/01/2010';
MT/MT = NEWDATE;
```

```
MTR/MTR = NEWDATE;
Mtr/Mtr = NEWDATE;
WR/WR = NEWDATE;
wr/wr = NEWDATE;
END
TABLE FILE GGSALES
SUM DATE NOPRINT
NEWDATE MT MTR Mtr WR wr
ON TABLE PCHOLD FORMAT XLSX
END
```

In Excel 2007 or 2010, the cells containing the days have General format. To see this, open the Format Cells dialog box.

The output is:



| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | NEWDATE | MT | MTR | Mtr | WR | wr |
| 2 | 01/01/2010 | Jan | January | January | FRIDAY | Friday |

# Usage Notes for Date Values in XLSX Report Output

- The following date formats are not supported in XLSX. They will translate into Excel General format and possibly produce unpredictable results:
  - JUL, YYJUL, and I2MT.
  - Dates stored as a packed or alphanumeric field with date display options.

# Passing Date-Time to XLSX

Most WebFOCUS date-time formats can be sent to XLSX as standard date/time values with format masks, enabling Excel to use them in functions, formulas, and sort sequences.

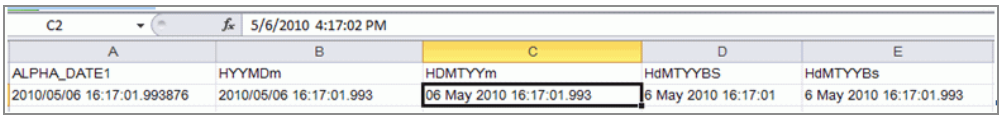
As with the Date formats, Excel only supports mixed-case to date-time fields, so if the date-time format contains text and is supported by Excel, the text will be in mixed-case, regardless of the casing defined within the WebFOCUS format.

# Passing Date-Time to XLSX

The following request shows an example against the GGSALES data source.

```
DEFINE FILE GGSALES
DT1/HYYMDm WITH REGION = DT(20100506 16:17:01.993876);
DPT1/HDMTYYm = DT1;
ALPHA_DATE1/A30 = HCNVRT(DT1,'(HYYMDm)',30,'A30');
END
TABLE FILE GGSALES
PRINT
ALPHA_DATE1
DT1 AS 'HYYMDm'
DPT1 AS 'HDMTYYm'
DT1/HdMTYYBS   AS 'HdMTYYBS'
DT1/HdMTYYBs   AS 'HdMTYYBs'
ON TABLE SET SPACES 1
IF RECORDLIMIT EQ 1
ON TABLE PCHOLD FORMAT XLSX
END
```

The output is:




**Note:** Minutes by themselves are not supported in Excel and will be sent as an integer to XLSX with a Custom format.

Also, Excel time formats only support to the milliseconds. WebFOCUS formats that display microseconds will send the value to Excel, but the value will be rounded to milliseconds within the worksheet if the cell is edited.

The following table shows how the date-time values appear.

| WebFOCUS Format | XLSX Displays | XLSX Value |
|---|---|---|
| HYYMDm | 2010/05/06 16:17:01.993 | 5/6/2010 4:17:02 PM |

| WebFOCUS Format | XLSX Displays | XLSX Value |
|---|---|---|
| HDMTYYm | 06 May 2010 16:17:01.993 | 5/6/2010 4:17:02 PM |
| HdMTYYBS | 6 May 2010 16:17:01 | 5/6/2010 4:17:01 PM |
| HdMTYYBs | 6 May 2010 16:17:01.993 | 5/6/2010 4:17:02 PM |

# Generating Native Excel Formulas in XLSX Report Output

When you display or save a tabular report request using XLSX FORMULA, the resulting worksheet contains an Excel formula that computes and displays the results of any type of summed information, such as column totals, row totals, subtotals, and calculated values, rather than static numbers. A formula for a calculated value is generated by translating the internal form of the WebFOCUS expression into an Excel formula. Worksheets saved using the XLSX FORMULA format are interactive, allowing for "what if" scenarios that immediately reflect any additions or modifications made to the data.

# Understanding Formula Versus Value

The XLSX FORMULA format will generate formulas rather than values for the following WebFOCUS TABLE commands: ROW-TOTAL, COLUMN-TOTAL, SUB-TOTAL, SUBTOTAL, and SUMMARIZE, as well as for calculations performed by functions.

- A DEFINE field will always generate a constant value and not a formula.
- COMPUTE will generate the formula, except when the COMPUTE is equal to a single variable. In that case, the constant is placed and not the formula.
- If your report contains a calculated value (generated by the COMPUTE or RECOMPUTE command), all of the fields referenced by the calculated value must be displayed in the report in order for a cell reference to be included in the formula. If the referenced column is not displayed in the workbook, the data value will be placed in the formula, rather than a cell reference. Additionally, if the value cannot be reliably calculated based on the information passed to Excel, the value, rather

than an expression, will be used. For example, using the LAST function in WebFOCUS cannot be translated correctly into Excel. In this instance, the LAST value is used in the expression, rather than a cell reference.

XLSX FORMULA is not supported with financial reports created with the Report canvas or the underlying Financial Modeling Language (FML).

For more information, see Translation Support for FORMAT XLSX FORMULA.

# Translation Support for FORMAT XLSX FORMULA

This topic describes translation support for FORMAT XLSX FORMULA. Use of unsupported WebFOCUS features may produce unreliable results.

- All standard operators are supported. These include arithmetic operators, relational operators, string operators, IF/THEN/ELSE, and logical operators. However, column notation is not supported.

  The IS-PRESENT, IS-MISSING, IS-FROM, FROM, NOT-FROM, IS-MORE-THAN, IS-LESS-THAN, CONTAINS, and OMITS operators are not supported.

  The logical operators AND and OR are not supported in conditional (IF-THEN-ELSE) or logical expressions.

- The following functions are supported:

  ABS, ARGLEN, ATODBL, BYTVAL, CHARGET, CTRAN, DMOD, DOWK, DOWK, DOWKL, EXP, FMOD, HEXBYT, HHMMSS, IMOD, LCWORD, LOCASE, LOG, MAX, MIN, OVRLAY, POSIT, RDUNIF, SQRT, SUBSTR, TODAY, and UPCASE. The EDIT function is supported for converting formats (one argument variant). It is not supported for editing strings.

  The functions CTRFLD, LJUST, and RJUST are not recommended for justifying data in Excel columns. With the use of Excel proportional fonts, the StyleSheet JUSTIFY attribute is more appropriate.

  Be cautious when using functions that use decimal values as an argument (BYTVAL, CTRAN, HEXBYT). Based on whether the operating environment is EBCDIC or ASCII, the results may be different.

- XLSX FORMULA is not supported with the following WebFOCUS commands and phrases:

    - DEFINE
    - OVER
    - FOR
    - NOPRINT
    - Multiple display (PRINT, LIST, SUM, and COUNT) commands
    - SEQUENCE StyleSheet attribute
    - RECAP
    - SET HIDENULLACRS
    - SET SUBTOTALS = ABOVE
    - LAST
- The BYDISPLAY ON setting is recommended to allow the sort field value to be available on all rows for recalculations.
- If an expression requires more than 1024 characters, WebFOCUS will place the value into the cell, and not the formula.
- Conditional styling is based on the values in the original report. If the worksheet values are changed and the formulas are recomputed, the styling will not reflect the updated information.

# Save Reports as FORMAT XLSX FORMULA

Add the following syntax to your request to take advantage of Excel formulas in your workbook:

```
ON TABLE {PCHOLD|HOLD} FORMAT XLSX FORMULA
```

where:

**PCHOLD**

Displays the output in an XLSX workbook.

**HOLD**

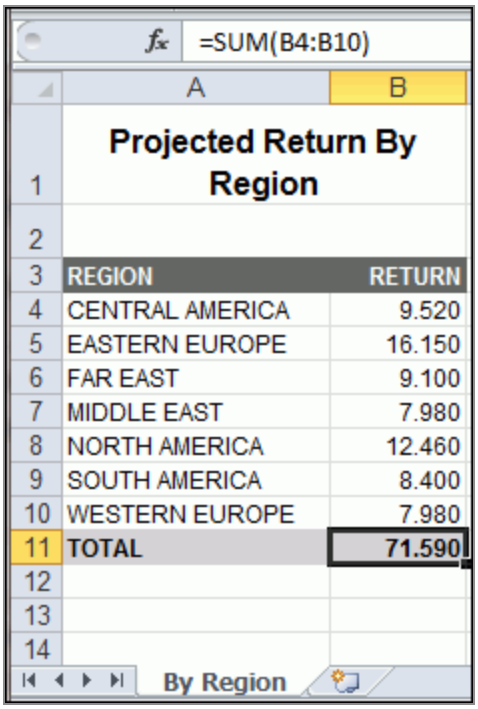
Saves the output for reuse in an Excel worksheet. For details, see Saving and Reusing Your Report Output.

# Generating Native Excel Formulas for Column Totals

The following example illustrates how a column total in a report request is translated to an Excel formula when you use the XLSX FORMULA format. Notice that the formatting of the column total (TYPE=GRANDTOTAL) is retained in the Excel workbook. When you select the total in the report, the equation =SUM(B4:B10) displays in the formula bar, representing the column total as a sum of cell ranges.

```
TABLE FILE SHORT
HEADING
"Projected Return By Region"
" "
SUM PROJECTED_RETURN AS 'RETURN'
BY REGION AS 'REGION'
ON TABLE COLUMN-TOTAL
ON TABLE PCHOLD FORMAT XLSX FORMULA
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, FONT='ARIAL', SIZE=9, TITLETEXT='By Region',$
TYPE=TITLE, BACKCOLOR=RGB(102 102 102), COLOR=RGB(255 255 255),$
TYPE=HEADING, SIZE=12, STYLE=BOLD, JUSTIFY=CENTER,$
TYPE=GRANDTOTAL, BACKCOLOR=RGB(210 210 210), STYLE=BOLD,$
END
```

The output is:




WebFOCUS can translate any total (subtotal, row total, or column total) to an Excel formula. For related information, see Translation Support for FORMAT XLSX FORMULA.

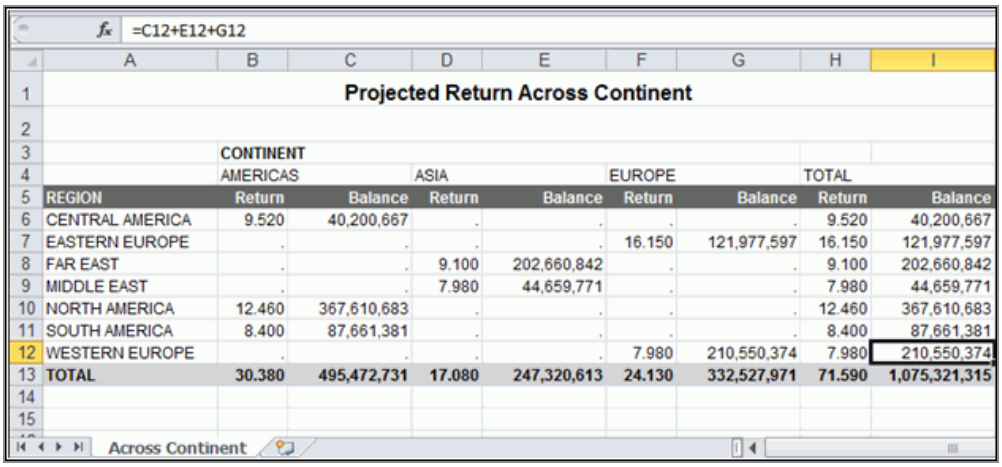
# Generating Native Excel Formulas for Row Totals

The following request calculates totals for returns and balances across continents. The row totals are represented as sums of cell ranges.

```
TABLE FILE SHORT
HEADING
"Projected Return Across Continent"
" "
SUM PROJECTED_RETURN AS 'Return' AND BALANCE AS 'Balance'
ACROSS CONTINENT AS 'CONTINENT'
BY REGION AS 'REGION'
ON CONTINENT ROW-TOTAL AS 'TOTAL'
ON TABLE COLUMN-TOTAL AS 'TOTAL'
ON TABLE PCHOLD FORMAT XLSX FORMULA
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, FONT='ARIAL', SIZE=9, TITLETEXT='Across
Continent',$
TYPE=TITLE, BACKCOLOR=RGB(102 102 102), COLOR=RGB(255 255 255),$
TYPE=HEADING, SIZE=12, STYLE=BOLD, JUSTIFY=CENTER,$
```

```
TYPE=ACROSSTITLE, STYLE=BOLD,$
TYPE=GRANDTOTAL, BACKCOLOR=RGB(210 210 210), STYLE=BOLD,$
END
```

The following output highlights the formula that calculates the row total in cell I12=C12+E12+G12.



=C12+E12+G12

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Projected Return Across Continent | | | | | | | | |
| 2 | | | | | | | | | |
| 3 | | CONTINENT | | | | | | | |
| 4 | | AMERICAS | | ASIA | | EUROPE | | TOTAL | |
| 5 | REGION | Return | Balance | Return | Balance | Return | Balance | Return | Balance |
| 6 | CENTRAL AMERICA | 9.520 | 40,200,667 | . | . | . | . | 9.520 | 40,200,667 |
| 7 | EASTERN EUROPE | . | . | . | . | 16.150 | 121,977,597 | 16.150 | 121,977,597 |
| 8 | FAR EAST | . | . | 9.100 | 202,660,842 | . | . | 9.100 | 202,660,842 |
| 9 | MIDDLE EAST | . | . | 7.980 | 44,659,771 | . | . | 7.980 | 44,659,771 |
| 10 | NORTH AMERICA | 12.460 | 367,610,683 | . | . | . | . | 12.460 | 367,610,683 |
| 11 | SOUTH AMERICA | 8.400 | 87,661,381 | . | . | . | . | 8.400 | 87,661,381 |
| 12 | WESTERN EUROPE | . | . | . | . | 7.980 | 210,550,374 | 7.980 | 210,550,374 |
| 13 | TOTAL | 30.380 | 495,472,731 | 17.080 | 247,320,613 | 24.130 | 332,527,971 | 71.590 | 1,075,321,315 |
| 14 | | | | | | | | | |
| 15 | | | | | | | | | |

Across Continent

# Generating Native Excel Formulas for Calculated Values

The following request totals the columns for retail cost and dealer cost, and calculates the value of a field called PROFIT by subtracting the DOLLARS from the BUDDOLLARS.

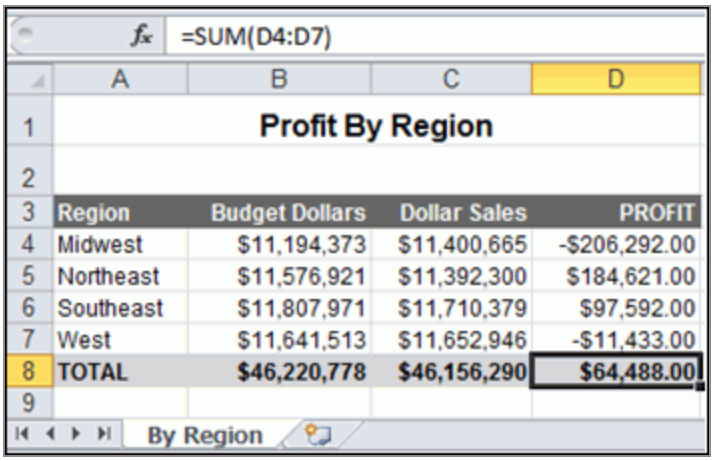
The formula for the calculated values is generated by translating the internal form of the WebFOCUS expression (PROFIT/D12.2MC = BUDDOLLARS - DOLLARS;) into an Excel formula. In this example, the formulas appear in cells B8, C8, and D8.

All fields referenced in the calculation should be displayed in the report for a valid formula to be created using cell references. Otherwise, it may be created using values not in the report. If the fields used in the calculation are not present in the report and there is a subsequent RECOMPUTE, the formula created for the RECOMPUTE will not be correct.

```
TABLE FILE GGSALES
ON TABLE SET PAGE-NUM OFF
SUM BUDDOLLARS/I8MC AND DOLLARS/I8MC
COMPUTE PROFIT/D12.2MC = BUDDOLLARS - DOLLARS;
BY REGION
```

```
HEADING
"Profit By Region"
" "
ON TABLE COLUMN-TOTAL
ON TABLE PCHOLD FORMAT XLSX FORMULA
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, FONT='ARIAL', SIZE=9, TITLETEXT='By Region',$
TYPE=TITLE, BACKCOLOR=RGB(102 102 102), COLOR=RGB(255 255 255),$
TYPE=HEADING, SIZE=12, STYLE=BOLD, JUSTIFY=CENTER,$
TYPE=GRANDTOTAL, BACKCOLOR=RGB(210 210 210), STYLE=BOLD,$
END
```

The following output highlights the formula that calculates for the column total of PROFIT: D8=SUM(D4:D7).



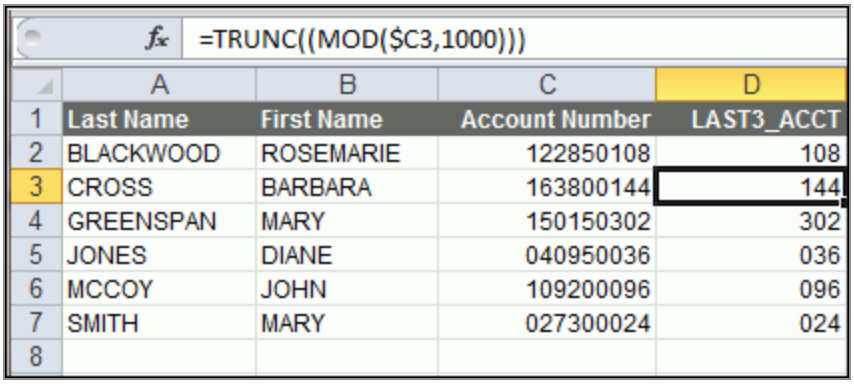

# Generating a Native Excel Formula for a Function

The following example illustrates how functions are translated to Excel reports. The function IMOD divides ACCTNUMBER by 1000 and returns the remainder to LAST3_ACCT. The Excel formula corresponds to =TRUNC((MOD($C3,(1000)))). TRUNC is used when the answer returned from an equation is being placed into an Integer field, to be sure there are no decimals.

```
TABLE FILE EMPLOYEE
PRINT ACCTNUMBER AS 'Account Number'
COMPUTE LAST3_ACCT/I3L = IMOD(ACCTNUMBER, 1000, LAST3_ACCT);
BY LAST_NAME AS 'Last Name'
BY FIRST_NAME AS 'First Name'
```

```
WHERE (ACCTNUMBER NE 000000000) AND (DEPARTMENT EQ 'MIS');
ON TABLE PCHOLD FORMAT XLSX FORMULA
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, FONT='ARIAL', SIZE=9,$
TYPE=TITLE, BACKCOLOR=RGB(102 102 102), COLOR=RGB(255 255 255),
STYLE=BOLD,$
END
```

The output is:




| | A | B | C | D |
|---|---|---|---|---|
| 1 | Last Name | First Name | Account Number | LAST3_ACCT |
| 2 | BLACKWOOD | ROSEMARIE | 122850108 | 108 |
| 3 | CROSS | BARBARA | 163800144 | 144 |
| 4 | GREENSPAN | MARY | 150150302 | 302 |
| 5 | JONES | DIANE | 040950036 | 036 |
| 6 | MCCOY | JOHN | 109200096 | 096 |
| 7 | SMITH | MARY | 027300024 | 024 |
| 8 | | | | |

# Generating a Formula With Recomputed Values

If your report contains a calculated value (generated by the COMPUTE or RECOMPUTE command), all of the fields referenced by the calculated value must be displayed in the report in order for cell references to be included in the formula. If a referenced column is not displayed in the workbook, the data value will be placed in the formula, rather than a cell reference. In the case of RECOMPUTE, the value used may be an incorrect value from the last detail record of the sort break.

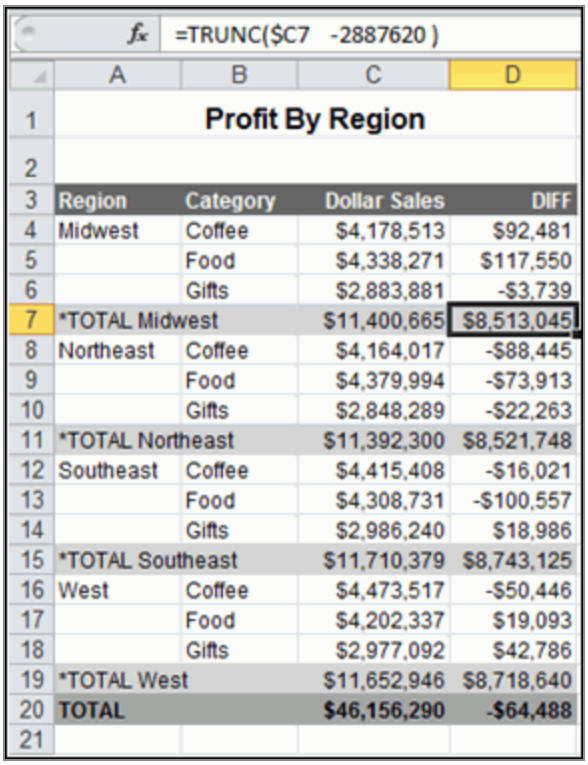
# Generating a Formula With Recomputed Values

The following request computes the difference (DIFF) by subtracting budgeted dollars from dollar sales. The budgeted dollars field used in the expression is not included in the SUM command. The value of DIFF is recomputed on the region level.

```
TABLE FILE GGSALES
HEADING
```

```
"Profit By Region"
" "
SUM DOLLARS/I8CM
COMPUTE DIFF/I8CM=DOLLARS - BUDDOLLARS;
BY REGION
BY CATEGORY
ON REGION RECOMPUTE
ON TABLE PCHOLD FORMAT XLSX FORMULA
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, FONT='ARIAL', SIZE=9, TITLETEXT='By Region',$
TYPE=TITLE, BACKCOLOR=RGB(102 102 102), COLOR=RGB(255 255 255),$
TYPE=HEADING, SIZE=12, STYLE=BOLD, JUSTIFY=CENTER,$
TYPE=SUBTOTAL, BACKCOLOR=RGB(210 210 210),$
TYPE=GRANDTOTAL, BACKCOLOR=RGB(166 166 166), STYLE=BOLD,$
END
```

The output shows that the formula is subtracting a data value that is not displayed on the worksheet. It is actually the BUDDOLLARS value from the current hardcoded value, since there is no cell reference.



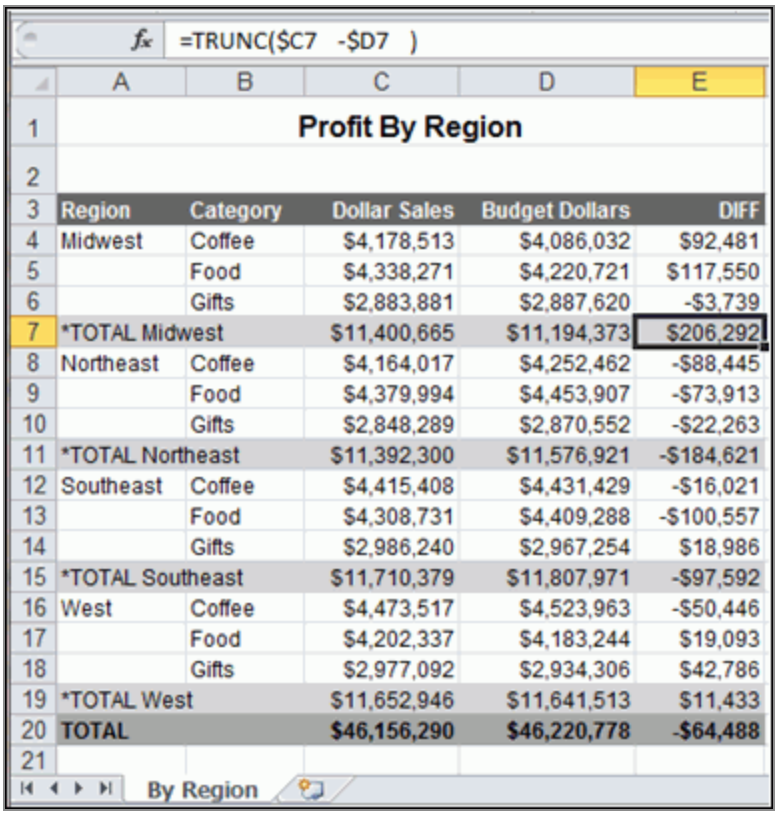
=TRUNC($C7 -2887620 )

| | A | B | C | D |
|---|---|---|---|---|
| 1 | Profit By Region | | | |
| 2 | | | | |
| 3 | Region | Category | Dollar Sales | DIFF |
| 4 | Midwest | Coffee | $4,178,513 | $92,481 |
| 5 | | Food | $4,338,271 | $117,550 |
| 6 | | Gifts | $2,883,881 | -$3,739 |
| 7 | *TOTAL Midwest | | $11,400,665 | $8,513,045 |
| 8 | Northeast | Coffee | $4,164,017 | -$88,445 |
| 9 | | Food | $4,379,994 | -$73,913 |
| 10 | | Gifts | $2,848,289 | -$22,263 |
| 11 | *TOTAL Northeast | | $11,392,300 | $8,521,748 |
| 12 | Southeast | Coffee | $4,415,408 | -$16,021 |
| 13 | | Food | $4,308,731 | -$100,557 |
| 14 | | Gifts | $2,986,240 | $18,986 |
| 15 | *TOTAL Southeast | | $11,710,379 | $8,743,125 |
| 16 | West | Coffee | $4,473,517 | -$50,446 |
| 17 | | Food | $4,202,337 | $19,093 |
| 18 | | Gifts | $2,977,092 | $42,786 |
| 19 | *TOTAL West | | $11,652,946 | $8,718,640 |
| 20 | TOTAL | | $46,156,290 | -$64,488 |
| 21 | | | | |

If you add the BUDDOLLARS column to the request, the formula can be recomputed correctly.

```
SUM DOLLARS/I8MC BUDDOLLARS/I8MC
```

The formula generated with the new SUM command contains cell references for both fields used in the calculation.




| Region | Category | Dollar Sales | Budget Dollars | DIFF |
|---|---|---|---|---|
| Midwest | Coffee | $4,178,513 | $4,086,032 | $92,481 |
| | Food | $4,338,271 | $4,220,721 | $117,550 |
| | Gifts | $2,883,881 | $2,887,620 | -$3,739 |
| *TOTAL Midwest | | $11,400,665 | $11,194,373 | $206,292 |
| Northeast | Coffee | $4,164,017 | $4,252,462 | -$88,445 |
| | Food | $4,379,994 | $4,453,907 | -$73,913 |
| | Gifts | $2,848,289 | $2,870,552 | -$22,263 |
| *TOTAL Northeast | | $11,392,300 | $11,576,921 | -$184,621 |
| Southeast | Coffee | $4,415,408 | $4,431,429 | -$16,021 |
| | Food | $4,308,731 | $4,409,288 | -$100,557 |
| | Gifts | $2,986,240 | $2,967,254 | $18,986 |
| *TOTAL Southeast | | $11,710,379 | $11,807,971 | -$97,592 |
| West | Coffee | $4,473,517 | $4,523,963 | -$50,446 |
| | Food | $4,202,337 | $4,183,244 | $19,093 |
| | Gifts | $2,977,092 | $2,934,306 | $42,786 |
| *TOTAL West | | $11,652,946 | $11,641,513 | $11,433 |
| **TOTAL** | | **$46,156,290** | **$46,220,778** | **-$64,488** |

# Using XLSX FORMULA With Prefix Operators

XLSX FORMULA output supports prefix operators that are used on summary lines generated by WebFOCUS commands, such as SUBTOTAL and RECOMPUTE. Where a corresponding formula exists in Excel, these prefix operators are translated into the equivalent Excel summarization formula. The results of prefix operators used directly against retrieved data continue to be passed to Excel as values, not formulas.

The following table identifies the prefix operators supported by XLSX FORMULA when used on summary lines, and the Excel formula equivalent placed in the generated worksheet.

| Prefix Operator | Excel Formula Equivalent |
|---|---|
| SUM. | =SUM() |
| AVE. | =AVERAGE() |
| CNT. | =COUNT() |
| MIN. | =MIN() |
| MAX. | =MAX() |

The following prefix operators are not translated to formulas when used on summary lines in XLSX FORMULA.

- ASQ.
- FST.
- LST.

**Note:**

- When using a prefix operator on a field specified directly against retrieved data, there is no space between the prefix operator and the field on which it operates.

  For example, in the following aggregating display command, the AVE. prefix operator operates on the DOLLARS field.

  ```
  SUM AVE.DOLLARS
  ```

- When using a prefix operator on a summary line, you must leave a space between the prefix operator and the aggregated field on which it operates.

  In the following summary command, the MAX. prefix operator operates on the DOLLARS field at the REGION sort break. Note the required blank space between the prefix operator and the field name.

  ```
  ON REGION RECOMPUTE MAX. DOLLARS
  ```

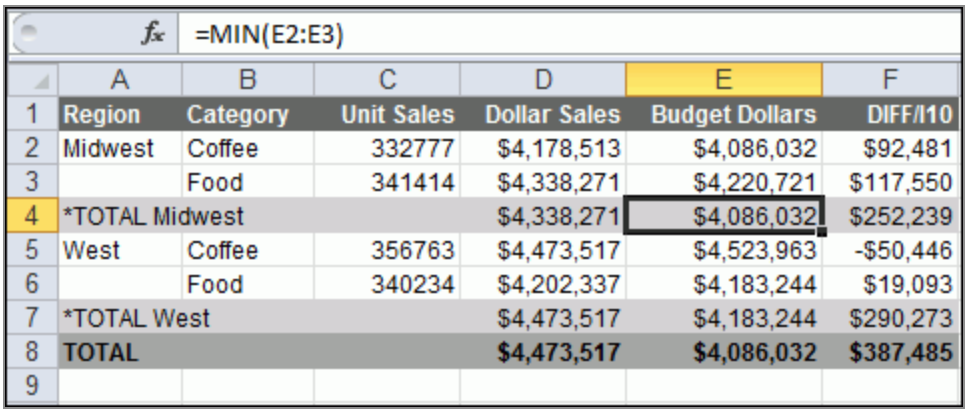
# Using a Summary Prefix Operator With FORMAT XLSX FORMULA

In the following request against the GGSALES data source, the RECOMPUTE command for the REGION sort field calculates the maximum of the aggregated DOLLARS field and the minimum of the aggregated BUDDOLLARS field.

```
TABLE FILE GGSALES
SUM UNITS DOLLARS/I8MC BUDDOLLARS/I8MC
AND COMPUTE DIFF/I8MC= DOLLARS-BUDDOLLARS;
BY REGION
BY CATEGORY
WHERE CATEGORY EQ 'Food' OR 'Coffee'
WHERE REGION EQ 'West' OR 'Midwest'
ON REGION RECOMPUTE MAX. DOLLARS MIN. BUDDOLLARS DIFF
ON TABLE PCHOLD FORMAT XLSX FORMULA
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, FONT='ARIAL', SIZE=9,$
TYPE=TITLE, BACKCOLOR=RGB(102 102 102), COLOR=RGB(255 255 255),$
TYPE=SUBTOTAL, BACKCOLOR=RGB(210 210 210),$
TYPE=GRANDTOTAL, BACKCOLOR=RGB(166 166 166), STYLE=BOLD,$
END
```

In the output, shown in the following image, the cell that represents the recomputed DOLLARS for the Midwest region has been generated as the following formula.

```
=MIN(E2:E3)
```



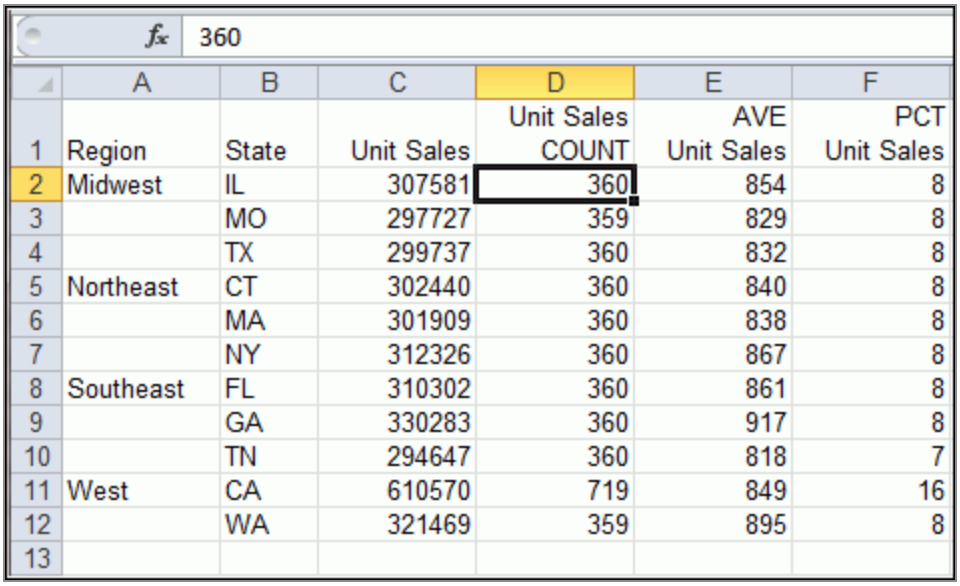

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | Region | Category | Unit Sales | Dollar Sales | Budget Dollars | DIFF/I10 |
| 2 | Midwest | Coffee | 332777 | $4,178,513 | $4,086,032 | $92,481 |
| 3 | | Food | 341414 | $4,338,271 | $4,220,721 | $117,550 |
| 4 | *TOTAL Midwest | | | $4,338,271 | $4,086,032 | $252,239 |
| 5 | West | Coffee | 356763 | $4,473,517 | $4,523,963 | -$50,446 |
| 6 | | Food | 340234 | $4,202,337 | $4,183,244 | $19,093 |
| 7 | *TOTAL West | | | $4,473,517 | $4,183,244 | $290,273 |
| 8 | TOTAL | | | $4,473,517 | $4,086,032 | $387,485 |
| 9 | | | | | | |

# Using a Prefix Operator on a Display Command With FORMAT XLSX FORMULA

In the following request against the GGSALES data source, the CNT., AVE., and PCT. Prefix operators are used in the SUM display command.

```
TABLE FILE GGSALES
SUM UNITS
CNT.UNITS
AVE.UNITS
PCT.UNITS
BY REGION
BY ST
ON TABLE PCHOLD FORMAT XLSX FORMULA
END
```

The output shows that the prefix operators were not passed to Excel as formulas. They were passed as data values.



fx 360

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | Region | State | Unit Sales | Unit Sales COUNT | AVE Unit Sales | PCT Unit Sales |
| 2 | Midwest | IL | 307581 | 360 | 854 | 8 |
| 3 | | MO | 297727 | 359 | 829 | 8 |
| 4 | | TX | 299737 | 360 | 832 | 8 |
| 5 | Northeast | CT | 302440 | 360 | 840 | 8 |
| 6 | | MA | 301909 | 360 | 838 | 8 |
| 7 | | NY | 312326 | 360 | 867 | 8 |
| 8 | Southeast | FL | 310302 | 360 | 861 | 8 |
| 9 | | GA | 330283 | 360 | 917 | 8 |
| 10 | | TN | 294647 | 360 | 818 | 7 |
| 11 | West | CA | 610570 | 719 | 849 | 16 |
| 12 | | WA | 321469 | 359 | 895 | 8 |
| 13 | | | | | | |

# NODATA With Formulas

Support for full Excel functionality requires that only valid numeric values are placed into cells that will be used for formula references.

The null value (NODATA='') is supported for calculations. When cells containing the default NODATA symbol (.) are used in a formula, they will cause a formula error.

For example:

```
SET NODATA=''
TABLE FILE GGSALES
SUM DOLLARS/D12CM UNITS/D12C AND ROW-TOTAL AND COLUMN-TOTAL
COMPUTE REVENUE/D12CM=DOLLARS*UNITS; AS 'Revenue'
BY LOWEST GGSALES.SALES01.CATEGORY
BY GGSALES.SALES01.PRODUCT
ACROSS REGION
ON TABLE PCHOLD FORMAT XLSX FORMULA
END
------------------------
SET NODATA=''
DEFINE FILE GGSALES
DOLLARMOD/D12CM MISSING ON=IF REGION GT 'V' THEN MISSING ELSE DOLLAR;
END
TABLE FILE GGSALES
SUM DOLLARMOD/D12CM UNITS/D12C AND ROW-TOTAL AND COLUMN-TOTAL
COMPUTE REVENUE/D12CM=DOLLARMOD*UNITS; AS 'Revenue'
BY REGION
BY LOWEST GGSALES.SALES01.CATEGORY
BY GGSALES.SALES01.PRODUCT
ON TABLE SET PAGE-NUM NOLEAD
ON TABLE PCHOLD FORMAT XLSX FORMULA
END
```

# Usage Notes for XLSX With Formulas

- Formulas are defined within a single worksheet. They will not be assigned across worksheets.
- BYTOC compound workbooks can contain formulas. A separate worksheet/tab is generated for each primary key value and formulas are defined with references within that sheet. In BYTOC compound workbooks, a separate tab is generated for overall grand totals. These will not contain formula references to the component worksheets.

# Controlling Column Width and Wrapping in XLSX Report Output

- Column width and data wrapping can be controlled in an Excel worksheet when using FORMAT XLSX.
- To size the column without wrapping and define the exact size width, use SQUEEZE=ON. If a data value is wider than the specified width of the column, a portion of the data will be hidden from view, but fully visible in the formula bar. You can adjust the column width in Excel after the worksheet has been generated.
- The default behavior is for all data to wrap within the defined column width. You can also specify the exact width of a column using WRAP=ON.
- WRAP is not supported for Date format fields.

# Set Column Width in XLSX Report Output

```
TYPE=REPORT, [COLUMN=column,] SQUEEZE=value,$
```

where:

**column**

Identifies a particular column. If COLUMN is not included in the declaration, default SQUEEZE behavior is applied to the entire report.

**value**

Is one of the following:

**ON**

Automatically sizes the columns based on the largest data value in the column. This is the default behavior.

**OFF**

Sizes the columns based on the maximum size defined for the field in the Master File or Define.

**n**

Represents a specific numeric value for which the column width can be set. The value represents the measure specified with the UNITS parameter (the default is inches). This is the most commonly used SQUEEZE setting in an XLSX report. This turns off data wrapping.

**Note:**

- SQUEEZE can be applied to the entire report by using the ON TABLE SET SQUEEZE ON command.
- SQUEEZE is not supported for columns created with the OVER phrase or with TABLEF.

# Wrap Data in XLSX Report Output

```
TYPE=REPORT, [COLUMN=column,] WRAP=value,$
```

where:

**column**

Designates a particular column to apply wrapping behavior to. If COLUMN is not included in the declaration, wrapping will be applied to the entire report.

**value**

Is one of the following:

**ON**

Turns on data wrapping. ON is the default value. With this setting, the column width is determined by the client (Excel). Data wraps if it exceeds the width of the column and the row height expands to meet the new height of the wrapped data.

**OFF**

Turns off data wrapping. Data will not wrap in any cell in the column.

**n**

Represents a specific numeric value that the column width can be set to. The value represents the measure specified with the UNITS parameter (the default is inches).

This setting implies ON. However, the column width is set to the specified width unless the data is wider than the column width, in which case, wrapping will occur as for ON.

**Note:** WRAP is not supported for Date format fields.

# Controlling Column Width and Wrapping in XLSX Report Output

The following example illustrates how to turn on and turn off data wrapping in a column and how to set the column width for a particular column. The UNITS in this example are set to inches (the default).

```
DEFINE FILE GGSALES
PROFIT/D14.3 = BUDDOLLARS-DOLLARS;
DESCRIPTION/A80 = 'Subtract Total Sales Quota from Reported Sales to
calculate profit.';
END
```

```
TABLE FILE GGSALES
SUM
DESCRIPTION AS 'DEFAULT'
DESCRIPTION AS 'WRAP = 2'
DESCRIPTION AS 'WRAP = OFF'
DESCRIPTION AS 'SQUEEZE = 1.5'
PROFIT
BY REGION NOPRINT
ON TABLE PCHOLD FORMAT XLSX
ON TABLE SET STYLE *
TYPE=REPORT, COLUMN=DESCRIPTION(2), WRAP=2,$
TYPE=REPORT, COLUMN=DESCRIPTION(3), WRAP=OFF,$
TYPE=REPORT, COLUMN=DESCRIPTION(4), SQUEEZE=1.5,$
END
```

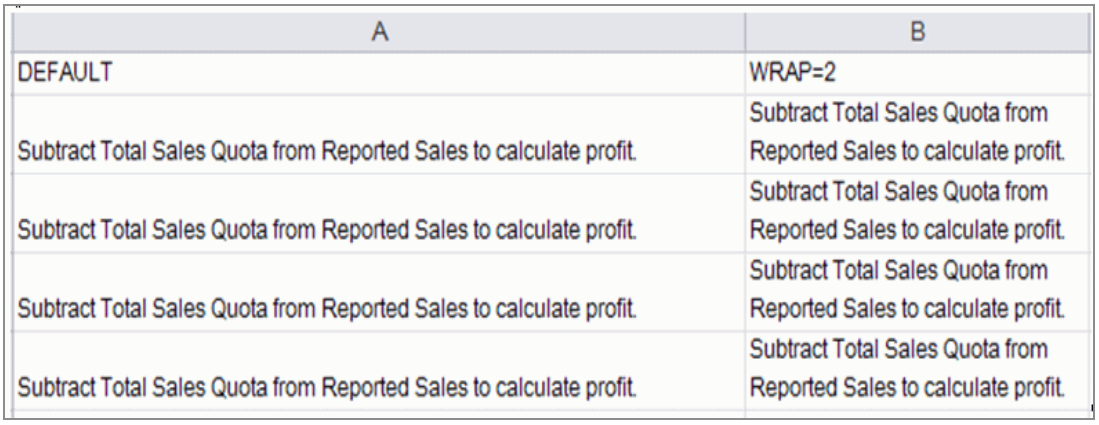
where:

1. The column titled "DEFAULT" illustrates the default column width and wrapping behavior.
2. The column titled "WRAP=2" sets the column width to 2 inches with data wrapping on.

3. The column titled "WRAP=OFF" turns off data wrapping for that column.
4. The column titled "SQUEEZE=1.5" sets the column width to 1.5 inches with data wrapping off.

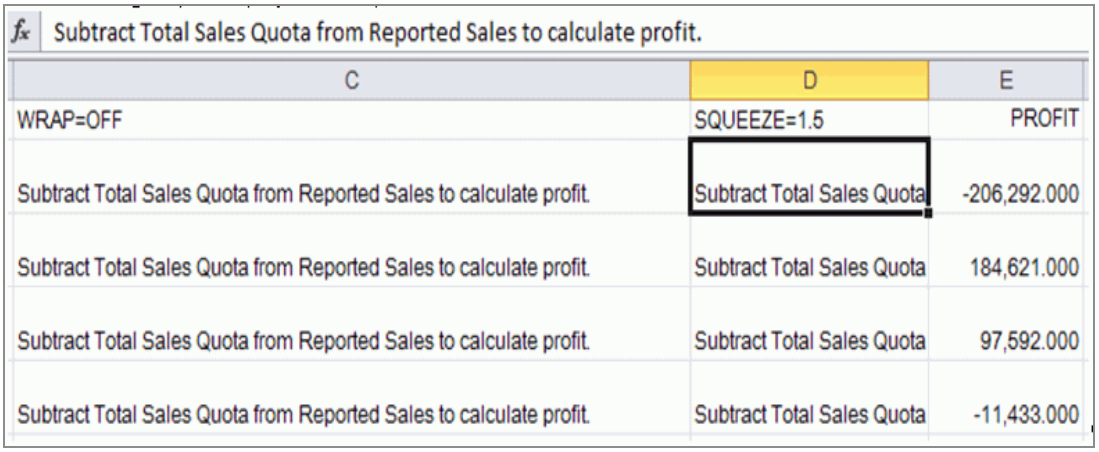
Since the output spans two pages, the output is shown below in two separate images.

The following XLSX output displays the different behavior for the "DEFAULT" and "WRAP=2" columns.



| A | B |
|---|---|
| DEFAULT | WRAP=2 |
| Subtract Total Sales Quota from Reported Sales to calculate profit. | Subtract Total Sales Quota from Reported Sales to calculate profit. |
| Subtract Total Sales Quota from Reported Sales to calculate profit. | Subtract Total Sales Quota from Reported Sales to calculate profit. |
| Subtract Total Sales Quota from Reported Sales to calculate profit. | Subtract Total Sales Quota from Reported Sales to calculate profit. |
| Subtract Total Sales Quota from Reported Sales to calculate profit. | Subtract Total Sales Quota from Reported Sales to calculate profit. |

The following XLSX output displays the output for the "WRAP=OFF" and "SQUEEZE=1.5" columns.



fx Subtract Total Sales Quota from Reported Sales to calculate profit.

| C | D | E |
|---|---|---|
| WRAP=OFF | SQUEEZE=1.5 | PROFIT |
| Subtract Total Sales Quota from Reported Sales to calculate profit. | Subtract Total Sales Quota | -206,292.000 |
| Subtract Total Sales Quota from Reported Sales to calculate profit. | Subtract Total Sales Quota | 184,621.000 |
| Subtract Total Sales Quota from Reported Sales to calculate profit. | Subtract Total Sales Quota | 97,592.000 |
| Subtract Total Sales Quota from Reported Sales to calculate profit. | Subtract Total Sales Quota | -11,433.000 |

# Freezing Columns in an XLSX Report

In XLSX report output, you can freeze columns so that when you scroll to the right to view data in the worksheet, the designated columns will remain on the screen without losing context.

# Freeze Columns in an XLSX Report

To set the columns to freeze in an XLSX report, use the following StyleSheet syntax:

```
TYPE=REPORT, FREEZE-COLUMN={Ncolumn|fieldname} ,$
```

where:

**column**

Indicates the column number at which the freeze should begin.

**fieldname**

Identifies the field name of the column at which the freeze should begin.

# Usage Notes for Freezing Columns

- Freezing columns in a report is supported for XLSX format only.
- The FREEZE-COLUMN attribute:
  - Is applied to an individual worksheet in the workbook.
  - Is applied to all worksheets in a generated workbook when using BYTOC to generate multiple worksheets in a workbook based on the sort field.
  - Can be used at the same time as HFREEZE = ON to freeze both rows and columns.

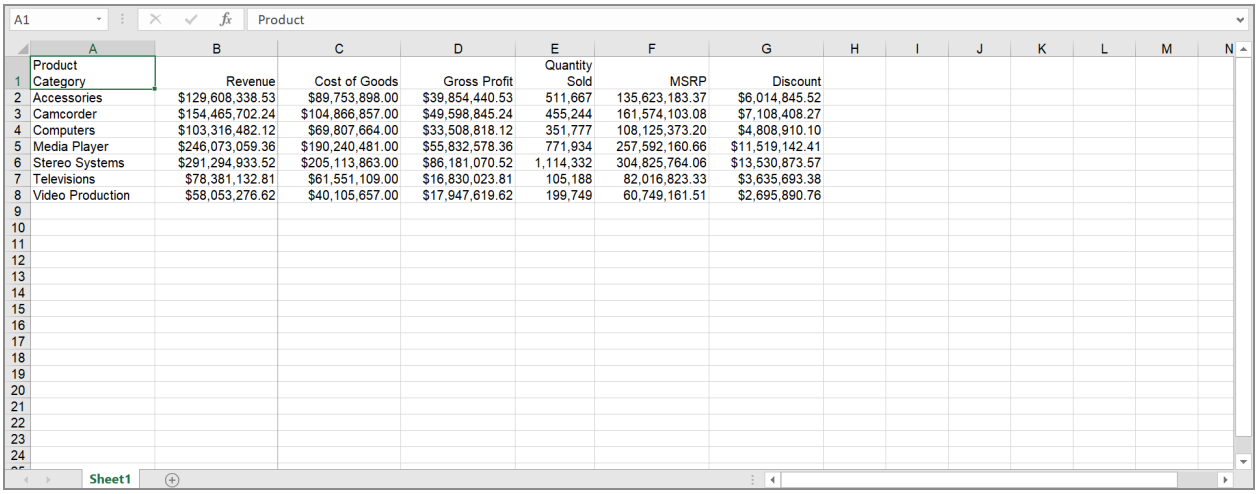
# Freezing Columns in an XLSX Report

The following request against the WF_RETAIL data source uses the FREEZE-COLUMN StyleSheet attribute to freeze the first two columns, Product Category and Revenue.

```
TABLE FILE WF_RETAIL
SUM
     REVENUE_US
     COGS_US
```

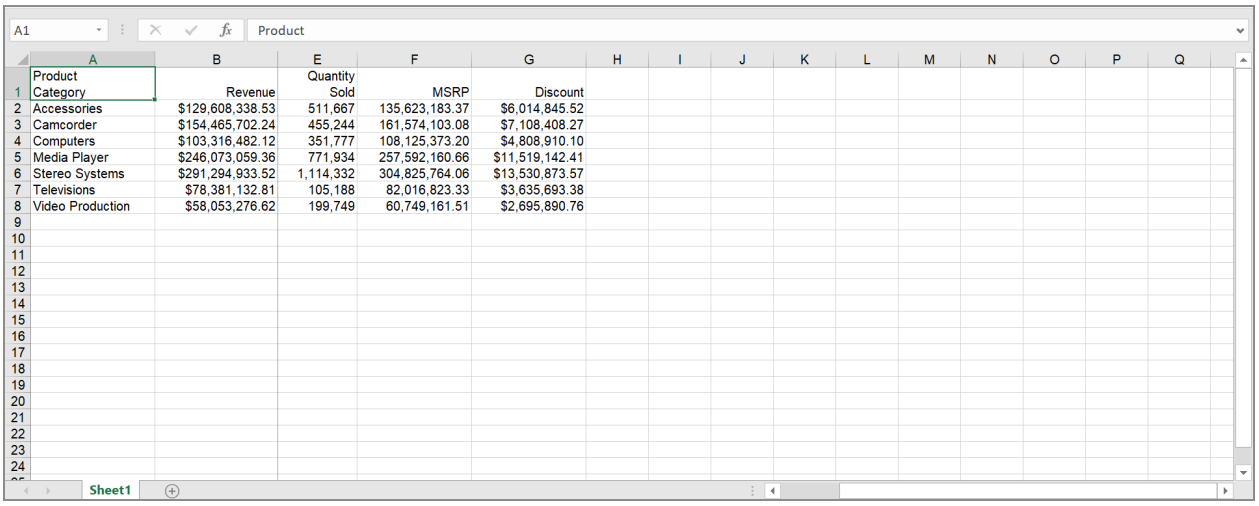
```
      GROSS_PROFIT_US
      QUANTITY_SOLD
      MSRP_US
      DISCOUNT_US
BY PRODUCT_CATEGORY
ON TABLE SET PAGE-NUM NOLEAD
ON TABLE SET ASNAMES ON
ON TABLE SET BYDISPLAY ON
ON TABLE PCHOLD FORMAT XLSX
ON TABLE SET STYLE *
TYPE=REPORT,
FREEZE-COLUMN=N2,
$
ENDSTYLE
END
```

The output is:



| Product Category | Revenue | Cost of Goods | Gross Profit | Quantity Sold | MSRP | Discount |
|---|---|---|---|---|---|---|
| Accessories | $129,608,338.53 | $89,753,898.00 | $39,854,440.53 | 511,667 | 135,623,183.37 | $6,014,845.52 |
| Camcorder | $154,465,702.24 | $104,866,857.00 | $49,598,845.24 | 455,244 | 161,574,103.08 | $7,108,408.27 |
| Computers | $103,316,482.12 | $69,807,664.00 | $33,508,818.12 | 351,777 | 108,125,373.20 | $4,808,910.10 |
| Media Player | $246,073,059.36 | $190,240,481.00 | $55,832,578.36 | 771,934 | 257,592,160.66 | $11,519,142.41 |
| Stereo Systems | $291,294,933.52 | $205,113,863.00 | $86,181,070.52 | 1,114,332 | 304,825,764.06 | $13,530,873.57 |
| Televisions | $78,381,132.81 | $61,551,109.00 | $16,830,023.81 | 105,188 | 82,016,823.33 | $3,635,693.38 |
| Video Production | $58,053,276.62 | $40,105,657.00 | $17,947,619.62 | 199,749 | 60,749,161.51 | $2,695,890.76 |

When you scroll two columns to the right, the Product Category and Revenue columns remain in place, while the other three columns scroll to the left, as shown in the following image.



| Product Category | Revenue | Quantity Sold | MSRP | Discount |
|---|---|---|---|---|
| Accessories | $129,608,338.53 | 511,667 | 135,623,183.37 | $6,014,845.52 |
| Camcorder | $154,465,702.24 | 455,244 | 161,574,103.08 | $7,108,408.27 |
| Computers | $103,316,482.12 | 351,777 | 108,125,373.20 | $4,808,910.10 |
| Media Player | $246,073,059.36 | 771,934 | 257,592,160.66 | $11,519,142.41 |
| Stereo Systems | $291,294,933.52 | 1,114,332 | 304,825,764.06 | $13,530,873.57 |
| Televisions | $78,381,132.81 | 105,188 | 82,016,823.33 | $3,635,693.38 |
| Video Production | $58,053,276.62 | 199,749 | 60,749,161.51 | $2,695,890.76 |

# Synchronizing WebFOCUS Page Breaks With Excel Page Breaks

When using the **BY_field** PAGE-BREAK phrase, WebFOCUS page breaks are automatically synchronized with Microsoft Excel page breaks.

# Synchronizing WebFOCUS Page Breaks With Excel Page Breaks in Format XLSX Report Output

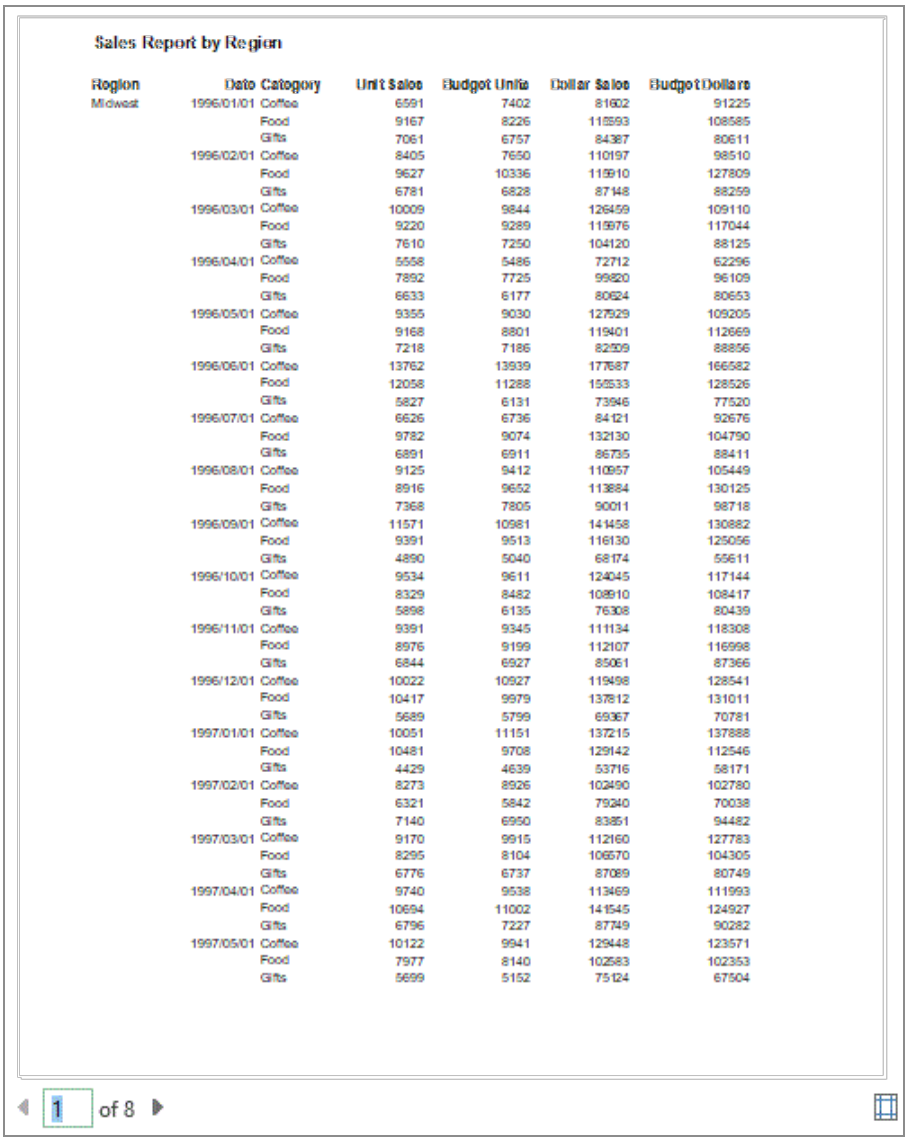
The following request generates format XLSX report output with WebFOCUS page breaks that are inserted using the BY REGION PAGE-BREAK phrase.

```
TABLE FILE GGSALES
HEADING
"Sales Report by Region"
" "
SUM UNITS BUDUNITS DOLLARS BUDDOLLARS
BY REGION PAGE-BREAK
BY DATE
BY CATEGORY
WHERE CITY LE 'Memphis'
ON TABLE PCHOLD FORMAT XLSX
ON TABLE SET STYLE *
```

```
TOPMARGIN=1.25, BOTTOMMARGIN=1, $
TYPE=REPORT, FONT=ARIAL, SIZE=9, $
TYPE=TITLE, STYLE=BOLD, SIZE=10, $
TYPE=HEADING, STYLE=BOLD, SIZE=12, $
ENDSTYLE
END
```

Using Print Preview in Excel, output for pages 1 and 2 for the Midwest Region are shown in the following images. The default Excel page breaks are synchronized with the page breaks specified in the WebFOCUS request. The page heading and column titles are displayed *only* when the BY value changes.

**Page 1 Output**

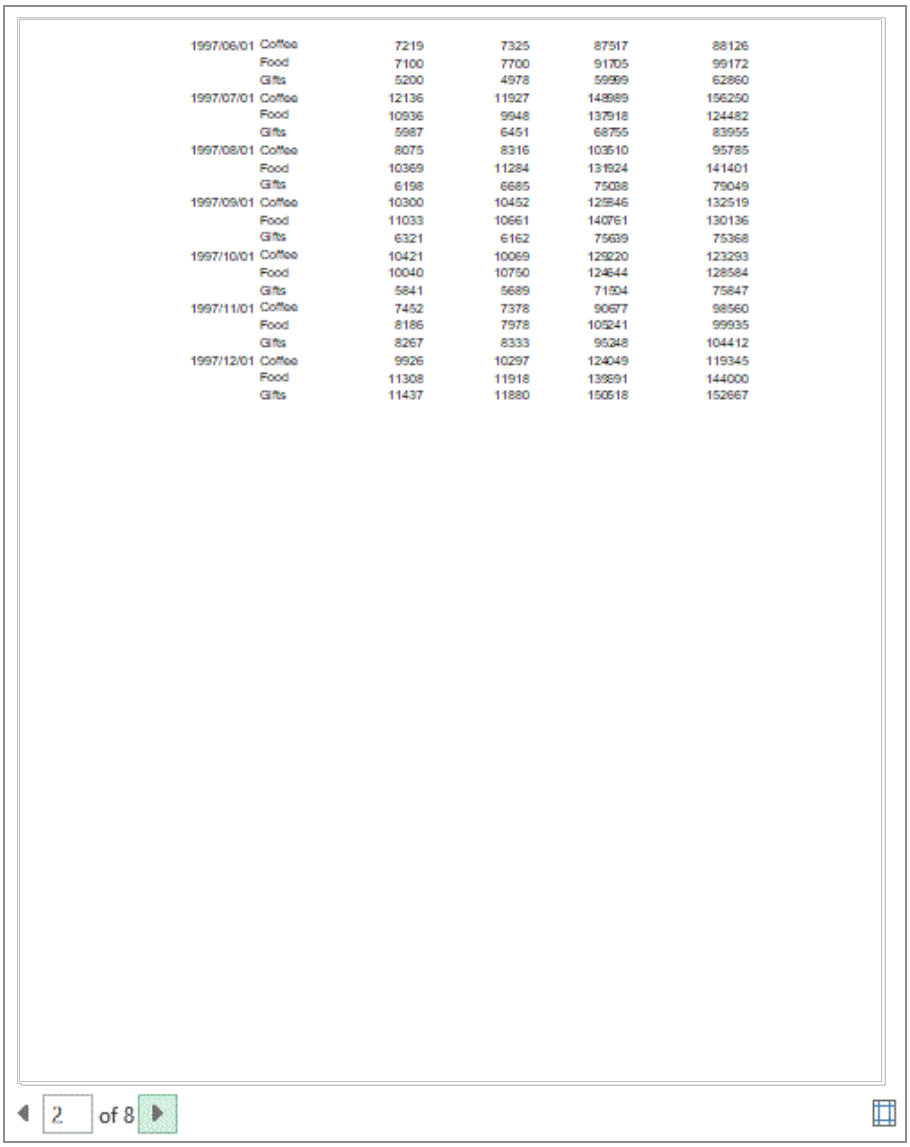


Sales Report by Region

| Region | Date | Category | Unit Sales | Budget Units | Dollar Sales | Budget Dollars |
|---|---|---|---|---|---|---|
| Midwest | 1996/01/01 | Coffee | 6591 | 7402 | 81602 | 91225 |
| | | Food | 9167 | 8226 | 115593 | 108585 |
| | | Gifts | 7061 | 6757 | 84387 | 80611 |
| | 1996/02/01 | Coffee | 8405 | 7650 | 110197 | 98510 |
| | | Food | 9627 | 10336 | 115910 | 127809 |
| | | Gifts | 6781 | 6828 | 87148 | 88259 |
| | 1996/03/01 | Coffee | 10009 | 9844 | 126459 | 109110 |
| | | Food | 9220 | 9289 | 115976 | 117044 |
| | | Gifts | 7610 | 7250 | 104120 | 88125 |
| | 1996/04/01 | Coffee | 5558 | 5486 | 72712 | 62296 |
| | | Food | 7892 | 7725 | 99820 | 96109 |
| | | Gifts | 6633 | 6177 | 80624 | 80653 |
| | 1996/05/01 | Coffee | 9355 | 9030 | 127929 | 109205 |
| | | Food | 9168 | 8801 | 119401 | 112669 |
| | | Gifts | 7218 | 7186 | 82509 | 88856 |
| | 1996/06/01 | Coffee | 13762 | 13939 | 177687 | 166582 |
| | | Food | 12058 | 11288 | 156533 | 128526 |
| | | Gifts | 5827 | 6131 | 73946 | 77520 |
| | 1996/07/01 | Coffee | 6626 | 6736 | 84121 | 92676 |
| | | Food | 9782 | 9074 | 132130 | 104790 |
| | | Gifts | 6891 | 6911 | 86735 | 88411 |
| | 1996/08/01 | Coffee | 9125 | 9412 | 110957 | 105449 |
| | | Food | 8916 | 9652 | 113884 | 130125 |
| | | Gifts | 7368 | 7805 | 90011 | 98718 |
| | 1996/09/01 | Coffee | 11571 | 10981 | 141458 | 130882 |
| | | Food | 9391 | 9513 | 116130 | 125056 |
| | | Gifts | 4890 | 5040 | 68174 | 55611 |
| | 1996/10/01 | Coffee | 9534 | 9611 | 124045 | 117144 |
| | | Food | 8329 | 8482 | 108910 | 108417 |
| | | Gifts | 5898 | 6135 | 76308 | 80439 |
| | 1996/11/01 | Coffee | 9391 | 9345 | 111134 | 118308 |
| | | Food | 8976 | 9199 | 112107 | 116998 |
| | | Gifts | 6844 | 6927 | 85061 | 87366 |
| | 1996/12/01 | Coffee | 10022 | 10927 | 119498 | 128541 |
| | | Food | 10417 | 9979 | 137812 | 131011 |
| | | Gifts | 5689 | 5799 | 69367 | 70781 |
| | 1997/01/01 | Coffee | 10051 | 11151 | 137215 | 137888 |
| | | Food | 10481 | 9708 | 129142 | 112546 |
| | | Gifts | 4429 | 4639 | 53716 | 58171 |
| | 1997/02/01 | Coffee | 8273 | 8926 | 102490 | 102780 |
| | | Food | 6321 | 5842 | 79240 | 70038 |
| | | Gifts | 7140 | 6950 | 83851 | 94482 |
| | 1997/03/01 | Coffee | 9170 | 9915 | 112160 | 127783 |
| | | Food | 8295 | 8104 | 106570 | 104305 |
| | | Gifts | 6776 | 6737 | 87089 | 80749 |
| | 1997/04/01 | Coffee | 9740 | 9538 | 113469 | 111993 |
| | | Food | 10694 | 11002 | 141545 | 124927 |
| | | Gifts | 6796 | 7227 | 87749 | 90282 |
| | 1997/05/01 | Coffee | 10122 | 9941 | 129448 | 123571 |
| | | Food | 7977 | 8140 | 102583 | 102353 |
| | | Gifts | 5699 | 5152 | 75124 | 67504 |

1 of 8

## Page 2 Output




To repeat the page heading and column titles on each printed page, use the **BY_field** PAGE-BREAK phrase in combination with the XLSXPAGETITLES=ON StyleSheet attribute, as shown in the following procedure.

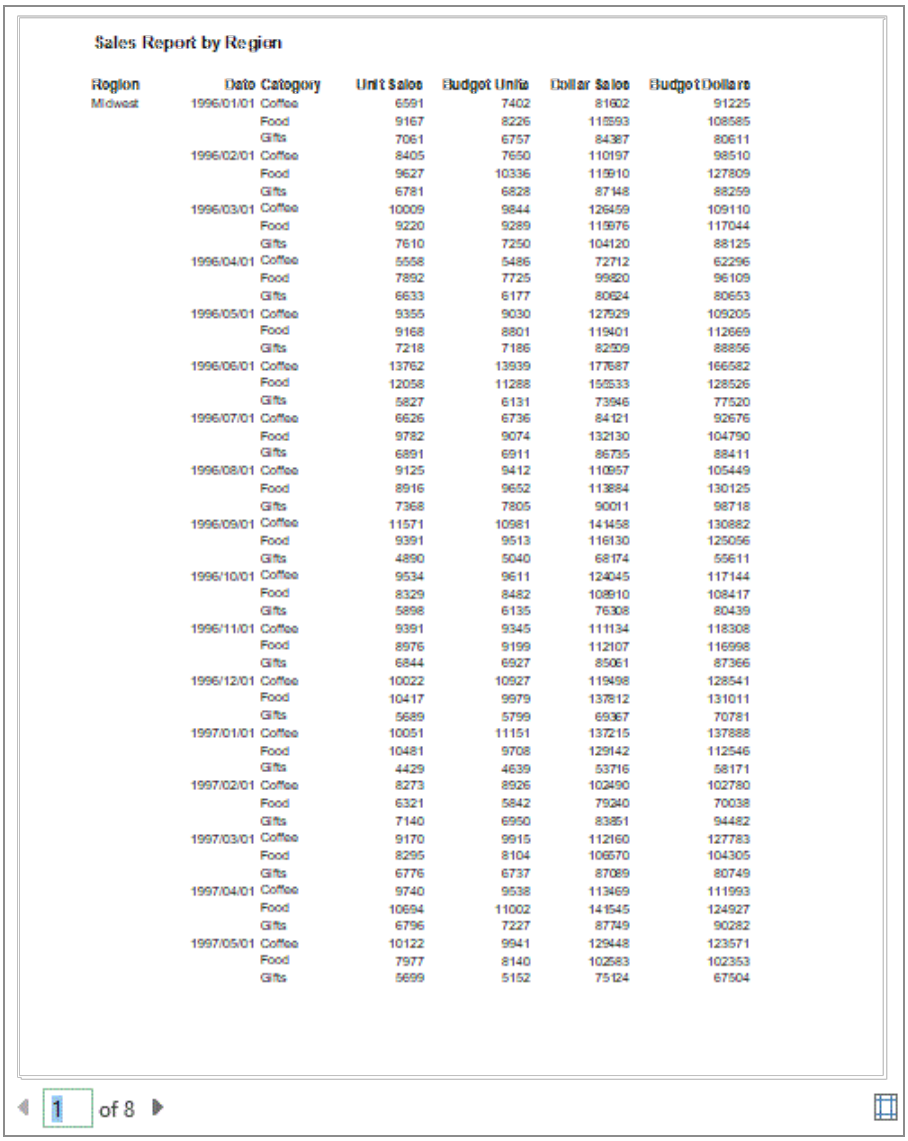
**Note:** You can also use XLSXPAGETITLES as a SET command.

```
TABLE FILE GGSALES
HEADING
"Sales Report by Region"
" "
SUM UNITS BUDUNITS DOLLARS BUDDOLLARS
BY REGION PAGE-BREAK
```

```
BY DATE
BY CATEGORY
WHERE CITY LE 'Memphis'
ON TABLE PCHOLD FORMAT XLSX
ON TABLE SET STYLE *
XLSXPAGETITLES=ON,
TOPMARGIN=1.25, BOTTOMMARGIN=1, $
TYPE=REPORT, FONT=ARIAL, SIZE=9, $
TYPE=TITLE, STYLE=BOLD, SIZE=10, $
TYPE=HEADING, STYLE=BOLD, SIZE=12, $
ENDSTYLE
END
```

Using Print Preview in Excel, output for pages 1 and 2 for the Midwest Region are shown in the following images. Notice that the page heading and column titles are repeated on each printed page.

**Page 1 Output**

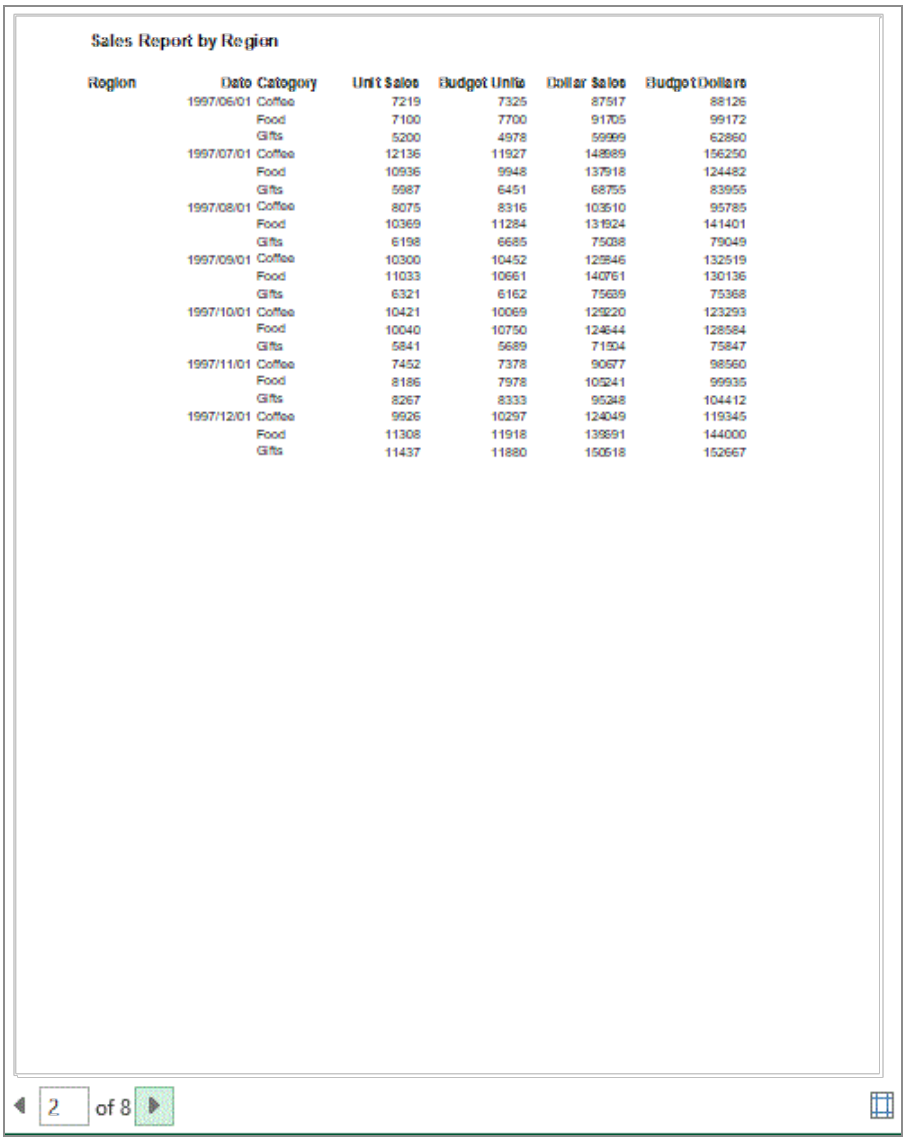


Sales Report by Region

| Region | Date | Category | Unit Sales | Budget Units | Dollar Sales | Budget Dollars |
|---|---|---|---|---|---|---|
| Midwest | 1996/01/01 | Coffee | 6591 | 7402 | 81602 | 91225 |
| | | Food | 9167 | 8226 | 115593 | 108585 |
| | | Gifts | 7061 | 6757 | 84387 | 80611 |
| | 1996/02/01 | Coffee | 8405 | 7650 | 110197 | 98510 |
| | | Food | 9627 | 10336 | 115910 | 127809 |
| | | Gifts | 6781 | 6828 | 87148 | 88259 |
| | 1996/03/01 | Coffee | 10009 | 9844 | 126459 | 109110 |
| | | Food | 9220 | 9289 | 115976 | 117044 |
| | | Gifts | 7610 | 7250 | 104120 | 88125 |
| | 1996/04/01 | Coffee | 5558 | 5486 | 72712 | 62296 |
| | | Food | 7892 | 7725 | 99820 | 96109 |
| | | Gifts | 6633 | 6177 | 80624 | 80653 |
| | 1996/05/01 | Coffee | 9355 | 9030 | 127929 | 109205 |
| | | Food | 9168 | 8801 | 119401 | 112669 |
| | | Gifts | 7218 | 7186 | 82509 | 88856 |
| | 1996/06/01 | Coffee | 13762 | 13939 | 177687 | 166582 |
| | | Food | 12058 | 11288 | 156533 | 128526 |
| | | Gifts | 5827 | 6131 | 73946 | 77520 |
| | 1996/07/01 | Coffee | 6626 | 6736 | 84121 | 92676 |
| | | Food | 9782 | 9074 | 132130 | 104790 |
| | | Gifts | 6891 | 6911 | 86735 | 88411 |
| | 1996/08/01 | Coffee | 9125 | 9412 | 110957 | 105449 |
| | | Food | 8916 | 9652 | 113884 | 130125 |
| | | Gifts | 7368 | 7805 | 90011 | 98718 |
| | 1996/09/01 | Coffee | 11571 | 10981 | 141458 | 130882 |
| | | Food | 9391 | 9513 | 116130 | 125056 |
| | | Gifts | 4890 | 5040 | 68174 | 55611 |
| | 1996/10/01 | Coffee | 9534 | 9611 | 124045 | 117144 |
| | | Food | 8329 | 8482 | 108910 | 108417 |
| | | Gifts | 5898 | 6135 | 76308 | 80439 |
| | 1996/11/01 | Coffee | 9391 | 9345 | 111134 | 118308 |
| | | Food | 8976 | 9199 | 112107 | 116998 |
| | | Gifts | 6844 | 6927 | 85061 | 87366 |
| | 1996/12/01 | Coffee | 10022 | 10927 | 119498 | 128541 |
| | | Food | 10417 | 9979 | 137812 | 131011 |
| | | Gifts | 5689 | 5799 | 69367 | 70781 |
| | 1997/01/01 | Coffee | 10051 | 11151 | 137215 | 137888 |
| | | Food | 10481 | 9708 | 129142 | 112546 |
| | | Gifts | 4429 | 4639 | 53716 | 58171 |
| | 1997/02/01 | Coffee | 8273 | 8926 | 102490 | 102780 |
| | | Food | 6321 | 5842 | 79240 | 70038 |
| | | Gifts | 7140 | 6950 | 83851 | 94482 |
| | 1997/03/01 | Coffee | 9170 | 9915 | 112160 | 127783 |
| | | Food | 8295 | 8104 | 106570 | 104305 |
| | | Gifts | 6776 | 6737 | 87089 | 80749 |
| | 1997/04/01 | Coffee | 9740 | 9538 | 113469 | 111993 |
| | | Food | 10694 | 11002 | 141545 | 124927 |
| | | Gifts | 6796 | 7227 | 87749 | 90282 |
| | 1997/05/01 | Coffee | 10122 | 9941 | 129448 | 123571 |
| | | Food | 7977 | 8140 | 102583 | 102353 |
| | | Gifts | 5699 | 5152 | 75124 | 67504 |

1 of 8

## Page 2 Output



Sales Report by Region

| Region | Date | Category | Unit Sales | Budget Units | Dollar Sales | Budget Dollars |
|---|---|---|---|---|---|---|
| | 1997/06/01 | Coffee | 7219 | 7325 | 87517 | 88126 |
| | | Food | 7100 | 7700 | 91705 | 99172 |
| | | Gifts | 5200 | 4978 | 59999 | 62860 |
| | 1997/07/01 | Coffee | 12136 | 11927 | 148989 | 156250 |
| | | Food | 10936 | 9948 | 137918 | 124482 |
| | | Gifts | 5987 | 6451 | 68755 | 83955 |
| | 1997/08/01 | Coffee | 8075 | 8316 | 103510 | 95785 |
| | | Food | 10369 | 11284 | 131924 | 141401 |
| | | Gifts | 6198 | 6685 | 75038 | 79049 |
| | 1997/09/01 | Coffee | 10300 | 10452 | 129846 | 132519 |
| | | Food | 11033 | 10661 | 140761 | 130136 |
| | | Gifts | 6321 | 6162 | 75639 | 75368 |
| | 1997/10/01 | Coffee | 10421 | 10069 | 129220 | 123293 |
| | | Food | 10040 | 10750 | 124644 | 128584 |
| | | Gifts | 5841 | 5689 | 71504 | 75847 |
| | 1997/11/01 | Coffee | 7452 | 7378 | 90677 | 98560 |
| | | Food | 8186 | 7978 | 105241 | 99935 |
| | | Gifts | 8267 | 8333 | 95348 | 104412 |
| | 1997/12/01 | Coffee | 9926 | 10297 | 124049 | 119345 |
| | | Food | 11308 | 11918 | 139891 | 144000 |
| | | Gifts | 11437 | 11880 | 150518 | 152667 |



**Note:** If your report contains OVER or ACROSS phrases, use the **BY_field** PAGE-BREAK phrase in combination with the XLSXPAGETITLES=ALL StyleSheet or SET command.

# Preserving Leading and Internal Blanks in Report Output

The SHOWBLANKS command allows you to preserve leading blanks in data cells and headings in XLSX reports. In XLSX, internal blanks will always be retained, but leading and trailing blanks in data fields are removed. You can use the SHOWBLANKS command to retain leading and trailing blanks.

Since XLSX is not HTML-based like EXL2K, setting SHOWBLANKS OFF will not affect internal blanks. By default, EXL2K reduces all embedded blanks to a single blank, while XLSX preserves all embedded blanks. This difference in spacing may cause additional differences in how fields wrap within a cell.

| SET SHOWBLANKS | XLSX (not HTML-based) | EXL2K (HTML-based) |
|---|---|---|
| SET SHOWBLANKS = ON | Leading and embedded blanks are preserved. | Leading and embedded blanks are preserved. |
| SET SHOWBLANKS = OFF | Leading blanks are removed, but embedded blanks are respected. | Leading and embedded blanks are removed. |

Blanks are handled differently in headings:

- By default, in standard headings containing multiple items (without HEADALIGN=BODY), items are concatenated together into a single text object. All blanks are retained.
- Fields placed in headings with HEADALIGN=BODY behave the same way as data elements.
- Variables placed in headings with HEADALIGN=BODY respect all leading, embedded blanks, and trailing blanks. With SHOWBLANKS=OFF, only embedded blanks are retained. With SHOWBLANKS=ON all leading, embedded, and trailing blanks are retained.

# Preserve Leading and Internal Blanks in XLSX Reports

In a FOCEXEC or in a profile, use the following syntax:

```
SET SHOWBLANKS = {OFF|ON}
```

In a request, use the following syntax

```
ON TABLE SET SHOWBLANKS {OFF|ON}
```

where:

**OFF**

Removes leading blanks and preserves internal blanks in XLSX report output. OFF is the default value.

**ON**

Preserves leading and internal blanks in XLSX report output. Also preserves trailing blanks in heading, subheading, footing, subfooting lines that use the default heading or footing alignment.

# Preserving Leading and Internal Blanks in XLSX Report Output

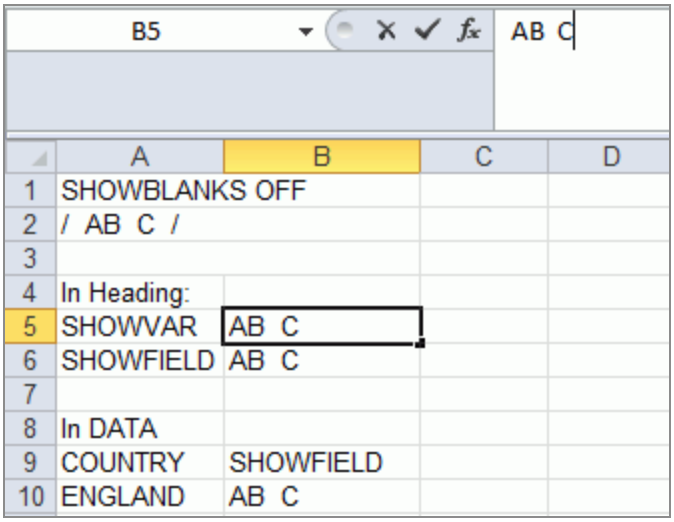
The following request creates a variable called SHOWVAR that contains leading, internal, and trailing blanks.

```
SET SHOWBLANKS = OFF

-SET &SHOWVAR= '  AB  C  ';
DEFINE FILE CAR
SHOWFIELD/A9 = '  AB  C  ';
END

TABLE FILE CAR
ON TABLE SUBHEAD
"SHOWBLANKS OFF"
"/&SHOWVAR/"
""
HEADING
"In Heading:"
"SHOWVAR<+0>&SHOWVAR"
"SHOWFIELD<+0><SHOWFIELD"
""
"In DATA":
PRINT SHOWFIELD
BY COUNTRY
WHERE RECORDLIMIT EQ 1;
```

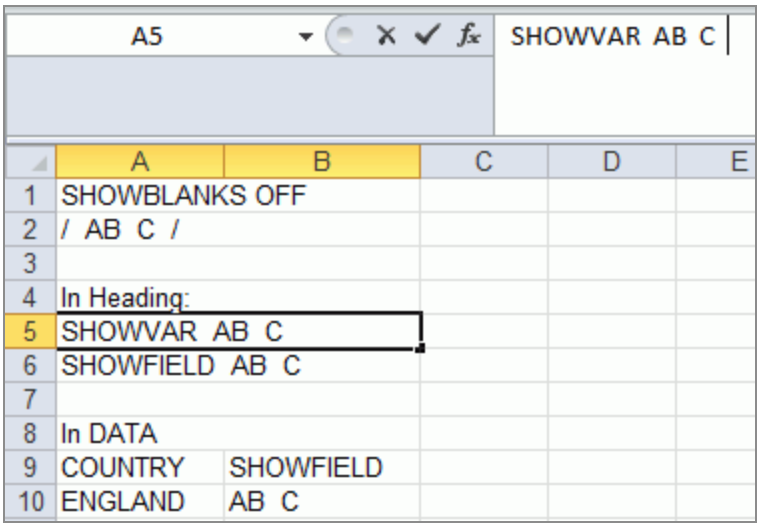
```
ON TABLE PCHOLD FORMAT XLSX
ON TABLE SET STYLE *
HEADALIGN=BODY,SQUEEZE=ON,$
TYPE=TABHEADING,COLSPAN=2,$
END
```

The following outputs show the differences in XLSX generated using SET SHOWBLANKS = OFF and SET SHOWBLANKS = ON.

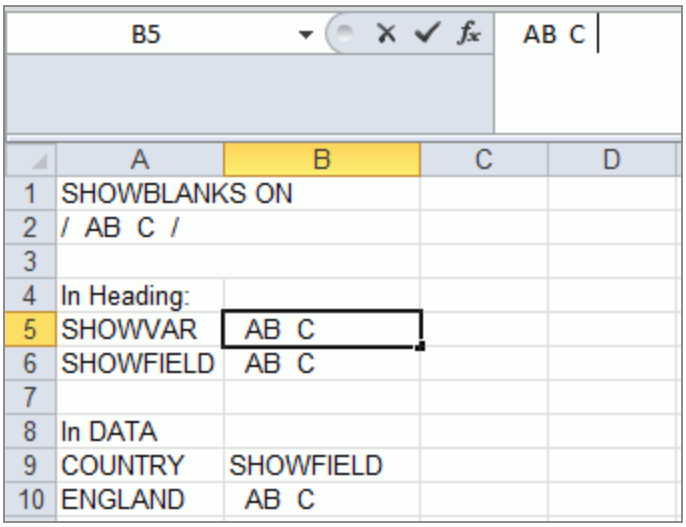
**SET SHOWBLANKS = OFF with HEADALIGN=BODY (no leading blanks or trailing blanks)**



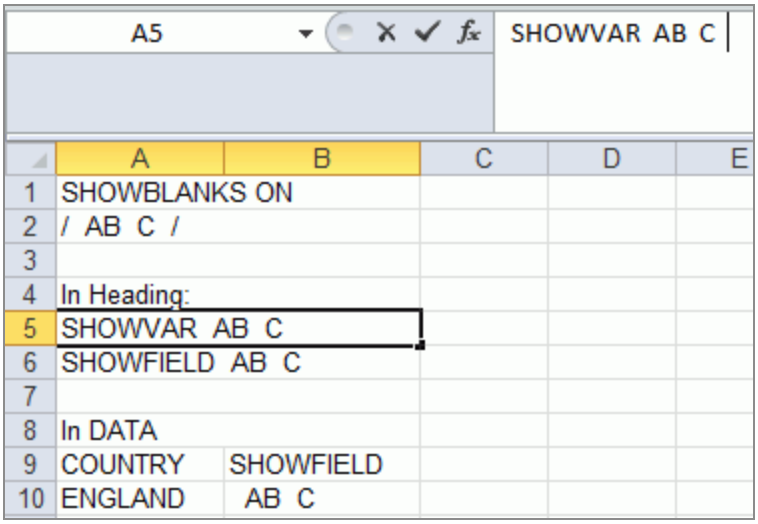

**SET SHOWBLANKS = OFF without HEADALIGN=BODY (preserved blanks and concatenated heading items)**




**SET SHOWBLANKS = ON with HEADALIGN=BODY (leading blanks and trailing blanks)**




**SET SHOWBLANKS = ON without HEADALIGN=BODY (preserved blanks and concatenated heading items)**




# Support for Drill Downs With XLSX Report Output

Drill downs are supported within the data elements in a report in XLSX format in the same manner as they are supported in EXL2K format. Hyperlink connections can be defined in the StyleSheet declaration of any data column to provide access to any external web source or to execute a FOCEXEC. Drill downs to FOCEXECs can contain data-driven

parameters and can generate any of the supported output formats, including XLSX, PDF, HTML, DHTML, and PPT.

Drill downs within text embedded in headings, subheadings, subfootings, and footings will be implemented for XLSX format in a future release.

**Note:**

- When the limit of 65530 hyperlinks for a worksheet is reached, a warning message displays and no further links can be inserted. For more information on drill downs, see Linking Using StyleSheets.
- The JAVASCRIPT and IMAGE drill-down options are not supported with FORMAT XLSX.

# Redirection and Excel Drill-Down Reports

The WebFOCUS Client can use redirection when passing the report output to the client application. When redirection is enabled, the WebFOCUS Client saves report output in a temporary directory when a request is executed. Then, an HTTP call is made from the browser to retrieve the temporary stored output for display. When redirection is disabled, the report output is sent directly to the browser without any buffering.

Redirection is disabled by default for the .xlsx file extension because this enables drill downs to run successfully whether the user machine is configured to launch Excel in the browser or as an application outside of the browser.

When redirection is enabled, drill downs within Excel reports will work differently depending on whether the workbook is opened in the browser (only applies to Windows XP) or in the Excel application. For information about launching Excel in the browser or as an application, see Viewing Excel Workbooks in the Browser vs. the Excel Application.

- **For workbooks opened outside the browser in the Excel application:** The current security context and any previously established session-related cookies are not retained, changing the user authorization, so drill-down reports will not have the information required to access the redirected files. The initial workbook will open within Excel, but the target drill-down workbook will not open and you will receive a message stating **You are not allowed to access this viewer file**. The drill-down feature in Microsoft Office products functioned in WebFOCUS Release 7.7.x because anonymous drill-down access was permitted.

  The following options are available to allow the feature in WebFOCUS Release 8.x:

    - Configure WebFOCUS authentication to allow anonymous access. For more information, see the *ibi™ WebFOCUS® Security and Administration* manual.
    - Use SSO with IIS/Tomcat Integrated Windows Authentication. Renegotiation occurs automatically and the Excel and PowerPoint reports display correctly.
    - As of WebFOCUS Release 8.x, the Remember Me feature can be enabled on the Sign-in page. If the end user uses the Remember Me feature, a persistent cookie is used.

- **For workbooks opened in the browser (only applies to Windows XP):** Drill downs will work with redirection enabled because the browser session has access to the HTTP header and/or cookies that need to be sent with the HTTP request to the WebFOCUS Client in order to obtain the redirected target workbook file.

  **Note:** For Windows 7, Excel applications no longer display in a browser window.

For additional information about redirection options, see WebFOCUS Administration Console Client Settings described in the *ibi™ WebFOCUS® Security and Administration* manual.

# Excel Page Settings

Excel page settings for the XLSX workbook default to the WebFOCUS standards:

- Orientation: Portrait
- Page Size: Letter
- ,75 inches (Excel default)
- .75 inches (Excel default)

To customize these page settings, turn the XLSXPAGESETS attribute ON and define individual attributes.

If XLSXPAGESETS is turned on, but the page margin attributes are not defined within the procedure, the values will be set to the WebFOCUS default of .25 inches.

# Define Excel Page Settings

```
[TYPE=REPORT,] XLSXPAGESETS={ON|OFF} [,PAGESIZE={pagesize|LETTER}]
 [,ORIENTATION={PORTRAIT|LANDSCAPE}] [,TOPMARGIN=n] [,BOTTOMMARGIN=m],$
```

where:

**XLSPAGESETS={ON|OFF}**

ON causes the page settings defined in the WebFOCUS request to be applied to the Excel worksheet page settings. OFF retains the default page settings defined in the standard Excel workbook. OFF is the default value.

**n**

Defines the top margin for the worksheet in the units identified by the UNITS parameter (inches, by default). The default value is .25.

**m**

Defines the bottom margin for the worksheet in the units identified by the UNITS parameter (inches, by default). The default value is .25.

**pagesize**

Is one of the PAGESIZE values supported in a WebFOCUS StyleSheet. LETTER is the default page size.

**PORTRAIT|LANDSCAPE**

PORTRAIT displays the report across the narrower dimension of a vertical page, producing a page that is longer than it is wide. PORTRAIT is the default value.

LANDSCAPE displays the report across the wider dimension of a horizontal page, producing a page that is wider than it is long.

# Adding an Image to a Report

WebFOCUS supports the placement of images within each area or node of the report on the worksheet. An image, such as a logo, gives corporate identity to a report, or provides visual appeal. Data specific images can be placed in headers, footers, and data columns to provide additional clarity and style.

The image must reside on the WebFOCUS Reporting Server in a directory named on EDAPATH or APPPATH. If the file is not on the search path, supply the full path name.

# Inserting Images Into Excel XLSX Reports

Images can be placed in any available WebFOCUS reporting node or element of a worksheet. Supported image formats include .gif and .jpg.

**Usage Considerations**

- All images will be placed in the top-left corner of the first cell of the defined area, based on the top and left gap. Defined explicit positioning and justification have not been implemented yet.
- Standard page setting keywords can be used in conjunction with XLSXPAGESETS to control the page layout in standard reports (not compound).
- Images placed within a report cell in a row or column is anchored to the top-left corner of the cell. The cell is automatically sized to the height and width to fit the largest image (SQUEEZE=ON).
- Additional lines may need to be added within a heading, footing, subhead, or subfoot to accommodate the placement of the image.

# Insert Images Into WebFOCUS Report Elements in XLSX Reports

```
TYPE={REPORT|heading|data}, IMAGE={url|file|(column)} [,BY=byfield]
[,SIZE=(w h)] ,$
```

where:

**REPORT**

Embeds an image in the body of a report. The image appears in the background of the report. REPORT is the default value.

***heading***

Embeds an image in a heading or footing. Valid values are TABHEADING, TABFOOTING, FOOTING, HEADING, SUBHEAD, and SUBFOOT. Provide sufficient blank space in the heading or footing so that the image does not overlap the heading or footing text. You may also want to place heading or footing text to the right of the image using spot markers.

***data***

Defines a cell within a data column to place the image. Must be used with COLUMNS= attributes to identify the specific report column where the image should be anchored.

***url***

Is the URL of the image file.

***file***

Is the name of the image file. It must reside on the WebFOCUSWebFOCUS Reporting Server in a directory named on EDAPATH or APPPATH. If the file is not on the search path, supply the full path name. When specifying a GIF file, you can omit the file extension.

***column***

Is an alphanumeric field in the data source that contains the name of an image file. Enclose the column in parentheses ( ). The field containing the file name or image must be a display field or BY field referenced in the request. Note that the value of the field is interpreted exactly as if it were typed as the URL of the image in the StyleSheet. If you omit the suffix, .GIF is supplied, by default. You can use the SET BASEURL command for supplying the base URL of the images. This way, the value of the field does not have to include the complete URL. This syntax is useful, for example, if you want to embed an image in a SUBHEAD, and you want a different image for each value of the BY field on which the SUBHEAD occurs.

***byfield***

Is the sort field that generates the subhead or subfoot.

**SIZE**

Is the size of the image. By default, an image is added at its original size.

***w***

Is the width of the image, expressed in the unit of measurement specified by the UNITS parameter. Enclose the *w* and *h* values in parentheses. Do not include a comma between them.

***h***

Is the height of the image, expressed in the unit of measurement specified by the UNITS parameter.

# Positioning Images in the Header or Footer in XLSX Reports

You can insert and position images in the header or footer by using the CELL-POSITION property in an XLSX report. Note the following points about this property:

- The CELL-POSITION property is applied with respect to the top-left corner of the header of the footer. For example, CELL-POSITION(+2, +1) in the footer is 2 cells to the right and one cell down from the top-left corner of the footer area.
- The image might overlap text if you put it in such a location that causes the image to overlap the text. Ensure that you use the correct size of the image to prevent this.
- You can use CELL-DIMENSION property to set the size of the image to fill the specified range of cells.
- If CELL-DIMENSION is not specified, then you can use the SIZE property. If you do not use CELL-POSITION or SIZE, the image is displayed in its original size.

```
TYPE=[HEADING | FOOTING], IMAGE=_image.gif_, CELL-POSITION=(x y), CELL-
DIMENSION(x y)$
```

where:

***heading***

Embeds an image in the header of an Excel report.

***footing***

Embeds an image in the footer of an Excel report.

***image***

The image you want to insert and position in an Excel report.

***cell-position***

States the position of the image from the top-left corner of the header or the footer.

***cell-dimension***

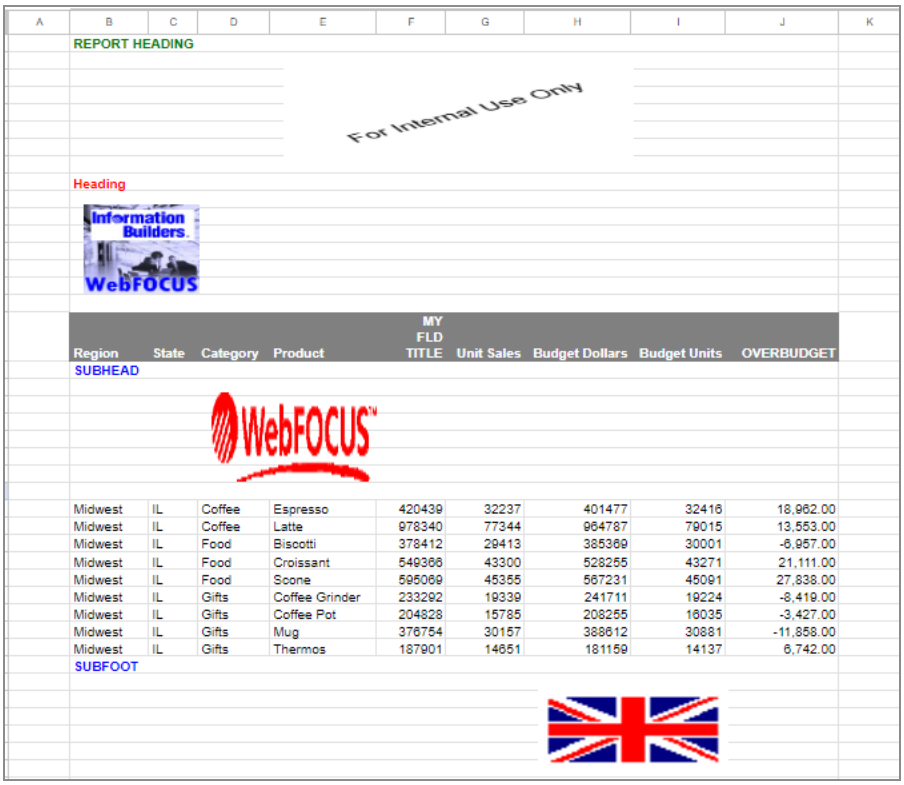
States the size of the image in cells, horizontally and vertically.

The following fex is an example showing how to position images in EXCEL in the header and footer of the report.

```
-INCLUDE STIM001A
-RUN

COMPOUND LAYOUT HOLD AS foccache/all_types_cmpd_1img FORMAT XLSX
SECTION=Section_1, LAYOUT=ON,  $
  PAGELAYOUT=1, $
    COMPONENT=Rpt_1, COMPONENT-TYPE=REPORT, POSITION=(.5 1), CELL-
POSITION=(2 1), DIMENSION=(4 5), $
END

SET COMPONENT=Rpt_1
-*SET LAYOUTRTL=ON
TABLE FILE GGSALES
HEADING
"Heading"
"</6"
ON TABLE SUBHEAD
"REPORT HEADING"
"</6"
SUM DOLLARS AS 'MY,FLD,TITLE' UNITS BUDDOLLARS BUDUNITS
COMPUTE OVERBUDGET/D12.2=DOLLARS-BUDDOLLARS;
BY REGION
BY ST
BY CATEGORY
BY PRODUCT
ON REGION SUBHEAD
"SUBHEAD"
"</6"
ON REGION SUBFOOT
"SUBFOOT"
"</6"
FOOTING
```

```
"Footing"
"</6"
ON TABLE SUBFOOT
"REPORT FOOTING"
"</6"
ON TABLE SET BYDISPLAY ON
ON TABLE SET STYLE *
TYPE=TITLE,      STYLE=BOLD, COLOR=WHITE, BACKCOLOR=GREY, $
TYPE=HEADING,    STYLE=BOLD, COLOR=RED, $
TYPE=FOOTING,    STYLE=BOLD, COLOR=RED, $
TYPE=TABHEADING, STYLE=BOLD, COLOR=GREEN, $
TYPE=TABFOOTING, STYLE=BOLD, COLOR=GREEN, $
TYPE=SUBHEAD,    STYLE=BOLD, COLOR=BLUE, $
TYPE=SUBFOOT,    STYLE=BOLD, COLOR=BLUE, $
TYPE=HEADING,  IMAGE=stim0017.jpg, position=(.25 .25), cell-position=(+0
+1), cell-dimension=(2 6), $
TYPE=TABHEADING, IMAGE=stii008a.jpg, position=(.25 .25), cell-position=
(+3 +1), cell-dimension=(4 7), $
TYPE=SUBHEAD, IMAGE=blob0011.gif, position=(4.25 .25), cell-position=(+2
+1), cell-dimension=(2 6), $
TYPE=FOOTING, IMAGE=stim0017.jpg, position=(8.25 .25), cell-position=(+7
+1), cell-dimension=(2 6), $
TYPE=TABFOOTING, IMAGE=stii008a.jpg, position=(8.25 .25), cell-position=
(+3 +1), cell-dimension=(4 7), $
TYPE=SUBFOOT, IMAGE=blob0005.gif, position=(4.25 .25), cell-position=(+6
+1), cell-dimension=(2 6), $
END

COMPOUND END
```

In the following image, you can see how the images have been positioned in the header and footer section of the report.




# Adding a GIF Image to a Single Table Request

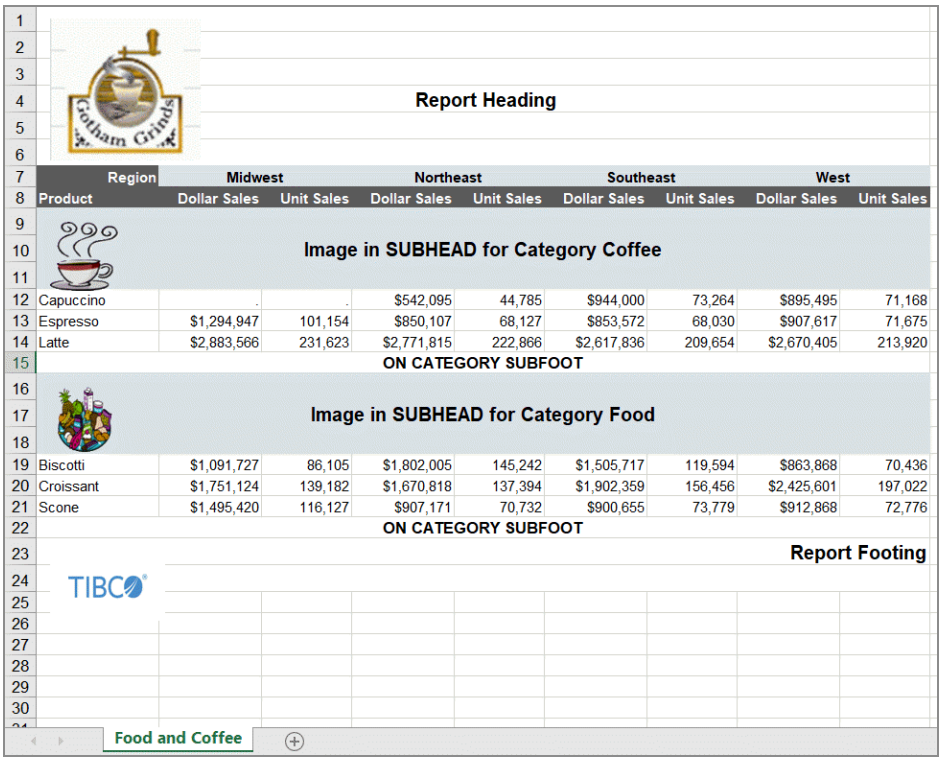
In the following request, since the referenced images are not part of the existing GGSALES table, the image files (.gif) are being built in the DEFINE and then referenced in the TABLE request. You can NOPRINT fields if you do not want them to display as columns, but the fields must be referenced in the table to include them in the internal matrix. This will allow the images to be placed in the headings, footings, or data cells. The specific location is defined using StyleSheet definitions for attaching the image based on field value.

```
DEFINE FILE GGSALES
SHOWCAT/A100=CATEGORY || '.GIF';
END
TABLE FILE GGSALES
SUM DOLLARS/D12CM UNITS/D12C
BY LOWEST CATEGORY NOPRINT
BY SHOWCAT NOPRINT
BY PRODUCT
ACROSS REGION
WHERE CATEGORY NE 'Gifts'
```

```
ON CATEGORY SUBHEAD
" "
“Image in SUBHEAD for Category <CATEGORY "
" "
ON TABLE SUBHEAD
" "
" "
" "
" Report Heading "
" "
" "
ON CATEGORY SUBFOOT
"ON CATEGORY SUBFOOT"
```

```
ON TABLE SUBFOOT
"Report Footing"
" "
ON TABLE SET PAGE-NUM NOLEAD
ON TABLE NOTOTAL
ON TABLE SET ACROSSTITLE SIDE
ON TABLE PCHOLD FORMAT XLSX
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, FONT='ARIAL', SIZE=9, TITLETEXT='Food and
Coffee',$
TYPE=REPORT, COLUMN=PRODUCT, SQUEEZE=1,$
TYPE=TITLE, BACKCOLOR=RGB(90 90 90), COLOR=RGB(255 255 255),
STYLE=BOLD,$
TYPE=ACROSSTITLE, STYLE=BOLD, BACKCOLOR=RGB(90 90 90),
COLOR=RGB(255 255 255),$
TYPE=ACROSSVALUE, BACKCOLOR=RGB(218 225 232), STYLE=BOLD,
JUSTIFY=CENTER,$
TYPE=HEADING, STYLE=BOLD, COLOR=RGB(0 35 95), SIZE=12, JUSTIFY=Center,$
TYPE=FOOTING, BACKCOLOR=RGB(90 90 90), SIZE=12, COLOR=RGB(255 255 255),
STYLE=BOLD, JUSTIFY=CENTER,$
TYPE=SUBHEAD, SIZE=12, STYLE=BOLD, BACKCOLOR=RGB(218 225 232),
JUSTIFY=CENTER,$
TYPE=SUBHEAD, IMAGE=(SHOWCAT), SIZE=(.6 .6),$
TYPE=SUBFOOT, SIZE=10, STYLE=BOLD, JUSTIFY=CENTER,$
TYPE=TABHEADING, SIZE=12, STYLE=BOLD, JUSTIFY=CENTER,$
TYPE=TABHEADING, IMAGE=gglogo.gif,$
TYPE=TABFOOTING, SIZE=12, STYLE=BOLD, JUSTIFY=RIGHT,$
TYPE=TABFOOTING, IMAGE=tibco.gif, SIZE=(1.0 .6),$
END
```

The output is shown in the following image.



| | Region | Midwest | | Northeast | | Southeast | | West | |
|---|---|---|---|---|---|---|---|---|---|
| | Product | Dollar Sales | Unit Sales | Dollar Sales | Unit Sales | Dollar Sales | Unit Sales | Dollar Sales | Unit Sales |
| | Capuccino | . | . | $542,095 | 44,785 | $944,000 | 73,264 | $895,495 | 71,168 |
| | Espresso | $1,294,947 | 101,154 | $850,107 | 68,127 | $853,572 | 68,030 | $907,617 | 71,675 |
| | Latte | $2,883,566 | 231,623 | $2,771,815 | 222,866 | $2,617,836 | 209,654 | $2,670,405 | 213,920 |
| | Biscotti | $1,091,727 | 86,105 | $1,802,005 | 145,242 | $1,505,717 | 119,594 | $863,868 | 70,436 |
| | Croissant | $1,751,124 | 139,182 | $1,670,818 | 137,394 | $1,902,359 | 156,456 | $2,425,601 | 197,022 |
| | Scone | $1,495,420 | 116,127 | $907,171 | 70,732 | $900,655 | 73,779 | $912,868 | 72,776 |



# Adding a GIF Image to a Compound Request

**Note:** Compound Layout syntax cannot contain hidden carriage return or line feed characters. For purposes of presenting this example, line feed characters have been added so that the sample code wraps to fit within the printed page. To run this example in your environment, copy the code into a text editor and delete any line feed characters within the Compound Layout syntax by going to the end of each line and pressing **Delete**. In some instances, you may need to add a space to maintain the structure of the string.

```
APP PATH IBISAMP
SET HTMLARCHIVE=ON
*-HOLD_SOURCE
COMPOUND LAYOUT PCHOLD FORMAT XLSX
UNITS=IN,$
SECTION=section1, LAYOUT=ON, METADATA='prop_with_names, Margins_
Left=0.5,
Margins_Top=0.5, Margins_Right=0.5, Margins_Bottom=0.5,
thumbnailscale=4', MERGE=OFF, ORIENTATION=LANDSCAPE, PAGESIZE=Legal,
SHOW_GLOBALFILTER=OFF,$
PAGELAYOUT=1, NAME='Page layout 1', text='Page layout 1', TOC-LEVEL=1,
BOTTOMMARGIN=0.5, TOPMARGIN=0.5, METADATA='BOTTOMMARGIN=0.5,
```

```
TOPMARGIN=0.5,
LEFTMARGIN=0,RIGHTMARGIN=0,',$
COMPONENT='report1', TEXT='report1', TOC-LEVEL=2, POSITION=(0.650
0.917),
DIMENSION=(7.250 3.000), BYTOC=0,  ARREPORTSIZE=DIMENSION,
METADATA='left: 0.65in; top: 0.917in; width: 7.25in; height: 3in;
position: absolute; z-index: 1;',$
COMPONENT='chart1', TEXT='chart1', TOC-LEVEL=2, POSITION=(0.735 4.332),
DIMENSION=(7.167 2.917), COMPONENT-TYPE=GRAPH,  ARREPORTSIZE=DIMENSION,
METADATA='left: 0.735in; top: 4.332in; width: 7.167in; height: 2.917in;
position: absolute; z-index: 2;',$
END
```

```
SET COMPONENT='report1'
-*component_type report
DEFINE FILE GGSALES
SHOWCAT/A100=CATEGORY || '.GIF';
SHOWDATEQ/Q=DATE;
SHOWDATEY/YY=DATE;
SHOWDATEQY/YYQ=DATE;
END
```

```
TABLE FILE GGSALES
SUM DOLLARS/D12CM AS 'Dollars'
BY REGION AS ''
BY LOWEST CATEGORY
BY SHOWCAT AS 'Data Image'
ACROSS SHOWDATEY AS ''
ACROSS SHOWDATEQ AS ''
WHERE REGION NE 'Midwest' OR 'West'
ON TABLE SET HIDENULLACRS ON
HEADING
" "
"Image in Page Heading "
ON REGION SUBHEAD
" <+0> SUBHEAD: <REGION"
FOOTING
" "
"Image in Page Footing"
ON TABLE SET PAGE-NUM NOLEAD
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT XLSX
ON TABLE SET STYLE *
TYPE=REPORT, SIZE=10, BACKCOLOR=NONE, GRID=OFF, FONT='ARIAL',
XLSXPAGESETS=ON, TOPMARGIN=1, BOTTOMMARGIN=1, ORIENTATION=LANDSCAPE,
```

```
PAGESIZE=LEGAL, TITLETEXT='With Images',$
TYPE=REPORT, COLUMN=REGION, SQUEEZE=1.5, JUSTIFY=CENTER,$
TYPE=DATA, BACKCOLOR=NONE,$
TYPE=DATA, COLUMN=SHOWCAT, IMAGE=(SHOWCAT), SIZE=(.5 .5),$
TYPE=TITLE, BACKCOLOR=RGB(218 225 232), BORDER=LIGHT,
STYLE=-UNDERLINE+BOLD,$
TYPE=HEADING, IMAGE=GGLOGO.GIF, SIZE=(.65 .65),$
TYPE=HEADING, SIZE=12, STYLE=BOLD, JUSTIFY=CENTER,$
TYPE=SUBHEAD, SIZE=10, STYLE=BOLD, BORDER-TOP=LIGHT,$
TYPE=SUBHEAD, BY=1, JUSTIFY=CENTER, BORDER-TOP=LIGHT,$
TYPE=SUBFOOT, STYLE=BOLD,$
TYPE=FOOTING, SIZE=12, STYLE=+BOLD, JUSTIFY=CENTER,$
TYPE=FOOTING, IMAGE=tibco.gif, SIZE=(1.0 .6),$
TYPE=ACROSS, JUSTIFY=CENTER, BORDER=LIGHT,$
TYPE=ACROSSTITLE, STYLE=-UNDERLINE+BOLD,$
TYPE=ACROSSVALUE, BACKCOLOR=RGB(218 225 232), STYLE=-UNDERLINE+BOLD,$
END
```

```
SET COMPONENT='chart1'
ENGINE INT CACHE SET ON
-DEFAULTH &WF_STYLE_UNITS='PIXELS';
-DEFAULTH &WF_STYLE_HEIGHT='1005.0';
-DEFAULTH &WF_STYLE_WIDTH='1070.0';
-DEFAULTH &WF_TITLE='WebFOCUS Report';
GRAPH FILE GGSALES
HEADING
"Sales Graph"
SUM
GGSALES.SALES01.DOLLARS
BY SHOWDATEY AS Year
BY GGSALES.SALES01.REGION
ON GRAPH PCHOLD FORMAT XLSX
ON GRAPH SET VZERO OFF
ON GRAPH SET HTMLENCODE ON
ON GRAPH SET GRAPHDEFAULT OFF
ON GRAPH SET GRWIDTH 1
ON GRAPH SET UNITS &WF_STYLE_UNITS
ON GRAPH SET HAXIS 1000
ON GRAPH SET VAXIS 1000
ON GRAPH SET GRMERGE ADVANCED
ON GRAPH SET GRLEGEND 0
ON GRAPH SET GRXAXIS 2
ON GRAPH SET LOOKGRAPH HBAR
ON GRAPH SET STYLE *
```

```
*GRAPH_SCRIPT
setPieDepth(0);
setPieTilt(0);
setDepthRadius(0);
setCurveFitEquationDisplay(false);
setPlace(true);
setPieFeelerTextDisplay(1);
setUseSeriesShapes(true);
setMarkerSizeDefault(50);
setScaleMustIncludeZero(getX1Axis(), false);
setScaleMustIncludeZero(getY1Axis(), false);
setScaleMustIncludeZero(getY2Axis(), false);
setMarkerSizeDefault(60);
*END
INCLUDE=IBFS:/FILE/IBI_HTML_DIR/javaassist/intl/EN/ENIADefault_combine.sty,$
TYPE=REPORT, TITLETEXT='Graph Over Time',$
*GRAPH_SCRIPT
setReportParsingErrors(false);
setSelectionEnableMove(false);
*END
ENDSTYLE
END
COMPOUND END
```

The output is shown in the following images.

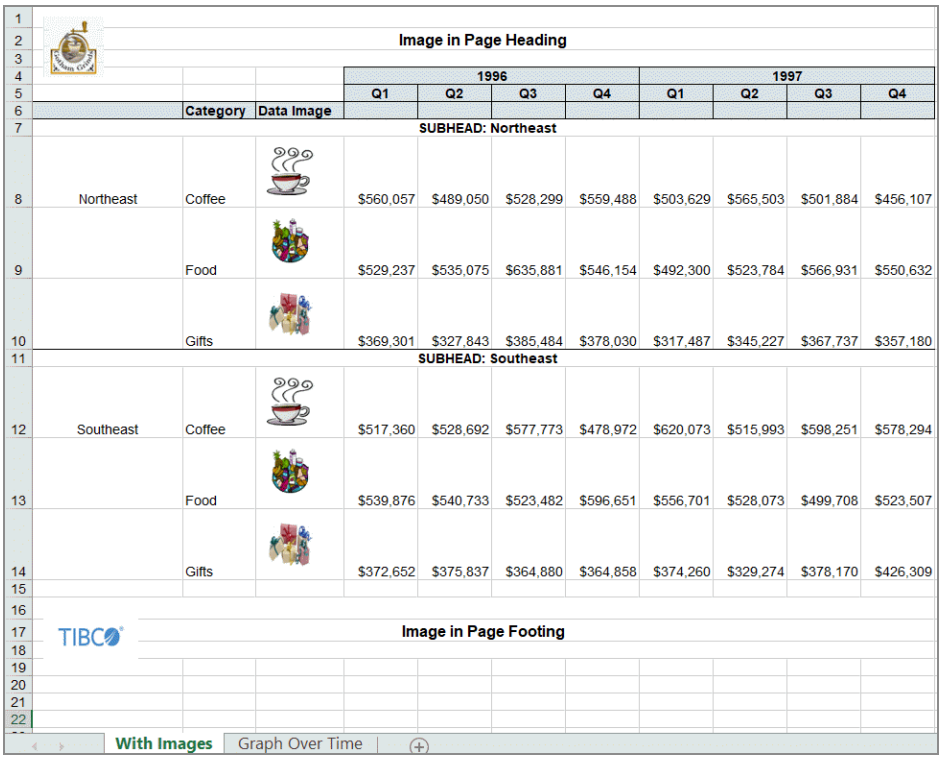
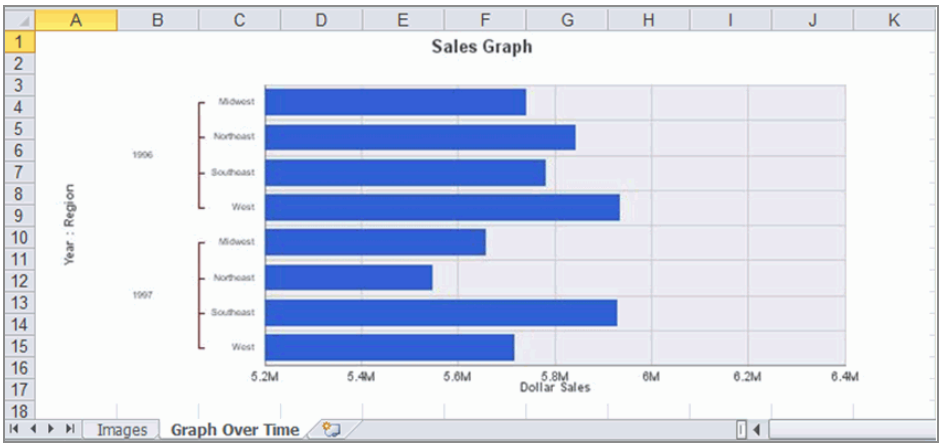


Image in Page Heading

| | Category | Data Image | 1996 Q1 | 1996 Q2 | 1996 Q3 | 1996 Q4 | 1997 Q1 | 1997 Q2 | 1997 Q3 | 1997 Q4 |
|---|---|---|---|---|---|---|---|---|---|---|
| SUBHEAD: Northeast | | | | | | | | | | |
| Northeast | Coffee | | $560,057 | $489,050 | $528,299 | $559,488 | $503,629 | $565,503 | $501,884 | $456,107 |
| | Food | | $529,237 | $535,075 | $635,881 | $546,154 | $492,300 | $523,784 | $566,931 | $550,632 |
| | Gifts | | $369,301 | $327,843 | $385,484 | $378,030 | $317,487 | $345,227 | $367,737 | $357,180 |
| SUBHEAD: Southeast | | | | | | | | | | |
| Southeast | Coffee | | $517,360 | $528,692 | $577,773 | $478,972 | $620,073 | $515,993 | $598,251 | $578,294 |
| | Food | | $539,876 | $540,733 | $523,482 | $596,651 | $556,701 | $528,073 | $499,708 | $523,507 |
| | Gifts | | $372,652 | $375,837 | $364,880 | $364,858 | $374,260 | $329,274 | $378,170 | $426,309 |

Image in Page Footing

With Images | Graph Over Time




# Adding a GIF Image to a BYTOC Compound Request

The following syntax is a portion of the code from the previous example to show the COMPOUND BYTOC syntax. By adding the ON TABLE SET COMPOUND BYTOC command to the compound report above, you can turn the report into a Compound Table of Contents report. The BYTOC syntax can be added to a stand-alone request or to a component of a compound document.

```
TABLE FILE GGSALES
SUM DOLLARS/D12CM AS 'Dollars'
SHOWREG
NOPRINT
BY REGION AS ''
BY LOWEST CATEGORY
BY SHOWCAT AS 'Data Image'
WHERE REGION NE 'Midwest' OR 'West'
ACROSS SHOWDATEY AS '' ACROSS SHOWDATEQ AS ''
ON TABLE SET HIDENULLACRS ON
HEADING
"Image in Page Heading"
ON REGION SUBHEAD
"<+0> Image in SUBHEAD:<REGION"
FOOTING
" "
"Image in Page Footing"
ON TABLE SET PAGE-NUM NOLEAD
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT XLSX
ON TABLE SET COMPOUND BYTOC
ON TABLE SET STYLE *
```

The output is:

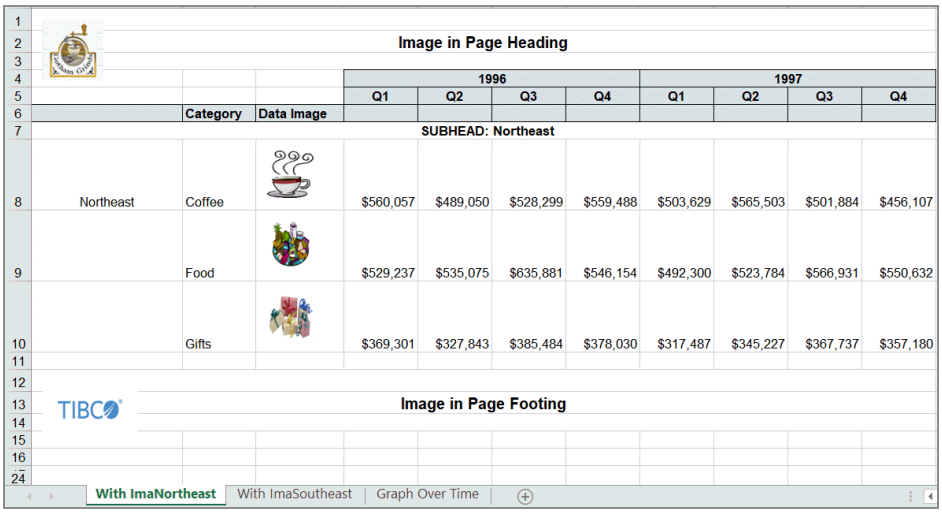


Image in Page Heading

| | | | 1996 | | | | 1997 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Category | Data Image | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| SUBHEAD: Northeast | | | | | | | | | | |
| Northeast | Coffee | | $560,057 | $489,050 | $528,299 | $559,488 | $503,629 | $565,503 | $501,884 | $456,107 |
| | Food | | $529,237 | $535,075 | $635,881 | $546,154 | $492,300 | $523,784 | $566,931 | $550,632 |
| | Gifts | | $369,301 | $327,843 | $385,484 | $378,030 | $317,487 | $345,227 | $367,737 | $357,180 |

Image in Page Footing

With ImaNortheast | With ImaSoutheast | Graph Over Time

# Inserting Text and Images Into XLSX Workbook Headers and Footers

WebFOCUS supports the insertion of text and images into Excel headers and footers and the definition of key page settings to support the placement of text and images in relationship to the overall worksheet and the Excel generated page breaks. This access to the Excel page functionality is designed to enhance overall usability of the worksheets for users who will be printing these reports. Page settings including orientation, page size, and page margins will directly affect the layout of each Excel page based on values defined within the FOCEXEC. Images and text can be included on headers and footers on every printed page, on the first page of the report only, or only on all subsequent pages. The WebFOCUS headings and footings continue to display within the worksheet. With this feature, WebFOCUS can insert logos to be printed once at the top of a report and watermark images that need to be displayed on every printed page.

# Insert Text and Images Into XLSX Workbook Headers and Footers

To place images in XLSX Workbook headers and footers, the syntax is:

```
TYPE={PAGEHEADER|PAGEFOOTER},OBJECT=IMAGE,
 IMAGE=imagename, JUSTIFY={LEFT|CENTER|RIGHT}
 [,DISPLAYON={FIRST|NOT-FIRST}] [,SIZE=(wh)],$
```

To place text in XLSX Workbook headers and footers, the syntax is:

```
TYPE={PAGEHEADER|PAGEFOOTER},OBJECT=STRING,
 TEXT=text, JUSTIFY={LEFT|CENTER|RIGHT}
 [,DISPLAYON={FIRST|NOT-FIRST}] ,$
```

where:

**PAGEHEADER**

Places the text or image in the worksheet header.

**PAGEFOOTER**

Places the text or image in the worksheet footer.

**imagename**

Is the name of a valid image file to be placed in the header or footer. The image must be located in the defined application path on the WebFOCUS Reporting Server. The image types supported are GIF and JPEG.

**text**

Is the text to be placed in the header or footer.

**JUSTIFY={LEFT|CENTER|RIGHT}**

Identifies the area in the header or footer to contain the text or image and the justification or placement within that defined area.

**DISPLAYON**

Defines whether the text or image should be placed on the first page only or on all pages except the first. Omit this attribute to place the text or image on all pages.

Valid values are:

`FIRST` places the text or image only on the first page.

`NOT-FIRST` places the text or image on every page, except the first page.

**SIZE=(wh)**

Is the size of the image. By default, an image is added at its original size.

**w** is the width of the image, expressed in the unit of measurement specified by the UNITS parameter.

**h** is the height of the image, expressed in the unit of measurement specified by the UNITS parameter.

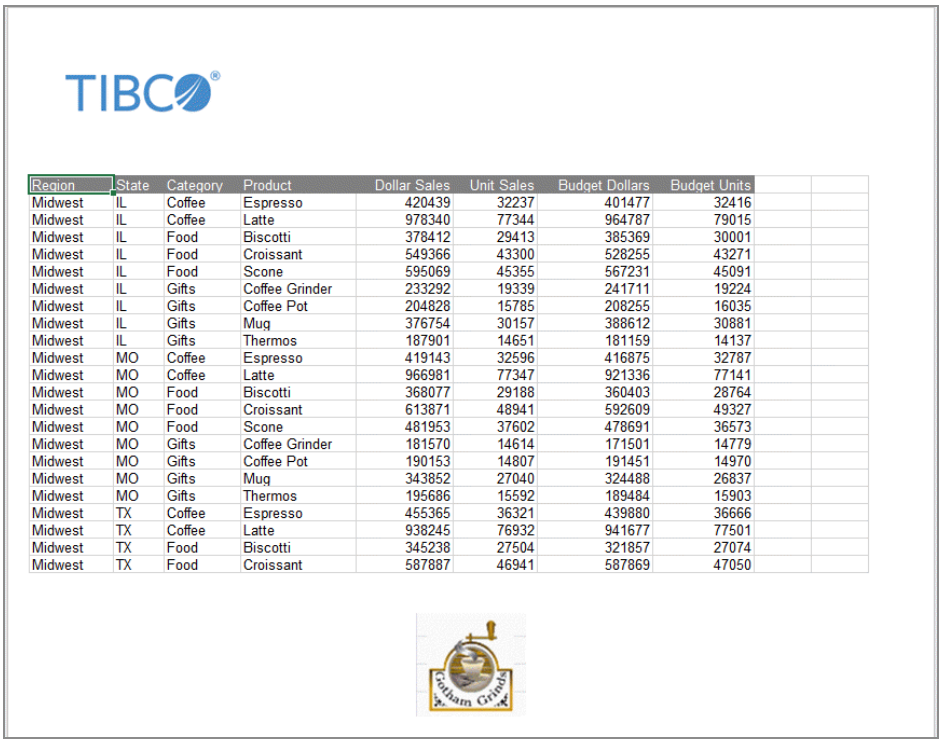
# Inserting Images in Excel Headers and Footers and Defining Page Settings

The following request against the GGSALES data source places the image tibco.gif on the left header area of the first page and the right header area of every subsequent page of the

resulting worksheet. It places the image gglogo1.gif in the center area of the footer on every page.

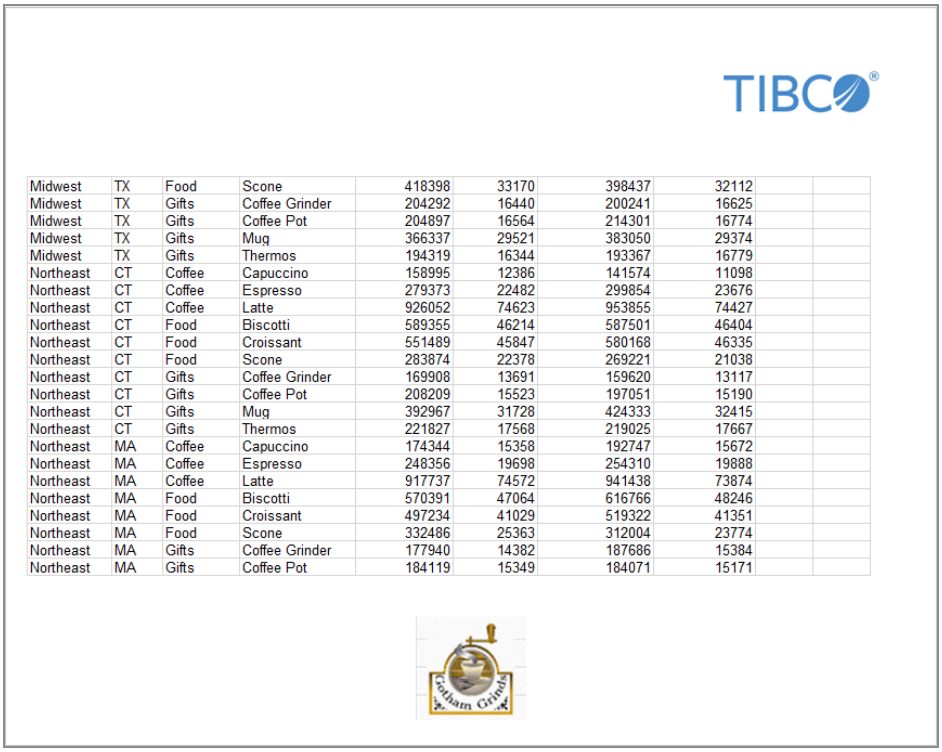
```
TABLE FILE GGSALES
SUM DOLLARS UNITS BUDDOLLARS BUDUNITS
BY REGION
BY ST
BY CATEGORY
BY PRODUCT
ON TABLE SET BYDISPLAY ON
ON TABLE PCHOLD FORMAT XLSX
ON TABLE SET STYLE *
FONT=ARIAL,SIZE=12,
XLSXPAGESETS=ON,TOPMARGIN=2,BOTTOMMARGIN=2,ORIENTATION=LANDSCAPE,
PAGESIZE=LETTER,$
TYPE=TITLE, COLOR=WHITE, BACKCOLOR=GREY,$
TYPE=PAGEHEADER, OBJECT=IMAGE, JUSTIFY=LEFT, IMAGE=tibco.GIF,
DISPLAYON=FIRST,$
TYPE=PAGEHEADER, OBJECT=IMAGE, JUSTIFY=RIGHT, IMAGE=tibco.GIF,
DISPLAYON=NOT-FIRST,$
TYPE=PAGEFOOTER, OBJECT=IMAGE, JUSTIFY=CENTER, IMAGE=gglogo.GIF,$
END
```

The first page of output has the image tibco.gif in the left area of the header and the image gglogo.gif in the center area of the footer.



| Region | State | Category | Product | Dollar Sales | Unit Sales | Budget Dollars | Budget Units |
|---|---|---|---|---|---|---|---|
| Midwest | IL | Coffee | Espresso | 420439 | 32237 | 401477 | 32416 |
| Midwest | IL | Coffee | Latte | 978340 | 77344 | 964787 | 79015 |
| Midwest | IL | Food | Biscotti | 378412 | 29413 | 385369 | 30001 |
| Midwest | IL | Food | Croissant | 549366 | 43300 | 528255 | 43271 |
| Midwest | IL | Food | Scone | 595069 | 45355 | 567231 | 45091 |
| Midwest | IL | Gifts | Coffee Grinder | 233292 | 19339 | 241711 | 19224 |
| Midwest | IL | Gifts | Coffee Pot | 204828 | 15785 | 208255 | 16035 |
| Midwest | IL | Gifts | Mug | 376754 | 30157 | 388612 | 30881 |
| Midwest | IL | Gifts | Thermos | 187901 | 14651 | 181159 | 14137 |
| Midwest | MO | Coffee | Espresso | 419143 | 32596 | 416875 | 32787 |
| Midwest | MO | Coffee | Latte | 966981 | 77347 | 921336 | 77141 |
| Midwest | MO | Food | Biscotti | 368077 | 29188 | 360403 | 28764 |
| Midwest | MO | Food | Croissant | 613871 | 48941 | 592609 | 49327 |
| Midwest | MO | Food | Scone | 481953 | 37602 | 478691 | 36573 |
| Midwest | MO | Gifts | Coffee Grinder | 181570 | 14614 | 171501 | 14779 |
| Midwest | MO | Gifts | Coffee Pot | 190153 | 14807 | 191451 | 14970 |
| Midwest | MO | Gifts | Mug | 343852 | 27040 | 324488 | 26837 |
| Midwest | MO | Gifts | Thermos | 195686 | 15592 | 189484 | 15903 |
| Midwest | TX | Coffee | Espresso | 455365 | 36321 | 439880 | 36666 |
| Midwest | TX | Coffee | Latte | 938245 | 76932 | 941677 | 77501 |
| Midwest | TX | Food | Biscotti | 345238 | 27504 | 321857 | 27074 |
| Midwest | TX | Food | Croissant | 587887 | 46941 | 587869 | 47050 |

The second page of output has the image tibco.gif in the right area of the header and the image gglogo.gif in the center area of the footer.



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Midwest | TX | Food | Scone | 418398 | 33170 | 398437 | 32112 |
| Midwest | TX | Gifts | Coffee Grinder | 204292 | 16440 | 200241 | 16625 |
| Midwest | TX | Gifts | Coffee Pot | 204897 | 16564 | 214301 | 16774 |
| Midwest | TX | Gifts | Mug | 366337 | 29521 | 383050 | 29374 |
| Midwest | TX | Gifts | Thermos | 194319 | 16344 | 193367 | 16779 |
| Northeast | CT | Coffee | Capuccino | 158995 | 12386 | 141574 | 11098 |
| Northeast | CT | Coffee | Espresso | 279373 | 22482 | 299854 | 23676 |
| Northeast | CT | Coffee | Latte | 926052 | 74623 | 953855 | 74427 |
| Northeast | CT | Food | Biscotti | 589355 | 46214 | 587501 | 46404 |
| Northeast | CT | Food | Croissant | 551489 | 45847 | 580168 | 46335 |
| Northeast | CT | Food | Scone | 283874 | 22378 | 269221 | 21038 |
| Northeast | CT | Gifts | Coffee Grinder | 169908 | 13691 | 159620 | 13117 |
| Northeast | CT | Gifts | Coffee Pot | 208209 | 15523 | 197051 | 15190 |
| Northeast | CT | Gifts | Mug | 392967 | 31728 | 424333 | 32415 |
| Northeast | CT | Gifts | Thermos | 221827 | 17568 | 219025 | 17667 |
| Northeast | MA | Coffee | Capuccino | 174344 | 15358 | 192747 | 15672 |
| Northeast | MA | Coffee | Espresso | 248356 | 19698 | 254310 | 19888 |
| Northeast | MA | Coffee | Latte | 917737 | 74572 | 941438 | 73874 |
| Northeast | MA | Food | Biscotti | 570391 | 47064 | 616766 | 48246 |
| Northeast | MA | Food | Croissant | 497234 | 41029 | 519322 | 41351 |
| Northeast | MA | Food | Scone | 332486 | 25363 | 312004 | 23774 |
| Northeast | MA | Gifts | Coffee Grinder | 177940 | 14382 | 187686 | 15384 |
| Northeast | MA | Gifts | Coffee Pot | 184119 | 15349 | 184071 | 15171 |

# Usage Notes for Inserting Text and Images Into XLSX Worksheet Headers and Footers

- In Microsoft Excel, the maximum number of characters in a page header or page footer is 255. This limit is for the entire page header or page footer (across the left, center, and right), and includes symbols or any other characters that Microsoft Excel needs to use, in addition to the text string itself. Any text string that exceeds this limit will be truncated.
- The Excel headers and footers are not automatically sized based on contents of the areas. Define page margins within the page settings (XLSPAGESETS) to account for the space required to display the images within each page of the report.
- The image sizing based on the specified height and width is not proportional. Sizing may cause image distortion.
- BLOB image fields are not supported in this release.

# Displaying Watermarks on XLSX Report Output

Watermark images can be placed into the Excel headers to display on every printed page of the generated worksheet.

Excel places images on the page starting in the header from left to right and then the footer from left to right. Large images placed in the header may overlap images before them in the presentation order. For page layouts with a logo in the left area and watermark centered on the page, watermark image background must be transparent so it does not overlay the logo image.

In Excel, images are placed first on the page. All other contents of the worksheet are then placed on top of the images. Text in cells and styling, such as background color and drawing objects, are placed on top of the images. Excel supports transparency in drawing objects and images, but not in cell background color. BACKCOLOR will cover over images placed on the page.

# Placing a Watermark in an XLSX Header

The following request against the GGSALES data source uses the image internaluseonly.gif as a watermark to display in the background of every page of the worksheet. Although the image is placed in the center area of the header, it is large enough to span the entire worksheet page. It has a transparent background, so it does not cover the logo images placed at the left in the header and the center in the footer.

```
TABLE FILE GGSALES
SUM DOLLARS UNITS BUDDOLLARS BUDUNITS
BY REGION
BY ST
BY CATEGORY
BY PRODUCT
ON TABLE SET BYDISPLAY ON
ON TABLE PCHOLD FORMAT XLSX
ON TABLE SET STYLE *
XLSXPAGESETS=ON,
TOPMARGIN=1,BOTTOMMARGIN=1,LEFTMARGIN=1, RIGHTMARGIN=1,
ORIENTATION=LANDSCAPE,PAGESIZE=LETTER,$
TYPE=PAGEHEADER, OBJECT=IMAGE, JUSTIFY=LEFT, IMAGE=TIBCO.GIF,
DISPLAYON=FIRST,$
TYPE=PAGEHEADER, OBJECT=IMAGE, JUSTIFY=CENTER,
IMAGE=WFINTERNALUSEONLY.GIF,$
TYPE=PAGEFOOTER, OBJECT=IMAGE, JUSTIFY=RIGHT, IMAGE=GGLOGO.GIF,$
END
```

The first page of the generated worksheet shows the watermark image beneath the data. This image is displayed on every page of the worksheet.

| Region | State | Category | Product | Dollar Sales | Unit Sales | Budget Dollars | Budget Units |
|---|---|---|---|---|---|---|---|
| Midwest | IL | Coffee | Espresso | 420439 | 32237 | 401477 | 32416 |
| Midwest | IL | Coffee | Latte | 978340 | 77344 | 964787 | 79015 |
| Midwest | IL | Food | Biscotti | 378412 | 29413 | 385369 | 30001 |
| Midwest | IL | Food | Croissant | 549366 | 43300 | 528255 | 43271 |
| Midwest | IL | Food | Scone | 595069 | [illegible] | 567231 | 45091 |
| Midwest | IL | Gifts | Coffee Grinder | 233292 | 18335 | 241711 | 19224 |
| Midwest | IL | Gifts | Coffee Pot | 204828 | 15785 | 208255 | 16035 |
| Midwest | IL | Gifts | Mug | 376869 | 30157 | 388612 | 30881 |
| Midwest | IL | Gifts | Thermos | 179301 | 14651 | 181159 | 14137 |
| Midwest | MO | Coffee | Espresso | 419143 | 32596 | 416875 | 32787 |
| Midwest | MO | Coffee | Latte | 966981 | 77347 | 321336 | 77141 |
| Midwest | MO | Food | Biscotti | 368077 | 29188 | 360403 | 28764 |
| Midwest | MO | Food | Croissant | 613871 | 48941 | 592609 | 49327 |
| Midwest | MO | Food | Scone | 481953 | 37602 | 478691 | 36573 |
| Midwest | MO | Gifts | Coffee Grinder | 181570 | 14614 | 171501 | 14779 |
| Midwest | MO | Gifts | Coffee Pot | 190153 | 14807 | 191451 | 14970 |
| Midwest | MO | Gifts | Mug | 343852 | 27040 | 324488 | 26837 |
| Midwest | MO | Gifts | Thermos | 195686 | 15592 | 189484 | 15903 |
| Midwest | TX | Coffee | Espresso | 455365 | 36321 | 439880 | 36666 |
| Midwest | TX | Coffee | Latte | 938245 | 76932 | 941677 | 77501 |
| Midwest | TX | Food | Biscotti | 345238 | 27504 | 321857 | 27074 |
| Midwest | TX | Food | Croissant | 587887 | 46941 | 587869 | 47050 |
| Midwest | TX | Food | Scone | 418398 | 33170 | 398437 | 32112 |
| Midwest | TX | Gifts | Coffee Grinder | 204232 | 16440 | 200241 | 16625 |
| Midwest | TX | Gifts | Coffee Pot | 204897 | 16564 | 214301 | 16774 |
| Midwest | TX | Gifts | Mug | 366337 | 29521 | 383050 | 29374 |
| Midwest | TX | Gifts | Thermos | 194319 | 16344 | 193367 | 16779 |
| Northeast | CT | Coffee | Capuccino | 158995 | 12386 | 141574 | 11098 |
| Northeast | CT | Coffee | Espresso | 279373 | 22482 | 299854 | 23676 |
| Northeast | CT | Coffee | Latte | 926052 | 74623 | 953855 | 74427 |
| Northeast | CT | Food | Biscotti | 589355 | 46214 | 587501 | 46404 |
| Northeast | CT | Food | Croissant | 551489 | 45847 | 580168 | 46335 |
| Northeast | CT | Food | Scone | 283874 | 22378 | 269221 | 21038 |
| Northeast | CT | Gifts | Coffee Grinder | 169308 | 13691 | 159620 | 13117 |
| Northeast | CT | Gifts | Coffee Pot | 208209 | 15523 | 197051 | 15190 |
| Northeast | CT | Gifts | Mug | 392967 | 31728 | 424333 | 32415 |

For Internal Use Only

# Creating Excel Tables Using Table Range Syntax

Using the IN-XLSXTABLE attribute for the TYPE=DATA declaration within a Stylesheet, you can create an Excel Table within an Excel worksheet. You can include the IN-XLSXTABLE attribute in a selected stylesheet and apply it to a procedure.

The IN-XLSXTABLE attribute automatically converts an XLSX tabular report generated with FORMAT XLSX into an Excel Table.

When the Excel Table is created, the output has all of the capabilities and benefits of using Microsoft Excel Tables. You can easily filter, sort, and style the resulting Excel Table.

The Excel Table that is created includes the entire DATA range. As a default, the column titles are the Excel Table column headings. Missing titles will generate default column names as table column header.

**Note:** Requests that render multi-sheet workbooks are not yet supported. For these requests, the IN-XLSXTABLE range will be turned off and reverted back to standard XLSX output.

# Create an Excel Table Using Table Range Syntax

To create an Excel Table using table range syntax, include the following StyleSheet syntax in your procedure, using a text editor. This syntax populates a single table range on a single worksheet in a workbook.

```
TYPE=DATA, IN-XLSXTABLE='name',$
```

where:

**name**

Is the desired table name.

# Creating an Excel Table Using Table Range Syntax

The following procedure uses the IN-XLSXTABLE attribute to create a table range that will be included as the data in an XLSX Table. The table range is assigned to the DATA node and includes all the data columns and rows. As the default, column titles are included as the Excel Table column Headings.

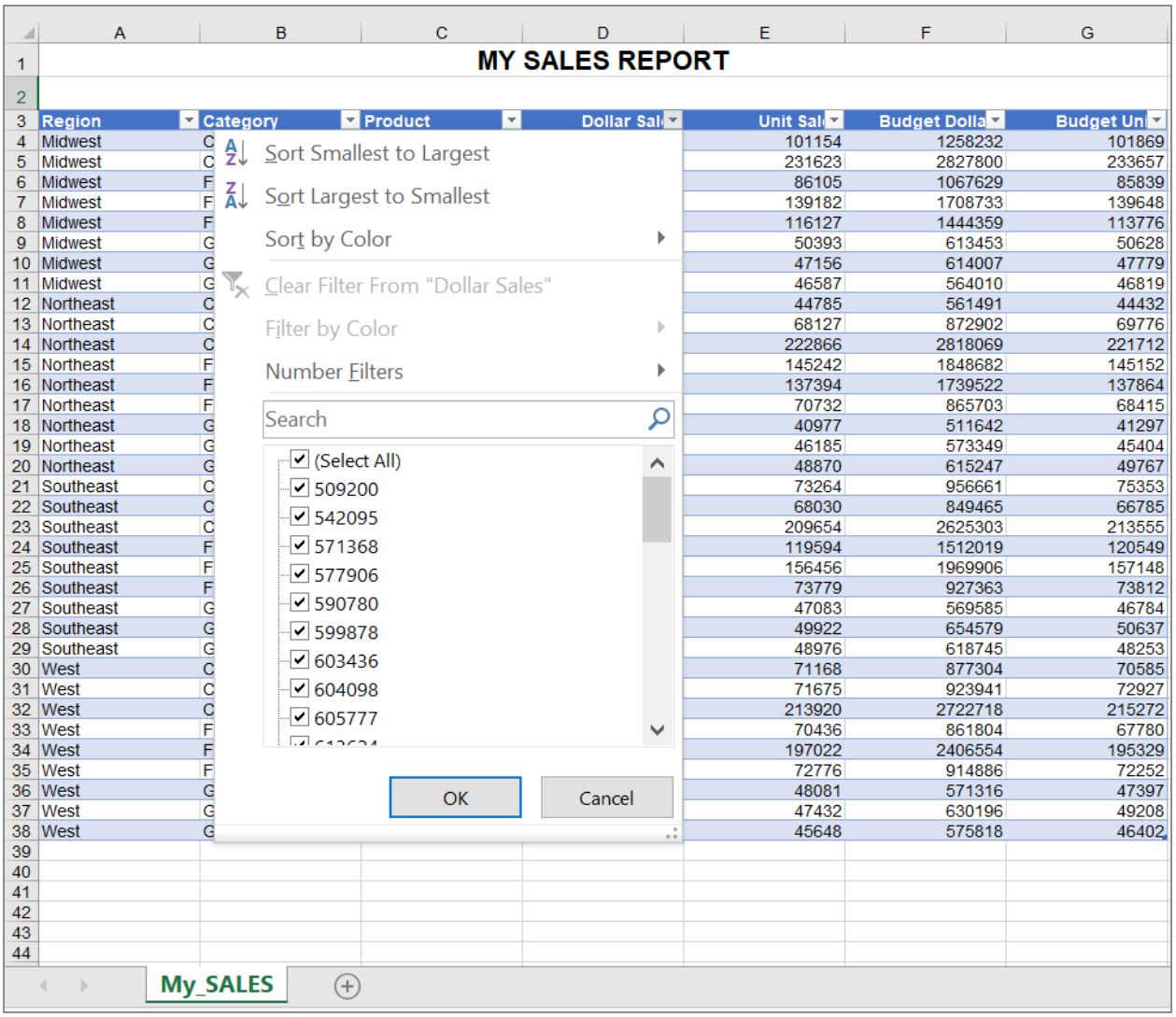
```
TABLE FILE GGSALES
SUM DOLLARS UNITS BUDDOLLARS BUDUNITS
BY REGION
BY CATEGORY
BY PRODUCT
WHERE PRODUCT NE 'Mug'
ON TABLE SUBHEAD
"MY SALES REPORT"
" "
ON TABLE SET BYDISPLAY ON
ON TABLE HOLD FORMAT XLSX
ON TABLE SET STYLE *
TYPE=REPORT, SQUEEZE=1.25, TITLETEXT='My_SALES',$
TYPE=TABHEADING, SIZE=16, STYLE=BOLD, JUSTIFY=CENTER,$
TYPE=DATA, IN-XLSXTABLE='Sales_
Table',$
END
```

The output is:

| | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 1 | MY SALES REPORT | | | | | | |
| 2 | | | | | | | |
| 3 | Region | Category | Product | Dollar Sal | Unit Sal | Budget Dolla | Budget Un |
| 4 | Midwest | Coffee | Espresso | 1294947 | 101154 | 1258232 | 101869 |
| 5 | Midwest | Coffee | Latte | 2883566 | 231623 | 2827800 | 233657 |
| 6 | Midwest | Food | Biscotti | 1091727 | 86105 | 1067629 | 85839 |
| 7 | Midwest | Food | Croissant | 1751124 | 139182 | 1708733 | 139648 |
| 8 | Midwest | Food | Scone | 1495420 | 116127 | 1444359 | 113776 |
| 9 | Midwest | Gifts | Coffee Grinder | 619154 | 50393 | 613453 | 50628 |
| 10 | Midwest | Gifts | Coffee Pot | 599878 | 47156 | 614007 | 47779 |
| 11 | Midwest | Gifts | Thermos | 577906 | 46587 | 564010 | 46819 |
| 12 | Northeast | Coffee | Capuccino | 542095 | 44785 | 561491 | 44432 |
| 13 | Northeast | Coffee | Espresso | 850107 | 68127 | 872902 | 69776 |
| 14 | Northeast | Coffee | Latte | 2771815 | 222866 | 2818069 | 221712 |
| 15 | Northeast | Food | Biscotti | 1802005 | 145242 | 1848682 | 145152 |
| 16 | Northeast | Food | Croissant | 1670818 | 137394 | 1739522 | 137864 |
| 17 | Northeast | Food | Scone | 907171 | 70732 | 865703 | 68415 |
| 18 | Northeast | Gifts | Coffee Grinder | 509200 | 40977 | 511642 | 41297 |
| 19 | Northeast | Gifts | Coffee Pot | 590780 | 46185 | 573349 | 45404 |
| 20 | Northeast | Gifts | Thermos | 604098 | 48870 | 615247 | 49767 |
| 21 | Southeast | Coffee | Capuccino | 944000 | 73264 | 956661 | 75353 |
| 22 | Southeast | Coffee | Espresso | 853572 | 68030 | 849465 | 66785 |
| 23 | Southeast | Coffee | Latte | 2617836 | 209654 | 2625303 | 213555 |
| 24 | Southeast | Food | Biscotti | 1505717 | 119594 | 1512019 | 120549 |
| 25 | Southeast | Food | Croissant | 1902359 | 156456 | 1969906 | 157148 |
| 26 | Southeast | Food | Scone | 900655 | 73779 | 927363 | 73812 |
| 27 | Southeast | Gifts | Coffee Grinder | 605777 | 47083 | 569585 | 46784 |
| 28 | Southeast | Gifts | Coffee Pot | 645303 | 49922 | 654579 | 50637 |
| 29 | Southeast | Gifts | Thermos | 632457 | 48976 | 618745 | 48253 |
| 30 | West | Coffee | Capuccino | 895495 | 71168 | 877304 | 70585 |
| 31 | West | Coffee | Espresso | 907617 | 71675 | 923941 | 72927 |
| 32 | West | Coffee | Latte | 2670405 | 213920 | 2722718 | 215272 |
| 33 | West | Food | Biscotti | 863868 | 70436 | 861804 | 67780 |
| 34 | West | Food | Croissant | 2425601 | 197022 | 2406554 | 195329 |
| 35 | West | Food | Scone | 912868 | 72776 | 914886 | 72252 |
| 36 | West | Gifts | Coffee Grinder | 603436 | 48081 | 571316 | 47397 |
| 37 | West | Gifts | Coffee Pot | 613624 | 47432 | 630196 | 49208 |
| 38 | West | Gifts | Thermos | 571368 | 45648 | 575818 | 46402 |
| 39 | | | | | | | |
| 40 | | | | | | | |
| 41 | | | | | | | |
| 42 | | | | | | | |
| 43 | | | | | | | |
| 44 | | | | | | | |

My_SALES

You can easily filter and sort all rows and columns in the output, as shown in the following image.




# Creating an Excel Table With Table-Level Syntax and Table Range Syntax

The following procedure uses the IN-XLSXTABLE attribute to create a table range that will be included as the data in the XLSX Table. The Table range is assigned to the DATA node and includes all the data columns and rows.

A centered table heading, report footing in red, and bold grand totals are also included in this request.

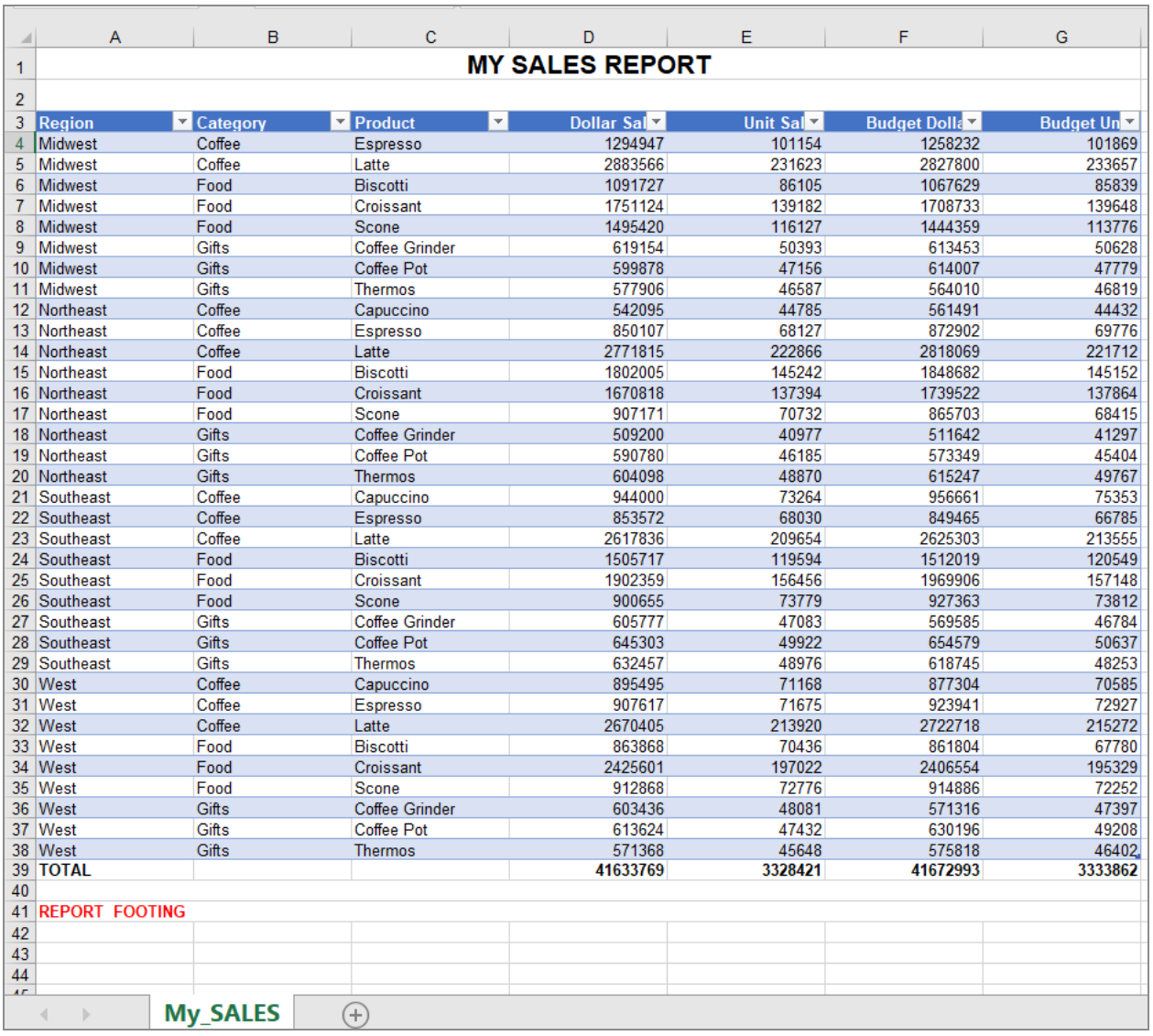
```
TABLE FILE GGSALES
SUM DOLLARS UNITS BUDDOLLARS BUDUNITS
BY REGION
BY CATEGORY
BY PRODUCT
WHERE PRODUCT NE 'Mug'
ON TABLE SUBHEAD
"MY SALES REPORT"
" "
FOOTING
" "
"REPORT  FOOTING"
ON TABLE SUBTOTAL
ON TABLE SET BYDISPLAY ON
ON TABLE PCHOLD FORMAT XLSX
ON TABLE SET STYLE *
TYPE=REPORT, SQUEEZE=1.25, TITLETEXT='My_SALES',$
TYPE=TABHEADING, SIZE=16, STYLE=BOLD, JUSTIFY=CENTER,$
TYPE=HEADING, STYLE=BOLD, SIZE=12,$
TYPE=FOOTING, STYLE=BOLD, COLOR=RED,$
TYPE=GRANDTOTAL, STYLE=BOLD,$
TYPE=DATA, IN-XLSXTABLE='Sales_Table',$
END
```

**Note:** Table-level subheads, subfoots, headings, footings, and grand totals will display outside of the Excel Table range (before or after, as appropriate). In this request, the footing and grand totals are excluded from the table DATA scope, the same way as the report heading is excluded.

The Table range (A3:G38) is the DATA portion and the column titles are the column Headers in the table.

Rows 1, 39, and 41 are the heading, grand totals, and footing. These lines are outside the table.

The output is:



| | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 1 | MY SALES REPORT | | | | | | |
| 2 | | | | | | | |
| 3 | Region | Category | Product | Dollar Sal | Unit Sal | Budget Dolla | Budget Un |
| 4 | Midwest | Coffee | Espresso | 1294947 | 101154 | 1258232 | 101869 |
| 5 | Midwest | Coffee | Latte | 2883566 | 231623 | 2827800 | 233657 |
| 6 | Midwest | Food | Biscotti | 1091727 | 86105 | 1067629 | 85839 |
| 7 | Midwest | Food | Croissant | 1751124 | 139182 | 1708733 | 139648 |
| 8 | Midwest | Food | Scone | 1495420 | 116127 | 1444359 | 113776 |
| 9 | Midwest | Gifts | Coffee Grinder | 619154 | 50393 | 613453 | 50628 |
| 10 | Midwest | Gifts | Coffee Pot | 599878 | 47156 | 614007 | 47779 |
| 11 | Midwest | Gifts | Thermos | 577906 | 46587 | 564010 | 46819 |
| 12 | Northeast | Coffee | Capuccino | 542095 | 44785 | 561491 | 44432 |
| 13 | Northeast | Coffee | Espresso | 850107 | 68127 | 872902 | 69776 |
| 14 | Northeast | Coffee | Latte | 2771815 | 222866 | 2818069 | 221712 |
| 15 | Northeast | Food | Biscotti | 1802005 | 145242 | 1848682 | 145152 |
| 16 | Northeast | Food | Croissant | 1670818 | 137394 | 1739522 | 137864 |
| 17 | Northeast | Food | Scone | 907171 | 70732 | 865703 | 68415 |
| 18 | Northeast | Gifts | Coffee Grinder | 509200 | 40977 | 511642 | 41297 |
| 19 | Northeast | Gifts | Coffee Pot | 590780 | 46185 | 573349 | 45404 |
| 20 | Northeast | Gifts | Thermos | 604098 | 48870 | 615247 | 49767 |
| 21 | Southeast | Coffee | Capuccino | 944000 | 73264 | 956661 | 75353 |
| 22 | Southeast | Coffee | Espresso | 853572 | 68030 | 849465 | 66785 |
| 23 | Southeast | Coffee | Latte | 2617836 | 209654 | 2625303 | 213555 |
| 24 | Southeast | Food | Biscotti | 1505717 | 119594 | 1512019 | 120549 |
| 25 | Southeast | Food | Croissant | 1902359 | 156456 | 1969906 | 157148 |
| 26 | Southeast | Food | Scone | 900655 | 73779 | 927363 | 73812 |
| 27 | Southeast | Gifts | Coffee Grinder | 605777 | 47083 | 569585 | 46784 |
| 28 | Southeast | Gifts | Coffee Pot | 645303 | 49922 | 654579 | 50637 |
| 29 | Southeast | Gifts | Thermos | 632457 | 48976 | 618745 | 48253 |
| 30 | West | Coffee | Capuccino | 895495 | 71168 | 877304 | 70585 |
| 31 | West | Coffee | Espresso | 907617 | 71675 | 923941 | 72927 |
| 32 | West | Coffee | Latte | 2670405 | 213920 | 2722718 | 215272 |
| 33 | West | Food | Biscotti | 863868 | 70436 | 861804 | 67780 |
| 34 | West | Food | Croissant | 2425601 | 197022 | 2406554 | 195329 |
| 35 | West | Food | Scone | 912868 | 72776 | 914886 | 72252 |
| 36 | West | Gifts | Coffee Grinder | 603436 | 48081 | 571316 | 47397 |
| 37 | West | Gifts | Coffee Pot | 613624 | 47432 | 630196 | 49208 |
| 38 | West | Gifts | Thermos | 571368 | 45648 | 575818 | 46402 |
| 39 | TOTAL | | | 41633769 | 3328421 | 41672993 | 3333862 |
| 40 | | | | | | | |
| 41 | REPORT FOOTING | | | | | | |
| 42 | | | | | | | |
| 43 | | | | | | | |
| 44 | | | | | | | |

My_SALES

# Usage Notes for the IN-XSLXTABLE Attribute

- Requests that render multi-sheet workbooks are not yet supported. For these requests, the IN-XLSXTABLE range will be turned off and reverted back to standard XLSX output.
- You can include the IN-XLSXTABLE attribute in a selected stylesheet and apply it to a procedure.
- Use of Subhead, Subfoots, and Subtotals on sort fields will display within the Excel

Table.

- Subhead, Subfoot, and Subtotal lines will not have merged cells like they do with standard XLSX output.
- When sorting values within an Excel Table that uses Subhead, Subfoot, or Subtotal, those lines are treated as any other data line and are not kept together with the data rows to which they correspond.
- As a best practice, do not use Subhead, Subfoot, or Subtotal when using an Excel Table, which will break up the integrity of the data in the middle of the table.

# Usage Notes for Excel Naming Conventions

The following topic describes general Excel and table naming rules.

**General Excel naming rules**

- **Maximum 255 characters.** An Excel name can have a maximum of 255 characters.
- **Use valid characters.** An Excel name must begin with a letter, underscore character (_), or backslash (\). Use letters, numbers, periods (.), and underscore characters for the remainder of the name.

  **Note:** Do not use *C*, *c*, *R*, or *r* for the Excel name. These are designated as a shortcut for selecting the column or row for the active cell, when you enter them in the Name or Go To box.
- **Do not use spaces.** Excel names cannot contain spaces and most punctuation characters. Consider how you can write the name, using no spaces, for example, DeptSales, Sales_Tax, or First.Quarter, or use an underscore or period as word separators.
- **Case-insensitivity.** Excel names are case-insensitive, meaning it evaluates two values being the same when the values contain the same characters, but have different casing. For example, Excel evaluates the values SALES and Sales to be the same value.
- **Do not use cell references.** Names cannot be the same as a cell reference, such as Z$100 or R1C1.

**Additional rules for Excel table names**

- **Use unique table names.** Each table must have a unique name within a workbook. Duplicate table names are not allowed.
- **Case-insensitivity.** Excel does not distinguish between uppercase and lowercase characters in names, so if you enter Sales but already have another name called SALES in the same workbook, you are prompted to choose a unique name.
- **Use valid characters.** You can only use letters, numbers, and the underscore character in a table name. A table name must begin with either a letter or an underscore, it cannot begin with a number.

# Creating Excel XLSX Worksheets Using Templates

XLSX report output can be generated based on Excel templates. This feature allows for the integration of WebFOCUS reports into workbooks containing multiple worksheets. Any native Excel template can be used to generate a new workbook containing a WebFOCUS report.

The following Excel file types can be used as template files to generate XLSX workbooks.

| Template File Type | Output Workbook Generated |
|---|---|
| Template (.xltx) | Workbook (.xlsx) |
| Macro-Enabled Template (.xltm) | Macro-Enabled workbook (.xlsm) |
| Workbook (.xlsx) | Workbook (.xlsx) |
| Macro-Enabled workbook (.xlsm) | Macro-Enabled workbook (.xlsm) |

WebFOCUS XLSX TEMPLATE format provides support for basic Excel templates (.xltx) files. These templates cannot contain macros or other content that Microsoft considers active, as well as templates with active content (XLTM/XLSM). Additionally, macro-enabled templates (.xltm) allow for the inclusion of active content (macros and VB script) into templates.

A WebFOCUS EXL07 template procedure generates a native Excel workbook with the standard Excel extension, based on the defined template file. The WebFOCUS request will replace an existing worksheet within the template workbook, and any formulas or

references defined in other worksheets to cells within the replaced worksheet will automatically update when the workbook is opened.

Since the template feature replaces existing worksheets, the designated worksheet must exist in the template workbook. Any content on the replaced worksheet within the template will not be retained. Content contained on any other worksheets will be retained and updated.

Named ranges can be defined within the procedure using the INRANGES attribute to designate cell groupings that can be referenced by other worksheets.

An Excel 2007/2010 template can be generated by saving any workbook with the .xltx extension. The template file should be stored within your application path (EDAPATH or APP PATH) rather than the default Excel template directory so that it can be accessed by the Reporting Server when the procedure is executed.

The EXL07 TEMPLATE feature is supported for basic EXL07 format reports. The following features are not supported with EXL07 TEMPLATE in this release: FORMULA, EXL97, EXCEL, and compound Excel reports.

In most cases, existing Excel 2003/2000 templates created as .mht files can easily be converted to Excel 2013/2010/2007 templates by opening the .mht file in Excel 2013/2010/2007 and resaving the file as either an Excel template (.xltx) or a macro enabled (.xltm) file. Native Excel formulas and functionality should be retained within these templates. Use .xltms to retain active content, including macros. This new XLTX template can be used with XLSX procedures.

# Create an XLSX Report Using Any Supported Template File Type

To support the expanded template files types, the template file name attribute has been enhanced to allow for the inclusion of the file extension. If no extension is specified within the template name, the file extension will default to .XLTX.

```
ON TABLE PCHOLD FORMAT XLSX TEMPLATE template_name SHEETNUMBER n
```

where:

**template_name**

Is the name of the Excel template file (workbook), up to 64 characters including the file name and extension, residing on the WebFOCUS Reporting Server application directory search path. For example, IPOLICY.XLTX, PRINTSHEETS.XLTM, or DASHBOARD.XLSM. If the extension is not provided, it defaults to .XLTX.

**n**

Is the number of the existing Excel worksheet being replaced in the template file (workbook).

# Usage Notes for XLSX Templates

The workbook template used by the WebFOCUS procedure must contain valid worksheets.

- The worksheet that is updated must exist in the workbook, as WebFOCUS is replacing the worksheet rather than inserting a worksheet. If the sheet designated does not exist, the procedure will return an error.
- In any template file, at least one of the sheets in the workbook must contain a cell with a valid value (blank or any other value). To replace a worksheet in a template that contains only empty worksheets, replace one of the cells in any of the sheets with a space and save. This will instantiate the worksheets so they are accessible to WebFOCUS for updating.
- The supported file name length has been extended to 64 characters. Any procedure referencing a template with a longer file name produces a message.

# Creating Excel Table of Contents Reports

Excel Table of Contents (BYTOC) enables you to generate a separate worksheet within an instance of the report for each value of the first BY field in the WebFOCUS report.

# Use the Excel Table of Contents Feature

There are three different ways that BYTOC can be invoked:

```
ON TABLE {HOLD|PCHOLD} FORMAT XLSX BYTOC
```

```
SET COMPOUND=BYTOC
```

```
ON TABLE SET COMPOUND BYTOC
```

Since a BYTOC report generates separate worksheets according to the value of the first BY field in the report, the report must contain at least one BY field. The primary BY field may be a NOPRINT field.

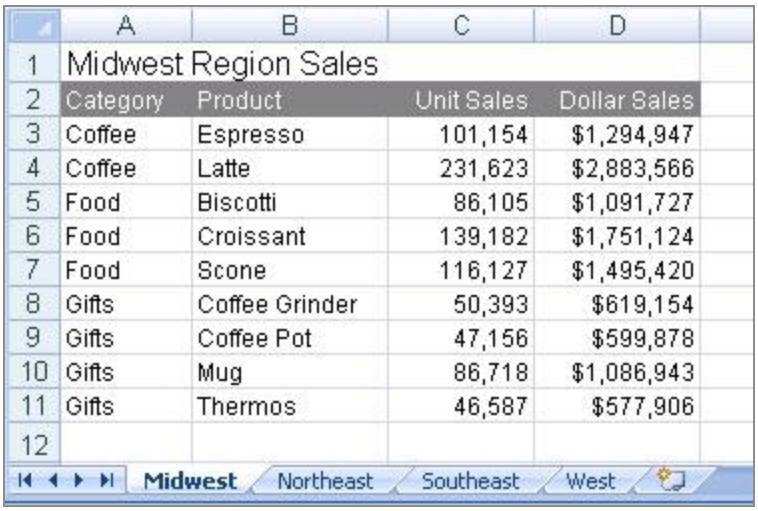
The BYTOC feature is not supported with the XLSX TEMPLATE format.

# Creating a Simple BYTOC Report

The following request against the GGSALES data source creates separate tabs based on the REGION sort field.

```
TABLE FILE GGSALES
SUM UNITS/D12C DOLLARS/D12CM
BY REGION NOPRINT
BY CATEGORY
BY PRODUCT
HEADING
"<REGION Region Sales"
ON TABLE PCHOLD FORMAT XLSX
ON TABLE SET BYDISPLAY ON
ON TABLE SET COMPOUND BYTOC
ON TABLE SET STYLE *
TYPE=REPORT, FONT=ARIAL, SIZE=9,$
TYPE=HEADING, SIZE=12,$
TYPE=TITLE, BACKCOLOR=GREY, COLOR=WHITE,$
ENDSTYLE
END
```

The output is:



| | A | B | C | D |
|---|---|---|---|---|
| 1 | Midwest Region Sales | | | |
| 2 | Category | Product | Unit Sales | Dollar Sales |
| 3 | Coffee | Espresso | 101,154 | $1,294,947 |
| 4 | Coffee | Latte | 231,623 | $2,883,566 |
| 5 | Food | Biscotti | 86,105 | $1,091,727 |
| 6 | Food | Croissant | 139,182 | $1,751,124 |
| 7 | Food | Scone | 116,127 | $1,495,420 |
| 8 | Gifts | Coffee Grinder | 50,393 | $619,154 |
| 9 | Gifts | Coffee Pot | 47,156 | $599,878 |
| 10 | Gifts | Mug | 86,718 | $1,086,943 |
| 11 | Gifts | Thermos | 46,587 | $577,906 |
| 12 | | | | |

Midwest | Northeast | Southeast | West

# How to Name Worksheets

- The worksheet tab names are the BY field values that correspond to the data on the current worksheet. If the user specifies the TITLETEXT keyword in the StyleSheet, it will be ignored.
- Excel limits the length of worksheet titles to 31 characters. The following special characters cannot be used: ':', '?', '*', and '/'.
- If you want to use date fields as the bursting BY field, you can include the - character instead of the / character. The - character is valid in an Excel tab title. However, if you do use the / character, WebFOCUS will substitute it with the - character.

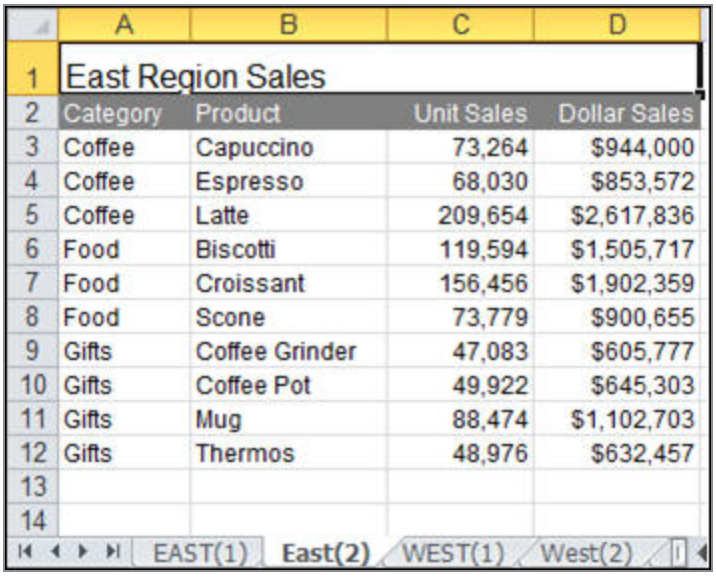
# Naming XLSX Worksheets With Case Sensitive Data

Excel requires each sheet name to be unique. Excel is case insensitive meaning it evaluates two values as being the same when the values contain the same characters but have different casing. For example, Excel evaluates the values WEST and West to be the same value. WebFOCUS XLSX format identifies duplicate names and adds a unique number to the name to allow Excel to maintain both sheets.

By default, WebFOCUS sort processing is case-sensitive, so the same field value with different casing is considered to be two different values when used as a sort (BY) field. In

an Excel BYTOC report, WebFOCUS will generate sheets with sheet names for each value of the primary sort (BY) key based on case sensitivity. To account for this, XLSX has been enhanced to add counters where duplicate tab names are found in the data to ensure the names are unique.

For example, if the report had EAST and East as the values for the Region, each worksheet would be displayed as EAST(1) and East(2), as shown in the following image.



| | A | B | C | D |
|---|---|---|---|---|
| 1 | East Region Sales | | | |
| 2 | Category | Product | Unit Sales | Dollar Sales |
| 3 | Coffee | Capuccino | 73,264 | $944,000 |
| 4 | Coffee | Espresso | 68,030 | $853,572 |
| 5 | Coffee | Latte | 209,654 | $2,617,836 |
| 6 | Food | Biscotti | 119,594 | $1,505,717 |
| 7 | Food | Croissant | 156,456 | $1,902,359 |
| 8 | Food | Scone | 73,779 | $900,655 |
| 9 | Gifts | Coffee Grinder | 47,083 | $605,777 |
| 10 | Gifts | Coffee Pot | 49,922 | $645,303 |
| 11 | Gifts | Mug | 88,474 | $1,102,703 |
| 12 | Gifts | Thermos | 48,976 | $632,457 |
| 13 | | | | |
| 14 | | | | |

EAST(1) East(2) WEST(1) West(2)

# Overcoming the Excel 2007/2010 Row Limit Using Overflow Worksheets

The maximum number of rows supported by Excel 2007/2010 on a worksheet is 1,048,576 (1MB). When you create an XLSX output file from a WebFOCUS report, the number of rows generated can be greater than this maximum.

To avoid creating an incomplete output file, you can have extra rows flow onto a new worksheet, called an *overflow worksheet*. The name of each overflow worksheet will be the name of the original worksheet appended with an increment number.

In addition, when the overflow worksheet feature is enabled, you can set a target value for the maximum number of rows to be included on a worksheet. By default, the row limit will be set to the default value for the LINES parameter (57).

**Note:** By default, when generating XLSX output, the WebFOCUS page heading and page footing commands generate only worksheet headings and worksheet footings.

# Enable Overflow Worksheets

Add the ROWOVERFLOW attribute to your WebFOCUS StyleSheet

```
TYPE=REPORT, ROWOVERFLOW={ON|OFF|PBON}, [ROWLIMIT={n|MAX},]$
```

where:

**ON**

Enables overflow worksheets.

**OFF**

Disables overflow worksheets. OFF is the default value.

**PBON**

Inserts WebFOCUS page breaks that display the page heading, footing, and column titles at the appropriate places within the worksheet rows. This option does not cause a new worksheet to start when a WebFOCUS page break occurs.

**ROWLIMIT=n**

Sets a target value for the number of rows to be included on a worksheet to **n** rows. The default value is the LINES value (by default, 57).

**ROWLIMIT=MAX**

Sets a target value for the number of rows to be included on a worksheet to 1,048,000 rows for XLSX output.

# Usage Notes for XLSX Overflow Worksheets

- The report heading is placed once at the start of the first sheet. The report footing is placed once at the bottom of the last overflow sheet.
- Unless the PBON setting is used, worksheet headings and column titles are repeated at the top of the original sheet and each subsequent overflow sheet. worksheet footings are placed at the bottom of the original sheet and each subsequent overflow sheet. The data values are displayed on the top data row of each overflow sheet as

they would be on a standard new page.

- Report total lines are displayed at the bottom of the last overflow sheet directly above the final page and table footings.
- Subheadings, subfootings, and subtotal lines display within the data flow as normal. No special consideration is made to retain groupings within a given sheet.
- If ROWOVERFLOW=PBON, the page headings and footings and column titles display within the worksheet when a WebFOCUS command causes a page break.
- For XLSX output, if the ROWOVERFLOW attribute is specified in the StyleSheet and ROWLIMIT is greater than 1MB, the following message is presented and no output file is generated:

  ```
  (FOC3338) The row limit for EXCEL XLSX worksheets is 1048576.
  ```

- Output types that contain formula references (EXL2K PIVOT and EXL2K FORMULA) are not supported, as formula references are not automatically updated to reflect placement on new overflow worksheets.
- The overflow worksheet feature applies to rows only, not columns. A new worksheet will not automatically be created if a report generates more than the Excel 2007/2010 limit or 16,384 columns.
- ROWOVERFLOW is supported for BYTOC reports for XLSX.
- As named ranges in Excel cannot run across multiple worksheets, the IN-RANGES phrase that defines named ranges in the resulting workbook is not supported with the ROWOVERFLOW feature. When they exist together in the same request, ROWOVERFLOW takes precedence and the IN-RANGES phrase is ignored.

# Creating Overflow Worksheets

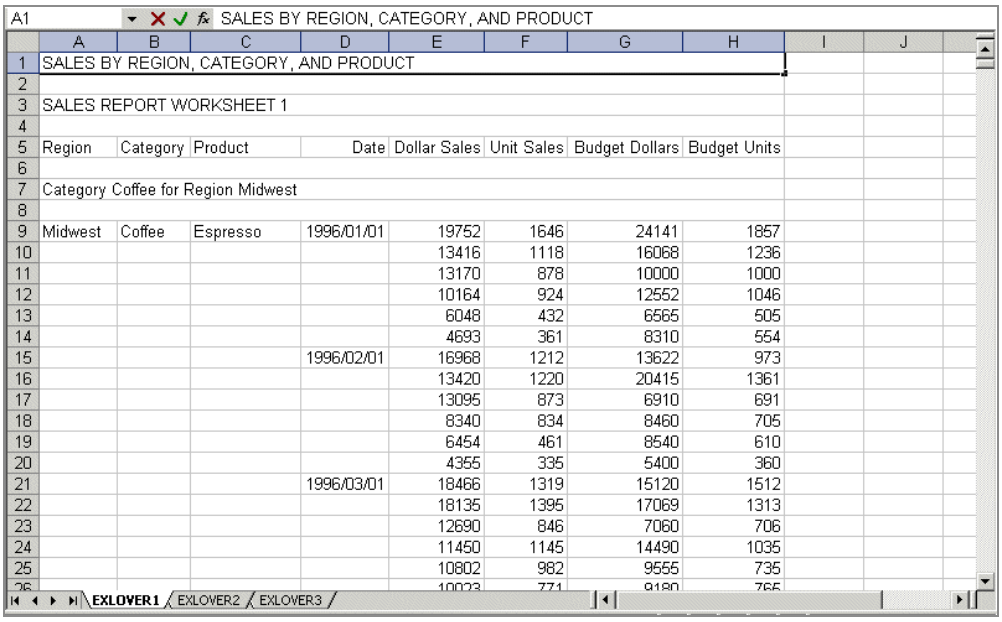
The following request creates XLSX report output with overflow worksheets. The ROWOVERFLOW=ON attribute in the StyleSheet activates the overflow feature. Without this attribute, one worksheet would have been generated instead of three.

```
TABLE FILE GGSALES
-* ****Report Heading****
ON TABLE SUBHEAD
```

```
"SALES BY REGION, CATEGORY, AND PRODUCT"
" "
-* ****Worksheet Heading****
HEADING
"SALES REPORT WORKSHEET <TABPAGENO"
" "
-* ****Worksheet Footing****
FOOTING
" "
"END OF WORKSHEET <TABPAGENO"
PRINT DOLLARS UNITS BUDDOLLARS BUDUNITS
BY REGION
BY CATEGORY
BY PRODUCT
BY DATE
```

```
-* ****Subfoot****
ON REGION SUBFOOT
" "
" End of Region <REGION"
" "
-* ****Subhead****
ON REGION SUBHESD
" "
"Category <CATEGORY for Region <REGION"
" "
-* ****Report Footing****
ON TABLE SUBFOOT
" "
"END OF REPORT"
ON TABLE PCHOLD FORMAT XLSX
ON TABLE SET STYLE *
TYPE=REPORT, TITLETEXT=EXLOVER, ROWOVERFLOW=ON, ROWLIMIT=2000,$
ENDSTYLE
END
```

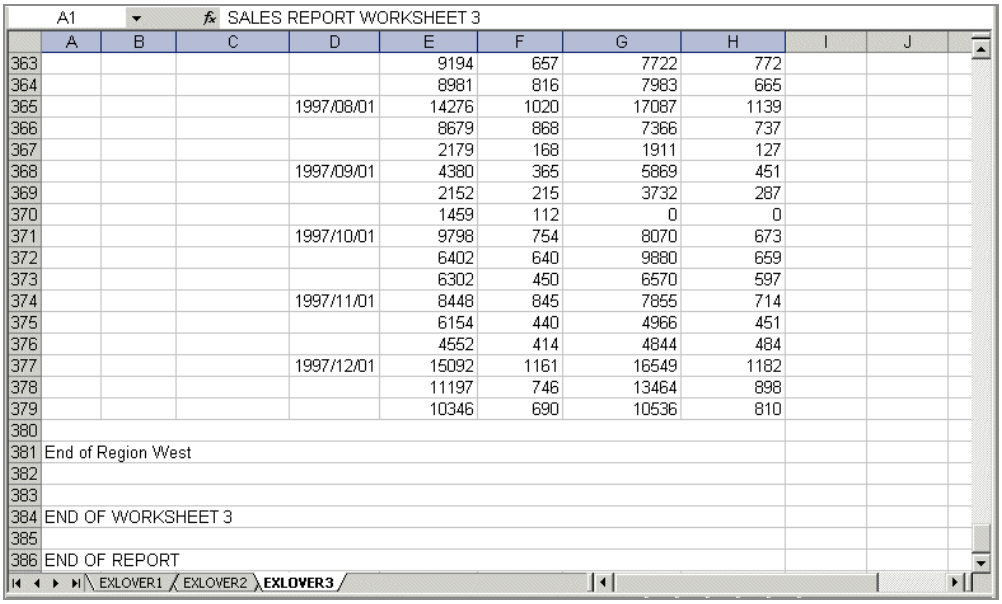
The report heading displays on the first worksheet only, the page heading and column titles display on each worksheet, and the subhead and subfoot display whenever the associated sort field changes value. The following image shows the top of the first worksheet, displaying the report heading, page heading, column titles, and first subhead.



| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | SALES BY REGION, CATEGORY, AND PRODUCT | | | | | | | |
| 2 | | | | | | | | |
| 3 | SALES REPORT WORKSHEET 1 | | | | | | | |
| 4 | | | | | | | | |
| 5 | Region | Category | Product | Date | Dollar Sales | Unit Sales | Budget Dollars | Budget Units |
| 6 | | | | | | | | |
| 7 | Category Coffee for Region Midwest | | | | | | | |
| 8 | | | | | | | | |
| 9 | Midwest | Coffee | Espresso | 1996/01/01 | 19752 | 1646 | 24141 | 1857 |
| 10 | | | | | 13416 | 1118 | 16068 | 1236 |
| 11 | | | | | 13170 | 878 | 10000 | 1000 |
| 12 | | | | | 10164 | 924 | 12552 | 1046 |
| 13 | | | | | 6048 | 432 | 6565 | 505 |
| 14 | | | | | 4693 | 361 | 8310 | 554 |
| 15 | | | | 1996/02/01 | 16968 | 1212 | 13622 | 973 |
| 16 | | | | | 13420 | 1220 | 20415 | 1361 |
| 17 | | | | | 13095 | 873 | 6910 | 691 |
| 18 | | | | | 8340 | 834 | 8460 | 705 |
| 19 | | | | | 6454 | 461 | 8540 | 610 |
| 20 | | | | | 4355 | 335 | 5400 | 360 |
| 21 | | | | 1996/03/01 | 18466 | 1319 | 15120 | 1512 |
| 22 | | | | | 18135 | 1395 | 17069 | 1313 |
| 23 | | | | | 12690 | 846 | 7060 | 706 |
| 24 | | | | | 11450 | 1145 | 14490 | 1035 |
| 25 | | | | | 10802 | 982 | 9555 | 735 |

Note that the TITLETEXT attribute in the StyleSheet specified the name EXLOVER, so the three worksheets were generated with the names EXLOVER1, EXLOVER2, and EXLOVER3. If there had been no TITLETEXT attribute, the sheets would have been named SHEET1, SHEET2, and SHEET3.

The worksheet footing displays at the bottom of each worksheet and the report footing displays at the bottom of the last worksheet. The following image shows the bottom of the last worksheet, displaying the last subfoot, the page footing, and the report footing.



| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 363 | | | | | 9194 | 657 | 7722 | 772 |
| 364 | | | | | 8981 | 816 | 7983 | 665 |
| 365 | | | | 1997/08/01 | 14276 | 1020 | 17087 | 1139 |
| 366 | | | | | 8679 | 868 | 7366 | 737 |
| 367 | | | | | 2179 | 168 | 1911 | 127 |
| 368 | | | | 1997/09/01 | 4380 | 365 | 5869 | 451 |
| 369 | | | | | 2152 | 215 | 3732 | 287 |
| 370 | | | | | 1459 | 112 | 0 | 0 |
| 371 | | | | 1997/10/01 | 9798 | 754 | 8070 | 673 |
| 372 | | | | | 6402 | 640 | 9880 | 659 |
| 373 | | | | | 6302 | 450 | 6570 | 597 |
| 374 | | | | 1997/11/01 | 8448 | 845 | 7855 | 714 |
| 375 | | | | | 6154 | 440 | 4966 | 451 |
| 376 | | | | | 4552 | 414 | 4844 | 484 |
| 377 | | | | 1997/12/01 | 15092 | 1161 | 16549 | 1182 |
| 378 | | | | | 11197 | 746 | 13464 | 898 |
| 379 | | | | | 10346 | 690 | 10536 | 810 |
| 380 | | | | | | | | |
| 381 | End of Region West | | | | | | | |
| 382 | | | | | | | | |
| 383 | | | | | | | | |
| 384 | END OF WORKSHEET 3 | | | | | | | |
| 385 | | | | | | | | |
| 386 | END OF REPORT | | | | | | | |

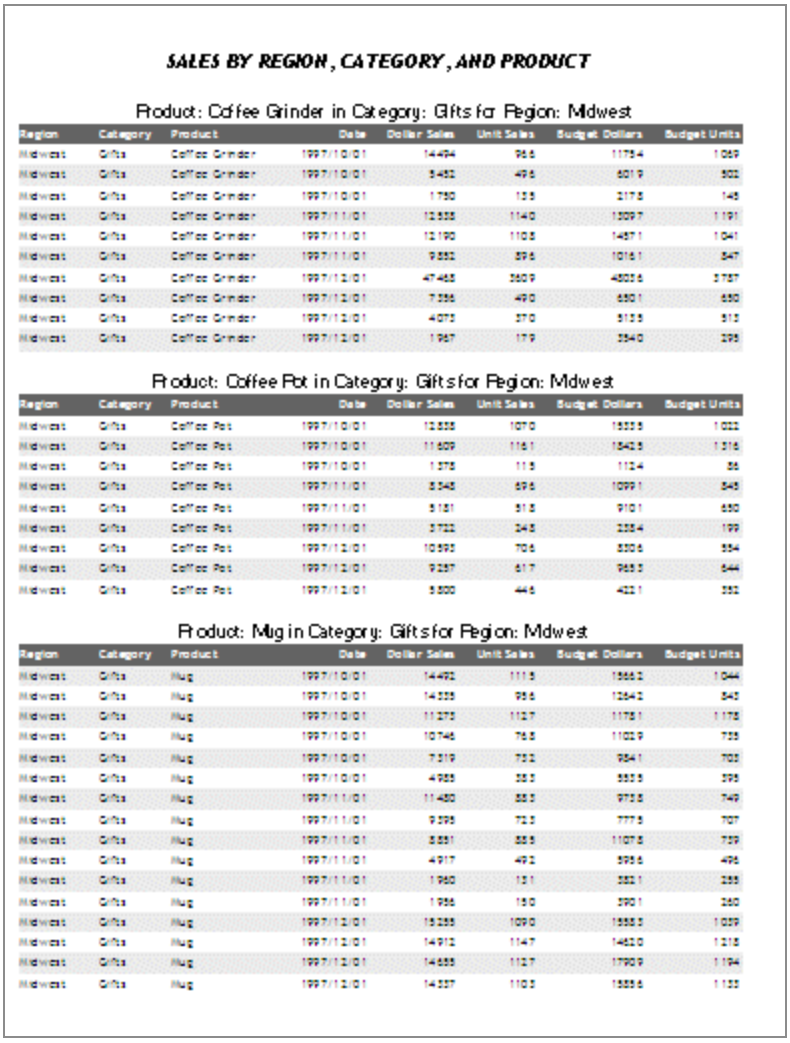
# Creating Overflow Worksheets With WebFOCUS Page Breaks

The following request creates XLSX report output with overflow worksheets. The ROWOVERFLOW=PBON attribute in the StyleSheet activates the overflow feature, and the ROWLIMIT=250 sets the maximum number of rows in each worksheet to approximately 250. Without this attribute, one worksheet would have been generated. The PRODUCT sort phrase specifies a page break.

```
TABLE FILE GGSALES
-* ****Report Heading****
ON TABLE SUBHEAD
"SALES BY REGION, CATEGORY, AND PRODUCT"
" "
PRINT DOLLARS UNITS BUDDOLLARS BUDUNITS
BY REGION
BY HIGHEST CATEGORY
BY PRODUCT PAGE-BREAK
BY DATE
WHERE DATE GE '19971001'
-* ****Page Heading****
HEADING
" Product: <PRODUCT in Category: <CATEGORY for Region: <REGION"
-* ****Page Footing****
FOOTING
" "
-* ****Report Footing****
ON TABLE SUBFOOT
" "
"END OF REPORT"
ON TABLE SET BYDISPLAY ON
ON TABLE PCHOLD FORMAT XLSX
ON TABLE SET STYLE *
INCLUDE=IBFS:/FILE/IBI_HTML_DIR/javaassist/intl/EN/ENIADefault_combine.sty,$
TITLETEXT=EXLOVER, ROWOVERFLOW=PBON, ROWLIMIT=250,
$
ENDSTYLE
END
```

The report heading displays on the first worksheet only, the page heading, footing, and column titles display on each worksheet and at each WebFOCUS page break (each time the

product changes), and the subhead and subfoot display whenever the associated sort field changes value. The following image shows the top of the first worksheet.



*SALES BY REGION, CATEGORY, AND PRODUCT*

Product: Coffee Grinder in Category: Gifts for Region: Midwest

| Region | Category | Product | Date | Dollar Sales | Unit Sales | Budget Dollars | Budget Units |
|---|---|---|---|---|---|---|---|
| Midwest | Gifts | Coffee Grinder | 1997/10/01 | 14494 | 966 | 11754 | 1069 |
| Midwest | Gifts | Coffee Grinder | 1997/10/01 | 5452 | 476 | 6019 | 503 |
| Midwest | Gifts | Coffee Grinder | 1997/10/01 | 1750 | 125 | 2178 | 145 |
| Midwest | Gifts | Coffee Grinder | 1997/11/01 | 12555 | 1140 | 13097 | 1191 |
| Midwest | Gifts | Coffee Grinder | 1997/11/01 | 12190 | 1105 | 14571 | 1041 |
| Midwest | Gifts | Coffee Grinder | 1997/11/01 | 9852 | 896 | 10161 | 847 |
| Midwest | Gifts | Coffee Grinder | 1997/12/01 | 47468 | 3609 | 48036 | 3787 |
| Midwest | Gifts | Coffee Grinder | 1997/12/01 | 7356 | 490 | 6501 | 650 |
| Midwest | Gifts | Coffee Grinder | 1997/12/01 | 4073 | 370 | 5135 | 513 |
| Midwest | Gifts | Coffee Grinder | 1997/12/01 | 1967 | 179 | 3540 | 295 |

Product: Coffee Pot in Category: Gifts for Region: Midwest

| Region | Category | Product | Date | Dollar Sales | Unit Sales | Budget Dollars | Budget Units |
|---|---|---|---|---|---|---|---|
| Midwest | Gifts | Coffee Pot | 1997/10/01 | 12555 | 1070 | 15555 | 1022 |
| Midwest | Gifts | Coffee Pot | 1997/10/01 | 11609 | 1161 | 18425 | 1316 |
| Midwest | Gifts | Coffee Pot | 1997/10/01 | 1375 | 115 | 1124 | 86 |
| Midwest | Gifts | Coffee Pot | 1997/11/01 | 8548 | 696 | 10991 | 848 |
| Midwest | Gifts | Coffee Pot | 1997/11/01 | 5151 | 515 | 9101 | 650 |
| Midwest | Gifts | Coffee Pot | 1997/11/01 | 3722 | 348 | 3384 | 199 |
| Midwest | Gifts | Coffee Pot | 1997/12/01 | 10395 | 706 | 8306 | 554 |
| Midwest | Gifts | Coffee Pot | 1997/12/01 | 9257 | 617 | 9653 | 644 |
| Midwest | Gifts | Coffee Pot | 1997/12/01 | 5300 | 446 | 4221 | 352 |

Product: Mug in Category: Gifts for Region: Midwest

| Region | Category | Product | Date | Dollar Sales | Unit Sales | Budget Dollars | Budget Units |
|---|---|---|---|---|---|---|---|
| Midwest | Gifts | Mug | 1997/10/01 | 14492 | 1115 | 15663 | 1044 |
| Midwest | Gifts | Mug | 1997/10/01 | 14335 | 956 | 12642 | 843 |
| Midwest | Gifts | Mug | 1997/10/01 | 11375 | 1137 | 11761 | 1176 |
| Midwest | Gifts | Mug | 1997/10/01 | 10746 | 768 | 11029 | 735 |
| Midwest | Gifts | Mug | 1997/10/01 | 7319 | 732 | 9541 | 703 |
| Midwest | Gifts | Mug | 1997/10/01 | 4985 | 355 | 5535 | 395 |
| Midwest | Gifts | Mug | 1997/11/01 | 11480 | 885 | 9735 | 749 |
| Midwest | Gifts | Mug | 1997/11/01 | 9395 | 725 | 7775 | 707 |
| Midwest | Gifts | Mug | 1997/11/01 | 8851 | 885 | 11075 | 739 |
| Midwest | Gifts | Mug | 1997/11/01 | 4917 | 492 | 5956 | 496 |
| Midwest | Gifts | Mug | 1997/11/01 | 1960 | 131 | 3821 | 255 |
| Midwest | Gifts | Mug | 1997/11/01 | 1956 | 150 | 3901 | 260 |
| Midwest | Gifts | Mug | 1997/12/01 | 15255 | 1090 | 15553 | 1039 |
| Midwest | Gifts | Mug | 1997/12/01 | 14913 | 1147 | 14620 | 1218 |
| Midwest | Gifts | Mug | 1997/12/01 | 14655 | 1127 | 17909 | 1194 |
| Midwest | Gifts | Mug | 1997/12/01 | 14337 | 1103 | 15556 | 1133 |

# Excel Compound Reports Using XLSX

Excel compound reports generate compound workbooks that can contain multiple worksheet reports using the XLSX output format.

You can use standard Compound Layout syntax to generate XLSX compound workbooks. By default, each PAGELAYOUT of the document is generated as a separate worksheet. Items can be positioned in the worksheet by using cell-specific positioning properties.

The components of an Excel compound report can include standard tables, Table of Content (BYTOC), and ROWOVERFLOW reports.

Component graphs will be added to worksheets as images.

# Usage Notes for Excel Compound Reports Using XLSX

- Images and graphs can be embedded within a component, but drawing objects (lines, boxes, strings) defined in Compound Layout syntax on a page layout will not be included in the generated workbook.
- Graphs and images are not supported in Excel headers and footers within XLSX compound workbooks.

**Note:** Since multiple tables are generated, WebFOCUS ensures that each tab name is unique.

# Compound Excel Report with Components

```
ENGINE INT CACHE SET ON
SET PAGE-NUM=NOLEAD
SET SQUEEZE=ON
-DEFAULTH &WF_HTMLENCODE=ON;
SET HTMLENCODE=&WF_HTMLENCODE

SET HTMLCSS=ON
-DEFAULTH &WF_EMPTYREPORT=ON;
SET EMPTYREPORT=&WF_EMPTYREPORT

-DEFAULTH &WF_EMBEDHEADING=ON;
SET EMBEDHEADING=&WF_EMBEDHEADING

SET GRAPHDEFAULT=OFF
-DEFAULTH &WF_UNITS=INCHES;
SET UNITS=&WF_UNITS


COMPOUND LAYOUT PCHOLD FORMAT XLSX
SECTION=Section_1, LAYOUT=ON, PAGESIZE=LETTER, ORIENTATION=PORTRAIT,
SHOW_GLOBALFILTER=OFF, $
PAGELAYOUT=1, NAME='Page 1', TEXT='Page 1', LEFTMARGIN=0.25,
RIGHTMARGIN=0.25, TOPMARGIN=0.25, BOTTOMMARGIN=0.25, $
```

```
COMPONENT=TableChart_1, COMPONENT-TYPE=REPORT, POSITION=(0.260416
0.260416), DIMENSION=(3.885416 3.802083), ARREPORTSIZE=DIMENSION, CELL-
POSITION=(1 1), CELL-DIMENSION=(5 15), METADATA='VERSION:1.0', $
COMPONENT=TableChart_2, COMPONENT-TYPE=REPORT, POSITION=(4.229166
0.260416), DIMENSION=(8.020833 4.21875), ARREPORTSIZE=DIMENSION, CELL-
POSITION=(+2 +0), CELL-RELATIVE-TO=TableChart_1, CELL-POSITION-
POINT=TOP-LEFT, CELL-RELATIVE-POINT=TOP-RIGHT, METADATA='VERSION:1.0', $
COMPONENT=TableChart_3, COMPONENT-TYPE=GRAPH, POSITION=(1.09375
4.364583), DIMENSION=(4.96875 3.46875), ARREPORTSIZE=DIMENSION, CELL-
POSITION=(+0 +1), CELL-DIMENSION=(5 15), CELL-RELATIVE-TO=TableChart_2,
CELL-POSITION-POINT=TOP-LEFT, CELL-RELATIVE-POINT=BOTTOM-LEFT,
METADATA='VERSION:1.0', $
PAGELAYOUT=2, NAME='Page 2', TEXT='Page 2', LEFTMARGIN=0.25,
RIGHTMARGIN=0.25, TOPMARGIN=0.25, BOTTOMMARGIN=0.25, $
COMPONENT=TableChart_4, COMPONENT-TYPE=REPORT, POSITION=(0.260416
0.260416), DIMENSION=(5.0 3.5), ARREPORTSIZE=DIMENSION, CELL-POSITION=(1
1), CELL-DIMENSION=(5 15), METADATA='VERSION:1.0', $
COMPONENT=TableChart_5, COMPONENT-TYPE=REPORT, POSITION=(0.260416
3.989583), DIMENSION=(4.96875 3.46875), ARREPORTSIZE=DIMENSION, CELL-
POSITION=(+0 +4), CELL-RELATIVE-TO=TableChart_4, CELL-POSITION-
POINT=TOP-LEFT, CELL-RELATIVE-POINT=BOTTOM-LEFT, METADATA='VERSION:1.0',
$
PAGELAYOUT=3, NAME='Page 3', TEXT='Page 3', LEFTMARGIN=0.25,
RIGHTMARGIN=0.25, TOPMARGIN=0.25, BOTTOMMARGIN=0.25, $
COMPONENT=TableChart_6, COMPONENT-TYPE=GRAPH, POSITION=(0.260416
0.260416), DIMENSION=(5.0 3.5), ARREPORTSIZE=DIMENSION, CELL-POSITION=(1
1), CELL-DIMENSION=(12 27), METADATA='VERSION:1.0', $
END

SET COMPONENT=TableChart_1
SET ARVERSION=2
-DEFAULTH &WF_SUMMARY='Summary';
-DEFAULTH &WF_TITLE='WebFOCUS Report';
TABLE FILE wfretail82/wf_retail_lite
SUM wf_retail_lite.WF_RETAIL_SALES.QUANTITY_SOLD
wf_retail_lite.WF_RETAIL_SALES.REVENUE_US
BY wf_retail_lite.WF_RETAIL_PRODUCT.PRODUCT_CATEGORY
BY wf_retail_lite.WF_RETAIL_TIME_SALES.TIME_YEAR
ON TABLE PCHOLD FORMAT PDF
ON TABLE NOTOTAL
ON TABLE SET VZERO OFF
ON TABLE SET STYLE *
INCLUDE=IBFS:/WFC/Global/Themes/Standard/Default/theme.sty,$
TYPE=REPORT, TITLETEXT='Report1', SUMMARY=&WF_SUMMARY.QUOTEDSTRING,
ARREPORTSIZE=DIMENSION, ARFILTER_TARGET='*', CHART-COLOR-MEASURES=ON,
ARGRAPHENGINE=JSCHART, $
ENDSTYLE
```

```
END

SET COMPONENT=TableChart_2
SET ARVERSION=2
-DEFAULTH &WF_SUMMARY='Summary';
-DEFAULTH &WF_TITLE='WebFOCUS Report';
TABLE FILE wfretail82/wf_retail_lite
SUM wf_retail_lite.WF_RETAIL_SALES.QUANTITY_SOLD
wf_retail_lite.WF_RETAIL_SALES.REVENUE_US
BY wf_retail_lite.WF_RETAIL_GEOGRAPHY_CUSTOMER.BUSINESS_REGION
BY wf_retail_lite.WF_RETAIL_TIME_SALES.TIME_YEAR
ON TABLE PCHOLD FORMAT PDF
ON TABLE NOTOTAL
ON TABLE SET VZERO OFF
ON TABLE SET STYLE *
INCLUDE=IBFS:/WFC/Global/Themes/Standard/Default/theme.sty,$
TYPE=REPORT, TITLETEXT='Report2', SUMMARY=&WF_SUMMARY.QUOTEDSTRING,
ARREPORTSIZE=DIMENSION, ARFILTER_TARGET='*', CHART-COLOR-MEASURES=ON,
ARGRAPHENGINE=JSCHART, $
ENDSTYLE
END

SET COMPONENT=TableChart_3
SET ARVERSION=2
-DEFAULTH &WF_TITLE='WebFOCUS Report';
GRAPH FILE wfretail82/wf_retail_lite
-* Created by Designer for Graph
SUM wf_retail_lite.WF_RETAIL_SALES.QUANTITY_SOLD
wf_retail_lite.WF_RETAIL_SALES.REVENUE_US
BY wf_retail_lite.WF_RETAIL_PRODUCT.PRODUCT_CATEGORY
ON GRAPH PCHOLD FORMAT JSCHART
ON GRAPH SET VZERO OFF
ON GRAPH SET HAXIS 4.96875
ON GRAPH SET VAXIS 3.46875
ON GRAPH SET GRAPHCVTUNITS ON
ON GRAPH SET UNITS INCHES
ON GRAPH SET LOOKGRAPH PIE
ON GRAPH SET AUTOFIT ON
ON GRAPH SET STYLE *
INCLUDE=IBFS:/WFC/Global/Themes/Standard/Default/theme.sty,$
TYPE=REPORT, TITLETEXT='Chart1', ARREPORTSIZE=DIMENSION, ARFILTER_
TARGET='*', ARGRAPHENGINE=JSCHART, $
TYPE=DATA, COLUMN=N1, BUCKET=color, $
TYPE=DATA, COLUMN=N2, BUCKET=measure, $
TYPE=DATA, COLUMN=N3, BUCKET=measure, $
*GRAPH_SCRIPT
```

```
*GRAPH_JS_FINAL
"extensions": {
    "com.ibi.galigeo_point": {
        "uniqueID": "uniqueId0x2827595240636638"
    },
    "com.ibi.galigeo_choropleth": {
        "uniqueID": "uniqueId0x5754462388070566"
    }
},
"pieProperties": {
    "holeSize": "65%"
}

*END
ENDSTYLE
END

SET COMPONENT=TableChart_4
SET ARVERSION=2
-DEFAULTH &WF_SUMMARY='Summary';
-DEFAULTH &WF_TITLE='WebFOCUS Report';
TABLE FILE wfretail82/wf_retail_lite
SUM wf_retail_lite.WF_RETAIL_SALES.QUANTITY_SOLD
wf_retail_lite.WF_RETAIL_SALES.REVENUE_US
wf_retail_lite.WF_RETAIL_SALES.GROSS_PROFIT_US
BY wf_retail_lite.WF_RETAIL_TIME_SALES.TIME_YEAR
ACROSS wf_retail_lite.WF_RETAIL_TIME_SALES.TIME_QTR
ON TABLE PCHOLD FORMAT PDF
ON TABLE NOTOTAL
ON TABLE SET VZERO OFF
ON TABLE SET STYLE *
INCLUDE=IBFS:/WFC/Global/Themes/Standard/Default/theme.sty,$
TYPE=REPORT, TITLETEXT='Report3', SUMMARY=&WF_SUMMARY.QUOTEDSTRING,
ARREPORTSIZE=DIMENSION, ARFILTER_TARGET='*', CHART-COLOR-MEASURES=ON,
ARGRAPHENGINE=JSCHART, $
ENDSTYLE
END

SET COMPONENT=TableChart_5
SET ARVERSION=2
-DEFAULTH &WF_SUMMARY='Summary';
-DEFAULTH &WF_TITLE='WebFOCUS Report';
TABLE FILE wfretail82/wf_retail_lite
SUM wf_retail_lite.WF_RETAIL_SALES.REVENUE_US
BY wf_retail_lite.WF_RETAIL_PRODUCT.BRAND
ACROSS wf_retail_lite.WF_RETAIL_PRODUCT.PRODUCT_CATEGORY
ON TABLE PCHOLD FORMAT PDF
```

```
ON TABLE NOTOTAL
ON TABLE SET VZERO OFF
ON TABLE SET STYLE *
INCLUDE=IBFS:/WFC/Global/Themes/Standard/Default/theme.sty,$
TYPE=REPORT, TITLETEXT='Report4', SUMMARY=&WF_SUMMARY.QUOTEDSTRING,
ARREPORTSIZE=DIMENSION, ARFILTER_TARGET='*', CHART-COLOR-MEASURES=ON,
ARGRAPHENGINE=JSCHART, $
ENDSTYLE
END

SET COMPONENT=TableChart_6
SET ARVERSION=2
-DEFAULTH &WF_TITLE='WebFOCUS Report';
GRAPH FILE wfretail82/wf_retail_lite
-* Created by Designer for Graph
SUM wf_retail_lite.WF_RETAIL_SALES.REVENUE_US
BY wf_retail_lite.WF_RETAIL_PRODUCT.PRODUCT_CATEGORY
BY wf_retail_lite.WF_RETAIL_TIME_SALES.TIME_DATE_QTR_COMPONENT
ON GRAPH PCHOLD FORMAT JSCHART
ON GRAPH SET VZERO OFF
ON GRAPH SET HAXIS 5.0
ON GRAPH SET VAXIS 3.5
ON GRAPH SET GRAPHCVTUNITS ON
ON GRAPH SET UNITS INCHES
ON GRAPH SET LOOKGRAPH LINE
ON GRAPH SET AUTOFIT ON
ON GRAPH SET STYLE *
INCLUDE=IBFS:/WFC/Global/Themes/Standard/Default/theme.sty,$
TYPE=REPORT, TITLETEXT='Chart2', ARREPORTSIZE=DIMENSION, ARFILTER_
TARGET='*', ARGRAPHENGINE=JSCHART, $
TYPE=DATA, COLUMN=N1, BUCKET=color, $
TYPE=DATA, COLUMN=N2, BUCKET=x-axis, AXIS-TYPE=time_auto, $
TYPE=DATA, COLUMN=N3, BUCKET=y-axis(1), $
*GRAPH_SCRIPT

*GRAPH_JS_FINAL
"extensions": {
    "com.ibi.galigeo_point": {
        "uniqueID": "uniqueId0x11339770590690268"
    },
    "com.ibi.galigeo_choropleth": {
        "uniqueID": "uniqueId0x7404939218587612"
    }
},
"blaProperties": {
    "seriesLayout": "absolute"
}
```

```
*END
ENDSTYLE
END

COMPOUND END
```

# Compound Excel Report including Table of Contents (BYTOC)

```
SET PAGE-NUM=OFF
COMPOUND LAYOUT PCHOLD FORMAT XLSX
SECTION=Example, LAYOUT=ON, MERGE=OFF,$
PAGELAYOUT=1,$
COMPONENT=R1, TYPE=REPORT,TEXT='report1', POSITION=(0.833 0.729),
DIMENSION=(6.250 1.771),$
COMPONENT=R2, TYPE=REPORT,TEXT='report2', POSITION=(0.833 2.917),
DIMENSION=(6.250 1.875),$
COMPONENT=R3, TYPE=REPORT,TEXT='report3', POSITION=(0.938 5.313),
DIMENSION=(6.250 1.354),$
COMPONENT=R4, TYPE=REPORT,TEXT='report4', POSITION=(0.938 7.083),
DIMENSION=(6.042 1.146),$
END
SET COMPONENT=R1
TABLE FILE GGSALES
HEADING CENTER
"Gotham Grinds Sales to Information Builders"
" "
"Report 1"
"Sales Summary by Region"
" "
SUM UNITS/D12C BUDUNITS/D12C DOLLARS/D12CM BUDDOLLARS/D12CM
BY REGION
ON TABLE HOLD FORMAT XLSX
ON TABLE SET STYLE *
TYPE=REPORT, TITLETEXT=Region Summary,$
TYPE=REPORT, TOPMARGIN=1.5, BOTTOMMARGIN=1, PAGESIZE=LETTER,$
TYPE=TITLE, COLOR=WHITE, BACKCOLOR=GREY,$
TYPE=HEADING, LINE=1, OBJECT=TEXT, COLOR=PURPLE, JUSTIFY=CENTER,
STYLE=BOLD,$
TYPE=HEADING, LINE=3, OBJECT=TEXT, COLOR=BLUE, JUSTIFY=CENTER,
STYLE=BOLD,$
```

```
TYPE=HEADING, LINE=4, OBJECT=TEXT, COLOR=PURPLE, JUSTIFY=CENTER,
STYLE=BOLD,$
ENDSTYLE
END
```

```
SET COMPONENT=R2
TABLE FILE GGSALES
SUM UNITS/D12C DOLLARS/D12CM
BY REGION BY CATEGORY BY PRODUCT
HEADING CENTER
"Gotham Grinds Sales to Information Builders"
" "
"Report 2"
"Sales Detail By Region"
ON REGION SUBHEAD
"<REGION Region Sales"
ON TABLE PCHOLD FORMAT XLSX
ON TABLE SET BYDISPLAY ON
ON TABLE SET COMPOUND BYTOC
ON TABLE SET STYLE *
TYPE=REPORT, TOPMARGIN=1.5, BOTTOMMARGIN=1, PAGESIZE=LETTER,$
TYPE=REPORT, TITLETEXT='Region-',$
TYPE=TITLE, COLOR=WHITE, BACKCOLOR=GREY,$
TYPE=HEADING, LINE=1, COLOR=PURPLE, JUSTIFY=CENTER,STYLE=BOLD,$
TYPE=HEADING, LINE=3, COLOR=BLUE, JUSTIFY=CENTER, STYLE=BOLD,$
TYPE=HEADING, LINE=4, COLOR=PURPLE, JUSTIFY=CENTER, STYLE=BOLD,$
ENDSTYLE
END
```

```
SET COMPONENT=R3
TABLE FILE GGSALES
HEADING CENTER
"Gotham Grinds Sales to Information Builders"
" "
"Report 3"
"Sales Summary by Category"
" "
SUM UNITS/D12C BUDUNITS/D12C DOLLARS/D12CM BUDDOLLARS/D12CM
BY CATEGORY
ON TABLE HOLD FORMAT XLSX
ON TABLE SET STYLE *
TYPE=REPORT, TITLETEXT=Sales Summary,$
TYPE=REPORT, TOPMARGIN=1.5, BOTTOMMARGIN=1, PAGESIZE=LETTER,$
```

```
TYPE=TITLE, COLOR=WHITE, BACKCOLOR=GREY,$
TYPE=HEADING,LINE=1,COLOR=PURPLE, JUSTIFY=CENTER, STYLE=BOLD,$
TYPE=HEADING,LINE=3,OBJECT=TEXT,COLOR=BLUE, JUSTIFY=CENTER, STYLE=BOLD,$
TYPE=HEADING,LINE=4,OBJECT=TEXT,COLOR=PURPLE, JUSTIFY=CENTER,
STYLE=BOLD,$
ENDSTYLE
END
```

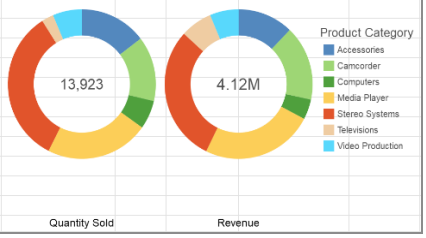
```
SET COMPONENT=R4
TABLE FILE GGSALES
HEADING CENTER
"Gotham Grinds Sales to Information Builders"
" "
"Report 4"
"Sales Detail Report By Category"
" "
SUM UNITS/D12C BUDUNITS/D12C DOLLARS/D12CM BUDDOLLARS/D12CM
BY CATEGORY BY PRODUCT BY REGION
ON TABLE SET BYDISPLAY ON
ON TABLE HOLD FORMAT XLSX
ON TABLE SET STYLE *
TYPE=REPORT, TITLETEXT=Sales Detail,$
TYPE=REPORT, TOPMARGIN=1.5, BOTTOMMARGIN=1, PAGESIZE=LETTER,$
TYPE=TITLE, COLOR=WHITE, BACKCOLOR=GREY,$
TYPE=HEADING,LINE=1,OBJECT=TEXT,COLOR=PURPLE, JUSTIFY=CENTER,
STYLE=BOLD,$
TYPE=HEADING,LINE=3,OBJECT=TEXT,COLOR=BLUE, JUSTIFY=CENTER, STYLE=BOLD,$
TYPE=HEADING,LINE=4,OBJECT=TEXT,COLOR=PURPLE, JUSTIFY=CENTER,
STYLE=BOLD,$
ENDSTYLE
END
COMPOUND END
```

The output is:

**Report 1: Compound Excel Report with Components**

| Product Category | Sale Year | Quantity Sold | Revenue |
|---|---|---|---|
| Accessories | 2020 | 2,034 | $499,551.40 |
| Camcorder | 2020 | 1,956 | $667,254.48 |
| Computers | 2020 | 865 | $179,761.46 |
| Media Player | 2020 | 3,140 | $1,009,790.56 |
| Stereo Systems | 2020 | 4,679 | $1,216,393.89 |
| Televisions | 2020 | 362 | $286,160.68 |
| Video Production | 2020 | 887 | $259,179.84 |

| Customer Business Region | Sale Year | Quantity Sold | Revenue |
|---|---|---|---|
| EMEA | 2020 | 5,947 | $1,745,614.57 |
| North America | 2020 | 6,848 | $2,032,343.92 |
| Oceania | 2020 | 52 | $13,657.33 |
| South America | 2020 | 1,076 | $326,476.49 |




## Report 2: Summary Report by Region

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Gotham Grinds Sales to TIBCO | | | | |
| 2 | | | | | |
| 3 | Report 1 | | | | |
| 4 | Sales Summary by Region | | | | |
| 5 | | | | | |
| 6 | Region | Unit Sales | Budget Units | Dollar Sales | Budget Dollars |
| 7 | Midwest | 905,045 | 907,107 | $11,400,665 | $11,194,373 |
| 8 | Northeast | 916,675 | 914,359 | $11,392,300 | $11,576,921 |
| 9 | Southeast | 935,232 | 942,247 | $11,710,379 | $11,807,971 |
| 10 | West | 932,039 | 930,781 | $11,652,946 | $11,641,513 |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 32 | | | | | |
| 33 | | | | | |
| 34 | | | | | |

Region Summary | Region-Midwest | Region-Northeast | Re

## Report 3: BYTOC Reports by Region

The following image shows the worksheet fot the first region.

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Gotham Grinds Sales to TIBCO | | | | |
| 2 | | | | | |
| 3 | Report 2 | | | | |
| 4 | Sales Detail By Region | | | | |
| 5 | Region | Category | Product | Unit Sales | Dollar Sales |
| 6 | Midwest Region Sales | | | | |
| 7 | Midwest | Coffee | Espresso | 101,154 | $1,294,947 |
| 8 | Midwest | Coffee | Latte | 231,623 | $2,883,566 |
| 9 | Midwest | Food | Biscotti | 86,105 | $1,091,727 |
| 10 | Midwest | Food | Croissant | 139,182 | $1,751,124 |
| 11 | Midwest | Food | Scone | 116,127 | $1,495,420 |
| 12 | Midwest | Gifts | Coffee Grinder | 50,393 | $619,154 |
| 13 | Midwest | Gifts | Coffee Pot | 47,156 | $599,878 |
| 14 | Midwest | Gifts | Mug | 86,718 | $1,086,943 |
| 15 | Midwest | Gifts | Thermos | 46,587 | $577,906 |
| 16 | | | | | |
| 17 | | | | | |
| 33 | | | | | |
| 34 | | | | | |

Region Summary | Region-Midwest | Region-Northeast

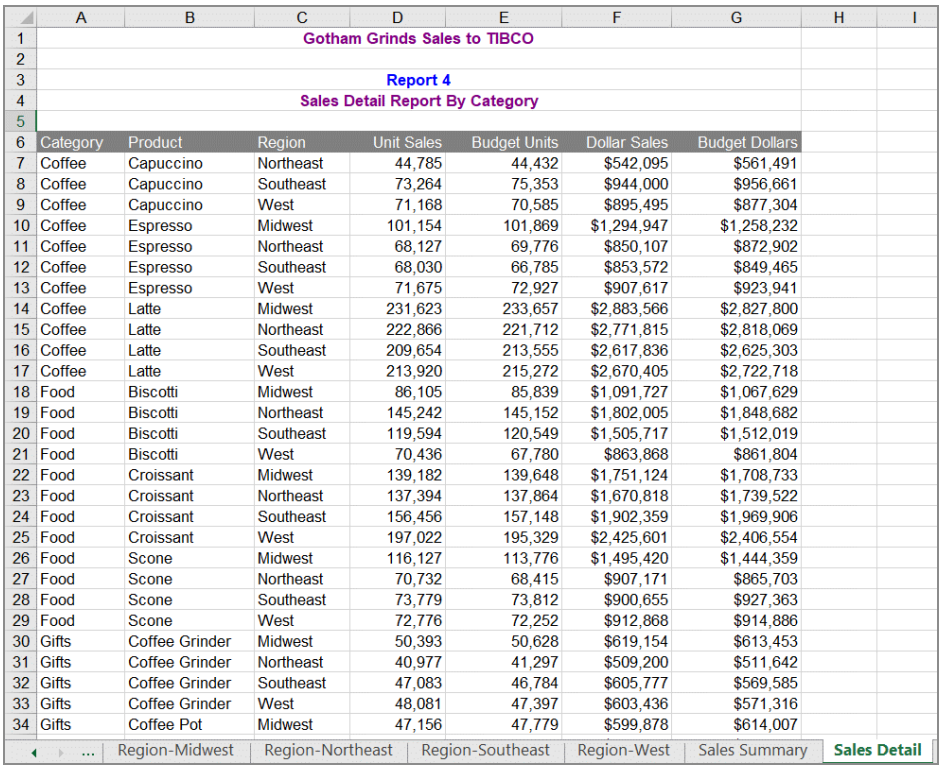
### Report 4 Sales Summary Report by Category

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Gotham Grinds Sales to TIBCO | | | | |
| 2 | | | | | |
| 3 | Report 3 | | | | |
| 4 | Sales Summary by Category | | | | |
| 5 | | | | | |
| 6 | Category | Unit Sales | Budget Units | Dollar Sales | Budget Dollars |
| 7 | Coffee | 1,376,266 | 1,385,923 | $17,231,455 | $17,293,886 |
| 8 | Food | 1,384,845 | 1,377,564 | $17,229,333 | $17,267,160 |
| 9 | Gifts | 927,880 | 931,007 | $11,695,502 | $11,659,732 |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |
| 34 | | | | | |

... | Region-Midwest | Region-Northeast | Region-Southeast

Ready

### Report 5: Sales Detail Report by Category



Gotham Grinds Sales to TIBCO

Report 4

Sales Detail Report By Category

| Category | Product | Region | Unit Sales | Budget Units | Dollar Sales | Budget Dollars |
|---|---|---|---|---|---|---|
| Coffee | Capuccino | Northeast | 44,785 | 44,432 | $542,095 | $561,491 |
| Coffee | Capuccino | Southeast | 73,264 | 75,353 | $944,000 | $956,661 |
| Coffee | Capuccino | West | 71,168 | 70,585 | $895,495 | $877,304 |
| Coffee | Espresso | Midwest | 101,154 | 101,869 | $1,294,947 | $1,258,232 |
| Coffee | Espresso | Northeast | 68,127 | 69,776 | $850,107 | $872,902 |
| Coffee | Espresso | Southeast | 68,030 | 66,785 | $853,572 | $849,465 |
| Coffee | Espresso | West | 71,675 | 72,927 | $907,617 | $923,941 |
| Coffee | Latte | Midwest | 231,623 | 233,657 | $2,883,566 | $2,827,800 |
| Coffee | Latte | Northeast | 222,866 | 221,712 | $2,771,815 | $2,818,069 |
| Coffee | Latte | Southeast | 209,654 | 213,555 | $2,617,836 | $2,625,303 |
| Coffee | Latte | West | 213,920 | 215,272 | $2,670,405 | $2,722,718 |
| Food | Biscotti | Midwest | 86,105 | 85,839 | $1,091,727 | $1,067,629 |
| Food | Biscotti | Northeast | 145,242 | 145,152 | $1,802,005 | $1,848,682 |
| Food | Biscotti | Southeast | 119,594 | 120,549 | $1,505,717 | $1,512,019 |
| Food | Biscotti | West | 70,436 | 67,780 | $863,868 | $861,804 |
| Food | Croissant | Midwest | 139,182 | 139,648 | $1,751,124 | $1,708,733 |
| Food | Croissant | Northeast | 137,394 | 137,864 | $1,670,818 | $1,739,522 |
| Food | Croissant | Southeast | 156,456 | 157,148 | $1,902,359 | $1,969,906 |
| Food | Croissant | West | 197,022 | 195,329 | $2,425,601 | $2,406,554 |
| Food | Scone | Midwest | 116,127 | 113,776 | $1,495,420 | $1,444,359 |
| Food | Scone | Northeast | 70,732 | 68,415 | $907,171 | $865,703 |
| Food | Scone | Southeast | 73,779 | 73,812 | $900,655 | $927,363 |
| Food | Scone | West | 72,776 | 72,252 | $912,868 | $914,886 |
| Gifts | Coffee Grinder | Midwest | 50,393 | 50,628 | $619,154 | $613,453 |
| Gifts | Coffee Grinder | Northeast | 40,977 | 41,297 | $509,200 | $511,642 |
| Gifts | Coffee Grinder | Southeast | 47,083 | 46,784 | $605,777 | $569,585 |
| Gifts | Coffee Grinder | West | 48,081 | 47,397 | $603,436 | $571,316 |
| Gifts | Coffee Pot | Midwest | 47,156 | 47,779 | $599,878 | $614,007 |

Region-Midwest | Region-Northeast | Region-Southeast | Region-West | Sales Summary | Sales Detail

# Positioning Components in an Excel Compound Document

Starting with Release 9.3.0, similar compound document syntax as used for PDF, AHTML, DHTML, and other formats can be used for XLSX. You can use PAGELAYOUTs and they are handled as separate worksheets. You can use cell-specific positioning options to apply dynamic output formats and position XLSX documents based on cells while still using units (like inches or centimeters) for non-XLSX output.

The following features are supported:

- Coordinated documents
- Page masters
- Excel tables
- ReportCaster bursting

## Example: Compound Layout with Multiple Page Layouts

```
  SECTION=Section_1, LAYOUT=ON, PAGESIZE=LETTER, ORIENTATION=PORTRAIT,
SHOW_GLOBALFILTER=OFF, $
  PAGELAYOUT=1, NAME='Page 1', TEXT='Page 1', LEFTMARGIN=0.25,
RIGHTMARGIN=0.25,
    TOPMARGIN=0.25, BOTTOMMARGIN=0.25, $
  COMPONENT='report1', COMPONENT-TYPE=REPORT,
    CELL-POSITION=(3 5), $
  COMPONENT='Chart',   COMPONENT-TYPE=GRAPH,
    CELL-RELATIVE-TO=report1, CELL-RELATIVE-POINT=BOTTOM-LEFT, CELL-
POSITION=(+3 +1),
    CELL-DIMENSION=(6 15), $
  COMPONENT='report2', COMPONENT-TYPE=REPORT,
    CELL-RELATIVE-TO=Chart,   CELL-RELATIVE-POINT=BOTTOM-LEFT, CELL-
POSITION=(-1 +1), $
  COMPONENT='report3', COMPONENT-TYPE=REPORT,
    CELL-RELATIVE-TO=report1, CELL-RELATIVE-POINT=TOP-RIGHT,   CELL-
POSITION=(+1 -2),$
```

where:

**PAGELAYOUT**

Specifies the page on which components within the pagelayout are placed.

**TEXT**

Specifies the worksheet name for each PAGELAYOUT.

**COMPONENT-TYPE**

Can be Report or Graph depending on the type of component. OBJECT=IMAGE can be used for images.

**CELL-POSITION**

Sets the cell in which the top-left corner of each item is placed by using the x and y coordinates. For example, (1 1) is cell A1. If the coordinates have plus (+) or minus (-) signs, they are assumed to use relative positioning.

**CELL-RELATIVE-TO**

Specifies the items relative to which the component must be positioned. The cell-specific property allows different layouts for Excel; properties pprefixed by CELL- are ignored for output for formats such as PDF, DHTML, AHTML, or other compound document output formats.

**CELL-RELATIVE-POINT**

Specifies the corner of the CELL-RELATIVE-TO item against which the top-left corner of the component must be positioned.

# Guidelines for Using the Legacy OPEN, CLOSE, and NOBREAK Keywords and SET COMPOUND

The keywords OPEN, CLOSE, and NOBREAK are used to control Excel compound reports. They can be specified with the HOLD or PCHOLD command or with a separate SET COMPOUND command.

- OPEN is used on the first report of a sequence of component reports to specify that a compound report should be started.
- CLOSE is used to designate the last report in a compound report.
- NOBREAK specifies that the next report be placed on the same worksheet as the current report. If it is not present, the default behavior is to place the next report on a separate worksheet.
- When used with the HOLD or PCHOLD syntax, the compound report keywords OPEN, CLOSE, and NOBREAK must appear immediately after FORMAT XLSX. For example, you can specify:
  - `ON TABLE PCHOLD FORMAT XLSX OPEN`
  - `ON TABLE HOLD AS MYHOLD FORMAT XLSX OPEN NOBREAK`
- As with PDF compound reports, compound report keywords can be alternatively specified using SET COMPOUND:
  - `SET COMPOUND = OPEN`
  - `SET COMPOUND = 'OPEN NOBREAK'`
  - `SET COMPOUND = NOBREAK`
  - `SET COMPOUND = CLOSE`

# Guidelines for Producing Excel Compound Reports Using XLSX

- **Naming of Worksheets.** The default worksheet tab names will be Sheet1, Sheet2, and so on. You have the option to specify a different worksheet tab name by using the TITLETEXT keyword in the StyleSheet. For example:

  ```
  TYPE=REPORT, TITLETEXT='Summary Report',$
  ```

  Excel limits the length of worksheet titles to 31 characters. The following special characters cannot be used: ':', '?', '*', and '/'.

- **File Names and Formats.** The output file name (AS name, or HOLD by default) is obtained from the first report of the compound report (the report with the OPEN keyword). Output file names on subsequent reports are ignored.

  The HOLD FORMAT syntax used in the first component report in a compound report applies to all subsequent reports in the compound report, regardless of their format.

- **NOBREAK Behavior.** When NOBREAK is specified, the following report appears on the row immediately after the last row of the report with the NOBREAK. If additional spacing is required between the reports, a FOOTING or an ON TABLE SUBFOOT can be placed on the report with the NOBREAK, or a HEADING or an ON TABLE SUBHEAD can be placed on the following report. This allows the most flexibility, since if blank rows were added by default, there would be no way to remove them.

# Creating a Simple Compound Report Using XLSX

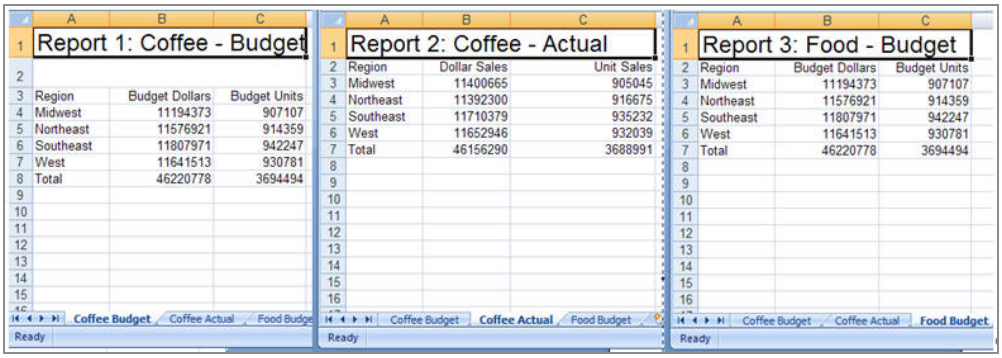
```
SET PAGE-NUM=OFF
TABLE FILE GGSALES
HEADING
"Report 1: Coffee - Budget"
" "
SUM BUDDOLLARS BUDUNITS COLUMN-TOTAL AS 'Total'
BY REGION
ON TABLE SET STYLE *
TYPE=REPORT, TITLETEXT=Coffee Budget,$
TYPE=HEADING, SIZE=14,$
ENDSTYLE
```

```
ON TABLE PCHOLD AS EX1 FORMAT XLSX OPEN
END
```

```
TABLE FILE GGSALES
HEADING
"Report 2: Coffee - Actual "
SUM DOLLARS UNITS COLUMN-TOTAL AS 'Total'
BY REGION
ON TABLE PCHOLD FORMAT XLSX
ON TABLE SET STYLE *
TYPE=REPORT, TITLETEXT=Coffee Actual,$
TYPE=HEADING, SIZE=14,$
ENDSTYLE
END
```

```
TABLE FILE GGSALES
HEADING
"Report 3: Food - Budget"
SUM BUDDOLLARS BUDUNITS COLUMN-TOTAL AS 'Total'
BY REGION
ON TABLE SET STYLE *
TYPE=REPORT, TITLETEXT=Food Budget,$
TYPE=HEADING, SIZE=14,$
ENDSTYLE
ON TABLE PCHOLD FORMAT XLSX CLOSE
END
```

The output is:



Report 1: Coffee - Budget

| Region | Budget Dollars | Budget Units |
|---|---|---|
| Midwest | 11194373 | 907107 |
| Northeast | 11576921 | 914359 |
| Southeast | 11807971 | 942247 |
| West | 11641513 | 930781 |
| Total | 46220778 | 3694494 |

Report 2: Coffee - Actual

| Region | Dollar Sales | Unit Sales |
|---|---|---|
| Midwest | 11400665 | 905045 |
| Northeast | 11392300 | 916675 |
| Southeast | 11710379 | 935232 |
| West | 11652946 | 932039 |
| Total | 46156290 | 3688991 |

Report 3: Food - Budget

| Region | Budget Dollars | Budget Units |
|---|---|---|
| Midwest | 11194373 | 907107 |
| Northeast | 11576921 | 914359 |
| Southeast | 11807971 | 942247 |
| West | 11641513 | 930781 |
| Total | 46220778 | 3694494 |

# Creating a Compound Report Using NOBREAK

In this example, the first two reports are on the first worksheet, and the last two reports are on the second worksheet, since NOBREAK appears on both the first and third reports.

```
TABLE FILE GGSALES
HEADING
"Report 1: Coffee - Budget"
SUM BUDDOLLARS BUDUNITS COLUMN-TOTAL AS 'Total'
BY REGION
IF CATEGORY EQ Coffee
ON TABLE PCHOLD FORMAT XLSX OPEN NOBREAK
ON TABLE SET STYLE *
TYPE=REPORT, TITLETEXT=Coffee, FONT=ARIAL, SIZE=10, STYLE=NORMAL,$
TYPE=TITLE, STYLE=BOLD,$
TYPE=HEADING, SIZE=12, STYLE=BOLD, COLOR=BLUE,$
TYPE=GRANDTOTAL, STYLE=BOLD,$
END
```

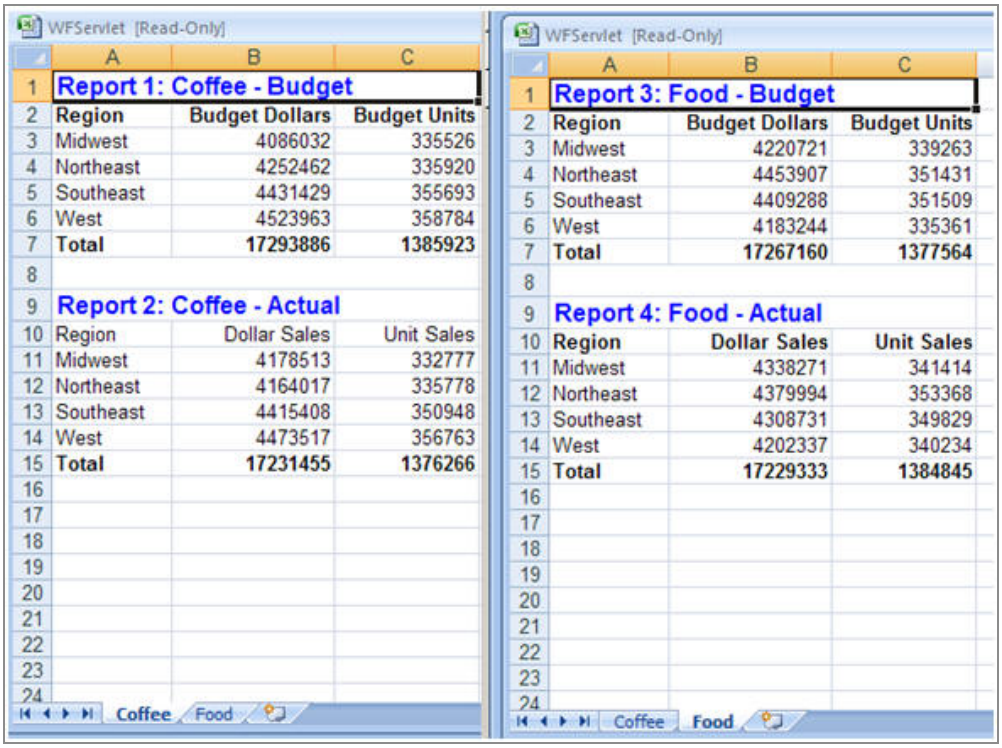
```
TABLE FILE GGSALES
HEADING
" "
"Report 2: Coffee - Actual "
SUM DOLLARS UNITS COLUMN-TOTAL AS 'Total'
BY REGION
IF CATEGORY EQ Coffee
ON TABLE PCHOLD FORMAT XLSX
ON TABLE SET STYLE *
TYPE=REPORT, FONT=ARIAL, SIZE=10, STYLE=NORMAL,$
TYPE=GRANDTOTAL, STYLE=BOLD,$
TYPE=HEADING, SIZE=12, STYLE=BOLD, COLOR=BLUE,$
END
```

```
TABLE FILE GGSALES
HEADING
"Report 3: Food - Budget"
SUM BUDDOLLARS BUDUNITS COLUMN-TOTAL AS 'Total'
BY REGION
IF CATEGORY EQ Food
ON TABLE PCHOLD FORMAT XLSX NOBREAK
ON TABLE SET STYLE *
TYPE=REPORT, TITLETEXT=Food, FONT=ARIAL, SIZE=10, STYLE=NORMAL,$
```

```
TYPE=HEADING, STYLE=BOLD, SIZE=12, COLOR=BLUE,$
TYPE=TITLE, STYLE=BOLD,$
TYPE=GRANDTOTAL, STYLE=BOLD,$
END
```

```
TABLE FILE GGSALES
HEADING
" "
"Report 4: Food - Actual"
SUM DOLLARS UNITS COLUMN-TOTAL AS 'Total'
BY REGION
IF CATEGORY EQ Food
ON TABLE PCHOLD FORMAT XLSX CLOSE
ON TABLE SET STYLE *
TYPE=REPORT, FONT=ARIAL, SIZE=10,  $
TYPE=TITLE, STYLE=BOLD,$
TYPE=HEADING, SIZE=12, STYLE=BOLD, COLOR=BLUE,$
TYPE=GRANDTOTAL, STYLE=BOLD,$
END
```

Report output is displayed in two separate tabs.



WFServlet [Read-Only]

| | A | B | C |
|---|---|---|---|
| 1 | **Report 1: Coffee - Budget** | | |
| 2 | **Region** | **Budget Dollars** | **Budget Units** |
| 3 | Midwest | 4086032 | 335526 |
| 4 | Northeast | 4252462 | 335920 |
| 5 | Southeast | 4431429 | 355693 |
| 6 | West | 4523963 | 358784 |
| 7 | **Total** | **17293886** | **1385923** |
| 8 | | | |
| 9 | **Report 2: Coffee - Actual** | | |
| 10 | Region | Dollar Sales | Unit Sales |
| 11 | Midwest | 4178513 | 332777 |
| 12 | Northeast | 4164017 | 335778 |
| 13 | Southeast | 4415408 | 350948 |
| 14 | West | 4473517 | 356763 |
| 15 | **Total** | **17231455** | **1376266** |
| 16 | | | |
| 17 | | | |
| 18 | | | |
| 19 | | | |
| 20 | | | |
| 21 | | | |
| 22 | | | |
| 23 | | | |
| 24 | | | |

Coffee | Food

WFServlet [Read-Only]

| | A | B | C |
|---|---|---|---|
| 1 | **Report 3: Food - Budget** | | |
| 2 | **Region** | **Budget Dollars** | **Budget Units** |
| 3 | Midwest | 4220721 | 339263 |
| 4 | Northeast | 4453907 | 351431 |
| 5 | Southeast | 4409288 | 351509 |
| 6 | West | 4183244 | 335361 |
| 7 | **Total** | **17267160** | **1377564** |
| 8 | | | |
| 9 | **Report 4: Food - Actual** | | |
| 10 | **Region** | **Dollar Sales** | **Unit Sales** |
| 11 | Midwest | 4338271 | 341414 |
| 12 | Northeast | 4379994 | 353368 |
| 13 | Southeast | 4308731 | 349829 |
| 14 | West | 4202337 | 340234 |
| 15 | **Total** | **17229333** | **1384845** |
| 16 | | | |
| 17 | | | |
| 18 | | | |
| 19 | | | |
| 20 | | | |
| 21 | | | |
| 22 | | | |
| 23 | | | |
| 24 | | | |

Coffee | Food

# Using XLSX FORMULA With Compound Reports

In new compound syntax, the implementation of compound workbooks with XLSX FORMULA can be activated in either of the following ways. Each of these approaches will generate a workbook with all of the component reports in FORMULA mode.

1. Add FORMAT XLSX FORMULA to the compound syntax header, as shown in the following syntax:

```
COMPOUND LAYOUT PCHOLD FORMAT XLSX FORMULA
UNITS=IN, $
SECTION=section1, LAYOUT=ON, METADATA='prop_with_names, Margins_
Left=0.5,
Margins_Top=0.5, Margins_Right=0.5, Margins_Bottom=0.5,
thumbnailscale=4,
MERGE=OFF, ORIENTATION=PORTRAIT, PAGESIZE=Letter, SHOW_
GLOBALFILTER=OFF, $
PAGELAYOUT=1, NAME='Page layout 1', text='Page layout 1', TOC-
LEVEL=1,
BOTTOMMARGIN=0.5, TOPMARGIN=0.5, METADATA='BOTTOMMARGIN=0.5,
TOPMARGIN=0.5,LEFTMARGIN=0,RIGHTMARGIN=0,', $
COMPONENT='report1', TEXT='report1', TOC-LEVEL=2, POSITION=(0.567
0.667),
DIMENSION=(6.883 2.314), BYTOC=0, ARREPORTSIZE=DIMENSION,
METADATA='left: 0.567in; top: 0.667in; width: 6.883in; height:
2.314in;
position: absolute; z-index: 1;', $
COMPONENT='report2', TEXT='report2', TOC-LEVEL=2, POSITION=(0.567
3.250),
DIMENSION=(7.000 2.833), BYTOC=0, ARREPORTSIZE=DIMENSION,
METADATA='left: 0.567in; top: 3.25in; width: 7in; height: 2.833in;
position: absolute; z-index: 2;', $
END
```

2. Define XLSX FORMULA as the output setting for the first component, as shown in the following syntax:

```
SET COMPONENT='report1'
-*component_type report
-*File: IBFS:/localhost/EDA/9999/APPPATH/xlsx2015/Report1.fex
-*Created by WebFOCUS AppStudio
DEFINE FILE GGSALES
D_UOVERBUD/D12C=GGSALES.SALES01.UNITS - GGSALES.SALES01.BUDUNITS;
END
```

```
TABLE FILE GGSALES
SUM
     GGSALES.SALES01.UNITS
     GGSALES.SALES01.BUDUNITS
     GGSALES.SALES01.DOLLARS
     GGSALES.SALES01.BUDDOLLARS
     GGSALES.SALES01.D_UOVERBUD
     COMPUTE C_DOVERBUD/D12.2CM = GGSALES.SALES01.DOLLARS -
       GGSALES.SALES01.BUDDOLLARS;
BY GGSALES.SALES01.REGION
BY GGSALES.SALES01.CATEGORY
HEADING
"XLSX FORMULA - the difference betweem DEFINE & COMPUTES"
ON TABLE SET PAGE-NUM NOLEAD
ON TABLE SET ASNAMES ON
ON TABLE COLUMN-TOTAL AS 'TOTAL'
ON TABLE PCHOLD FORMAT XLSX FORMULA
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
     INCLUDE = endeflt,
$
ENDSTYLE
```

**Note:**

- Although both of these approaches will work, from a tool perspective, it is advantageous to use the first approach (add FORMAT XLSX FORMULA to the compound syntax header) since the user may not have control of the first table when system tables are generated with page masters and in other page layout scenarios. This approach ensures that the XLSX FORMULA designation is always moved to the first table.
- If you change the format for the compound workbook so that the compound header requests XLSX, not XLSX FORMULA, this will *not* automatically turn off FORMULA. When FORMULA is set in the first component, this will always override the compound heading setting. This may cause confusion when you think you have turned FORMULA off at the document level, but it is actually retained at the first component level.

# WebFOCUS Pivot Support for XLSX

The WebFOCUS XLSX format can generate a workbook based on a template that contains predefined pivot tables. These pivot tables can be built based on data fed from a report and/or exist independently of the WebFOCUS data on other worksheets.

# Feeding Data From a WebFOCUS Report Into a Pivot Table and Pivot Chart

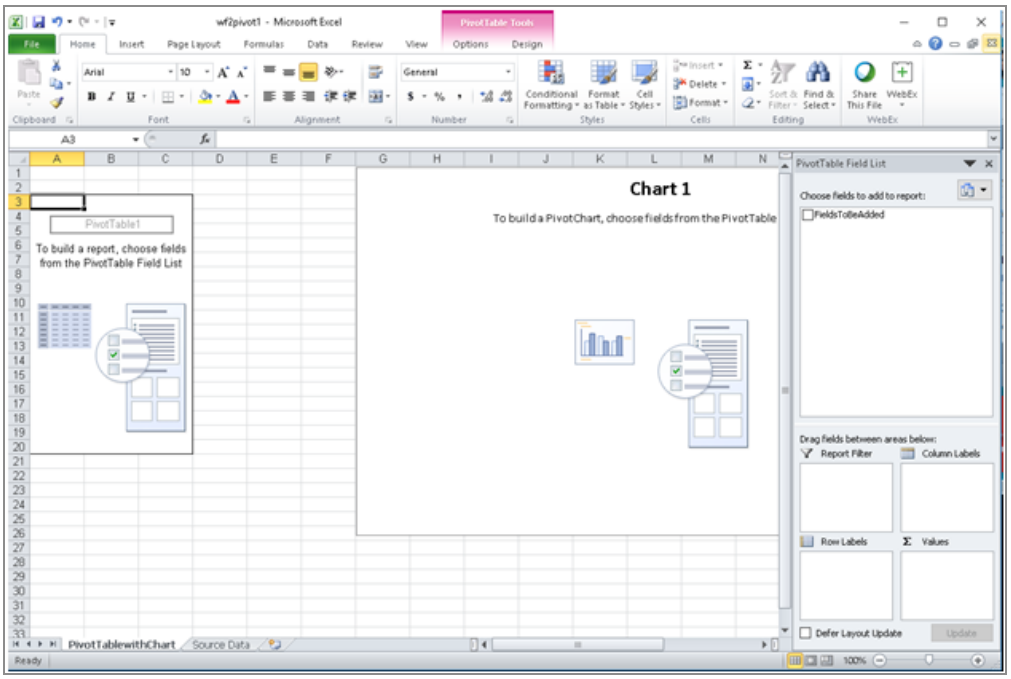
The following sample procedure shows how to feed data from a WebFOCUS report into a pivot table and pivot chart within an existing Excel template called *wf2pivot.xltx*.

**Note:** Template names containing embedded blanks must be enclosed in single quotation marks.

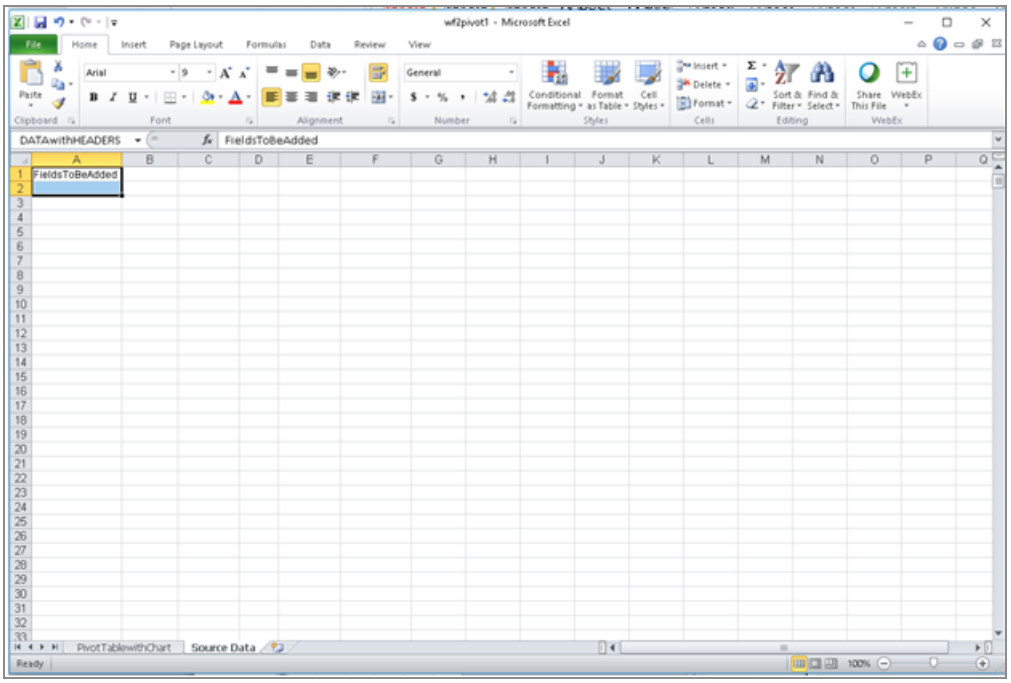
```
TABLE FILE GGSALES
PRINT
UNITS/D12C DOLLARS/D12CM
BUDUNITS/D12C BUDDOLLARS/D12CM
BY LOWEST REGION
BY LOWEST ST
BY HIGHEST CATEGORY
BY LOWEST PRODUCT
ON TABLE SET BYDISPLAY ON
ON TABLE PCHOLD AS PIVOTWITHCHART FORMAT XLSX TEMPLATE wf2pivot.xltx
SHEETNUMBER 2
ON TABLE SET STYLE *
TYPE=DATA,IN-RANGES='DATAwithHEADERS',$
TYPE=TITLE,IN-RANGES='DATAwithHEADERS',$
ENDSTYLE
END
```

The wf2pivot.xltx template file must be in the WebFOCUS Reporting Server path. The following images show the default of the first and second worksheets in the wf2pivot.xltx template, before executing the sample procedure.

The first worksheet, PivotTablewithChart, contains an empty pivot table and pivot chart. It also contains an empty PivotTableFieldList. The first worksheet is shown in the following image.



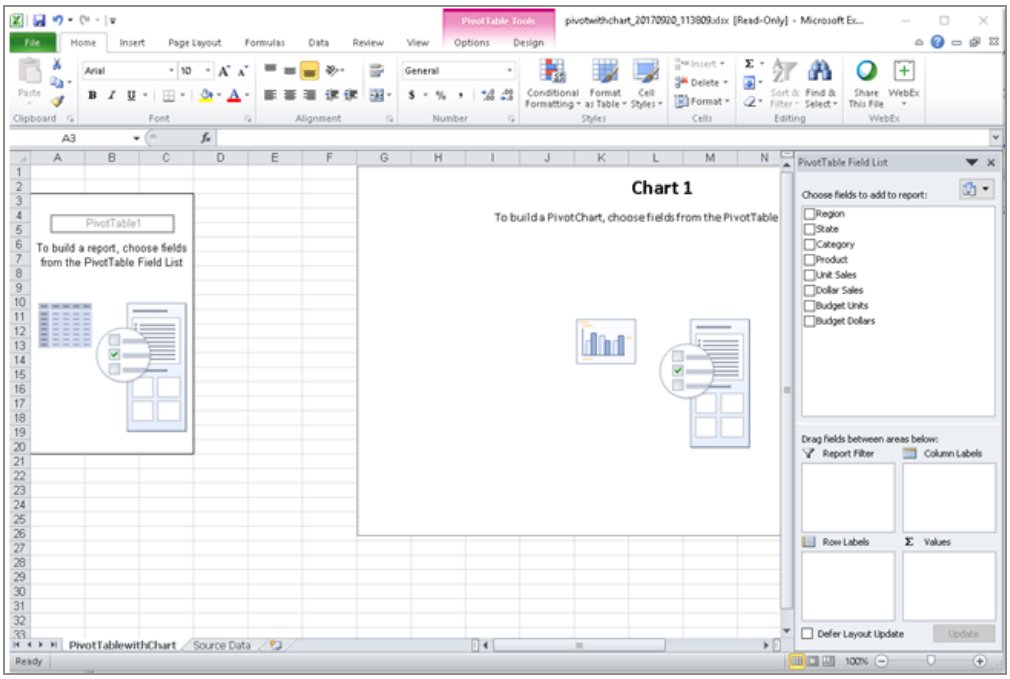

The second worksheet, Source Data, contains one column called FieldsToBeAdded, for which there is initially no data. The second worksheet is shown in the following image.



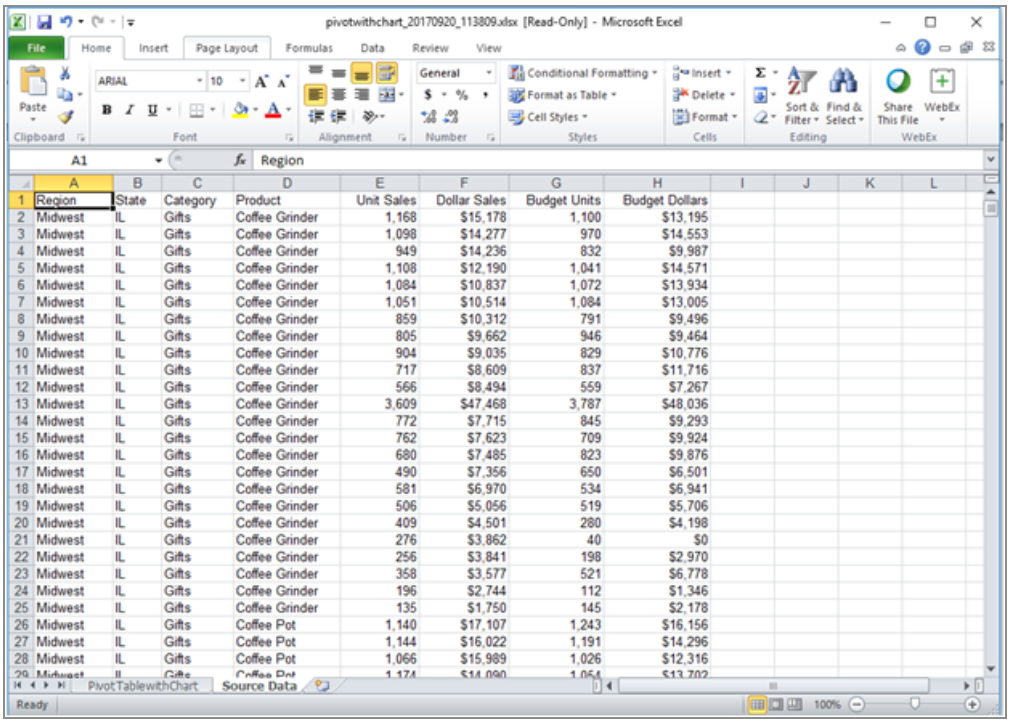

When you run the sample procedure, a pivotwithchart.xlsx workbook is generated, with the WebFOCUS report data stored in the second worksheet.

The following images show the first and second worksheets in the pivotwithchart.xlsx workbook after you run the sample procedure.

### First Worksheet




### Second Worksheet

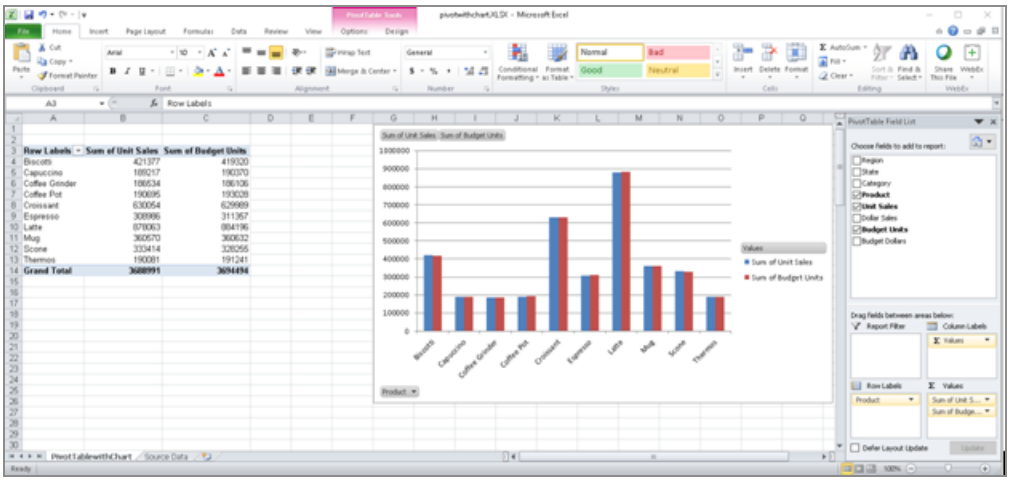



| Region | State | Category | Product | Unit Sales | Dollar Sales | Budget Units | Budget Dollars |
|---|---|---|---|---|---|---|---|
| Midwest | IL | Gifts | Coffee Grinder | 1,168 | $15,178 | 1,100 | $13,195 |
| Midwest | IL | Gifts | Coffee Grinder | 1,098 | $14,277 | 970 | $14,553 |
| Midwest | IL | Gifts | Coffee Grinder | 949 | $14,236 | 832 | $9,987 |
| Midwest | IL | Gifts | Coffee Grinder | 1,108 | $12,190 | 1,041 | $14,571 |
| Midwest | IL | Gifts | Coffee Grinder | 1,084 | $10,837 | 1,072 | $13,934 |
| Midwest | IL | Gifts | Coffee Grinder | 1,051 | $10,514 | 1,084 | $13,005 |
| Midwest | IL | Gifts | Coffee Grinder | 859 | $10,312 | 791 | $9,496 |
| Midwest | IL | Gifts | Coffee Grinder | 805 | $9,662 | 946 | $9,464 |
| Midwest | IL | Gifts | Coffee Grinder | 904 | $9,035 | 829 | $10,776 |
| Midwest | IL | Gifts | Coffee Grinder | 717 | $8,609 | 837 | $11,716 |
| Midwest | IL | Gifts | Coffee Grinder | 566 | $8,494 | 559 | $7,267 |
| Midwest | IL | Gifts | Coffee Grinder | 3,609 | $47,468 | 3,787 | $48,036 |
| Midwest | IL | Gifts | Coffee Grinder | 772 | $7,715 | 845 | $9,293 |
| Midwest | IL | Gifts | Coffee Grinder | 762 | $7,623 | 709 | $9,924 |
| Midwest | IL | Gifts | Coffee Grinder | 680 | $7,485 | 823 | $9,876 |
| Midwest | IL | Gifts | Coffee Grinder | 490 | $7,356 | 650 | $6,501 |
| Midwest | IL | Gifts | Coffee Grinder | 581 | $6,970 | 534 | $6,941 |
| Midwest | IL | Gifts | Coffee Grinder | 506 | $5,056 | 519 | $5,706 |
| Midwest | IL | Gifts | Coffee Grinder | 409 | $4,501 | 280 | $4,198 |
| Midwest | IL | Gifts | Coffee Grinder | 276 | $3,862 | 40 | $0 |
| Midwest | IL | Gifts | Coffee Grinder | 256 | $3,841 | 198 | $2,970 |
| Midwest | IL | Gifts | Coffee Grinder | 358 | $3,577 | 521 | $6,778 |
| Midwest | IL | Gifts | Coffee Grinder | 196 | $2,744 | 112 | $1,346 |
| Midwest | IL | Gifts | Coffee Grinder | 135 | $1,750 | 145 | $2,178 |
| Midwest | IL | Gifts | Coffee Pot | 1,140 | $17,107 | 1,243 | $16,156 |
| Midwest | IL | Gifts | Coffee Pot | 1,144 | $16,022 | 1,191 | $14,296 |
| Midwest | IL | Gifts | Coffee Pot | 1,066 | $15,989 | 1,026 | $12,316 |

In the PivotTablewithChart worksheet, note that the PivotTableFieldList is populated with the fields from the WebFOCUS report. There is one check box for each field in the report procedure. All the check boxes are not selected, by default.

The data used to populate the check boxes is obtained from the Source Data worksheet, where the data from the WebFOCUS report was saved upon executing the sample procedure.

To start building a pivot report and pivot chart, you can select the check boxes for the desired fields in the PivotTableFieldList. For example, selecting the check boxes for Product, Unit Sales, and Budget Units will automatically feed the data from the Source Data worksheet into the pivot table and pivot chart in the PivotTablewithChart worksheet. The resulting pivot table and pivot chart are shown in the following image.



The wf2pivot.xltx template is provided, by default, with the WebFOCUS Reporting Server installation as part of the Legacy Samples. For information on how to download the WebFOCUS Reporting Server Legacy Samples, see the ibi™ WebFOCUS® Reporting Server *Administration* manual.

You can use the WebFOCUS XLSX template as is, or you can customize it to meet the your business requirements.

**Note:** The wf2pivot.xltx template includes a pivot table and pivot chart on the same worksheet, but you can use a macro-enabled template to generate a pivot table and a pivot chart on separate worksheets, which are linked to a common data source.

# FORMAT XLSX Limitations

Format XLSX does not support the following features, currently supported for EXL2K:

- Cell locking
- XLSX reports are available on a z/OS USS server but are not currently supported on a z/OS PDS server or on a z/OS USS server with the setting DYNAM TEMP ALLOC MVS.

For additional support on the implementation of features supported by the XLSX format, see *WebFOCUS XLSX Format Supported Features Roadmap*, located at the following link:

https://techsupport.informationbuilders.com/tech/wbf/wbf_rln_formatXLSX_support.html

# Using PowerPoint PPT Display Format

Specifying PowerPoint (PPT) as the output format creates a PowerPoint document with a single slide that includes the report.

You can add multiple graphs and images to a PowerPoint presentation. The PowerPoint output format can contain a variety of graphs positioned anywhere on a slide to create a visual layout.

You can also place report output on a specific slide in a PowerPoint template.

# Using PowerPoint PPT Templates

A WebFOCUS report can be placed inside of an existing PowerPoint presentation. This enables you to populate existing presentations with preset Slide Masters, styling, and other business content. PowerPoint PPT templates are stored on the server with a .MHT extension and can be distributed automatically with ReportCaster.

# Create PowerPoint PPT Report Output

```
ON TABLE {PCHOLD|HOLD|SAVE} [AS name] FORMAT PPT
      [TEMPLATE 'template' SLIDENUMBER n]
```

where:

**name**

Is the name of the PowerPoint output file.

**template**

Is the name of the PowerPoint template file. The template file must have at least one blank slide and must be saved as a Web Archive (.MHT extension) on your WebFOCUS Reporting Server application directory.

**Tip:** Since the WebFOCUS Reporting Server cannot differentiate between Excel and PowerPoint template files (.MHT), it is important to apply a naming convention to your template files. This will help you organize and distinguish the different Excel and

PowerPoint template files when developing your reports. For example, Excel_ template.MHT or PPT_template.MHT.

**n**

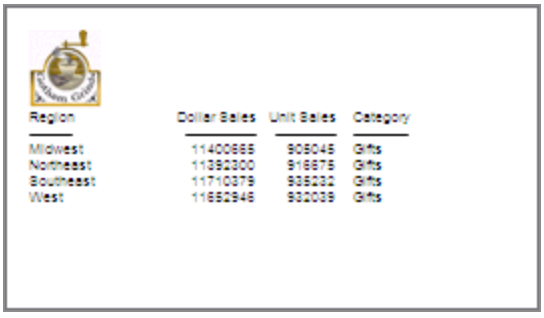
Is the number of the slide on which to place the report output. This number is optional if the template has only one slide.

# Using a PowerPoint PPT Template

The following request against the GGSALES data source inserts a WebFOCUS report into a PowerPoint template named mytemplate.mht, which is stored in the application directory:

```
TABLE FILE GGSALES
HEADING
" "
" "
" "
" "
" "
SUM DOLLARS UNITS CATEGORY
BY  REGION
ON TABLE SET PAGE-NUM NOLEAD
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT PPT TEMPLATE 'mytemplate' SLIDENUMBER 1
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
TYPE=REPORT, FONT=ARIAL, SIZE=10,$
TYPE=HEADING, image=gglogo.gif, POSITION=(0.000000 0.000000),$
ENDSTYLE
END
```

The output is:



| Region | Dollar Sales | Unit Sales | Category |
|---|---|---|---|
| Midwest | 11400668 | 905045 | Gifts |
| Northeast | 11392300 | 916875 | Gifts |
| Southeast | 11710379 | 935232 | Gifts |
| West | 11652946 | 932039 | Gifts |

# Saving Report Output in PPTX Format

You can retrieve data from any WebFOCUS supported data source and generate a PPTX formatted (PowerPoint 2007, PowerPoint 2010, and PowerPoint 2013) presentation. This section, which describes important PPTX features, applies to PowerPoint 2007, PowerPoint 2010, and PowerPoint 2013, unless otherwise indicated.

The PPTX format in WebFOCUS supports the following Microsoft Office software products:

- Microsoft Office 2013/2010/2007.
- Microsoft Office 2000/2003 with the Microsoft Office Compatibility Pack.

  **Note:** As per the Microsoft Support has ended for Office 2003 statement, support and updates for Office 2003 are no longer available. Although you will still be able to start and work in the Microsoft Office 2003 application, Microsoft recommends that you upgrade to a newer version of Office to get continuing support and updates. If you are using Office 2003, see end of support page for Windows XP SP3 and Office 2003 for more information.
- Open Office Support (FORMAT PPTX). Core PowerPoint functionality generated by the PPTX format is supported for Open Office. For details on Open Office, see http://www.openoffice.org/.
- Mac Office 2008 and 2011. FORMAT PPTX is supported.

WebFOCUS generates PPTX presentations based on the Microsoft PPTX standard. These presentations are accessible through all browsers and the Microsoft PowerPoint mobile application.

- Microsoft Office 365™. Microsoft Office 365 offers the local installation of PowerPoint 2013. It works with the Office 2010 release and provides limited functionality with Office 2007. Microsoft Office 365 also permits uploading Microsoft PowerPoint files to the cloud, where they can be accessed on most devices using Office Online. For information on the Microsoft Office 365 plans and features, see Office 365 for business FAQ.

  You can use Microsoft Office 365 to access a WebFOCUS PPTX report. First, display the PPTX report on the screen using the PCHOLD command, and then save the report to OneDrive® for Business. Once the file is in the cloud, you can access the file using Office Online.

  For information on the differences in features available in PowerPoint Online and in Microsoft Office 2013, see Office Online Service Description.

For more information on working with Office Online and OneDrive for Business, see Using Office Online in OneDrive.

# Building the .pptx Presentation File

Microsoft changed the format and structure of the PowerPoint presentation file in PowerPoint 2007. The new .pptx file is a binary compilation of a group of .xml files. Generating this new file format using WebFOCUS is a two-step process that consists of generating the .xml files containing the report output and zipping the .xml documents into the binary .pptx format. The WebFOCUS Reporting Server performs the xml generation process. The zipping process can be completed either by the Client (WebFOCUS Servlet) or the Server (JSCOM3):

- **WebFOCUS Servlet.** The WebFOCUS Client within the application server performs the zipping process. This can be done within the local client or through a remotely accessed client. The servlet method is the default approach defined for each WebFOCUS Client, with the client pointing to itself, by default.
- **JSCOM3.** The Java layer of the WebFOCUS Reporting Server performs the zipping operation. This option should be used when the WebFOCUS Servlet is configured on a secured web or application server. This is because JSCOM3 does not require URL access to a remote WebFOCUS Client.

# Select the Method for Zipping the .pptx File

You designate the method and location where the zipping will occur by setting EXCELSERVURL to a URL (for the WebFOCUS Servlet) or to a blank (for JSCOM3). Even though this setting is prefaced with EXCEL, when applied, the same results are achieved for PowerPoint. You can set this value for a specific procedure or for the entire environment:

- **For a procedure.** Issue the SET EXCELSERVURL command within the procedure.
- **For the entire environment.** Edit the IBIF_excelservurl variable in the WebFOCUS Administration Console by selecting *Configuration/Client Settings/General/IBIF_excelservurl*.

For more information on accessing the WebFOCUS Administration Console and setting the IBIF_excelservurl variable, see the *ibi™ WebFOCUS® Security and Administration* manual.

The value you assign to EXCELSERVURL determines whether the WebFOCUS Servlet or JSCOM3 performs the zipping operation:

- **Specifying the Servlet.** To specify that the WebFOCUS Servlet should be used, set the EXCELSERVURL parameter or the IBIF_excelservurl variable to the URL of a WebFOCUS Release 8.0 Version 09 or higher client configuration.

  In a procedure:

  ```
  SET EXCELSERVURL = http://servername:8080/ibi_apps
  ```

  In the WebFOCUS Administration Console:

  ```
  IBIF_excelservurl = http://servername:8080/ibi_apps
  ```

- **Specifying JSCOM3.** To specify that JSCOM3 should be used within the current WebFOCUS Reporting Server, set EXCELSERVURL to a blank or an empty string.

  In a procedure:

  ```
  SET EXCELSERVURL = ' '
  ```

  In the WebFOCUS Administration Console:

  ```
  IBIF_excelservurl = ' '
  ```

  By default, each WebFOCUS Client contains the following URL definition that points to itself:

  ```
  &URL_PROTOCOL://&servername:&server_port&IBIF_webapp
  ```

# Generate a PPTX Presentation

You can specify that a report should be saved to a PPTX presentation, displayed in the browser, or displayed in the PowerPoint application.

```
ON TABLE {PCHOLD|HOLD} AS name FORMAT PPTX
```

where:

**PCHOLD**

Displays the generated presentation in either the browser or the PowerPoint application, based on your desktop settings. For information, see Viewing PowerPoint Presentations in the Browser vs. the PowerPoint Application.

**HOLD**

Saves a presentation with a .pptx extension to the designated location.

**name**

Specifies a file name for the generated presentation.

**Note:** To assign a file name to the generated presentation, set the Save Report option to *YES* for the .pptx file extension in the WebFOCUS Client Redirection Settings. When opened in the PowerPoint application, the generated presentation will retain the designated AS name. For more information on the Redirection Settings, see the *ibi™ WebFOCUS® Security and Administration* manual.

# Opening PPTX Report Output

To open PPTX presentations, the user must have an account for Microsoft Office365 or Microsoft PowerPoint 2013, 2010, or 2007 must be installed on the desktop.

Upon execution of a report with FORMAT PPTX, the user is prompted to Open or Save the PPTX file. The file name displayed before the .pptx extension is an internally generated name.

The WebFOCUS procedure generates a presentation containing as many slides as required to display output. A report may contain defined elements, such as headings, subtotals, and titles, as well as StyleSheet syntax, such as conditional styling and drill downs.

# Opening PPTX Report Output in Microsoft PowerPoint 2000/2003

PowerPoint 2000 and PowerPoint 2003 can be updated to read PowerPoint PPTX presentations using the Microsoft Office Compatibility Pack available from the Microsoft download site (http://www.microsoft.com/downloads/en/default.aspx). When the file

extension of the file being opened is .pptx (PPTX presentation), the Microsoft Office Compatibility Pack performs the necessary conversion to allow PowerPoint 2000/2003 to read and open it.

In addition to the Microsoft Office Compatibility Pack, it is important to enable the WebFOCUS Client Redirection Settings Save As option so that PowerPoint 2000/2003 will be able to open the PPTX report output without users first having to save it to their machine with the .pptx file extension. The WebFOCUS Client processing Redirection Settings Save As option configures how the WebFOCUS Client sends each report output file type to the user machine.

This option can be set as follows:

- **Save As Option disabled (NO).** The WebFOCUS Client Redirection Setting Save As is disabled, by default. When the Save As option is disabled, the WebFOCUS Client sends report output to the user machine in memory with the application association specified for the report format in the WebFOCUS Client Redirection Settings configuration file (mime.wfs).

  A user machine that does not have PowerPoint 2007 or higher installed will not recognize the application association for PowerPoint and PowerPoint will display a message. The PowerPoint 2000/2003 user can select Save and provide a file name with the .pptx extension to save the report output to their machine. The user can then open the .pptx file directly from PowerPoint 2000/2003.

- **Save As Option enabled (YES).** When the WebFOCUS Redirection Save As option is enabled, the WebFOCUS Client sends the report output to the user as a file with the extension specified in the WebFOCUS Client Redirection Settings configuration file (mime.wfs). Upon receiving the file, Windows will display the File Download prompt asking the user to Open or Save the file with the identified application type. The File Download prompt displays the Name with the .pptx file extension for the report output that is recognized as a PowerPoint PPTX file type.

  **Note:** The download prompt will display for all users, including users who have PowerPoint 2007 or higher installed on their machines.

  If a PowerPoint 2000/2003 user chooses to open the file, the Microsoft Office Compatibility Pack will recognize the .pptx file extension and perform the necessary conversion to allow PowerPoint 2000/2003 to read the PowerPoint PPTX presentation.

  If a PowerPoint 2007 or higher user chooses to open the file, PowerPoint will recognize the .pptx file extension and read the PowerPoint PPTX presentation.

  For additional information on WebFOCUS Client Redirection Settings, see the *ibi™*

*WebFOCUS® Security and Administration* manual.

# Viewing PowerPoint Presentations in the Browser vs. the PowerPoint Application

Your Operating System and desktop settings determine whether PowerPoint output sent to the client is displayed in an Internet Browser window or within the PowerPoint application. When PowerPoint output has been defined within the Windows environment to Browse in same window, the workbook generated by a WebFOCUS request is opened within an Internet Explorer® browser window. When the Browse in same window option is unchecked for the .ppt file type, the browser window created by WebFOCUS is blank because the report output is displayed in the stand-alone PowerPoint application window.

- In Windows XP and earlier, file type specific settings are managed on the desktop within Windows Explorer by selecting **Tools/Folder Options**, clicking the **File Types** tab, selecting the extension (.ppt or .pptx), clicking the **Advanced** button, and checking the **Browse in same window** check box.

  As per the Microsoft Support has ended for Office 2003 statement, support and updates for Office 2003 are no longer available. Although you will still be able to start and work in the Microsoft Office 2003 application, Microsoft recommends that you upgrade to a newer version of Office to get continuing support and updates. If your organization uses Office 2003, go to the end of support page for Windows XP SP3 and Office 2003 for more information.

- In Windows 7, Microsoft removed the desktop settings that support opening worksheets in the browser. This means that to change this behavior, you can no longer simply navigate to the Folder Options dialog box, but you must change a registry setting.

  **Note:** This works the same for both PPT and PPTX formats. The only difference is the selection of file type based on the version of PowerPoint output you will be generating.

# Grouping Tables and Components in a PowerPoint Slide

When table elements are placed on a PowerPoint slide, the elements are placed in individual text boxes to allow for explicit positioning to match the other positioned drivers, such as PDF and DHTML.

The PPTXGROUP parameter enables you to group elements together in a PPTX report. You can rotate, flip, move, or resize objects within a group at the same time as though they were a single object. You can also change the attributes of all of the objects in a group at one time, including font, color, or size, and you can ungroup a group of objects at any time, and then regroup them later.

In WebFOCUS, grouping is done within each report component. Objects within the report component (or stand-alone report), including data, all headings and footings, and images, are grouped together. In compound reports, each component report is grouped individually and non-component elements, such as drawing objects, lines, and images, are not included in any group.

# Group Tables and Components in a PowerPoint Slide

```
SET PPTXGROUP = {ON|OFF}
```

The command can also be issued from within a report using:

```
ON TABLE SET PPTXGROUP = {ON|OFF}
```

In a StyleSheet:

```
TYPE=REPORT, PPTXGROUP = {ON|OFF}
```

where:

**ON**

Enables you to group elements together in a PPTX report.

**OFF**

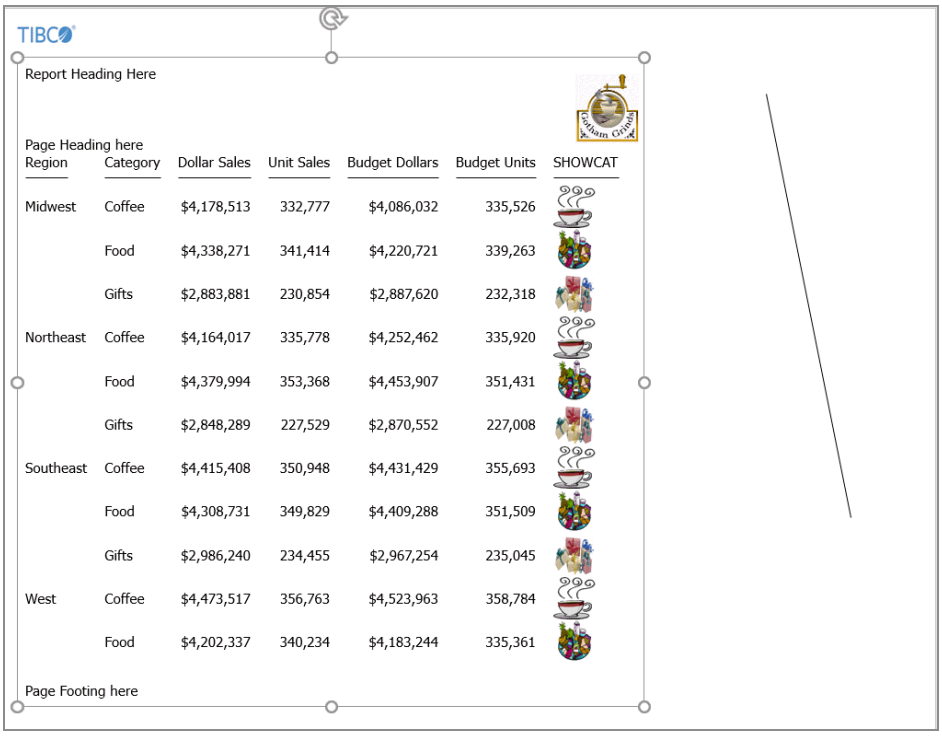
Indicates no grouping of elements, which is the legacy behavior. OFF is the default value.

# Displaying Group Tables and Components in a Standard Report

In the following standard report, the grouping is defined for the core report elements, excluding images and drawing objects, defined at the TYPE=REPORT level.

```
TABLE FILE GGSALES
SUM DOLLARS/D12CM UNITS/D12C BUDDOLLARS/D12CM BUDUNITS/D12C
COMPUTE SHOWCAT/A100=CATEGORY||'.GIF';
BY REGION
BY CATEGORY
ON TABLE SUBHEAD
"Report Heading Here"
" "
" "
" "
HEADING
"Page Heading here"
FOOTING
"Page Footing here"
ON TABLE SUBFOOT
"Report Footing Here"
ON TABLE PCHOLD AS GROUPTEST FORMAT PPTX
ON TABLE SET STYLE *
TYPE=REPORT, PPTXGROUP = ON, SQUEEZE=ON, FONT=TAHOMA,SIZE=12,
ORIENTATION=LANDSCAPE, $
TYPE=REPORT, OBJECT=LINE, POSITION=(9 1), DIMENSION=(1 5), COLOR=BLUE, $
TYPE=REPORT, IMAGE=TIBCO, POSITION=(0 0),SIZE=(1 .6), $
TYPE=TABHEADING, IMAGE=GGLOGO.GIF, POSITION=(6.5 .10), $
TYPE=DATA,COLUMN=SHOWCAT, IMAGE=(SHOWCAT), PRESERVERATIO=ON,
SIZE=(.5 .5), $
END
```

The output is:




# Displaying Group Tables and Components in a Compound Report

In the following compound report, the grouping is defined for the component report. Additional objects on the page, including the chart image, logo image, lines, and text box are not included in the grouping.

```
SET HTMLARCHIVE=ON
SET PPTXGRAPHTYPE=PNG
SET PPTXGROUP=ON
COMPOUND LAYOUT PCHOLD FORMAT PPTX
UNITS=IN, $
SECTION=section1, LAYOUT=ON, MERGE=OFF, ORIENTATION=LANDSCAPE,
PAGESIZE=PPT Slide, $
PAGELAYOUT=1, NAME='Page layout 1', TEXT='Page layout 1',
BOTTOMMARGIN=0.5, TOPMARGIN=0.5, $
OBJECT=STRING, NAME='text1', TEXT='<left>Grouping is supported within
the component reports of a compound report:
<ul type=disc>
<LI>Each table / report is grouped together. </LI>
<LI>Drawing objects such as images and lines are not included in any
```

```
group. </LI>
<LI>Charts are inserted as images.</LI></ul><div><br></div><br></left>',
POSITION=(2.764 4.958), MARKUP=ON, WRAP=ON, DIMENSION=(4.000 1.992),
FONT='TREBUCHET MS', COLOR=RGB(0 0 0), SIZE=10, $
COMPONENT='report1', TEXT='report1', POSITION=(1.028 2.083), DIMENSION=
(4.431 1.667), $
COMPONENT='chart2', TEXT='chart2', POSITION=(4.972 1.319), DIMENSION=
(4.456 3.085), COMPONENT-TYPE=GRAPH, $
OBJECT=BOX, NAME='line1', POSITION=(0.498 6.500),
DIMENSION=(9.167 0.022), BACKCOLOR=BLACK, BORDER-COLOR=BLACK, $
OBJECT=BOX, NAME='line2', POSITION=(0.502 1.097),
DIMENSION=(9.167 0.022), BACKCOLOR=BLACK, BORDER-COLOR=BLACK, $
OBJECT=IMAGE, NAME='image4', IMAGE=tibco.gif, ALT='',
POSITION=(0.502 0.499), DIMENSION=(1.861 0.7), $
END
```

```
SET COMPONENT='report1'
TABLE FILE GGSALES
SUM
   GGSALES.SALES01.DOLLARS
BY GGSALES.SALES01.REGION
ACROSS LOWEST GGSALES.SALES01.CATEGORY
ON TABLE SET PAGE-NUM NOLEAD
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT PPTX
ON TABLE SET STYLE *
     INCLUDE=IBFS:/FILE/IBI_HTML_DIR/ibi_themes/Warm.sty,$
$
ENDSTYLE
END
```

```
SET COMPONENT='chart2'
SET PAGE-NUM=NOLEAD
SET ARGRAPHENGINE=JSCHART
SET EMBEDHEADING=ON
SET GRAPHDEFAULT=OFF
GRAPH FILE GGSALES
SUM GGSALES.SALES01.DOLLARS
BY GGSALES.SALES01.CATEGORY
ACROSS GGSALES.SALES01.REGION
ON GRAPH PCHOLD FORMAT HTML
ON GRAPH SET VZERO OFF
ON GRAPH SET GRWIDTH 1
ON GRAPH SET UNITS 'PIXELS'
ON GRAPH SET HAXIS 770.0
```

```
ON GRAPH SET VAXIS 405.0
ON GRAPH SET GRMERGE ADVANCED
ON GRAPH SET GRMULTIGRAPH 0
ON GRAPH SET GRLEGEND 1
ON GRAPH SET GRXAXIS 1
ON GRAPH SET LOOKGRAPH HBAR
ON GRAPH SET STYLE *
```

```
*GRAPH_SCRIPT
setPieDepth(0);
setPieTilt(0);
setDepthRadius(0);
setCurveFitEquationDisplay(false);
setPlace(true);
*END
INCLUDE=IBFS:/FILE/IBI_HTML_DIR/ibi_themes/Warm.sty,$
TYPE=REPORT, TITLETEXT='WebFOCUS Report', $
*GRAPH_SCRIPT
setLegendPosition(4);
*GRAPH_JS_FINAL
"blaProperties": {
    "orientation": "horizontal"
},
"agnosticSettings": {
    "chartTypeFullName": "Bar_Clustered_Horizontal"
}
*END
ENDSTYLE
END
-RUN

COMPOUND END
```

The output is:

| Category<br>Region | Coffee | Food | Gifts |
|---|---|---|---|
| Midwest | 4178513 | 4338271 | 2883881 |
| Northeast | 4164017 | 4379994 | 2848289 |
| Southeast | 4415408 | 4308731 | 2986240 |
| West | 4473517 | 4202337 | 2977092 |

# Date and Page/Slide Number

You can add the date and page numbers to both single and Compound Reports.

- For single reports, use the TABPAGENO feature and the associated attributes.
- For Compound Reports, add your data and page number to text objects. For more information, see Text Formatting Markup Tags for a Text Object.

# Text Formatting Markup Tags for a Text Object

**Note:** If your text contains any open caret characters (<), you must put a blank space after each open caret that is part of the text, for example, “< 250”. If you do not, everything following the open caret will be interpreted as the start of a markup tag and will not display as text.

### Font Properties

The font tag supports three attributes: face, size, and color (where the color must be specified as the hexadecimal number code for the color):

```
<font face="font" size=[+|-]n color=color_code>text</font>
```

For example:

```
<font face="New Century Schoolbook">Test1</font>
<font face="Times" size=12>test2</font>
<font face="Times New Roman" color=#0000FF size=+4>Test3</font>
<font size=-2 face="Times New Roman" color=#0000FF >Test4</font>
```

**Text Styles**

The supported text styles are bold, italic, underline, and superscript:

Bold: `<b>text</b>`

Italic: `<i>text</i>`

Underline: `<u>text</u>`

Superscript: `<sup>text</sup>`

**Line Breaks**

The line break tag after a portion of text begins the next portion of text on a new line. Note that there is no closing tag for a line break:

```
<br>
```

**Text Alignment**

The alignment options pertain to wrapped text, as well as specified line breaks. Both horizontal justification and vertical alignment are supported.

- **Horizontal Justification**

  Left Justification:

  ```
  <left>text</left>
  ```

  Right Justification:

  ```
  <right>text</right>
  ```

  Center Justification:

```
<center>text</center>
```

Full Justification:

```
<full>text</full>
```

- **Vertical Alignment**

  Top Alignment:

  ```
  <top>text</top>
  ```

  Middle Alignment:

  ```
  <mid>text</mid>
  ```

  Bottom Alignment:

  ```
  <bottom>text</bottom>
  ```

**Unordered (Bullet) List**

The unordered (ul) list tag encloses a bullet list. Each item is enclosed in a list item tag (li). The start tag and end tag for the list must each be on its own line. Each list item must start on a new line:

```
<ul>
<li>list item1</li>
<li>list item2</li>
  .
  .
  .
</ul>
```

By default, the bullet type is disc. You can also specify circle or square:

```
<ul type=disc>
```

```
<ul type=circle>
```

```
<ul type=square>
```

**Ordered (Number or Letter) List**

The ordered (ol) list tag encloses a list in which each item has a consecutive number or letter. Each item is enclosed in a list item tag (li). The start tag and end tag for the list must each be on its own line. Each list item must start on a new line:

```
<ol>
<li>list item1</li>
<li>list item2</li>
  .
  .
  .
</ol>
```

By default, Arabic numerals (type=1) are used for the ordering of the list. You can specify the following types of order:

Arabic numerals (the default): `<ol type=1>`

Lowercase letters: `<ol type=a>`

Uppercase letters: `<ol type=A>`

Lowercase Roman numerals: `<ol type=I>`

Uppercase Roman numerals: `<ol type=I>`

**Hyperlinks**

Hyperlinks can be included within text markup in a PPTX output file.

The syntax for the anchor markup tag is a subset of the HTML anchor syntax:

```
<a href="hyperlink">Text to display</a>
```

where:

**hyperlink**

Is the hyperlink to jump to when the text is clicked.

**Text to display**

Is the text to display for the hyperlink.

For example:

```
<a href="http://www.example.com/help.htm">Click here for help</a>
```

No other attributes are supported in the anchor markup tag.

**Page Numbering**

There are two pseudo-HTML tags for embedding page numbers in text on a Page Master for a Coordinated Compound Layout report:

Current page number: `<ibi-page-number/>`

Total number of pages: `<ibi-total-pages/>`

Note that when MARKUP=ON, space is allocated for the largest number of pages, so there may be a wide gap between the page number and the text that follows. To remove the extra space in the text object that has the page numbering tags:

- If specific styling of the text object is not required, do not insert markup tags, and turn MARKUP=OFF.

  ```
  MARKUP=OFF, TEXT='Page <ibi-page-number/> of <ibi-total-pages/> of
  Sales Report', $
  ```

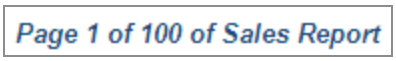
  This displays the following output:

  ```
  Page 1 of 100 of Sales Report
  ```

- If specific styling of the text object is required, you must set MARKUP=ON. With MARKUP=ON, set WRAP=OFF and do not place any styling tags between the page number variables within the string. Tags can be used around the complete **Page n of m** string. The following code produces a page number string without the extra spaces:

  ```
  MARKUP=ON, WRAP=OFF, TEXT='<font face="ARIAL" size=10><i>Page <ibi-
  page-number/> of <ibi-total-pages/> of Sales Report </i>', $
  ```

  This displays the following output:

**Dates**

To display a date in the report output, insert a WebFOCUS date variable in a text object on a Page Master (such as &DATEtrMDYY) in the text object.

# Formatting a Compound Layout Text Object With Markup Tags

The following request displays a text object with markup tags in a PPTX output file.

**Important:** Text markup syntax cannot contain hidden carriage return or line feed characters. For purposes of presenting the example in this documentation, line feed characters have been added so that the sample code wraps to fit within the printed page. To run this example in your environment, copy the code into a text editor and delete any line feed characters within the text markup object by going to the end of each line and pressing the Delete key. In some instances, you may need to add a space to maintain the structure of the string. For additional information on displaying carriage returns within the text object see Text Formatting Markup Tags for a Text Object.

```
SET PAGE-NUM=OFF
SET LAYOUTGRID=ON
TABLE FILE GGSALES
BY REGION NOPRINT
ON TABLE PCHOLD AS LINESP1 FORMAT PPTX
ON TABLE SET STYLE *
type=report, size=8, $
object=string, position=(1 1), dimension=(7 3), wrap=on, markup=on,
 linespacing=multiple(3),
 text='<b><font face="Arial" size=12>This paragraph is triple-spaced
 (LINESPACING=MULTIPLE(3)):</font></b>
 <full>Our <i>primary</I> goal for fiscal 2006 was to accelerate our
 transformation to customer centricity. In this letter, I'd like to
 give you an update on this work, which contributed to the 22-percent
 increase in earnings from continuing operations we garnered for fiscal
 2006. Since the past is often prologue to the future, I'd like to
 describe how customer centricity is influencing not only our goals for
 fiscal 2007, but also our long-term plans. At Gotham Grinds, customer
 centricity means treating each customer as a unique individual, meeting
 their needs with end-to-end solutions, and engaging and energizing our
 employees to serve them.</full>', $
ENDSTYLE
END
```

In this request:

- No fields from the data source are displayed. Only the text object displays on the output.
- The SET LAYOUTGRID command displays a grid to indicate the coordinates and dimensions of the text object.
- The OBJECT=STRING declaration specifies triple spacing: LINESPACING=MULTIPLE(3).
- The following text is displayed in boldface, in the Arial font face, and with a font size of 12 (the default is 8 from the TYPE=REPORT declaration):

  'This paragraph is triple-spaced (LINESPACING=MULTIPLE(3)):'

  The markup for this formatting is:

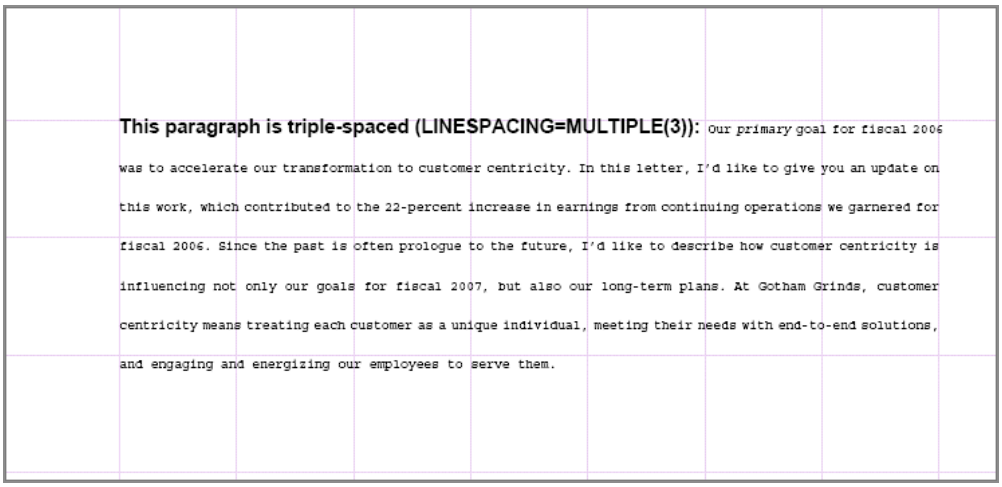
  ```
  <b><font face="Arial" size=12>This paragraph is triple-spaced
  (LINESPACING=MULTIPLE(3)):</font></b>
  ```

  Note, however, that the image has been resized to fit the page so the font may appear smaller:
- The remainder of the text is displayed with full justification (left and right sides align):

  ```
  <full>Our ... </full>
  ```
- The following markup displays the text 'primary' in italics:

  ```
  <i>primary</I>
  ```

The output is:




# Drawing Text and Line objects on a Page Master

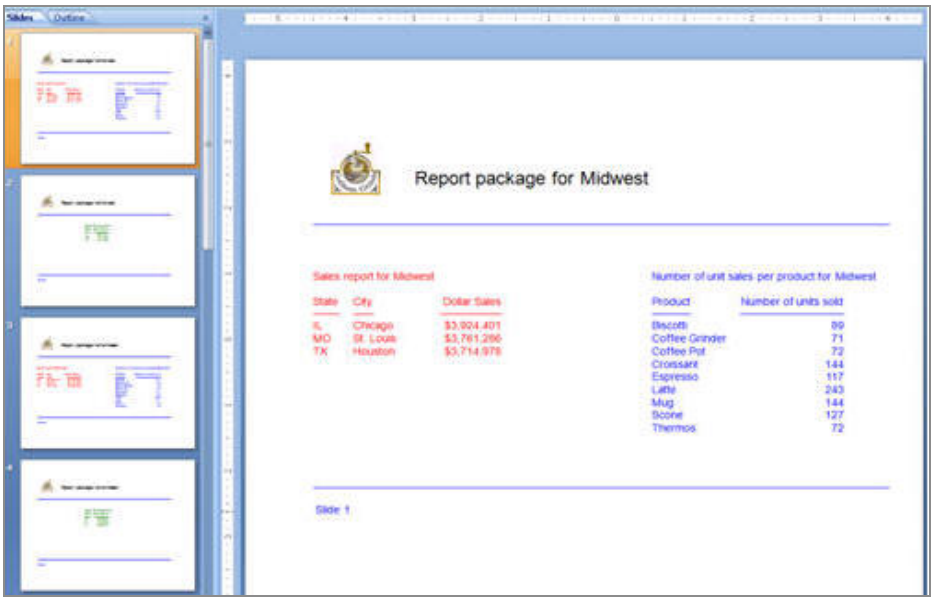
The following request places a line on the Page Master between the header report and the component reports and places a line and a text string on the bottom of each page:

```
SET PAGE-NUM=OFF
SET SQUEEZE=ON
COMPOUND LAYOUT PCHOLD FORMAT PPTX
SECTION=S1, LAYOUT=ON, MERGE=ON, ORIENTATION=LANDSCAPE, $
PAGELAYOUT=ALL, $
COMPONENT=HEADER, TYPE=REPORT, POSITION=(1 1), DIMENSION=(4 4), $
OBJECT=STRING, POSITION=(1 6.6), MARKUP=ON,
TEXT='<font face="Arial" color=#0000FF size=12> Slide <ibi-page-number/>
        </font> ', WRAP=ON, DIMENSION=(4 4),$
OBJECT=LINE, POSITION=(1 2.5), ENDPOINT=(9.5 2.5),
        BORDER-COLOR=BLUE,$
OBJECT=LINE, POSITION=(1 6.5), ENDPOINT=(9.5 6.5),
        BORDER-COLOR=BLUE,$
PAGELAYOUT=1, $
COMPONENT=R1, TYPE=REPORT, POSITION=(1 3), DIMENSION=(4 4), $
COMPONENT=R2, TYPE=REPORT, POSITION=(6 3), DIMENSION=(4 4), $
PAGELAYOUT=2, $
COMPONENT=R3, TYPE=REPORT, POSITION=(4 3), DIMENSION=(4 4), $
END
```

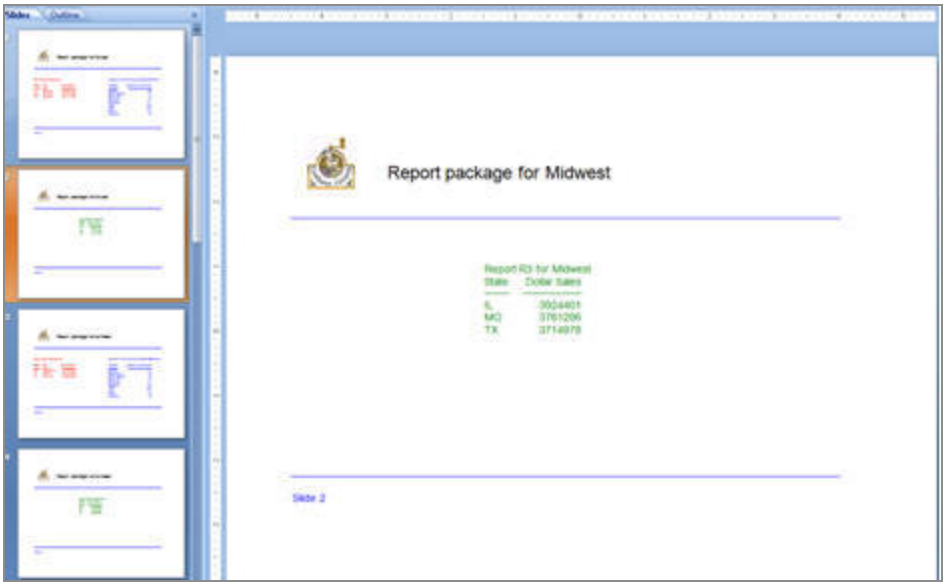
```
SET COMPONENT=HEADER
TABLE FILE GGSALES
" "
"Report package for <REGION"
```

```
BY REGION NOPRINT
ON TABLE HOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT, FONT=HELVETICA, SIZE=20, $
TYPE=REPORT, IMAGE=gglogo.gif, POSITION=(+.25 +.25), $
TYPE=HEADING, LINE=2, ITEM=1, POSITION=1.5, $
END
SET COMPONENT=R1
TABLE FILE GGSALES
"Sales report for <REGION"
" "
SUM DOLLARS/F8M
BY REGION NOPRINT
BY ST
BY CITY
ON TABLE SET STYLE *
TYPE=REPORT, FONT=HELVETICA, COLOR=RED, SQUEEZE=ON, $
END
SET COMPONENT=R2
TABLE FILE GGSALES
"Number of unit sales per product for <REGION"
" "
SUM CNT.UNITS AS 'Number of units sold'
BY REGION NOPRINT
BY PRODUCT
ON TABLE SET STYLE *
TYPE=REPORT, FONT=HELVETICA, COLOR=BLUE, SQUEEZE=ON, $
END
SET COMPONENT=R3
TABLE FILE GGSALES
"Report R3 for <REGION"
BY REGION NOPRINT
SUM DOLLARS BY ST
ON TABLE SET STYLE *
TYPE=REPORT, FONT=HELVETICA, COLOR=GREEN, $
END
COMPOUND END
```

The first page of output is:




The second page of output has the same drawing objects:




# Vertically Aligning Text Markup in PPTX Report Output

The following request creates three boxes and places a text string object within each of them:

- In the left box, the text is aligned vertically at the top.
- In the middle box, the text is aligned vertically at the middle.
- In the right box, the text is aligned vertically at the bottom.

**Important:** Text markup syntax cannot contain hidden carriage return or line feed characters. For purposes of presenting the example in this documentation, line feed characters have been added so that the sample code wraps to fit within the printed page. To run this example in your environment, copy the code into a text editor and delete any line feed characters within the text markup object by going to the end of each line and pressing the Delete key. In some instances, you may need to add a space to maintain the structure of the string. For additional information on displaying carriage returns within the text object see Text Formatting Markup Tags for a Text Object.

```
SET PAGE-NUM=OFF
TABLE FILE GGSALES
BY REGION NOPRINT
ON TABLE PCHOLD FORMAT PPTX
ON TABLE SET STYLE *
type=report, font=arial, size=10, $
object=box, position=(1 1), dimension=(6 1), $
object=line, position=(3 1), endpoint=(3 2), $
object=line, position=(5 1), endpoint=(5 2), $
object=string, text='<top>Vertically aligned text within a text object
using top alignment.</top>', position=(1.05 1), dimension=(2 1),
linespacing=exact(.15), markup=on, wrap=on, $
object=string, text='<mid>Vertically aligned text within a text object
using middle alignment.</mid>', position=(3.05 1), dimension=(2 1),
linespacing=exact(.15), markup=on, wrap=on, $
object=string, text='<bottom>Vertically aligned text within a text
object using bottom alignment.</bottom>', position=(5.05 .9), dimension=
(2 1),linespacing=exact(.15), markup=on, wrap=on,
$
END
```

The output is:

| | | |
|---|---|---|
| Vertically aligned text within a text object using top alignment. | Vertically aligned text within a text object using middle alignment. | Vertically aligned text within a text object using bottom alignment. |

# Display Unordered Lists With Bullets, Discs, Squares, and Circles

The unordered (ul) list tag encloses a bulleted list in which each item is marked by a bullet of a particular shape or design. Each item or point is enclosed in a list item tag (li). The start and end tags for each point may occupy one continuous line or be placed on different lines. When each list is placed on a new line, insert a backslash (\) after each closing tag.

# Displaying Unordered Lists With Bullets, Squares, and Circles

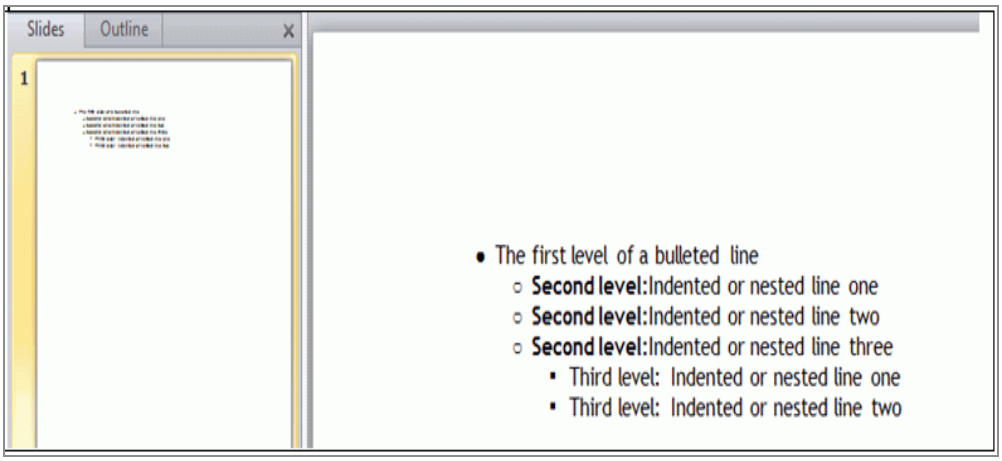
The following request displays a bulleted list with bullets of particular shapes and designs.

```
<ul>
<li>list item1</li>\
<li>list item2</li>\
</ul>
```

```
SET HTMLARCHIVE=ON
COMPOUND LAYOUT PCHOLD FORMAT PPTX
UNITS=IN, $
SECTION=section1, LAYOUT=ON, MERGE=OFF, ORIENTATION=PORTRAIT,
PAGESIZE=Letter, SHOW_GLOBALFILTER=OFF, $
PAGELAYOUT=1, NAME='Page layout 1', text='Page layout 1',
BOTTOMMARGIN=0.5, TOPMARGIN=0.5, $
OBJECT=STRING, NAME='text1', TEXT='<font face="TREBUCHET MS" size=10>\
<UL>
<LI>The first level of a bulleted line </LI>\
<UL>
<LI><b>Second level:</b> Indented or nested line one</LI>\
<LI><b>Second level:</b> Indented or nested line two</LI>\
<LI><b>Second level:</b> Indented or nested line three</LI>\
<UL>\
<LI>Third level: Indented or nested line one</LI>\
<LI>Third level: Indented or nested line two</LI>\
</UL>\
```

```
<BR><BR><BR><U><DIV><BR></DIV></U></font>', POSITION=(0.938 0.938),
MARKUP=ON, WRAP=ON, DIMENSION=(6.563 4.167), $
COMPONENT='DfltCmpt1', POSITION=(0 0), DIMENSION=(0 0), $
END
SET COMPONENT='DfltCmpt1'
TABLE FILE SYSCOLUM
" "
SUM TBNAME NOPRINT
IF READLIMIT EQ 1
ON TABLE SET PREVIEW ON
ON TABLE PCHOLD FORMAT PPTX
ON TABLE SET STYLE *
END
COMPOUND END
```

The output is:

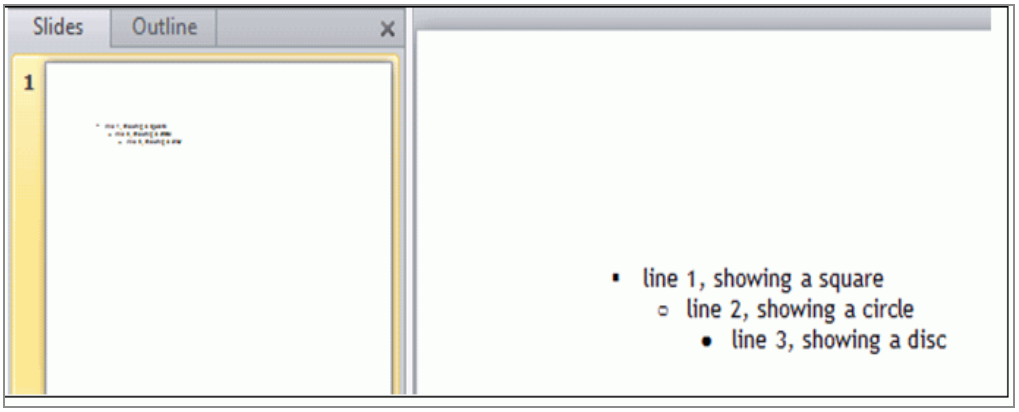



The default bullet type is disc. You may also specify circle or square, as shown in the following request.

```
SET HTMLARCHIVE=ON
COMPOUND LAYOUT PCHOLD FORMAT PPTX
UNITS=IN, $
SECTION=section1, LAYOUT=ON, MERGE=OFF, ORIENTATION=PORTRAIT,
PAGESIZE=Letter, SHOW_GLOBALFILTER=OFF, $
PAGELAYOUT=1, NAME='Page layout 1', text='Page layout 1',
BOTTOMMARGIN=0.5, TOPMARGIN=0.5, $
OBJECT=STRING, NAME='text1', TEXT='<font face="TREBUCHET MS" size=10>\
<UL type=square>\
<LI> line 1, showing a square </LI>\
<UL type=circle>\
```

```
<LI> line 2, showing a circle </LI>\
<UL type=disc>\
<LI> line 3, showing a disc </LI>\
</UL>\
<BR><BR><BR><U><DIV><BR></DIV></U></font>', POSITION=(0.938 0.938),
MARKUP=ON, WRAP=ON, DIMENSION=(6.563 4.167), $
COMPONENT='DfltCmpt1', POSITION=(0 0), DIMENSION=(0 0), $
END
SET COMPONENT='DfltCmpt1'
TABLE FILE SYSCOLUM
" "
SUM TBNAME NOPRINT
IF READLIMIT EQ 1
ON TABLE SET PREVIEW ON
ON TABLE PCHOLD FORMAT PPTX
ON TABLE SET STYLE *
END
COMPOUND END
```

The output is:




# Inserting Images In Various Elements of PowerPoint PPTX Reports

WebFOCUS supports the placement of images within each element or node of the report. An image, such as a logo, gives corporate identity to a report, or provides visual appeal. Data specific images can be placed in headers and footers to provide additional clarity and style. The image must reside on the WebFOCUS Reporting Server in a directory named on EDAPATH or APPPATH. If the file is not on the search path, supply the full path name.

All images will be placed in the defined area, based on the explicit positioning defined by the POSITION attribute within the style sheet.

Images can be placed in any available WebFOCUS reporting node or element. Supported image formats include .gif, .jpg, and .png. Images may be positioned and resized by using the POSITION and SIZE attributes to set the x, y coordinates and height, width settings, respectively. Justification of images is not supported.

**Note:** The highest quality image format for charts is PNG, which allows for transparency, as well as better integration with the styling within slide backgrounds.

# Insert Images Into WebFOCUS PPTX Reports

```
TYPE={REPORT|HEADING|data}, IMAGE={file|(column)}
[,BY=byfield] [,SIZE=(wh)] ,$
```

where:

**REPORT**

Embeds an image in the body of a report. The image appears in the background of the report. REPORT is the default value.

**HEADING**

Embeds an image in a heading or footing. Valid values are TABHEADING, TABFOOTING, FOOTING, HEADING, SUBHEAD, and SUBFOOT. Provide sufficient blank space in the heading or footing so that the image does not overlap the heading or footing text. You may also want to place heading or footing text to the right of the image using spot markers.

**data**

Defines a data column in which to place the image. Must be used with COLUMNS=*column title* to identify the specific report column where the image should be anchored.

**file**

Is the name of the image file. It must reside on the WebFOCUSWebFOCUS Reporting Server in a directory named on EDAPATH or APPPATH. If the file is not on the search path, supply the full path name. When specifying a GIF file, you can omit the file

extension.

# Inserting Images in the Headers and Footers of a Report

The following request inserts images in the headers and footers of a report.

```
TABLE FILE EMPDATA
SUM
EMPDATA.EMPDATA.SALARY
BY LOWEST EMPDATA.EMPDATA.DEPT
BY EMPDATA.EMPDATA.LASTNAME
ON EMPDATA.EMPDATA.DEPT SUBFOOT "Subfoot"
" "
ON EMPDATA.EMPDATA.DEPT PAGE-BREAK
ON TABLE SUBHEAD
"Report Heading"
" "
HEADING
"Page Heading"
" "
FOOTING
"Page Footing"
" "
ON TABLE SUBFOOT "Report Footing"
" "
ON TABLE SET PAGE-NUM NOLEAD
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT PPTX
ON TABLE SET STYLE *
PAGESIZE='PPT Slide',
  ORIENTATION=LANDSCAPE,
$
TYPE=REPORT,
  OBJECT=STATUS-AREA,
  JUSTIFY=LEFT,
  PAGE-LOCATION=BOTTOM,
$
```

```
TYPE=REPORT,
  GRID=OFF,
  FONT='ARIAL',
  SIZE=12,
```

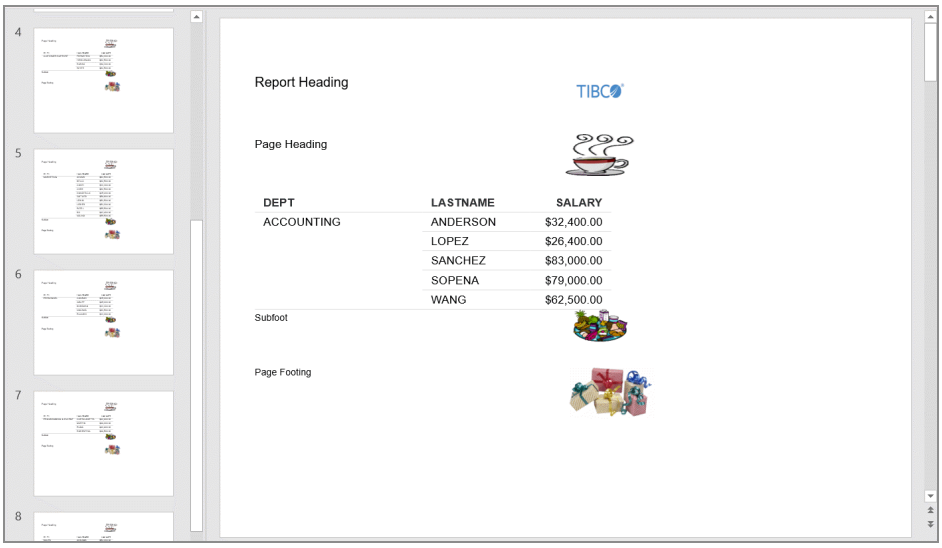
```
  STYLE=NORMAL,
  SQUEEZE=ON,
  TOPGAP=0.05,
  BOTTOMGAP=0.05,
  BORDER-COLOR=RGB(219 219 219),
  TITLELINE=SKIP,
  TOPMARGIN=.75,
  LEFTMARGIN=.5,
$
TYPE=TITLE,
  COLOR=RGB(51 51 51),
  STYLE=-UNDERLINE +BOLD,
$
TYPE=DATA,
  BORDER-TOP=LIGHT,
  BORDER-TOP-COLOR=RGB(219 219 219),
$
TYPE=SUBTOTAL,
  STYLE=BOLD,
  BORDER-TOP=LIGHT,
  BORDER-TOP-COLOR=RGB(219 219 219),
$
TYPE=TABHEADING,
  SIZE=14,
  JUSTIFY=LEFT,
$
TYPE=TABHEADING,
  IMAGE=tibco.gif,
  POSITION=(+4.500000 +0.000000),SIZE=(1 .6),
$
TYPE=TABFOOTING,
  SIZE=10,
$
```

```
TYPE=SUBHEAD,
  BACKCOLOR=RGB(246 246 246),
  BORDER-TOP=LIGHT,
  BORDER-TOP-COLOR=RGB(219 219 219),
$
TYPE=SUBHEAD,
  BY=1,
  BORDER-TOP=LIGHT,
  BORDER-TOP-COLOR=RGB(102 102 102),
$
TYPE=SUBHEAD,
  OBJECT=FIELD,
```

```
  STYLE=BOLD,
$
TYPE=SUBFOOT,
  SIZE=9,
  BORDER-TOP=LIGHT,
  BORDER-TOP-COLOR=RGB(219 219 219),
$
TYPE=TABFOOTING,
  IMAGE=gglogo.gif,
  POSITION=(+4.500000 +0.000000),
$
```

```
TYPE=HEADING,
  SIZE=12,
$
TYPE=HEADING,
  IMAGE=coffee.gif,
  POSITION=(+4.500000 +0.000000),SIZE=(1 .6),
$
TYPE=FOOTING,
  SIZE=10,
$
TYPE=FOOTING,
  STYLE=BOLD,
  JUSTIFY=LEFT,
  IMAGE=gifts.gif,
  POSITION=(+4.500000 +0.000000),
$
TYPE=SUBFOOT,
  SIZE=10,
$
TYPE=SUBFOOT,
  IMAGE=food.gif,
  POSITION=(+4.500000 +0.000000),
  SIZE=(1.000000 0.500000),
$
ENDSTYLE
END
```

The output is:




# Inserting Images in the Data Cells of a Report

The following request inserts images in the data cells of a report.

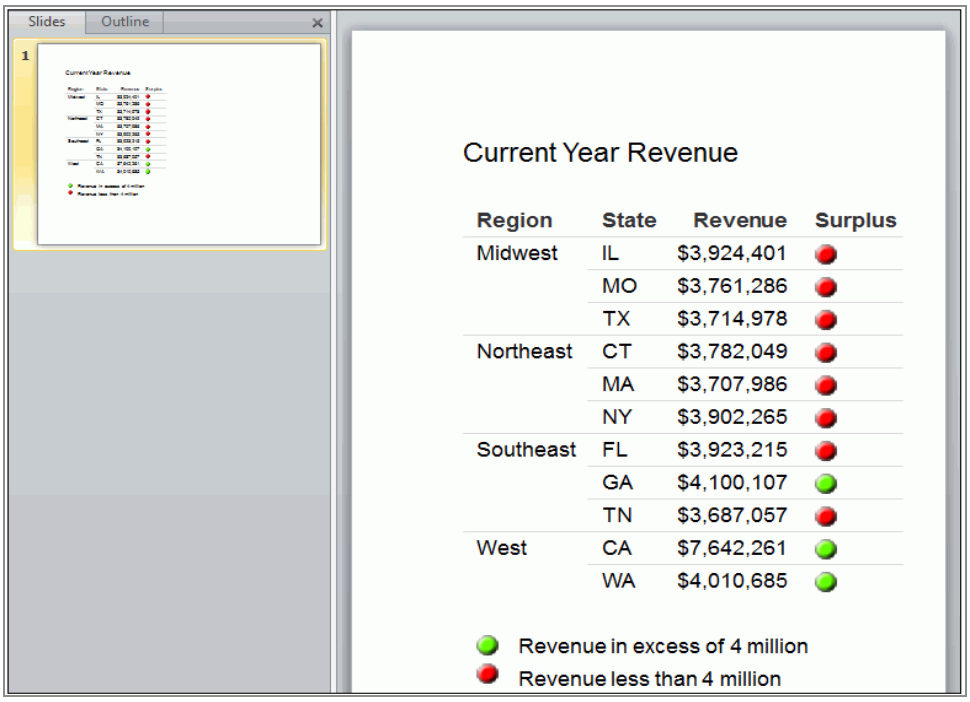
```
APP PATH IBISAMP IBIDEMO
TABLE FILE GGSALES
SUM DOLLARS/D17M AS 'Revenue'
COMPUTE Surplus/A15 = IF DOLLARS GE 4000000 THEN 'g1.gif' ELSE 'r1.gif';
BY REGION
BY ST
ON TABLE SUBHEAD
"Current Year Revenue"
FOOTING
"Revenue in excess of 4 million"
"Revenue less than 4 million"
ON TABLE SET PAGE-NUM NOLEAD
ON TABLE PCHOLD FORMAT PPTX
ON TABLE SET SQUEEZE ON
ON TABLE SET STYLE *
TYPE=REPORT,
     GRID=OFF,
     FONT='ARIAL',
     SIZE=14,
     STYLE=NORMAL,
     SQUEEZE=ON,
     TOPGAP=0.05,
     BOTTOMGAP=0.05,
     BORDER-COLOR=RGB(219 219 219),
```

```
     TITLELINE=SKIP,
     ORIENTATION = LANDSCAPE,TOPMARGIN=1,LEFTMARGIN=1,
$
TYPE=DATA, COLUMN=Surplus, IMAGE=(Surplus), SIZE=(.2 .2),$
TYPE=FOOTING,IMAGE=g1.gif, position=(.122 .055), SIZE=(.2 .2 ),$
TYPE=FOOTING,line=1,item=1,position=.5,$
TYPE=FOOTING,IMAGE='r1.gif', position=(.122 .33), SIZE=(.2 .2),$
TYPE=FOOTING,line=2,item=1, position=.5,$
TYPE=DATA,
     BORDER-TOP=LIGHT,
     BORDER-TOP-COLOR=RGB(219 219 219),
$
```

```
TYPE=TITLE,
     COLOR=RGB(51 51 51),
     STYLE=-UNDERLINE +BOLD,
$
TYPE=TABHEADING,
     SIZE=18,
     JUSTIFY=LEFT,
$
TYPE=TABFOOTING,
     SIZE=10,
$
TYPE=HEADING,
     JUSTIFY=LEFT,
     SIZE=12,
$
TYPE=SUBHEAD,
     BACKCOLOR=RGB(246 246 246),
     BORDER-TOP=LIGHT,
     BORDER-TOP-COLOR=RGB(219 219 219),
$
TYPE=SUBHEAD,
      BY=1,
      BORDER-TOP=LIGHT,
      BORDER-TOP-COLOR=RGB(102 102 102),
$
TYPE=SUBHEAD,
     OBJECT=FIELD,
     STYLE=BOLD,
$
TYPE=SUBFOOT,
     SIZE=9,
     BORDER-TOP=LIGHT,
     BORDER-TOP-COLOR=RGB(219 219 219),
```

```
$
END
```

The report output is as follows:




# Displaying PPTX Charts in PNG Image Format

The PPTXGRAPHTYPE attribute enhances the quality of charts embedded into PowerPoint (PPTX) slides. As of Release 8.2.01M, you can use the PNG output format to enhance the image and text quality and support transparency.

This is useful for a number of important scenarios, including use of templates with background color and for overlapping a chart with other components and drawing objects.

# Display PPTX Charts in PNG Image Format

```
SET PPTXGRAPHTYPE={PNG|PNG_NOSCALE|JPEG}
```

where:

**PNG**

Scales the PNG image to twice its dimensions to get significantly improved quality. This may cause problems if you have non-scalable items in the chart, such as text with absolute point sizes (including embedded scales headings). The output file is also larger due to the larger bitmap. Text within the chart is noticeable sharper than the legacy JPEG format.

PNG preserves font sizes in the chart when it is internally rescaled for increased resolution. It converts absolute font sizes set in the stylesheet (*GRAPH_SCRIPT) to sizes expressed in virtual coordinates (which are relative to the dimensions of the chart) and generates font sizes for embedded headings and footings in virtual coordinates.

**PNG_NOSCALE**

Renders in PNG, but does not scale. This produces slightly better quality than JPEG. Going from JPEG to PNG_NOSCALE makes the chart sharper, but has only a slight effect on the text.

**JPEG**

Indicates legacy format. This is the default value.

# Displaying a PNG Chart With Transparency

Transparency enables greater control over how components and drawing objects can be placed together on a slide. The following report contains a text box, report, and chart that can be intertwined on the page because the background of the chart does not cover the contents of the other objects.

```
SET PPTXGRAPHTYPE=PNG

COMPOUND LAYOUT PCHOLD FORMAT PPTX
UNITS=IN, $
SECTION=section1, LAYOUT=ON, MERGE=OFF, ORIENTATION=LANDSCAPE,
PAGESIZE=PPT Slide, $
PAGELAYOUT=1, NAME='Page layout 1', text='Page layout 1',
BOTTOMMARGIN=0.5, TOPMARGIN=0.5, $
COMPONENT='report1', TEXT='report1', POSITION=(5.088 1.375),
DIMENSION=(2.260 2.500), $
COMPONENT='chart2', TEXT='chart2', POSITION=(0.815 1.351),
```

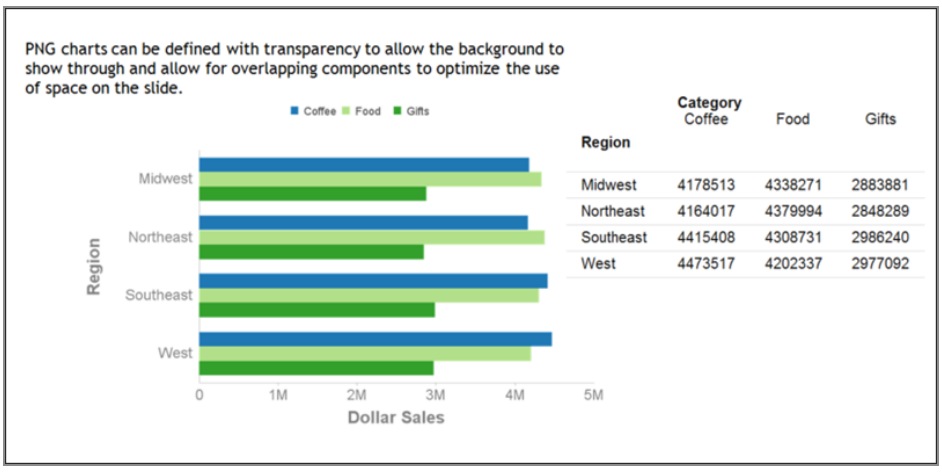
```
DIMENSION=(5.104 2.917), COMPONENT-TYPE=GRAPH,  $
OBJECT=STRING, NAME='text1', TEXT='<left>PNG charts can be defined with
transparency to allow the background to show through and allow for
overlapping components to optimize the use of space on the slide.
</left>',
POSITION=(0.500 0.979), MARKUP=ON, WRAP=ON, DIMENSION=(4.635 0.729),
font='TREBUCHET MS', color=RGB(0 0 0), size=10, $
END
```

```
SET COMPONENT='report1'
TABLE FILE GGSALES
SUM
   GGSALES.SALES01.DOLLARS
BY GGSALES.SALES01.REGION
ACROSS LOWEST GGSALES.SALES01.CATEGORY
ON TABLE SET PAGE-NUM NOLEAD
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT PPTX
ON TABLE SET STYLE *
INCLUDE=IBFS:/FILE/IBI_HTML_DIR/ibi_themes/Warm.sty,$
$
ENDSTYLE
END
```

```
SET COMPONENT='chart2'
GRAPH FILE ggsales
SUM GGSALES.SALES01.DOLLARS
BY GGSALES.SALES01.CATEGORY
ACROSS GGSALES.SALES01.REGION
ON GRAPH PCHOLD FORMAT HTML
ON GRAPH SET VZERO OFF
ON GRAPH SET HTMLENCODE ON
ON GRAPH SET GRAPHDEFAULT OFF
ON GRAPH SET EMBEDHEADING ON
ON GRAPH SET GRWIDTH 1
ON GRAPH SET UNITS 'PIXELS'
ON GRAPH SET HAXIS 770.0
ON GRAPH SET VAXIS 405.0
ON GRAPH SET GRMERGE ADVANCED
ON GRAPH SET GRMULTIGRAPH 0
ON GRAPH SET GRLEGEND 1
ON GRAPH SET GRXAXIS 1
ON GRAPH SET LOOKGRAPH HBAR
ON GRAPH SET STYLE *
```

```
*GRAPH_SCRIPT
setPieDepth(0);
setPieTilt(0);
setDepthRadius(0);
setPlace(true);
setCurveFitEquationDisplay(false);
*END
INCLUDE=IBFS:/FILE/IBI_HTML_DIR/ibi_themes/Warm.sty,$
TYPE=REPORT, TITLETEXT='WebFOCUS Report', $
*GRAPH_SCRIPT
setFillColor(getChartBackground(),new Color(255,255,255,0));
setLegendPosition(4);
*GRAPH_JS_FINAL
"blaProperties": {
    "orientation": "horizontal"
},
"agnosticSettings": {
    "chartTypeFullName": "Bar_Clustered_Horizontal"
}
*END
ENDSTYLE
END
-RUN

COMPOUND END
```

The output is:




| Region | Category Coffee | Food | Gifts |
|---|---|---|---|
| Midwest | 4178513 | 4338271 | 2883881 |
| Northeast | 4164017 | 4379994 | 2848289 |
| Southeast | 4415408 | 4308731 | 2986240 |
| West | 4473517 | 4202337 | 2977092 |

# Displaying a PNG Image With Transparency in a Designated Template

The following compound report places a chart defined with transparency on a slide from the designated template that contains background colors and patterns.

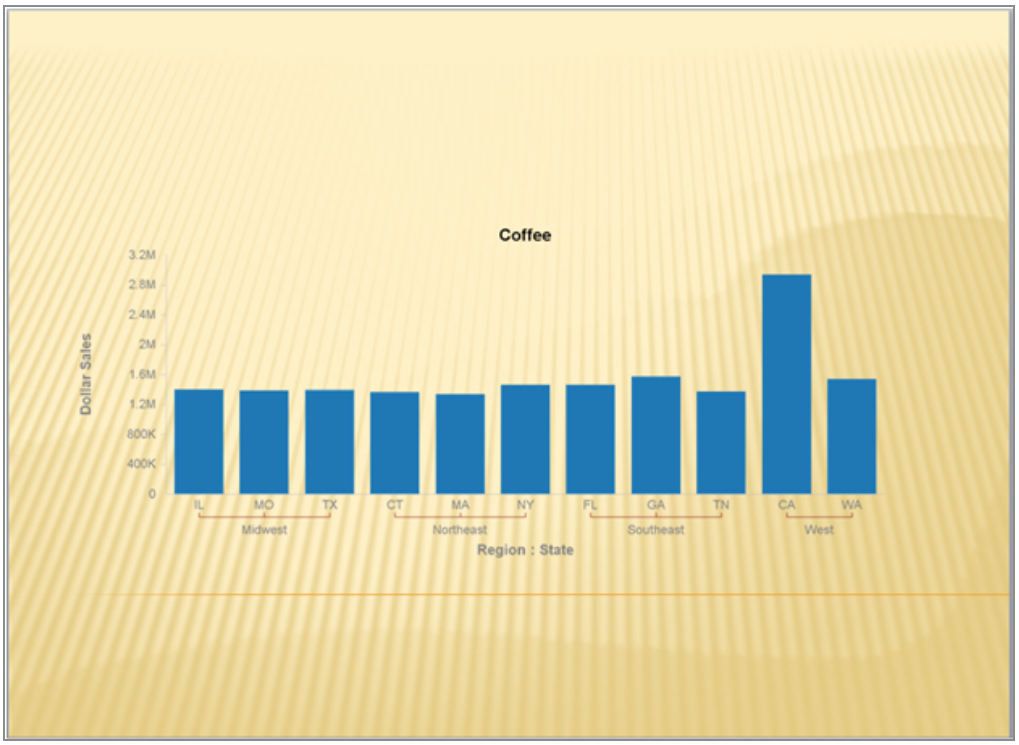
```
SET PPTXGRAPHTYPE=PNG

COMPOUND LAYOUT PCHOLD FORMAT PPTX
UNITS=IN, $
SECTION=section1, LAYOUT=ON, MERGE=OFF, ORIENTATION=LANDSCAPE,
PAGESIZE=Letter, $
PAGELAYOUT=1, NAME='Page layout 1', text='Page layout 1', $
COMPONENT='ppt_template', $
COMPONENT='chart1', TEXT='chart1', POSITION=(0.500 2.10),
DIMENSION=(9.336 3.437),
COMPONENT-TYPE=GRAPH, ARREPORTSIZE=DIMENSION, $
END

SET COMPONENT='ppt_template'
TABLE FILE SYSCOLUM
SUM TBNAME NOPRINT
IF READLIMIT EQ 1
ON TABLE PCHOLD FORMAT PPTX TEMPLATE 'golden.potx' SLIDENUMBER 1
END
```

```
SET COMPONENT='chart1'
GRAPH FILE ggsales
SUM GGSALES.SALES01.DOLLARS
BY GGSALES.SALES01.CATEGORY
BY GGSALES.SALES01.REGION
BY GGSALES.SALES01.ST
ON GRAPH PCHOLD FORMAT HTML
ON GRAPH SET EMBEDHEADING ON
ON GRAPH SET GRWIDTH 1
ON GRAPH SET UNITS PIXELS
ON GRAPH SET HAXIS 770.0
ON GRAPH SET VAXIS 405.0
ON GRAPH SET GRMERGE ADVANCED
ON GRAPH SET GRMULTIGRAPH 1
ON GRAPH SET GRLEGEND 0
ON GRAPH SET GRXAXIS 2
```

```
ON GRAPH SET LOOKGRAPH VBAR
ON GRAPH SET STYLE *
```

```
*GRAPH_SCRIPT
setPieDepth(0);
setPieTilt(0);
setDepthRadius(0);
setCurveFitEquationDisplay(false);
setPlace(true);
*END
INCLUDE=IBFS:/FILE/IBI_HTML_DIR/ibi_themes/Warm.sty,$
TYPE=REPORT, TITLETEXT='WebFOCUS Report', $
*GRAPH_SCRIPT
setFillType(getChartBackground(),2);
setGradientNumPins(getChartBackground(),2);
setFillColor(getChartBackground(),new Color(255,255,255,0));
setFillType(getChartBackground(),1);
*END
ENDSTYLE
END
-RUN
COMPOUND END
```

The output is:




# Drill Down From Microsoft PowerPoint

Two types of drill downs are supported:

- WebFOCUS content
- External URL

When working in the WebFOCUS Repository or Content environment, drill-down hyperlinks in PPTX reports will not work when Microsoft PowerPoint opens in a PowerPoint application window instead of in a browser. The current security context and any previously established session-related cookies are not retained and this changes user authorization. The recommendation is to configure one of the three security models described below, to allow successful drill down from reports displayed in a Microsoft PowerPoint application.

**The Remember Me Security Model**

The Remember Me Security model is a method of user authentication that enables WebFOCUS to store a trusted sign-in cookie locally, on the workstation, for a default period of 14 days. WebFOCUS does not however, store the user password in the sign-in cookie.

Enable the Remember Me feature on the Sign-in page. If the end-user uses the Remember Me feature, a persistent cookie is used.

**Public Access**

Public Access is useful for procedures that are available to everyone within an organization or the general public and do not require authentication. Set up WebFOCUS security such that the PUBLIC user has the necessary permissions to drill down to reports.

**Integrated Windows Authentication**

Integrated Windows Authentication (IWA) is enabled by configuring the browser. Use SSO with IIS/Tomcat Integrated Windows Authentication. Renegotiation occurs automatically and the PowerPoint formatted reports display correctly.

Refer to the *ibi™ WebFOCUS® Security and Administration* manual for details on these authentication models.

# Drilling Down to an External URL

The following request places a reference to an external URL on the grand total line tag.

```
TABLE FILE GGSALES
SUM
  GGSALES.SALES01.BUDDOLLARS/D12CM
  GGSALES.SALES01.DOLLARS/D12CM
BY GGSALES.SALES01.REGION
BY GGSALES.SALES01.CATEGORY
BY GGSALES.SALES01.PRODUCT
HEADING
"REVENUE BY REGION "
ON GGSALES.SALES01.REGION SUBTOTAL AS '*TOTAL'
WHERE GGSALES.SALES01.CATEGORY NE 'Gifts';
ON TABLE SET PAGE-NUM NOLEAD
ON TABLE COLUMN-TOTAL AS 'TOTAL'
ON TABLE PCHOLD FORMAT PPTX
ON TABLE SET STYLE *
PAGESIZE='PPT Slide',
  ORIENTATION=LANDSCAPE,
$
```

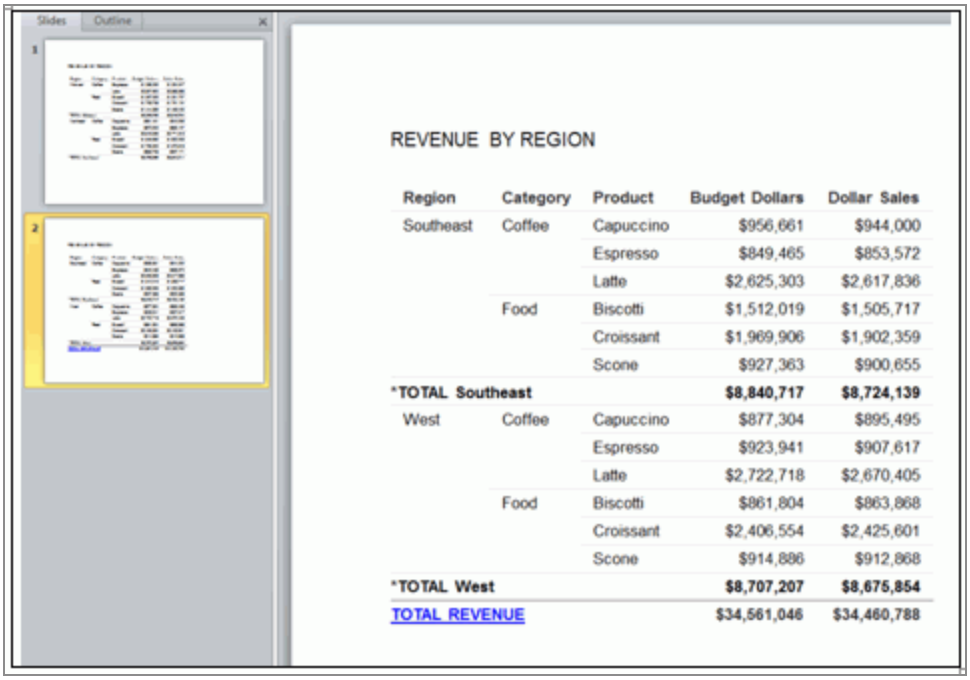
```
TYPE=REPORT,
  OBJECT=STATUS-AREA,
```

```
  JUSTIFY=LEFT,
  PAGE-LOCATION=BOTTOM,
$
TYPE=REPORT,
  GRID=OFF,
  FONT='ARIAL',
  SIZE=12,
  STYLE=NORMAL,
  SQUEEZE=ON,
  TOPGAP=0.05,
  BOTTOMGAP=0.05,
  BORDER-COLOR=RGB(219 219 219),
  TITLELINE=SKIP,
  TOPMARGIN=1,
  LEFTMARGIN=1,
$
TYPE=TITLE,
  COLOR=RGB(51 51 51),
  STYLE=-UNDERLINE +BOLD,
$
TYPE=DATA,
  BORDER-TOP=LIGHT,
  BORDER-TOP-COLOR=RGB(219 219 219),
$
TYPE=HEADING,
  JUSTIFY=LEFT,
  SIZE=14,
$
TYPE=SUBTOTAL,
  STYLE=BOLD,
  BORDER-TOP=LIGHT,
  BORDER-TOP-COLOR=RGB(219 219 219),
$
TYPE=GRANDTOTAL,
  OBJECT=TAG,
  URL=http://www.tibco.com,
$
```

```
TYPE=REPORT,
  OBJECT=STATUS-AREA,
  JUSTIFY=LEFT,
  PAGE-LOCATION=BOTTOM,
$
TYPE=GRANDTOTAL,
  COLOR=RGB(51 51 51),
  STYLE=BOLD,
```

```
  BORDER-TOP=LIGHT,
  BORDER-TOP-COLOR=RGB(102 102 102),
$
ENDSTYLE
END
```

The output is:



REVENUE BY REGION

| Region | Category | Product | Budget Dollars | Dollar Sales |
|---|---|---|---|---|
| Southeast | Coffee | Capuccino | $956,661 | $944,000 |
| | | Espresso | $849,465 | $853,572 |
| | | Latte | $2,625,303 | $2,617,836 |
| | Food | Biscotti | $1,512,019 | $1,505,717 |
| | | Croissant | $1,969,906 | $1,902,359 |
| | | Scone | $927,363 | $900,655 |
| ***TOTAL Southeast** | | | **$8,840,717** | **$8,724,139** |
| West | Coffee | Capuccino | $877,304 | $895,495 |
| | | Espresso | $923,941 | $907,617 |
| | | Latte | $2,722,718 | $2,670,405 |
| | Food | Biscotti | $861,804 | $863,868 |
| | | Croissant | $2,406,554 | $2,425,601 |
| | | Scone | $914,886 | $912,868 |
| ***TOTAL West** | | | **$8,707,207** | **$8,675,854** |
| TOTAL REVENUE | | | $34,561,046 | $34,460,788 |

# PowerPoint PPTX Presentations Using Templates

PPTX report output can be generated based on PowerPoint templates. This feature allows for the integration of WebFOCUS reports into presentations containing multiple slides. Any native PowerPoint template can be used to generate a new presentation containing a WebFOCUS report.

The following PowerPoint file types can be used as template files to generate PPTX presentations.

| Template File Type | Presentation Output Generated |
|---|---|
| Template (.potx) | Presentation (.pptx) |
| Macro-Enabled Template (.potm) | Macro-Enabled presentation (.pptm) |
| Presentation (.pptx) | Presentation (.pptx) |
| Macro-Enabled presentation (.pptm) | Macro-Enabled presentation (.pptm) |

**Note:** For more information on working with active content in macro-enabled templates, see the Microsoft webpage: https://support.office.com/en-nz/article/Enable-or-disable-macros-in-Office-documents-7b4fdd2e-174f-47e2-9611-9efe4f860b12

# Using Standard PowerPoint Templates (POTX)

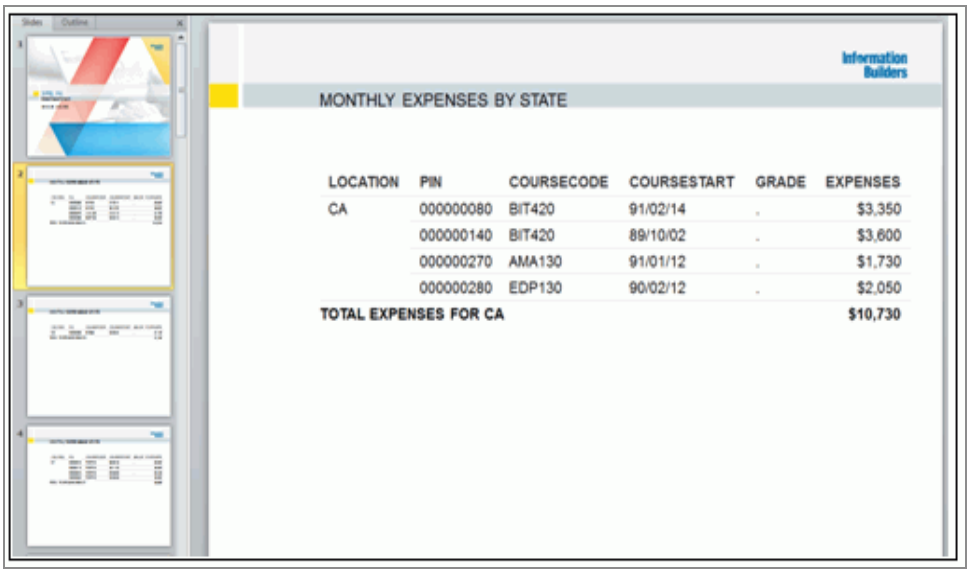
In the following request, the report occupies multiple slides. The designated slide is replaced by as many slides as are needed to display the report output.

```
TABLE FILE TRAINING
SUM
TRAINING.TRAINING.EXPENSES/D12CM
BY TRAINING.TRAINING.LOCATION
BY TRAINING.TRAINING.PIN
BY LOWEST TRAINING.TRAINING.COURSECODE
BY TRAINING.TRAINING.COURSESTART
BY TRAINING.TRAINING.GRADE
ON TRAINING.TRAINING.LOCATION SUBTOTAL AS 'TOTAL EXPENSES FOR'
ON TRAINING.TRAINING.LOCATION PAGE-BREAK
HEADING
"MONTHLY EXPENSES BY STATE"
" "
ON TABLE SET ASNAMES ON
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT PPTX TEMPLATE 'ibi_template.potx' SLIDENUMBER 2
ON TABLE SET STYLE *
PAGESIZE='PPT Slide',
  ORIENTATION=LANDSCAPE,
$
TYPE=REPORT,
  OBJECT=STATUS-AREA,
  JUSTIFY=LEFT,
```

```
  PAGE-LOCATION=BOTTOM,
$
TYPE=REPORT,
  GRID=OFF,
  FONT='ARIAL',
  SIZE=14,
  STYLE=NORMAL,
  SQUEEZE=ON,
  TOPGAP=0.05,
  BOTTOMGAP=0.05,
  BORDER-COLOR=RGB(219 219 219),
  TITLELINE=SKIP,
  TOPMARGIN=.1,
  LEFTMARGIN=1.5,
$
```

```
TYPE=TITLE,
  COLOR=RGB(51 51 51),
  STYLE=-UNDERLINE +BOLD,
$
TYPE=DATA,
  BORDER-TOP=LIGHT,
  BORDER-TOP-COLOR=RGB(219 219 219),
$
TYPE=HEADING,
  JUSTIFY=LEFT,
  SIZE=16,
$
TYPE=SUBTOTAL,
  STYLE=BOLD,
  BORDER-TOP=LIGHT,
  BORDER-TOP-COLOR=RGB(219 219 219),
$
ENDSTYLE
END
```

The output is:




# Using a Multi-Report Request to Populate Designated Slides in a Template

The following request is a technique for inserting different components across multiple slides.

```
-* Replace Slide #2
TABLE FILE GGSALES
HEADING
"FIRST SLIDE"
SUM
DOLLARS/D12CM UNITS
BY REGION AS 'My Field'
BY CATEGORY
ON TABLE COLUMN-TOTAL
ON TABLE HOLD AS SLIDE_A FORMAT PPTX TEMPLATE 'ibi_template.potx'
SLIDENUMBER 2
ON TABLE SET STYLE *
TYPE=REPORT,
  OBJECT=STATUS-AREA,
  JUSTIFY=LEFT,
  PAGE-LOCATION=BOTTOM,
$
TYPE=REPORT,
  GRID=OFF,
  FONT='ARIAL',
```

```
  SIZE=14,
  STYLE=NORMAL,
  SQUEEZE=ON,
  TOPGAP=0.05,
  BOTTOMGAP=0.05,
  BORDER-COLOR=RGB(219 219 219),
  TITLELINE=SKIP,
  ORIENTATION = LANDSCAPE,
  TOPMARGIN=.1,
  LEFTMARGIN=1.5,
$
TYPE=TITLE,
  COLOR=RGB(51 51 51),
  STYLE=-UNDERLINE +BOLD,
$
```

```
TYPE=DATA,
  BORDER-TOP=LIGHT,
  BORDER-TOP-COLOR=RGB(219 219 219),
$
TYPE=HEADING,
  JUSTIFY=LEFT,
  SIZE=16,
$
TYPE=DATA,
  COLUMN=DOLLARS,
  COLOR=BLUE,
$
TYPE=REPORT,
  COLUMN=REGION,
  COLOR=RED,
$
TYPE=REPORT,
  COLUMN=CATEGORY,
  COLOR=GREEN,
$
TYPE=GRANDTOTAL,
  COLOR=RGB(51 51 51),
  STYLE=BOLD,
  BORDER-TOP=LIGHT,
  BORDER-TOP-COLOR=RGB(102 102 102),
$
END
-* Replace Slide #3
TABLE FILE GGSALES HEADING
"SECOND SLIDE"
```

```
SUM DOLLARS/D12CM UNITS
BY REGION AS 'My Field'
BY CATEGORY
ON TABLE COLUMN-TOTAL
ON TABLE HOLD AS SLIDE_1 FORMAT PPTX TEMPLATE 'slide_a.pptx' SLIDENUMBER
3
ON TABLE COLUMN-TOTAL
ON TABLE SET STYLE *
$
TYPE=REPORT,
  OBJECT=STATUS-AREA,
  JUSTIFY=LEFT,
  PAGE-LOCATION=BOTTOM,
$
```

```
TYPE=REPORT,
  GRID=OFF,
  FONT='ARIAL',
  SIZE=14,
  STYLE=NORMAL,
  SQUEEZE=ON,
  TOPGAP=0.05,
  BOTTOMGAP=0.05,
  BORDER-COLOR=RGB(219 219 219),
  TITLELINE=SKIP,
  ORIENTATION = LANDSCAPE,
  TOPMARGIN=.1,
  LEFTMARGIN=1.5,
$
TYPE=TITLE,
  COLOR=RGB(51 51 51),
  STYLE=-UNDERLINE +BOLD,
$
TYPE=DATA,
  BORDER-TOP=LIGHT,
  BORDER-TOP-COLOR=RGB(219 219 219),
$
TYPE=HEADING,
  JUSTIFY=LEFT,
  SIZE=16,
$
TYPE=DATA,
  COLUMN=DOLLARS,
  COLOR=BLUE,
$
TYPE=REPORT,
```

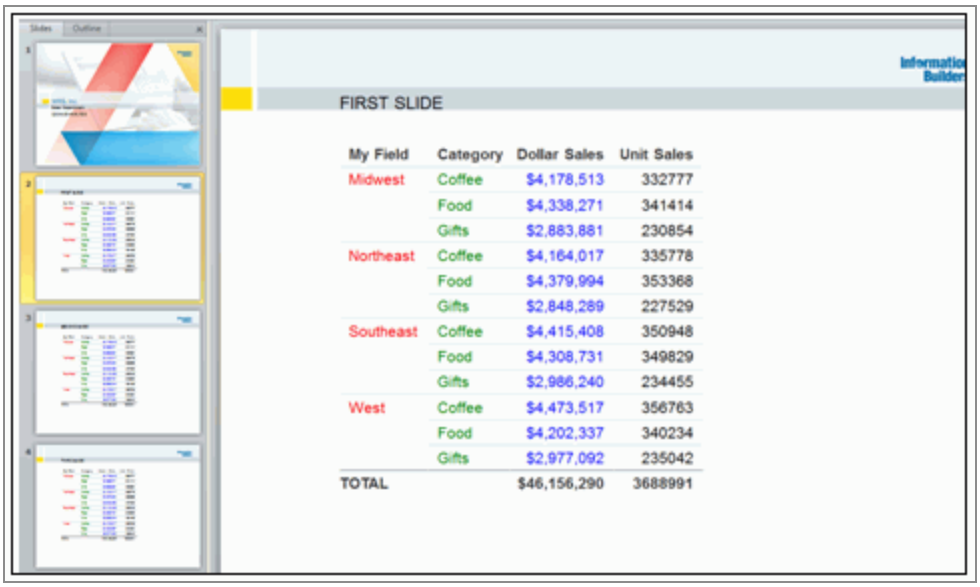
```
  COLUMN=REGION,
  COLOR=RED,
$
TYPE=REPORT,
  COLUMN=CATEGORY,
  COLOR=GREEN,
$
TYPE=GRANDTOTAL,
  COLOR=RGB(51 51 51),
  STYLE=BOLD,
  BORDER-TOP=LIGHT,
  BORDER-TOP-COLOR=RGB(102 102 102),
$
END
```

```
-* Replace Slide #4
TABLE FILE GGSALES
HEADING
"THIRD SLIDE"
SUM
DOLLARS/D12CM
UNITS
BY REGION AS 'My Field'
BY CATEGORY
ON TABLE COLUMN-TOTAL
ON TABLE PCHOLD AS THRID_SLIDE FORMAT PPTX TEMPLATE 'SLIDE_1.pptx'
SLIDENUMBER 4
ON TABLE SET STYLE *
TYPE=REPORT,
  OBJECT=STATUS-AREA,
  JUSTIFY=LEFT,
  PAGE-LOCATION=BOTTOM,
$
TYPE=REPORT,
  GRID=OFF,
  FONT='ARIAL',
  SIZE=14,
  STYLE=NORMAL,
  SQUEEZE=ON,
  TOPGAP=0.05,
  BOTTOMGAP=0.05,
  BORDER-COLOR=RGB(219 219 219),
  TITLELINE=SKIP,
  ORIENTATION = LANDSCAPE,
  TOPMARGIN=.1,
  LEFTMARGIN=1.5,
```

```
$
TYPE=TITLE,
  COLOR=RGB(51 51 51),
  STYLE=-UNDERLINE +BOLD,
$
TYPE=DATA,
  BORDER-TOP=LIGHT,
  BORDER-TOP-COLOR=RGB(219 219 219),
$
TYPE=HEADING,
  JUSTIFY=LEFT,
  SIZE=16,
```

```
$
TYPE=DATA,
  COLUMN=DOLLARS,
  COLOR=BLUE,
$
TYPE=REPORT,
  COLUMN=REGION,
  COLOR=RED,
$
TYPE=REPORT,
  COLUMN=CATEGORY,
  COLOR=GREEN,
$
TYPE=GRANDTOTAL,
  COLOR=RGB(51 51 51),
  STYLE=BOLD,
  BORDER-TOP=LIGHT,
  BORDER-TOP-COLOR=RGB(102 102 102),
$
END
```

The output is:




# PowerPoint PPTX Compound Syntax

PowerPoint Compound Documents generate presentations that may contain multiple slides. The components of a PowerPoint Compound Document can include standard tables and charts.

## Generating a Compound Document

The following request creates a slide deck, which presents the selected information in standard tables and charts.

```
SET HTMLARCHIVE=ON
COMPOUND LAYOUT PCHOLD FORMAT PPTX
UNITS=IN, $
SECTION=section1, LAYOUT=ON, MERGE=OFF,
ORIENTATION=LANDSCAPE, PAGESIZE=PPT Slide, SHOW_GLOBALFILTER=OFF, $
PAGELAYOUT=1, NAME='Page layout 1', text='Page layout 1',
BOTTOMMARGIN=0.2, TOPMARGIN=0.5, LEFTMARGIN=2.0, $
COMPONENT='chart1', TEXT='chart1', POSITION=(0.707 0.520),
DIMENSION=(8.750 2.917), COMPONENT-TYPE=GRAPH, $
COMPONENT='report1', TEXT='report1', POSITION=(0.500 3.542),
DIMENSION=(9.271 3.646), $
END
```

```
SET COMPONENT='chart1'
ENGINE INT CACHE SET ON
-DEFAULTH &WF_STYLE_UNITS='PIXELS';
-DEFAULTH &WF_STYLE_HEIGHT='405.0';
-DEFAULTH &WF_STYLE_WIDTH='770.0';
-DEFAULTH &WF_TITLE='WebFOCUS Report';
GRAPH FILE ibisamp/ggsales
SUM GGSALES.SALES01.DOLLARS
BY GGSALES.SALES01.REGION
BY TOTAL HIGHEST GGSALES.SALES01.DOLLARS NOPRINT
BY GGSALES.SALES01.ST
ON GRAPH PCHOLD FORMAT PPTX
ON GRAPH SET HTMLENCODE ON
ON GRAPH SET GRAPHDEFAULT OFF
ON GRAPH SET ARGRAPHENGIN JSCHART
ON GRAPH SET EMBEDHEADING ON
ON GRAPH SET VZERO OFF
ON GRAPH SET GRWIDTH 1
```

```
ON GRAPH SET UNITS &WF_STYLE_UNITS
ON GRAPH SET HAXIS &WF_STYLE_WIDTH
ON GRAPH SET VAXIS &WF_STYLE_HEIGHT
ON GRAPH SET GRMERGE ADVANCED
ON GRAPH SET GRMULTIGRAPH 1
ON GRAPH SET GRLEGEND 0
ON GRAPH SET GRXAXIS 2
ON GRAPH SET LOOKGRAPH VBAR
ON GRAPH SET STYLE *
*GRAPH_SCRIPT
setPieDepth(0);
setPieTilt(0);
setDepthRadius(0);
setCurveFitEquationDisplay(false);
setPlace(true);
setPieFeelerTextDisplay(1);
setUseSeriesShapes(true);
setMarkerSizeDefault(50);
*END
INCLUDE=IBFS:/FILE/IBI_HTML_DIR/javaassist/intl/EN/combine_
templates/warm.sty,$
TYPE=REPORT, TITLETEXT=&WF_TITLE.QUOTEDSTRING, $
*GRAPH_SCRIPT
setReportParsingErrors(false);
setSelectionEnableMove(false);
setFillType(getSeries(0),2);
setGradientPinLeftColor0(getSeries(0),new Color(0,127,192));
```

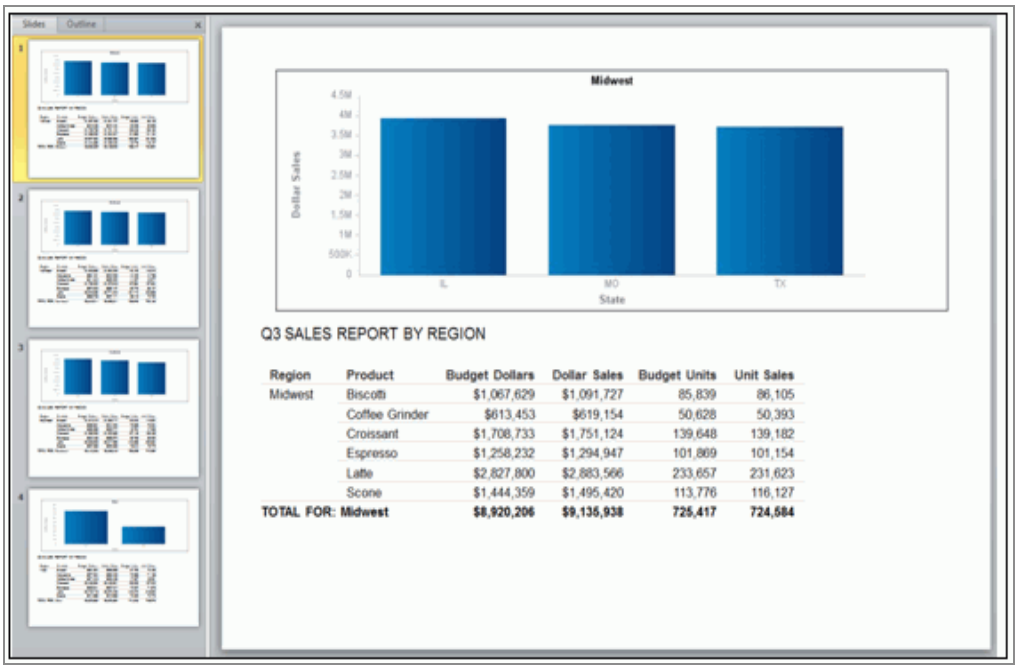
```
setGradientPinRightColor0(getSeries(0),new Color(0,127,192));
setGradientPinLeftColor2(getSeries(0),new Color(0,127,192));
setGradientPinRightColor2(getSeries(0),new Color(0,127,192));
setGradientPinLeftColor1(getSeries(0),new Color(0,64,128));
setGradientPinRightColor1(getSeries(0),new Color(0,64,128));
setGradientPinPosition0(getSeries(0),0.0);
setGradientPinPosition1(getSeries(0),1.0);
setPieTilt(0);
setPieDepth(0);
setDepthRadius(0);
setDepthAngle(0);
setFillType(getSeries(7),2);
setGradientPinPosition0(getSeries(7),0.0);
setGradientPinPosition1(getSeries(7),1.0);
setFillType(getSeries(9),2);
setGradientDirection(getSeries(9),16);
setGradientPinPosition0(getSeries(9),0.0);
setGradientPinPosition1(getSeries(9),1.0);
*END
ENDSTYLE
END
-RUN
```

```
SET COMPONENT='report1'
TABLE FILE IBISAMP/GGSALES
SUM
  GGSALES.SALES01.BUDDOLLARS/D12CM
  GGSALES.SALES01.DOLLARS/D12CM
  GGSALES.SALES01.BUDUNITS/D12C
  GGSALES.SALES01.UNITS/D12C
BY GGSALES.SALES01.REGION
BY GGSALES.SALES01.PRODUCT
ON GGSALES.SALES01.REGION SUBTOTAL AS 'TOTAL FOR:'
ON GGSALES.SALES01.REGION PAGE-BREAK
HEADING
"Q3 SALES REPORT BY REGION"
WHERE GGSALES.SALES01.PRODUCT NE 'Coffee Pot' OR 'Mug' OR 'Thermos';
ON TABLE SET PAGE-NUM NOLEAD
ON TABLE SET ASNAMES ON
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT PPTX
ON TABLE SET STYLE *
  PAGESIZE='PPT Slide',
  LEFTMARGIN=1.000000,
  TOPMARGIN=0.500000,
  BOTTOMMARGIN=0.000000,
```

```
  SQUEEZE=ON,
  ORIENTATION=LANDSCAPE,
$
TYPE=REPORT,
  BORDER-TOP-COLOR=RGB(219 219 219),
  BORDER-BOTTOM-COLOR=RGB(219 219 219),
  BORDER-LEFT-COLOR=RGB(219 219 219),
  BORDER-RIGHT-COLOR=RGB(219 219 219),
  FONT='ARIAL',
  SIZE=12,
    TITLELINE=SKIP,
  STYLE=NORMAL,
  TOPGAP=0.041667,
$
TYPE=DATA,
  BORDER-TOP=LIGHT,
  BORDER-TOP-COLOR=RGB(219 219 219),
$
```

```
TYPE=TITLE,
  COLOR=RGB(51 51 51),
  STYLE=-UNDERLINE+BOLD,
$
TYPE=HEADING,
  SIZE=14,
  JUSTIFY=LEFT,
$
TYPE=SUBTOTAL,
  BORDER-TOP=LIGHT,
  BORDER-TOP-COLOR=RGB(219 219 219),
  STYLE=BOLD,
$
TYPE=REPORT,
  OBJECT=STATUS-AREA,
  JUSTIFY=LEFT,
  PAGE-LOCATION=BOTTOM,
$
ENDSTYLE
END
COMPOUND END
```

The resulting Compound Document output is:




# Coordinated Compound Layout Reports

A Coordinated Compound Layout report is coordinated so that all reports and graphs that contain a common sort field are burst into separate page layouts. Pages are generated for each value of the common sort field, with every component displaying the data it retrieved for that value on that page. You create a Coordinated Compound Layout report by specifying MERGE=ON in the SECTION declaration for the Compound Layout report.

In a Coordinated Compound Layout report, if at least one component contains data for a specific sort field value, a page is generated for that value even though some of the components may be missing.

While the length of the report will always include all of the rows of data generated by the query, the width of the report is limited by the size of the defined component container. This means that paneling is not supported for Compound Reports, although it is for non-Compound PPTX Reports.

If the width of the report data is wider than the defined page size, a panel (or horizontal overflow page) is automatically generated.

In legacy compound syntax, if one of the component reports is too large to fit within the defined page width, execution is halted and the user is presented with an error message stating that paneling is not supported.

In Compound Layout syntax, if a component is too wide to fit within the defined container, the report wraps the contents within the container. The container size is defined through a combination of the POSITION and DIMENSIONS parameters for the component within the compound syntax.

# Generating a Coordinated Compound Layout Report

The following request generates a Coordinated Compound Layout report. This Compound Report is coordinated by Region, so that individual slides are generated for each value of the primary Key, Region.

```
SET HTMLARCHIVE=ON
*-HOLD_SOURCE
COMPOUND LAYOUT PCHOLD FORMAT PPTX
UNITS=IN, $
SECTION=section1, LAYOUT=ON, MERGE=ON, ORIENTATION=LANDSCAPE,
PAGESIZE=PPT Slide, SHOW_GLOBALFILTER=OFF,$
PAGELAYOUT=1, NAME='Page layout 1', text='Page layout 1',
BOTTOMMARGIN=0.5,
TOPMARGIN=0.5, $
COMPONENT='report1', TEXT='report1', POSITION=(0.500 0.625),
DIMENSION=(* *), $
COMPONENT='report2', TEXT='report2', POSITION=(0.712 0.771),
DIMENSION=(* *), $
COMPONENT='report3', TEXT='report3', POSITION=(5.702 0.759),
DIMENSION=(* *), $
END
SET COMPONENT='report1'
TABLE FILE WF_RETAIL
BY WF_RETAIL.WF_RETAIL_GEOGRAPHY_CUSTOMER.BUSINESS_REGION NOPRINT
HEADING
"PROFIT REPORTS FOR <WF_RETAIL.WF_RETAIL_GEOGRAPHY_CUSTOMER.BUSINESS_
REGION
<+15>
DISCOUNTS APPLIED: <WF_RETAIL.WF_RETAIL_GEOGRAPHY_CUSTOMER.BUSINESS_
REGION"
" "
ON TABLE SET ASNAMES ON
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT PPTX
ON TABLE SET STYLE *
```

```
TYPE=REPORT,
  GRID=OFF,
  FONT='ARIAL',
  SIZE=9,
  STYLE=NORMAL,
  SQUEEZE=ON,
  TOPGAP=0.05,
  BOTTOMGAP=0.05,
  PAGECOLOR='WHITE',
  BORDER-COLOR=RGB(219 219 219),
  TITLELINE=SKIP,
    TOPMARGIN=.5,
    LEFTMARGIN=.15,
$
TYPE=HEADING,
  JUSTIFY=LEFT,
  SIZE=14,
$
ENDSTYLE
END
SET COMPONENT='report2'
TABLE FILE WF_RETAIL
SUM
WF_RETAIL.WF_RETAIL_SALES.COGS_US
WF_RETAIL.WF_RETAIL_SALES.GROSS_PROFIT_US
BY WF_RETAIL.WF_RETAIL_GEOGRAPHY_CUSTOMER.BUSINESS_REGION NOPRINT
BY WF_RETAIL.WF_RETAIL_PRODUCT.PRODUCT_CATEGORY
ON WF_RETAIL.WF_RETAIL_GEOGRAPHY_CUSTOMER.BUSINESS_REGION SUBTOTAL AS
'TOTAL FOR'
ON TABLE SET ASNAMES ON
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT PPTX
ON TABLE SET STYLE *
PAGESIZE='PPT Slide',
  ORIENTATION=LANDSCAPE,
$
TYPE=REPORT,
  OBJECT=STATUS-AREA,
  JUSTIFY=LEFT,
  PAGE-LOCATION=BOTTOM,
$
```

```
TYPE=REPORT,
  GRID=OFF,
  FONT='ARIAL',
  SIZE=14,
```

```
  STYLE=NORMAL,
  SQUEEZE=ON,
  TOPGAP=0.05,
  BOTTOMGAP=0.05,
  PAGECOLOR='WHITE',
  BORDER-COLOR=RGB(219 219 219),
  TITLELINE=SKIP,
    TOPMARGIN=.5,
    LEFTMARGIN=.15,
$
TYPE=DATA,
  BORDER-TOP=LIGHT,
  BORDER-TOP-COLOR=RGB(219 219 219),
$
TYPE=TITLE,
  COLOR=RGB(51 51 51),
  STYLE=-UNDERLINE +BOLD,
$
TYPE=DATA,
  COLUMN=ROWTOTAL(*),
  STYLE=BOLD,
$
TYPE=TITLE,
  COLUMN=ROWTOTAL(*),
  COLOR=RGB(51 51 51),
  STYLE=-UNDERLINE +BOLD,
$
TYPE=SUBTOTAL,
  STYLE=BOLD,
  BORDER-TOP=LIGHT,
  BORDER-TOP-COLOR=RGB(219 219 219),
$
ENDSTYLE
END
SET COMPONENT='report3'
TABLE FILE WF_RETAIL
SUM
WF_RETAIL.WF_RETAIL_SALES.DISCOUNT_US
BY WF_RETAIL.WF_RETAIL_GEOGRAPHY_CUSTOMER.BUSINESS_REGION NOPRINT
BY WF_RETAIL.WF_RETAIL_PRODUCT.PRODUCT_CATEGORY
ON WF_RETAIL.WF_RETAIL_GEOGRAPHY_CUSTOMER.BUSINESS_REGION SUBTOTAL
AS 'TOTAL FOR'
```

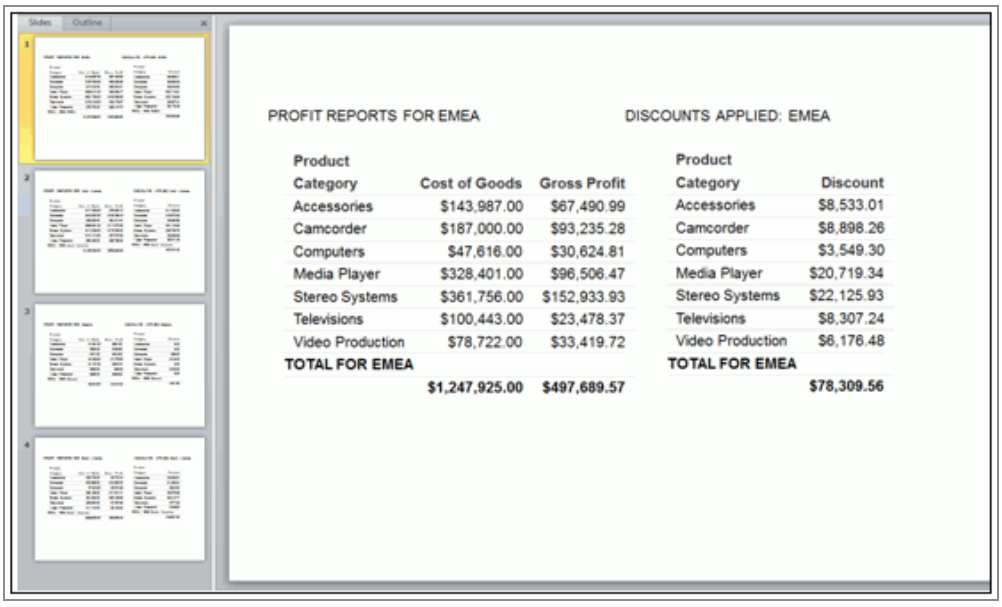
```
ON TABLE SET ASNAMES ON
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT PPTX
```

```
ON TABLE SET STYLE *
PAGESIZE='PPT Slide',
  ORIENTATION=LANDSCAPE,
$
TYPE=REPORT,
  OBJECT=STATUS-AREA,
  JUSTIFY=LEFT,
  PAGE-LOCATION=BOTTOM,
$
TYPE=REPORT,
  GRID=OFF,
  FONT='ARIAL',
  SIZE=14,
  STYLE=NORMAL,
  SQUEEZE=ON,
  TOPGAP=0.05,
  BOTTOMGAP=0.05,
  PAGECOLOR='WHITE',
  BORDER-COLOR=RGB(219 219 219),
  TITLELINE=SKIP,
$
TYPE=DATA,
  BORDER-TOP=LIGHT,
  BORDER-TOP-COLOR=RGB(219 219 219),
$
TYPE=TITLE,
  COLOR=RGB(51 51 51),
  STYLE=-UNDERLINE +BOLD,
$
TYPE=DATA,
  COLUMN=ROWTOTAL(*),
  STYLE=BOLD,
$
```

```
TYPE=TITLE,
  COLUMN=ROWTOTAL(*),
  COLOR=RGB(51 51 51),
  STYLE=-UNDERLINE +BOLD,
$
TYPE=SUBTOTAL,
  STYLE=BOLD,
  BORDER-TOP=LIGHT,
  BORDER-TOP-COLOR=RGB(219 219 219),
$
ENDSTYLE
```

```
END
COMPOUND END
```

The output is:



PROFIT REPORTS FOR EMEA

| Product Category | Cost of Goods | Gross Profit |
|---|---|---|
| Accessories | $143,987.00 | $67,490.99 |
| Camcorder | $187,000.00 | $93,235.28 |
| Computers | $47,616.00 | $30,624.81 |
| Media Player | $328,401.00 | $96,506.47 |
| Stereo Systems | $361,756.00 | $152,933.93 |
| Televisions | $100,443.00 | $23,478.37 |
| Video Production | $78,722.00 | $33,419.72 |
| **TOTAL FOR EMEA** | **$1,247,925.00** | **$497,689.57** |

DISCOUNTS APPLIED: EMEA

| Product Category | Discount |
|---|---|
| Accessories | $8,533.01 |
| Camcorder | $8,898.26 |
| Computers | $3,549.30 |
| Media Player | $20,719.34 |
| Stereo Systems | $22,125.93 |
| Televisions | $8,307.24 |
| Video Production | $6,176.48 |
| **TOTAL FOR EMEA** | **$78,309.56** |

# Templates for Compound Reports

For Compound Reports, the template is defined in the first component report. For compound reports with Page Masters, this table will be the default table used to substantiate the page layout. For uncoordinated standard compound reports, this default component can be created using the system table, as shown in the following request.

```
SET COMPONENT='ppt_template'
TABLE FILE SYSCOLUM
SUM TBNAME NOPRINT
IF READLIMIT EQ 1
ON TABLE PCHOLD FORMAT PPTX TEMPLATE 'template_plus.potx' SLIDENUMBER 1
END
```

For Coordinated Compound Reports, this table must contain the same primary key as the other components in the report. This includes any preprocessing of the data to define the universe of available primary key values including JOINS and DEFINES.

```
SET COMPONENT='ppt_template'
TABLE FILE GGSALES
BY REGION NOPRINT
IF READLIMIT EQ 1
ON TABLE PCHOLD FORMAT PPTX TEMPLATE 'template_plus.potx' SLIDENUMBER 1
END
```

# Adding Images to a Compound Request

Images may be inserted on the Page Master, Page Layout, and PowerPoint template (POTX) to enhance the Compound Document. Images inserted on the Page Master will be visible on every Page Layout within the Compound Document. Images on a Page Layout will be displayed only on that page. If the Document is to be displayed on a PowerPoint Template, images may be saved on the Template so that they will be displayed as positioned on the individual slides.

**Important:** Compound Layout syntax cannot contain hidden carriage return or line feed characters. For purposes of presenting this example, line feed characters have been added so that the sample code wraps to fit within the printed page. To run this example in your environment, copy the code into a text editor and delete any line feed characters within the Compound Layout syntax by going to the end of each line and pressing the Delete key.

# Adding Images to a Compound Request

The following compound syntax creates a Document with images in the Page Master, the Page Layout, and that is displayed on a PowerPoint template on which an image has been inserted.

```
SET HTMLARCHIVE=ON
*-HOLD_SOURCE
COMPOUND LAYOUT PCHOLD FORMAT PPTX
UNITS=IN, $
SECTION=section1, LAYOUT=ON, MERGE=OFF,
ORIENTATION=LANDSCAPE, PAGESIZE=PPT Slide, SHOW_GLOBALFILTER=OFF, $
PAGELAYOUT=ALL, NAME='Page Master', $
COMPONENT='ppt_template', $
OBJECT=BOX, NAME='line1', POSITION=(0.052 0.500), DIMENSION=(10.000
0.031),
```

```
BACKCOLOR=RGB(176 196 222), BORDER-COLOR=RGB(176 196 222), $
OBJECT=BOX, NAME='line2', POSITION=(-12.000 -10.000), DIMENSION=(0.000
0.000), BACKCOLOR=BLACK, BORDER-COLOR=BLACK, $
OBJECT=BOX, NAME='line3', POSITION=(0.479 0.000), DIMENSION=(0.025
7.600),
BACKCOLOR=RGB(176 196 222), BORDER-COLOR=RGB(176 196 222), $
OBJECT=IMAGE, NAME='image1', IMAGE=webfocus1.gif, ALT='',
POSITION=(0.601 6.700), DIMENSION=(1.248 0.436), $
PAGELAYOUT=1, NAME='Page layout 1', text='Page layout 1',
BOTTOMMARGIN=0.15, TOPMARGIN=0.5, $
COMPONENT='report1', TEXT='report1', POSITION=(1.853 1.289),
DIMENSION=(6.458 5.417), $
OBJECT=IMAGE, NAME='image2', IMAGE=analyst_logo.gif, ALT='',
POSITION=(0.499 0.509), DIMENSION=(2.081 0.477), $
END
```

```
SET COMPONENT='ppt_template'
TABLE FILE SYSCOLUM
SUM TBNAME NOPRINT
IF READLIMIT EQ 1
ON TABLE PCHOLD FORMAT PPTX TEMPLATE '_ibi_template.potx' SLIDENUMBER 2
END
SET COMPONENT='report1'
TABLE FILE IBISAMP/EMPDATA
SUM
  EMPDATA.EMPDATA.SALARY
BY LOWEST EMPDATA.EMPDATA.DEPT
BY EMPDATA.EMPDATA.LASTNAME
ON EMPDATA.EMPDATA.DEPT SUBFOOT
"Subfoot"
" "
ON EMPDATA.EMPDATA.DEPT PAGE-BREAK
ON TABLE SUBHEAD
"Report Heading "
" "
" "
HEADING
"Page Heading "
" "
FOOTING
"Page Footing"
" "
ON TABLE SUBFOOT
"Report Footing"
WHERE EMPDATA.EMPDATA.SALARY GE 40900;
ON TABLE SET PAGE-NUM NOLEAD
```

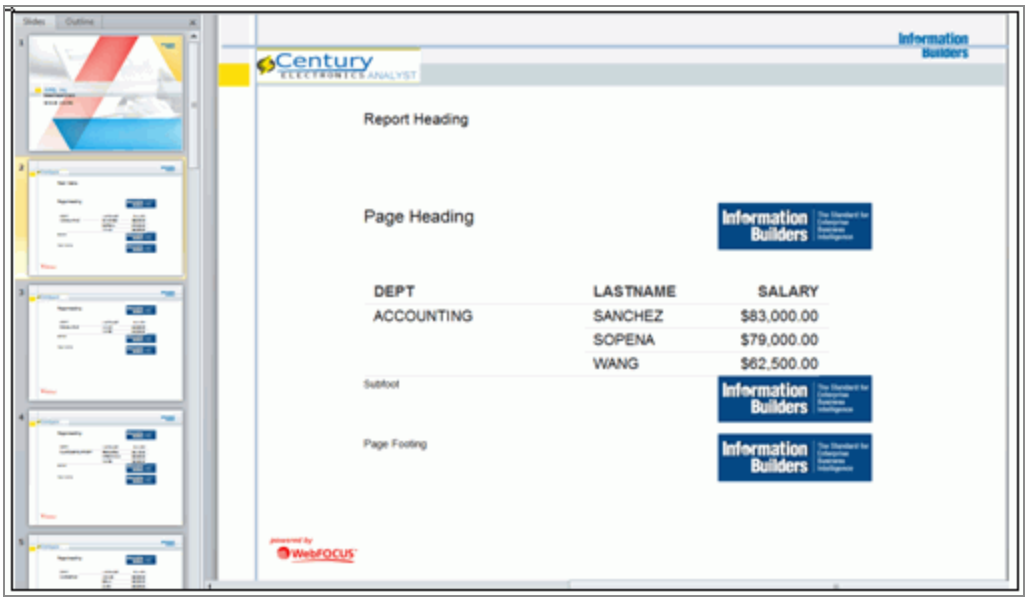
```
ON TABLE SET ASNAMES ON
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT PPTX
ON TABLE SET STYLE *
  PAGESIZE='PPT Slide',
    ORIENTATION=LANDSCAPE,
$
TYPE=REPORT,
  OBJECT=STATUS-AREA,
  JUSTIFY=LEFT,
  PAGE-LOCATION=BOTTOM,
$
```

```
TYPE=REPORT,
  GRID=OFF,
  FONT='ARIAL',
  SIZE=14,
  STYLE=NORMAL,
  SQUEEZE=ON,
  TOPGAP=0.05,
  BOTTOMGAP=0.05,
  BORDER-COLOR=RGB(219 219 219),
  TITLELINE=SKIP,
  TOPMARGIN=.25,
  LEFTMARGIN=2,
  BOTTOMMARGIN=0.05,
$
TYPE=TITLE,
  COLOR=RGB(51 51 51),
  STYLE=-UNDERLINE +BOLD,
$
TYPE=DATA,
  BORDER-TOP=LIGHT,
  BORDER-TOP-COLOR=RGB(219 219 219),
$
TYPE=HEADING,
  JUSTIFY=LEFT,
  SIZE=16,
$
TYPE=HEADING,
  IMAGE=smplogo1.gif,
  POSITION=(+4.500000 +0.000000),
$
TYPE=TABFOOTING,
  IMAGE=smplogo1.gif,
  POSITION=(+4.500000 +0.000000),
```

```
$
TYPE=TABFOOTING,
  SIZE=10,
$
TYPE=FOOTING,
  SIZE=10,
$
TYPE=FOOTING,
  IMAGE=smplogo1.gif,
  POSITION=(+4.500000 +0.000000),
$
```

```
TYPE=SUBFOOT,
  SIZE=9,
  BORDER-TOP=LIGHT,
  BORDER-TOP-COLOR=RGB(219 219 219),
$
TYPE=SUBFOOT,
  BY=1,
  IMAGE=smplogo1.gif,
  POSITION=(+4.500000 +0.000000),
$
ENDSTYLE
END
COMPOUND END
```

The output is:



# Template Masters and Slide Layouts

A Microsoft PPTX 2007 and higher template can contain one or more Slide Masters, defining a variety of different Slide Layouts.

A Slide Master is the top slide in a hierarchy of slides that stores information about the theme and Slide Layouts of a presentation, including the background, color, fonts, effects, placeholder sizes, and positioning.

You can incorporate two or more different styles or themes, such as backgrounds, color schemes, fonts, and effects, by inserting an individual Slide Master into the template for each different theme.

**Note:** Additional information on Microsoft PowerPoint Slide Layouts is available in an article titled What is a slide layout? on the Microsoft support site.

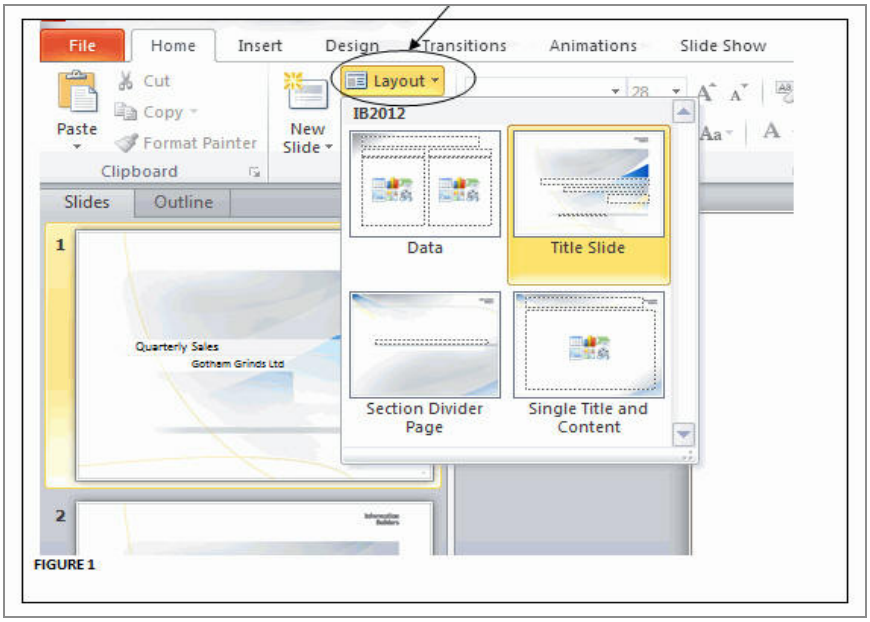
By default, the first Slide Layout in the first Slide Master is applied to slides on which WebFOCUS data is displayed.

With this new feature, WebFOCUS enables the developer to select any Slide Layout in any Slide Master in a PowerPoint template (POTX/POTM) or Presentation file (PPTX/PPTM). One Slide Layout may be applied to a slide or slides, displaying the output of a standard report, while one or different Slide Layouts may be applied to each Page Layout in a PPTX formatted Compound Document. The WebFOCUS generated ouput is placed on top of the styling on the selected Slide Layout.

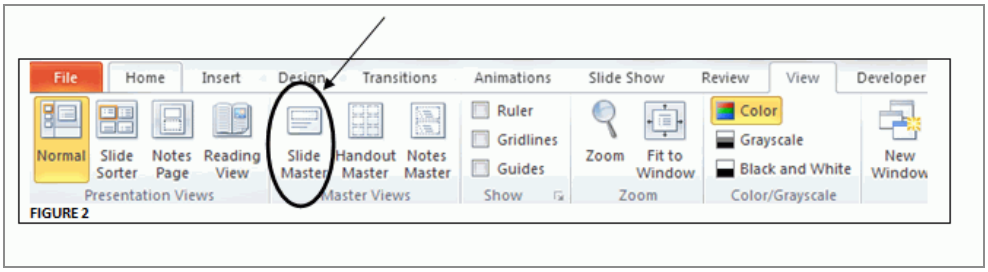
# Identifying Slide Master Attributes in PowerPoint

To identify Slide Masters and Slide Layouts in a template, open the file in the PowerPoint application, select the **Home** tab, and click the **Layout** button on the ribbon.

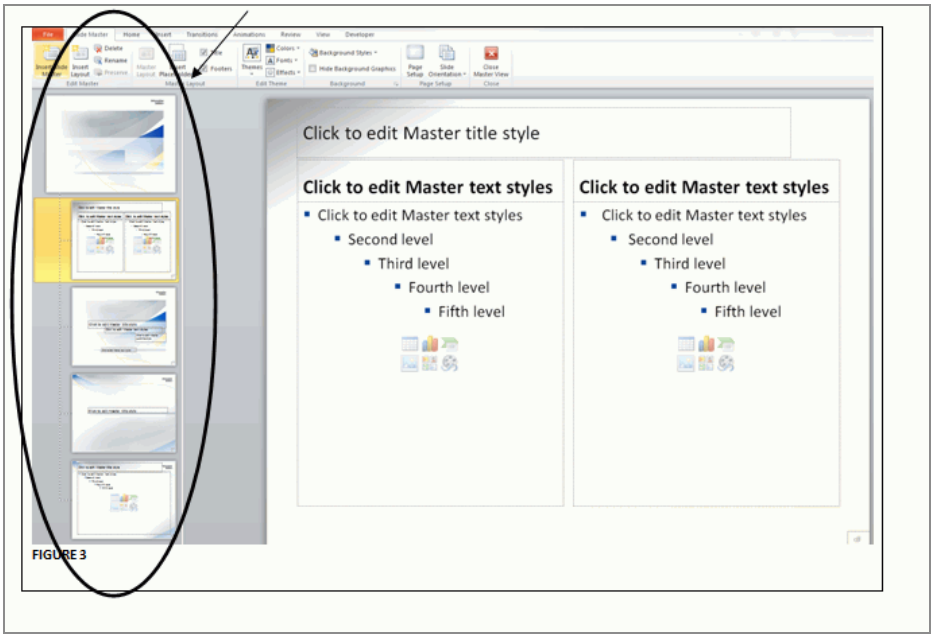
A context menu displays all Slide Layouts with labels, as shown in the following image.



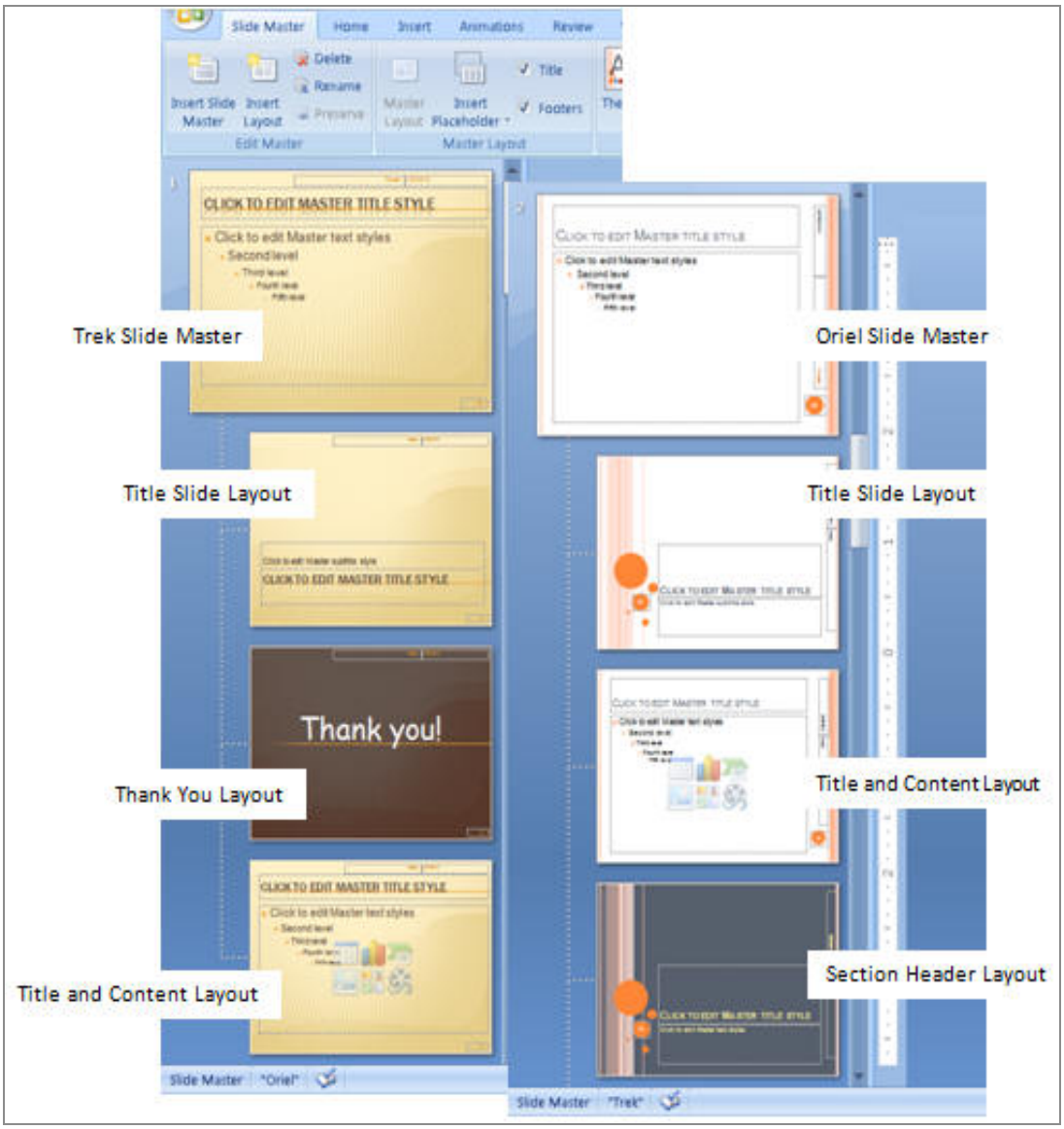

To view the Slide Master, select the **View** tab, and in the Master Views group on the ribbon, click the **Slide Master** button, as shown in the following image.




The Master View opens to show the Slide Master and its associated Slide Layouts, as shown in the following image.




The following image shows the Slide Master view of the template used in this example. It contains two Slide Masters: (1) Trek and (2) Oriel. Within each Master, the image displays the layouts selected for the report generation. Notice that the Slide Master and Layout names can be identified by hovering over the slide image. Use the name without the *Slide Master* or *Slide Layout* suffixes.




# Identify Slide Master Attributes in PowerPoint

For single reports:

```
TYPE=REPORT,SLIDE-MASTER='slidemaster_name',SLIDE-LAYOUT='layout_name',
$
```

For Compound syntax:

```
PAGELAYOUT=n, NAME='Page layout (n)', SLIDE-MASTER='slidemaster_name',
SLIDE-LAYOUT='layout_name', $
```

**Note:** Slide Masters and Slide Layouts can be defined on the Page Master within the Section syntax or on any Page Layout.

# Compound Report Accessing Multiple Masters

The following syntax creates a full PPTX presentation based on a template with two Slide Masters and four individual Slide Layouts. Each of the five individual procedures (.fex) shown in this example need to be copied to a separate file.

```
COMPOUND LAYOUT PCHOLD FORMAT PPTX
UNITS=IN, $
SECTION=section1, LAYOUT=ON, SLIDE-MASTER='TREK',
SLIDE-LAYOUT='Title and Content',
MERGE=OFF, ORIENTATION=LANDSCAPE,
PAGESIZE=PPT Slide, SHOW_GLOBALFILTER=OFF, $
PAGELAYOUT=1, NAME='Page layout 1', SLIDE-MASTER='TREK',
SLIDE-LAYOUT='Title Slide', text='Page layout 1',
BOTTOMMARGIN=0.5, TOPMARGIN=0.5, $
COMPONENT='ppt_template', $
OBJECT=STRING, NAME='text1', TEXT='Gotham Grinds Sales Summary',
POSITION=(1.083 3.117), MARKUP=OFF, WRAP=ON, DIMENSION=(6.799 0.620),
font='TREBUCHET MS', color=RGB(0 0 0), size=36, $
OBJECT=STRING, NAME='text2', TEXT='Profit By Category',
POSITION=(1.100 3.733), MARKUP=OFF, WRAP=ON, DIMENSION=(6.833 0.500),
font='TREBUCHET MS', color=RGB(0 0 0), size=18, $
OBJECT=STRING, NAME='text3', TEXT='Prepared By:<br><br>Anne T Jones,
EVP of Sales<br>Joe F Smith, VP of Sales<br><br>&DATEtrMDYY',
POSITION=(5.683 5.433), MARKUP=ON, WRAP=ON, DIMENSION=(4.049 1.721),
font='TREBUCHET MS', color=RGB(0 0 0), size=18, $
PAGELAYOUT=2, NAME='Page layout 2', text='Page layout 2',
BOTTOMMARGIN=0.025, TOPMARGIN=4.8, $
```

```
OBJECT=STRING, NAME='pl2_text2', TEXT='Sales By Region',
POSITION=(0.5 0.325), MARKUP=ON, WRAP=ON, DIMENSION=(4.146 0.609),
font='TREBUCHET MS', color=RGB(0 0 0), style=bold, size=24, $
OBJECT=STRING, NAME='pl2_text3', TEXT=' ', POSITION=(0.5 .725),
MARKUP=ON,
WRAP=ON, DIMENSION=(4.146 0.609), font='TREBUCHET MS', color=RGB(0 0 0),
style=bold, size=20, $
```

```
COMPONENT='report1', TEXT='report1', POSITION=(2.2 4.8),
DIMENSION=(* *), $
COMPONENT='chart1', TEXT='chart1', POSITION=(0.733 1.25),
DIMENSION=(8.680 3.10), COMPONENT-TYPE=GRAPH, $
PAGELAYOUT=5, NAME='Page layout 5', SLIDE-MASTER='ORIEL',
SLIDE-LAYOUT='Section Header', text='Page layout 3',
BOTTOMMARGIN=0.5, TOPMARGIN=0.5, $
OBJECT=STRING, NAME='pl3text1', TEXT='Sales Performance Regional
Breakdowns', POSITION=(1.0 3.35), MARKUP=OFF, WRAP=ON,
DIMENSION=(6.799 0.620), font='TREBUCHET MS', color=RGB(0 0 0),
size=24,$
COMPONENT='DfltCmpt2_3', POSITION=(0 0), DIMENSION=(0 0), $
PAGELAYOUT=6, NAME='Page layout 2', text='Page layout 4',
SLIDE-MASTER='ORIEL', SLIDE-LAYOUT='Title and Content',
BOTTOMMARGIN=0.025, TOPMARGIN=4.8, $
OBJECT=STRING, NAME='pl4_text2', TEXT='Sales By Category',
POSITION=(0.5 0.325), MARKUP=ON, WRAP=ON, DIMENSION=(4.146 0.609),
font='TREBUCHET MS', color=RGB(0 0 0), style=bold, size=24, $
OBJECT=STRING, NAME='pl4_text3', TEXT=' ', POSITION=(0.5 .725),
MARKUP=ON,
WRAP=ON, DIMENSION=(4.146 0.609), font='TREBUCHET MS', color=RGB(0 0 0),
style=bold, size=20, $
COMPONENT='report2_2', TEXT='report2', POSITION=(2.2 4.8),
DIMENSION=(* *), $
COMPONENT='chart2_2', TEXT='chart2', POSITION=(0.733 1.25),
DIMENSION=(8.680 3.10), COMPONENT-TYPE=GRAPH, $
COMPONENT='report2_3', TEXT='report3', POSITION=(0.5 .725),
DIMENSION=(3 3), $
PAGELAYOUT=9, NAME='Page layout 9', SLIDE-MASTER='TREK',
SLIDE-LAYOUT='Thank You', text='Page layout 3',
BOTTOMMARGIN=0.5, TOPMARGIN=0.5, $
COMPONENT='DfltCmpt9', POSITION=(0 0), DIMENSION=(0 0), $
END

SET COMPONENT='ppt_template'
TABLE FILE SYSCOLUM
SUM TBNAME NOPRINT
IF READLIMIT EQ 1
ON TABLE PCHOLD FORMAT PPTX TEMPLATE 'template_plus.potx' SLIDENUMBER 1
END
```

```
SET COMPONENT='report1'
-INCLUDE GG_RPT1

SET COMPONENT='chart1'
-INCLUDE GG_CHART1
```

```
SET COMPONENT='DfltCmpt2_3'
TABLE FILE SYSCOLUM
" "
SUM TBNAME NOPRINT
IF READLIMIT EQ 1
ON TABLE SET PAGE-NUM NOLEAD
ON TABLE PCHOLD FORMAT PPTX
ON TABLE SET STYLE *
END

SET COMPONENT='report2_2'
-INCLUDE GG_RPT2
SET COMPONENT='chart2_2'
-INCLUDE GG_CHART2
SET COMPONENT='report2_3'
-INCLUDE GG_RPT3

SET COMPONENT='DfltCmpt9'
TABLE FILE SYSCOLUM
" "
SUM TBNAME NOPRINT
IF READLIMIT EQ 1
ON TABLE SET PAGE-NUM NOLEAD
ON TABLE PCHOLD FORMAT PPTX
ON TABLE SET STYLE *
END

COMPOUND END
```

```
-*gg_rpt1.fex
TABLE FILE GGSALES
SUM DOLLARS/D12CM BUDDOLLARS/D12CM UNITS/D12 BUDUNITS/D12
BY REGION
ON TABLE SET PAGE-NUM NOLEAD
ON TABLE PCHOLD FORMAT PPTX
ON TABLE SET STYLE *
     INCLUDE = warm,
$
ENDSTYLE
END
```

```
-*gg_rpt2.fex
TABLE FILE GGSALES
SUM DOLLARS/D12CM BUDDOLLARS/D12CM UNITS/D12 BUDUNITS/D12
```

```
BY REGION NOPRINT
BY CATEGORY
ON REGION PAGE-BREAK
ON TABLE SET PAGE-NUM NOLEAD
ON TABLE PCHOLD FORMAT PPTX
ON TABLE SET STYLE *
     INCLUDE = warm,
$
ENDSTYLE
END
```

```
-*gg_chart1.fex
ENGINE INT CACHE SET ON
-DEFAULTH &WF_STYLE_UNITS='INCHES';
-DEFAULTH &WF_STYLE_HEIGHT='4.21875';
-DEFAULTH &WF_STYLE_WIDTH='8.020833';
-DEFAULTH &WF_TITLE='WebFOCUS Report';
GRAPH FILE GGSALES
SUM DOLLARS UNITS
BY REGION NOPRINT
ON GRAPH PCHOLD FORMAT PPTX
ON GRAPH SET HTMLENCODE ON
ON GRAPH SET GRAPHDEFAULT OFF
ON GRAPH SET ARGRAPHENGIN JSCHART
ON GRAPH SET VZERO OFF
ON GRAPH SET GRWIDTH 1
ON GRAPH SET UNITS &WF_STYLE_UNITS
ON GRAPH SET HAXIS &WF_STYLE_WIDTH
ON GRAPH SET VAXIS &WF_STYLE_HEIGHT
ON GRAPH SET GRMERGE ADVANCED
ON GRAPH SET GRMULTIGRAPH 0
ON GRAPH SET GRLEGEND 1
ON GRAPH SET GRXAXIS 0
ON GRAPH SET LOOKGRAPH VBAR
ON GRAPH SET STYLE *
*GRAPH_SCRIPT
setPieDepth(0);
setPieTilt(0);
setDepthRadius(0);
setCurveFitEquationDisplay(false);
setPlace(true);
*END
```

```
INCLUDE = warm,$
TYPE=REPORT, TITLETEXT=&WF_TITLE.QUOTEDSTRING, $
```

```
*GRAPH_SCRIPT
setReportParsingErrors(false);
setSelectionEnableMove(false);
setTransparentBorderColor(getChartBackground(),true);
setTransparentFillColor(getFrameSide(),true);
setTransparentBorderColor(getFrameSide(),true);
setTransparentFillColor(getFrameBottom(),true);
setTransparentBorderColor(getFrameBottom(),true);
*GRAPH_SCRIPT
-* Make the chart background, borders, etc. transparent:
setTransparentFillColor(getChartBackground(),true);
setFillColor(getChartBackground(),new Color(255,255,255,0));
setTransparentBorderColor(getChartBackground(),true);
setTransparentFillColor(getFrameSide(),true);
setTransparentBorderColor(getFrameSide(),true);
setTransparentFillColor(getFrameBottom(),true);
setTransparentBorderColor(getFrameBottom(),true);
setPlace(true);
*END
ENDSTYLE
END
-RUN
```

```
-*gg_chart2.fex
-DEFAULTH &WF_STYLE_UNITS='INCHES';
-DEFAULTH &WF_STYLE_HEIGHT='4.21875';
-DEFAULTH &WF_STYLE_WIDTH='8.020833';
-DEFAULTH &WF_TITLE='WebFOCUS Report';
GRAPH FILE GGSALES
SUM DOLLARS UNITS
BY REGION NOPRINT
BY CATEGORY
ON GRAPH PCHOLD FORMAT PPTX
ON GRAPH SET HTMLENCODE ON
ON GRAPH SET GRAPHDEFAULT OFF
ON GRAPH SET ARGRAPHENGIN JSCHART
ON GRAPH SET VZERO OFF
ON GRAPH SET GRWIDTH 1
ON GRAPH SET UNITS &WF_STYLE_UNITS
ON GRAPH SET HAXIS &WF_STYLE_WIDTH
ON GRAPH SET VAXIS &WF_STYLE_HEIGHT
ON GRAPH SET GRMERGE ADVANCED
ON GRAPH SET GRMULTIGRAPH 1
ON GRAPH SET GRLEGEND 1
ON GRAPH SET GRXAXIS 0
```

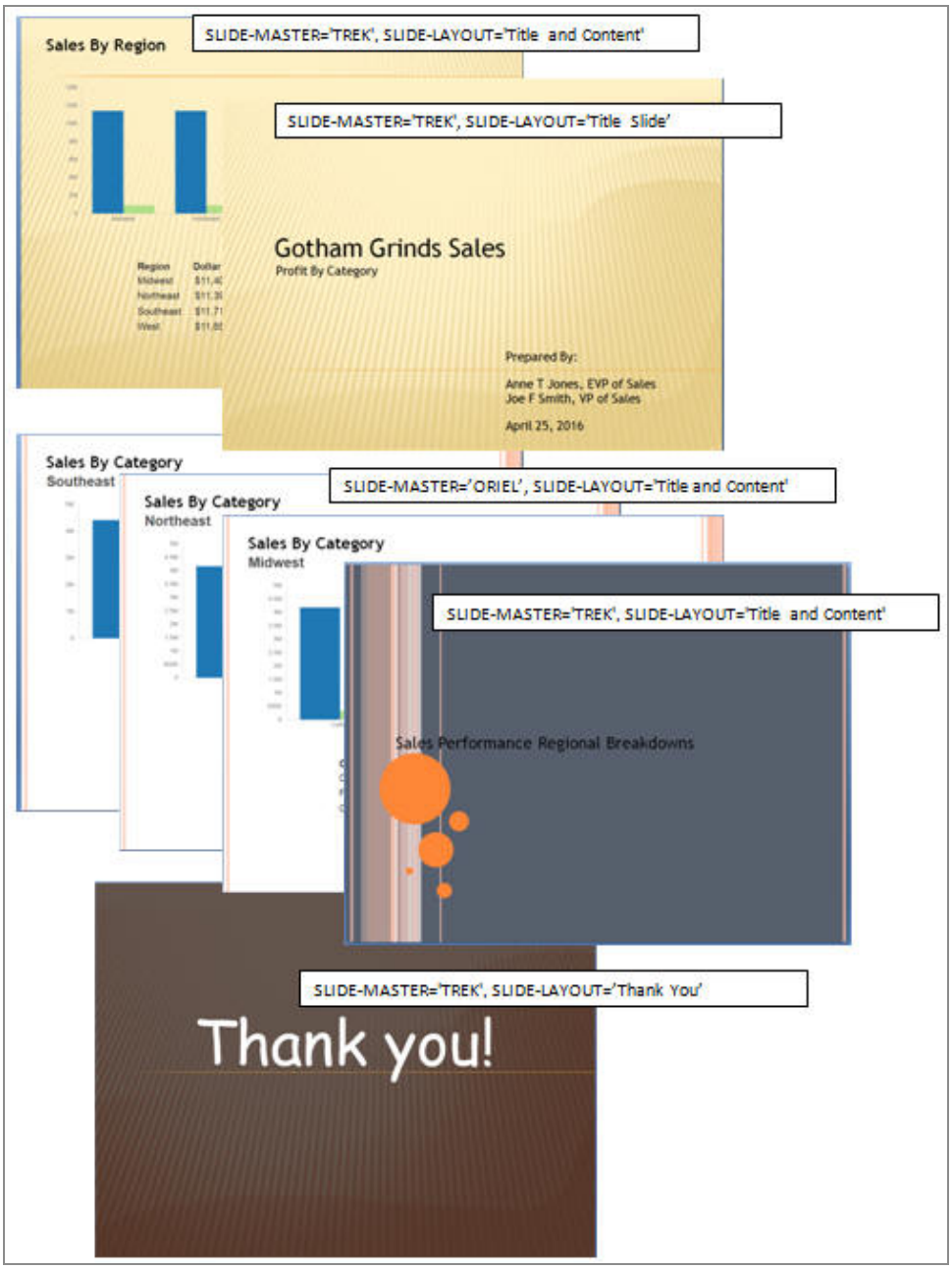
```
ON GRAPH SET LOOKGRAPH VBAR
ON GRAPH SET STYLE *
```

```
 *GRAPH_SCRIPT
 setPieDepth(0);
 setPieTilt(0);
 setDepthRadius(0);
 setCurveFitEquationDisplay(false);
 setPlace(true);
 *END
 INCLUDE = warm,$
 TYPE=REPORT, TITLETEXT=&WF_TITLE.QUOTEDSTRING, $
 *GRAPH_SCRIPT
 setReportParsingErrors(false);
 setSelectionEnableMove(false);
 setTransparentBorderColor(getChartBackground(),true);
 setTransparentFillColor(getFrameSide(),true);
 setTransparentBorderColor(getFrameSide(),true);
 setTransparentFillColor(getFrameBottom(),true);
 setTransparentBorderColor(getFrameBottom(),true);
 *GRAPH_SCRIPT
 -* Make the chart background, borders, etc. transparent:
 setTransparentFillColor(getChartBackground(),true);
 setFillColor(getChartBackground(),new Color(255,255,255,0));
 setTransparentBorderColor(getChartBackground(),true);
 setTransparentFillColor(getFrameSide(),true);
 setTransparentBorderColor(getFrameSide(),true);
 setTransparentFillColor(getFrameBottom(),true);
 setTransparentBorderColor(getFrameBottom(),true);
 setPlace(true);
 *END
 ENDSTYLE
 END
 -RUN
```

```
-*gg_rpt3.fex
TABLE FILE GGSALES
BY REGION PAGE-BREAK NOPRINT
HEADING
"<REGION"
ON TABLE SET PAGE-NUM NOLEAD
ON TABLE PCHOLD FORMAT PPTX
ON TABLE SET STYLE *
     INCLUDE = warm,
$
```

```
TYPE=HEADING, SIZE=20,
$
ENDSTYLE
END
```

The output is:



# Merging WebFOCUS Content With PowerPoint Template Content

Using the TEMPLATE-ACTION Stylesheet attribute, you can merge WebFOCUS content with PowerPoint template content. The MERGE action allows you to edit components, such as comments in native PowerPoint text boxes, in the resulting PowerPoint PPTX output.

# Merge WebFOCUS Content With PowerPoint Template Content

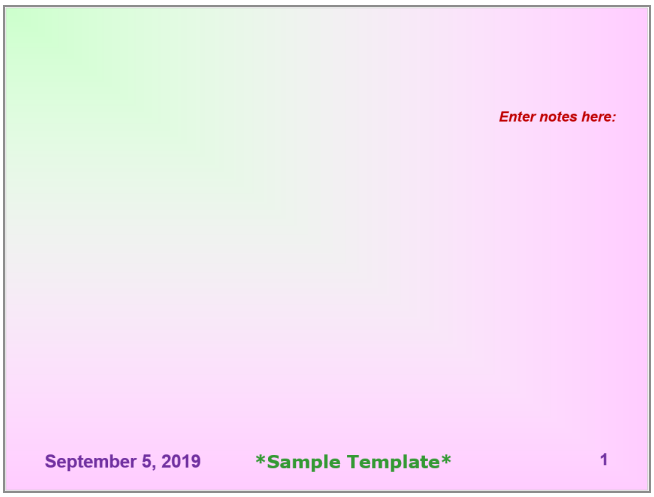
To merge WebFOCUS content with PowerPoint template content, include the following StyleSheet syntax in your procedure.

```
TYPE=REPORT, TEMPLATE-ACTION=MERGE ,$
```

**Note:** You can include the TEMPLATE-ACTION=REPLACE StyleSheet attribute to retain the default behavior, which causes WebFOCUS output to override all target slide content.

# Merging WebFOCUS Content With PowerPoint Template Content

The following example shows how to merge WebFOCUS content with the PowerPoint template content shown in the image below. The name of the PowerPoint template is *my_template.potx*.

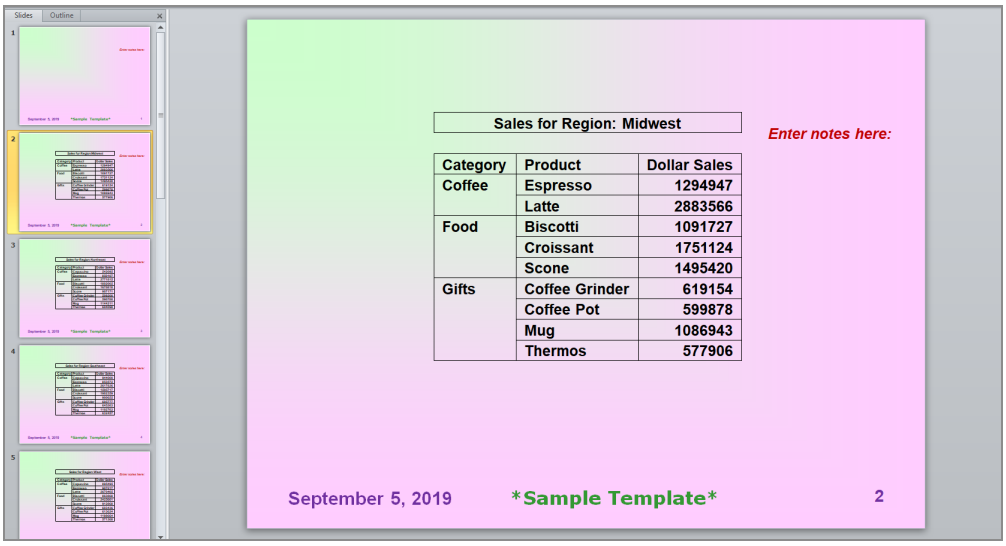



### Merge Procedure

The following procedure includes the TEMPLATE-ACTION=MERGE StyleSheet attribute to merge WebFOCUS content with PowerPoint template content, *my_template.potx*.

```
TABLE FILE GGSALES
HEADING CENTER
"Sales for Region: <REGION"
SUM DOLLARS
BY REGION NOPRINT PAGE-BREAK
BY CATEGORY
BY PRODUCT

ON TABLE HOLD AS MERGEPPTX FORMAT PPTX TEMPLATE 'my_template.potx'
SLIDENUMBER 2

ON TABLE SET STYLE *
TYPE=REPORT, PAGESIZE=PPT-SLIDE, ORIENTATION=LANDSCAPE,
  TEMPLATE-ACTION=MERGE,
  LEFTMARGIN=2.75, TOPMARGIN=.75, BOTTOMMARGIN=1.5,
  FONT=ARIAL, SQUEEZE=ON, BORDER=LIGHT, STYPE=BOLD, SIZE=16, $
ENDSTYLE

END
```

The output is:

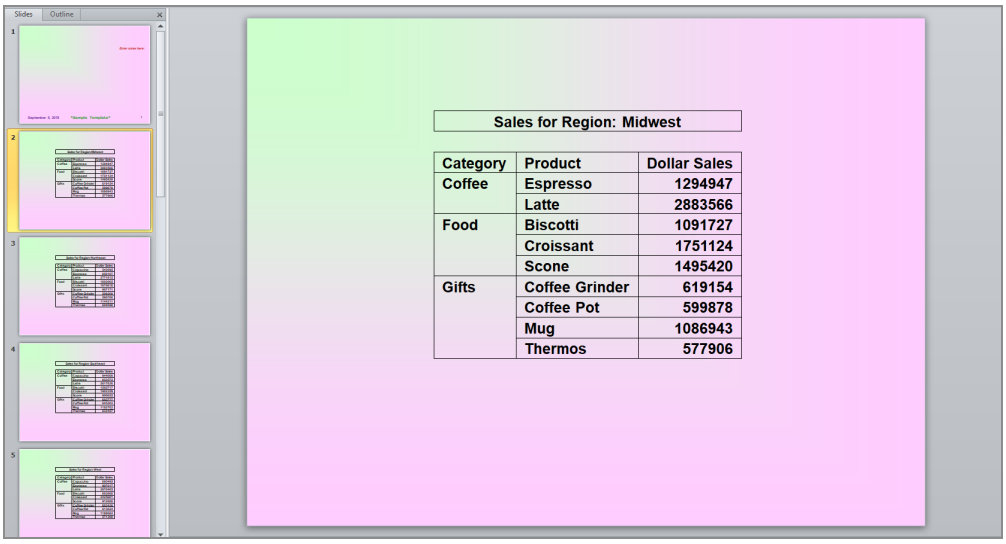



# Overriding Target Slide Content

The following procedure includes the TEMPLATE-ACTION=REPLACE StyleSheet attribute to retain the default behavior and override all target slide content.

```
TABLE FILE GGSALES
HEADING CENTER
"Sales for Region: <REGION"
SUM DOLLARS
BY REGION NOPRINT PAGE-BREAK
BY CATEGORY
BY PRODUCT

ON TABLE HOLD AS REPLACEPPTX FORMAT PPTX TEMPLATE 'my_template.potx'
SLIDENUMBER 2
ON TABLE SET STYLE *
TYPE=REPORT, PAGESIZE=PPT-SLIDE, ORIENTATION=LANDSCAPE,
  TEMPLATE-ACTION=REPLACE,
  LEFTMARGIN=2.75, TOPMARGIN=.75, BOTTOMMARGIN=1.5,
  FONT=ARIAL, SQUEEZE=ON, BORDER=LIGHT, STYPE=BOLD, SIZE=16, $
ENDSTYLE

END
```

The output is:




# ReportCaster Distribution and ReportCaster Bursting

ReportCaster Distribution is supported for simple reports, reports with images, PPTX Templates, Coordinated Compound Reports, and graphs. Bursting is supported for simple reports, reports with images, PPTX Templates, and Coordinated Compound Reports. For more information, see the *ibi™ WebFOCUS® ReportCaster* manual.

# PPTX Limitations

The following is a limitation when using PPTX output format:

- Justification of images in report elements.

In Compound syntax, the following are limitations when using PPTX output format:

- Paneled reports.
- Nested syntax.
- Multi-pane reports or reports with multiple columns.
- OPEN, CLOSE, or NOBREAK command.

# Related Information

For related information on these topics, see the following WebFOCUS manuals:

- *Describing Data With ibi™ WebFOCUS® Language*
- *ibi™ WebFOCUS® Developing Reporting Applications*
- *ibi™ WebFOCUS® Using Functions*
- *ibi™ WebFOCUS® ReportCaster*

# Linking a Report to Other Resources

You can use StyleSheet declarations to define links from any report component. You can use links to:

- Create a series of drill-down reports by linking the procedures that generate these reports.
- Link to URLs. These can be other webpages, websites, Servlet programs, or non-World Wide Web resources, such as an email application.
- Execute JavaScript functions to perform additional analysis of the report data.

You can create links from report data as well as graphical images within a report. You can also create links from a graph. For details on linking from a graph, see Creating a Graph.

# Linking Using StyleSheets

You can use StyleSheets to define a link from any report component. You can create links from report data (including headings and footings) as well as graphic images (such as a company logo or product image), to other reports, procedures, URLs, or JavaScript functions.  StyleSheets and links" />

The links you create can be dynamic. With a dynamic link, your selection passes the value of the selected report component to the linked report (procedure, URL, or JavaScript function). The resource uses the passed value to dynamically determine the results that are returned. You can pass one or more parameters. For details, see Creating Parameters.

# Create Links Using StyleSheets

This procedure is a basic overview of how to create links using StyleSheets.  StyleSheets and links" />

**Procedure**

1. Identify the report component that the user selects in the web browser to execute the link.
2. Specify the name of the embedded procedure, URL, or JavaScript function to execute.
3. Identify the parameters that define the specifics of your link, if necessary.

# Linking to Another Report

A link allows you to drill down to a report for more details or execute a procedure by selecting a designated hot spot (the link) in the report. By linking reports you provide easy access to more detailed data that supplements the information in your base report. The drill-down report can contain information that is either independent of the data in the base report or depends and expands on a specific data value in the base report.

To create a link, you must have a report to link from (the base report) and a report to link to (the drill-down report). If the drill-down report depends on a specific data value in the base report, you also need to pass that value to the drill-down report by creating parameters. For details, see Creating Parameters.

# Link to Reports and Procedures

```
TYPE=type, [subtype], FOCEXEC=fex[(parameters ...)], [TARGET=frame,]
[ALT = 'description',] $
```

where:

**type**

Identifies the report component that you select in the web browser to execute the link. The TYPE attribute and its value must appear at the beginning of the declaration.

**subtype**

Are any additional attributes, such as COLUMN, LINE, or ITEM, that are needed to identify the report component that you are formatting. For information on identifying report components, see Identifying a Report Component in a WebFOCUS StyleSheet.

**fex**

Identifies the file name of the linked procedure to run when you select the report component.

**Note:** The procedure cannot be named NONE (all uppercase). Using NONE as the procedure name will result in a syntax error. Mixed or lowercase is allowed.

To determine the file name in WebFOCUS, see Linking to Another Report.

The maximum length of a FOCEXEC=*fex* argument, including any associated parameters, is 2400 characters. The FOCEXEC argument can span more than one line, as described in Creating and Managing a WebFOCUS StyleSheet.

**parameters**

Values that are passed to the report, URL, or JavaScript function. For details, see Creating Parameters.

**frame**

Identifies the target frame in the webpage in which the output from the drill-down link is displayed. For details, see Specifying a Target Frame.

**description**

Is a textual description of the link supported in an HTML report for compliance with Section 508 accessibility. Enclose the description in single quotation marks.

The description also displays as a pop-up description when your mouse or cursor hovers over the link in the report output.

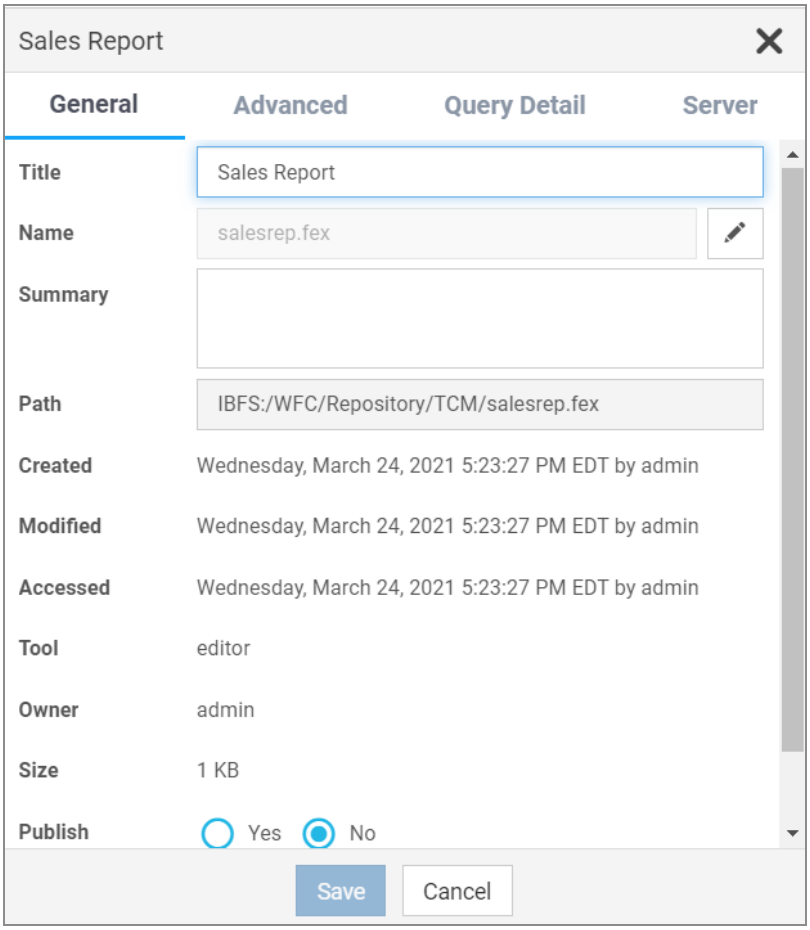
# Usage Notes for Drilldown Reports in PDF Format

When going back to the original report from a drilldown report in PDF format, you must click the Back button twice quickly. The alternative is to use the drop-down list presented to the right of the Back button to view the browser history and select the link two steps back. The first history item will point to the redirection page and be titled based on the method used to access the WFServlet. The previous item will be titled *WebFOCUS Report* and will point back to the original PDF report.

# Determine a WebFOCUS File Name

**Procedure**

1. Right-click the report name and select **Properties**. The Report Properties dialog box opens.
2. The file name appears under **Name**. In the example below, the name of the file is **"salesrep"**. Do not include the file extension (.fex) or the directory location and slash (/).




# Linking to a Report From a Footing

The following report request summarizes product sales and sorts the data by region, state, and store code. The store code also displays in the subfootings where links to detailed

reports about the store's sales (by product or by date) display. Each line of the subfoot contains two text objects and one embedded field. The relevant StyleSheet declarations are highlighted in the request.

The main report is:

```
TABLE FILE GGSALES
HEADING
"Sales Report"
SUM DOLLARS/I08M
BY REGION BY ST BY STCD
ON STCD SUBFOOT
"View Store <STCD Sales By Product"
" "
"View Store <STCD Sales By Date"
ON REGION PAGE-BREAK
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=HEADING, SIZE=12, STYLE=BOLD, $
TYPE=SUBFOOT, LINE=1, OBJECT=TEXT, ITEM=2, COLOR=GREEN,
     FOCEXEC=PRDSALES(STOREID=STCD), $
TYPE=SUBFOOT, LINE=3, OBJECT=TEXT, ITEM=2, COLOR=BLUE,
     FOCEXEC=HSTSALES(STOREID=STCD), $
ENDSTYLE
END
```

Using StyleSheet declarations, the subfoot phrase *Sales By Product* links to a second procedure named PRDSALES and passes it the value of STCD displayed in the subfoot. The subfoot phrase *Sales By Date* links to a procedure named HSTSALES and passes it the value of STCD displayed in the subfoot.

The request for the linked report HSTSALES is:

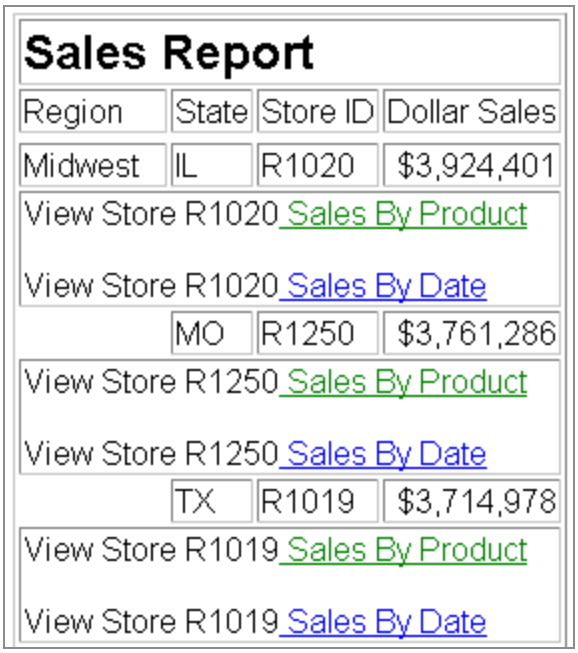
```
TABLE FILE GGSALES
SUM UNITS
BY STCD
BY DATE
WHERE STCD = '&STOREID'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The request for the linked report PRDSALES is:

```
TABLE FILE GGSALES
SUM UNITS
BY STCD
BY PRODUCT
WHERE STCD = '&STOREID'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The first page of output for the main report follows. If you select **Sales By Product** for Store R1020, the value R1020 is passed to the PRDSALES procedure. If you select **Sales By Date** for Store R1019, the value R1019 is passed to the HSTSALES procedure.

The output is:



**Sales Report**

| Region | State | Store ID | Dollar Sales |
|---|---|---|---|
| Midwest | IL | R1020 | $3,924,401 |
| View Store R1020 Sales By Product<br>View Store R1020 Sales By Date | | | |
| | MO | R1250 | $3,761,286 |
| View Store R1250 Sales By Product<br>View Store R1250 Sales By Date | | | |
| | TX | R1019 | $3,714,978 |
| View Store R1019 Sales By Product<br>View Store R1019 Sales By Date | | | |

If you click the **Sales By Product** link for store R1020, the output is:

| Store ID | Product | Unit Sales |
|---|---|---|

| | | |
|---|---|---|
| R1020 | Biscotti | 29413 |
| | Coffee Grinder | 19339 |
| | Coffee Pot | 15785 |
| | Croissant | 43300 |
| | Espresso | 32237 |
| | Latte | 77344 |
| | Mug | 30157 |
| | Scone | 45355 |
| | Thermos | 14651 |

# Linking to a URL

You can define a link from any report component to any URL including webpages, websites, Servlet programs, or non-World Wide Web resources, such as an email application. After you have defined a link, you can select the report component to access the URL.

The links you create can be dynamic. With a dynamic link, your selection passes the value of the selected report component to the URL. The resource uses the passed value to

dynamically determine the results that are returned. You can pass one or more parameters. For details, see Creating Parameters.

# Link to a URL

```
TYPE=type, [subtype], URL=url[(parameters ...)], [TARGET=frame,] [ALT =
'description',] $
```

where:

**type**

Identifies the report component that you select in the web browser to execute the link. The TYPE attribute and its value must appear at the beginning of the declaration.

**subtype**

Are any additional attributes, such as COLUMN, LINE, or ITEM, that are needed to identify the report component that you are formatting. For information on identifying report components, see Identifying a Report Component in a WebFOCUS StyleSheet.

**url**

Identifies any valid URL, including a URL that specifies a WebFOCUS Servlet program, or the name of a report column enclosed in parentheses whose value is a valid URL to which the link will jump.

**Note:**

- The maximum length of a URL=*url* argument, including any associated variable=object parameters, is limited by the maximum number of characters allowed by the browser. For information about this limit for your browser, search on your browser vendor's support site. The URL argument can span more than one line, as described in Creating and Managing a WebFOCUS StyleSheet.

  Note that the length of the URL is limited by the maximum number of characters allowed by the browser. For information about this limit for your browser, search on your browser vendor’s support site.

- If the URL refers to a WebFOCUS Servlet program that takes parameters, the URL must end with a question mark (?).

**parameters**

Values that are passed to the URL. For details, see Creating Parameters.

**frame**

Identifies the target frame in the webpage in which the output from the drill-down link is displayed. For details, see Specifying a Target Frame.

**description**

Is a textual description of the link supported in an HTML report for compliance with Section 508 accessibility. Enclose the description in single quotation marks.

The description also displays as a pop-up description when your mouse or cursor hovers over the link in the report output.

# Linking to a URL

The following example illustrates how to link to a URL from a report. The heading *Click here to access the IB homepage* is linked to the URL www.ibi.com. The relevant StyleSheet declarations are highlighted in the request.

Note that *webserver* indicates the name of the webserver that runs WebFOCUS.

```
TABLE FILE GGSALES
ON TABLE SET PAGE-NUM OFF
SUM UNITS AND DOLLARS
BY CATEGORY BY REGION
HEADING
"Regional Sales Report"
"Click here to access the IB homepage."
" "
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=HEADING, LINE=2, OBJECT=TEXT, ITEM=1,
   URL=http://www.ibi.com, $
ENDSTYLE
END
```

The output is:

Regional Sales Report
Click here to access the IB homepage.

| Category | Region | Unit Sales | Dollar Sales |
|---|---|---|---|
| Coffee | Midwest | 332777 | 4178513 |
| | Northeast | 335778 | 4164017 |
| | Southeast | 350948 | 4415408 |
| | West | 356763 | 4473517 |
| Food | Midwest | 341414 | 4338271 |
| | Northeast | 353368 | 4379994 |
| | Southeast | 349829 | 4308731 |
| | West | 340234 | 4202337 |
| Gifts | Midwest | 230854 | 2883881 |
| | Northeast | 227529 | 2848289 |
| | Southeast | 234455 | 2986240 |
| | West | 235042 | 2977092 |

When you click the link the site displays in your browser.

# Linking to a URL to Run a Drilldown WebFOCUS Server Procedure

The following request is initiated from a browser session and runs a drill down report stored on the WebFOCUS Reporting Server.

This procedure is run from a browser, so the drilldown in the example is specified as a relative URL (it does not have protocol, host, or port) because it will be submitted using the protocol, host, and port of the current browser session.

**Note:** This technique is useful in a Managed Reporting procedure for creating a drill down to a WebFOCUS Server procedure. The FOCEXEC= technique for running a drill down procedure does not work because Managed Reporting always looks for the procedure in the Managed Reporting repository.

The main procedure is:

```
TABLE FILE GGSALES
ON TABLE SET PAGE-NUM OFF
SUM UNITS AND DOLLARS
BY CATEGORY BY REGION
HEADING
"Regional Sales Report"
" "
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=DATA, COLUMN=REGION,
URL=/ibi_apps/WFServlet?(IBIF_ex='ggdrill' AREA=REGION IBIC_
server='EDASERVE' IBI_APPS='IBISAMP'),$
ENDSTYLE
END
```

The drilldown report, which must be in application ibisamp, is:

```
-DEFAULTS &REGION='$*';
TABLE FILE GGSALES
ON TABLE SET PAGE-NUM OFF
SUM UNITS AND DOLLARS
BY PRODUCT
WHERE REGION = '&AREA'
HEADING
"Sales Report for Region &AREA"
" "
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The output of the main report is:

Regional Sales Report
Click a region to see a report for that region.

| Category | Region | Unit Sales | Dollar Sales |
|---|---|---|---|
| Coffee | Midwest | 332777 | 4178513 |
| | Northeast | 335778 | 4164017 |
| | Southeast | 350948 | 4415408 |
| | West | 356763 | 4473517 |
| Food | Midwest | 341414 | 4338271 |
| | Northeast | 353368 | 4379994 |
| | Southeast | 349829 | 4308731 |
| | West | 340234 | 4202337 |
| Gifts | Midwest | 230854 | 2883881 |
| | Northeast | 227529 | 2848289 |
| | Southeast | 234455 | 2986240 |
| | West | 235042 | 2977092 |

If you click the region Northeast, the output is:

Sales Report for Region Northeast

| Product | Unit Sales | Dollar Sales |
|---|---|---|
| Biscotti | 145242 | 1802005 |
| Capuccino | 44785 | 542095 |
| Coffee Grinder | 40977 | 509200 |
| Coffee Pot | 46185 | 590780 |
| Croissant | 137394 | 1670818 |
| Espresso | 68127 | 850107 |
| Latte | 222866 | 2771815 |
| Mug | 91497 | 1144211 |
| Scone | 70732 | 907171 |
| Thermos | 48870 | 604098 |

# Usage Notes for Linking to a URL

- Special characters that should be interpreted as text within a URL must be encoded. For example, if you need to include a slash character (/) as text in the URL string, you must use its encoded value, '%2F'. For example, to drill down on the title of a report to a URL, such as passing 'A' with value '2009/03' to test.asp, the StyleSheet command should be:

```
TYPE=TITLE, URL=/test.asp?(A='2009%2F03'), $
```

# Defining a Hyperlink Color

You can use the HYPERLINK-COLOR attribute to designate a color for a hyperlink within a report. This applies to all hyperlinks generated in the report. You can define a single color for the entire report or different colors for each individual element.

# Define a Hyperlink Color

```
TYPE = type, HYPERLINK-COLOR = color
```

where:

**type**

Is the report component you wish to affect. You can apply this keyword to the entire report using TYPE=REPORT. The attribute can also individually be set for any other element of the report. For details, see Identifying a Report Component in a WebFOCUS StyleSheet.

**color**

Can use any style sheet supported color value designation. For available color values that can be utilized with the syntax, see Color Values in a Report.

# Defining a Hyperlink Color

The following PDF request illustrates how to define hyperlink colors for the entire report, as well as individual elements.

- The default font color for the entire report is grey and the default hyperlink color for the entire report is slate blue.
- For the Dollar Sales column (DOLLARS), the font color is green and the hyperlink color is purple.
- For both the Dollar Sales column (DOLLARS) and the Unit Sales column (UNITS), conditional styling has been applied using the same condition (REGION GE 'O').
- For the Unit Sales column (UNITS), when the conditional styling is met, the hyperlink color is inherited from the default hyperlink color for the report (slate blue).
- For the Dollar Sales column (DOLLARS), when the conditional styling is met, the hyperlink color is purple.

```
TABLE FILE GGSALES
SUM DOLLARS/D12CM UNITS/D12C
BY REGION
BY CATEGORY
HEADING
"Hyperlinks of Many Colors"
""
ON TABLE SET PAGE-NUM OFF
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT, SQUEEZE=ON, FONT=ARIAL, GRID=OFF, COLOR=GREY,
  HYPERLINK-COLOR='SLATE BLUE',$
TYPE=DATA, COLUMN=UNITS, WHEN=REGION GE 'O', URL='http://www.ibi.com',$
TYPE=DATA, COLUMN=DOLLARS, COLOR=GREEN, HYPERLINK-COLOR='PURPLE',$
TYPE=DATA, COLUMN=DOLLARS, WHEN=REGION GE 'O',
URL='http://www.ibi.com',$
ENDSTYLE
END
```

The output is:

Hyperlinks of Many Colors

| Region | Category | Dollar Sales | Unit Sales |
|---|---|---|---|
| Midwest | Coffee | $4,178,513 | 332,777 |
| | Food | $4,338,271 | 341,414 |
| | Gifts | $2,883,881 | 230,854 |
| Northeast | Coffee | $4,164,017 | 335,778 |
| | Food | $4,379,994 | 353,368 |
| | Gifts | $2,848,289 | 227,529 |
| Southeast | Coffee | $4,415,408 | 350,948 |
| | Food | $4,308,731 | 349,829 |
| | Gifts | $2,986,240 | 234,455 |
| West | Coffee | $4,473,517 | 356,763 |
| | Food | $4,202,337 | 340,234 |
| | Gifts | $2,977,092 | 235,042 |

# Usage Notes for HYPERLINK-COLOR

- By default, drill-down links are presented in hyperlink blue and underlined.
- In HTML and DHTML reports, any designated report font color overrides the drill-down default font color.
- For standard reports, set the HYPERLINK-COLOR attribute using the TYPE=REPORT declaration of the style sheet.
- For compound reports, set the HYPERLINK-COLOR attribute using the TYPE=REPORT declaration of the style sheet of the first component report (excluding anything on the Page Master).
- For PPTX, the hyperlink color is stored as part of the PPTX Slide Master theme. Only one HYPERLINK-COLOR attribute can be defined for each request (report/compound report).

# Linking to a JavaScript Function

You can use a StyleSheet to define a link to a JavaScript function from any report component. After you have defined the link, you can select the report component to execute the JavaScript function.

Just as with drill-down links to procedures and URLs, you can specify optional parameters that allow values of a report component to be passed to the JavaScript function. The

function will use the passed value to dynamically determine the results that are returned to the browser. For details, see Creating Parameters.

**Note:**

- JavaScript functions can, in turn, call other JavaScript functions.
- You cannot specify a target frame if you are executing a JavaScript function. However, the JavaScript function itself can specify a target frame for its results.

# Link to a JavaScript Function

```
TYPE=type, [subtype], JAVASCRIPT=function[(parameters ...)], $
```

where:

**type**

Identifies the report component that you select in the web browser to execute the link. The TYPE attribute and its value must appear at the beginning of the declaration.

**subtype**

Are any additional attributes, such as COLUMN, LINE, or ITEM, that are needed to identify the report component that you are formatting. See Identifying a Report Component in a WebFOCUS StyleSheet for details.

**function**

Identifies the JavaScript function to run when you select the report component.

The maximum length of a JAVASCRIPT=*function* argument, including any associated parameters, is 2400 characters and can span more than one line. If you split a single argument across a line, you need to use the \ character at the end of the first line, as continuation syntax. If you split an argument at a point where a space is required as a delimiter, the space must be before the \ character or be the first character on the next line. The \ character does not act as the delimiter.

In this example,

```
JAVASCRIPT=myfunc(COUNTRY \
CAR MODEL 'ABC'),$
```

the argument correctly spans two lines.

**Note:**

- You can use the Dialogue Manager -HTMLFORM command to embed the report into an HTML document in which the function is defined.
- When you have an HTML document called by -HTMLFORM, ensure that the file extension is .HTM (not .HTML).

For more information about the -HTMLFORM command, see the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

**parameters**

Values that are passed to the JavaScript function. For details, see Creating Parameters.

# Linking to a JavaScript Function

The following displays the report and StyleSheet syntax used to link to a JavaScript function. It also shows the JavaScript function that is executed, and the result that is displayed in the browser.

The report request (which contains the inline StyleSheet) is:

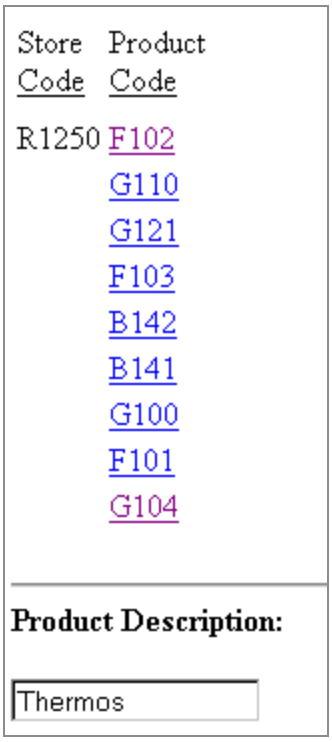
```
TABLE FILE GGORDER
SUM PRODUCT_ID
BY STORE_CODE
BY PRODUCT_DESCRIPTION NOPRINT
IF STORE_CODE EQ 'R1250'
ON TABLE HOLD AS JAVATEMP FORMAT HTMTABLE
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=DATA, COLUMN=PRODUCT_ID, JAVASCRIPT=showitem(PRODUCT),$
ENDSTYLE
END
-RUN
-HTMLFORM JAVAFORM
```

The JAVAFORM.HTM file that contains the JavaScript function is:

```
<HTML>
<HEAD>
```

```
<SCRIPT LANGUAGE="JavaScript">
// This function will display the value in the text box
function showitem(string) {
document.form1.text1.value = string;
}
// End the hiding here
</SCRIPT>
</HEAD>
<BODY>
!IBI.FIL.JAVATEMP;
<HR>
<B>Product Description:</B>
<FORM NAME="form1">
<INPUT TYPE="text" NAME="text1" SIZE="16"> </FORM>
</BODY>
</HTML>
```

When you execute the report procedure, the following report displays in the web browser. If you select a Product Code link, the JavaScript function **ShowItem** executes, and displays the value of the PRODUCT_DESCRIPTION field (a NOPRINT field) in the text box in the form below the report. For example, if you select the Product Code *G104*, "Thermos" displays in the Product Description field.



# Linking to a Maintain Data Procedure

You can provide update capabilities directly from your report by linking it to a Maintain Data procedure.

The link can be either a URL for the WebFOCUS Servlet or a JavaScript drilldown to the Maintain Data procedure.

If it is a URL for the WebFOCUS Servlet, it must include the IBIF_cmd command with the MNTCON RUN or MNTCON EX syntax to invoke an existing Maintain Data form procedure. The link can pass control to a Maintain form, or run a batch mode Maintain procedure that does not display a user interface.

If it is a JavaScript drilldown, it uses the parent.IbComposer_drillMntdata function.

# Link to a Maintain Data Procedure Using a URL

```
TYPE=type, [subtype, ] URL=/ibi_apps/WFServlet? IBIF_cmd='MNTCON
  {RUN|EX} procname' IBIS_passthru='on' IBIS_connect='on'
  [(parameters...)], $
```

where:

**type**

Identifies the report component that you select in the web browser to execute the link. The TYPE attribute and its value must appear at the beginning of the declaration.

**subtype**

Are any additional attributes, such as COLUMN, LINE, or ITEM, that are needed to identify the report component that you are formatting. See Identifying a Report Component in a WebFOCUS StyleSheet for information on identifying report components.

**procname**

Is the name of the Maintain Data procedure.

**parameters**

Values that are passed to the Maintain Data procedure. For details, see Creating Parameters.

# Linking to a Maintain Data Procedure

The following report allows you to update the unit price for a product directly from the report output by linking the report to the appropriate Maintain procedure.

The report request is:

```
TABLE FILE GGPRODS
PRINT PRODUCT_DESCRIPTION VENDOR_CODE VENDOR_NAME UNIT_PRICE
BY PRODUCT_ID
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=DATA, COLUMN=N1,
    URL=/ibi_apps/WFServlet?(PRODUCT_ID=N1 IBIF_cmd='MNTCON RUN GGUPD1'
IBIS_passthru=\
     'on' IBIS_connect='on'), $
ENDSTYLE
END
```

The Maintain Data procedure (ggupd1) is:

```
MAINTAIN FILE ggprods
module import(mntuws FOCCOMP)
$$Declarations
Declare pcode/a4;
Case Top
compute timechk/a0=HHMMSS();
document.referer='/ibi_apps/WFServlet?IBIF_ex=ggprod&IBIS_connect
=on'||
'&timechk='|timechk;
compute pcode = IWC.getAppCGIValue("PRODUCT_ID");
Infer ggprods.prods01.product_id into ggstk1;
Reposition PRODUCT_ID
Stack clear ggstk1 ;
For all next ggprods.prods01.product_id into ggstk1
 where product_id eq pcode;
Winform Show Form1;
EndCase
```

```
Case Updte1
for all Update ggprods.prods01.unit_price from ggstk1(1) ;
EndCase
END
```

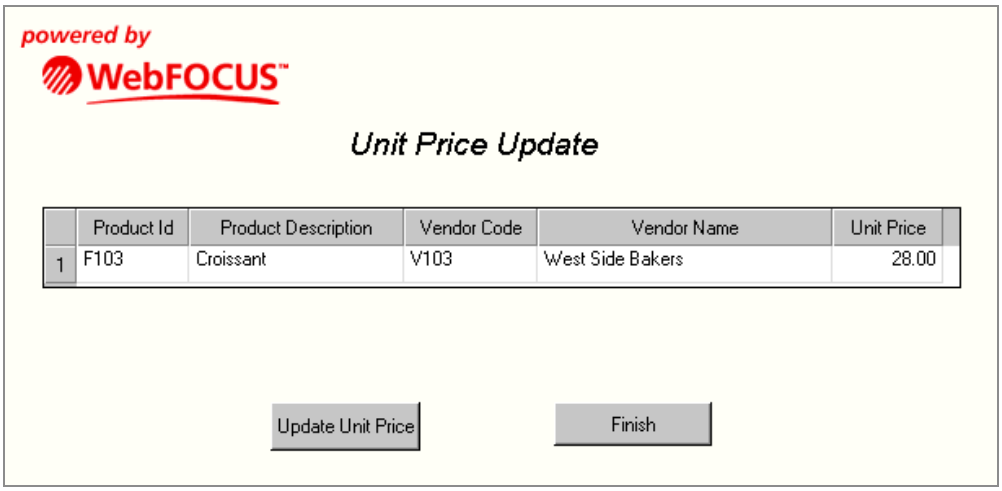
**Note:** This is an interactive form to display data and is created in App Studio.

The report is:

| Product Code | Product | Vendor ID | Vendor Name | Unit Price |
|---|---|---|---|---|
| B141 | Hazelnut | V082 | Coffee Connection | 59.00 |
| B142 | French Roast | V083 | European Specialities, | 81.00 |
| B144 | Kona | V081 | Evelina Imports, Ltd | 76.00 |
| F101 | Scone | V102 | Ridgewood Bakeries | 13.00 |
| F102 | Biscotti | V100 | Delancey Bakeries | 17.00 |
| F103 | Croissant | V103 | West Side Bakers | 30.00 |
| G100 | Mug | V305 | NY Ceramic Supply | 26.00 |
| G104 | Thermos | V305 | ThermoTech, Inc | 97.00 |
| G110 | Coffee Grinder | V303 | Appliance Craft | 125.00 |
| G121 | Coffee Pot | V304 | Appliance Craft | 140.00 |

When you click a Product Code, the Maintain procedure ggupd1 is invoked, which uses the IWC.getAppCGIValue function to retrieve the correct value.

Form 1 in the Maintain Data procedure ggupd1 opens and you can update the unit price for that product:




# Link to a Maintain Data Procedure Using a JavaScript Drilldown

```
TYPE=DATA,
     DRILLMENUITEM='DrillDown 1',
          JAVASCRIPT=parent.IbComposer_drillMntdata( \
     'Request2' \
     'mntcase' \
     'stack_field' \
     rptcol \
     ),
          TARGET='_parent',
$
```

where:

**'DrillDown 1'**

Is the text that displays for the drilldown link.

**'Request2'**

Is the name of the Maintain Data procedure.

**'mntcase'**

Is the name of the Maintain case.

**'stack_field'**

Is the stack and stack field associated with the report column.

**rptcol**

Is the report column specification.

**Note:** Multiple stack fields and report columns can be specified to pass additional values from the report to Maintain.

In the Maintain procedure, make sure the stack retrieving the values is created and the case being performed exists.

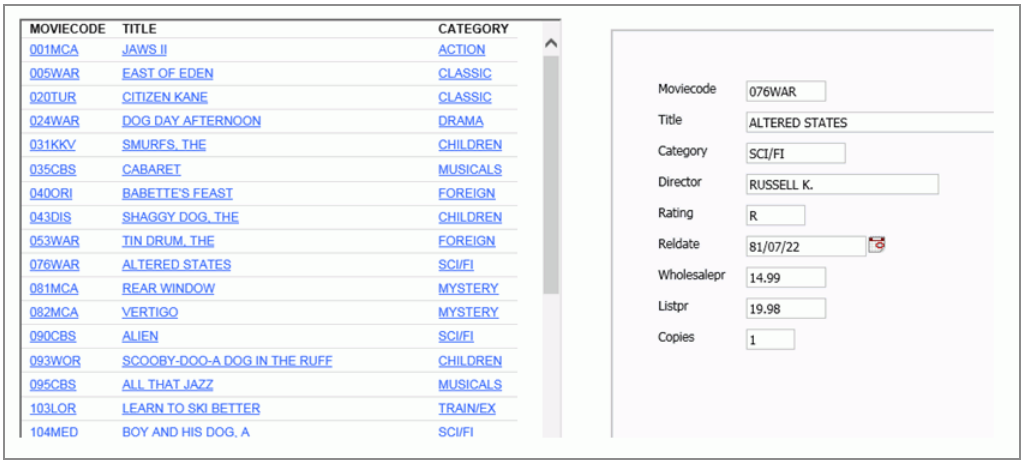
The following is a sample drilldown from a report against the MOVIES data source to a Maintain procedure. It passes the value from the first report column (N1) to the Moviecode field in the Movstk stack in the the LoadData case of the Maintain procedure named Request2.

```
TYPE=DATA,
     DRILLMENUITEM='DrillDown 1',
          JAVASCRIPT=parent.IbComposer_drillMntdata( \
     'Request2' \
     'LoadData' \
     'Movstk.Moviecode' \
     N1 \
     ),
          TARGET='_parent',
$
```

The following is the Maintain code needed in order to pass these values from the report. The Maintain procedure is named Request2.

```
MAINTAIN FILE movies

$$Declarations

Case Top
infer moviecode into movstk
perform loaddata
Winform Show Form1;
EndCase

Case LoadData
reposition moviecode
stack clear detailstk
next moviecode into detailstk
  where moviecode eq movstk.moviecode;
endcase

END
```

When the report and the Maintain form are placed on the same HTML page, clicking one of the links in the report passes the values to the Maintain form, as shown in the following image.



| MOVIECODE | TITLE | CATEGORY |
|---|---|---|
| 001MCA | JAWS II | ACTION |
| 005WAR | EAST OF EDEN | CLASSIC |
| 020TUR | CITIZEN KANE | CLASSIC |
| 024WAR | DOG DAY AFTERNOON | DRAMA |
| 031KKV | SMURFS, THE | CHILDREN |
| 035CBS | CABARET | MUSICALS |
| 040ORI | BABETTE'S FEAST | FOREIGN |
| 043DIS | SHAGGY DOG, THE | CHILDREN |
| 053WAR | TIN DRUM, THE | FOREIGN |
| 076WAR | ALTERED STATES | SCI/FI |
| 081MCA | REAR WINDOW | MYSTERY |
| 082MCA | VERTIGO | MYSTERY |
| 090CBS | ALIEN | SCI/FI |
| 093WOR | SCOOBY-DOO-A DOG IN THE RUFF | CHILDREN |
| 095CBS | ALL THAT JAZZ | MUSICALS |
| 103LOR | LEARN TO SKI BETTER | TRAIN/EX |
| 104MED | BOY AND HIS DOG, A | SCI/FI |

| | |
|---|---|
| Moviecode | 076WAR |
| Title | ALTERED STATES |
| Category | SCI/FI |
| Director | RUSSELL K. |
| Rating | R |
| Reldate | 81/07/22 |
| Wholesalepr | 14.99 |
| Listpr | 19.98 |
| Copies | 1 |

# Multi-Drill Feature With Cascading Menus and User-Defined Styling

The multi-drill feature supports multiple menu items, as well as multiple cascading levels, that you can incorporate into any WebFOCUS report that works with JavaScript (for example, HTML and DHTML). Styling of the menu can be customized using WebFOCUS StyleSheet syntax.

The multi-drill feature for HTML and DHTML provides:

- Flexible cascading menus.
- Fully customizable styling at each element and level within the menu.
- Menus intelligently positioned in relationship to the data elements selected.

For PDF, PS, PPT, PPTX, EXL2K, and XLSX formats, the first active link is used to create a hyperlink on the designated location.

# Accessibility Support

The multi-drill feature provides 508 accessibility support to the cascading multi-drill menus available in HTML format.

In reports, for the multi-drill cascading menu options Auto Drill and Auto Link, accessibility users should:

- Turn the Virtual PC cursor setting mode off.
- Use keystrokes to navigate to the link in the report.
- Open the cascading menu item and then press Enter to view the item.
- Turn the Virtual PC cursor setting on to navigate through the report.

For more information, see *TM4505: WebFOCUS HTML Report Accessibility Support*.

# Creating Multiple Drill-Down Links

You can customize the drill-down menu at two levels:

- Global styling of all menus within the current procedure (fex).
- Item level styling for each entry in the menu.

# Global Menu Styling

To define styling attributes for all menus within the current procedure (fex):

```
TYPE=REPORT, OBJECT=MENU, [FONT=font], [SIZE=size], [COLOR=color],
[HOVER-COLOR=hover_color], [BACKCOLOR=backcolor],
[HOVER-BACKCOLOR=hover_backcolor], [BORDER={ON|OFF|n}],
[BORDER-COLOR=border_color], [BORDER-STYLE=border_style]
$
```

where:

**font**

Defines the font typeface for the menu item. The default is inherited from the report.

**size**

Defines the font size for the menu item. The default font size is 9.

**color**

Defines the text color for the menu item (named colors or RGB/HEX values). The default text color for the menu item is RGB(#6B6B6B). Also used to define the color of the SEPARATOR line and the control caret.

**hover_color**

Defines the text color for the hover over or select menu item (named colors or RGB/HEX values). The default text color for hover over or select menu item is RGB(#495263).

**backcolor**

Defines the background color for the menu item (named colors or RGB/HEX values). The default background color is RGB(#F8F8F8).

**hover_backcolor**

Defines the background color for hover over or select menu item (named colors or RGB/HEX values). The default background color for hover over or select menu item is

RGB(#DFDFDF).

**BORDER={ON|OFF|n}**

where:

- ON displays borders around the menu objects and as the separator lines, based on user defined styling or system defaults.
- OFF displays no border around the menu objects.
- *n* is border weight in pixels (valid values 1, 2, 3, light, medium, heavy).

The default border weight is light.

**border_color**

Defines border coloring to be used for borders around the menu. This will also be used for the color of the separator lines within the menu. Is one of the preset color values. The default border color is RGB(#D6D6D6).

**border_style**

Defines line styles to be used for borders around the menu, as well as separator lines. Possible values are listed in the following table. This will also be used for separator style within the menu. The default border style is solid. Seeing the distinction in border style may require using a heavier weight (for example, border=heavy, or border=3).

| Style | Description |
|---|---|
| NONE | No border/divider |
| SOLID | Solid line |
| DOTTED | Dotted line |
| DASHED | Dashed line |
| DOUBLE | Double line |
| GROOVE | 3D groove |

| Style | Description |
|---|---|
| RIDGE | 3D ridge |
| INSET | 3D inset |
| OUTSET | 3D outset |

**Note:**

- If a multi-drill menu is tagged with the DRILL-SOURCE attribute, it indicates that the menu was generated by WebFOCUS and should be merged into the existing drilldowns added by the user for the specified report element, if any. The value of the attribute indicates which WebFOCUS feature generated the menu. This attribute is reserved for internal use only.
- When you create multiple drill-down links, you cannot specify a single drill-down action (for example, FOCEXEC or URL) before the first DRILLMENUITEM.

# Menu Items Styling

The syntax for cascading menus is an extension of the existing multi-drill (DRILLMENUITEM) syntax. Any syntax that is currently valid should behave the same after the extended syntax is implemented.

To define individual menus and items attached to a report node or data element:

```
TYPE=type, [subtype], [DRILLMENUITEM='description', action|'keyword'],
  [NAME=name], [PARENT=parentname],
```

where:

**type**

Identifies the report component that you select in the web browser to execute the link. The TYPE attribute and its value must appear at the beginning of the declaration.

**subtype**

Are any additional attributes, such as COLUMN, LINE, or ITEM, that are needed to identify the report component that you are formatting.

Each DRILLMENUITEM item must have a description or a keyword pair. Descriptions without actions will automatically be inactive by default.

The exception to this rule will be parent items containing children entries linked with the NAME/PARENT pairing. In this instance, the action will be to present the children in the cascading menu.

**description**

Is the text that appears on the pop-up menu of drill-down options on the report output. The default value is DrillDown *n*, where *n* is a consecutive integer, such as DrillDown 1, DrillDown 2, and so on.

**Note:**

- If DRILLMENUITEM is set to the special value 'SEPARATOR':
  - A horizontal separator line will be drawn using the styling and color attributes defined for the menu borders at the location within the menu.
  - A separator cannot be associated with an action.
- The DRILLMENUITEM value cannot be empty or blank.

**action**

Is the type of link, as described in Drill-Down Action Options. For example, a link to a detail report or URL.

The following attributes are optional. They are only required for cascading menus where a hierarchy must be defined.

**name**

An optional unique identifier for the current item to use as a link between parent and children items. Only required if this node serves as a parent to children menu items where a link must be identified.

**parentname**

An optional unique identifier/name of the parent menu item for the current child item. Only required if this node serves as a parent to another item in the hierarchy.

# Drill-Down Action Options

Each drill menu item can be linked to a single instance of the actions below:

**FOCEXEC=report.fex**

Another report. The StyleSheet attribute is FOCEXEC.

```
TYPE=type, [subtype], FOCEXEC=fex[(parameters...)], [TARGET=frame,]
[ALT='description',] $
```

**URL=url string**

A URL. The StyleSheet attribute is URL. You pass a valid URL. Note that the length of the URL is limited by the maximum number of characters allowed by the browser. For information about this limit for your browser, see the browser support site.

```
TYPE=type, [subtype], URL=url[(parameters...)], [TARGET=frame,]
[ALT='description',] $
```

**URL=(field)**

A URL from a field. The StyleSheet attribute is URL. You pass the name of a report column whose value is a valid URL to which the link will jump.

```
TYPE=type, [subtype], URL=url[(parameters ...)], [TARGET=frame,]
[ALT='description',] $
```

**JAVASCRIPT=function**

A JavaScript function. The StyleSheet attribute is JAVASCRIPT.

```
TYPE=type, [subtype], JAVASCRIPT=function[(parameters ...)], $
```

**Note:** If a drilldown link calls a JavaScript function that displays a popup message, the drill menu will remain open until the popup message is dismissed.

# Summary of Drill-Down Links

Within a multi-drill menu, you can link to:

- Another report. The StyleSheet attribute is FOCEXEC. For details on the syntax, see Linking to Another Report.
- A URL. The StyleSheet attribute is URL. You pass a valid URL. For details on the syntax, see Linking to a URL.

  Note that the length of the URL is limited by the maximum number of characters allowed by the browser. For information about this limit for your browser, search on your browser vendor support site.
- A URL from a field. The StyleSheet attribute is URL. You pass the name of a report column whose value is a valid URL to which the link will jump. For details on the syntax, see Linking to a URL.
- A JavaScript function. The StyleSheet attribute is JAVASCRIPT. For details on the syntax, see Linking to a JavaScript Function.
- A Maintain Data procedure. The StyleSheet attribute is URL with the keyword MNTCON EX. For details on the syntax, see Linking to a Maintain Data Procedure.
- A WebFOCUS compiled Maintain Data procedure. The StyleSheet attribute is URL with the keyword MNTCON RUN. For details on the syntax, see Linking to a Maintain Data Procedure.

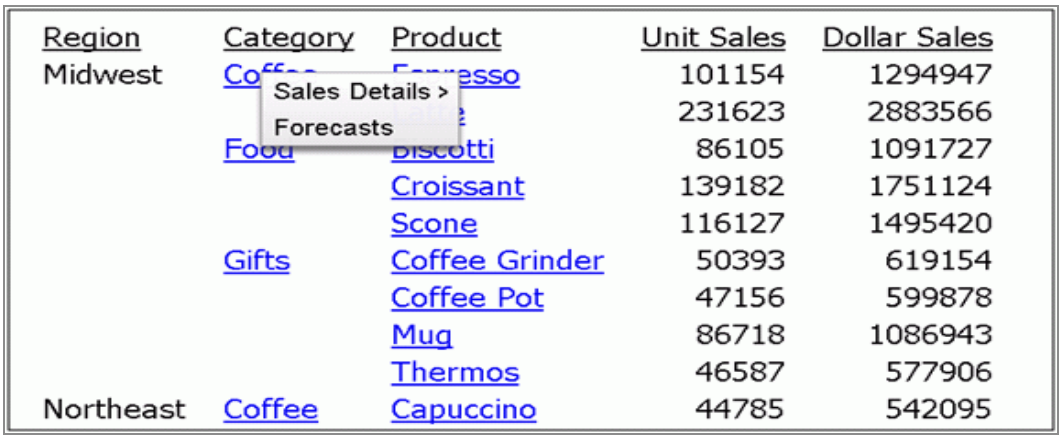
# Sample Drill Menu Stylesheet Code

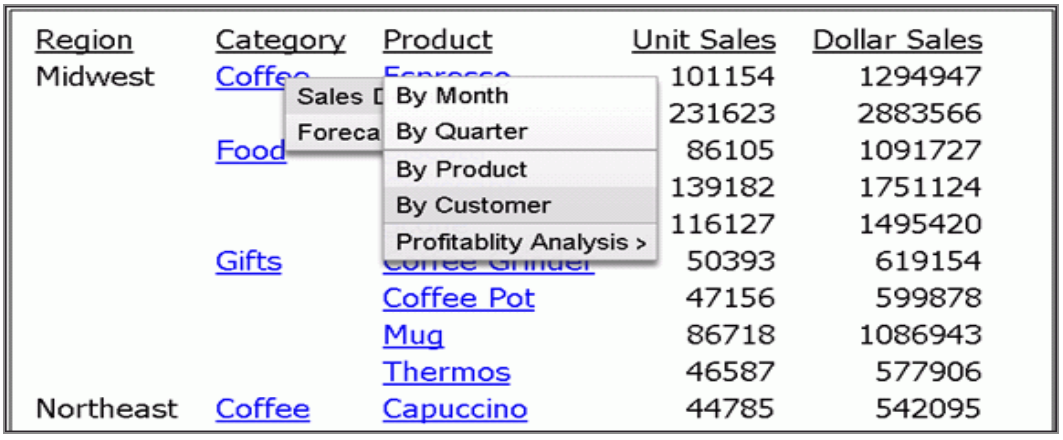
```
TABLE FILE GGSALES
SUM
   GGSALES.SALES01.UNITS
   GGSALES.SALES01.DOLLARS
BY GGSALES.SALES01.REGION
BY GGSALES.SALES01.CATEGORY
BY GGSALES.SALES01.PRODUCT
ON TABLE SET PAGE-NUM NOLEAD
ON TABLE SET ASNAMES ON
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT HTML
ON TABLE SET HTMLEMBEDIMG ON
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
FONT=TAHOMA, GRID=OFF,$
```

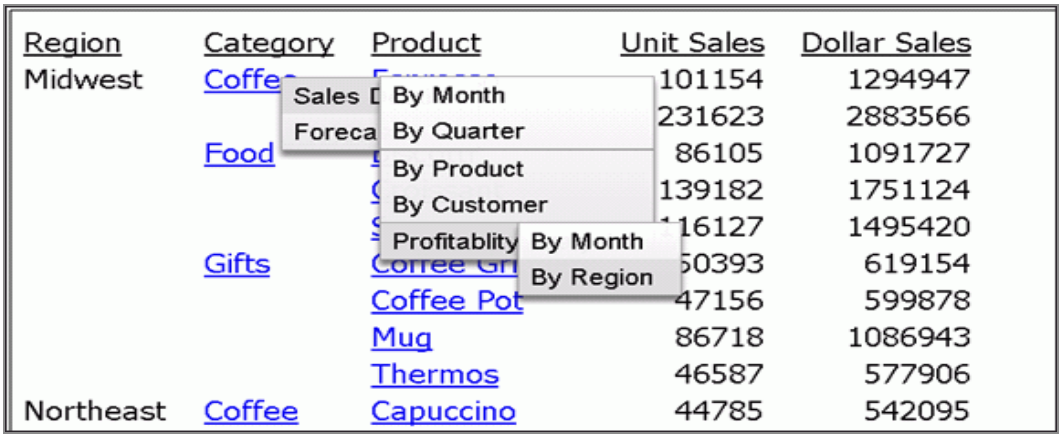
```
TYPE=DATA,COLUMN=B2,
  DRILLMENUITEM='Sales Details', NAME=menu2,
  DRILLMENUITEM='By Month',
    PARENT=menu2, NAME=menu21,
    FOCEXEC=detailreport.fex(PARAMETER=CATEGORY),TARGET=_blank,
  DRILLMENUITEM='By Quarter',
    PARENT=menu2, NAME=menu23,
    FOCEXEC=detailreport.fex(PARAMETER=CATEGORY),TARGET=_blank,
  DRILLMENUITEM=SEPARATOR, PARENT=menu2,
  DRILLMENUITEM='By Product',
    PARENT=menu2, NAME=menu24,
    FOCEXEC=detailreport.fex(PARAMETER=CATEGORY),TARGET=_blank,
  DRILLMENUITEM='By Customer',
    PARENT=menu2,NAME=menu25,
    FOCEXEC=detailreport.fex(PARAMETER=CATEGORY),TARGET=_blank,
  DRILLMENUITEM=SEPARATOR, PARENT=menu2,
  DRILLMENUITEM='Profitablity Analysis',
    PARENT=menu2,NAME=menu3,
  DRILLMENUITEM='By Month',
    PARENT=menu3, NAME=menu31,
    FOCEXEC=detailreport.fex(PARAMETER=CATEGORY),TARGET=_blank,
  DRILLMENUITEM='By Region',
    PARENT=menu3, NAME=menu32,
    FOCEXEC=detailreport.fex(PARAMETER=CATEGORY),TARGET=_blank,
  DRILLMENUITEM='Forecasts',
    FOCEXEC=detailreport.fex(PARAMETER=CATEGORY),TARGET=_blank,
$
TYPE=DATA,COLUMN=B3,
  DRILLMENUITEM='IBI Links',NAME=menu4a,
  DRILLMENUITEM='Information Builders',
    PARENT=menu4a, NAME=menu41,
    URL=http://www.ibi.com,TARGET=_blank,
  DRILLMENUITEM='Summit 2015',
    PARENT=menu4a, NAME=menu42,
    URL=http://www.ibi.com,TARGET=_blank,
  DRILLMENUITEM='Competative Analysis',
    PARENT=menu4a, NAME=menu43,
    URL=http://www.ibi.com,TARGET=_blank,
  DRILLMENUITEM='External Links', NAME=menu4b,
  DRILLMENUITEM='Google',
    PARENT=menu4b, NAME=menu45, URL=http://www.google.com,TARGET=_blank,
  DRILLMENUITEM='Weather',
    PARENT=menu4b, NAME=menu46, URL=http://www.weather.com,TARGET=_
blank,
  DRILLMENUITEM='CNN',
    PARENT=menu4b,NAME=menu47, URL=http://www.cnn.com,TARGET=_blank,
$
```

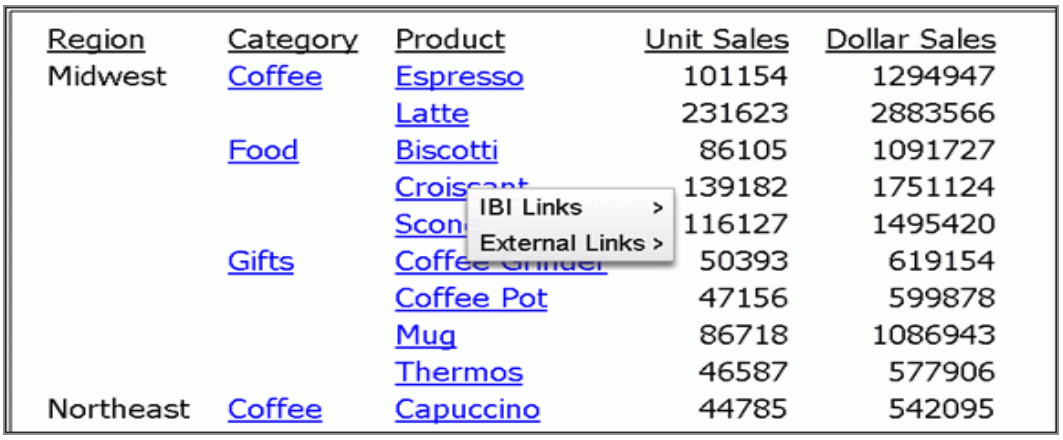
```
ENDSTYLE
END
```

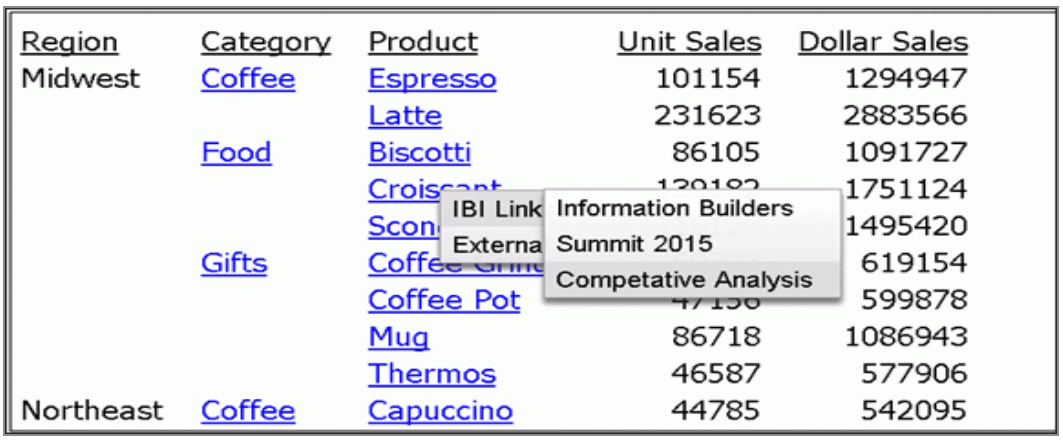
This code generates a menu structure that looks like the following images.



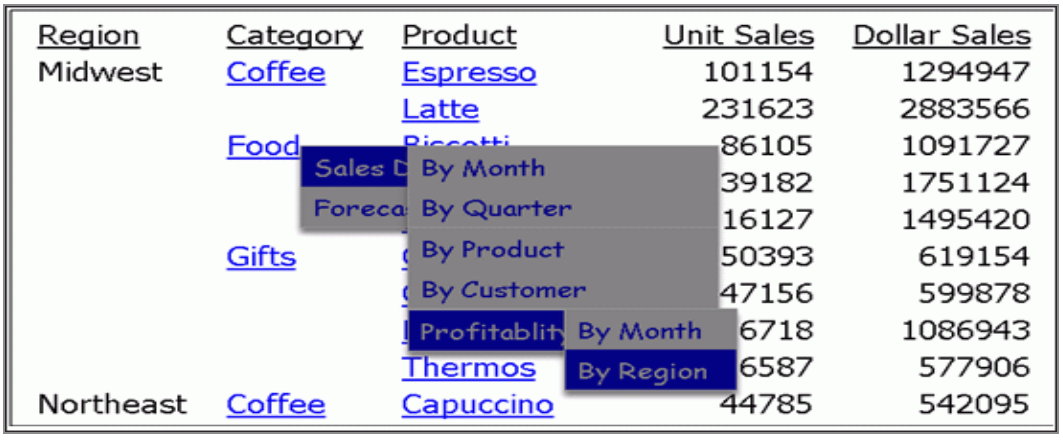


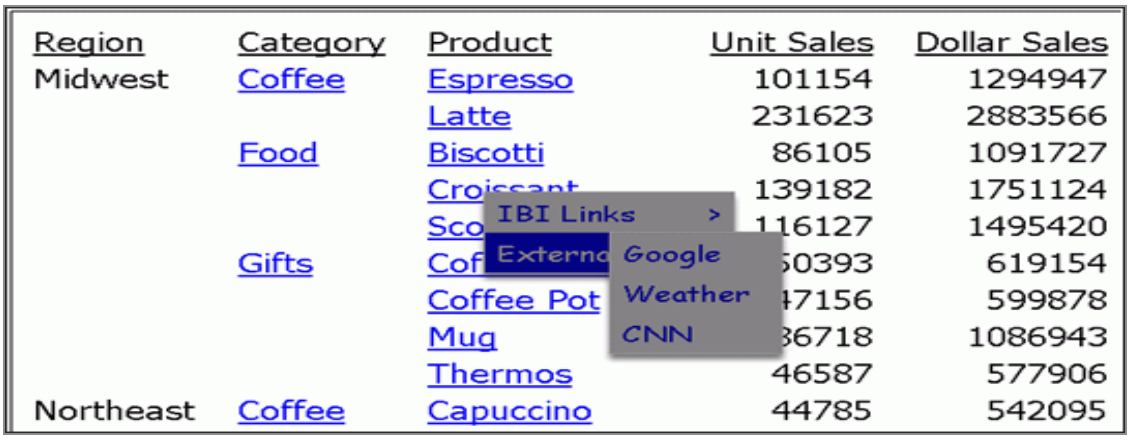




To apply custom styling to the menus, add the following syntax to the StyleSheet:

```
TYPE=REPORT, OBJECT=MENU, FONT="COMIC SANS MS", COLOR=NAVY,
BACKCOLOR=GREY, HOVER-COLOR=GREY, HOVER-BACKCOLOR=NAVY, $
```

The menu structure will now look like the following images.






# Usage Notes for Multi-Drill Menus

The following interactive reports are supported with the multi-drill cascading menus with user defined styling:

- HFREEZE
- Accordion by Row (EXPANDBYROW, EXPANDBYROWTREE)
- Accordion by Column (EXPANDABLE)
- OLAP
- HTML TOC

**Note:** As of Release 8.2 Version 01, when the Multi-Drill and On Demand Paging features are enabled in a report, the cascading Multi-Drill menus do not display. Instead, the legacy Multi-Drill menus generated prior to Release 8.2.01 will be generated. Cascading menus are not available and all hyperlinks display on the same level on the menu.

# Applying Conditional Styling

You can apply conditional styling to a report component, using a phrase such as WHEN, and use it to select one of a number of different actions, depending on the value of fields in the report.

The WHEN condition must precede the DRILLMENUITEM syntax.

For details on creating conditions, see Linking With Conditions.

# Applying Conditional Styling to a Multiple Drill-Down Report

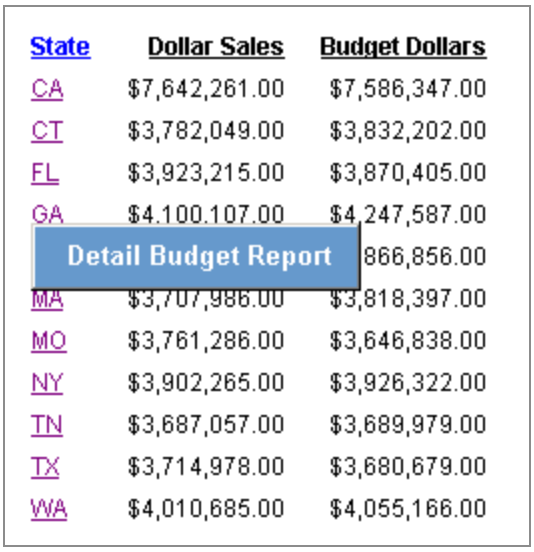
Add the following boldface code to the sample summary report in Creating Multiple Drill-Down Links. Notice that the WHEN condition precedes the code for DRILLMENUITEM, as required.

When you run the summary report, the State field is in red instead of blue whenever budget dollars is greater than dollar sales, and the pop-up menu of drill-down options shows Detail Budget Report instead of DrillDown 1 and DrillDown 2.

```
.
.
.
TYPE=DATA,
     COLUMN=N1,
     COLOR='BLUE',
     STYLE=UNDERLINE,
     DRILLMENUITEM='DrillDown 1',
          URL=http://www.informationbuilders.com?,
     DRILLMENUITEM='DrillDown 2',
          FOCEXEC=DETAILREPORT(PARAMETER=N1),$
```

```
TYPE=DATA,
     COLUMN=N1,
     COLOR='RED',
     STYLE=UNDERLINE,
     WHEN=BUDDOLLARS GT DOLLARS,
     DRILLMENUITEM='Detail Budget Report',
          FOCEXEC=DETAILREPORT(PARAMETER=N1),$.
.
.
```

Sample output is:




# Creating Parameters

If your drill-down report depends on a specific data value in the base report, you must create a parameter (or parameters) that can pass one or more values to the report you are drilling down to. StyleSheets and parameters" />

Parameters are useful when you want to create a dynamic link. For example, your first report is a summary report that lists the total number of products ordered by a company on a specific date. You can drill down from a specific product in that report to a more detailed report that shows the name of the product's vendor and the individual number of units ordered by order number. With a dynamic link, you create only one drill-down report that uses the value passed from the first report to determine what information to display, instead of several static reports.

You can create multiple parameters. The entire string of parameters must be enclosed in parentheses, separated from each other by a blank space, and cannot exceed 2400 characters.

You can use any combination of the following methods to create parameters in your StyleSheet declaration. You can specify:

- A constant value.
- The name or the position of a field.
- The name of an amper variable to pass its value. Amper variables can only be used with inline StyleSheets. For details on inline StyleSheets, see Creating and Managing

a WebFOCUS StyleSheet.

# Create Parameters

```
parameter=value
```

where:

**parameter**

Is the name of the variable in the linked procedure.

**Note:** To avoid conflicts, do not name variables beginning with Date, IBI, or WF. Variable names beginning with these values are reserved for internal use.

**value**

Identifies the value to be passed. Values can be any of the following:

'constant_value' identifies an actual value to be passed. The value must be enclosed in single quotation marks.

field identifies the field in the report whose value is to be passed to the procedure. You can identify the field using either the field name or the field position. For details on field position, see Identifying a Report Component in a WebFOCUS StyleSheet.

'&variable' identifies an amper variable whose value is to be passed to the procedure. The name of the amper variable must be enclosed in single quotation marks. You can use amper variables only in inline StyleSheets.

**Note:** The usual use of an amper variable is to pass a constant value. If the amper variable corresponds to an alphanumeric field, the amper variable would have to be embedded in single quotation marks, for example:

```
'&ABC'.
```

The entire string of parameter names and values must be enclosed in parentheses. Each *parameter=value* pair must be separated by a blank space. You can include multiple parameters in your request but the entire string cannot exceed 2400 characters.

**Note:** If the drill-down report contains a -DEFAULTS statement that sets a default value to the same amper variable passed from the main report, the amper variable value passed down overwrites the -DEFAULTS statement in the target procedure.

# Creating Parameters by Specifying a Constant Value

The following example illustrates how to create parameters by specifying a constant value. The relevant StyleSheet declarations are highlighted in the request.

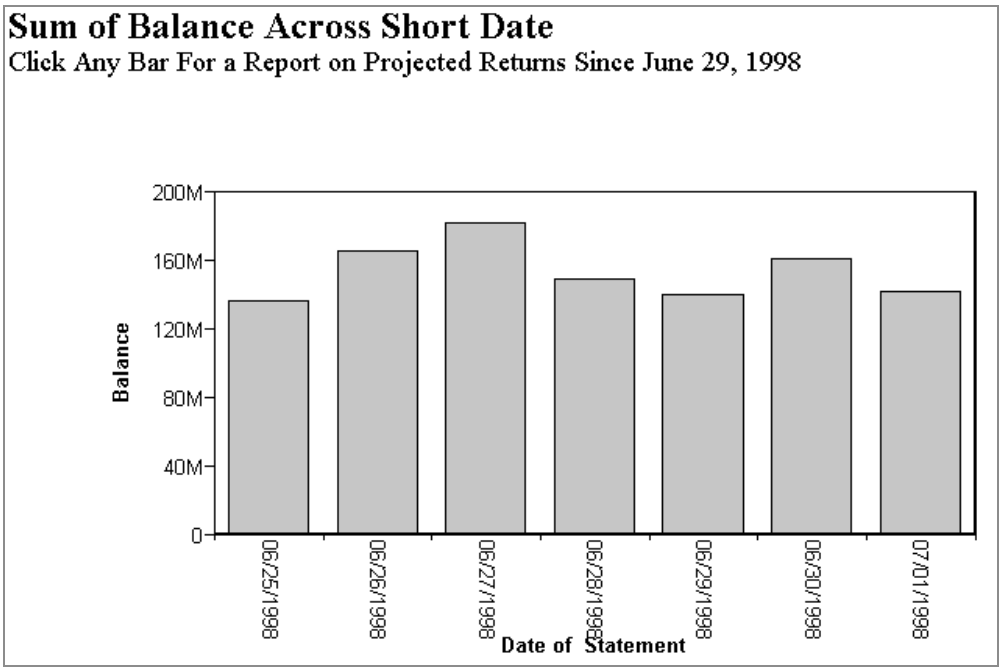
Main report:

```
SET LOOKGRAPH BAR
SET 3D=OFF
GRAPH FILE SHORT
HEADING
"Sum of Balance Across Short Date"
"Click Any Bar For a Report on Projected Returns Since June 29, 1998 "
SUM BALANCE
ACROSS SHORT_DATE
ON GRAPH SET STYLE *
TYPE=DATA, ACROSSCOLUMN=N1,FOCEXEC=PROJRET(Short_Date='06291998'),$
ENDSTYLE
END
```

Drill-down report (PROJRET):

```
TABLE FILE SHORT
HEADING
"Projected Returns Since June 29, 1998 "
SUM PROJECTED_RETURN
BY SHORT_DATE
BY REGION
WHERE SHORT_DATE GE '&Short_Date';
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The output for the main report is:




When you click a bar the output is:

Projected Returns Since June 29, 1998

| | | |
|---|---|---|
| Date of Statement | Region | Projected Annualized Return |
| 06/29/1998 | CENTRAL AMERICA | 1.360 |

| | | |
|---|---|---|
| | EASTERN EUROPE | 2.300 |
| | FAR EAST | 1.300 |
| | MIDDLE EAST | 1.140 |
| | NORTH AMERICA | 1.780 |
| | SOUTH AMERICA | 1.200 |
| | WESTERN EUROPE | 1.140 |
| 06/30/1998 | CENTRAL AMERICA | 1.360 |
| | EASTERN EUROPE | 2.350 |
| | FAR EAST | 1.300 |
| | MIDDLE EAST | 1.140 |
| | NORTH AMERICA | 1.780 |

| | | |
|---|---|---|
| | SOUTH AMERICA | 1.200 |
| | WESTERN EUROPE | 1.140 |
| 07/01/1998 | CENTRAL AMERICA | 1.360 |
| | EASTERN EUROPE | 2.300 |
| | FAR EAST | 1.300 |
| | MIDDLE EAST | 1.140 |
| | NORTH AMERICA | 1.780 |
| | SOUTH AMERICA | 1.200 |
| | WESTERN EUROPE | 1.140 |

# Creating Parameters By Specifying a Field

The following example illustrates how to create a parameter by specifying a field, in this case CATEGORY. The SALES drill-down report (the report that is linked to the main report)

sets the CATEGORY field equal to &TYPE. In the base report, TYPE is set to equal the field CATEGORY.  StyleSheets and parameters" />

When you run the report, the values for the field CATEGORY (Coffee, Food, Gifts) are linked to a report that contains the product and regional breakdowns for the respective value.

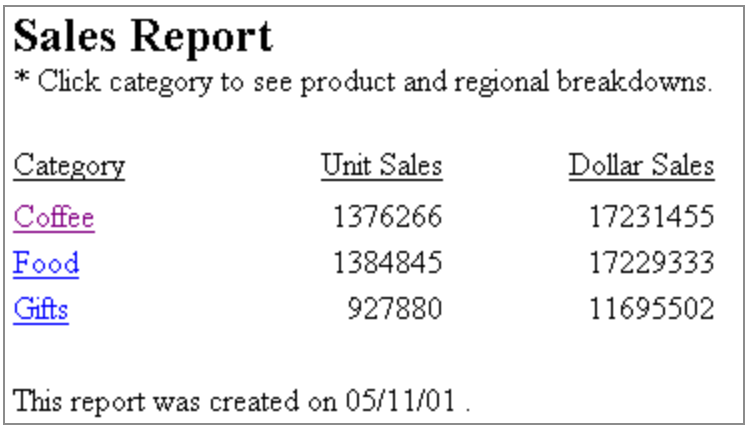
Main report:

```
TABLE FILE GGSALES
SUM UNITS DOLLARS
BY CATEGORY
HEADING
"* Click category to see product and regional breakdowns."
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=DATA, COLUMN=CATEGORY, FOCEXEC=SALES (TYPE=CATEGORY), $
ENDSTYLE
FOOTING
"This report was created on &DATE ."
END
```

Drill-down report (SALES):

```
TABLE FILE GGSALES
ON TABLE SET PAGE-NUM OFF
SUM UNITS DOLLARS
BY CATEGORY BY PRODUCT
ACROSS REGION
WHERE CATEGORY = '&TYPE';
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The output for the main report is:



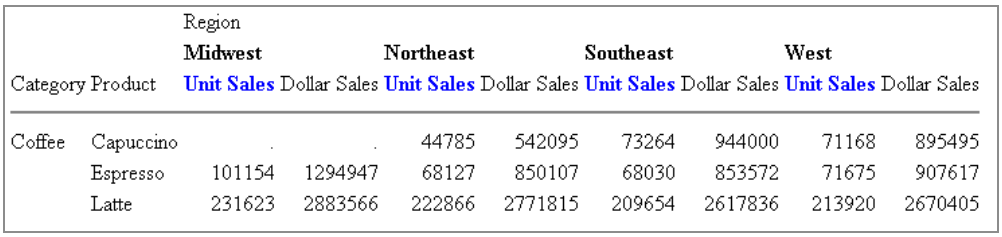
**Sales Report**

* Click category to see product and regional breakdowns.

| Category | Unit Sales | Dollar Sales |
|---|---|---|
| Coffee | 1376266 | 17231455 |
| Food | 1384845 | 17229333 |
| Gifts | 927880 | 11695502 |

This report was created on 05/11/01 .

Click **Coffee** and the product and regional breakdown for Coffee displays:



| | | Region | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | **Midwest** | | **Northeast** | | **Southeast** | | **West** | |
| Category | Product | **Unit Sales** | Dollar Sales | **Unit Sales** | Dollar Sales | **Unit Sales** | Dollar Sales | **Unit Sales** | Dollar Sales |
| Coffee | Capuccino | . | . | 44785 | 542095 | 73264 | 944000 | 71168 | 895495 |
| | Espresso | 101154 | 1294947 | 68127 | 850107 | 68030 | 853572 | 71675 | 907617 |
| | Latte | 231623 | 2883566 | 222866 | 2771815 | 209654 | 2617836 | 213920 | 2670405 |

# Creating Parameters by Specifying an Amper Variable

The following request illustrates how to create a parameter by specifying an amper variable. The relevant StyleSheet declarations are highlighted in the request.

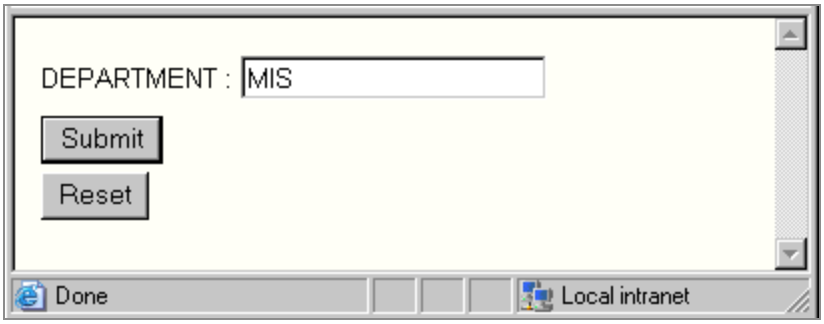
Main report:

```
SET3D=OFF
GRAPH FILE EMPLOYEE
HEADING
"Salary Report Per Employee ID"
"Click A Bar For The List of Employees in the '&DEPARTMENT' Department"
SUM SALARY
ACROSS EMP_ID AS 'EMPLOYEE ID'
ON GRAPH SET STYLE *
TYPE=DATA, ACROSSCOLUMN=SALARY,
FOCEXEC=EMPBYDEP(DEPARTMENT='&DEPARTMENT'), $
ENDSTYLE
END
```

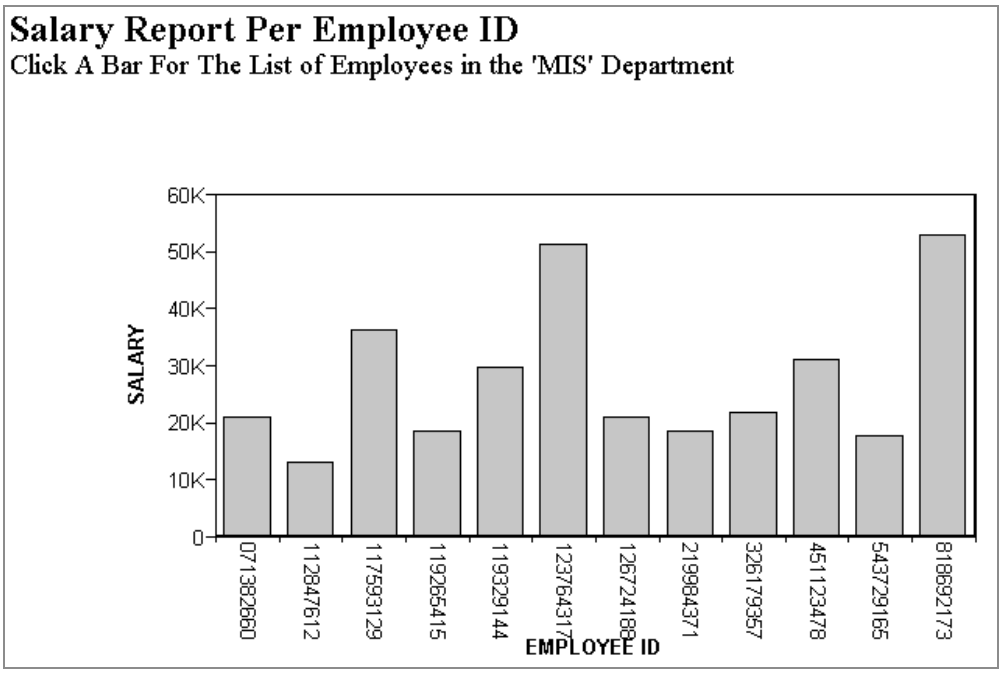
Linked report (EMPBYDEP):

```
TABLE FILE EMPLOYEE
HEADING
"List Of Employees in the '&DEPARTMENT' Department "
PRINT FIRST_NAME LAST_NAME
BY DEPARTMENT
WHERE DEPARTMENT EQ '&DEPARTMENT';
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

When the main report request is run, the following prompt opens:




Enter **MIS** and click **Submit**. The output is:




When you click a bar on the graph, the output is:

```
List Of Employees in the 'MIS' Department
```

| DEPARTMENT | FIRST NAME | LAST NAME |
|---|---|---|
| MIS | MARY | SMITH |
| | DIANE | JONES |
| | JOHN | MCCOY |
| | ROSEMARIE | BLACKWOOD |

| | | |
|---|---|---|
| | MARY | GREENSPAN |
| | BARBARA | CROSS |

# Using DRILLMETHOD in a Drill-Down Request

The following example illustrates how to use the DRILLMETHOD parameter to control the method used in a drill-down request.

- When DRILLMETHOD is set to POST, parameters and values are not included in the URL or stored in the logs, which makes this method more secure.
- When DRILLMETHOD is set to GET, parameters and values are included in the URL and stored in the logs.

The following drill-down request against the GGSALES data source includes a SET DRILLMETHOD=POST command and two parameters, one for CATEGORY and one for PRODUCT.

```
SET DRILLMETHOD=POST
TABLE FILE GGSALES
SUM DOLLARS BUDDOLLARS
BY CATEGORY
BY PRODUCT
ON TABLE PCHOLD FORMAT HTML
ON TABLE SET STYLE *
INCLUDE=IBFS:/FILE/IBI_HTML_DIR/ibi_themes/Warm.sty,$
TYPE=DATA, COLUMN=N1, TARGET='_blank', FOCEXEC=IBFS:/WFC/Repository/My_
Workspace/~admin/child_report.fex(PARA1=CATEGORY PARA2=PRODUCT), $
ENDSTYLE
END
-RUN
```

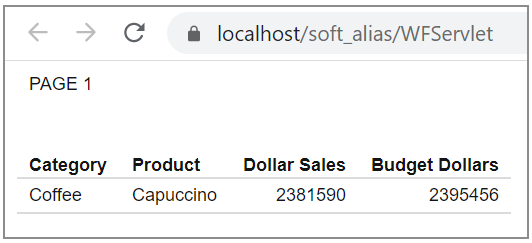
**Note:** You can also use DRILLMETHOD in a StyleSheet command for each drill down, for example:

```
TYPE=DATA, COLUMN=N1, DRILLMETHOD='POST', FOCEXEC=drilldown.fex, $
```

The following request is the child report.

```
TABLE FILE GGSALES
SUM DOLLARS BUDDOLLARS
BY CATEGORY
BY PRODUCT
WHERE CATEGORY EQ &PARA1.QUOTEDSTRING AND PRODUCT EQ
&PARA2.QUOTEDSTRING;
ON TABLE PCHOLD FORMAT HTML
ON TABLE SET STYLE *
INCLUDE=IBFS:/FILE/IBI_HTML_DIR/ibi_themes/Warm.sty,$
ENDSTYLE
END
```

When you run the drill-down request with DRILLMETHOD=POST and select a category, for example, *Coffee*, the parameters and values are not included in the URL, as shown in the following image.




If you run the drill-down request with DRILLMETHOD=GET, and select a category, for example, *Coffee*, the parameters and values are included in the URL, as shown in the following image.

**Note:** For more information about the SET DRILLMETHOD command, see *Customizing Your Environment* in the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

# Using Multiple Parameters

When using multiple parameters, the entire string must be enclosed in parentheses and separated from each other by a blank space. The relevant StyleSheet declarations are highlighted in the request.

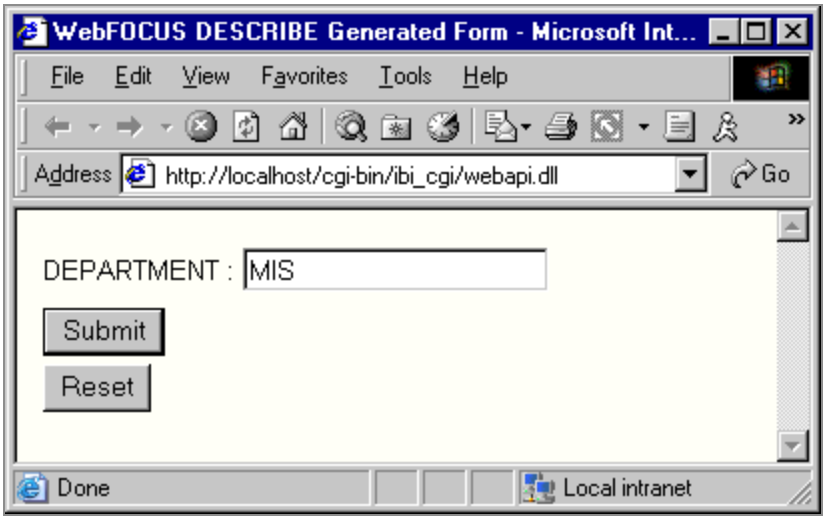
Main report:

```
SET 3D=OFF
GRAPH FILE EMPLOYEE
SUM CURR_SAL
ACROSS DEPARTMENT
ON GRAPH SET STYLE *
TYPE=DATA, ACROSSCOLUMN=CURR_SAL,
FOCEXEC=REPORT2 (DEPARTMENT='&DEPARTMENT' LAST_NAME='SMITH'), $
ENDSTYLE
END
```

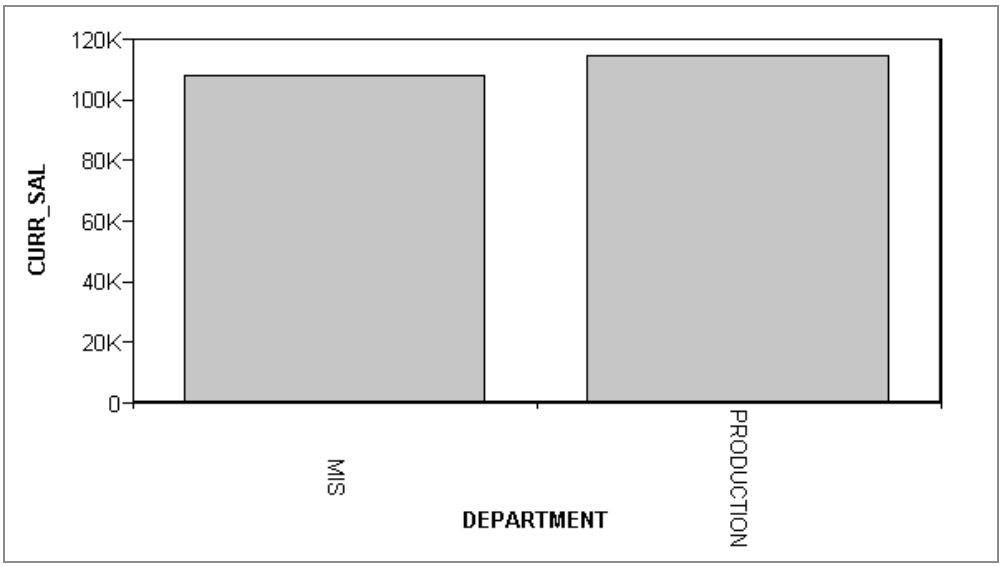
Drill-down report (REPORT2):

```
TABLE FILE EMPLOYEE
PRINT SALARY
BY DEPARTMENT
BY FIRST_NAME
BY LAST_NAME
WHERE DEPARTMENT EQ '&DEPARTMENT'
WHERE LAST_NAME EQ '&LAST_NAME'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

When the main report request is run, the following prompt opens:




Enter **MIS** and click **Submit**. The output is:




When you click the MIS bar, the output is:

| DEPARTMENT | FIRST NAME | LAST NAME | SALARY |
|---|---|---|---|
| MIS | MARY | SMITH | $13,200.00 |

# Linking With Conditions

You can create conditions when linking to a report, URL, or JavaScript function from a report or graph. For example, you may only be interested in displaying current salaries for a particular department. You can accomplish this by creating a WHEN condition.

For complete details on WHEN, see Controlling Report Formatting.

**Note:** Linking with conditions is not supported in GRAPH requests.

# Link With Conditions

To specify a conditional link to a report use:

```
TYPE=type, [subtype], FOCEXEC=fex[(parameters...)],
   WHEN=expression,[TARGET=frame,] $
```

To specify a conditional link to a URL use:

```
TYPE=type, [subtype], URL=url[(parameters...)],
   WHEN=expression,[TARGET=frame,] $
```

To specify a conditional link to a JavaScript function use:

```
TYPE=type, [subtype], JAVASCRIPT=function[(parameters...)],
   WHEN=expression,[TARGET=frame,] $
```

where:

**type**

Identifies the report component that you select in the web browser to execute the link. The TYPE attribute and its value must appear at the beginning of the declaration.

**subtype**

Are any additional attributes, such as COLUMN, LINE, or ITEM, that are needed to identify the report component that you are formatting. For information on identifying report components, see Identifying a Report Component in a WebFOCUS StyleSheet.

**fex**

Identifies the file name of the linked procedure to run when you select the report component. For details about linking to another procedure, see Linking to Another Report.

**url**

Identifies any valid URL, or the name of a report column enclosed in parentheses whose value is a valid URL. For details about linking to a URL, see Linking to a URL.

**function**

Identifies the JavaScript function to run when you select the report component. For details about calling a JavaScript function, see Linking to a JavaScript Function.

**parameters**

Values that are passed to the report, URL, or JavaScript function. For details, see Creating Parameters.

**expression**

Is any Boolean expression that would be valid on the right side of a COMPUTE expression.

**Note:** IF... THEN... ELSE logic is not necessary in a WHEN clause and is not supported. All non-numeric literals in a WHEN expression must be specified within single quotation marks.

**frame**

Identifies the target frame in the webpage in which the output from the drill-down link is displayed. For details, see Specifying a Target Frame.

# Linking With Conditions

In this example, we only want to link the MIS value of the DEPARTMENT field to REPORT3. To do this we include the phrase WHEN=DEPARTMENT EQ 'MIS' in the StyleSheet declaration. The relevant declarations are highlighted in the requests.

Main report:

```
TABLE FILE EMPLOYEE
SUM CURR_SAL AS 'Total,Current,Salaries'
BY DEPARTMENT AS 'Department'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=DATA, COLUMN=N1, FOCEXEC=REPORT3(DEPARTMENT=N1),
     WHEN=DEPARTMENT EQ 'MIS', $
ENDSTYLE
END
```

Drill-down report (REPORT3):

```
TABLE FILE EMPLOYEE
PRINT SALARY
BY DEPARTMENT
```

```
BY LAST_NAME
WHERE DEPARTMENT EQ '&DEPARTMENT'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

In the following output, note that only the MIS department is linked:

| Department | Total Current Salaries |
|---|---|
| MIS | $108,002.00 |
| PRODUCTION | $114,282.00 |

When you click **MIS**, the following output displays:

| DEPARTMENT | LAST NAME | SALARY |
|---|---|---|
| MIS | BLACKWOOD | $21,780.00 |
| | CROSS | $27,062.00 |
| | | $25,755.00 |
| | GREENSPAN | $9,000.00 |
| | | $8,650.00 |

| | | |
|---|---|---|
| | JONES | $18,480.00 |
| | | $17,750.00 |
| | MCCOY | $18,480.00 |
| | SMITH | $13,200.00 |

# Linking From a Graphic Image

You can link to a report or procedure from an image in an HTML report. The image can be attached to the entire report or to the report heading or footing (this includes table headings/table footings, and sub-headings/sub-footings).

The syntax for linking from a graphic image is the same as for linking from a report component. The only difference is adding IMAGE=*image* to the StyleSheet declaration.

**Note:** You can only link to a report or procedure from an image when you are using HTML format.

# Specify Links From a Graphic Image

To specify a link from an image in a report or procedure use:

```
TYPE=type, [subtype], IMAGE=image, FOCEXEC=fex
   [(parameters ...)],[TARGET=frame,] $
```

To specify a link from an image in an URL use:

```
TYPE=type, [subtype], IMAGE=image, URL=url
   [(parameters ...)],[TARGET=frame,] $
```

To specify a link from an image in a JavaScript function use:

```
TYPE=type, [subtype], IMAGE=image, JAVASCRIPT=function
   [(parameters ...)],$
```

where:

**type**

Identifies the report component that the user selects to execute the link. The TYPE attribute and its value must appear at the beginning of the declaration. You can specify the following types of components:

`REPORT` enables you to drill down from a graphical image that is attached to the entire report.

`TABHEADING` or `TABFOOTING` enables you to drill down from a graphical image that is attached to a report heading or footing.

`HEADING` or `FOOTING` enables you to drill down from a graphical image that is attached to a page heading or footing.

`SUBHEAD` or `SUBFOOT` enables you to drill down from a graphical image that is attached to a sub heading or sub footing.

Report components are described in Identifying a Report Component in a WebFOCUS StyleSheet.

**subtype**

Are any additional attributes, such as COLUMN, LINE, or ITEM, that are needed to identify the report component that you are formatting. See Identifying a Report Component in a WebFOCUS StyleSheet for information on identifying report components.

**image**

Specifies the file name of a graphical image file. The image must exist as a separate graphic file in a format that your browser supports. Most browsers support GIF and JPEG file types.

You can specify a local image file, or identify an image elsewhere on the network using a URL. URLs can be absolute, such as, http://www.ibi.com/graphic.gif, or relative alias that can be identified to the application server or web server, such as, /ibi_apps/ibi_html/ibi_logo.gif.

Alternatively, you can specify an alphanumeric field in the report (either a BY sort field or a display field) whose value corresponds to the name of the image file. For information about using StyleSheets to incorporate and position graphical images in a report, see Laying Out the Report Page.

**fex**

Identifies the file name of the linked procedure to run when the user selects the report component. For details about linking to another procedure, see Linking to Another Report.

**url**

Identifies any valid URL, or the name of a report column enclosed in parentheses whose value is a valid URL. For details about linking to an URL, see Linking to a URL.

**function**

Identifies the JavaScript function to run when the user selects the report component. For details about calling a JavaScript function, see Linking to a JavaScript Function.

**parameters**

Are values that are passed to the report, URL, or JavaScript function. You can pass one or more parameters. The entire string of parameters must be enclosed in parentheses, and separated from each other by a blank space. For details, see Creating Parameters.

**frame**

Identifies the target frame in the webpage in which the output from the drill-down link is displayed. For details, see Specifying a Target Frame.

**Note:** You cannot specify a target frame if you are executing a JavaScript function. However, the JavaScript function itself can specify a target frame for its results.

# Specifying a Link From an Image

The following example illustrates how to link a report from an image. The relevant StyleSheet declarations are highlighted in the request.

Main report:

```
TABLE FILE EMPLOYEE
PRINT LAST_NAME BY EMP_ID
```

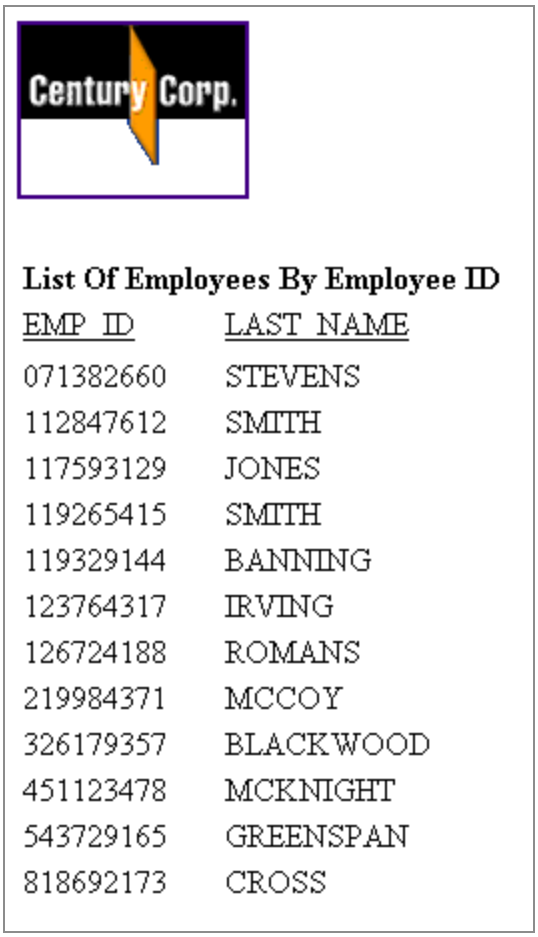
```
HEADING
"List Of Employees By Employee ID"
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=HEADING, STYLE=BOLD, $
TYPE=REPORT, GRID=OFF, $
TYPE=REPORT,
IMAGE=E:\IBI\WEBFOCUS81\APPS\IBINCCEN\IMAGES\LEFTLOGO.GIF,
     FOCEXEC=IMAGE-D, $
ENDSTYLE
END
```

**Note:** The IBINCCEN directory contains the English version of the samples.

Drill-down report (IMAGE-D):

```
TABLE FILE EMPDATA
PRINT SALARY
BY DIV
WHERE DIV LE 'CORP';
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The output for the main report is:




When you click the graphic, the output is:

| DIV | SALARY |
|---|---|
| CE | $62,500.00 |
| | $54,100.00 |
| | $25,400.00 |

| | |
|---|---|
| | $115,000.00 |
| | $33,300.00 |
| | $25,000.00 |
| | $49,000.00 |
| | $40,900.00 |
| | $43,000.00 |
| | $45,000.00 |
| CORP | $55,500.00 |
| | $83,000.00 |
| | $32,000.00 |
| | $62,500.00 |
| | $79,000.00 |

| | |
|---|---|
| | $35,200.00 |
| | $62,500.00 |
| | $26,400.00 |

# Specifying a Base URL

If you want to link to files, images, and Java files, but do not know their full, physical URLs, you can specify a default location where the browser searches for relative URLs.

To specify a default URL location, use the SET BASEURL command. Using SET BASEURL puts <BASE HREF="*url*"> into the HTML file that WebFOCUS generates. When a report is run, the specified directory is searched for the HTML files, graphics files, and Java applet CLASS files that are called by the generated webpage.

For more details on specifying URLs, see Navigating Within an HTML Report.

# Specify a Base URL

```
SET BASEURL=url
```

where:

**url**

Is the default location where the browser searches for relative URLs specified in the HTML documents created by your application.

The URL must begin with http:// and end with a closing delimiter (/).

# Specifying a Base URL

The following illustrates how to specify a base URL:

```
SET BASEURL=http://host[:port]/ibi_apps/ibi_html/
```

where:

**host**

Is the host name where the WebFOCUS Web application is deployed.

**port**

Is the port number (specified only if you are not using the default port number) where the WebFOCUS Web application is deployed.

If you are including a graphic image in your report that is stored in the specified base URL, you can add the following declaration to your StyleSheet instead of typing the entire URL:

```
TYPE=HEADING, IMAGE=ib_logo.gif, ..., $
```

**Note:** If the URL is at a remote website, it may take longer to retrieve. Whenever possible, store graphic image files on your WebFOCUS system.

# Specifying a Target Frame

You can use frames to subdivide application HTML pages into separate scrollable sections. Frames enable users to explore various information items on a page by scrolling through a section, instead of linking to a separate page. When defining a link from a report component to a report procedure or URL, you can specify that the results of the drill-down link be displayed in a target frame on a webpage.

There are two ways to specify a target frame. You can specify:

- A target frame in a StyleSheet declaration using the TARGET attribute. You can use StyleSheets to specify that drill-down links from a report or graph are displayed in a target frame on the webpage displaying the report or graph. However, using StyleSheets to specify target frames adds extra HTML syntax to every HREF that is generated.

**Note:** When specifying a target frame from the Report canvas, manually added commands in the StyleSheet are not recognized. The Report canvas removes commands that it does not generate itself.

- A default target frame with a SET command. SET TARGETFRAME puts the HTML code <BASE TARGET="*framename*"> into the header of the HTML file that WebFOCUS displays. All drill-down links from the base report or graph are directed to the specified frame, unless overridden by the TARGET attribute in the StyleSheet.

To use the TARGET attribute or the SET TARGETFRAME command, you must create multiple frames on the webpage.

**Note:** You cannot specify a target frame if you are executing a JavaScript function. However, the JavaScript function itself can specify a target frame for its results.

# Specify a Target Frame

To specify a target frame in a report or procedure use:

```
TYPE=type, [subtype], FOCEXEC=fex[(parameters ...)], [TARGET=frame,] $
```

To specify a target frame for an URL use:

```
TYPE=type, [subtype], URL=url[(parameters ...)], [TARGET=frame,] $
```

where:

**type**

Identifies the report component that the user selects in the web browser to execute the link. The TYPE attribute and its value must appear at the beginning of the declaration.

**subtype**

Are any additional attributes, such as COLUMN, LINE, or ITEM, that are needed to identify the report component that you are formatting. See Identifying a Report Component in a WebFOCUS StyleSheet for information on identifying report components.

**fex**

Identifies the file name of the linked procedure to run when the user selects the report component. For details about linking to another procedure, see Linking to Another Report.

**url**

Identifies any valid URL, or the name of a report column enclosed in parentheses whose value is a valid URL to which the link will jump. For details about linking to an URL, see Linking to a URL.

**parameters**

Are values being passed to the procedure or URL. You can pass one or more parameters. The entire string of values must be enclosed in parentheses, and separated from each other by a blank space. For details, see Creating Parameters.

**frame**

Identifies the target frame in the web page in which the output from the drill-down link (either a FOCEXEC or URL) is displayed.

If the name of the target frame contains embedded spaces, the name will be correctly interpreted without enclosing the name in quotation marks. For example:

```
TYPE=DATA, COLUMN=N1,
FOCEXEC=MYREPORT, TARGET=MY FRAME, $
```

The name of the target frame is correctly interpreted to be MY FRAME.

You can also use the following standard HTML frame names: _BLANK, _SELF, _PARENT, _TOP.

# Specify a Default Target Frame

```
SET TARGETFRAME=frame
```

where:

**frame**

Identifies the target frame in the webpage in which the output from the drill-down link (either a FOCEXEC or URL) is displayed.

# Specifying a Target Frame

The following illustrates how to specify a default target frame:

```
SET TARGETFRAME=_SELF
```

The following illustrates how to specify a target frame in a request. The relevant StyleSheet declaration is highlighted in the request.

```
TABLE FILE EMPLOYEE
PRINT CURR_SAL
BY DEPARTMENT
ON TABLE SET STYLE *
TYPE=DATA, COLUMN=N1, URL=http:\\www.informationbuilders.com,
     TARGET=_SELF, $
ENDSTYLE
END
```

# Creating a Compound Report

Compound reports combine multiple reports into a single file. This enables you to concatenate reports with styled formats (such as PDF, DHTML, PS, EXL2K, or XLSX). You can also embed image files, including graphs saved as images, in a compound report.

Three types of compound reports exist:

- **Legacy Compound Reports (or, simply, Compound Reports).** These reports string the individual reports or graphs together sequentially into a single output file. The functionality for this type of compound report has been stabilized. The syntax is included in this document for upward compatibility, and applications using this technique will continue to work. For more information, see Creating a Compound PDF or PS Report and Creating a Compound Excel Report.
- **Compound Layout Reports.** A Compound Layout report is comprised of individual

component reports or graphs, either embedded or external. Reports and graphs can be positioned anywhere on the page. You can assign specific pages to combinations of reports and specify how to handle overflow onto additional pages. For more information, see Creating a Compound Layout Report With Document Syntax.

- **Coordinated Compound Layout Reports.** A Coordinated Compound Layout report is *coordinated* so that all reports and graphs that contain a common sort field are burst into separate page layouts. Pages are generated for each value of the common sort field, with every component displaying the data it retrieved for that value on that page. You create a Coordinated Compound Layout report by specifying MERGE=ON in the SECTION declaration for the Compound Layout report.

  In a Coordinated Compound Layout report, if at least one component contains data for a specific sort field value, a page is generated for that value even though some of the components may be missing. For more information about Coordinated Compound Layout reports with missing data, see Coordinated Compound Layout Reports With Missing Data.

While the length of the report will always include all of the rows of data generated by the query, the width of the report is limited by the size of the defined component container. This means that paneling is not supported for compound reports, although it is for non-compound PDF reports. For non-compound PDF documents, if the width of the report data is wider than the defined page size, a panel (or horizontal overflow page) is automatically generated. This paneling feature is not supported for compound PDF documents, so each compound component must fit within the width of the defined container in order for the report to be successfully generated. The container size is defined within each type of report.

- In legacy compound syntax, if one of the component reports is too large to fit within the defined page width, execution is halted and the user is presented with an error message stating that paneling is not supported.
- In Compound Layout Syntax, if a component is too wide to fit within the defined container, the report wraps the contents within the container. The container size is defined through a combination of the POSITION and DIMENSIONS parameters for the component within the compound syntax. For more information about compound layout syntax, see Creating a Compound Layout Report With Document Syntax.

For information about creating PDF Compound Reports with Drill Through links, see Creating a Drill Through PDF Compound Report.

# Creating a Compound Layout Report With Document Syntax

Typically, you create a compound layout report by using the options in the Document canvas. Alternatively, you may create a compound layout report by modifying the syntax in any text editor.

Syntax for a compound layout report is structured by a compound layout block, which places all of the layout information in a single block that precedes the report. This block begins with a COMPOUND LAYOUT declaration and is terminated with END. The language it contains is based on StyleSheet syntax and is parsed by the StyleSheet parser.

This is supported with styled formats, such as PDF, PS, DHTML, EXL2K, or XLSX.

**Tip:** For details about StyleSheet syntax, see Creating and Managing a WebFOCUS StyleSheet.

The compound layout block consists of SECTION, PAGELAYOUT, and COMPONENT declarations. The general structure of the compound layout block of syntax is:

```
COMPOUND LAYOUT PCHOLD AS filename FORMAT format
```

```
SECTION
    PAGELAYOUT
      COMPONENT
      COMPONENT
    ...
    PAGELAYOUT
      COMPONENT
      COMPONENT
    ...
  ...
END
...
COMPOUND END
```

**Note on Compound Layout Declaration:** The available compound layout output formats are PDF, DHTML, PowerPoint, AHTML, Excel, FLEX, and APDF. The selected compound layout format will override any report output format from the individual components. The output file name can be defined using an AS **filename** phrase in the COMPOUND block. If none is defined, the file name is taken from the ON TABLE HOLD phrase in the first component report.

END signifies the end of the COMPOUND LAYOUT block, whereas COMPOUND END signifies the end of the compound report.

Additionally, the syntax SET COMPONENT=report(n) is added after each component, followed by the actual WebFOCUS code to generate the report.

# SECTION Declaration and Syntax

A compound report section, or SECTION declaration, is a grouping of component reports within a compound report. While the current functionality only supports reports with a single section, this structure is used to support more complex reports. The SECTION declaration is mandatory when creating a compound layout report.

The SECTION syntax appears as:

```
SECTION=section-name, LAYOUT=ON, [MERGE=ON|OFF,]
 [UNITS=IN|CM|PTS,] [PAGESIZE=size,] [ORIENTATION=PORTRAIT|LANDSCAPE,]
 [LEFTMARGIN=m,] [RIGHTMARGIN=m,] [TOPMARGIN=m,] [BOTTOMMARGIN=m,] $
```

where:

**section-name**

Is the unique identifier of the section, up to 16 characters.

**LAYOUT=ON**

Specifies that the section uses a complex layout.

**Note:** LAYOUT=ON is the only applicable option at this time.

**MERGE={ON|OFF}**

Specifies whether the section is coordinated (merged) based on the value of the initial BY field.

**Note:** The default value is OFF.

**m**

Specifies the margins (LEFT, RIGHT, TOP, BOTTOM) in inches, centimeters, or points.

If the optional items, UNITS, PAGESIZE, ORIENTATION, or MARGIN are present in the SECTION declaration, they override any settings of these parameters within the component reports, global SET commands, ON TABLE SET commands, and StyleSheet keywords.

# PAGELAYOUT Declaration

A SECTION consists of one or more PAGELAYOUT declarations, each of which group together a number of COMPONENT declarations that are laid out on that particular page of the section.

The PAGELAYOUT keyword brackets a group of COMPONENT declarations that follow, up to the next PAGELAYOUT keyword, or the end of the section.

The PAGELAYOUT syntax appears as:

```
PAGELAYOUT={n|ALL},
 [TOPMARGIN=m,] [BOTTOMMARGIN=m,]$
```

where:

**{n|ALL}**

Specifies on what page of a multi-page layout the components appear. The value **(n)** is either a page number within the current section, or ALL to indicate that the component appears on every page of the section.

- The PAGELAYOUT values are numbered starting with 1. For example, if a compound report is printed on two sides of a page, the component reports on the front side would be specified as PAGELAYOUT 1, and the reverse side would be PAGELAYOUT 2.

  **Note:** Syntax is required even if the report only contains a single page.

  ```
  PAGELAYOUT=1, $
  ```

- The PAGELAYOUT=ALL syntax specifies a component that appears on every page. This is useful for components that generate page headers or footers.

  ```
  PAGELAYOUT=ALL, $
  ```

**m**

Defines the boundaries (TOP, BOTTOM) for flowing reports in current units. For a description of flowing reports, see COMPONENT Declaration.

# Page Masters

Components included in a declaration for PAGELAYOUT=ALL appear on every page of the report output. This is useful for creating a design theme for the compound report output:

- Page masters must have a default report component (since COMPONENT is a required syntax element), but that report component should not display any data, except in the heading. If the component displays data or graphics in the heading, you must leave space for the heading on every page, being careful to place the other components in areas on the page that do not overlap with the heading.

  For example, the following report does not display any data:

  ```
  SET COMPONENT='DfltCmpt1'
  TABLE FILE SYSCOLUM
  SUM TBNAME NOPRINT
  IF READLIMIT EQ 1
  ON TABLE SET PREVIEW ON
  ON TABLE SET PAGE-NUM NOLEAD
  END
  ```

- Page masters for coordinated compound reports must have the same primary BY field as other components in the compound layout report. The best way to create the default component for the page master in a coordinated compound report is to use one of the data sources for one of the compound layout reports. For example, if a component report for PAGELAYOUT1 is against the GGSALES data source, and the primary BY field is PCD, the default component for the page master could be:

  ```
  SET COMPONENT='DfltCmpt1'
  TABLE FILE GGSALES
  SUM UNITS NOPRINT
  BY PCD NOPRINT
  IF READLIMIT EQ 1
  ON TABLE SET PREVIEW ON
  ON TABLE SET PAGE-NUM NOLEAD
  END
  ```

Note that the recommended way to create a design theme with repeating text and images on a page master is to place drawing objects on the page master. For information, see Draw Objects With Document Syntax.

- Page master styling for size and orientation only applies to the default document level. Page master elements do not automatically resize and position for various page orientations throughout the document. For documents requiring mixed page orientations, each page layout can be defined with its own orientation. In this scenario, styling elements should be applied to the individual page layouts so that the styling can be appropriately applied for each change in page orientation.

# COMPONENT Declaration

The order of COMPONENT declarations in the COMPOUND LAYOUT block must match the order in which the component reports are executed, and there must be a COMPONENT declaration for each component report.

There are two types of components: fixed and flowing. A fixed component fills the container defined by the dimension parameters on the page and, if additional data exists, it overflows onto the next page in the same fixed size in the same location. The size and location of the fixed overflow component can be customized on the overflow page (using the OVERFLOW-POSITION and OVERFLOW-DIMENSION parameters). In a flowing component, the data flows from the top of the defined component to the bottom page margin and then begins to flow again on the top page margin of the overflow page, until the data is complete. The starting position of each type of component is defined by the POSITION parameter.

You can also specify the starting position of a component relative to another component, using the RELATIVE-TO, RELATIVE-POINT, and POSITION-POINT keywords. In this case, the relative coordinates of the component's POSITION are interpreted based on where the component, to which it is relative, ends. If the relative component is a flowing component, you can optionally use the REQUIRED-SPACE keyword in conjunction with the RELATIVE-TO keyword to specify where to start the current component.

The fixed or flowing aspect of the component is determined by the DIMENSION parameter. For a fixed component, the DIMENSION parameter specifies sizes for the dimensions of the bounding box. However, for a flowing component the DIMENSION parameter specifies asterisks (* *) for the dimensions.

The COMPONENT syntax appears as:

```
COMPONENT=component-name, TYPE=component-type,
    POSITION=(x y), DIMENSION=(xsize ysize),
    [OVERFLOW-POSITION=(x y),] [OVERFLOW-DIMENSION=(xsize ysize),]
    [RELATIVE-TO=relative_component_name,]
    [RELATIVE-POINT=relative-value, POSITION-POINT=position-value,
      REQUIRED-SPACE=required-space-value,]
    [DRILLMAP=((L1 targetreport)),]  $
```

where:

**component-name**

The name of the component must be a unique identifier, up to 16 characters. It designates a component report that appears later in the request (in the same procedure (FOCEXEC) or in a called procedure), and is identified by **SET COMPONENT=component-name** syntax, using the same name.

**Note:** The SET syntax only tags styled reports that can participate in a compound report, so it can be placed before unstyled reports that precede the report to be named. For example, reports that generate extract files.

**component-type**

Specifies the type of component being declared. Currently, only REPORT is supported.

**POSITION=(x y)**

Specifies the (x y) coordinate on the page where the upper-left corner of the component is to be placed. All coordinates are in current UNITs (default inches), and (0 0) is the upper-left corner of the physical page.

**Note:** By default, coordinates are absolute locations on the physical page. If x or y is preceded by a plus sign (+) or a minus sign ( - ), for example, (+.25 +0), the coordinate is relative to the top-left page margin. If the RELATIVE-TO keyword is present, then a relative coordinate is relative to the named object of RELATIVE-TO declared in the keyword.

**DIMENSION=(xsize ysize)**

Specifies the size of the bounding box of the component (in current UNITs).

For a fixed component, **xsize** and **ysize** must be numeric dimension sizes.

For a flowing component, **xsize** and **ysize** must both be asterisks DIMENSION = (* *).

**OVERFLOW-POSITION=(x y) and OVERFLOW-DIMENSION=(xsize ysize)**

These optional items specify the position and dimension on subsequent pages, if it overflows its initial bounding box.

OVERFLOW-POSITION and OVERFLOW-DIMENSION are supported for flowing components, as well. For example:

```
COMPONENT='report2', TEXT='report2', TOC-LEVEL=2,
POSITION=(0.5 1.7), DIMENSION=(* *), OVERFLOW-POSITION=(0.5 1.7),
OVERFLOW-DIMENSION=(* *),
```

**RELATIVE-TO=relative_component_name**

Specifies another component with respect to which relative coordinates of the current component's POSITION are interpreted.

The relative component must either have a fixed position, or be generated prior to the current component.

**RELATIVE-POINT=relative-value and POSITION-POINT=position-value**

These optional parameters designate which point on the current component is positioned relative to which point on the relative component (for example, TOP-LEFT of the current component relative to BOTTOM-LEFT of the relative component).

Can be set to any combination of the following values:

- TOP-LEFT
- TOP-CENTER
- TOP-RIGHT
- CENTER-LEFT
- CENTER
- CENTER-RIGHT
- BOTTOM-LEFT
- BOTTOM-CENTER
- BOTTOM-RIGHT

**REQUIRED-SPACE=required-space-value**

Specifies the minimum amount of space that must be left on the page, from where the relative component ends, in order to start the current component. If there is not enough space left from where the relative component ends, the current component will start on the next page.

Can be one of the following:

- An (*xy*) pair that specifies, in current units, the minimum horizontal and vertical space left on the page after the relative component and that is needed in order to start the current component.
- AUTO, which will automatically calculate the remaining available space left on the page after the relative component and determine if the entire current component can fit into that space. If it cannot fit in the available space, it will start the current component on the next page.

**DRILLMAP=((L1 targetreport))**

Identifies the link identifier and the target report for a Drill Through hyperlink from this report. L1 is a sufficient link identifier at this time. For more information on Drill Through reports, see Creating a Drill Through PDF Compound Report.

**Note:** The double parentheses are required.

# Creating a Compound Layout Report With Document Syntax

In this simple example using the GGSALES Master File, the MERGE keyword specifies that a Coordinated Compound Layout Report is to be generated. Since the first BY field of each component is REGION, a page will be generated for each value of REGION, with the first report (Sales) positioned at (1 1) and the second report (Units) at (6.25 1).

Enter the following syntax in the Text Editor.

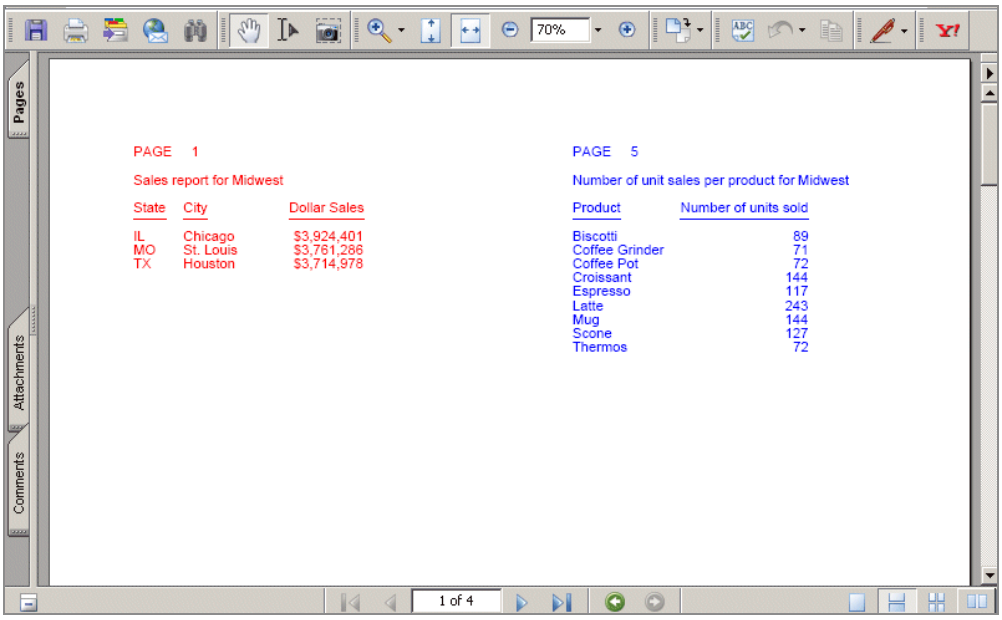
```
SET PAGE-NUM=OFF
COMPOUND LAYOUT PCHOLD FORMAT PDF
SECTION=S1, LAYOUT=ON, MERGE=ON, ORIENTATION=LANDSCAPE, $
PAGELAYOUT=1, $
COMPONENT=Sales, TYPE=REPORT, POSITION=(1 1), DIMENSION=(4 4), $
COMPONENT=Units, TYPE=REPORT, POSITION=(6.25 1), DIMENSION=(4 4), $
```

```
END
SET COMPONENT=Sales
TABLE FILE GGSALES
"Sales report for <REGION"
" "
SUM DOLLARS/F8M
BY REGION NOPRINT
BY ST
BY CITY
ON TABLE HOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT, FONT=HELVETICA, COLOR=RED, SQUEEZE=ON, $
END
SET COMPONENT=Units
TABLE FILE GGSALES
"Number of unit sales per product for <REGION"
" "
SUM CNT.UNITS AS 'Number of units sold'
BY REGION NOPRINT
BY PRODUCT
ON TABLE HOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT, FONT=HELVETICA, COLOR=BLUE, SQUEEZE=ON, $
ENDSTYLE
END
COMPOUND END
```

The following syntax is an example of what the same report might look like if the component reports were in pre-existing procedures (FOCEXECs), as indicated by **R1** and **R2**.

```
SET PAGE-NUM=OFF
SET SQUEEZE=ON
COMPOUND LAYOUT PCHOLD FORMAT PDF
SECTION=S1, LAYOUT=ON, MERGE=ON, ORIENTATION=LANDSCAPE, $
PAGELAYOUT=1, $
COMPONENT=R1, TYPE=REPORT, POSITION=(1 1), DIMENSION=(4 4), $
COMPONENT=R2, TYPE=REPORT, POSITION=(6 1), DIMENSION=(4 4), $
END
SET COMPONENT=R1
EX REPORT1
SET COMPONENT=R2
EX REPORT2
COMPOUND END
```

The first page of output is:




# Creating a Coordinated Graph With Document Syntax

This example, using the GGSALES Master File, generates a Coordinated Compound Layout report that contains a graph and a report (by replacing the first report in the previous example with a graph). Note that a graph request with two BY fields will generate a graph for each value of the first BY field (REGION), and that these files are named by appending sequence numbers to the HOLD file name. For example, HOLD0.SVG, HOLD1.SVG, and so on.

To place these graphs into a report as a component of a Coordinated Compound Layout report, several COMPUTE commands are required to construct the name of each graph file (HOLD0.SVG, HOLD1.SVG, and so on). Additionally, a COMPUTE command will add the image files into the HEADING of the TABLE request so that they are associated with the same value of REGION, from which they were originally produced.

Enter the following syntax in the Text Editor.

```
SET PAGE-NUM=OFF
COMPOUND LAYOUT PCHOLD FORMAT PDF
SECTION=S1, LAYOUT=ON, MERGE=ON, ORIENTATION=LANDSCAPE, $
PAGELAYOUT=1, $
COMPONENT=Sales, TYPE=REPORT, POSITION=(0.25 1), DIMENSION=(4 4), $
```

```
COMPONENT=Fuel, TYPE=REPORT, POSITION=(7.25 1), DIMENSION=(4 4), $
END
```

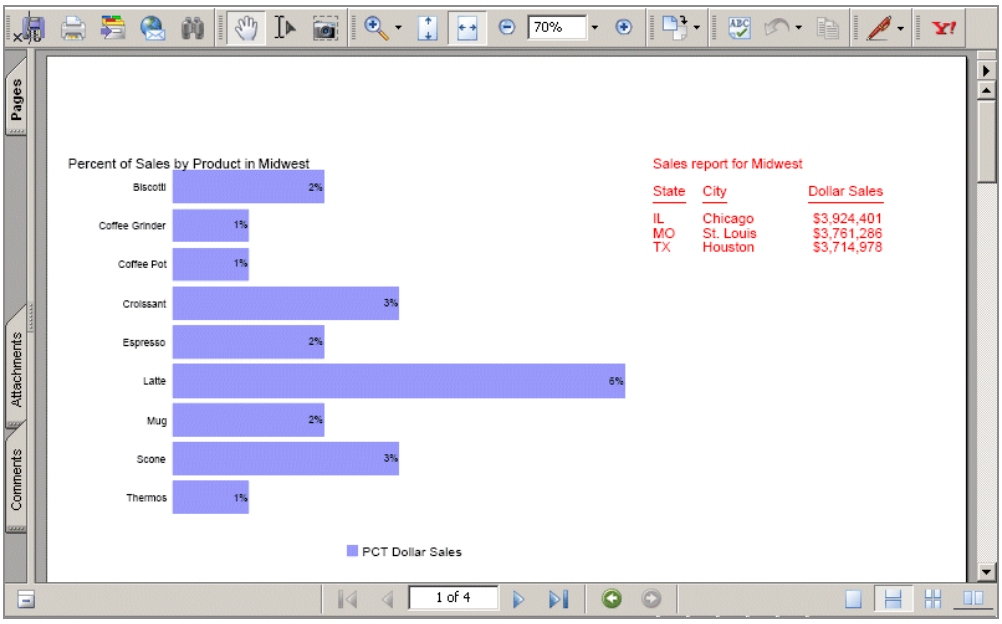
```
SET COMPONENT=Sales
GRAPH FILE GGSALES
SUM PCT.DOLLARS
BY REGION NOPRINT
BY PRODUCT
ON GRAPH SET LOOKGRAPH HBAR
ON GRAPH HOLD AS HOLD FORMAT SVG
ON GRAPH SET GRAPHSTYLE *
setPlace(true);
setColorMode(1);
setDepthRadius(0);
setDepthAngle(0);
setDisplay(getO1MajorGrid(),false);
setTransparentBorderColor(getFrame(),true);
setDisplay(getDataText(),true);
setTextFormatPreset(getDataText(),28);
setFontSizeAbsolute(getDataText(),true);
setFontSizeInPoints(getDataText(),9);
setPlaceResize(getDataText(),0);
setFontStyle(getDataText(),0);
setTransparentBorderColor(getSeries(0),true);
setDisplay(getO1AxisLine(),false);
setFontSizeAbsolute(getO1Label(),true);
setFontSizeInPoints(getO1Label(),9);
setPlaceResize(getO1Label(),0);
setFontSizeAbsolute(getY1Label(),true);
setFontSizeInPoints(getY1Label(),9);
setPlaceResize(getY1Label(),0);
setTextFormatPreset(getY1Label(),28);
setGridStyle(getY1MajorGrid(),3);
setDisplay(getY1AxisLine(),false);
setDisplay(getY1MajorGrid(),false);
setDisplay(getY1Label(),false);
setDataTextPosition(3);
setTextString(getO1Title(),"");
setTextString(getY1Title(),"");
setFontStyle(getTitle(),0);
ENDSTYLE
END
```

```
TABLE FILE GGSALES
"Percent of Sales by Product in <REGION"
```

```
" "
SUM
COMPUTE CNTR/I4 = CNTR + 1; NOPRINT
COMPUTE CNTR2/A4 = IF &FOCGRAPHCNT EQ 1 THEN ' ' ELSE FTOA(CNTR-1,'
(F4)','A4'); NOPRINT
COMPUTE IMG/A16 = 'HOLD'||LJUST(4,CNTR2,'A4')|| '.svg'; NOPRINT
BY REGION NOPRINT
ON REGION PAGE-BREAK
ON TABLE HOLD FORMAT PDF
ON TABLE SET STYLE *
type=HEADING, IMAGE=(IMG), position=(0 0), $
TYPE=REPORT,PAGE-LOCATION=OFF,$
TYPE=REPORT, FONT=HELVETICA, COLOR=BLACK, SQUEEZE=ON, $
ENDSTYLE
END
```

```
SET COMPONENT=Fuel
TABLE FILE GGSALES
"Sales report for <REGION"
" "
SUM DOLLARS/F8M
BY REGION NOPRINT
BY ST
BY CITY
ON TABLE HOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT, FONT=HELVETICA, COLOR=RED, SQUEEZE=ON, $
ENDSTYLE
END
COMPOUND END
```

The first page of output is:




# Creating Multi-Page Layouts With Document Syntax

In this example using the GGSALES Master File, multi-page layouts allow components to be placed in fixed locations on multiple pages. For example, a Coordinated Compound Layout report can contain component reports R1 and R2 for each value of the first sort field on the odd-numbered pages (front side), and R3 on the even-numbered pages (reverse side). Additionally, you can place the same heading that contains a logo and some text with the embedded value of the first sort field at the top of each side.

For the heading report, create a procedure (named HEADER.FEX), and enter the following syntax:

```
TABLE FILE GGSALES
" "
"Report package for <REGION"
BY REGION NOPRINT
ON TABLE HOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT, FONT=HELVETICA, SIZE=20, $
TYPE=REPORT, IMAGE=poweredbyibi.gif, POSITION=(+.25 +.25), $
TYPE=HEADING, LINE=2, ITEM=1, POSITION=4, $
ENDSTYLE
END
```

We will use components R1 and R2 from the previous example. If you did not already do so, save them as REPORT1.FEX and REPORT2.FEX. Enter the following syntax as the R3 report component, by creating a procedure named REPORT3.FEX.

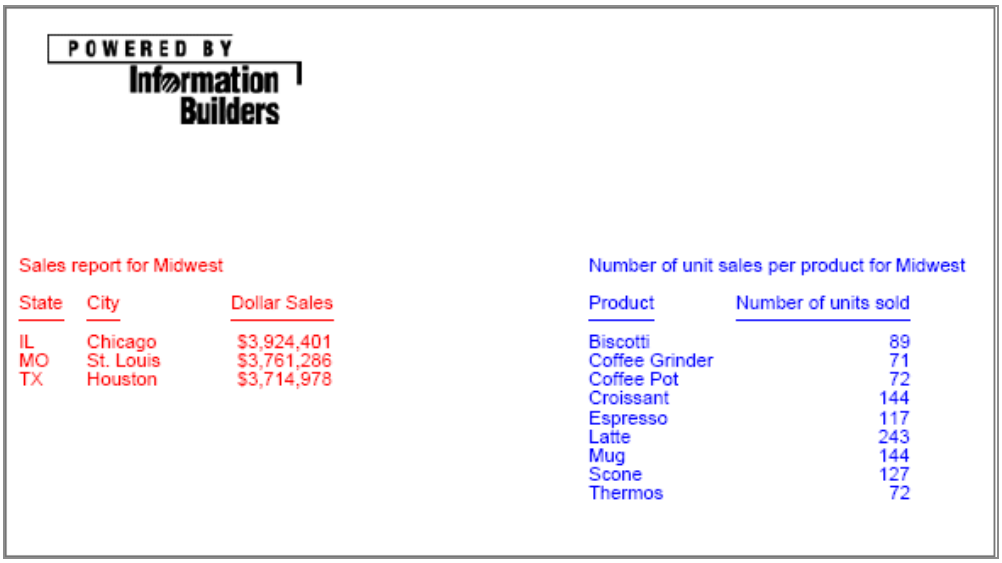
```
TABLE FILE GGSALES
"Report R3 for <REGION"
BY REGION NOPRINT
SUM DOLLARS BY ST
ON TABLE HOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT, FONT=HELVETICA, COLOR=GREEN, $
ENDSTYLE
END
```

From the Text Editor, enter the following syntax specifying that the R1 and R2 report components appear on page 1. The R3 report component appears on page 2, and the heading report will appear on all pages of the document.

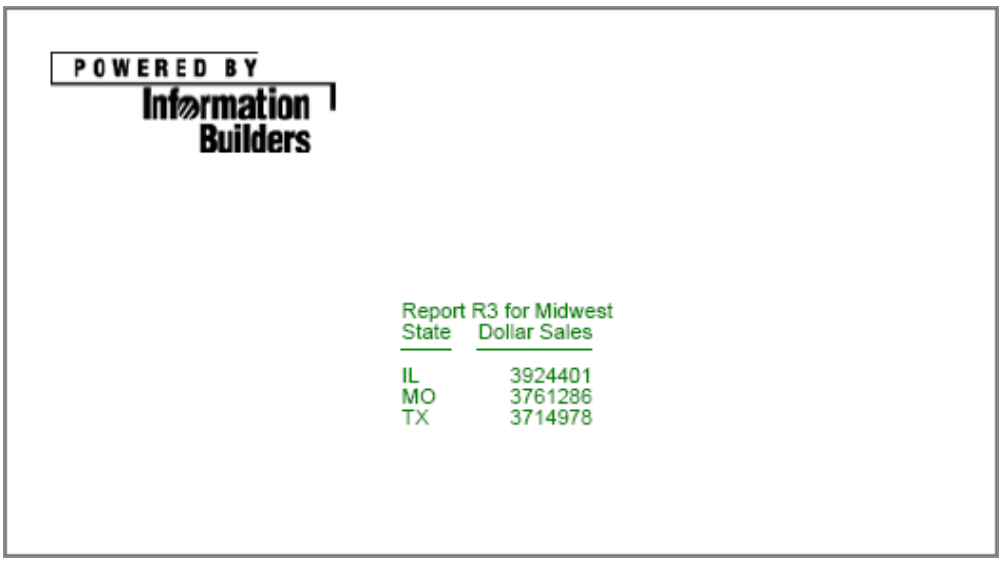
```
SET PAGE-NUM=OFF
SET SQUEEZE=ON
COMPOUND LAYOUT PCHOLD FORMAT PDF
SECTION=S1, LAYOUT=ON, MERGE=ON, ORIENTATION=LANDSCAPE, $
PAGELAYOUT=ALL, $
COMPONENT=HEADER, TYPE=REPORT, POSITION=(1 1), DIMENSION=(4 4), $
PAGELAYOUT=1, $
COMPONENT=R1, TYPE=REPORT, POSITION=(1 3), DIMENSION=(4 4), $
COMPONENT=R2, TYPE=REPORT, POSITION=(6 3), DIMENSION=(4 4), $
PAGELAYOUT=2, $
COMPONENT=R3, TYPE=REPORT, POSITION=(4 3), DIMENSION=(4 4), $
END
```

```
SET COMPONENT=HEADER
EX HEADER
SET COMPONENT=R1
EX REPORT1
SET COMPONENT=R2
EX REPORT2
SET COMPONENT=R3
EX REPORT3
COMPOUND END
```

Page 1 of the output is:




Page 2 of the output is:




# Creating Page Overflow With Document Syntax

A common type of report contains a fixed layout at the top of the page, followed by a report containing detail records of unfixed length. For example, a brokerage statement may contain the customer name and address, an asset-allocation graph, and a comparison of the portfolio with market indexes at the top, followed by a list of securities held in the account. If the list of securities overflows the first page, we would like it to continue on the second page, underneath the common heading which appears on all pages (a logo, account number, page number for instance). The OVERFLOW-POSITION and OVERFLOW-

DIMENSION syntax enables us to specify where on the overflow page the report continues and what its maximum length on each overflow page should be. (Note that its width should not vary from one page to the next.)

The following example, using the GGSales Master File, demonstrates how you can use OVERFLOW-POSITION and OVERFLOW-DIMENSION to reposition the second report component (R2) so that it begins below the first component on the initial page, and two inches below the top of the page on subsequent pages. Note that this leaves enough space for the header report component (HEADER) at the top of each page.

Additionally, PAGELAYOUT=ALL forces the HEADER component to appear at the top of each overflow page.

Enter the following syntax in the Text Editor.

```
SET PAGE-NUM=OFF
COMPOUND LAYOUT PCHOLD FORMAT PDF
SECTION=Example, LAYOUT=ON, MERGE=OFF, $
 PAGELAYOUT=1, $
    COMPONENT=R1, TYPE=REPORT, POSITION=(1.5 2), DIMENSION=(8 3), $
    COMPONENT=R2, TYPE=REPORT, POSITION=(.5 5), DIMENSION=(8 5),
        OVERFLOW-POSITION=(.5 2), OVERFLOW-DIMENSION=(8 8.5), $
  PAGELAYOUT=ALL, $
    COMPONENT=HEADER, TYPE=REPORT, POSITION=(1.25 1), DIMENSION=(6 1), $
END
```

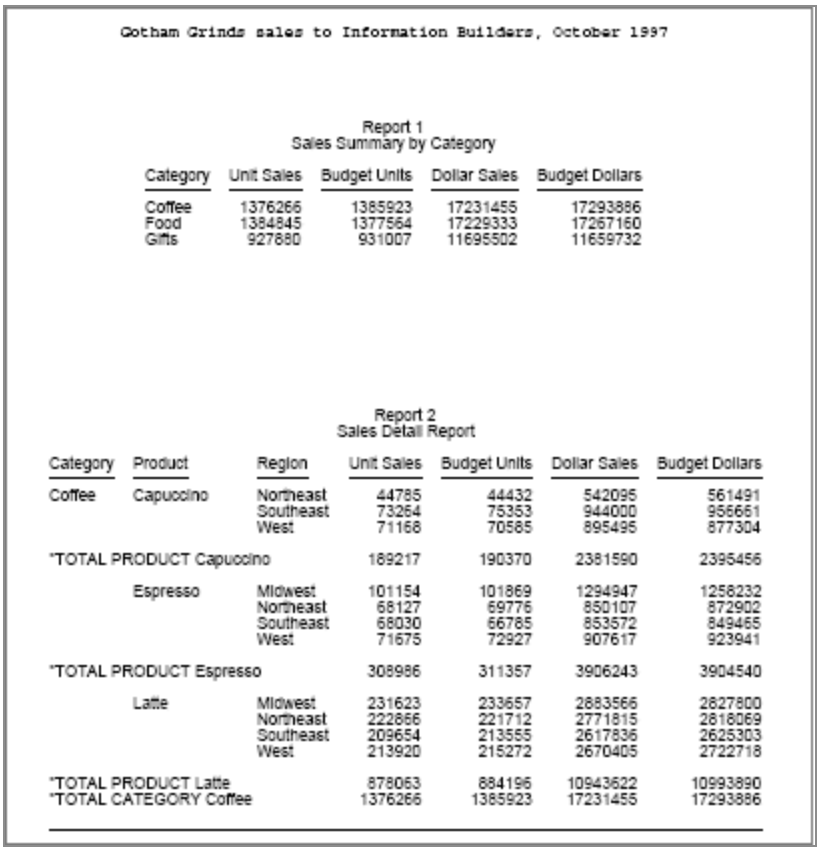
```
SET COMPONENT=R1
TABLE FILE GGSALES
HEADING CENTER
"Report 1"
"Sales Summary by Category"
" "
SUM UNITS BUDUNITS DOLLARS BUDDOLLARS BY CATEGORY
ON TABLE HOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT, FONT=HELVETICA, SQUEEZE=ON, $
ENDSTYLE
END
```

```
SET COMPONENT=R2
TABLE FILE GGSALES
HEADING CENTER
"Report 2"
```

```
"Sales Detail Report"
" "
SUM UNITS BUDUNITS DOLLARS BUDDOLLARS
BY CATEGORY BY PRODUCT BY REGION
ON CATEGORY UNDER-LINE
ON PRODUCT SUB-TOTAL
ON TABLE HOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT, FONT=HELVETICA, SQUEEZE=ON, $
ENDSTYLE
END
```

```
SET COMPONENT=HEADER
TABLE FILE GGSALES
HEADING
"Gotham Grinds sales to Information Builders, October 1997"
BY CATEGORY NOPRINT
ON TABLE HOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT, IMAGE=gotham.gif, POSITION=(3.25 .25), DIMENSION=(2 .75), $
ENDSTYLE
END
```

The first page of output is:



Gotham Grinds sales to Information Builders, October 1997

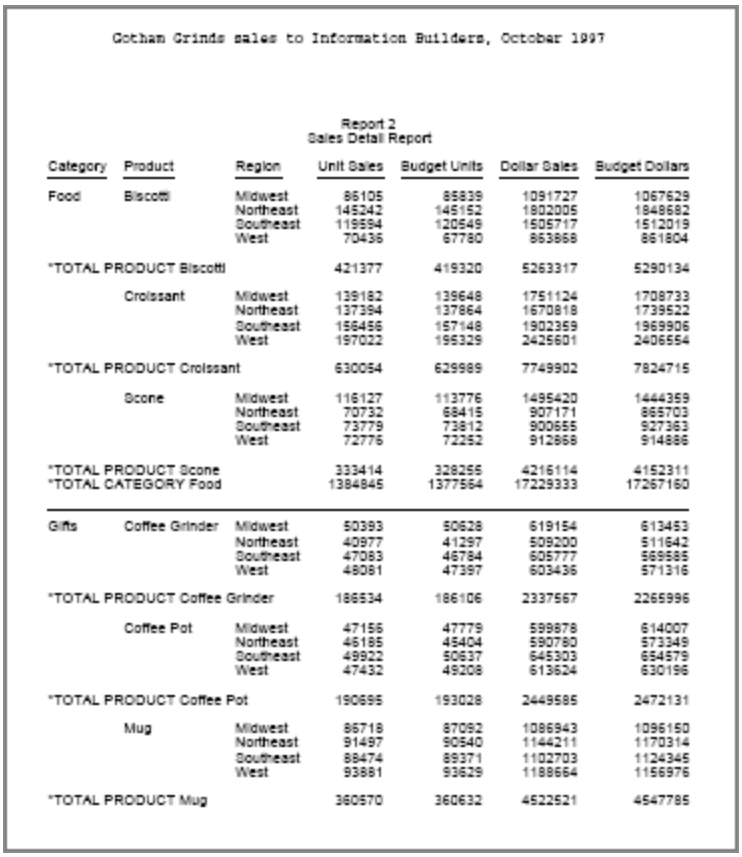
Report 1
Sales Summary by Category

| Category | Unit Sales | Budget Units | Dollar Sales | Budget Dollars |
|---|---|---|---|---|
| Coffee | 1376266 | 1385923 | 17231455 | 17293886 |
| Food | 1384845 | 1377564 | 17229333 | 17267160 |
| Gifts | 927680 | 931007 | 11695502 | 11659732 |

Report 2
Sales Detail Report

| Category | Product | Region | Unit Sales | Budget Units | Dollar Sales | Budget Dollars |
|---|---|---|---|---|---|---|
| Coffee | Capuccino | Northeast | 44785 | 44432 | 542095 | 561491 |
| | | Southeast | 73264 | 75353 | 944000 | 956661 |
| | | West | 71168 | 70585 | 895495 | 877304 |
| *TOTAL PRODUCT Capuccino | | | 189217 | 190370 | 2381590 | 2395456 |
| | Espresso | Midwest | 101154 | 101869 | 1294947 | 1258232 |
| | | Northeast | 68127 | 69776 | 850107 | 872902 |
| | | Southeast | 68030 | 66785 | 853572 | 849465 |
| | | West | 71675 | 72927 | 907617 | 923941 |
| *TOTAL PRODUCT Espresso | | | 308986 | 311357 | 3906243 | 3904540 |
| | Latte | Midwest | 231623 | 233657 | 2883566 | 2827800 |
| | | Northeast | 222866 | 221712 | 2771815 | 2818069 |
| | | Southeast | 209654 | 213555 | 2617836 | 2625303 |
| | | West | 213920 | 215272 | 2670405 | 2722718 |
| *TOTAL PRODUCT Latte | | | 878063 | 884196 | 10943622 | 10993890 |
| *TOTAL CATEGORY Coffee | | | 1376266 | 1385923 | 17231455 | 17293886 |

The second page of output is:



Gotham Grinds sales to Information Builders, October 1997

Report 2
Sales Detail Report

| Category | Product | Region | Unit Sales | Budget Units | Dollar Sales | Budget Dollars |
|---|---|---|---|---|---|---|
| Food | Biscotti | Midwest | 86105 | 85839 | 1091727 | 1067629 |
| | | Northeast | 145242 | 146152 | 1802005 | 1848682 |
| | | Southeast | 119594 | 120549 | 1505717 | 1512019 |
| | | West | 70436 | 67780 | 863868 | 861804 |
| *TOTAL PRODUCT Biscotti | | | 421377 | 419320 | 5263317 | 5290134 |
| | Croissant | Midwest | 139182 | 139648 | 1751124 | 1708733 |
| | | Northeast | 137394 | 137864 | 1670818 | 1739522 |
| | | Southeast | 156456 | 157148 | 1902359 | 1969906 |
| | | West | 197022 | 195329 | 2425601 | 2406554 |
| *TOTAL PRODUCT Croissant | | | 630054 | 629989 | 7749902 | 7824715 |
| | Scone | Midwest | 116127 | 113776 | 1495420 | 1444359 |
| | | Northeast | 70732 | 68415 | 907171 | 865703 |
| | | Southeast | 73779 | 73812 | 900655 | 927363 |
| | | West | 72776 | 72252 | 912868 | 914886 |
| *TOTAL PRODUCT Scone | | | 333414 | 328256 | 4216114 | 4152311 |
| *TOTAL CATEGORY Food | | | 1384845 | 1377564 | 17229333 | 17267160 |
| Gifts | Coffee Grinder | Midwest | 50393 | 50628 | 619154 | 613453 |
| | | Northeast | 40977 | 41297 | 509200 | 511642 |
| | | Southeast | 47083 | 46784 | 605777 | 569585 |
| | | West | 48081 | 47397 | 603436 | 571316 |
| *TOTAL PRODUCT Coffee Grinder | | | 186534 | 186106 | 2337567 | 2265996 |
| | Coffee Pot | Midwest | 47156 | 47779 | 599878 | 614007 |
| | | Northeast | 46185 | 46404 | 590780 | 573349 |
| | | Southeast | 49922 | 50637 | 645303 | 654579 |
| | | West | 47432 | 48208 | 613624 | 630196 |
| *TOTAL PRODUCT Coffee Pot | | | 190695 | 193028 | 2449585 | 2472131 |
| | Mug | Midwest | 86718 | 87092 | 1086943 | 1096150 |
| | | Northeast | 91497 | 90540 | 1144211 | 1170314 |
| | | Southeast | 88474 | 89371 | 1102703 | 1124345 |
| | | West | 93881 | 93629 | 1188664 | 1156976 |
| *TOTAL PRODUCT Mug | | | 360570 | 360632 | 4522521 | 4547785 |

# Draw Objects With Document Syntax

A variety of objects can be drawn on the page to enhance a report. The currently supported objects include Lines, Boxes, Static text strings, and Images.

The syntax for drawing these objects may appear in the StyleSheet of a report, but they may also be included within a PAGELAYOUT grouping in the COMPOUND LAYOUT declarations. The syntax for each drawing object is described below.

- **Lines.** To draw a line from point (x1 y1) to point (x2 y2), enter the following syntax:

  ```
  OBJECT=LINE, POSITION=(x1 y1), ENDPOINT=(x2 y2),
          [BORDER=b,] [BORDER-COLOR=c,] [BORDER-STYLE=s,]$
  ```

  Optionally, the border attributes BORDER, BORDER-COLOR, and BORDER-STYLE follow the existing BORDER syntax, as shown below:

```
OBJECT=LINE, POSITION=(1 1), ENDPOINT=(8 1),
        BORDER=HEAVY, BORDER-COLOR=RED, BORDER-STYLE=DASHED, $
```

- **Boxes.** To draw a box, whose upper left corner is at (x y), and whose dimensions are xdim by ydim, enter the following syntax:

```
OBJECT=BOX, POSITION=(x y), DIMENSION=(xdim ydim),
        BACKCOLOR=c,
        [BORDER=b,] [BORDER-COLOR=bc,] [BORDER-STYLE=bs,] $
```

  **Tip:** The background color, which is **c**, specifies the color with which the box is filled and can be any valid color. For example, yellow or RGB(200 200 200).

  As in the BORDER syntax, the individual sides of the box can be styled separately. For example:

```
OBJECT=BOX, POSITION=(1 1), DIMENSION=(2 3),
        BACKCOLOR=YELLOW,
        BORDER=HEAVY, BORDER-TOP-COLOR=RED, BORDER-BOTTOM-
COLOR=BLUE, $
```

  Note that, as in the BORDER syntax, attributes of lines or boxes that are not explicitly specified have the following defaults:

  - Color: black
  - Style: solid
  - Width border attribute: medium

- **Static text strings.** Static text strings display text that you enter as part of the object description.

  You can format the text displayed in the text object by including markup tags within the text portion of the text object. A report with markup tags in a text object is called a **markup report**. A markup report can be generated as a PDF, DHTML, PPT, or PPTX output file. WebFOCUS supports a subset of HTML tags and its own page numbering tags. To activate these markup tags (so that they are treated as formatting elements instead of displaying as text), add the attribute MARKUP=ON to the string object. For additional information, see Text Formatting Markup Tags for a Text Object.

  To draw a static text string at position (x y), enter the following syntax:

```
OBJECT=STRING, POSITION=(X Y), TEXT='any text you like', [MARKUP=
{ON|OFF},] [FONT=f,] [SIZE=sz,] [STYLE=st,] [COLOR=c,]
        [WRAP=ON, DIMENSION=(xdim ydim),] [LINESPACING=linesoption
,]
 $
```

where:

**POSITION=(xy)**

Specifies the (x y) coordinate on the page where the upper-left corner of the component is to be placed. All coordinates are in current UNITs (default is inches), and (0 0) is the upper-left corner of the physical page.

**Note:** By default, coordinates are absolute locations on the physical page. If x or y is preceded by a plus sign (+) or minus sign ( - ), for example, (+.25 +0), the coordinate is relative to the left or top page margin.

**TEXT='any text you like'**

Is the text to be placed in the text object.

**Note:** If your text contains any open caret characters (<), you must put a blank space after each open caret that is part of the text. If you do not, everything following the open caret will be interpreted as the start of a markup tag and will not display as text.

**MARKUP={ON|OFF}**

ON causes the markup tags to be interpreted as formatting options. OFF displays the tags as text. OFF is the default value.

**FONT=f**

Is the default font to be used for the text.

**SIZE=sz**

Is the default font size to be used for the text.

**STYLE=st**

Is the default font style to be used for the text.

**COLOR=c**

Is the default font color to be used for the text.

**WRAP=ON**

Specifies that the text should wrap when it reaches the end of the text object bounding box.

**DIMENSION=(xdimydim)**

Specifies the size of the text object bounding box (in current UNITs).

**LINESPACING=linesoption**

Determines the amount of vertical space between lines of text in a paragraph. Two types of LINESPACING attributes are supported:

```
LINESPACING={SINGLE|1.5LINES|DOUBLE}
```

or

```
LINESPACING=type(value)
```

where:

**SINGLE**

Accommodates the largest font in that line, plus a small amount of extra space. The amount of extra space varies depending on the font used. SINGLE is the default option.

**1.5LINES**

Is one-and-one-half times that of single line spacing.

**DOUBLE**

Is twice that of single line spacing.

**type(value)**

Can be one of the following where **value** is a positive number:

| Type | Value | Example |
|---|---|---|
| `MULTIPLE` | The percentage by which to increase or decrease the line space. | LINESPACING=MULTIPLE(1.2) increases line space by 20 percent. |
| `MIN` | The minimum line space (in the unit specified by UNITS parameter) needed to fit the largest font on the line. | LINESPACING=MIN(0.5) provides a minimum line space of 0.5 inch when UNITS=IN. |
| `EXACT` | The fixed line space (in the unit specified by UNITS parameter) that WebFOCUS does not adjust. | LINESPACING=EXACT(.3) provides a fixed line space of 0.3 inch when UNITS=IN. |

Optionally, you may specify the FONT, SIZE, STYLE, and COLOR attributes as you would for any textual object in a report. For example:

```
OBJECT=STRING, POSITION=(1 1), TEXT='Hello world!',
        FONT=TIMES, SIZE=12, STYLE=BOLD, COLOR=RED, $
```

**Note:** A position of a string is measured from its bottom left to allow strings with different heights to be aligned to a common base-line. However, if WRAP=ON is present, it indicates that the string should be wrapped to a bounding box whose top-left corner is at (x y) and whose dimensions are (xdim ydim). In this case, the top left of the text string is positioned at point (x y).

- **Images.** An image can be drawn as a drawing object by entering the following syntax:

```
OBJECT=IMAGE, IMAGE=file, POSITION=(x y), DIMENSION=(xdim ydim), $
```

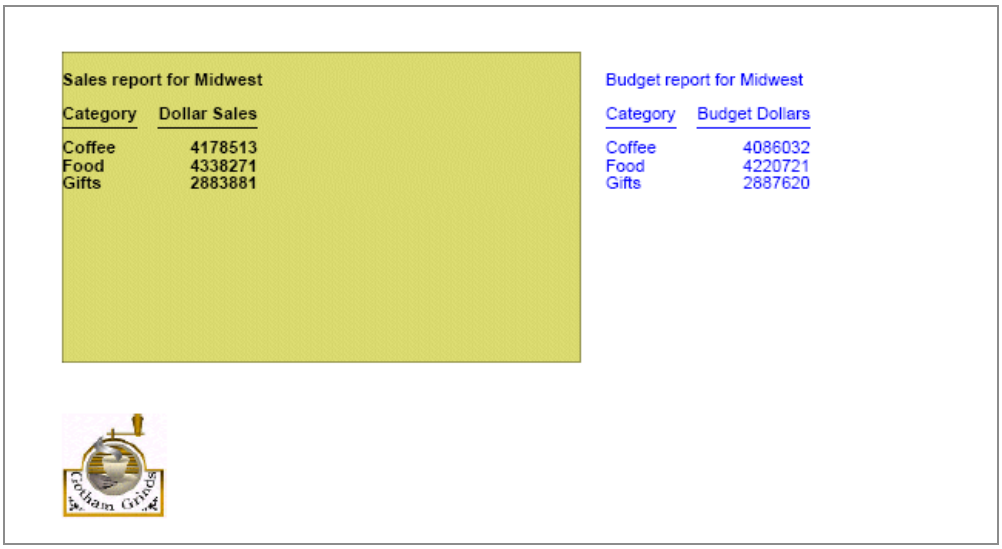
**Note:** The image file name=*file* can be any image file valid in a PDF report. POSITION is used as with a conventional image, and DIMENSION is used in place of the SIZE attribute of a conventional image.

# Drawing Objects With Document syntax

The following example shows how drawing objects can be placed inside the COMPOUND LAYOUT syntax using the GGSALES Master File. Note that a drawing object, like a COMPONENT, appears on the page whose PAGELAYOUT declaration it follows.

```
SET PAGE-NUM=OFF
SET SQUEEZE=ON
COMPOUND LAYOUT PCHOLD FORMAT PDF
SECTION=S1, LAYOUT=ON, MERGE=ON, ORIENTATION=LANDSCAPE, $
PAGELAYOUT=1, $
COMPONENT=Sales, TYPE=REPORT, POSITION=(1 1), DIMENSION=(4 4), $
COMPONENT=Budget, TYPE=REPORT, POSITION=(6.25 1), DIMENSION=(4 4), $
OBJECT=IMAGE, IMAGE=gglogo.gif, POSITION=(1 4.5), DIMENSION=(1 1), $
OBJECT=BOX, POSITION=(1 1), DIMENSION=(5 3), BACKCOLOR=GOLDENROD, $
END
SET COMPONENT=Sales
TABLE FILE GGSALES
"Sales report for <REGION"
" "
SUM DOLLARS
BY REGION NOPRINT
BY CATEGORY
ON TABLE HOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT, FONT=HELVETICA, STYLE=BOLD, $
ENDSTYLE
END
SET COMPONENT=Budget
TABLE FILE GGSALES
"Budget report for <REGION"
" "
SUM BUDDOLLARS
BY REGION NOPRINT
BY CATEGORY
ON TABLE HOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT, FONT=HELVETICA, COLOR=BLUE, $
ENDSTYLE
END
COMPOUND END
```

The first page of output is:




**Note:** A drawing object will not be drawn unless there is at least one COMPONENT in its PAGELAYOUT.

# Display Grids With Document Syntax

The SET LAYOUTGRID command can be used as an aid to manually develop report layouts. Displaying grids superimposes a light one-inch by one-inch grid on the page so that the locations of the various report components can be verified. Currently, the grid only works in inches.

Enter the following syntax to display grids:

```
SET LAYOUTGRID=ON
```

# Text Formatting Markup Tags for a Text Object

**Note:** If your text contains any open caret characters (<), you must put a blank space after each open caret that is part of the text. If you do not, everything following the open caret will be interpreted as the start of a markup tag and will not display as text.

**Font Properties**

The font tag supports three attributes: face, size, and color (where the color must be specified as the hexadecimal number code for the color):

```
<font face="font" size=[+|-]n color=color_code>text</font>
```

For example:

```
<font face="New Century Schoolbook">Test1</font>
<font face="Times" size=12>test2</font>
<font face="Times New Roman" color=#0000FF size=+4>Test3</font>
<font size=-2 face="Times New Roman" color=#0000FF >Test4</font>
```

**Text Styles**

The supported text styles are bold, italic, underline, and superscript:

Bold: `<b>text</b>`

Italic: `<i>text</i>`

Underline: `<u>text</u>`

Superscript: `<sup>text</sup>`

**Line Breaks**

The line break tag after a portion of text begins the next portion of text on a new line. Note that there is no closing tag for a line break:

```
<br>
```

**Text Alignment**

The alignment options pertain to wrapped text, as well as specified line breaks. Both horizontal justification and vertical alignment are supported.

- **Horizontal Justification**

  Left Justification:

  ```
  <left>text</left>
  ```

  Right Justification:

```
<right>text</right>
```

Center Justification:

```
 <center>text</center>
```

Full Justification:

```
 <full>text</full>
```

- **Vertical Alignment**

  Top Alignment:

  ```
  <top>text</top>
  ```

  Middle Alignment:

  ```
  <mid>text</mid>
  ```

  Bottom Alignment:

  ```
  <bottom>text</bottom>
  ```

**Unordered (Bullet) List**

The unordered (ul) list tag encloses a bullet list. Each item is enclosed in a list item tag (li). The start tag and end tag for the list must each be on its own line. Each list item must start on a new line:

```
<ul>
<li>list item1</li>
<li>list item2</li>
  .
  .
  .
</ul>
```

By default, the bullet type is disc. You can also specify circle or square:

```
<ul type=disc>
```

```
<ul type=circle>
```

```
<ul type=square>
```

**Ordered (Number or Letter) List**

The ordered (ol) list tag encloses a list in which each item has a consecutive number or letter. Each item is enclosed in a list item tag (li). The start tag and end tag for the list must each be on its own line. Each list item must start on a new line:

```
<ol>
<li>list item1</li>
<li>list item2</li>
  .
  .
  .
</ol>
```

By default, Arabic numerals (type=1) are used for the ordering of the list. You can specify the following types of order:

Arabic numerals (the default): `<ol type=1>`

Lowercase letters: `<ol type=a>`

Uppercase letters: `<ol type=A>`

Lowercase Roman numerals: `<ol type=I>`

Uppercase Roman numerals: `<ol type=I>`

**Hyperlinks**

Hyperlinks can be included within text markup in PDF documents.

The syntax for the anchor markup tag is a subset of the HTML anchor syntax:

```
<a href="hyperlink">Text to display</a>
```

where:

**hyperlink**

Is the hyperlink to jump to when the text is clicked.

**Text to display**

Is the text to display for the hyperlink.

For example:

```
<a href="http://www.example.com/help.htm">Click here for help</a>
```

No other attributes are supported in the anchor markup tag.

**Page Numbering and Dates**

There are two pseudo-HTML tags for embedding page numbers in text on a Page Master for a Coordinated Compound Layout report:

Current page number: `<ibi-page-number/>`

Total number of pages: `<ibi-total-pages/>`

Note that when MARKUP=ON, space is allocated for the largest number of pages, so there may be a wide gap between the page number and the text that follows. To remove the extra space in the text object that has the page numbering tags:

- If specific styling of the text object is not required, do not insert markup tags, and turn MARKUP=OFF.

  ```
  MARKUP=OFF, TEXT='Page <ibi-page-number/> of <ibi-total-pages/> of
  Sales Report', $
  ```

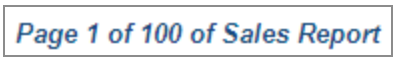
  This displays the following

  ```
  Page 1 of 100 of Sales Report
  ```

- If specific styling of the text object is required, you must set MARKUP=ON. With MARKUP=ON, set WRAP=OFF and do not place any styling tags between the page number variables within the string. Tags can be used around the complete **Page n of m** string. The following code produces a page number string without the extra spaces:

  ```
  MARKUP=ON, WRAP=OFF, TEXT='<font face="ARIAL" size=10><i>Page <ibi-
  page-number/> of <ibi-total-pages/> of Sales Report </i>', $
  ```

  This displays the following




To display a date in the report output, insert a WebFOCUS date variable in a text object on a Page Master (such as &DATEtrMDYY) in the text object.

# Formatting a Compound Layout Text Object With Markup Tags

The following request displays a text object with markup tags in a PDF output file.

**Note:** Text markup syntax cannot contain hidden carriage return or line feed characters. For purposes of presenting the example in this documentation, line feed characters have been added so that the sample code wraps to fit within the printed page. To run this example in your environment, copy the code into a text editor and delete any line feed characters within the text markup object by going to the end of each line and pressing **Delete**. In some instances, you may need to add a space to maintain the structure of the string. For additional information on displaying carriage returns within the text object see Text Formatting Markup Tags for a Text Object.

```
SET PAGE-NUM=OFF
SET LAYOUTGRID=ON
TABLE FILE GGSALES
BY REGION NOPRINT
ON TABLE PCHOLD AS LINESP1 FORMAT PDF
ON TABLE SET STYLE *
type=report, size=8, $
object=string, position=(1 1), dimension=(7 3), wrap=on, markup=on,
 linespacing=multiple(3),
 text='<b><font face="Arial" size=12>This paragraph is triple-spaced
 (LINESPACING=MULTIPLE(3)):</font></b>
 <full>Our <i>primary</I> goal for fiscal 2006 was to accelerate our
 transformation to customer centricity. In this letter, I'd like to
 give you an update on this work, which contributed to the 22-percent
 increase in earnings from continuing operations we garnered for fiscal
 2006. Since the past is often prologue to the future, I'd like to
 describe how customer centricity is influencing not only our goals for
 fiscal 2007, but also our long-term plans. At Gotham Grinds, customer
 centricity means treating each customer as a unique individual, meeting
 their needs with end-to-end solutions, and engaging and energizing our
 employees to serve them.</full>', $
ENDSTYLE
END
```

In this request:

- No fields from the data source are displayed. Only the text object displays on the output.
- The SET LAYOUTGRID command displays a grid to indicate the coordinates and dimensions of the text object.
- The OBJECT=STRING declaration specifies triple spacing: LINESPACING=MULTIPLE(3).
- The following text is displayed in boldface, in the Arial font face, and with a font size of 12 (the default is 8 from the TYPE=REPORT declaration):

  'This paragraph is triple-spaced (LINESPACING=MULTIPLE(3)):'

  The markup for this formatting is:

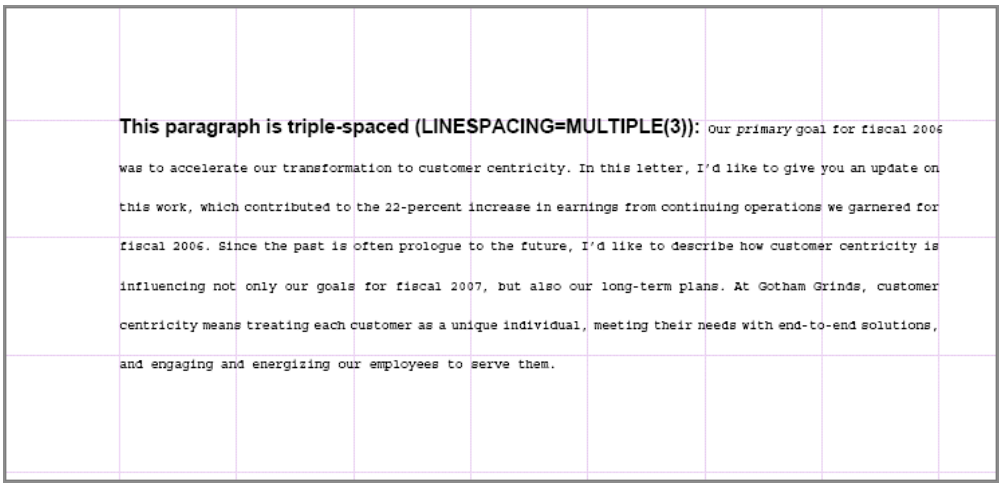
  ```
  <b><font face="Arial" size=12>This paragraph is triple-spaced
  (LINESPACING=MULTIPLE(3)):</font></b>
  ```

  Note, however, that the image has been resized to fit the page so the font may appear smaller:
- The remainder of the text is displayed with full justification (left and right sides align):

  ```
  <full>Our ... </full>
  ```
- The following markup displays the text 'primary' in italics:

  ```
  <i>primary</I>
  ```

The output is:




# Drawing Text and Line objects on a Page Master

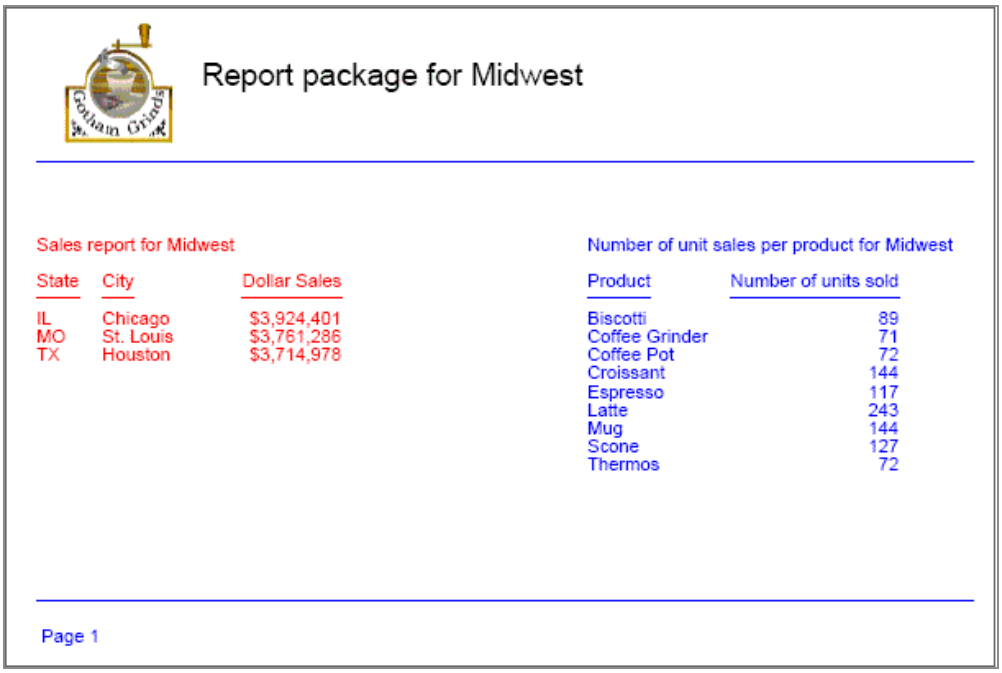
The following request places a line on the page master between the header report and the component reports and places a line and a text string on the bottom of each page:

```
SET PAGE-NUM=OFF
SET SQUEEZE=ON
COMPOUND LAYOUT PCHOLD FORMAT PDF
SECTION=S1, LAYOUT=ON, MERGE=ON, ORIENTATION=LANDSCAPE, $
PAGELAYOUT=ALL, $
COMPONENT=HEADER, TYPE=REPORT, POSITION=(1 1), DIMENSION=(4 4), $
OBJECT=STRING, POSITION=(1 6.6), MARKUP=ON,
TEXT='<font face="Arial" color=#0000FF size=12> Page <ibi-page-number/>
        </font> ', WRAP=ON, DIMENSION=(4 4),$
OBJECT=LINE, POSITION=(1 2.5), ENDPOINT=(9.5 2.5),
        BORDER-COLOR=BLUE,$
OBJECT=LINE, POSITION=(1 6.5), ENDPOINT=(9.5 6.5),
        BORDER-COLOR=BLUE,$
PAGELAYOUT=1, $
COMPONENT=R1, TYPE=REPORT, POSITION=(1 3), DIMENSION=(4 4), $
COMPONENT=R2, TYPE=REPORT, POSITION=(6 3), DIMENSION=(4 4), $
PAGELAYOUT=2, $
COMPONENT=R3, TYPE=REPORT, POSITION=(4 3), DIMENSION=(4 4), $
END
```

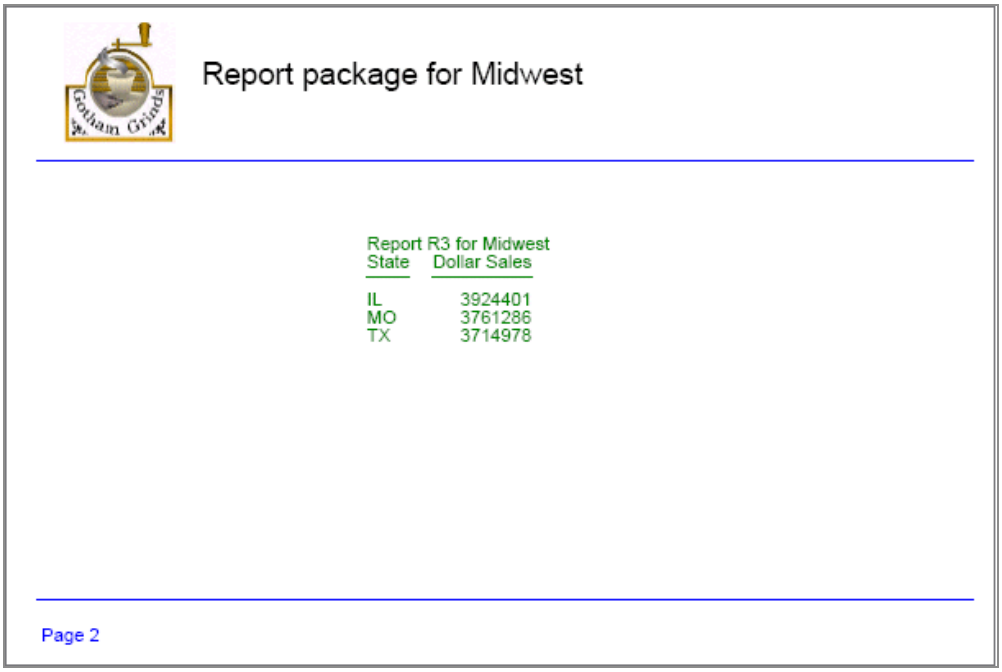
```
SET COMPONENT=HEADER
TABLE FILE GGSALES
" "
"Report package for <REGION"
```

```
BY REGION NOPRINT
ON TABLE HOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT, FONT=HELVETICA, SIZE=20, $
TYPE=REPORT, IMAGE=gglogo.gif, POSITION=(+.25 +.25), $
TYPE=HEADING, LINE=2, ITEM=1, POSITION=1.5, $
ENDSTYLE
END
SET COMPONENT=R1
TABLE FILE GGSALES
"Sales report for <REGION"
" "
SUM DOLLARS/F8M
BY REGION NOPRINT
BY ST
BY CITY
ON TABLE SET STYLE *
TYPE=REPORT, FONT=HELVETICA, COLOR=RED, SQUEEZE=ON, $
ENDSTYLE
END
SET COMPONENT=R2
TABLE FILE GGSALES
"Number of unit sales per product for <REGION"
" "
SUM CNT.UNITS AS 'Number of units sold'
BY REGION NOPRINT
BY PRODUCT
ON TABLE SET STYLE *
TYPE=REPORT, FONT=HELVETICA, COLOR=BLUE, SQUEEZE=ON, $
ENDSTYLE
END
SET COMPONENT=R3
TABLE FILE GGSALES
"Report R3 for <REGION"
BY REGION NOPRINT
SUM DOLLARS BY ST
ON TABLE SET STYLE *
TYPE=REPORT, FONT=HELVETICA, COLOR=GREEN, $
ENDSTYLE
END
COMPOUND END
```

The first page of output is:




The second page of output has the same drawing objects:



# Vertically Aligning Text Markup in PDF Report Output

The following request creates three boxes and places a text string object within each of them:

- In the left box, the text is aligned vertically at the top.
- In the middle box, the text is aligned vertically at the middle.
- In the right box, the text is aligned vertically at the bottom.

**Note:** Text markup syntax cannot contain hidden carriage return or line feed characters. For purposes of presenting the example in this documentation, line feed characters have been added so that the sample code wraps to fit within the printed page. To run this example in your environment, copy the code into a text editor and delete any line feed characters within the text markup object by going to the end of each line and pressing **Delete**. In some instances, you may need to add a space to maintain the structure of the string. For additional information on displaying carriage returns within the text object see Text Formatting Markup Tags for a Text Object.

```
SET PAGE-NUM=OFF
TABLE FILE GGSALES
BY REGION NOPRINT
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET STYLE *
type=report, font=arial, size=10, $
object=box, position=(1 1), dimension=(6 1), $
object=line, position=(3 1), endpoint=(3 2), $
object=line, position=(5 1), endpoint=(5 2), $
object=string, text='<top>Vertically aligned text within a text object
using top alignment.</top>', position=(1.05 1), dimension=(2 1),
linespacing=exact(.15), markup=on, wrap=on, $
object=string, text='<mid>Vertically aligned text within a text object
using middle alignment.</mid>', position=(3.05 1), dimension=(2 1),
linespacing=exact(.15), markup=on, wrap=on, $
object=string, text='<bottom>Vertically aligned text within a text
object using bottom alignment.</bottom>', position=(5.05 .9), dimension=
(2 1),linespacing=exact(.15), markup=on, wrap=on, $
ENDSTYLE
END
```

The output is:

| | | |
|---|---|---|
| Vertically aligned text within a text object using top alignment. | Vertically aligned text within a text object using middle alignment. | Vertically aligned text within a text object using bottom alignment. |

# Coordinated Compound Layout Reports With Missing Data

A Coordinated Compound Layout report is comprised of individual component reports or graphs with a common first sort field. The compound procedure generates an output document with a separate page (or set of pages) for each individual value of the sort field, with the embedded components segmented to display the data that corresponds to that sort field value.

A Coordinated Compound Layout report page is generated in the designated page layout for every sort field value found in at least one of the component reports, presenting the appropriate data for those components where data exists for that value, and presenting an empty component report where data does not exist.

The way an empty component is represented on the report page is dependent on how the component positioning is defined within the Coordinated Compound Layout report. Components can be defined with absolute positioning or relative to other components in the layout. If the empty component and subsequent components on the page are defined with absolute positioning, the empty component report will display as blank space in the designated location. If relative positioning is defined between the empty component and subsequent components, the subsequent components will float up on the page, and no empty space will be displayed in the area defined for the empty component.

In compound reports with relative positioning defined between reports, when an empty report is encountered, the report following the empty report is positioned vertically relative to the bottom of the last non-empty report and horizontally relative to the page margin. This means that when a report contains no data, the subsequent report will float up (vertically) and begin relative to the previous report but it will not move horizontally on the page relative to either of the previous reports

Using POSITION = (X Y), the placement of a report is designated by the left coordinate (X = horizontal) and the top coordinate (Y = vertical). Each of these coordinates can be defined independently as relative to the previous report or in a fixed position on the page.

To define positioning so that the report floats up on the page to replace the empty report but is anchored in a fixed left position on the page, you can define the Y coordinate (top) as relative and anchor the X coordinate (left). To anchor one of the position coordinates, change the reference from a relative position (+/-) to an absolute position. For example:

Both coordinates relative: POSITION(+0.003 +0.621)

Anchor horizontal / flow vertical: POSITION( 0.520 +0.621)

You do not need to change or add any WebFOCUS syntax to your request in order to take advantage of this feature. You will, however, want to pay attention to how you select and relate the data within your coordinated components to ensure you are generating the desired output.

# Setup: Creating a Coordinated Compound Report With Missing Data

In this example, we will create a set of statements reporting the outstanding inventory orders for a select group of stores. Each store may have unfilled orders in any of three inventory categories: **Food**, **Coffee**, and **Gifts**.

To demonstrate how this works we will first build a set of data files: a header file containing contact information for the selected set of stores, and transaction files for each inventory category. We are selecting specific data to demonstrate how this will work when different component reports are empty.

After creating the data files, we will build four component reports, one to display the header information and one for each inventory category.

Finally, we will bring them together in a Coordinated Compound Layout report that merges all of this information into a single statement page for each store.

# Step 1: Creating the Data Files

The following four data files will be created from a join of the GGORDER and GGSALES data sources:

| Data File Created | Type of Information Included | Stores included |
|---|---|---|
| GGHDR | Store information | R1019, R1020, R1040, R1041 |
| GG1 | Order transactions for Coffee | R1019, R1040, R1088 |
| GG2 | Order transactions for Food | R1019, R1020, R1041, R1088 |
| GG3 | Order transactions for Gifts | R1019, R1020, R1040, R1088 |

The APP HOLD, JOIN, and DEFINE commands are:

```
APP HOLD baseapp
JOIN
 GGORDER.ORDER01.STORE_CODE IN GGORDER TO
   UNIQUE GGSTORES.STORES01.STORE_CODE
   IN GGSTORES AS J1
END
DEFINE FILE GGORDER
PRODUCT_CATEGORY/A15=IF (PRODUCT_DESCRIPTION IN
                    ('Biscotti','Croissant','Scone')) THEN 'Food'
                    ELSE IF (PRODUCT_DESCRIPTION IN
                    ('French Roast','Hazelnut','Kona')) THEN 'Coffee'
ELSE 'Gifts';
END
```

The following procedure creates the data source GGHDR:

```
TABLE FILE GGORDER
SUM
     FST.STORE_NAME
     FST.ADDRESS1
     FST.ADDRESS2
     FST.CITY
     FST.STATE
     FST.ZIP
BY STORE_CODE
WHERE STORE_CODE IN ('R1019','R1020','R1040','R1041');
ON TABLE NOTOTAL
ON TABLE HOLD AS GGHDR FORMAT FOCUS INDEX 'STORE_CODE'
END
```

The following procedure creates the data source GG1:

```
TABLE FILE GGORDER
PRINT
     QUANTITY
     UNIT_PRICE
     PACKAGE_TYPE
     SIZE
     VENDOR_NAME
     PRODUCT_CATEGORY
BY STORE_CODE
BY ORDER_DATE
BY PRODUCT_DESCRIPTION
WHERE ( PRODUCT_CATEGORY EQ 'Coffee' ) AND ( ORDER_DATE GE '09/01/97' );
WHERE STORE_CODE IN ('R1019','R1040','R1088');
ON TABLE HOLD AS GG1 FORMAT FOCUS INDEX 'STORE_CODE'
END
```

The following procedure creates the data source GG2:

```
TABLE FILE GGORDER
PRINT
     QUANTITY
     UNIT_PRICE
     PACKAGE_TYPE
     SIZE
     VENDOR_NAME
     PRODUCT_CATEGORY
BY STORE_CODE
BY ORDER_DATE
BY PRODUCT_DESCRIPTION
WHERE ( PRODUCT_CATEGORY EQ 'Food' ) AND ( ORDER_DATE GE '09/01/97' );
WHERE STORE_CODE IN ('R1019','R1020','R1041','R1088');
ON TABLE HOLD AS GG2 FORMAT FOCUS INDEX 'STORE_CODE'
END
```

The following procedure creates the data source GG3:

```
TABLE FILE GGORDER
PRINT
     QUANTITY
     UNIT_PRICE
     PACKAGE_TYPE
     SIZE
     VENDOR_NAME
```

```
     PRODUCT_CATEGORY
BY STORE_CODE
BY ORDER_DATE
BY PRODUCT_DESCRIPTION
WHERE ( PRODUCT_CATEGORY EQ 'Gifts' ) AND ( ORDER_DATE GE '09/01/97' );
WHERE STORE_CODE IN ('R1019','R1020','R1040','R1088');
ON TABLE HOLD AS GG3 FORMAT FOCUS INDEX 'STORE_CODE'
END
```

# Step 2: Creating the Component Reports

The following procedure, GGHDR.FEX, creates the first report component for the Coordinated Compound Layout report from the GGHDR data source. This will function as a header for each page of the Compound Layout report. The shared sort field for all of the report components is STORE_CODE. On each page of the PDF output file, this procedure lists the name and address of one store:

```
TABLE FILE GGHDR
BY STORE_CODE NOPRINT
HEADING
"<STORE_NAME "
"<ADDRESS1 "
"<ADDRESS2 "
"<CITY , <STATE   <ZIP "
" "
ON TABLE SET PAGE-NUM OFF
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT HTML
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
     UNITS=IN,
     SQUEEZE=ON,
     ORIENTATION=PORTRAIT,$
TYPE=REPORT,
     GRID=OFF,
     FONT='ARIAL',
     SIZE=9,$
TYPE=HEADING,
     SIZE=10,
     STYLE=BOLD,
     COLOR=BLUE,$
```

```
ENDSTYLE
END
```

The following procedure, GGRPT1.FEX, creates the second report component for the Coordinated Compound Layout report. For the same store code value in the header report, it displays data from the GG1 data source about the product category Coffee:

```
TABLE FILE GG1
SUM
     QUANTITY
     UNIT_PRICE
     FST.PACKAGE_TYPE AS ',Package'
     FST.SIZE AS ',Size'
     VENDOR_NAME
BY STORE_CODE AS 'Store'
BY PRODUCT_DESCRIPTION
HEADING
"<PRODUCT_CATEGORY"
" "
ON TABLE SET PAGE-NUM OFF
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT HTML
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
     UNITS=IN,
     SQUEEZE=ON,
     ORIENTATION=PORTRAIT,$
TYPE=REPORT,
     GRID=OFF,
     FONT='ARIAL',
     SIZE=9,$
TYPE=DATA,
     SIZE=10,$
TYPE=TITLE,
     STYLE=BOLD,
     SIZE=10,$
TYPE=HEADING,
     SIZE=10,
     STYLE=BOLD,
    COLOR=RED,$
ENDSTYLE
END
```

The following procedure, GGRPT2.FEX, creates the third report component for the Coordinated Compound Layout report. For the same store code value in the header report, it displays data from the GG2 data source about the product category Food:

```
TABLE FILE GG2
SUM
     QUANTITY
     UNIT_PRICE
     FST.PACKAGE_TYPE AS ',Package'
     FST.SIZE AS ',Size'
     VENDOR_NAME
BY STORE_CODE
BY PRODUCT_DESCRIPTION
HEADING
"<PRODUCT_CATEGORY"
" "
ON TABLE SET PAGE-NUM OFF
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT HTML
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
     UNITS=IN,
     SQUEEZE=ON,
     ORIENTATION=PORTRAIT,$
TYPE=REPORT,
     GRID=OFF,
     FONT='ARIAL',
     SIZE=9,$
TYPE=DATA,
    SIZE=10,$
TYPE=TITLE,
     STYLE=BOLD,
     SIZE=10,$
TYPE=HEADING,
     SIZE=10,
     STYLE=BOLD,
     COLOR=RED,$
ENDSTYLE
END
```

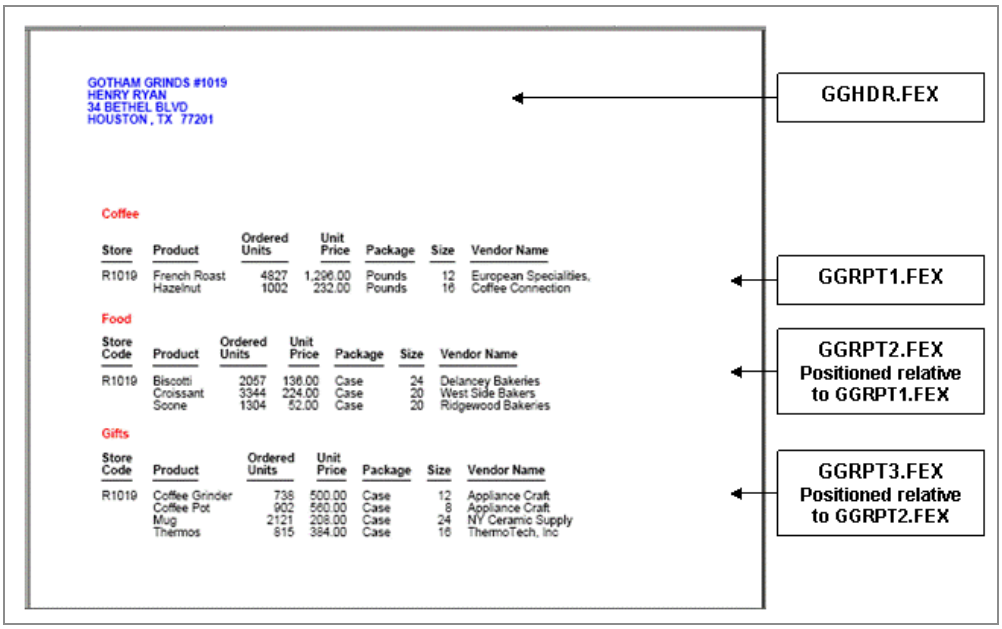
The following procedure, GGRPT3.FEX, creates the final report component for the Coordinated Compound Layout report. For the same store code value in the header report, it displays data from the GG3 data source about the product category Gifts:

```
TABLE FILE GG3
SUM
     QUANTITY
     UNIT_PRICE
     FST.PACKAGE_TYPE AS ',Package'
```

```
     FST.SIZE AS ',Size'
     VENDOR_NAME
BY STORE_CODE
BY PRODUCT_DESCRIPTION
HEADING
"<PRODUCT_CATEGORY"
" "
ON TABLE SET PAGE-NUM OFF
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT HTML
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
     UNITS=IN,
     SQUEEZE=ON,
     ORIENTATION=PORTRAIT,$
TYPE=REPORT,
     GRID=OFF,
     FONT='ARIAL',
     SIZE=9,$
TYPE=DATA,
     SIZE=10,$
TYPE=TITLE,
     STYLE=BOLD,
     SIZE=10,$
TYPE=HEADING,
     SIZE=10,
     STYLE=BOLD,
     COLOR=RED,$
ENDSTYLE
END
```

# Step 3: Building the Coordinated Compound Layout Report

The following procedure, GGCMPD.FEX, combines the four components into a Coordinated Compound Layout report. The reports and relative positioning for each component is presented in the following diagram:

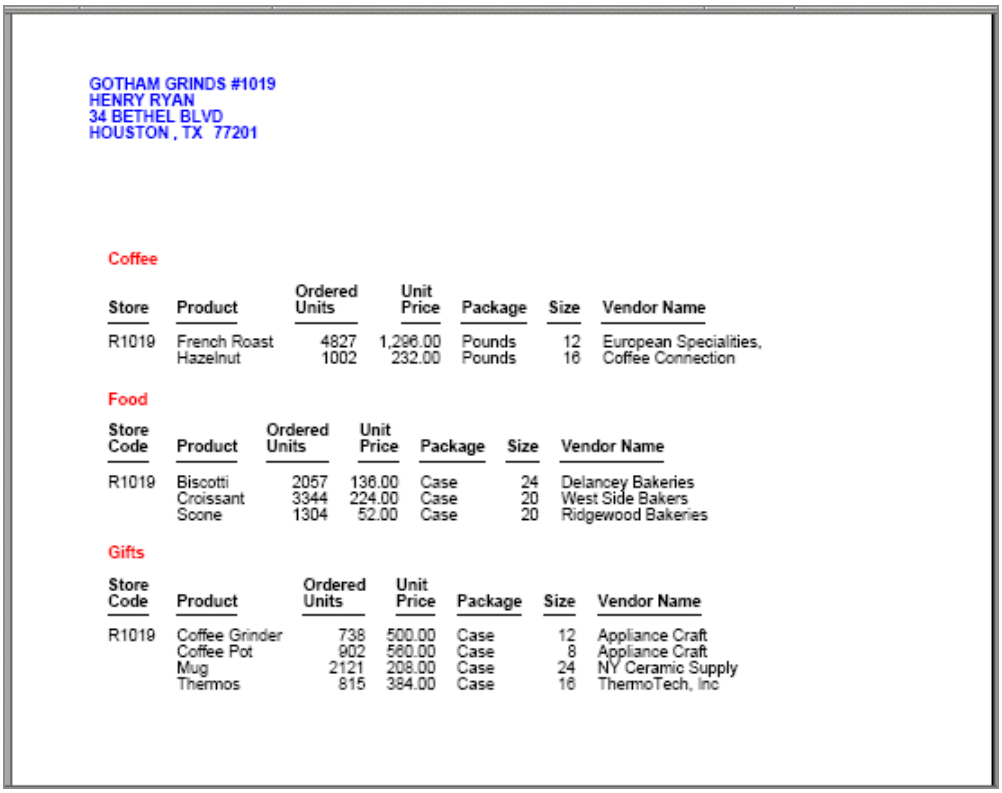



The Coordinated Compound Layout syntax is:

```
SET HTMLARCHIVE=ON
COMPOUND LAYOUT PCHOLD FORMAT PDF
UNITS=IN, $
SECTION=section1, LAYOUT=ON, MERGE=ON, ORIENTATION=PORTRAIT,
   PAGESIZE=Letter,  $
PAGELAYOUT=1, NAME='Page layout 1', text='Page layout 1',
   TOC-LEVEL=1, BOTTOMMARGIN=0.5, TOPMARGIN=0.5,  $
COMPONENT='report1', TEXT='report1', TOC-LEVEL=2,
   POSITION=(0.667 1.083), DIMENSION=(3.417 1.412),  $
COMPONENT='report2', TEXT='report2', TOC-LEVEL=2,
   POSITION=(0.837 2.584), DIMENSION=(* *),  $
COMPONENT='report3', TEXT='report3', TOC-LEVEL=2,
   POSITION=(-0.006 +0.084), DIMENSION=(* *),
   RELATIVE-TO='report2', RELATIVE-POINT=BOTTOM-LEFT,
   POSITION-POINT=TOP-LEFT, $
COMPONENT='report4', TEXT='report4', TOC-LEVEL=2,
   POSITION=(+0.010 +0.080), DIMENSION=(* *),
   RELATIVE-TO='report3', RELATIVE-POINT=BOTTOM-LEFT,
   POSITION-POINT=TOP-LEFT, $
END
SET COMPONENT='report1'
-INCLUDE GGHDR.FEX
SET COMPONENT='report2'
-INCLUDE GGRPT1.FEX
SET COMPONENT='report3'
-INCLUDE GGRPT2.FEX
```

```
SET COMPONENT='report4'
-INCLUDE GGRPT3.FEX
COMPOUND END
```

On the first page of the PDF output file, all components have data and appear on the report output:



GOTHAM GRINDS #1019
HENRY RYAN
34 BETHEL BLVD
HOUSTON , TX 77201

Coffee

| Store | Product | Ordered Units | Unit Price | Package | Size | Vendor Name |
|---|---|---|---|---|---|---|
| R1019 | French Roast | 4827 | 1,296.00 | Pounds | 12 | European Specialities, |
| | Hazelnut | 1002 | 232.00 | Pounds | 16 | Coffee Connection |

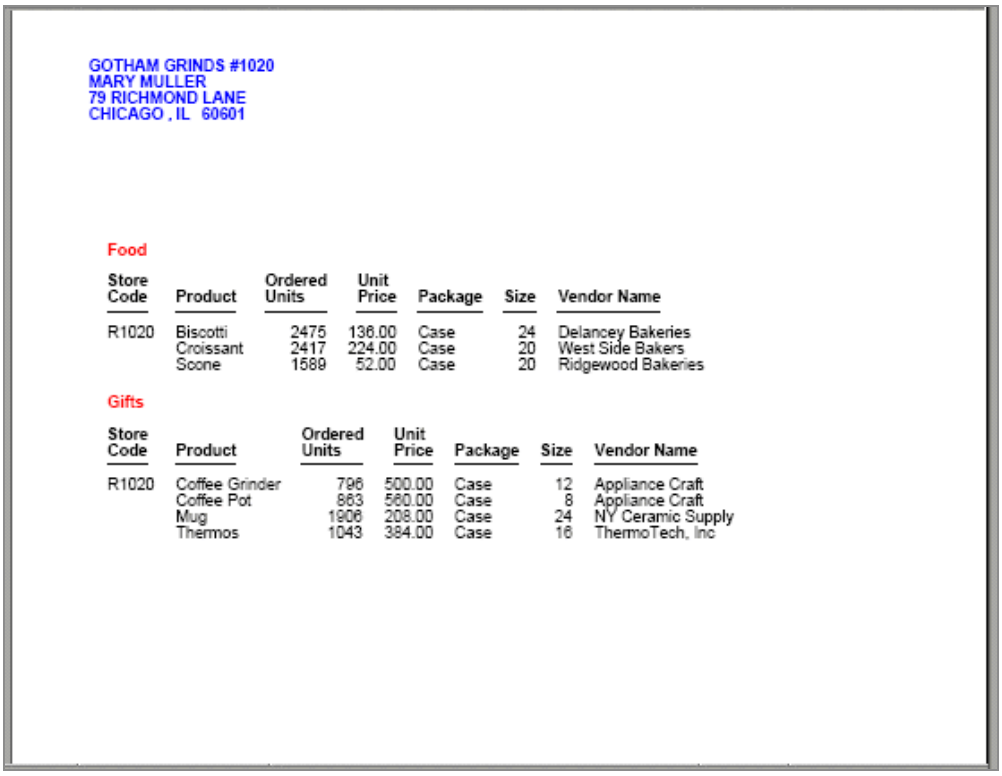
Food

| Store Code | Product | Ordered Units | Unit Price | Package | Size | Vendor Name |
|---|---|---|---|---|---|---|
| R1019 | Biscotti | 2057 | 136.00 | Case | 24 | Delancey Bakeries |
| | Croissant | 3344 | 224.00 | Case | 20 | West Side Bakers |
| | Scone | 1304 | 52.00 | Case | 20 | Ridgewood Bakeries |

Gifts

| Store Code | Product | Ordered Units | Unit Price | Package | Size | Vendor Name |
|---|---|---|---|---|---|---|
| R1019 | Coffee Grinder | 738 | 500.00 | Case | 12 | Appliance Craft |
| | Coffee Pot | 902 | 560.00 | Case | 8 | Appliance Craft |
| | Mug | 2121 | 208.00 | Case | 24 | NY Ceramic Supply |
| | Thermos | 815 | 384.00 | Case | 16 | ThermoTech, Inc |

On the second page, report GGRPT2.FEX did not retrieve any data for the store in the header. Therefore, the Coffee component is missing. Note that because Component 3 and 4 are positioned RELATIVE-TO the components defined above them in the Compound Layout syntax, the Food and Gifts components move up instead of leaving blank space where the Coffee component would have been:



GOTHAM GRINDS #1020
MARY MULLER
79 RICHMOND LANE
CHICAGO , IL 60601

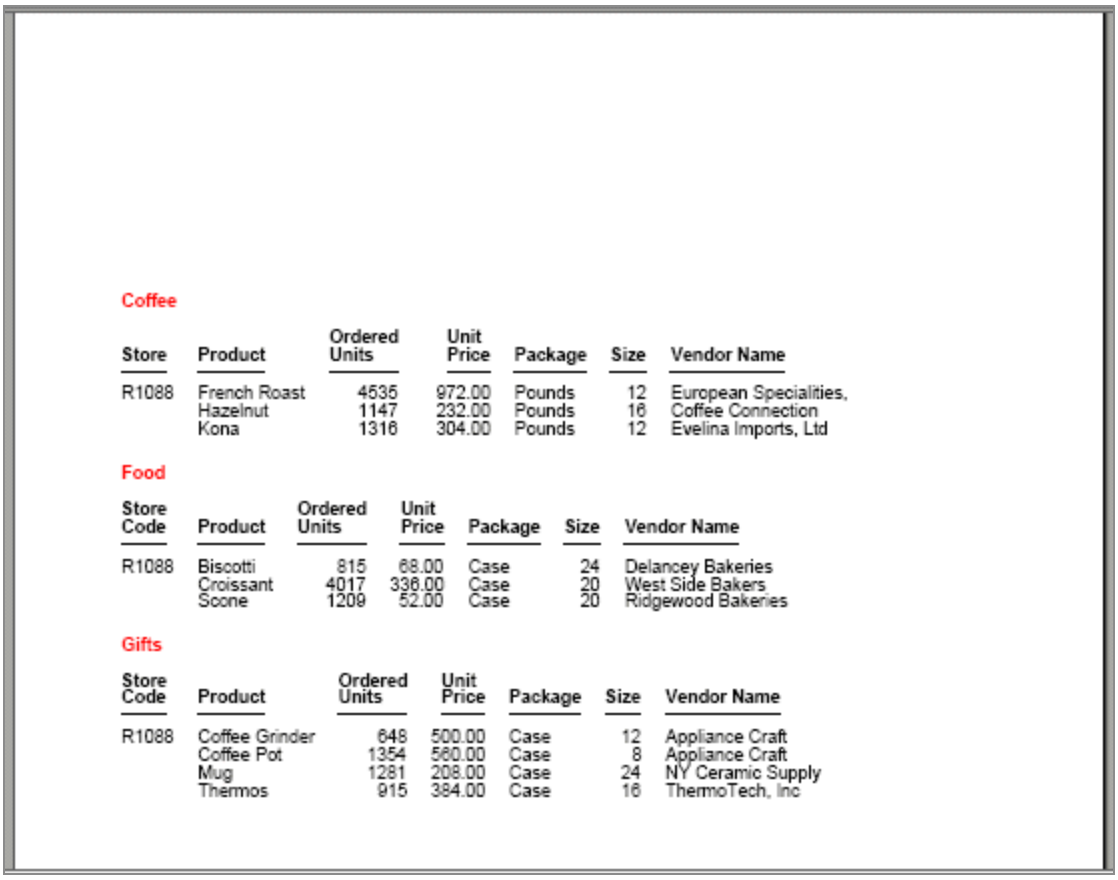
Food

| Store Code | Product | Ordered Units | Unit Price | Package | Size | Vendor Name |
|---|---|---|---|---|---|---|
| R1020 | Biscotti | 2475 | 136.00 | Case | 24 | Delancey Bakeries |
| | Croissant | 2417 | 224.00 | Case | 20 | West Side Bakers |
| | Scone | 1589 | 52.00 | Case | 20 | Ridgewood Bakeries |

Gifts

| Store Code | Product | Ordered Units | Unit Price | Package | Size | Vendor Name |
|---|---|---|---|---|---|---|
| R1020 | Coffee Grinder | 796 | 500.00 | Case | 12 | Appliance Craft |
| | Coffee Pot | 863 | 560.00 | Case | 8 | Appliance Craft |
| | Mug | 1906 | 208.00 | Case | 24 | NY Ceramic Supply |
| | Thermos | 1043 | 384.00 | Case | 16 | ThermoTech, Inc |

On page 5, the header report did not retrieve any data for a store code value present in the other three components. A page is still generated for this store code. Since the second component (Coffee report) was positioned absolutely in the Compound Layout syntax, not RELATIVE-TO the first component (header report), the space where the header report would have been is left blank:



Coffee

| Store | Product | Ordered Units | Unit Price | Package | Size | Vendor Name |
|---|---|---|---|---|---|---|
| R1088 | French Roast | 4535 | 972.00 | Pounds | 12 | European Specialities, |
| | Hazelnut | 1147 | 232.00 | Pounds | 16 | Coffee Connection |
| | Kona | 1316 | 304.00 | Pounds | 12 | Evelina Imports, Ltd |

Food

| Store Code | Product | Ordered Units | Unit Price | Package | Size | Vendor Name |
|---|---|---|---|---|---|---|
| R1088 | Biscotti | 815 | 68.00 | Case | 24 | Delancey Bakeries |
| | Croissant | 4017 | 336.00 | Case | 20 | West Side Bakers |
| | Scone | 1209 | 52.00 | Case | 20 | Ridgewood Bakeries |

Gifts

| Store Code | Product | Ordered Units | Unit Price | Package | Size | Vendor Name |
|---|---|---|---|---|---|---|
| R1088 | Coffee Grinder | 648 | 500.00 | Case | 12 | Appliance Craft |
| | Coffee Pot | 1354 | 560.00 | Case | 8 | Appliance Craft |
| | Mug | 1281 | 208.00 | Case | 24 | NY Ceramic Supply |
| | Thermos | 915 | 384.00 | Case | 16 | ThermoTech, Inc |

# Generating a Table of Contents With BY Field Entries for PPTX and PDF Compound Layout Reports

Using compound layout syntax, you can generate a Table of Contents for a PPTX and PDF compound report.

In PPTX, the Table of Contents can be presented as a Table of Contents page placed at the beginning of the document. In PDF, the Table of Contents can be presented as either PDF bookmarks displayed by Adobe Reader®, or as a Table of Contents page placed at the beginning of the document, or both. Both the Table of Contents entries and the bookmarks (in PDF) provide links to each of the components and included sort fields. These links position the reader on the page where the Table of Contents link is located.

Include any report or graph component in the Table of Contents at a specific level by defining a TOC Description and TOC Level in the compound layout syntax for the component. Additionally, the BY field values of any of the report components can be presented within the TOC tree indented one level within the component report entry. BYTOC entries are supported for report components only (not graph components).

Compound reports defining the Table of Contents page or Bookmarks (in PDF) based on BY field entries are supported for both non-coordinated (MERGE=OFF) and coordinated reports (MERGE=ON). For coordinated reports, the primary sort key is presented as the top-level entry for individual instances of the report, and subsequent keys are presented within the appropriate components within the tree. These coordinated reports can also be burst into separate documents by the primary sort key and distributed using ReportCaster.

# Table of Contents Features

The Table of Contents (TOC) page shows a summary of the contents of the document, along with page numbers, and can be printed with the document. The entries in the Table of Contents enable you to easily navigate to a particular section while viewing the document online. The entries can link to any component of the compound output (page, report, or graph), any object (image, text box) within the compound report, and vertical sort field values (BY field values) within each component report.

The actual content of the Table of Contents is represented as a text element in the compound layout syntax. When using a Table of Contents page, you can:

- Customize the title of the Table of Contents, as well as format all of the text.
- Specify a TOC level for each component to be included in the Table of Contents.
- Enable TOC page numbering so that each element in the Table of Contents is numbered. You can also add tab leaders (dots) from the entry to the page number for easier selection of the contents.
- Control which reports and graphs show up in the Table of Contents by customizing the object properties.
- Use hypertext links in the Table of Contents page which enable you to click on an entry and jump to the specified page in the document.

**Note:** If the Table of Contents overflows to more than one page at run time, the remaining content is executed with the same size and dimensions as the first page until the entire TOC has been output.

# Generate a Table of Contents in a PPTX Compound Layout Report

The following example creates a Table of Contents page for a compound PPTX report. Each component is at TOC level 1 and each component has two levels of BY fields under the level 1 entries.

```
COMPOUND LAYOUT PCHOLD FORMAT PPTX
OBJECT=TOC, NAME='text1',
TEXT='<font face="ARIAL" size=10>Table of Contents</font>',
MARKUP=ON, TOC-NUMBERING=ON, POSITION=(0.854 0.854),
DIMENSION=(7.000 9.500), font='ARIAL', color=RGB(0 0 0),
size=10, METADATA=' TOCTITLE: Table of Contents', $
SECTION=S1, LAYOUT=ON, MERGE=OFF, ORIENTATION=PORTRAIT, $
PAGELAYOUT=1, $
COMPONENT=report1, TEXT='Sales By Product', TOC-LEVEL=1, BYTOC=2,
POSITION=(1 1), DIMENSION=(* *), $
COMPONENT=report2, TEXT='Sales By Region', TOC-LEVEL=1, BYTOC=2,
POSITION=(+0.00 +0.519), DIMENSION=(* *), RELATIVE-TO='report1',
RELATIVE-POINT=BOTTOM-LEFT, POSITION-POINT=TOP-LEFT, $
END
SET COMPONENT=report1
TABLE FILE GGSALES
SUM DOLLARS/F8M
BY CATEGORY
BY PRODUCT
BY REGION
BY ST
HEADING
"Sales by Category"
ON TABLE HOLD FORMAT PPTX
ON TABLE SET STYLE *
TYPE=REPORT, SQUEEZE=ON, $
ENDSTYLE
END
SET COMPONENT=report2
TABLE FILE GGSALES
SUM DOLLARS/F8M
BY REGION
BY ST
BY CATEGORY
BY PRODUCT
HEADING
"Sales by Region"
```

```
ON TABLE HOLD FORMAT PPTX
ON TABLE SET STYLE *
TYPE=REPORT, SQUEEZE=ON, $
ENDSTYLE
END
COMPOUND END
```

The output shows that each component report is at Table of Contents level 1 and has two levels of sort fields under it, as shown in the following image. For the Sales by Product report, the BY fields are Category and Product. For the Sales by Region report, the BY fields are Region and State. Each entry in the Table of Contents is a link to the page containing that value.

From PowerPoint presentation view, clicking any entry on the Table of Contents page opens the page containing that entry. For example, clicking the Sales by Region Southeast entry displays the following page.

```
Sales by Region
Region     State  Category  Product         Dollar Sales
_______    _____  ________  _______         ____________
Northeast  CT     Coffee    Espresso            $279,373
                            Latte               $926,052
                  Food      Biscotti            $589,355
                            Croissant           $551,489
                            Scone               $283,874
                  Gifts     Coffee Grinder      $169,908
                            Coffee Pot          $208,209
                            Mug                 $392,967
                            Thermos             $221,827
           MA     Coffee    Capuccino           $174,344
                            Espresso            $248,356
                            Latte               $917,737
                  Food      Biscotti            $570,391
                            Croissant           $497,234
                            Scone               $332,486
                  Gifts     Coffee Grinder      $177,940
                            Coffee Pot          $184,119
                            Mug                 $401,944
                            Thermos             $203,435
           NY     Coffee    Capuccino           $208,756
                            Espresso            $322,378
                            Latte               $928,026
                  Food      Biscotti            $642,259
                            Croissant           $622,095
                            Scone               $290,811
                  Gifts     Coffee Grinder      $161,352
                            Coffee Pot          $198,452
                            Mug                 $349,300
                            Thermos             $178,836
Southeast  FL     Coffee    Capuccino           $317,027
                            Espresso            $256,539
                            Latte               $889,887
                  Food      Biscotti            $511,597
                            Croissant           $602,076
                            Scone               $311,836
                  Gifts     Coffee Grinder      $217,204
                            Coffee Pot          $212,057
                            Mug                 $409,466
                            Thermos             $195,526
           GA     Coffee    Capuccino           $352,161
                            Espresso            $317,389
                            Latte               $907,365
                  Food      Biscotti            $555,231
                            Croissant           $661,806
                            Scone               $273,420
                  Gifts     Coffee Grinder      $217,254
                            Coffee Pot          $232,552
                            Mug                 $355,447
                            Thermos             $227,482
```

# Generate a Table of Contents in a PDF Compound Layout Report

You can generate bookmarks, a Table of Contents page, or both by including the BOOKMARKS and/or TOC object in the compound layout syntax. Then in the component definitions, specify the Table of Contents level and description and, optionally, the BYTOC levels.

### TOC Attributes

```
COMPOUND LAYOUT PCHOLD FORMAT PDF
[OBJECT=BOOKMARKS, $]
[OBJECT=TOC, NAME='text1',
   TEXT='<font face="font1" size=sz1>Table of Contents</font>',
   MARKUP=ON, TOC-NUMBERING={OFF|ON}, POSITION=(xy), [TOC-FILL=DOTS,]
   DIMENSION=(mn),
   font='font2', color={color|RGB(rgb)}, size=sz2,
   METADATA=' TOCTITLE: Table of Contents', $]
```

where:

**OBJECT=BOOKMARKS**

Generates PDF bookmarks for the Table of Contents entries specified in the COMPONENT declarations.

**OBJECT=TOC**

Generates a Table of Contents page for the Table of Contents entries specified in the COMPONENT declarations.

**NAME='text1'**

Specifies a name for the Table of Contents page item.

**TEXT='<font face="font1" size=sz1>Table of Contents</font>'**

Specifies the title and text characteristics for the Table of Contents title. In order for this information to be interpreted correctly, the MARKUP=ON attribute must be specified. The text will not wrap and must fit within the width of the overall text element.

**MARKUP=ON**

Causes the markup tags used with the Table of Contents title to be interpreted as formatting options, not as text.

**TOC-NUMBERING={OFF|ON}**

Specifies whether the entries on the Table of Contents page are numbered. ON is the default value.

**POSITION=(xy)**

Defines the x and y coordinates for the object on the page.

**DIMENSION=(ab)**

Defines the size of the bounding box for the object.

**font='font2', color={color|RGB(rgb)}, size=sz2,**

Specifies text characteristics for the Table of Contents body. If omitted, the attributes are taken from the TEXT attribute.

**TOC-FILL=DOTS**

Places tab leader dots from the entry to the page number. If this attribute is not included, the entry and the page number are separated by blank space.

**Component Entries**

```
COMPONENT=component1, TITLE='title1', TOC-LEVEL=n, [BYTOC=m,]
   POSITION=(xy),DIMENSION=(ab), $
```

where:

**component1**

Is a component to be included in the Table of Contents.

**title1**

Is the title for the component to be used as the TOC entry.

**TOC-LEVEL=n**

Defines *n* as the Table of Contents level for the report, graph, or page layout object. This option defines the hierarchical order of objects within the Table of Contents.

0 = the object is not shown in the Table of Contents.

1 = the object is shown as a first level item in the Table of Contents.

2 = the object is shown as a second level item in the Table of Contents and so on.

**BYTOC=m**

Specifies the number of BY fields to be included within the current component entry (*m*).

**POSITION=(xy)**

Defines the x and y coordinates for the object on the page.

**DIMENSION=(ab)**

Defines the size of the bounding box for the object.

# Usage Notes for Table of Contents

### General Notes

- The Table of Contents entry is a link to the overall page, not a direct link to the location of the selected data element on the page.
- Reports used for headings or footings on overflow pages (DisplayOn=OVERFLOW-ONLY) should not be included in any TOC or BYTOC entries. These components will generate duplicate entries in the Table of Contents because they are repeated on the second page and all subsequent pages of a given page layout based on page count rather than sort field values.
- For an uncoordinated document, the TOC presents all of the page layouts and components designated in the TOC parameters.
- For a coordinated document, the TOC presents a reference to each of the coordinated sort fields, with a link to the first page of the associated pages for that common sort field.

### BYTOC Notes

- If the BYTOC value designated is greater than the count of BY fields in the component report, the value defaults to the total count of available BY fields.
- Any valid field that can be used as a BY field can be used in a BYTOC entry, including those taken directly from a data source or created in a DEFINE.
- BY fields designated not to be displayed within the body of the component report (NOPRINT fields) will still be displayed within the Table of Contents.
- The TOC-level values defined cannot skip levels. Any skip in level will cause the bookmarks below that level not to display.

# Creating Bookmarks and a Table of Contents Page

The following example has two component reports. Both PDF bookmarks and a Table of Contents page are generated. Each component is at TOC level 1 and each has two levels of BY fields under the Level 1 entries:

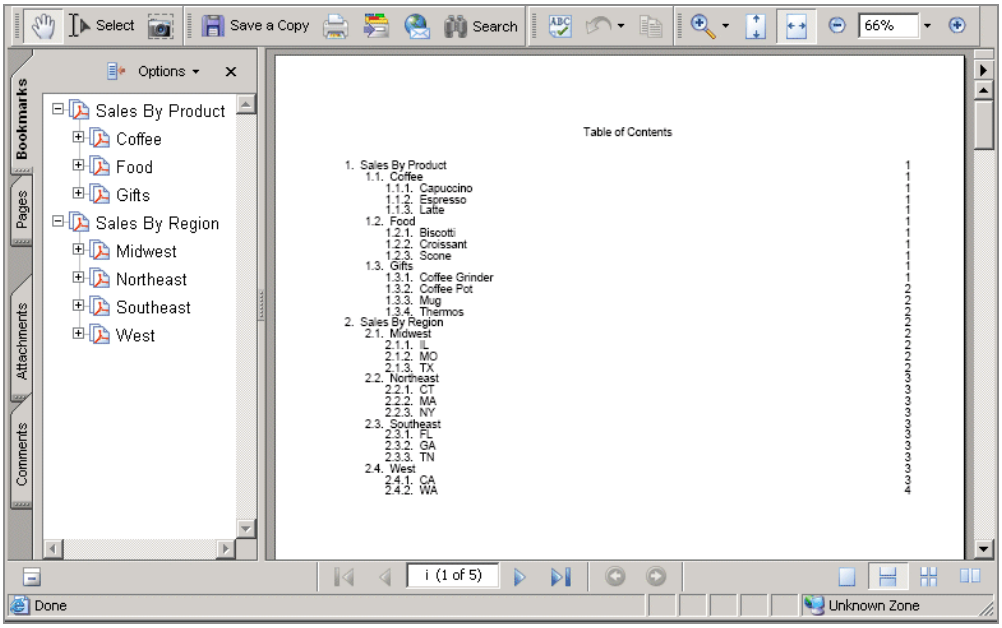
```
COMPOUND LAYOUT PCHOLD FORMAT PDF
OBJECT=BOOKMARKS, $
OBJECT=TOC, NAME='text1',
  TEXT='<font face="ARIAL" size=10>Table of Contents</font>',
  MARKUP=ON, TOC-NUMBERING=ON, POSITION=(0.854 0.854),
  DIMENSION=(7.000 9.500), font='ARIAL', color=RGB(0 0 0),
  size=10, METADATA=' TOCTITLE: Table of Contents', $
SECTION=S1, LAYOUT=ON, MERGE=OFF, ORIENTATION=PORTRAIT, $
PAGELAYOUT=1, $
COMPONENT=report1, TEXT='Sales By Product', TOC-LEVEL=1, BYTOC=2,
  POSITION=(1 1), DIMENSION=(* *), $
COMPONENT=report2, TEXT='Sales By Region', TOC-LEVEL=1, BYTOC=2,
  POSITION=(+0.00 +0.519), DIMENSION=(* *), RELATIVE-TO='report1',
  RELATIVE-POINT=BOTTOM-LEFT, POSITION-POINT=TOP-LEFT, $
END
```

```
SET COMPONENT=report1
TABLE FILE GGSALES
SUM DOLLARS/F8M
BY CATEGORY
BY PRODUCT
BY REGION
BY ST
HEADING
"Sales by Category"
ON TABLE HOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT, SQUEEZE=ON, $
ENDSTYLE
END
```

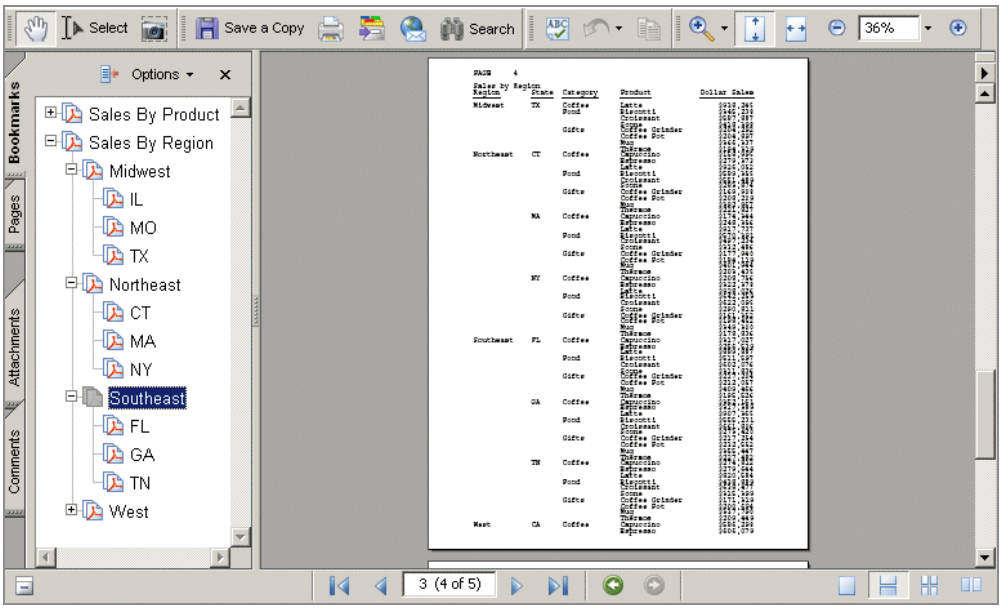
```
SET COMPONENT=report2
TABLE FILE GGSALES
SUM DOLLARS/F8M
BY REGION
BY ST
```

```
BY CATEGORY
BY PRODUCT
HEADING
"Sales by Region"
ON TABLE HOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT, SQUEEZE=ON, $
ENDSTYLE
END
COMPOUND END
```

The output shows that each component reports is at Table of Contents level 1 and has two levels of sort fields under it. For the Sales by Product report, the BY fields are Category and Product. For the Sales by Region report, the BY fields are Region and State. Each entry in the Table of Contents is a link to the page containing that value:




Clicking any entry on the Table of Contents page or in the bookmarks pane opens the page containing that entry. For example, clicking the Sales by Region/Southeast entry opens the following page:




# Creating a Compound PDF or PS Report

Compound reports combine multiple reports into a single PDF or PS file. The first PDF or PS report defines the format for the concatenated report, enabling you to intersperse intermediate reports of other formats into one encompassing report. Using compound reports, you can gather data from different data sources and combine reports into one governing report that runs each request and concatenates the output into a single PDF or PS file.

You can then run or distribute the report with ReportCaster, which displays the compound PDF report in Adobe Reader or sends the compound PS report directly to a printer. See the ReportCaster documentation for details about this product.

This is supported with styled formats, such as PDF, PS, EXL2K, or XLSX.

For information about creating Drill Through PDF Compound Reports, see Creating a Drill Through PDF Compound Report. For information about creating Excel Compound Reports, see Creating Excel Compound Reports.

# Display Compound Reports

For a compound report that may contain different report types, use the syntax

```
SET COMPOUND= {OPEN|CLOSE} [NOBREAK]
```

or

```
ON TABLE SET COMPOUND {OPEN|CLOSE}
```

Note that when you are using this syntax, you must also include the following code to identify the display format of each of the reports to be concatenated:

```
ON TABLE {PCHOLD|HOLD|SAVE} [AS name] FORMAT formatname
```

If all of the reports in the compound set are of the same type, either PDF or PS, you can use the following, more compact, syntax

```
ON TABLE {PCHOLD|HOLD|SAVE} [AS name] FORMAT {PDF|PS} {OPEN|CLOSE}
[NOBREAK]
```

where:

**name**

Is the name of the generated file. The name is taken from the first request in the compound report. If no name is specified in the first report, the name HOLD is used.

**OPEN**

Is specified with the first report, and begins the concatenation process. A report that contains the OPEN attribute must be PDF or PS format.

**CLOSE**

Is specified with the last report, and ends the concatenation process.

**NOBREAK**

Is an optional phrase that suppresses page breaks. By default, each report is displayed on a separate page.

You can use NOBREAK selectively in a request to control which reports are displayed on the same page.

**Note:**

- Compound reports cannot be nested.

- You can save or hold the output from a compound report. For details, see Saving and Reusing Your Report Output.
- Multi-Pane reports cannot be used in a Compound Report.

# Creating a Compound PDF Report

The following illustrates how to combine three separate PDF reports into one by creating a compound report. Notice that:

- Report 1 specifies ON TABLE PCHOLD FORMAT PDF OPEN. This defines the report as the first report and sets the format for the entire compound report as PDF.
- Report 2 species only the format, ON TABLE PCHOLD FORMAT PDF.
- Report 3 specifies ON TABLE PCHOLD FORMAT PDF CLOSE. This defines the report as the last report.

Note that in this example, all reports are set to PDF format. However, when you create a compound report, only the first report must be in either PDF or PS format. Subsequent reports can be in any styled format. For an illustration, see Embed Graphics in a Compound Report.

**Report 1:**

```
SET PAGE-NUM=OFF
TABLE FILE CENTORD
HEADING
"Sales Report"
" "
SUM LINEPRICE
BY PRODCAT
ON TABLE SET STYLE *
TYPE=HEADING, SIZE=18, $
ENDSTYLE
ON TABLE PCHOLD FORMAT PDF OPEN NOBREAK
END
```

**Report 2:**

```
TABLE FILE CENTORD
HEADING
"Inventory Report"
```

```
" "
SUM QUANTITY
BY PRODCAT
ON TABLE SET STYLE *
TYPE=HEADING, SIZE=18, $
ENDSTYLE
ON TABLE PCHOLD FORMAT PDF NOBREAK
END
```

**Report 3:**

```
TABLE FILE CENTORD
HEADING
"Cost of Goods Sold Report"
" "
SUM LINE_COGS
BY PRODCAT
ON TABLE SET STYLE *
TYPE=HEADING, SIZE=18, $
ENDSTYLE
ON TABLE PCHOLD FORMAT PDF CLOSE
END
```

The output displays as a PDF report. Because the syntax for reports 1 and 2 contain the NOBREAK command, the three reports appear on a single page. (Without NOBREAK, each report displays on a separate page.)

Sales Report

| PRODCAT | Line Total |
|---|---|
| CD Players | $40,694,863.53 |
| Camcorders | $333,884,927.52 |
| Cameras | $9,718,752.55 |
| DVD | $53,182,674.89 |
| Digital Tape Recorders | $38,773,229.69 |
| PDA Devices | $233,967,566.49 |
| VCRs | $23,801,009.34 |

Inventory Report

| PRODCAT | Quantity: |
|---|---|
| CD Players | 308,274 |
| Camcorders | 950,700 |
| Cameras | 98,141 |
| DVD | 241,287 |
| Digital Tape Recorders | 524,027 |
| PDA Devices | 610,844 |
| VCRs | 170,977 |

Cost of Goods Sold Report

| PRODCAT | Line Cost Of Goods Sold |
|---|---|
| CD Players | 30,519,126.00 |
| Camcorders | 299,487,742.00 |
| Cameras | 8,944,891.00 |
| DVD | 47,275,593.00 |
| Digital Tape Recorders | 36,157,863.00 |
| PDA Devices | 202,123,656.00 |
| VCRs | 22,056,033.00 |

# Embed Graphics in a Compound Report

You can embed a graphic, such as a logo or a WebFOCUS graph captured as a GIF file, in a compound report. The graphic file must be embedded in a particular report within the set of compound reports.

To save a graph as a graphic image, include the following syntax in your graph request:

```
HOLD FORMAT GIF
```

For details on saving a graph as an image file, see Creating a Graph.

To embed a graphic in a compound report, you must identify the image file in the StyleSheet declaration of the report in which you want to include it, along with size and position specifications if desired. For details about embedding and positioning graphics in reports, see Adding an Image to a Report.

# Combining Report Formats and Graphs in a Compound Report

This request generates a compound report from three different report types (PDF, HTML, and EXL2K), and embeds a graph in each report. Notice that each graph is saved as a GIF file in the graph request. The graph is then identified, sized, and positioned within the StyleSheet declaration (TYPE=REPORT, IMAGE=*graphname*...) of the report in which it is being embedded). Variations on the SET COMPOUND= syntax (OPEN, NOBREAK, CLOSE) combine the three reports on the same page. Key lines of code are highlighted in the following request.

**Report 1:**

```
SET GRMERGE = ON
GRAPH FILE SHORT
SUM PROJECTED_RETURN AS 'Return on Investment'
BY HOLDER
ACROSS CONTINENT
ON GRAPH SET LOOKGRAPH 3D_BAR
ON GRAPH SET GRAPHEDIT SERVER
ON GRAPH HOLD AS SLSGRPH1 FORMAT GIF
END
```

```
SET COMPOUND='OPEN NOBREAK'
TABLE FILE SHORT
SUM PROJECTED_RETURN AS 'Return on Investment'
BY CONTINENT
BY HOLDER
HEADING
"Investment Report"
" "
```

```
ON TABLE SET STYLE *
TYPE=DATA, BACKCOLOR=( BY=B2 'SILVER' 'WHITE' ), $
TYPE=HEADING, SIZE=14, STYLE=BOLD, $
TYPE=REPORT, IMAGE=SLSGRPH1.gif, POSITION=(4.5 0.5), SIZE=(3.5 2.5), $
ENDSTYLE
ON TABLE PCHOLD FORMAT PDF

END
```

**Report 2:**

```
GRAPH FILE TRADES
SUM AMOUNT
BY CONTINENT
ON GRAPH SET LOOKGRAPH PIE
ON GRAPH SET GRAPHEDIT SERVER
ON GRAPH HOLD AS TRDSGR1 FORMAT GIF
END
```

```
SET COMPOUND=NOBREAK
TABLE FILE TRADES
SUM AMOUNT AS 'Amount'
BY CONTINENT AS 'Continent'
BY REGION AS 'Region'
HEADING
"Trades Report"
" "
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
 TYPE=DATA, BACKCOLOR=( BY=B2 'SILVER' 'WHITE' ), $
TYPE=HEADING, SIZE=14, STYLE=BOLD, $
TYPE=REPORT, IMAGE=TRDSGR1.gif, POSITION=(4 3), SIZE=(4 2.5),
$
ENDSTYLE
ON TABLE PCHOLD FORMAT HTML
END
```

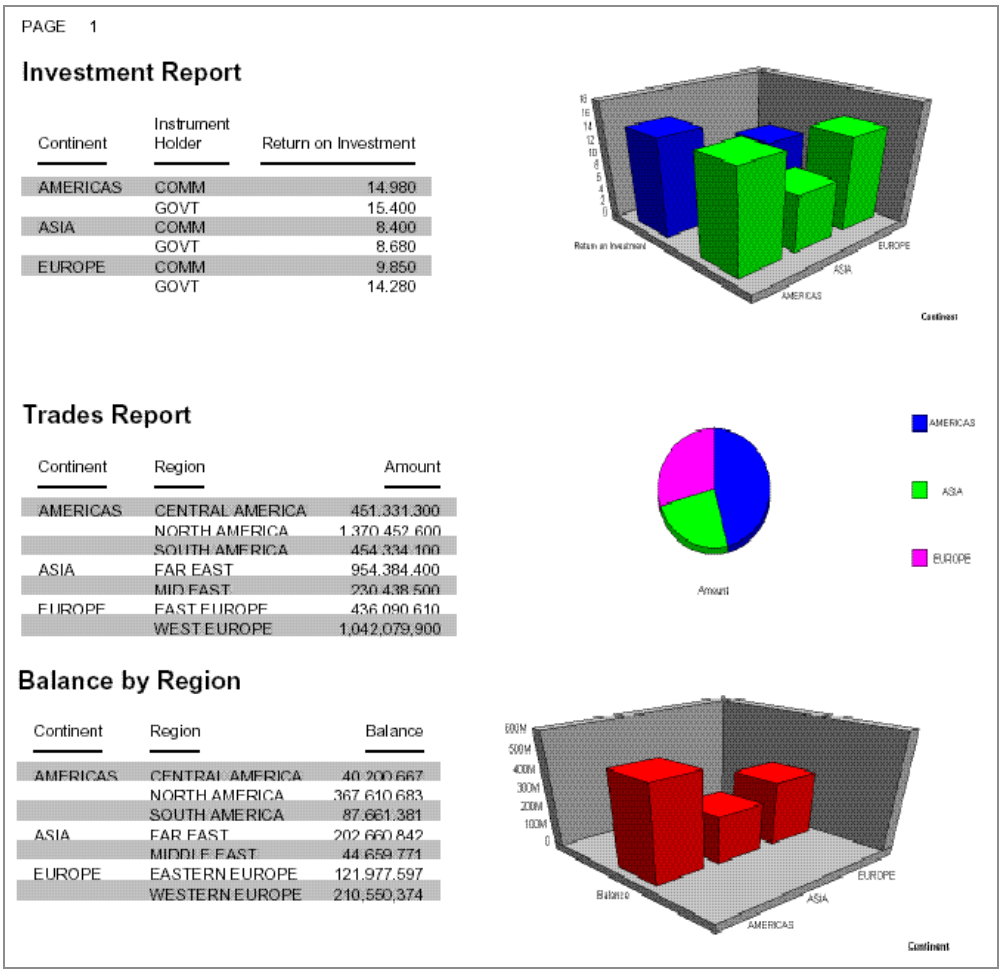
**Report 3:**

```
GRAPH FILE SHORT
SUM BALANCE
BY CONTINENT
ON GRAPH SET LOOKGRAPH 3D_BAR
ON GRAPH SET GRAPHEDIT SERVER
ON GRAPH SET STYLE *
TYPE=DATA, COLOR=RED,$
ENDSTYLE
ON GRAPH HOLD AS BALGR1 FORMAT GIF
END
```

```
SET COMPOUND=CLOSE
TABLE FILE SHORT
```

```
SUM BALANCE AS 'Balance'
BY CONTINENT AS 'Continent'
BY REGION AS 'Region'
HEADING
"Balance by Region"
" "
ON TABLE SET STYLE *
 TYPE=DATA, BACKCOLOR=( BY=B2 'SILVER' 'WHITE' ), $
TYPE=HEADING, SIZE=14, STYLE=BOLD, $
TYPE=REPORT, IMAGE=BALGR1.gif, POSITION=(4 6), SIZE=(4 2.5),
$
ENDSTYLE
ON TABLE PCHOLD FORMAT EXL2K
END
```

The output is:



PAGE 1

**Investment Report**

| Continent | Instrument Holder | Return on Investment |
|---|---|---|
| AMERICAS | COMM | 14.980 |
| | GOVT | 15.400 |
| ASIA | COMM | 8.400 |
| | GOVT | 8.680 |
| EUROPE | COMM | 9.850 |
| | GOVT | 14.280 |



**Trades Report**

| Continent | Region | Amount |
|---|---|---|
| AMERICAS | CENTRAL AMERICA | 451,331,300 |
| | NORTH AMERICA | 1,370,452,600 |
| | SOUTH AMERICA | 454,334,100 |
| ASIA | FAR EAST | 954,384,400 |
| | MID EAST | 230,438,500 |
| EUROPE | EAST EUROPE | 436,090,610 |
| | WEST EUROPE | 1,042,079,900 |



**Balance by Region**

| Continent | Region | Balance |
|---|---|---|
| AMERICAS | CENTRAL AMERICA | 40,200,667 |
| | NORTH AMERICA | 367,610,683 |
| | SOUTH AMERICA | 87,661,381 |
| ASIA | FAR EAST | 202,660,842 |
| | MIDDLE EAST | 44,659,771 |
| EUROPE | EASTERN EUROPE | 121,977,597 |
| | WESTERN EUROPE | 210,550,374 |

# Creating a Compound Excel Report Using EXL2K

Excel Compound Reports generate multiple worksheet reports using the EXL2K output format.

The syntax of Excel Compound Reports is identical to that of PDF Compound Reports. By default, each of the component reports from the compound report is placed in a new Excel worksheet (analogous to a new page in PDF). If the NOBREAK keyword is used, the next report follows the current report on the same worksheet (analogous to starting the report on the same page in PDF).

Output, whether sent to the client using PCHOLD or saved in a file using HOLD, is generated in Microsoft Web Archive format. This format is labeled Single File Web Page in the Excel Save As dialog. Excel provides the conventionally given file suffixes: .mht or .mhtml. WebFOCUS uses the same .xht suffix that is used for EXL2K reports.Since the output is always a single file, it can be easily distributed using ReportCaster.

The components of an Excel compound report can be FORMULA or PIVOT reports (subject to the restrictions). They cannot be Table of Contents (TOC) reports.

**Note:** Excel 2002 (Office XP) or higher must be installed. Excel Compound Reports will not work with earlier versions of Excel since they do not support the Web Archive file format.

# Guidelines for Using the OPEN, CLOSE, and NOBREAK Keywords and SET COMPOUND

As with PDF, the keywords OPEN, CLOSE, and NOBREAK are used to control Excel compound reports. They can be specified with the HOLD or PCHOLD command or with a separate SET COMPOUND command.

- OPEN is used on the first report of a sequence of component reports to specify that a compound report be produced.
- CLOSE is used to designate the last report in a compound report.
- NOBREAK specifies that the next report be placed on the same worksheet as the current report. If it is not present, the default behavior is to place the next report on

a separate worksheet.

NOBREAK may appear with OPEN on the first report, or alone on a report between the first and last reports. (Using CLOSE is irrelevant, since it refers to the placement of the next report, and no report follows the final report on which CLOSE appears.)

- When used with the HOLD/PCHOLD syntax, the compound report keywords OPEN, CLOSE, and NOBREAK must appear immediately after FORMAT EXL2K, and before any additional keywords, such as FORMULA or PIVOT. For example, you can specify:
  - `ON TABLE PCHOLD FORMAT EXL2K OPEN`
  - `ON TABLE HOLD AS MYHOLD FORMAT EXL2K OPEN NOBREAK`
  - `ON TABLE PCHOLD FORMAT EXL2K NOBREAK FORMULA`
  - `ON TABLE HOLD FORMAT EXL2K CLOSE PIVOT PAGEFIELDS COUNTRY`
- As with PDF compound reports, compound report keywords can be alternatively specified using SET COMPOUND:
  - `SET COMPOUND = OPEN`
  - `SET COMPOUND = 'OPEN NOBREAK'`
  - `SET COMPOUND = NOBREAK`
  - `SET COMPOUND = CLOSE`

# Guidelines for Producing Excel Compound Reports Using EXL2K

- **Pivot Tables and NOBREAK.** Pivot Table Reports may appear in compound reports, but they may not be combined with another report on the same worksheet using NOBREAK.
- **Naming of Worksheets.** The default worksheet tab names will be Sheet1, Sheet2, and so on. You have the option to specify a different worksheet tab name by using the TITLETEXT keyword in the stylesheet. For example:

```
TYPE=REPORT, TITLETEXT='Summary Report', $
```

Excel limits the length of worksheet titles to 31 characters. The following special characters cannot be used: ':', '?', '*', and '/'.

- **File Names and Formats.** The output file name (AS name, or HOLD by default) is obtained from the first report of the compound report (the report with the OPEN keyword). Output file names on subsequent reports are ignored.

  The HOLD FORMAT syntax used in the first component report in a compound report applies to all subsequent reports in the compound report, regardless of their format.

- **NOBREAK Behavior.** When NOBREAK is specified, the following report appears on the row immediately after the last row of the report with the NOBREAK. If additional spacing is required between the reports, a FOOTING or an ON TABLE SUBFOOT can be placed on the report with the NOBREAK, or a HEADING or an ON TABLE SUBHEAD can be placed on the following report. This allows the most flexibility, since if blank rows were added by default there would be no way to remove them.

# Creating a Simple Compound Report Using EXL2K

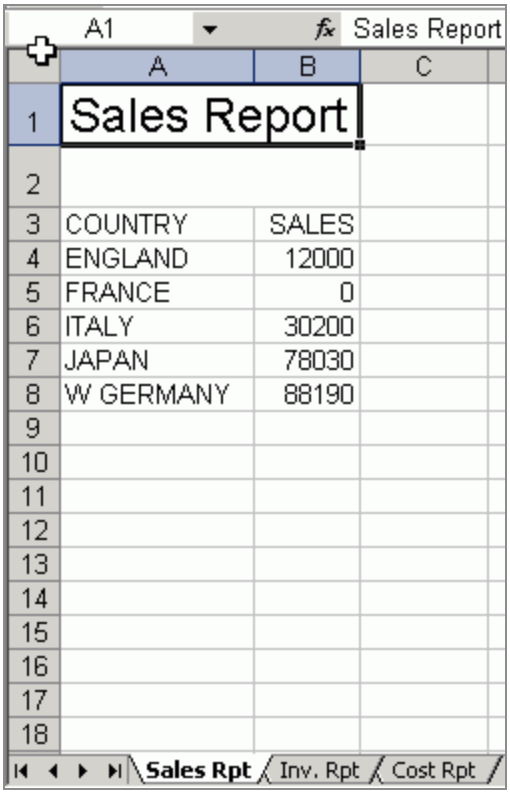
```
SET PAGE-NUM=OFF
TABLE FILE CAR
HEADING
"Sales Report"
" "
SUM SALES
BY COUNTRY
ON TABLE SET STYLE *
type=report, titletext='Sales Rpt', $
type=heading, size=18, $
ENDSTYLE
ON TABLE PCHOLD AS EX1 FORMAT EXL2K OPEN
END
```

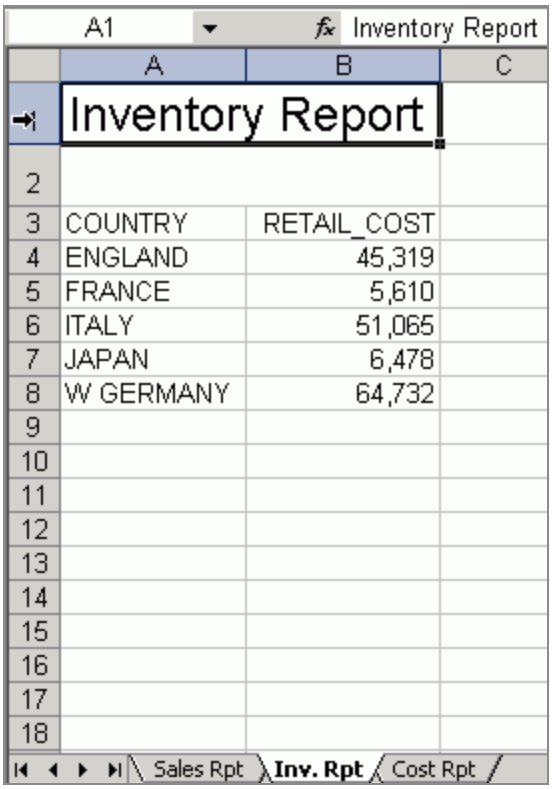
```
TABLE FILE CAR
HEADING
"Inventory Report"
" "
SUM RC
BY COUNTRY
ON TABLE SET STYLE *
type=report, titletext='Inv. Rpt', $
type=heading, size=18, $
```

```
ENDSTYLE
ON TABLE HOLD AS EX1 FORMAT EXL2K
END
```

```
TABLE FILE CAR
HEADING
"Cost of Goods Sold Report"
" "
SUM DC
BY COUNTRY
ON TABLE SET STYLE *
type=report, titletext='Cost Rpt', $
type=heading, size=18, $
ENDSTYLE
ON TABLE HOLD AS EX1 FORMAT EXL2K CLOSE
END
```

The output for each tab in the Excel worksheet is:

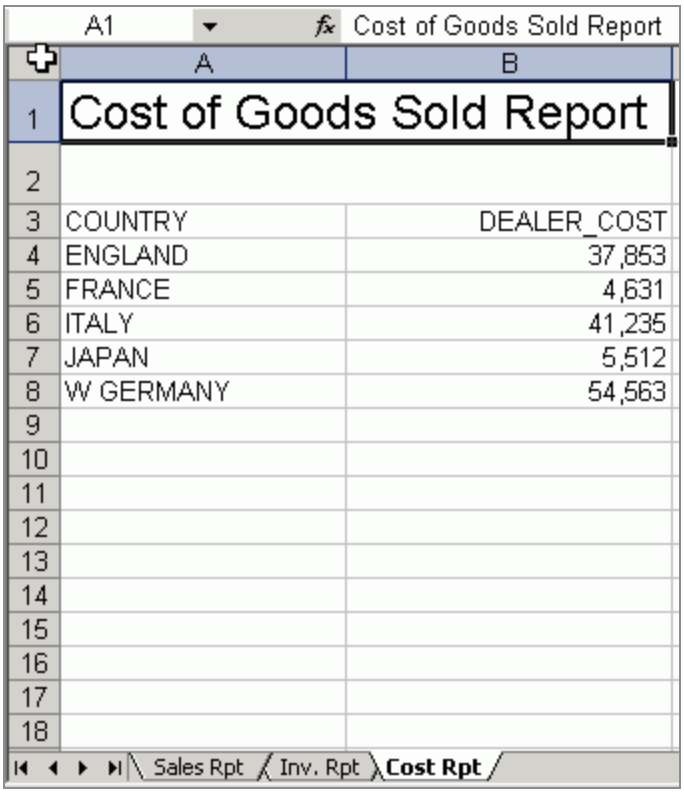




A1 fx Inventory Report

| | A | B | C |
|---|---|---|---|
| 1 | Inventory Report | | |
| 2 | | | |
| 3 | COUNTRY | RETAIL_COST | |
| 4 | ENGLAND | 45,319 | |
| 5 | FRANCE | 5,610 | |
| 6 | ITALY | 51,065 | |
| 7 | JAPAN | 6,478 | |
| 8 | W GERMANY | 64,732 | |
| 9 | | | |
| 10 | | | |
| 11 | | | |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |
| 16 | | | |
| 17 | | | |
| 18 | | | |

Sales Rpt | **Inv. Rpt** | Cost Rpt




# Creating a Compound Report With Pivot Tables and Formulas

```
SET PAGE-NUM=OFF
TABLE FILE CAR
HEADING
"Sales Report"
" "
PRINT RCOST
BY COUNTRY
ON TABLE SET STYLE *
type=report, titletext='Sales Rpt', $
type=heading, size=18, $
ENDSTYLE
ON TABLE PCHOLD AS PIV1 FORMAT EXL2K OPEN
END
```

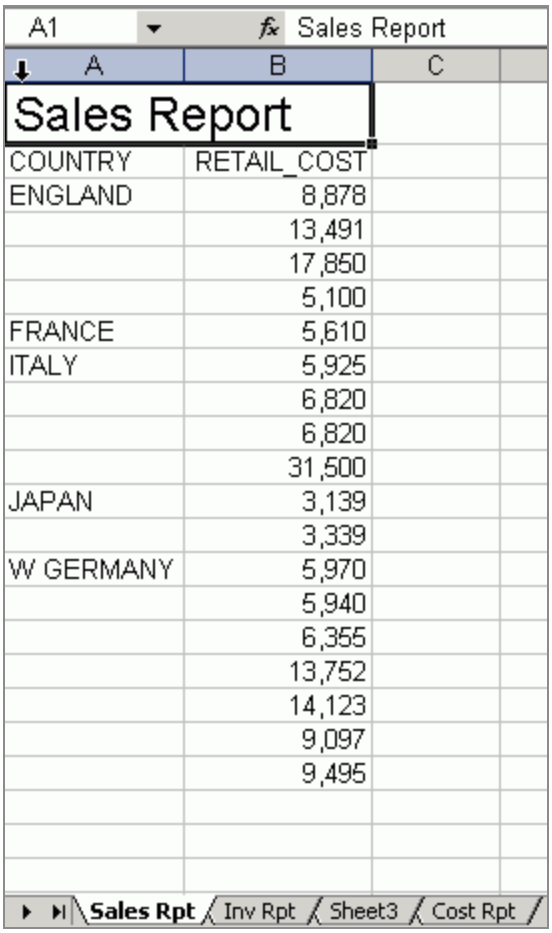
```
TABLE FILE CAR
HEADING
```

```
"Inventory Report"
" "
PRINT SALES
BY COUNTRY
ON TABLE SET STYLE *
type=report, titletext='Inv. Rpt', $
type=heading, size=18, $
ENDSTYLE
ON TABLE HOLD AS PPPP FORMAT EXL2K PIVOT
PAGEFIELDS TYPE SEATS
CACHEFIELDS MODEL MPG RPM
END
```

```
TABLE FILE CAR
SUM RCOST
BY COUNTRY BY CAR BY MODEL BY TYPE BY SEATS SUMMARIZE
ON MODEL SUB-TOTAL
ON TABLE HOLD AS XFOCB FORMAT EXL2K FORMULA
END
```

```
TABLE FILE CAR
HEADING
"Cost of Goods Sold Report"
" "
PRINT DCOST
BY COUNTRY
ON TABLE SET STYLE *
type=report, titletext='Cost Rpt', $
type=heading, size=18, $
ENDSTYLE
ON TABLE HOLD AS ONE FORMAT EXL2K CLOSE PIVOT
PAGEFIELDS RCOST
CACHEFIELDS MODEL TYPE SALES ACCEL SEATS
END
```

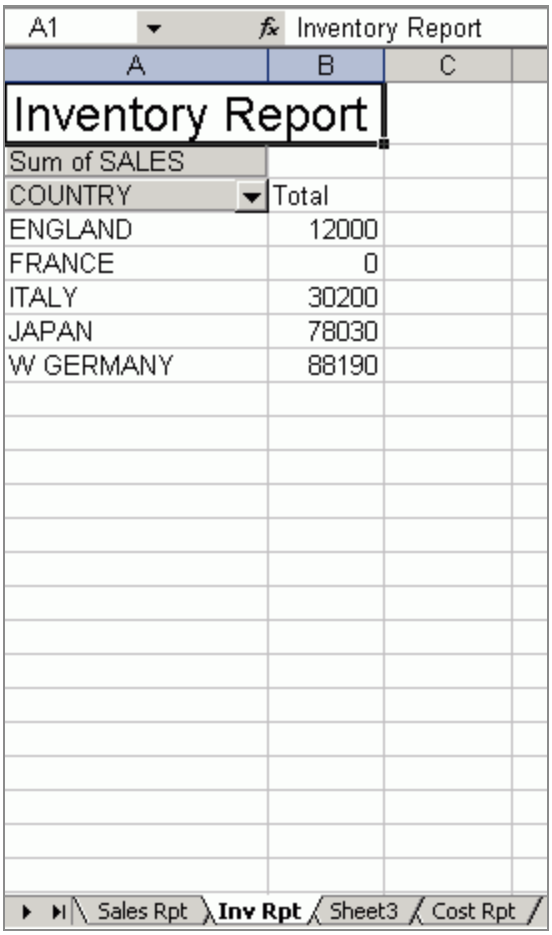
The output for each tab in the Excel worksheet is:



A1 Sales Report

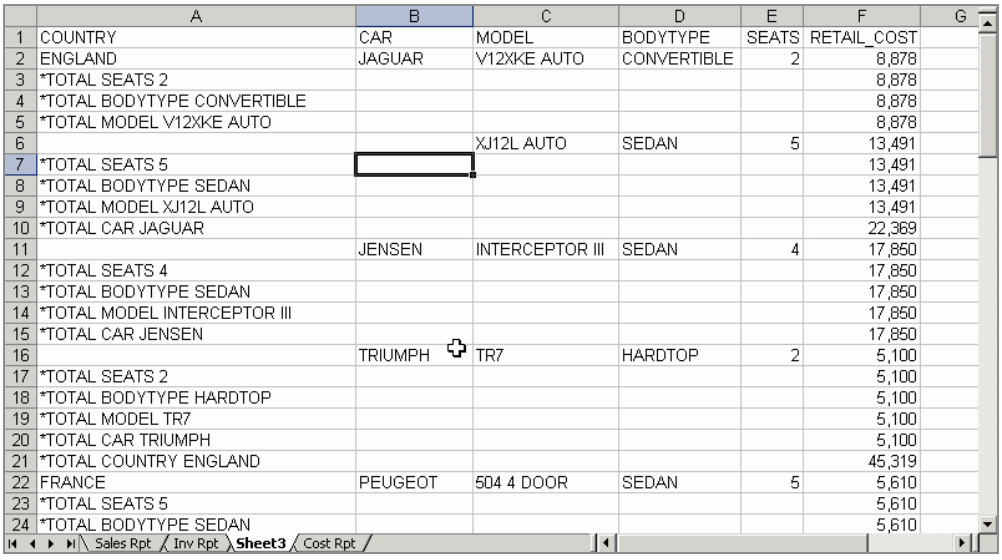
| A | B | C |
|---|---|---|
| Sales Report | | |
| COUNTRY | RETAIL_COST | |
| ENGLAND | 8,878 | |
| | 13,491 | |
| | 17,850 | |
| | 5,100 | |
| FRANCE | 5,610 | |
| ITALY | 5,925 | |
| | 6,820 | |
| | 6,820 | |
| | 31,500 | |
| JAPAN | 3,139 | |
| | 3,339 | |
| W GERMANY | 5,970 | |
| | 5,940 | |
| | 6,355 | |
| | 13,752 | |
| | 14,123 | |
| | 9,097 | |
| | 9,495 | |
| | | |
| | | |
| | | |

Sales Rpt | Inv Rpt | Sheet3 | Cost Rpt



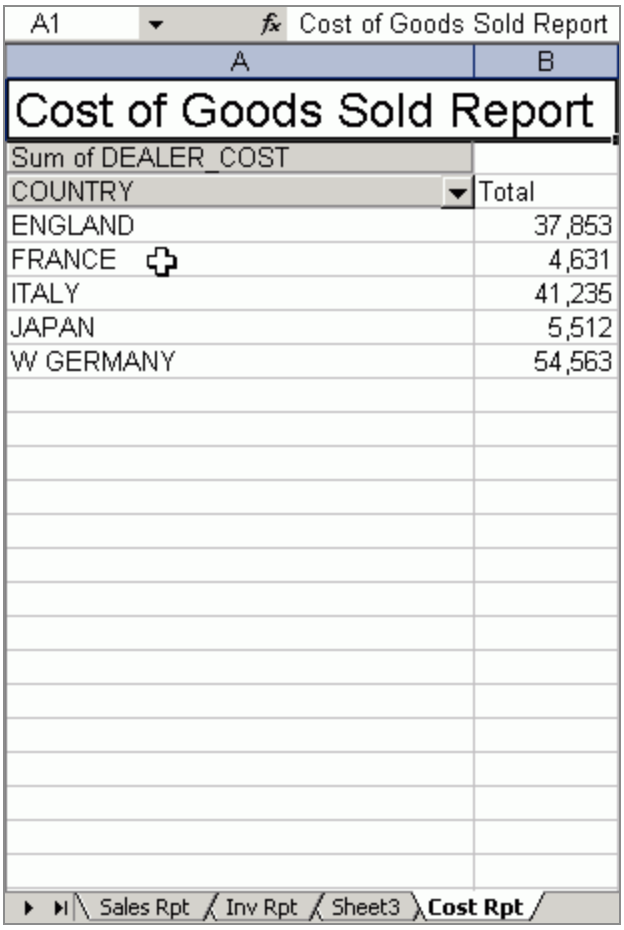
| | A | B | C |
|---|---|---|---|
| A1 | Inventory Report | | |
| 1 | Inventory Report | | |
| 2 | Sum of SALES | | |
| 3 | COUNTRY | Total | |
| 4 | ENGLAND | 12000 | |
| 5 | FRANCE | 0 | |
| 6 | ITALY | 30200 | |
| 7 | JAPAN | 78030 | |
| 8 | W GERMANY | 88190 | |

Sales Rpt | Inv Rpt | Sheet3 | Cost Rpt



| | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 1 | COUNTRY | CAR | MODEL | BODYTYPE | SEATS | RETAIL_COST | |
| 2 | ENGLAND | JAGUAR | V12XKE AUTO | CONVERTIBLE | 2 | 8,878 | |
| 3 | *TOTAL SEATS 2 | | | | | 8,878 | |
| 4 | *TOTAL BODYTYPE CONVERTIBLE | | | | | 8,878 | |
| 5 | *TOTAL MODEL V12XKE AUTO | | | | | 8,878 | |
| 6 | | | XJ12L AUTO | SEDAN | 5 | 13,491 | |
| 7 | *TOTAL SEATS 5 | | | | | 13,491 | |
| 8 | *TOTAL BODYTYPE SEDAN | | | | | 13,491 | |
| 9 | *TOTAL MODEL XJ12L AUTO | | | | | 13,491 | |
| 10 | *TOTAL CAR JAGUAR | | | | | 22,369 | |
| 11 | | JENSEN | INTERCEPTOR III | SEDAN | 4 | 17,850 | |
| 12 | *TOTAL SEATS 4 | | | | | 17,850 | |
| 13 | *TOTAL BODYTYPE SEDAN | | | | | 17,850 | |
| 14 | *TOTAL MODEL INTERCEPTOR III | | | | | 17,850 | |
| 15 | *TOTAL CAR JENSEN | | | | | 17,850 | |
| 16 | | TRIUMPH | TR7 | HARDTOP | 2 | 5,100 | |
| 17 | *TOTAL SEATS 2 | | | | | 5,100 | |
| 18 | *TOTAL BODYTYPE HARDTOP | | | | | 5,100 | |
| 19 | *TOTAL MODEL TR7 | | | | | 5,100 | |
| 20 | *TOTAL CAR TRIUMPH | | | | | 5,100 | |
| 21 | *TOTAL COUNTRY ENGLAND | | | | | 45,319 | |
| 22 | FRANCE | PEUGEOT | 504 4 DOOR | SEDAN | 5 | 5,610 | |
| 23 | *TOTAL SEATS 5 | | | | | 5,610 | |
| 24 | *TOTAL BODYTYPE SEDAN | | | | | 5,610 | |

Sales Rpt | Inv Rpt | Sheet3 | Cost Rpt




# Creating a Compound Report Using NOBREAK

In this example, the first two reports are on the first worksheet, and the last two reports are on the second worksheet, since NOBREAK appears on both the first and third reports.

```
TABLE FILE GGSALES
HEADING
"Report 1: Coffee - Budget"
SUM BUDDOLLARS BUDUNITS COLUMN-TOTAL AS 'Total'
BY REGION
IF CATEGORY EQ Coffee
ON TABLE PCHOLD FORMAT EXL2K OPEN NOBREAK
ON TABLE SET STYLE *
type=report, font=Arial, size = 10, style=normal, $
type=title, style=bold, $
type=heading,   size=12, style=bold, color=blue, $
type=grandtotal,  style=bold,  $
```

```
ENDSTYLE
END
```

```
TABLE FILE GGSALES
HEADING
" "
"Report 2: Coffee - Actual "
SUM DOLLARS UNITS COLUMN-TOTAL AS 'Total'
BY REGION
IF CATEGORY EQ Coffee
ON TABLE PCHOLD FORMAT EXL2K
ON TABLE SET STYLE *
type=report, font=Arial, size=10, style=normal, $
type=grandtotal,  style=bold, $
type=heading,  size=12, style=bold, color=blue, $
ENDSTYLE
END
```

```
TABLE FILE GGSALES
HEADING
"Report 3: Food - Budget"
SUM BUDDOLLARS BUDUNITS COLUMN-TOTAL AS 'Total'
BY REGION
IF CATEGORY EQ Food
ON TABLE PCHOLD FORMAT EXL2K NOBREAK
ON TABLE SET STYLE *
type=REPORT, font=Arial, size=10, style=normal, $
type=HEADING,  style=bold, size=12, color=blue, $
type=title, style=bold, $
type=grandtotal,  style=bold,  $
ENDSTYLE
END
```

```
TABLE FILE GGSALES
HEADING
" "
"Report 4: Food - Actual"
SUM DOLLARS UNITS COLUMN-TOTAL AS 'Total'
BY REGION
IF CATEGORY EQ Food
ON TABLE PCHOLD FORMAT EXL2K CLOSE
ON TABLE SET STYLE *
type=report, font=Arial, size=10,  $
```

```
type=title, style=bold, $
type=heading,size=12, style=bold,  color=blue,$
type=grandtotal, style=bold,  $
ENDSTYLE
END
```

The output is:

| | A | B | C |
|---|---|---|---|
| 1 | **Report 1: Coffee - Budget** | | |
| 2 | **Region** | **Budget Dollars** | **Budget Units** |
| 3 | Midwest | 4086032 | 335526 |
| 4 | Northeast | 4252462 | 335920 |
| 5 | Southeast | 4431429 | 355693 |
| 6 | West | 4523963 | 358784 |
| 7 | **Total** | **17293886** | **1385923** |
| 8 | | | |
| 9 | **Report 2: Coffee - Actual** | | |
| 10 | Region | Dollar Sales | Unit Sales |
| 11 | Midwest | 4178513 | 332777 |
| 12 | Northeast | 4164017 | 335778 |
| 13 | Southeast | 4415408 | 350948 |
| 14 | West | 4473517 | 356763 |
| 15 | **Total** | **17231455** | **1376266** |

| | A | B | C |
|---|---|---|---|
| 1 | **Report 3: Food - Budget** | | |
| 2 | **Region** | **Budget Dollars** | **Budget Units** |
| 3 | Midwest | 4220721 | 339263 |
| 4 | Northeast | 4453907 | 351431 |
| 5 | Southeast | 4409288 | 351509 |
| 6 | West | 4183244 | 335361 |
| 7 | **Total** | **17267160** | **1377564** |
| 8 | | | |
| 9 | **Report 4: Food - Actual** | | |
| 10 | **Region** | **Dollar Sales** | **Unit Sales** |
| 11 | Midwest | 4338271 | 341414 |
| 12 | Northeast | 4379994 | 353368 |
| 13 | Southeast | 4308731 | 349829 |
| 14 | West | 4202337 | 340234 |
| 15 | **Total** | **17229333** | **1384845** |

# Creating a PDF Compound Report With Drill Through Links

A common technique in business reporting is to create two related reports:

- **Summary Report.** Contains condensed information for a category such as a business account, with summed data such as total balances and total sales.
- **Detail Report.** For specified fields in the associated summary report, a detail report contains all the component values that contributed to each summary field value.

Drill Through provides a way to easily relate the data in these two types of reports. For example, a user scanning a summary report account may see an unusual figure in one of the accounts, requiring examination of the specific data behind that figure.

There are two forms of Compound Drill Through reports:

- **Legacy Drill Through Compound Reports.** These reports use the legacy compound report syntax (PCHOLD with the OPEN and CLOSE options) to create the compound report.
- **Drill Through Compound Layout Reports.** These reports use document syntax declarations to create the compound procedure and define which reports will be related through hyperlinks.

In both types of Compound Drill Through reports, the syntax for creating hyperlinks between reports within the PDF file are exactly the same.

# Drill Through and Drill Down Compared

Using Drill Down, you can construct a summary report in which clicking a hyperlink displays detail data. A Drill Down is implemented dynamically. Clicking a hyperlink causes a new report to run. The detail report typically displays only the detail data for a selected field on the summary report.

In contrast, Drill Through reports are static. Drill Through creates a PDF document that contains the summary report plus the detail report, with the detail report containing all the detail data for designated fields in the summary report. Clicking a Drill Through hyperlink navigates internally in the PDF file. No additional reports are run. You can save the PDF file

to disk or distribute it using ReportCaster. When opened with Adobe Reader, it retains its full Drill Through functionality.

Drill Through provides flexibility in the appearance of reports and location of hyperlinks:

- Drill Through hyperlinks may appear in headings and subheadings, as well as, in rows of data.
- You can format the reports using a WebFOCUS StyleSheet.
- You can indicate a hyperlink by color, font, underlining, and so forth.
- You can mix conventional Drill Down hyperlinks freely in the same report with Drill Through hyperlinks.
- The PDF file created with Drill Through can consist of more than two reports.

# Use With Other Features

You can use Drill Through with other WebFOCUS features:

- Compound reports that contain linked Drill Through reports may also contain unrelated reports, before or after the Drill Through reports. For example, you can add to the compound report package a PDF report that contains embedded graphs.
- You can add Drill Down and URL hyperlinks to a PDF report that contains Drill Through hyperlinks.
- Since Drill Through reports are standard PDF compound reports packaged into a single PDF file, you can distribute them using ReportCaster.
- Reports with DRILLTHROUGH syntax can be rendered in all other styled output formats: HTML, PostScript, EXL2K, and so on. In these other formats, the DRILLTHROUGH syntax is ignored. It is useful, for example, to generate a PostScript version of a Drill Through report, which is formatted identically to the PDF version, but which you can send directly to a PostScript printer using ReportCaster or operating system commands.
- Drill Through automates the process of navigating quickly and easily from general to specific information in related reports packaged in a single PDF compound report. Drill Through syntax sets up hyperlinks that take you from an item in a summary report to a corresponding item in a detail report.

# Create a Drill Through in a PDF Compound Layout Report

To create a Drill Through in a PDF Compound Layout report:

**Procedure**

1. Create the summary report with a DRILLTHROUGH hyperlink.
2. Create the detail report with sort values that match the hyperlink field values.
3. Create the Compound Layout report with page layouts for each component report, and define a DRILLMAP attribute within the calling report to specify the targets of the drill through hyperlinks.

# Create a Drill Through in a PDF Compound Report

To create a Drill Through in a PDF Compound Report:

**Procedure**

1. Create the summary report.
2. Create the detail report.
3. Connect the reports with hyperlinks.
4. Merge the summary and detail reports into a PDF compound report.

# Specify Drill Through Hyperlinks

```
TYPE=type, [element,] [styling_attributes,]
     DRILLTHROUGH={DOWN|FIRST}(link_fields) , $
```

where:

**type**

Is one of the following StyleSheet types:

- DATA
- HEADING
- FOOTING
- SUBHEAD
- SUBFOOT
- SUBTOTAL
- RECAP

**element**

Is one or more identifying elements allowed in a WebFOCUS StyleSheet and Drill Through report. An element can describe a specific column (for example, COLUMN=PRODUCT) or heading item (for example, LINE=2, OBJECT=field, ITEM=3).

**styling_attributes**

Optionally specify the appearance of the hyperlink (for example, COLOR=RED, STYLE=BOLD).

**DOWN**

Links to the next (the following) report.

**FIRST**

Links to the first Drill Through report in the sequence.

**link_fields**

Specifies blank-delimited link field pairs with the following format:

**T1=S1 T2=S2 T3=S3...**

T1, T2, and T3 represent column references in the target (linked) report, and S1, S2, and S3 represent column references in the source (current) report. There may be more than three pairs.

A column reference can be the name of a field or any of the other symbols valid in WebFOCUS StyleSheets syntax (for example, Bn, Cn, Pn, Nn, An, subscripted field name, and so on).

The order of the syntax is similar to Drill Down syntax, in which the parameter pairs specify the column reference in the current (source) report on the right and the name of the Dialogue Manager variable in the Drill Down (target) procedure on the left.

If the column reference in the target report is identical to the column reference in the source report, you can use a single column reference, for example, COUNTRY instead of COUNTRY=COUNTRY.

## Specifying Drill Through Hyperlinks

The following StyleSheet declaration places a hyperlink on the PRODUCT field on each DATA line, specifies that the fields to link to the next report are CATEGORY and PRODUCT, specifies the action DOWN, so that clicking a hyperlink brings you to the location in the next report that has the corresponding values of the two link fields, and uses the default appearance for the hyperlinks, which is blue, underlined text. Since the target fields in the detail report have identical names in the summary report, you can use the notation CATEGORY rather than CATEGORY=CATEGORY.

```
TYPE=DATA, COLUMN=PRODUCT, DRILLTHROUGH=DOWN(CATEGORY PRODUCT), $
```

# Specify Which Compound Layout Reports Will be Related Through Hyperlinks

The target report is specified in the DRILLMAP attribute of the COMPONENT declaration for the calling report.

```
DRILLMAP=((L1 targetreport))
```

where:

**L1**

Is the link identifier.

**targetreport**

Is the component name of hyperlink destination.

**Note:** The double parentheses around the DRILLMAP values are required.

# Sample Component Declarations With DRILLMAP Attributes

The following COMPONENT declaration for REPORT1 specifies a DRILLMAP attribute that points to REPORT2:

```
COMPONENT='REPORT1', TEXT='REPORT1', TOC-LEVEL=2,
DRILLMAP=((L1 REPORT2)), POSITION=(0.750 1.083), DIMENSION=(7.000
3.167),
METADATA='Z-INDEX: 100; LEFT: 0.75in; OVERFLOW: auto; WIDTH: 7in;
POSITION: absolute; TOP: 1.083in; HEIGHT: 3.167in', $
```

The following COMPONENT declaration for REPORT2 specifies a DRILLMAP attribute that points to REPORT1:

```
COMPONENT='REPORT2', TEXT='REPORT2', TOC-LEVEL=2,
DRILLMAP=((L1 REPORT1)), POSITION=(0.500 0.667), DIMENSION=(7.417
7.000),
METADATA='Z-INDEX: 100; LEFT: 0.5in; OVERFLOW: auto; WIDTH: 7.417in;
POSITION: absolute; TOP: 0.667in; HEIGHT: 7in', $
```

# Usage Notes for Drill Through

- As of Release 8.2 Version 01, individual component reports containing Drill Through designations can be run standalone. You will see a warning message in the Message Viewer indicating that outside of the compound report, the Drill Through will not be active.

- Only one Drill Through behavior can be specified per report.
- The field specified to contain a Drill Through behavior must also be present in the target report.
- The originating report containing the Drill Through link must be rendered (by the Reporting Server) prior to the target report. The order of reports must be handled by the user.
- Live Drill Through links are only generated for PDF output. Reports with DRILLTHROUGH syntax can be rendered in all other styled output formats: HTML, PostScript, EXL2K, and so on. In these other formats, the DRILLTHROUGH syntax is ignored. It is useful, for example, to generate a PostScript version of a Drill Through report, which is formatted identically to the PDF version, but which you can send directly to a PostScript printer using ReportCaster or operating system commands.
- Drill Through is only supported for reports (TABLE).

# Sample Drill Through PDF Compound Reports

The following examples illustrate how to use Drill Through syntax to create a compound report with a summary and detail report and navigate between them.

## Creating the Summary Report (Step 1)

The following syntax generates a sample summary report:

```
TABLE FILE GGSALES
SUM UNITS DOLLARS BY CATEGORY BY PRODUCT
ON TABLE PCHOLD FORMAT PDF
END
```

The output is:

```
PAGE     1

Category     Product           Unit Sales  Dollar Sales
--------     -------           ----------  ------------
Coffee       Capuccino             189217       2381590
             Espresso              308986       3906243
             Latte                 878063      10943622
Food         Biscotti              421377       5263317
             Croissant             630054       7749902
             Scone                 333414       4216114
Gifts        Coffee Grinder        186534       2337567
             Coffee Pot            190695       2449585
             Mug                   360570       4522521
             Thermos               190081       2385829
```

# Creating the Detail Report (Step 2)

The following syntax generates a sample detail report:

The first page of the output is:

```
SET SQUEEZE=ON
TABLE FILE GGSALES
SUM UNITS BUDUNITS DOLLARS
BY CATEGORY NOPRINT BY PRODUCT NOPRINT
ON CATEGORY PAGE-BREAK
HEADING CENTER
"Category: <CATEGORY"
" "
ON PRODUCT SUBHEAD
"**** Product: <PRODUCT"
ON PRODUCT SUBFOOT
" "
"<25 **** Return to Summary ****"
ON PRODUCT PAGE-BREAK
BY REGION BY CITY
ON TABLE PCHOLD FORMAT PDF
END
```

```
PAGE     1

                        Category: Coffee

Region     City           Unit Sales  Budget Units  Dollar Sales

**** Product: Capuccino
Northeast  Boston              15358         15672        174344
           New Haven           12386         11098        158995
           New York            17041         17662        208756
Southeast  Atlanta             27522         29171        352161
           Memphis             21599         23090        274812
           Orlando             24143         23092        317027
West       Los Angeles         23222         22909        306468
           San Francisco       23311         23555        279830
           Seattle             24635         24121        309197

                        **** Return to Summary ****
```

# Connecting the Reports With Hyperlinks (Step 3)

The example illustrates the following:

- When you place a Drill Through hyperlink on a sort-break element, ensure the sort-break is at least at the level of the last sort field participating in the Drill Through. For example, in the second report, the Drill Through hyperlink is on the subfooting associated with PRODUCT rather than the heading (with a sort break) associated with CATEGORY.

  Although the code can infer a value of PRODUCT for the CATEGORY heading (you can verify this by embedding the field <PRODUCT> in the heading), it is always the value of the first PRODUCT within that CATEGORY. Typically you want a Drill Through hyperlink for each value of PRODUCT within each CATEGORY.

  You do not need to place the hyperlink on an embedded item. You can just as effectively place it on a text item. Any item in the subfooting is associated with the same values of CATEGORY and PRODUCT. Similarly, you can place a hyperlink on any field in a DATA line, and the values of the associated link fields will be identical. Conventional Drill Down hyperlinks also work this way.

The summary report:

- Places a hyperlink on the PRODUCT field on each DATA line.
- Specifies that the fields to link to the next report are CATEGORY and PRODUCT. Since the target fields in the detail report have identical names in the summary report, you can use the notation CATEGORY rather than CATEGORY=CATEGORY.

- Specifies the action DOWN, so that clicking a hyperlink brings you to the location in the next report that has the corresponding values of the two link fields.
- Uses the default appearance for the hyperlinks, which is blue, underlined text.

The summary report is:

```
TABLE FILE GGSALES
SUM UNITS DOLLARS BY CATEGORY BY PRODUCT
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=DATA, COLUMN=PRODUCT, DRILLTHROUGH=DOWN(CATEGORY PRODUCT), $
ENDSTYLE
END
```

The detail report:

- Places a hyperlink in the subfooting associated with the link field PRODUCT. Since CATEGORY is a higher level BY field than PRODUCT, each PRODUCT subheading is also associated with a unique value of CATEGORY.
- Places a hyperlink on the first item of the second line of the subfooting, which is the text **Return to Summary**.
- Specifies action FIRST, so that clicking the hyperlink jumps to the line in the first (summary) report that contains the same values of the two link fields CATEGORY and PRODUCT.
- Uses the COLOR attribute to display the hyperlink as red, underlined text.

The detail report is:

```
SET SQUEEZE=ON
TABLE FILE GGSALES
SUM UNITS BUDUNITS DOLLARS
BY CATEGORY NOPRINT BY PRODUCT NOPRINT
ON CATEGORY PAGE-BREAK
HEADING CENTER
"Category: <CATEGORY"
" "
ON PRODUCT SUBHEAD
"**** Product: <PRODUCT"
ON PRODUCT SUBFOOT
" "
"<25 **** Return to Summary ****"
ON PRODUCT PAGE-BREAK
```

```
BY REGION BY CITY
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=SUBFOOT, LINE=2, ITEM=1, DRILLTHROUGH=FIRST(CATEGORY PRODUCT),
COLOR=RED, $
ENDSTYLE
END
```

The next step is the only step that is different for creating a Compound Layout report or a legacy Compound Report.

# Creating the Compound Layout Report (Step 4)

Perform this version of Step 4 if you are creating a Compound Layout report.

To create the Compound Layout report:

- Add a COMPOUND LAYOUT and SECTION declaration to the top of the procedure.
- Add PAGELAYOUT and COMPONENT declarations for the two reports. Add DRILLMAP attributes to the COMPONENT declarations.
- Add SET COMPONENT commands and the two reports.
- End the procedure with a COMPOUND END command:

```
SET HTMLARCHIVE=ON
COMPOUND LAYOUT PCHOLD FORMAT PDF
UNITS=IN, $
SECTION=section1, LAYOUT=ON, METADATA='0.5^0.5^0.5^0.5', MERGE=OFF,
   ORIENTATION=PORTRAIT, PAGESIZE=Letter,  $
PAGELAYOUT=1, NAME='Page layout 1', text='Page layout 1', TOC-LEVEL=1,
   BOTTOMMARGIN=0.5, TOPMARGIN=0.5, METADATA='BOTTOMMARGIN=0.5,
   TOPMARGIN=0.5,LEFTMARGIN=0,RIGHTMARGIN=0, $
COMPONENT='REPORT1', TEXT='REPORT1', TOC-LEVEL=2,
DRILLMAP=((L1 REPORT2)), POSITION=(0.750 1.083), DIMENSION=(7.000
3.167),
   METADATA='Z-INDEX: 100; LEFT: 0.75in; OVERFLOW: auto; WIDTH: 7in;
   POSITION: absolute; TOP: 1.083in; HEIGHT: 3.167in', $
PAGELAYOUT=2, NAME='Page layout 2', text='Page layout 2', TOC-LEVEL=1,
   BOTTOMMARGIN=0.5, TOPMARGIN=0.5, METADATA='BOTTOMMARGIN=0.5,
   TOPMARGIN=0.5,LEFTMARGIN=0,RIGHTMARGIN=0, $
COMPONENT='REPORT2', TEXT='REPORT2', TOC-LEVEL=2,
DRILLMAP=((L1 REPORT1)), POSITION=(0.500 0.667), DIMENSION=(7.417
```

```
7.000),
   METADATA='Z-INDEX: 100; LEFT: 0.5in; OVERFLOW: auto; WIDTH: 7.417in;
   POSITION: absolute; TOP: 0.667in; HEIGHT: 7in', $
END
```

```
-* Add Report1 code and SET COMPONENT command
SET COMPONENT='REPORT1'
TABLE FILE GGSALES
SUM UNITS DOLLARS BY CATEGORY BY PRODUCT
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=DATA, COLUMN=PRODUCT, DRILLTHROUGH=DOWN(CATEGORY PRODUCT), $
ENDSTYLE
END
```

```
-* Add report2 code and SET COMPONENT command
SET COMPONENT='REPORT2'
SET SQUEEZE=ON
TABLE FILE GGSALES
SUM UNITS BUDUNITS DOLLARS
BY CATEGORY NOPRINT BY PRODUCT NOPRINT
ON CATEGORY PAGE-BREAK
HEADING CENTER
"Category: <CATEGORY"
" "
ON PRODUCT SUBHEAD
"**** Product: <PRODUCT"
ON PRODUCT SUBFOOT
" "
"<25 **** Return to Summary ****"
ON PRODUCT PAGE-BREAK
BY REGION BY CITY
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=SUBFOOT, LINE=2, ITEM=1, DRILLTHROUGH=FIRST(CATEGORY PRODUCT),
COLOR=RED, $
ENDSTYLE
END
COMPOUND END
```

# Merging Summary and Detail Reports Into a PDF Compound Report (Step 4)

Perform this version of Step 4 if you are creating a legacy compound report.

The next step is to combine the reports into a single PDF Compound Report. You can:

- Code the OPEN and CLOSE options on the [PC]HOLD FORMAT PDF command.
- Code the OPEN and CLOSE options on the SET COMPOUND command before the component report syntax.

Drill Through does not support the NOBREAK option, which displays compound reports without intervening page breaks.

This example uses the OPEN and CLOSE options on the PCHOLD FORMAT PDF command:

```
TABLE FILE GGSALES
SUM UNITS DOLLARS BY CATEGORY BY PRODUCT
ON TABLE PCHOLD FORMAT PDF OPEN
ON TABLE SET STYLE *
TYPE=DATA, COLUMN=PRODUCT, DRILLTHROUGH=DOWN(CATEGORY PRODUCT), $
ENDSTYLE
END
```

```
SET SQUEEZE=ON
TABLE FILE GGSALES
SUM UNITS BUDUNITS DOLLARS
BY CATEGORY NOPRINT BY PRODUCT NOPRINT
ON CATEGORY PAGE-BREAK
HEADING CENTER
"Category: <CATEGORY"
" "
ON PRODUCT SUBHEAD
"**** Product: <PRODUCT"
ON PRODUCT SUBFOOT
" "
"<25 **** Return to Summary ****"
ON PRODUCT PAGE-BREAK
BY REGION BY CITY
ON TABLE PCHOLD FORMAT PDF CLOSE
ON TABLE SET STYLE *
```

```
TYPE=SUBFOOT, LINE=2, ITEM=1, DRILLTHROUGH=FIRST(CATEGORY PRODUCT),
COLOR=RED, $
ENDSTYLE
END
```

# Run the Drill Through Report (Step 5)

Run the compound report. The first page of output has the summary report with the hyperlinks to the individual products in blue and underlined:

```
PAGE     1

Category      Product          Unit Sales  Dollar Sales

Coffee        Capuccino            189217       2381590
              Espresso             308986       3906243
              Latte                878063      10943622
Food          Biscotti             421377       5263317
              Croissant            630054       7749902
              Scone                333414       4216114
Gifts         Coffee Grinder       186534       2337567
              Coffee Pot           190695       2449585
              Mug                  360570       4522521
              Thermos              190081       2385829
```

Click the hyperlink **Croissant** for the category **Food**. You jump to that detail information. In the detail report, the hyperlink back to the summary report is in red and underlined:

```
PAGE     6

                          Category: Food

Region     City          Unit Sales  Budget Units  Dollar Sales

**** Product: Croissant
Midwest    Chicago            43300         43271        549366
           Houston            46941         47050        587887
           St. Louis          48941         49327        613871
Northeast  Boston             41029         41351        497234
           New Haven          45847         46335        551489
           New York           50518         50178        622095
Southeast  Atlanta            53782         54126        661806
           Memphis            52499         51585        638477
           Orlando            50175         51437        602076
West       Los Angeles        66049         64432        800084
           San Francisco      65214         66025        824457
           Seattle            65759         64872        801060

                        **** Return to Summary ****
```

Click the hyperlink **Return to Summary** to return to the first page (summary report).

# Guidelines on Links For FIRST

The following guidelines apply:

- The set of link fields used with FIRST must correspond to the set of link fields used with DOWN on the first report.
- The action of a FIRST hyperlink in the last report should return to the corresponding line in the first report. The chosen set of links must uniquely identify that line of the first report.
- The DOWN hyperlink on the line of the first report must uniquely identify that line of the first report to locate the matching line of the detail report. The set of links for the DOWN in the first report and the FIRST link in the last report are the same, since they both must uniquely identify a line in the first report.

# Rules For Drill Through Hyperlinks

Reports linked with Drill Through must follow certain rules to ensure that the hyperlinks between them work correctly. The following are key concepts:

- **Source report.** The report from which you are linking. The source report contains hyperlinks to the target report.
- **Target report.** The report to which you are linking.
- **Link field.** One of a set of corresponding fields of the same data type that exist in both the source and target reports. Link fields locate the position in the target report to which a hyperlink in the source report jumps.

Source and target terminology refer to each pair of linked reports. For example, if there are three reports linked with Drill Through, the second report is generally the target report of the first report, and also the source report of the third report.

To process a report as a Drill Through, you must identify the link fields in the source report that relate to the target report:

- Choose meaningful link fields whose values match in the source and target reports.

For example, if a field in the source report contains a part number and a field in the target report contains a Social Security number, the field values will not match and you cannot construct hyperlinks.

- Specify as many link fields as necessary to uniquely locate the position in the target report that corresponds to the link fields in the source report. For example, if the source report is sorted by STATE and CITY, specifying CITY alone as the link field will be problematic if different states contain a city with the same name.
- The link fields in the source and target reports must have the same internal (actual) format: the stopped data type and internal length must be identical. Formatting options, such as number of displayed digits and comma suppression, may differ. For example, an A20 field must link to another A20 field. However, an I6C field may link to an I8 field, since internally both are four-byte fields.
- The link fields must be sort fields or verb objects in both the source and target reports. You can include a NOPRINT (non-display) field, which is useful when constructing a report in which a field is in embedded in heading text.
- Designing Drill Through reports is very similar to designing Drill Down reports. Choosing the link fields for a Drill Through report is similar to choosing the parameter fields in a Drill Down report. Likewise, the syntax of a Drill Through closely parallels the syntax of a Drill Down.
- Since Drill Through reports are linked by corresponding values of link fields, the hyperlinks must appear on report elements associated with a particular value of a link field. However, hyperlinks do not have to appear on any link itself.
- Not all line types are appropriate for placement of a Drill Through hyperlink. For example, if a page break occurs on a BY field that is also a Drill Through link, each page heading is clearly associated with a value in that field. However, if a page break occurs because of page overflow, avoid placing a Drill Through link in a heading. Similarly, subheadings, subfootings, subtotals, and recaps are associated only with the values of particular BY fields.

# Navigating Within an HTML Report

You can include the following navigation features within a report to control the report display:

- **Dynamic TOC.** You can add a multi-level table of contents to a report to enhance the viewing and navigation of data. The TOC can appear as an expandable list of clickable values or as a series of drop-down form controls. By clicking values in the TOC, you can toggle between views of the data and quickly locate specific values in the report.  Viewer" />
- **WebFOCUS Viewer.** You can divide an HTML report into multiple webpages to speed the delivery of information to your browser. This feature, also known as on-demand paging, is implemented in the WebFOCUS Viewer, where you can navigate to subsequent, previous, or specific pages after your first page of output is displayed.
- **Hyperlinks between pages.** You can define automatic hyperlinks in a report that contains multiple pages, making it easy to link consecutive report pages together and navigate to the next or previous page.

For related information, see Navigating Between Reports.

# Navigating Sort Groups From a Table of Contents

You can enhance navigation within a large HTML report by adding a dynamic HTML-based Table of Contents (TOC). To take advantage of this feature, the report must contain at least one vertical sort (BY) field. If you include more than one sort field in a report, the hierarchy is determined by the order in which the sort fields are specified in the request. StyleSheets" /> StyleSheets" />

The TOC also enhances the display of groups of data. You can view one section (or page) of the report at a time, or you can view all sections at once. You can control this with a page break. For more information, see Grouping Sort Fields for Display.

The TOC displays all values of the first (highest-level) vertical sort field, as well as the values of any lower level BY fields that you designate for inclusion. These values are displayed as an expandable series of links or as a series of list controls. Unless otherwise specified in the request, a new page begins when the highest-level sort field changes.

The display of data for a lower level sort field is controlled by your selection of a higher-level sort field value. For example, in a report sorted first by country and then by car model, if you choose Italy from the TOC for country, you will only see a listing of Italian models in the TOC for cars. Cars produced in other countries are not displayed.

Using the TOC, you can:

- View any section of a report by clicking the associated link.
- Toggle between a single section and the entire report content by clicking **View Entire Report**.
- Remove the TOC by clicking **Remove Table of Contents**. This is beneficial when printing the report from the browser. Double-click anywhere in the report to restore it and continue navigation.

The TOC itself is an object that initially appears as an icon in the upper-left corner of the report or as one or more drop-down lists in a page heading or footing or a report heading or footing.

- **Heading Option.** To add the TOC to a heading or footing, you can use a StyleSheet. See Add TOC Drop-down List Controls to a Heading.
- **Report Option.** To add an HTML TOC object to the upper-left hand corner of a report, you can use a SET command or a PCHOLD command. See Add a TOC Tree Control to a Report Using a SET Command.

The sizing of tables within the HTML report is done by the browser. The columns are sized to fit the largest data value, and trailing spaces are automatically removed. In standard HTML reports, the data is presented in a single table, so the column widths are fixed for all data rows. Both HTML BYTOC (Report)/TOC (Heading) features place the data for each sort key value into individual tables or sections that are accessed using the HTML control. In the HTML BYTOC/TOC reports, the column widths in each individual table are determined by the data presented for each value, rather than the overall report. These different table sizes become apparent when the **View Entire Report** option is selected. Set SQUEEZE = OFF to define fixed column widths across all of the tables.

# Usage Notes for HTMLARCHIVE With HTML Table of Contents

WebFOCUS interactive reporting features must have a connection to the WebFOCUS client in order to access the components required to operate successfully.

HTMLARCHVE can be used to create self-contained HTML pages with user-defined images when client access is not available.

To generate HTML pages containing user-defined images that can operate interactively, use one of the following commands:

```
SET HTMLEMBEDIMG=ON
SET HTMLARCHIVE=ON
```

Define BASEURL to point directly to the host machine where these files can be accessed using the following syntax:

```
SET BASEURL=http://{hostname:portnumber}
```

For more information on SET BASEURL, see Specifying a Base URL.

# Adding the HTML Table of Contents Tree Control to Reports

You can use three different types of syntax to add an HTML TOC object to a report. StyleSheets" /> StyleSheets" />

# Add a TOC Tree Control to a Report Using a SET Command.

Using a SET command, the syntax is

At the beginning of a request:

```
SET COMPOUND = 'BYTOC [n]'
```

In a request, use the syntax:

```
ON TABLE SET COMPOUND 'BYTOC [n]'
```

where:

**n**

Represents the number of vertical sort (BY) fields to include in the TOC, beginning with the first (highest-level) sort field in the request. The hierarchy of sort fields is determined by the order in which they are specified in the request.

The default value is 1, meaning that only the highest-level sort field and its values are displayed in the TOC.

By default, a section break is placed after the first (highest-level) sort field, unless otherwise specified in the request.

**Note:** Single quotation marks (') should be used when BYTOC is specified with a number in a SET command.

# Add a TOC Tree Control to a Report by Using the PCHOLD Command

Using a PCHOLD command, the syntax is  StyleSheets" /> StyleSheets" />

```
ON TABLE PCHOLD FORMAT HTML BYTOC [n]
```

where:

**n**

Represents the number of vertical sort (BY) fields to include in the TOC, beginning with the first (highest-level) sort field in the request. The hierarchy of sort fields is determined by the order in which they are specified in the request.

The default value is 1, meaning that only the highest-level sort field and its values are displayed in the TOC.

By default, a section break is placed after the first (highest-level) sort field, unless otherwise specified in the request.

**Note:** Single quotation marks (') should not be used when BYTOC is specified in a PCHOLD command with a number.

# Add a TOC Tree Control to a Report Using a StyleSheet Declaration

The following syntax enables the TOC tree control in the StyleSheet:

```
TYPE=REPORT, TOC='n',$
```

or

```
TYPE=REPORT, TOC='sortfieldname',$
```

where:

**n**

Represents the number of vertical sort (BY) fields to include in the TOC, beginning with the first (highest-level) sort field in the request. The hierarchy of sort fields in the TOC Tree is determined by the order in which they are listed in the request.

**sortfieldname**

Specifies the vertical sort (BY) column by its field name.

**Note:** Single quotation marks (') should be used when TOC is specified in the StyleSheet.

# Adding an HTML TOC as an Object in the Report (Report Option)

You can add an HTML TOC as an icon to the upper-left corner of a report by preceding the request with a SET command, as illustrated in the following request. The TOC will list values of the first (highest level) vertical sort field, PLANT:

```
SET COMPOUND='BYTOC 2'
```

```
TABLE FILE CENTORD
HEADING
"SALES REPORT"
SUM LINEPRICE BY PLANT BY PRODCAT
ON TABLE SET PAGE-NUM OFF
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT HTML
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

You can also add an HTML TOC as an icon to the upper-left corner of a report by using a SET command within the request.

```
TABLE FILE CENTORD
HEADING
"SALES REPORT"
SUM LINEPRICE BY PLANT BY PRODCAT
ON TABLE SET PAGE-NUM OFF
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT HTML
ON TABLE SET COMPOUND 'BYTOC 2'
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The following example shows how you can use a PCHOLD command to run the request:

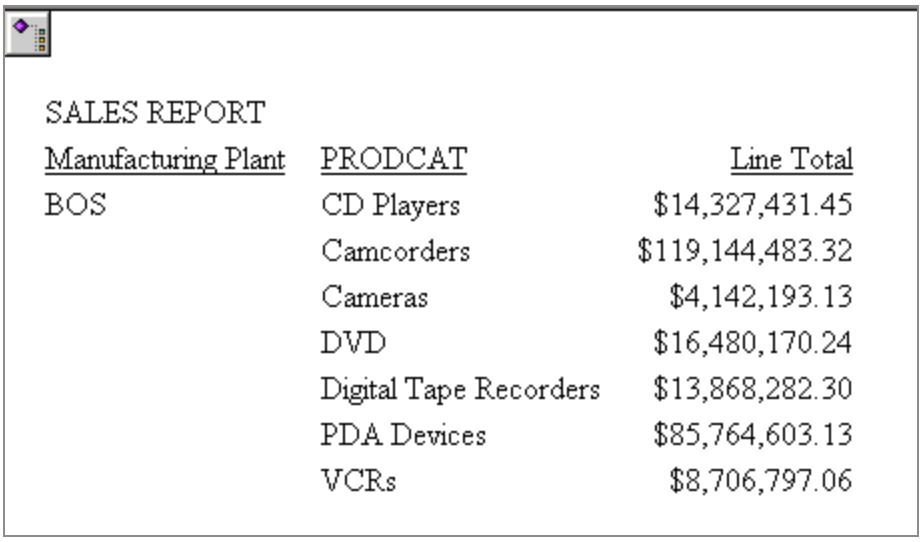
```
TABLE FILE CENTORD
HEADING
"SALES REPORT"
SUM LINEPRICE BY PLANT BY PRODCAT
ON TABLE SET PAGE-NUM OFF
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT HTML BYTOC 2
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

In the following request, the TOC Tree control is enabled in the Report StyleSheet:

```
TABLE FILE CENTORD
HEADING
"SALES REPORT"
SUM LINEPRICE
BY PLANT BY PRODCAT
ON TABLE SET PAGE-NUM OFF
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT HTML
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=REPORT, TOC='PRODCAT', $
ENDSTYLE
END
```

**Note:** Single quotation marks (') should be used when TOC is specified in the StyleSheet.

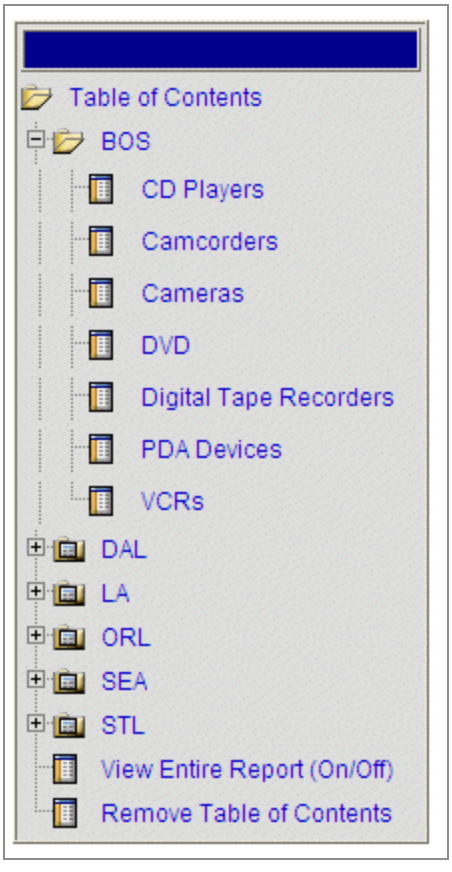
Run the report. The TOC object displays in the upper-left corner.



SALES REPORT

| Manufacturing Plant | PRODCAT | Line Total |
|---|---|---|
| BOS | CD Players | $14,327,431.45 |
| | Camcorders | $119,144,483.32 |
| | Cameras | $4,142,193.13 |
| | DVD | $16,480,170.24 |
| | Digital Tape Recorders | $13,868,282.30 |
| | PDA Devices | $85,764,603.13 |
| | VCRs | $8,706,797.06 |

Double-click the TOC icon to open the Table of Contents Tree control. This displays the values of the sort fields in the report in the order in which they have been specified.



**Note:** You can move the TOC by clicking the blue area above Table of Contents and then dragging it to another area of the report, or double-click on a desired location in the report.

If you wish to display all available fields (the whole report), click the **View Entire Report (On/Off)** option.

**Tip:** You can also customize the look and feel of the TOC object by editing a .css file. It is recommended that you make a backup copy prior to editing.

- If you are working in a self service or Managed Reporting environment from a browser, go to the \ibi\WebFOCUS##\ibi_apps\ibi_html\javaassist\intl*xx* directory, where *##* is the release of WebFOCUS and *xx* is the language abbreviation. For English (EN) the .css file name is toc.css. For all other languages the .css file name is *xx*toc.css, where *xx* is the language abbreviation.

**Note:** If you click **Remove Table of Contents** and then want to view the TOC again, simply double-click on a desired location in the report.

# Grouping Sort Fields for Display

Data in a TOC report is grouped into sections based on the sort fields. TOC reports only display one section at a time for easier viewing. Each section contains all of the values for its sort field. You can customize each section with a page break. By default, a page break is included in the first (highest level) sort field. You can add page breaks to create additional sections and group data that is based on lower level sort fields.

When adding a TOC to a heading, add additional page breaks for each lower level sort field. This ensures that the sorted data is correctly grouped and displayed.

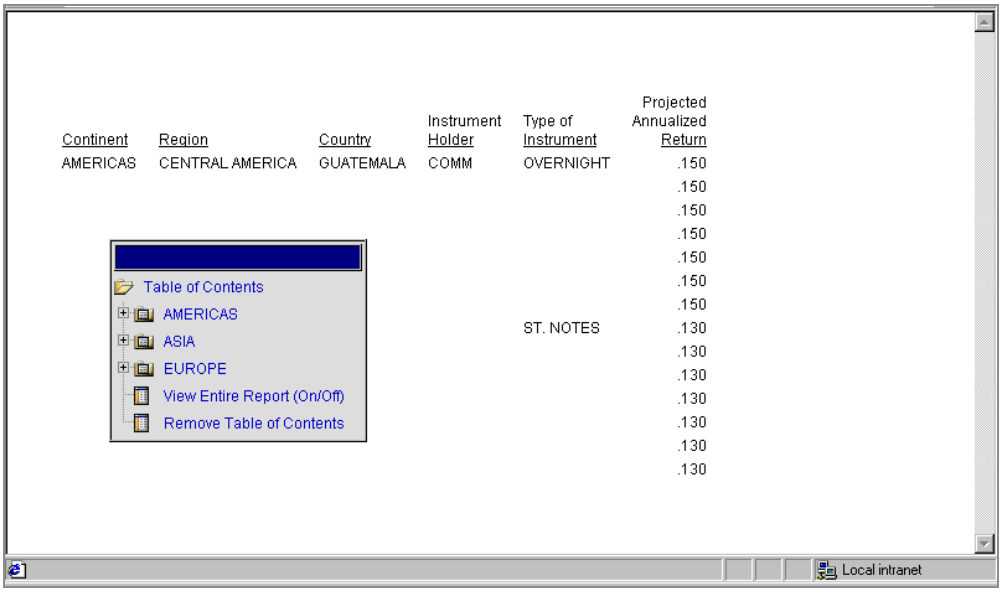
# Customizing Sections of the Report With a Page Break

```
TABLE FILE SHORT
PRINT PROJECTED_RETURN
BY CONTINENT
BY REGION
BY COUNTRY
```

```
BY HOLDER
BY TYPE
ON HOLDER PAGE-BREAK
ON TABLE SET PAGE-NUM OFF
ON TABLE PCHOLD FORMAT HTML
ON TABLE SET COMPOUND 'BYTOC 5'
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
TYPE=REPORT,
GRID=OFF,
FONT='ARIAL',
SIZE=9,
COLOR='BLACK',
BACKCOLOR='NONE',
STYLE=NORMAL,
$
ENDSTYLE
END
```

One section of the report is displayed at a time.

The report is broken into sections based on the values for HOLDER. You will see the detail for each value of HOLDER in a single section.



# Navigation Behavior in a Multi-Level TOC

If you select a value in the TOC, that value flashes (that is, it is highlighted in gray) to draw your attention to it in the browser window. Where the flash appears, and whether and how the screen display changes, is controlled by the following factors:

- When you change the highest level sort group from the TOC (either from the hierarchy above the report or from the first drop-down list in a heading or footing), the selected value flashes three times in the browser window.
- When you change a lower-level sort value within the current high-level sort group, the selected value flashes three times in window. This is because you are still within the same major sort group, and, therefore, within the same page-break. From the selected value at the top of the window: you can then scroll quickly to the related details.

  If the selected lower level value is already viewable on the screen, and the remaining report will fit on the screen, the value flashes, but the report does not scroll.

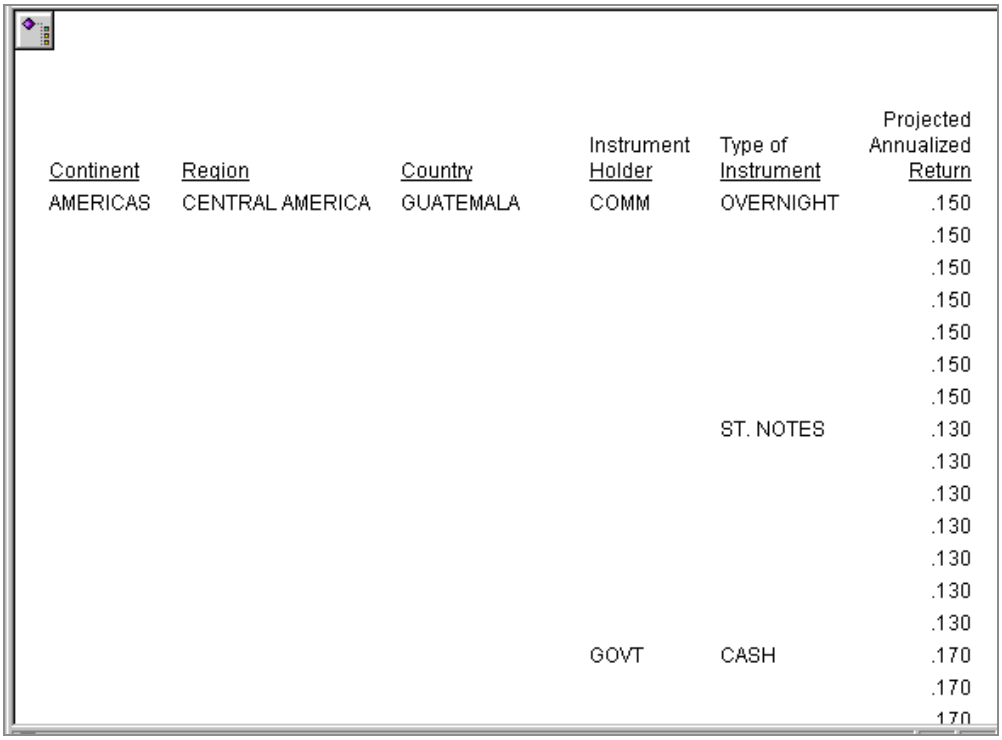
# Navigating Sorted Data From a Multi-Level TOC

This request adds a dynamic HTML TOC as an icon in the upper-left corner of the report by including a SET command in the request. The TOC displays a hierarchy consisting of *four* levels of sort fields, beginning with the first (highest-level). The sort fields are: CONTINENT, REGION, COUNTRY, and TYPE.

```
TABLE FILE SHORT
PRINT PROJECTED_RETURN
BY CONTINENT
BY REGION
BY COUNTRY
BY HOLDER
BY TYPE
ON TABLE SET PAGE-NUM OFF
ON TABLE PCHOLD FORMAT HTML
ON TABLE SET COMPOUND 'BYTOC 5'
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
TYPE=REPORT,
GRID=OFF,
FONT='ARIAL',
```

```
SIZE=9,
STYLE=NORMAL,
$
ENDSTYLE
END
```

The output is displayed with the TOC object in the upper-left corner.



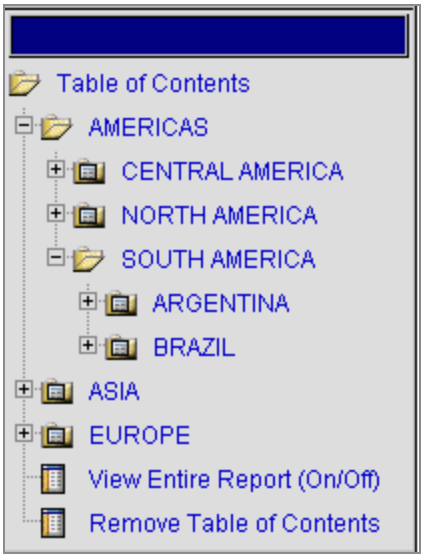
| Continent | Region | Country | Instrument Holder | Type of Instrument | Projected Annualized Return |
|---|---|---|---|---|---|
| AMERICAS | CENTRAL AMERICA | GUATEMALA | COMM | OVERNIGHT | .150 |
| | | | | | .150 |
| | | | | | .150 |
| | | | | | .150 |
| | | | | | .150 |
| | | | | | .150 |
| | | | | | .150 |
| | | | | ST. NOTES | .130 |
| | | | | | .130 |
| | | | | | .130 |
| | | | | | .130 |
| | | | | | .130 |
| | | | | | .130 |
| | | | | | .130 |
| | | | GOVT | CASH | .170 |
| | | | | | .170 |
| | | | | | .170 |

Double-click the object to expand the Table of Contents.

Select **View Entire Report**. Scroll down to see that the report contains data for all of the continents.

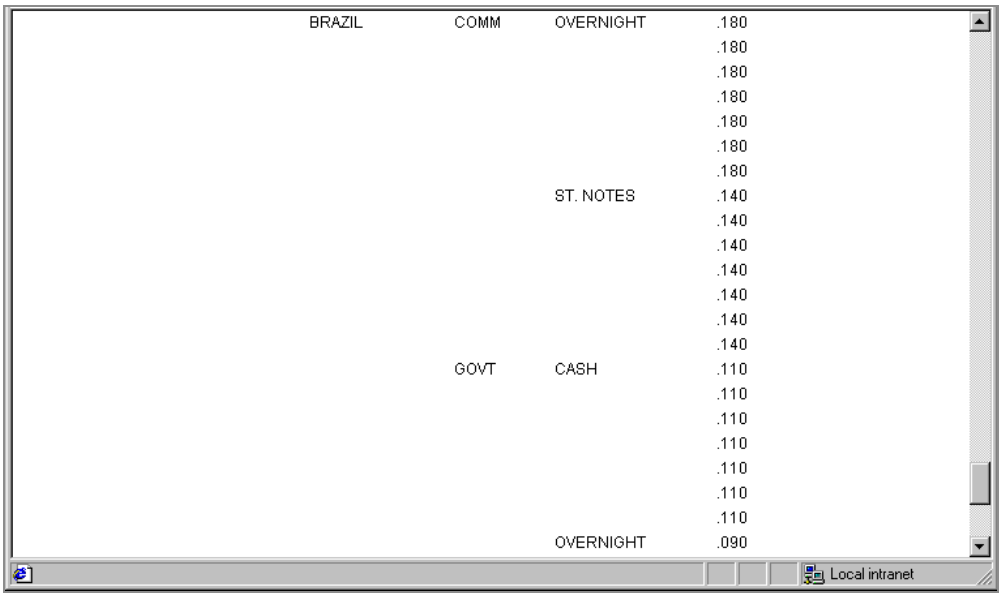
Scroll back to the top of the report window and reopen the TOC. This time select **Americas**. Your selection flashes to highlight it on the screen. Although the report display does not appear to change, if you scroll down now you will see that the report only contains values for the Americas.

Scroll up again and double-click anywhere in the report to open the TOC. This time click the + sign next to Americas, then click the + sign next to South America.




The field values (Argentina and Brazil) are listed in the TOC. These are values of the field COUNTRY. If you wish to see the field name of a value in the TOC, hover over that value with your cursor.

Select **Brazil**. Your selection flashes and moves to the top of the window, as shown next.




Scroll down to see the data for Brazil.

Continue to navigate to the detail you want to view by choosing values at any sort level in the TOC.

- Clicking a + sign expands the field to display its values in the TOC.
- Clicking an actual value (hyperlink) in the TOC momentarily highlights that value and, if necessary, adjusts the report display to move the value into view.

  The TOC collapses to its icon when you click **Table of Contents**, but you can continue to scroll back, expand it, and make additional selections.

# Add TOC Drop-down List Controls to a Heading

Include the following attribute in your StyleSheet declaration StyleSheets" /> StyleSheets" />

```
TYPE=heading, [subtype,] TOC=sort_column, $
```

where:

**heading**

Is the type of heading or footing that contains the TOC.

Valid values are:

| | |
|---|---|
| `TABHEADING` | Report heading. |
| `TABFOOTING` | Report footing. |
| `HEADING` | Page heading. |
| `FOOTING` | Page footing. |

**subtype**

Are attributes that identify the location in the heading or footing where each requested drop-down list will be displayed. These options can be used separately or in combination, depending upon the degree of specificity required to identify a component. Valid values are:

`LINE_#` identifies a line by its position in a heading or footing.

If a heading or footing has multiple lines and you apply a StyleSheet declaration that does not specify LINE_#, the declaration is applied to *all* lines. Blank lines are counted when interpreting the value of LINE.

`LINE=n` is required for a heading or footing that has multiple lines. Otherwise, you can omit it.

`OBJECT` identifies the TOC object in a heading or footing as a text string or field value. Valid values are TEXT or FIELD.

You can use a field and/or text as a placeholder for a TOC drop-down list. However, field is preferred. (If the TOC feature is not in effect, the field name is displayed in the report.)

TEXT may represent free text or a Dialogue Manager amper (&) variable.

It is not necessary to specify OBJECT=TEXT unless you are styling both text strings and embedded fields in the same heading or footing.

For related information, see ITEM_#.

`ITEM_#` which identifies an item by its position in a line.

To determine an ITEM_# for an OBJECT, follow these guidelines:

- When used with OBJECT=TEXT, count only the text strings from left to right.
- When used with OBJECT=FIELD, count only the fields from left to right.

If you apply a StyleSheet declaration that specifies ITEM_#, the number is counted from the beginning of each line in the heading or footing, not just from the beginning of the first line.

**sort_column**

Identifies the vertical sort columns (BY fields) to include as TOCs. You can identify a column using the following notations:

`TOC=fieldname` specifies the sort column by its field name.

`TOC=Bn` specifies the sort column by its order in the request. For example, B2 denotes the second BY field (NOPRINT BY fields are included in the count).

`TOC=n` is the same as `TOC=Bn`.

**Note:** You must maintain the hierarchy of BY fields because the TOC objects in headings (the drop-down lists) are interdependent and corresponds with the hierarchy in the report.

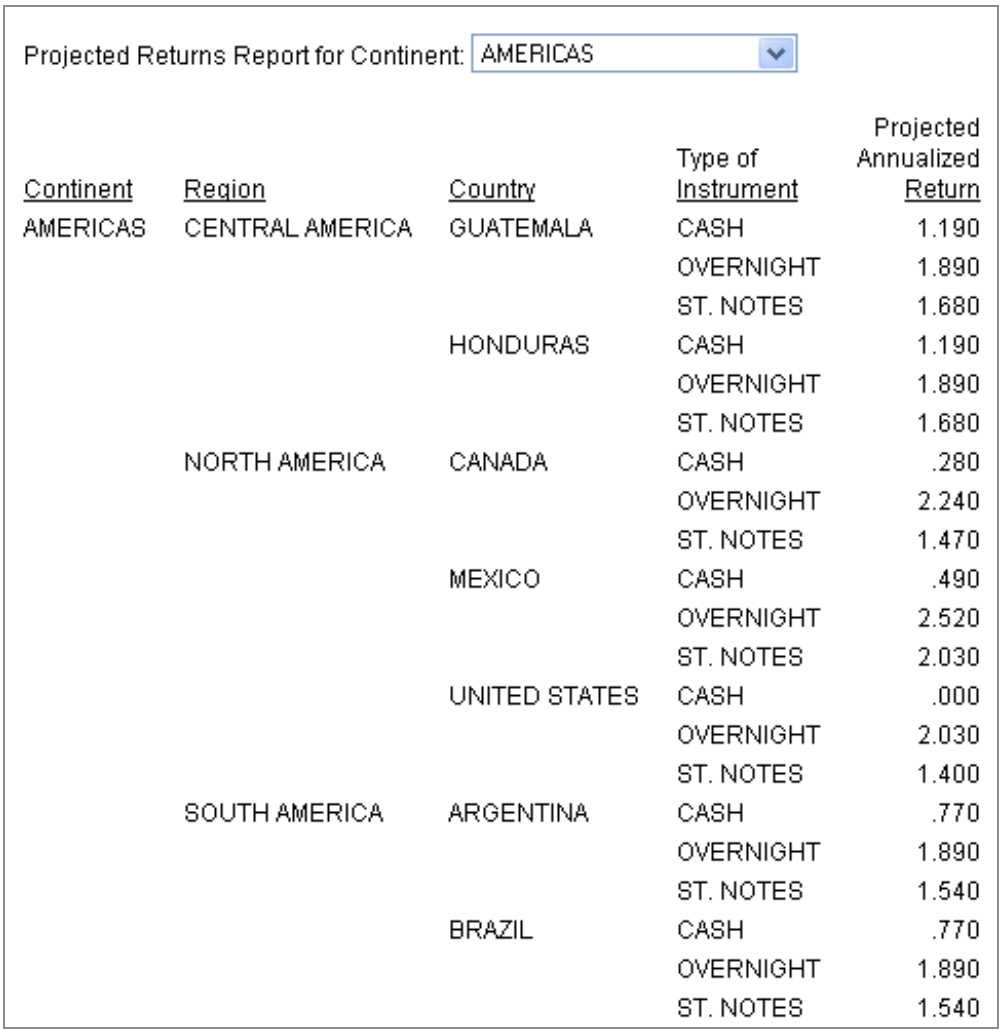
# Adding HTML TOC Drop Down Lists in a Page Heading

This request uses the required StyleSheet attributes to add a TOC to an HTML report. The drop-down TOC lists the values of the field CONTINENT, identified in the StyleSheet code as OBJECT=FIELD, ITEM=1, TOC=CONTINENT.  StyleSheets" /> StyleSheets" />

```
TABLE FILE SHORT
HEADING
"Projected Returns Report for Region:  <REGION in Continent:  <CONTINENT
"
" "
SUM PROJECTED_RETURN
BY CONTINENT
BY REGION
BY COUNTRY
BY TYPE
```

```
ON TABLE SET PAGE-NUM OFF
ON TABLE PCHOLD FORMAT HTML
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
TYPE=REPORT,
GRID=OFF,
FONT='ARIAL',
SIZE=9,
STYLE=NORMAL,
$
TYPE=HEADING, LINE=1, OBJECT=FIELD, ITEM=1, TOC=CONTINENT, $
ENDSTYLE
END
```

When you run the report. The TOC appears as a drop-down menu in the heading, in place of the field CONTINENT:



Projected Returns Report for Continent: AMERICAS

| Continent | Region | Country | Type of Instrument | Projected Annualized Return |
|---|---|---|---|---|
| AMERICAS | CENTRAL AMERICA | GUATEMALA | CASH | 1.190 |
| | | | OVERNIGHT | 1.890 |
| | | | ST. NOTES | 1.680 |
| | | HONDURAS | CASH | 1.190 |
| | | | OVERNIGHT | 1.890 |
| | | | ST. NOTES | 1.680 |
| | NORTH AMERICA | CANADA | CASH | .280 |
| | | | OVERNIGHT | 2.240 |
| | | | ST. NOTES | 1.470 |
| | | MEXICO | CASH | .490 |
| | | | OVERNIGHT | 2.520 |
| | | | ST. NOTES | 2.030 |
| | | UNITED STATES | CASH | .000 |
| | | | OVERNIGHT | 2.030 |
| | | | ST. NOTES | 1.400 |
| | SOUTH AMERICA | ARGENTINA | CASH | .770 |
| | | | OVERNIGHT | 1.890 |
| | | | ST. NOTES | 1.540 |
| | | BRAZIL | CASH | .770 |
| | | | OVERNIGHT | 1.890 |
| | | | ST. NOTES | 1.540 |

Click the TOC to see the list of sort values: AMERICAS, ASIA, EUROPE.

Click each continent to see the related information. The selected value flashes gray to highlight it in the window.

You can display all available fields (the whole report) by clicking the **View Entire Report** option. To remove the TOC, click the **Remove Table of Contents** option. To restore the TOC, double-click anywhere in the report or click the **Refresh** button in your browser.

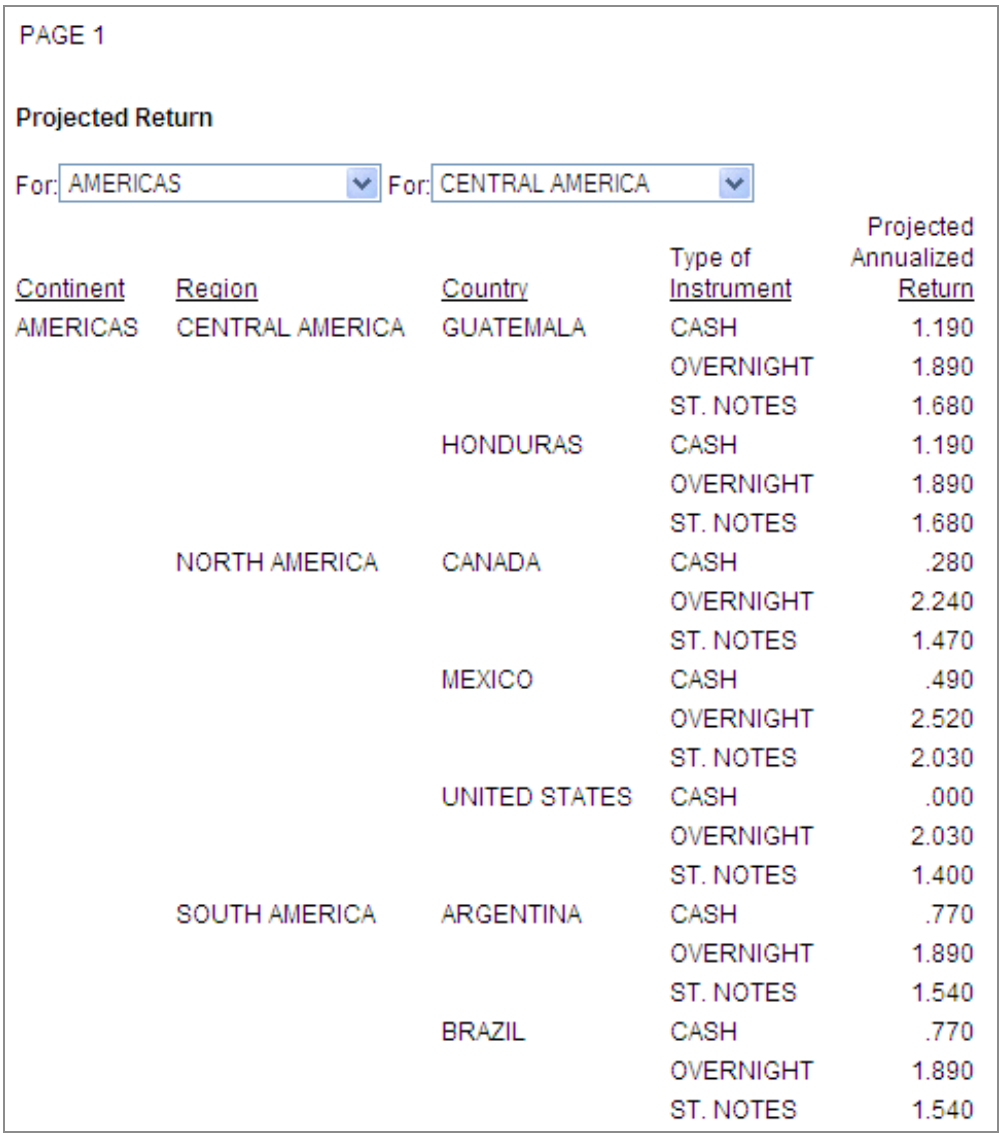
# Navigating a Multi-Level HTML TOC in a Page Heading

This request uses a StyleSheet to add an HTML TOC that contains drop-down lists in the third line of the page heading for two sort (BY) fields specified in the request: CONTINENT

and REGION. Each field becomes a place-holder for its TOC. (If the TOC features were not in effect, the field would display in the report.)

```
TABLE FILE SHORT
"Projected Return"
" "
"For:<CONTINENT For:<REGION "
SUM PROJECTED_RETURN
BY CONTINENT BY REGION BY COUNTRY BY TYPE
ON TABLE PCHOLD FORMAT HTML
ON TABLE SET HTMLCSS ON
ON CONTINENT PAGE-BREAK
ON TABLE SET STYLE *
TYPE=REPORT,
GRID=OFF,
FONT='ARIAL',
SIZE=9,
STYLE=NORMAL,
$
TYPE=HEADING, LINE=1, STYLE=BOLD, $
TYPE=HEADING, LINE=3, OBJECT=FIELD, ITEM=1, TOC=B1,$
TYPE=HEADING, LINE=3, OBJECT=FIELD, ITEM=2, TOC=REGION,$
ENDSTYLE
END
```

The output is:



PAGE 1

**Projected Return**

For: AMERICAS For: CENTRAL AMERICA

| Continent | Region | Country | Type of Instrument | Projected Annualized Return |
|---|---|---|---|---|
| AMERICAS | CENTRAL AMERICA | GUATEMALA | CASH | 1.190 |
| | | | OVERNIGHT | 1.890 |
| | | | ST. NOTES | 1.680 |
| | | HONDURAS | CASH | 1.190 |
| | | | OVERNIGHT | 1.890 |
| | | | ST. NOTES | 1.680 |
| | NORTH AMERICA | CANADA | CASH | .280 |
| | | | OVERNIGHT | 2.240 |
| | | | ST. NOTES | 1.470 |
| | | MEXICO | CASH | .490 |
| | | | OVERNIGHT | 2.520 |
| | | | ST. NOTES | 2.030 |
| | | UNITED STATES | CASH | .000 |
| | | | OVERNIGHT | 2.030 |
| | | | ST. NOTES | 1.400 |
| | SOUTH AMERICA | ARGENTINA | CASH | .770 |
| | | | OVERNIGHT | 1.890 |
| | | | ST. NOTES | 1.540 |
| | | BRAZIL | CASH | .770 |
| | | | OVERNIGHT | 1.890 |
| | | | ST. NOTES | 1.540 |

Click the arrow in the second TOC drop-down list and select **North America**. Keep in mind that the values in this drop-down list are related to those in the higher level drop-down list. They are all part of the same higher level sort group, and therefore, within the same section break. The selected value, North America, flashes and moves to the *top* of the browser window. From there, you can scroll to see the related data, as shown in the image below.

| | | | |
|---|---|---|---|
| | | ST. NOTES | 1.680 |
| NORTH AMERICA | CANADA | CASH | .280 |
| | | OVERNIGHT | 2.240 |
| | | ST. NOTES | 1.470 |
| | MEXICO | CASH | .490 |
| | | OVERNIGHT | 2.520 |
| | | ST. NOTES | 2.030 |
| | UNITED STATES | CASH | .000 |
| | | OVERNIGHT | 2.030 |
| | | ST. NOTES | 1.400 |
| SOUTH AMERICA | ARGENTINA | CASH | .770 |

Note that if you select information already in your field of view, the value will be highlighted in gray and will flash, to draw your attention to it.

Next, scroll up and choose **ASIA** from the first TOC list. This selection changes your highest-level sort group, and affects all of the lists below it. ASIA flashes and moves to the top of the window, where you see information for the first country (Hong Kong) in the Far East region. The page number is now 2 since this is the second of the high-level sort groups in the TOC.

PAGE 2

**Projected Return**

For: ASIA For: FAR EAST

| Continent | Region | Country | Type of Instrument | Projected Annualized Return |
|---|---|---|---|---|
| ASIA | FAR EAST | HONG KONG | CASH | .770 |
| | | | OVERNIGHT | 2.170 |
| | | | ST. NOTES | 1.610 |
| | | JAPAN | CASH | .770 |
| | | | OVERNIGHT | 2.170 |
| | | | ST. NOTES | 1.610 |
| | MIDDLE EAST | ISRAEL | CASH | .700 |
| | | | OVERNIGHT | 1.680 |
| | | | ST. NOTES | 1.400 |
| | | SAUDI ARABIA | CASH | .770 |
| | | | OVERNIGHT | 1.890 |
| | | | ST. NOTES | 1.540 |

Continue to experiment with other selections.

# Navigating Between Reports

Along with techniques and tools for navigating within a report, WebFOCUS provides several mechanisms for navigating between reports. With these features, a user initiates navigation from a report display. You can:

- Drill down to other reports, URLs, and JavaScript functions. See Linking a Report to Other Resources.
- Define frames and populate them with reports. See Specifying a Target Frame.

# HTML Table of Contents Limits

The TOC feature:

- Applies to HTML output.
- Is supported with Internet Explorer. This feature may generate unexpected behavior when using other browsers. See the Web Browser Support Statement for WebFOCUS (https://techsupport.informationbuilders.com/tech/wbf/wbf_tmo_027.html) for information on supported browsers for this and other WebFOCUS features.
- Does not support the Dialogue Manager command -HTMLFORM.
- Is not supported with Accordion reports.
- You cannot designate a TOC for a BY field without also specifying a TOC for its parent (BY) fields. The reason for this is that the TOC controls are interdependent and require the physical presence of each parent control to operate correctly. For example, if the request contains BY COUNTRY BY CAR BY MODEL, a report cannot include a TOC control for CAR without also including one for COUNTRY.
- The size of a TOC-enabled report is limited to the memory available on the WebFOCUS Client.
- If your request has both BYTOC Table of Contents and a Heading Table of Contents in the StyleSheet, the output will have the Heading TOC.

If you have installed ReportCaster, you can distribute a report with an HTML TOC by including the following commands in the report request:

- The SET BASEURL command set to the URL to connect to the application server on

which WebFOCUS Client is installed. For information, see Specifying a Base URL.

# Controlling the Display of Sorted Data With Accordion Reports

Accordion Reports provide a way to control the amount of sorted data that appears on an HTML report page. You can produce reports with expandable views for each vertical sort field in a request with multiple BY fields.

You can create two types of Accordion Reports:

- **Accordion By Row.** Accordion By Row reports present sort field values and their corresponding aggregated measures rolled up so that the highest level sort field and the grand totals are at the top of the report. A tree control can be used to open each dimension and view the associated aggregated values. Clicking the plus sign (+) next to a sort field value opens new rows that display the next lower-level sort field values and subtotals. The lowest-level sort field, when expanded, displays the aggregated data values. This type of Accordion Report is generated using the SET EXPANDBYROW command.

  Using the Accordion By Row enhanced interface, navigation is easier when working with wide and large reports in a portal page, the data automatically resizes to fit the size of the container, and the column widths automatically adjust based on the largest data value or column title, whichever is larger. The SET EXPANDBYROWTREE=ON command in a procedure enables the enhanced Accordion by Row feature. For more information on the enhanced interface, see Controlling the Display of Sorted Data With Accordion Reports.

  **Note:** EXPANDBYROW is functionally stabilized. Any future enhancements will be done for EXPANDBYROWTREE.

- **Accordion By Column.** Accordion By Column reports present rolled up sort field and data values. However, they do not automatically display entire report rows. A plus sign appears to the left of each data value in the column under the highest-level sort heading. For data associated with lower-level sort fields, a plus sign is placed to the left of each data value, but the data does not appear unless manually expanded. Data values of the lowest-level sort field are not expandable. To expand your view of data for any expandable sort field, click a plus sign and all data associated with the next lower-level sort field appears. When you expand a data value under the next to lowest sort heading, all of the remaining associated data values in the report appear.

This type of Accordion Report is generated using the SET EXPANDABLE command.

The use of horizontal sort fields coded with ACROSS phrases is supported with Accordion Reports. The ACROSS sort headings that appear above vertical sort headings in a standard HTML report do not display in an Accordion Report until at least one sorted data value has been manually expanded in each expandable sort column.

Two vertical sort fields coded with BY phrases are required when using Accordion Reports. If the command syntax does not contain at least two BY phrases, the Accordion Reports EXPANDABLE, EXPANDBYROW, or EXPANDBYROWTREE command is ignored, no message is generated, and a standard HTML report is created.

**Note:** Accordion Reports are only supported for HTML report output.

# Requirements for Accordion Reports

The following requirements must be taken into consideration when creating Accordion Reports:

- Adding a drill-down link to an Accordion Report requires that the TARGET parameter must be set to a value that specifies a new HTML frame.
- Once an Accordion Report is created and delivered to the user, there are no subsequent calls to the WebFOCUS Reporting Server required when the user is interacting with the report. However, the collapsible folder controls on the sort fields require JavaScript and images that reside on the WebFOCUS Client. The user must be connected to the WebFOCUS Web tier components in order to use this feature. For online, connected users of WebFOCUS, no change is required to the report.

  However, for distribution of reports using ReportCaster, see the following Reference topic to ensure that the report is delivered correctly as an email attachment or as an archived report in the Report Library.

# Usage Notes for HTMLARCHIVE With Accordion Reports

WebFOCUS interactive reporting features must have a connection to the WebFOCUS client in order to access the components required to operate successfully.

HTMLARCHVE can be used to create self-contained HTML pages with user-defined images when client access is not available.

To generate HTML pages containing user-defined images that can operate interactively, use one of the following commands:

```
SET HTMLEMBEDIMG=ON
SET HTMLARCHIVE=ON
```

Define BASEURL to point directly to the host machine where these files can be accessed using the following syntax:

```
SET BASEURL=http://{hostname:portnumber}
```

For more information on SET BASEURL, see Specifying a Base URL.

# Distributing Accordion Reports With ReportCaster

Distributing Accordion Reports with ReportCaster requires the use of JavaScript components and images located on the WebFOCUS Client. To access the JavaScript components and images from a report distributed by ReportCaster, the scheduled procedure must contain the SET FOCHTMLURL command, which must be set to an absolute URL instead of the default value. For example,

```
SET FOCHTMLURL = http://hostname[:port]/ibi_apps/ibi_html
```

where:

**hostname[:port]**

Is the host name and optional port number (specified only if you are not using the default port number) where the WebFOCUS Web application is deployed.

**ibi_apps/ibi_html**

ibi_apps is the site-customized web server alias pointing to the WEBFOCUS81/ibi_apps directory (where ibi_apps is the default value). ibi_html is a directory within the path to the JavaScript files that are required to be accessible when viewing an Accordion report.

For more information about coding reports for use with ReportCaster, see the *Tips and Techniques for Coding a ReportCaster Report* appendix in the *ibi™ WebFOCUS® ReportCaster* manual.

# Creating an Accordion By Row Report

Accordion By Row reports are HTML reports that offer an interactive interface to data aggregated at multiple levels by presenting the sort fields within an expandable tree. By default, the report will present the highest dimension or sort field (BY value) and the aggregated measures associated with each value. The tree control can be used to open or close each dimension and view the associated aggregated values. Clicking the plus sign (+) next to a sort field value opens new rows that display the next lower level sort field values and subtotals. The lowest level sort field, when expanded, displays the aggregated data values.

Using the SET EXPANDBYROW or SET EXPANDBYROWTREE command with HTMLCSS ON enables any HTML report to be turned into an Accordion By Row request. EXPANDBYROW and EXPANDBYROWTREE automatically invoke the SET SUBTOTALS=ABOVE command, which moves the subtotal rows above the subheading and data rows. A SUB-TOTAL command is automatically added for the next-to-last BY field.

When an Accordion By Row report uses the PRINT command, the innermost level of the resulting tree contains detail records from the data source. There can be many detail records for each combination of BY fields, so it may be unclear what distinguishes the various detail records within the display. In order to make the report more useful, include at least one field in the report that can be used to distinguish between the detail level rows.

When an Accordion By Row report uses the SUM command, each row, even at the innermost level of the tree, is actually a subtotal row and is completely described by the

combination of BY fields in the request. Each level will be presented at the aggregated level, and the data values will represent the aggregation of the lowest level BY.

Styling an Accordion By Row report can be done using standard HTML report techniques, but it is important to keep the report structure in mind. All rows, except the lowest level, are actually SUBTOTAL rows and the lowest level contains the report DATA.

Accordion By Row reports display the grand total row as an anchor row below the data. This anchor row displays above both the report and page footings aligned to the left margin of the report. To generate Accordion By Row reports without the grand total anchor row, add ON TABLE NOTOTAL to the request.

Using the Accordion By Row enhanced interface, navigation is easier when working with wide and large reports in a portal page, the data automatically resizes to fit the size of the container, and the column widths automatically adjust based on the largest data value or column title, whichever is larger. The SET EXPANDBYROWTREE=ON command in a procedure enables the enhanced Accordion by Row feature. The SET AUTOFIT ON command in a procedure automatically resizes the data to fit the size of the container. For more information on the enhanced interface, see Controlling the Display of Sorted Data With Accordion Reports.

Accordion reports can also be created to be opened by column, instead of by row. See Controlling the Display of Sorted Data With Accordion Reports for information on how to create Accordion reports using the SET EXPANDABLE command.

# Create Accordion Reports That Expand By Row

```
SET EXPANDBYROW = {OFF|ON|n}
```

```
ON TABLE SET EXPANDBYROW {OFF|ON|n}
```

where:

**OFF**

Does not create an Accordion report. OFF is the default value.

**ON**

Creates an Accordion report, which initially displays only the highest sort field level. To see rows on lower levels, click the plus sign (+) next to one of the displayed sort field values.

**ALL**

Creates an Accordion report in which all sort field levels are initially expanded. To roll up a sort field level, click the minus sign (-) next to one of the sort field values on that level.

**n**

Creates an Accordion report in which *n* sort field levels are initially expanded. To roll up an expanded sort field level, click the minus sign (-) next to one of the sort field values on that level.

**Note:**

- Accordion By Row reports require that the HTMLCSS parameter be set to ON.
- By default, a blank line is generated before a subtotal on the report output. You can eliminate these automatic blank lines by issuing the SET DROPBLNKLINE=ON command.

# Creating an Accordion By Row SUM Report

The following request against the GGSALES data source has four sort fields, REGION, ST, CATEGORY, and PRODUCT:

```
TABLE FILE GGSALES
SUM DOLLARS/D8MC
UNITS/D8C
BUDDOLLARS/D8MC BUDUNITS/D8C
BY REGION
BY ST
BY CATEGORY
BY PRODUCT
ON TABLE SET HTMLCSS ON
ON TABLE SET EXPANDBYROW ON
ON TABLE SET DROPBLNKLINE ON
ON TABLE PCHOLD FORMAT HTML
```

```
ON TABLE SET STYLE *
TYPE=REPORT,
    COLOR=RGB(66 70 73),
    FONT='TREBUCHET MS',
    SIZE=9,
    SQUEEZE=ON,
    GRID=OFF,
$
TYPE=REPORT,
    GRID=OFF,
    FONT='TREBUCHET MS',
    COLOR=RGB(52 85 64),
$
```

```
TYPE=TITLE,
    COLOR='WHITE',
    BACKCOLOR=RGB(52 85 64),
    STYLE=-UNDERLINE,
$
TYPE=HEADING,
    COLOR='WHITE',
    BACKCOLOR=RGB(52 85 64),
$
TYPE=FOOTING,
    COLOR='WHITE',
    BACKCOLOR=RGB(52 85 64),
$
TYPE=SUBTOTAL,
    BACKCOLOR=RGB(72 118 91),
$
TYPE=SUBTOTAL,
    BY=1,
    COLOR='WHITE',
$
TYPE=SUBTOTAL,
    BY=2,
    COLOR='WHITE',
    BACKCOLOR=RGB(132 159 126),
$
TYPE=SUBTOTAL,
    BY=3,
    COLOR='WHITE',
    BACKCOLOR=RGB(158 184 153),
$
TYPE=GRANDTOTAL,
    COLOR='WHITE',
```

```
    BACKCOLOR=RGB(52 85 64),
    STYLE=BOLD,
$
ENDSTYLE
END
```

The initial output shows only the top level BY field (REGION), as shown in the following image.

| | Dollar Sales | Unit Sales | Budget Dollars | Budget Units |
|---|---|---|---|---|
| ⊞ Midwest | $11,400,665 | 905,045 | $11,194,373 | 907,107 |
| ⊞ Northeast | $11,392,300 | 916,675 | $11,576,921 | 914,359 |
| ⊞ Southeast | $11,710,379 | 935,232 | $11,807,971 | 942,247 |
| ⊞ West | $11,652,946 | 932,039 | $11,641,513 | 930,781 |
| TOTAL | $46,156,290 | 3,688,991 | $46,220,778 | 3,694,494 |

Clicking the plus sign (+) next to the Midwest region opens the rows that show the states associated with that region, as shown in the following image.

| | | Dollar Sales | Unit Sales | Budget Dollars | Budget Units |
|---|---|---|---|---|---|
| ⊟ Midwest | | $11,400,665 | 905,045 | $11,194,373 | 907,107 |
| | ⊞ IL | $3,924,401 | 307,581 | $3,866,856 | 310,071 |
| | ⊞ MO | $3,761,286 | 297,727 | $3,646,838 | 297,081 |
| | ⊞ TX | $3,714,978 | 299,737 | $3,680,679 | 299,955 |
| ⊞ Northeast | | $11,392,300 | 916,675 | $11,576,921 | 914,359 |
| ⊞ Southeast | | $11,710,379 | 935,232 | $11,807,971 | 942,247 |
| ⊞ West | | $11,652,946 | 932,039 | $11,641,513 | 930,781 |
| TOTAL | | $46,156,290 | 3,688,991 | $46,220,778 | 3,694,494 |

Clicking the plus sign (+) next to the state IL opens the rows that show the categories associated with that state, as shown in the following image.

| | Dollar Sales | Unit Sales | Budget Dollars | Budget Units |
|---|---|---|---|---|
| ⊟ Midwest | $11,400,665 | 905,045 | $11,194,373 | 907,107 |
| ⊟ IL | $3,924,401 | 307,581 | $3,866,856 | 310,071 |
| ⊞ Coffee | $1,398,779 | 109,581 | $1,366,264 | 111,431 |
| ⊞ Food | $1,522,847 | 118,068 | $1,480,855 | 118,363 |
| ⊞ Gifts | $1,002,775 | 79,932 | $1,019,737 | 80,277 |
| ⊞ MO | $3,761,286 | 297,727 | $3,646,838 | 297,081 |
| ⊞ TX | $3,714,978 | 299,737 | $3,680,679 | 299,955 |
| ⊞ Northeast | $11,392,300 | 916,675 | $11,576,921 | 914,359 |
| ⊞ Southeast | $11,710,379 | 935,232 | $11,807,971 | 942,247 |
| ⊞ West | $11,652,946 | 932,039 | $11,641,513 | 930,781 |
| TOTAL | $46,156,290 | 3,688,991 | $46,220,778 | 3,694,494 |

Clicking the plus sign (+) next to the Coffee category shows the products associated with that category, as shown in the following image. This is the lowest level of the Accordion By Row report.

| | Dollar Sales | Unit Sales | Budget Dollars | Budget Units |
|---|---|---|---|---|
| ⊟ Midwest | $11,400,665 | 905,045 | $11,194,373 | 907,107 |
| ⊟ IL | $3,924,401 | 307,581 | $3,866,856 | 310,071 |
| ⊟ Coffee | $1,398,779 | 109,581 | $1,366,264 | 111,431 |
| Espresso | $420,439 | 32,237 | $401,477 | 32,416 |
| Latte | $978,340 | 77,344 | $964,787 | 79,015 |
| ⊞ Food | $1,522,847 | 118,068 | $1,480,855 | 118,363 |
| ⊞ Gifts | $1,002,775 | 79,932 | $1,019,737 | 80,277 |
| ⊞ MO | $3,761,286 | 297,727 | $3,646,838 | 297,081 |
| ⊞ TX | $3,714,978 | 299,737 | $3,680,679 | 299,955 |
| ⊞ Northeast | $11,392,300 | 916,675 | $11,576,921 | 914,359 |
| ⊞ Southeast | $11,710,379 | 935,232 | $11,807,971 | 942,247 |
| ⊞ West | $11,652,946 | 932,039 | $11,641,513 | 930,781 |
| TOTAL | $46,156,290 | 3,688,991 | $46,220,778 | 3,694,494 |

# Creating an Accordion By Row PRINT Report

The following request against the EMPLOYEE data source has two sort fields, DEPARTMENT and YEAR. It uses the PRINT display command.

```
SET EXPANDBYROW = ALL
DEFINE FILE EMPLOYEE
YEAR/YY = HIRE_DATE;
YEARMO/YYM = HIRE_DATE;
```

```
END
TABLE FILE EMPLOYEE
PRINT LAST_NAME AS 'Last,Name' FIRST_NAME AS 'First,Name'
CURR_SAL AS 'Current,Salary' ED_HRS AS 'Education,Hours'
BY DEPARTMENT BY YEAR
WHERE YEAR GT 1980
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
TYPE=REPORT,
    COLOR=RGB(66 70 73),
    FONT='TREBUCHET MS',
    SIZE=9,
    SQUEEZE=ON,
    GRID=OFF,
$
```

```
TYPE=TITLE,
    BACKCOLOR=RGB(102 102 102),
    COLOR=RGB(255 255 255),
    STYLE=-UNDERLINE+BOLD,
$
TYPE=DATA,
    BACKCOLOR=RGB(255 255 255),
$
TYPE=TITLE,
    COLOR='WHITE',
    BACKCOLOR=RGB(52 85 64),
    STYLE=-UNDERLINE,
$
TYPE=HEADING,
    COLOR='WHITE',
    BACKCOLOR=RGB(52 85 64),
$
TYPE=FOOTING,
    COLOR='WHITE',
    BACKCOLOR=RGB(52 85 64),
$
TYPE=SUBTOTAL,
    BACKCOLOR=RGB(72 118 91),
$
TYPE=SUBTOTAL,
    BY=1,
    COLOR='WHITE',
$
TYPE=SUBTOTAL,
    BY=2,
```

```
    COLOR='WHITE',
    BACKCOLOR=RGB(132 159 126),
$
TYPE=SUBTOTAL,
    BY=3,
    COLOR='WHITE',
    BACKCOLOR=RGB(158 184 153),
$
TYPE=GRANDTOTAL,
    COLOR='WHITE',
    BACKCOLOR=RGB(52 85 64),
    STYLE=BOLD,
$
ENDSTYLE
END
```

Including the fields LAST_NAME and FIRST_NAME in the report output distinguishes each detail line. However, those fields do not apply to the summary lines, so they are blank on the summary lines.

The output is:

| | Last Name | First Name | Current Salary | Education Hours |
|---|---|---|---|---|
| ⊟ MIS | | | $108,002.00 | 231.00 |
| ⊟ 1981 | | | $58,742.00 | 81.00 |
| | SMITH | MARY | $13,200.00 | 36.00 |
| | MCCOY | JOHN | $18,480.00 | .00 |
| | CROSS | BARBARA | $27,062.00 | 45.00 |
| ⊟ 1982 | | | $49,260.00 | 150.00 |
| | JONES | DIANE | $18,480.00 | 50.00 |
| | BLACKWOOD | ROSEMARIE | $21,780.00 | 75.00 |
| | GREENSPAN | MARY | $9,000.00 | 25.00 |
| ⊟ PRODUCTION | | | $103,282.00 | 95.00 |
| ⊟ 1982 | | | $103,282.00 | 95.00 |
| | SMITH | RICHARD | $9,500.00 | 10.00 |
| | BANNING | JOHN | $29,700.00 | .00 |
| | IRVING | JOAN | $26,862.00 | 30.00 |
| | ROMANS | ANTHONY | $21,120.00 | 5.00 |
| | MCKNIGHT | ROGER | $16,100.00 | 50.00 |
| TOTAL | | | $211,284.00 | 326.00 |

# Create an Accordion Report With the Enhanced Interface

```
SET EXPANDBYROWTREE = {OFF|ON|ALL|n}
ON TABLE SET EXPANDBYROWTREE {OFF|ON|ALL|n}
```

where:

**OFF**

Does not create an Accordion report, with the enhanced interface. OFF is the default value.

**ON**

Creates an Accordion report, with the enhanced interface. This setting initially displays only the highest sort field level. To see rows on lower levels, click the plus sign (+) next to one of the displayed sort field values.

**ALL**

Creates an Accordion report, with the enhanced interface. This setting displays all sort field levels initially expanded. To roll up a sort field level, click the minus sign (-) row next to one of the sort field values on that level.

**n**

Creates an Accordion report, with the enhanced interface. This setting displays the *n* sort field levels initially expanded. To roll up an expanded sort field level, click the minus sign (-) next to one of the sort field values on that level.

# Creating an Accordion Report With the Enhanced Interface

The following request against the GGSALES data source has four sort fields, REGION, ST, CATEGORY, and PRODUCT. The request uses the default StyleSheet and the default plus sign (+) and minus sign (-) to expand or collapse a row. In order to create the Accordion report, with the enhanced interface, the SET EXPANDBYROWTREE command must be set to ON. In order to automatically resize the data to fit the size of the container, the SET AUTOFIT command must be set to ON.

```
TABLE FILE GGSALES
SUM DOLLARS/D8MC
UNITS/D8C
BUDDOLLARS/D8MC BUDUNITS/D8C
BY REGION
BY ST
BY CATEGORY
BY PRODUCT
ON TABLE SET EXPANDBYROWTREE ON
```

```
ON TABLE SET DROPBLNKLINE ON
ON TABLE SET AUTOFIT ON
ON TABLE PCHOLD FORMAT HTML
ON TABLE SET STYLE *
INCLUDE=IBFS:/FILE/IBI_HTML_DIR/ibi_themes/Warm.sty,$
ENDSTYLE
END
```

The initial output shows only the top level BY field (REGION), as shown in the following image.

| | Dollar Sales | Unit Sales | Budget Dollars | Budget Units |
|---|---|---|---|---|
| + Midwest | $11,400,665 | 905,045 | $11,194,373 | 907,107 |
| + Northeast | $11,392,300 | 916,675 | $11,576,921 | 914,359 |
| + Southeast | $11,710,379 | 935,232 | $11,807,971 | 942,247 |
| + West | $11,652,946 | 932,039 | $11,641,513 | 930,781 |
| TOTAL | $46,156,290 | 3,688,991 | $46,220,778 | 3,694,494 |

Clicking the plus sign (+) next to the Midwest region opens the rows that show the states associated with that region, as shown in the following image.

| | Dollar Sales | Unit Sales | Budget Dollars | Budget Units |
|---|---|---|---|---|
| − Midwest | $11,400,665 | 905,045 | $11,194,373 | 907,107 |
| + IL | $3,924,401 | 307,581 | $3,866,856 | 310,071 |
| + MO | $3,761,286 | 297,727 | $3,646,838 | 297,081 |
| + TX | $3,714,978 | 299,737 | $3,680,679 | 299,955 |
| + Northeast | $11,392,300 | 916,675 | $11,576,921 | 914,359 |
| + Southeast | $11,710,379 | 935,232 | $11,807,971 | 942,247 |
| + West | $11,652,946 | 932,039 | $11,641,513 | 930,781 |
| TOTAL | $46,156,290 | 3,688,991 | $46,220,778 | 3,694,494 |

Clicking the plus sign (+) next to the state IL opens the rows that show the categories associated with that state, as shown in the following image.

| | Dollar Sales | Unit Sales | Budget Dollars | Budget Units |
|---|---|---|---|---|
| − Midwest | $11,400,665 | 905,045 | $11,194,373 | 907,107 |
| − IL | $3,924,401 | 307,581 | $3,866,856 | 310,071 |
| + Coffee | $1,398,779 | 109,581 | $1,366,264 | 111,431 |
| + Food | $1,522,847 | 118,068 | $1,480,855 | 118,363 |
| + Gifts | $1,002,775 | 79,932 | $1,019,737 | 80,277 |
| + MO | $3,761,286 | 297,727 | $3,646,838 | 297,081 |
| + TX | $3,714,978 | 299,737 | $3,680,679 | 299,955 |
| + Northeast | $11,392,300 | 916,675 | $11,576,921 | 914,359 |
| + Southeast | $11,710,379 | 935,232 | $11,807,971 | 942,247 |
| + West | $11,652,946 | 932,039 | $11,641,513 | 930,781 |
| TOTAL | $46,156,290 | 3,688,991 | $46,220,778 | 3,694,494 |

Clicking the plus sign (+) next to the Coffee category shows the products associated with that category, as shown in the following image. This is the lowest level of the Accordion By Row report.

| | Dollar Sales | Unit Sales | Budget Dollars | Budget Units |
|---|---|---|---|---|
| − Midwest | $11,400,665 | 905,045 | $11,194,373 | 907,107 |
| − IL | $3,924,401 | 307,581 | $3,866,856 | 310,071 |
| − Coffee | $1,398,779 | 109,581 | $1,366,264 | 111,431 |
| Espresso | $420,439 | 32,237 | $401,477 | 32,416 |
| Latte | $978,340 | 77,344 | $964,787 | 79,015 |
| + Food | $1,522,847 | 118,068 | $1,480,855 | 118,363 |
| + Gifts | $1,002,775 | 79,932 | $1,019,737 | 80,277 |
| + MO | $3,761,286 | 297,727 | $3,646,838 | 297,081 |
| + TX | $3,714,978 | 299,737 | $3,680,679 | 299,955 |
| + Northeast | $11,392,300 | 916,675 | $11,576,921 | 914,359 |
| + Southeast | $11,710,379 | 935,232 | $11,807,971 | 942,247 |
| + West | $11,652,946 | 932,039 | $11,641,513 | 930,781 |
| TOTAL | $46,156,290 | 3,688,991 | $46,220,778 | 3,694,494 |

You can use the EBRT_ANCHOR StyleSheet attribute to change the default plus sign (+) and minus sign (-) to an arrow. Valid settings for the EBRT_ANCHOR attribute are PLUSMINUS and ARROWS. The following request changes the default plus sign (+) and minus sign (-) to an arrow, and applies StyleSheet formatting to the request to change the color of the text to white and the background color to different shades of purple.

**Note:** The color of the arrows match the color of the SUBTOTAL line, in this case, white.

```
TABLE FILE GGSALES
SUM DOLLARS/D8MC
UNITS/D8C
BUDDOLLARS/D8MC BUDUNITS/D8C
BY REGION
BY ST
```

```
BY CATEGORY
BY PRODUCT
ON TABLE SET EXPANDBYROWTREE ON
ON TABLE SET DROPBLNKLINE ON
ON TABLE SET AUTOFIT ON
ON TABLE PCHOLD FORMAT HTML
ON TABLE SET STYLE *
TYPE=REPORT, EBRT_ANCHOR=ARROWS,
COLOR=RGB(66 70 73), FONT='TREBUCHET MS', SIZE=9, SQUEEZE=ON,$
TYPE=REPORT, FONT='TREBUCHET MS', COLOR=RGB(151 43 153),$
TYPE=TITLE, COLOR='WHITE', BACKCOLOR=RGB(151 43 153), STYLE=-UNDERLINE,$
TYPE=HEADING, COLOR='WHITE', BACKCOLOR=RGB(151 43 153),$
TYPE=FOOTING, COLOR='WHITE', BACKCOLOR=RGB(151 43 153),$
TYPE=SUBTOTAL, COLOR=WHITE, BACKCOLOR=RGB(179 72 180),$
TYPE=SUBTOTAL, BY=2, BACKCOLOR=RGB(208 99 208),$
TYPE=SUBTOTAL, BY=3, BACKCOLOR=RGB(237 127 236),$
TYPE=GRANDTOTAL, COLOR='WHITE', BACKCOLOR=RGB(151 43 153), STYLE=BOLD,$
ENDSTYLE
END
```

The initial output shows only the top level BY field (REGION), as shown in the following image.

| | Dollar Sales | Unit Sales | Budget Dollars | Budget Units |
|---|---|---|---|---|
| ▸ Midwest | $11,400,665 | 905,045 | $11,194,373 | 907,107 |
| ▸ Northeast | $11,392,300 | 916,675 | $11,576,921 | 914,359 |
| ▸ Southeast | $11,710,379 | 935,232 | $11,807,971 | 942,247 |
| ▸ West | $11,652,946 | 932,039 | $11,641,513 | 930,781 |
| TOTAL | $46,156,290 | 3,688,991 | $46,220,778 | 3,694,494 |

Clicking the arrow next to the Midwest region opens the rows that show the states associated with that region, as shown in the following image.

| | Dollar Sales | Unit Sales | Budget Dollars | Budget Units |
|---|---|---|---|---|
| ▾ Midwest | $11,400,665 | 905,045 | $11,194,373 | 907,107 |
| ▸ IL | $3,924,401 | 307,581 | $3,866,856 | 310,071 |
| ▸ MO | $3,761,286 | 297,727 | $3,646,838 | 297,081 |
| ▸ TX | $3,714,978 | 299,737 | $3,680,679 | 299,955 |
| ▸ Northeast | $11,392,300 | 916,675 | $11,576,921 | 914,359 |
| ▸ Southeast | $11,710,379 | 935,232 | $11,807,971 | 942,247 |
| ▸ West | $11,652,946 | 932,039 | $11,641,513 | 930,781 |
| TOTAL | $46,156,290 | 3,688,991 | $46,220,778 | 3,694,494 |

Clicking the right arrow next to the state IL opens the rows that show the categories associated with that state, as shown in the following image.

| | Dollar Sales | Unit Sales | Budget Dollars | Budget Units |
|---|---|---|---|---|
| ▼ Midwest | $11,400,665 | 905,045 | $11,194,373 | 907,107 |
| ▼ IL | $3,924,401 | 307,581 | $3,866,856 | 310,071 |
| ► Coffee | $1,398,779 | 109,581 | $1,366,264 | 111,431 |
| ► Food | $1,522,847 | 118,068 | $1,480,855 | 118,363 |
| ► Gifts | $1,002,775 | 79,932 | $1,019,737 | 80,277 |
| ► MO | $3,761,286 | 297,727 | $3,646,838 | 297,081 |
| ► TX | $3,714,978 | 299,737 | $3,680,679 | 299,955 |
| ► Northeast | $11,392,300 | 916,675 | $11,576,921 | 914,359 |
| ► Southeast | $11,710,379 | 935,232 | $11,807,971 | 942,247 |
| ► West | $11,652,946 | 932,039 | $11,641,513 | 930,781 |
| TOTAL | $46,156,290 | 3,688,991 | $46,220,778 | 3,694,494 |

Clicking the right arrow next to the Coffee category shows the products associated with that category, as shown in the following image. This is the lowest level of the Accordion By Row report.

| | Dollar Sales | Unit Sales | Budget Dollars | Budget Units |
|---|---|---|---|---|
| ▼ Midwest | $11,400,665 | 905,045 | $11,194,373 | 907,107 |
| ▼ IL | $3,924,401 | 307,581 | $3,866,856 | 310,071 |
| ▼ Coffee | $1,398,779 | 109,581 | $1,366,264 | 111,431 |
| Espresso | $420,439 | 32,237 | $401,477 | 32,416 |
| Latte | $978,340 | 77,344 | $964,787 | 79,015 |
| ► Food | $1,522,847 | 118,068 | $1,480,855 | 118,363 |
| ► Gifts | $1,002,775 | 79,932 | $1,019,737 | 80,277 |
| ► MO | $3,761,286 | 297,727 | $3,646,838 | 297,081 |
| ► TX | $3,714,978 | 299,737 | $3,680,679 | 299,955 |
| ► Northeast | $11,392,300 | 916,675 | $11,576,921 | 914,359 |
| ► Southeast | $11,710,379 | 935,232 | $11,807,971 | 942,247 |
| ► West | $11,652,946 | 932,039 | $11,641,513 | 930,781 |
| TOTAL | $46,156,290 | 3,688,991 | $46,220,778 | 3,694,494 |

You can use the CONTROLCOLOR StyleSheet attribute on the SUBTOTAL line to specify the color of the arrows. The following syntax shows how to change the color of the arrows to purple.

```
TABLE FILE GGSALES
SUM DOLLARS/D8MC
UNITS/D8C
BUDDOLLARS/D8MC BUDUNITS/D8C
BY REGION
BY ST
BY CATEGORY
BY PRODUCT
ON TABLE SET EXPANDBYROWTREE ON
ON TABLE SET DROPBLNKLINE ON
```

```
ON TABLE SET AUTOFIT ON
ON TABLE PCHOLD FORMAT HTML
ON TABLE SET STYLE *
TYPE=REPORT, EBRT_ANCHOR=ARROWS,
COLOR=RGB(66 70 73), FONT='TREBUCHET MS', SIZE=9, SQUEEZE=ON,$
TYPE=REPORT, FONT='TREBUCHET MS', COLOR=RGB(151 43 153),$
TYPE=TITLE, COLOR='WHITE', BACKCOLOR=RGB(151 43 153), STYLE=-UNDERLINE,$
TYPE=HEADING, COLOR='WHITE', BACKCOLOR=RGB(151 43 153),$
TYPE=FOOTING, COLOR='WHITE', BACKCOLOR=RGB(151 43 153),$
TYPE=SUBTOTAL, COLOR=WHITE, BACKCOLOR=RGB(179 72 180),
CONTROLCOLOR=PURPLE,$
TYPE=SUBTOTAL, BY=2, BACKCOLOR=RGB(208 99 208),$
TYPE=SUBTOTAL, BY=3, BACKCOLOR=RGB(237 127 236),$
TYPE=GRANDTOTAL, COLOR='WHITE', BACKCOLOR=RGB(151 43 153), STYLE=BOLD,$
ENDSTYLE
END
```

The following output shows the lowest level of the Accordion By Row report, with purple arrows.

| | Dollar Sales | Unit Sales | Budget Dollars | Budget Units |
|---|---|---|---|---|
| ▼ Midwest | $11,400,665 | 905,045 | $11,194,373 | 907,107 |
| ▼ IL | $3,924,401 | 307,581 | $3,866,856 | 310,071 |
| ▼ Coffee | $1,398,779 | 109,581 | $1,366,264 | 111,431 |
| Espresso | $420,439 | 32,237 | $401,477 | 32,416 |
| Latte | $978,340 | 77,344 | $964,787 | 79,015 |
| ► Food | $1,522,847 | 118,068 | $1,480,855 | 118,363 |
| ► Gifts | $1,002,775 | 79,932 | $1,019,737 | 80,277 |
| ► MO | $3,761,286 | 297,727 | $3,646,838 | 297,081 |
| ► TX | $3,714,978 | 299,737 | $3,680,679 | 299,955 |
| ► Northeast | $11,392,300 | 916,675 | $11,576,921 | 914,359 |
| ► Southeast | $11,710,379 | 935,232 | $11,807,971 | 942,247 |
| ► West | $11,652,946 | 932,039 | $11,641,513 | 930,781 |
| TOTAL | $46,156,290 | 3,688,991 | $46,220,778 | 3,694,494 |

# Usage Notes for EXPANDBYROW and EXPANDBYROWTREE

- As of Release 8.2 Version 04, grids are supported with EXPANDBYROWTREE.
- The maximum length of a BY field value is 245 bytes.

- EXPANDBYROWTREE is not supported with OLAP. When both OLAP and EXPANDBYROWTREE are enabled, EXPANDBYROWTREE will be ignored. As a workaround, use EXPANDBYROW.
- EXPANDBYROWTREE is not supported with the AHTML output format. When using EXPANDBYROWTREE with an active report, EXPANDBYROWTREE will be ignored.
- When running an accordion summary report against a SQL Server Analysis Services (SSAS) cube data source, the PRINT command is used internally to retrieve the data, so that the report output displayed will be that of a detailed report, instead of a summary report. This is because the SSAS cube data source contains pre-aggregated data, and therefore SUM commands are internally changed to PRINT commands.

# Accordion By Row Tooltips

By default, EXPANDBYROW and EXPANDBYROWTREE reports display field information in tooltips activated when you hover the mouse over the values at each level of the tree. Since the column titles are not displayed above the tree control columns, as they would be in a standard HTML report, the field list for the tree is presented in the tooltip in the top-left corner of the report.

Pop-up field descriptions can also be enabled in Accordion By Row reports to present the field descriptions maintained within the Master File or DEFINE associated with the fields.

Titles can be customized by defining an AS name. To remove pop-up field descriptions from the expanding tree, define a blank AS name for the column title. In an Accordion By Row report, pop-up text boxes that display on mouse over present additional information about the fields and columns within the report. In standard Accordion reports, these pop-up text boxes display the column title or AS name for all of the BY values in the expandable tree.

As with standard HTML reports, the POPUPDESC parameter can be set ON to display field descriptions in these pop-up text boxes for all verb columns. Additionally, turning POPUPDESC ON will cause the BY field pop-up text to present the description value, if available.

The table below represents the order of precedence for descriptions displayed in tooltips when the EXPANDBYROW or EXPANDBYROWTREE setting is on.

| Existing Field Information | Pop-Up Description Off | Pop-Up Description On |
|---|---|---|
| Description | | 1 |
| AS Name | 1 | 2 |
| Column Title | 2 | 3 |
| Field Name | 3 | 4 |

The color and size presentation of the tooltips and pop-up descriptions have been standardized for a uniform look throughout all reports.

# Creating an Accordion By Row Report Without Pop-Up Field Descriptions

The following example demonstrates how pop-up text will display for the standard Accordion report in the default presentation, which means pop-up descriptions are not turned on.

```
DEFINE FILE GGSALES.
UNITS/D12C DESCRIPTION ''=UNITS;
TOTSALES/D12CM DESCRIPTION 'DOLLARS*UNITS'=DOLLARS*UNITS;
END
TABLE FILE GGSALES
SUM DOLLARS UNITS AS 'Units'
TOTSALES AS 'Total Sales'
BY REGION
BY CATEGORY AS ''
BY PRODUCT AS 'Product AS Name'
ON TABLE SET EXPANDBYROW ALL
ON TABLE SET DROPBLNKLINE ALL
ON TABLE SET STYLE *
TYPE=REPORT,
    COLOR=RGB(66 70 73),
    FONT='TREBUCHET MS',
    SIZE=9,
    SQUEEZE=ON,
    GRID=OFF,
```

```
$
TYPE=TITLE,
    BACKCOLOR=RGB(102 102 102),
    COLOR=RGB(255 255 255),
    STYLE=-UNDERLINE+BOLD,
$
TYPE=DATA,
    BACKCOLOR=RGB(255 255 255),
$
TYPE=SUBTOTAL,
    BACKCOLOR=RGB(200 200 200),
    STYLE=BOLD,
 $
TYPE=GRANDTOTAL,
    BACKCOLOR=RGB(66 70 73),
    COLOR=RGB(255 255 255),
    STYLE=BOLD,
$
ENDSTYLE
END
```

Fields as defined in the Master File:

```
FIELD=CATEGORY, ALIAS=E02, FORMAT=A11, INDEX=I, TITLE='Category',
   DESC='Product category',$
FIELD=PRODUCT, ALIAS=E04, FORMAT=A16, TITLE='Product', DESC='Product
name',$
 FIELD=REGION, ALIAS=E05, FORMAT=A11, INDEX=I, TITLE='Region',
   DESC='Region code',$
FIELD=UNITS, ALIAS=E10, FORMAT=I08, TITLE='Unit Sales',
   DESC='Number of units sold',$
```

The following image shows the pop-up description for the tree control, located at the top-left corner of the table, displaying the list of column titles or AS name for the given BY column within the underlying tree control.

| | Dollar Sales | Units | Total Sales |
|---|---|---|---|
| ⊟ Midwest | Region, , Product AS Name | 045 | $12,712,781,111 |
| ⊟ Coffee | 4178513 | 332,777 | $4,949,425,049 |
| Espresso | 1294947 | 101,154 | $1,473,777,907 |
| Latte | 2883566 | 231,623 | $3,475,647,142 |
| ⊟ Food | 4338271 | 341,414 | $5,339,526,754 |
| Biscotti | 1091727 | 86,105 | $1,351,488,188 |
| Croissant | 1751124 | 139,182 | $2,183,132,532 |
| Scone | 1495420 | 116,127 | $1,804,906,034 |

The following image shows the pop-up text that will display when the mouse hovers over any of the top level BY values that do not have an AS name, but do have a defined description and title. In this case, the column titles will display.

| | Region | Units | Total Sales |
|---|---|---|---|
| ⊟ Midwest | 11400665 | 905,045 | $12,712,781,111 |
| ⊟ Coffee | 4178513 | 332,777 | $4,949,425,049 |
| Espresso | 1294947 | 101,154 | $1,473,777,907 |
| Latte | 2883566 | 231,623 | $3,475,647,142 |

The pop-up text for a top level BY value that has an AS name and a defined description will display the AS name.

| | Dollar Sales | Units | Total Sales |
|---|---|---|---|
| ⊟ Midwest | 11400665 | 905,045 | $12,712,781,111 |
| ⊟ Coffee | 4178513 | 332,777 | $4,949,425,049 |
| Espresso | Product AS Name | 154 | $1,473,777,907 |
| Latte | 2883566 | 231,623 | $3,475,647,142 |

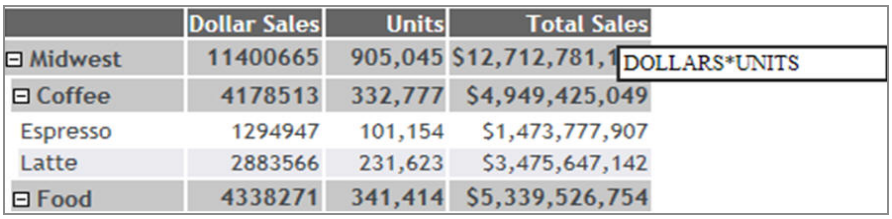
# Creating an Accordion By Row Report With Pop-Up Field Descriptions

The following example demonstrates how pop-up text displays with pop-up descriptions turned on.

```
SET POPUPDESC = ON
DEFINE FILE GGSALES.
UNITS/D12C DESCRIPTION ''=UNITS;
TOTSALES/D12CM DESCRIPTION 'DOLLARS*UNITS'=DOLLARS*UNITS;
END
```

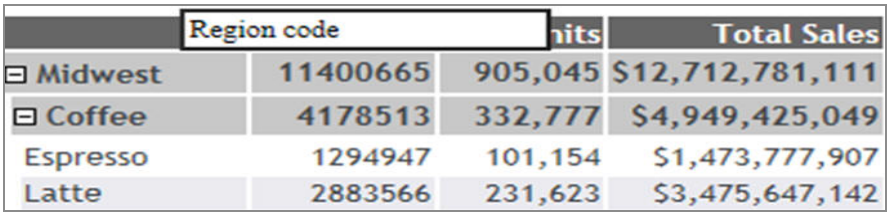
```
TABLE FILE GGSALES
SUM DOLLARS UNITS AS 'Units'
TOTSALES AS 'Total Sales'
BY REGION
BY CATEGORY AS ''
BY PRODUCT AS 'Product AS Name'
ON TABLE SET EXPANDBYROW ALL
ON TABLE SET DROPBLNKLINE ALL
ON TABLE SET STYLE *
INCLUDE=IBFS:/FILE/IBI_HTML_DIR/javaassist/intl/EN/ENIADefault_
combine.sty,$
ENDSTYLE
END
```

As with all HTML reports, setting POPUPDESC=ON will activate a text box that displays the field descriptions for each of the verb column titles.




Additionally, with POPUPDESC set ON, the field description will be presented for the BY elements within the tree. If no field description is defined, the column title or AS name will display.

With POPUPDESC=ON, the defined description will display in the pop-up text, as shown in the following image.




The image that shows the description for the BY value appears in the pop-up text even though an AS name has been given to this field.

For additional information on pop-up field descriptions with HTML reports, see Displaying Report Data.

# Accordion By Row With NOPRINT

Hidden, NOPRINT BY fields, can be used in Accordion by Row reports. They allow the calculation of values for, and the sorting of data by, fields which are hidden. NOPRINT sort fields are included in the internal matrix and affect the sorting and aggregation of data in the Accordion report, even though they are not displayed in the report. These NOPRINT sort fields are defined using the BY *sortfield* NOPRINT phrase.

**Note:**

- Hidden or NOPRINT fields are not displayed in tooltips or pop-up descriptions.
- When using empty or blank AS names, if spaces are added between the quotation marks, for example, BY *fieldname* ' ', the spaces will be removed and the functionality will be the same as BY *fieldname* ''.

# Creating an Accordion By Row Report With an Explicit NOPRINT

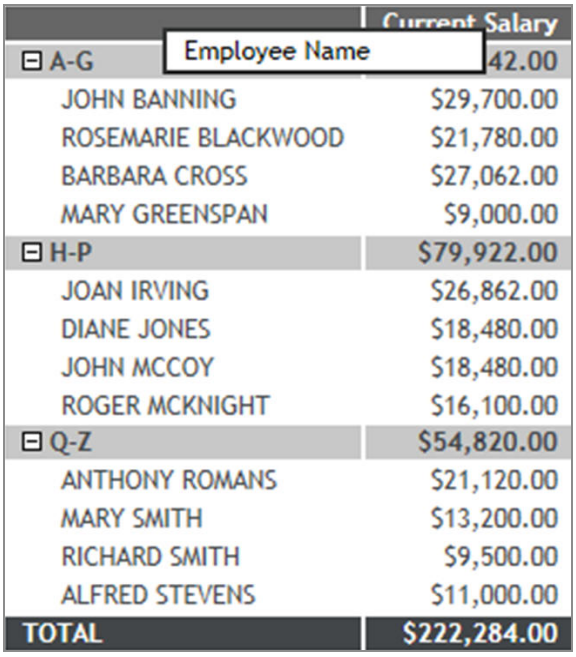
The following request against the EMPLOYEE data source shows salary data for employees, grouped in categories. The output is sorted by the virtual field NAME_SORT, which concatenates the LAST_NAME and FIRST_NAME fields. The NAME_SORT field is hidden using NOPRINT on the sort phrase. To display employee names, the NAME_DISPLAY virtual field is created, which concatenates the FIRST_NAME field and the LAST_NAME field.

```
DEFINE FILE EMPLOYEE
NAME_SORT/A50=EMPLOYEE.EMPINFO.LAST_NAME || ( ', ' |
EMPLOYEE.EMPINFO.FIRST_NAME );
NAME_DISPLAY/A57=EMPLOYEE.EMPINFO.FIRST_NAME | EMPLOYEE.EMPINFO.LAST_
NAME;
NAME_CODE/A1=EDIT(LAST_NAME, '9');
NAME_GROUP/A10=IF NAME_CODE LE 'G' THEN 'A-G' ELSE IF NAME_CODE LE 'P'
 THEN 'H-P' ELSE 'Q-Z';
END
TABLE FILE EMPLOYEE
SUM
EMPLOYEE.EMPINFO.CURR_SAL AS 'Current Salary'
BY NAME_GROUP AS 'Alphabetical Group'
BY LOWEST NAME_SORT NOPRINT
BY LOWEST NAME_DISPLAY AS 'Employee Name'
```

```
ON TABLE SET PAGE-NUM NOLEAD
ON TABLE SET EXPANDBYROW 2
ON TABLE PCHOLD FORMAT HTML
ON TABLE SET DROPBLNKLINE ON
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
TYPE=REPORT,
    COLOR=RGB(66 70 73),
    FONT='TREBUCHET MS',
    SIZE=9,
    SQUEEZE=ON,
    GRID=OFF,
$
```

```
TYPE=TITLE,
    BACKCOLOR=RGB(102 102 102),
    COLOR=RGB(255 255 255),
    STYLE=-UNDERLINE+BOLD,
$
TYPE=DATA,
    BACKCOLOR=RGB(255 255 255),
$
TYPE=SUBTOTAL
    BY=1,
    BACKCOLOR=RGB(200 200 200),
    STYLE=BOLD,
$
TYPE=SUBTOTAL,
    BY=2,
    BACKCOLOR=RGB(200 220 220),
    STYLE=BOLD,
$
TYPE=SUBTOTAL,
    BY=3,
    BACKCOLOR=RGB(220 220 200),
    STYLE=BOLD,
$
TYPE=GRANDTOTAL,
    BACKCOLOR=RGB(66 70 73),
    COLOR=RGB(255 255 255),
    STYLE=BOLD,
$
ENDSTYLE
END
```

If you hover the mouse over any value in the NAME_DISPLAY column, the tooltip will display the AS name, Employee Name, as shown in the following image.




# Differences Between Reformatted and Redefined BY Fields

When a sort field is dynamically reformatted, both the original and reformatted fields are placed in the internal matrix. The original field is not displayed, but is used to sort or aggregate values.

When using a redefined field, the new column is used to display, sort, or aggregate values.

# Creating an Accordion By Row Report With Dynamically Reformatted BY Fields

The following request against the EMPLOYEE data source shows employees and salaries by year of hire. The display fields, HIRE_DATE and CURR_SAL, are sorted by HIRE_DATE reformatted with the format, YY, and by the virtual field NAME_DISPLAY (employee name).

```
DEFINE FILE EMPLOYEE
NAME_SORT/A50=EMPLOYEE.EMPINFO.LAST_NAME || ( ', ' |
 EMPLOYEE.EMPINFO.FIRST_NAME ); NAME_DISPLAY/A57=EMPLOYEE.EMPINFO.FIRST_
NAME | EMPLOYEE.EMPINFO.LAST_NAME;NAME_CODE/A1=EDIT(LAST_NAME, '9');
NAME_GROUP/A10=IF NAME_CODE LE 'G'
 THEN 'A-G' ELSE IF NAME_CODE LE  'P' THEN 'H-P' ELSE 'Q-Z';
END
TABLE FILE EMPLOYEE
SUM
HIRE_DATE
EMPLOYEE.EMPINFO.CURR_SAL
BY HIRE_DATE/YY
BY LOWEST NAME_DISPLAY AS 'Employee Name'
ON TABLE SET PAGE-NUM NOLEAD
WHERE HIRE_DATE LT '820101';
ON TABLE SET EXPANDBYROW ALL
ON TABLE PCHOLD FORMAT HTML
ON TABLE SET DROPBLNKLINE ON
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
INCLUDE=IBFS:/FILE/IBI_HTML_DIR/javaassist/intl/EN/ENIADefault_
combine.sty,$
ENDSTYLE
END
```

In the report generated, there are multiple expandable groups or nodes for the same year, 1981. This occurs because the reformatted values are used for display, but the original values are still used for sorting and aggregating. In this report, 1981 is the common value used to represent two different dates, 81/07/01 and 81/11/02. The sorting takes place on the date, not on the year.

| | HIRE_DATE | CURR_SAL |
|---|---|---|
| ⊟ 1980 | | $11,000.00 |
| ALFRED STEVENS | 80/06/02 | $11,000.00 |
| ⊟ 1981 | | $31,680.00 |
| JOHN MCCOY | 81/07/01 | $18,480.00 |
| MARY SMITH | 81/07/01 | $13,200.00 |
| ⊟ 1981 | | $27,062.00 |
| BARBARA CROSS | 81/11/02 | $27,062.00 |
| TOTAL | | $69,742.00 |

# Creating an Accordion By Row Report With Redefined BY Fields

To sort your data on the reformatted field values instead of the original field values, create a virtual field containing the BY value with the new format applied. This will allow you to display, sort, and aggregate on the new redefined BY value.

```
DEFINE FILE EMPLOYEE
NAME_SORT/A50=EMPLOYEE.EMPINFO.LAST_NAME || ( ', ' |
EMPLOYEE.EMPINFO.FIRST_NAME );
NAME_DISPLAY/A57=EMPLOYEE.EMPINFO.FIRST_NAME | EMPLOYEE.EMPINFO.LAST_
NAME;
NAME_CODE/A1=EDIT(LAST_NAME, '9');
NAME_GROUP/A10=IF NAME_CODE LE 'G' THEN 'A-G' ELSE IF NAME_CODE LE 'P'
 THEN 'H-P' ELSE 'Q-Z';
DATE_HIRED/YY=HIRE_DATE;
END
TABLE FILE EMPLOYEE
SUM EMPLOYEE.EMPINFO.CURR_SAL
BY DATE_HIRED
BY LOWEST NAME_DISPLAY AS 'Employee Name'
ON TABLE SET PAGE-NUM NOLEAD
WHERE HIRE_DATE LT '820101';
ON TABLE SET EXPANDBYROW ALL
ON TABLE PCHOLD FORMAT HTML
ON TABLE SET DROPBLNKLINE ON
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
INCLUDE=IBFS:/FILE/IBI_HTML_DIR/javaassist/intl/EN/ENIADefault_
combine.sty,$
ENDSTYLE
END
```

In the above request, the verb fields, HIRE_DATE and CURR_SAL are sorted by the DEFINE field, DATE_HIRED. The result is a report sorted and aggregated by the redefined date values, as shown in the following image.

| | HIRE_DATE | CURR_SAL |
|---|---|---|
| ⊟ 1980 | | $11,000.00 |
| ALFRED STEVENS | 80/06/02 | $11,000.00 |
| ⊟ 1981 | | $58,742.00 |
| BARBARA CROSS | 81/11/02 | $27,062.00 |
| JOHN MCCOY | 81/07/01 | $18,480.00 |
| MARY SMITH | 81/07/01 | $13,200.00 |
| TOTAL | | $69,742.00 |

# Usage for SET EXPANDBYROW and EXPANDBYROWTREE

The following features are not supported with Accordion By Row reports:

- HFREEZE
- HTML Table of Contents
- On Demand Paging
- TABLEF
- OVER
- ROW-TOTAL
- ON field RECAP
- FOR
- IN
- SEQUENCE
- PAGENUM
- SUBHEAD
- BORDER
- MULTILINES
- BY HIERARCHY

- Compound Reports
- Multiple requests in a single HTML report

In certain scenarios, a blank line is generated before a subtotal on the report output. You can eliminate these automatic blank lines by issuing the SET DROPBLNKLINE=ON command.

# Creating an Accordion By Column Report

Accordion By Column reports do not automatically display entire report rows. A plus sign appears to the left of each data value in the column under the highest-level sort heading. For data associated with lower-level sort fields, a plus sign is placed to the left of each data value, but the data does not appear unless manually expanded. Data values of the lowest-level sort field are not expandable. To expand your view of data for any expandable sort field, click a plus sign and all data associated with the next lower-level sort field appears. When you expand a data value under the next to lowest sort heading, all of the remaining associated data values in the report appear. This type of Accordion Report is generated using the SET EXPANDABLE command.

# Support for Accordion By Column Reports

The following commands are not supported when using Accordion Reports:

```
BORDER, COLUMN, FOR, IN, OVER, PAGE-NUM, ROW-TOTAL, TOTAL
```

Data Visualization, HTML BYTOC, OLAP, On Demand Paging (WebFOCUS Viewer), column freezing, and the ReportCaster burst feature are also not supported with Accordion Reports.

# Create Accordion by Column Reports

To enable Accordion By Column Reports, specify the following

```
ON TABLE SET EXPANDABLE = {ON|OFF}
```

where:

**ON**

Enables Accordion By Column Reports.

**OFF**

Disables Accordion By Column Reports. OFF is the default value.

# Creating an Accordion By Column Report

This example shows how to use an EXPANDABLE command to create an Accordion By Column Report.

```
TABLE FILE GGSALES
SUM UNITS DOLLARS
BY REGION BY ST BY CITY BY CATEGORY
ON TABLE SET EXPANDABLE ON
END
```

The following image shows an Accordion by Column Report which displays all data associated with the first-level sort field, Region, by default. The expanded data values you see are the result of a report user clicking plus signs to the left of specific first, second- and third-level sort fields after the report is generated.

| Region | State | City | Category | Unit Sales | Dollar Sales |
|---|---|---|---|---|---|
| ⊞ Midwest | | | | | |
| ⊟ Northeast | ⊞ CT | | | | |
| | ⊞ MA | | | | |
| | ⊟ NY | ⊟ New York | Coffee | 116659 | 1459160 |
| | | | Food | 125473 | 1555165 |
| | | | Gifts | 70194 | 887940 |
| ⊞ Southeast | | | | | |
| ⊟ West | ⊟ CA | ⊟ Los Angeles | Coffee | 109082 | 1383924 |
| | | | Food | 110417 | 1381698 |
| | | | Gifts | 78571 | 1006381 |
| | | ⊞ San Francisco | | | |
| | ⊞ WA | | | | |

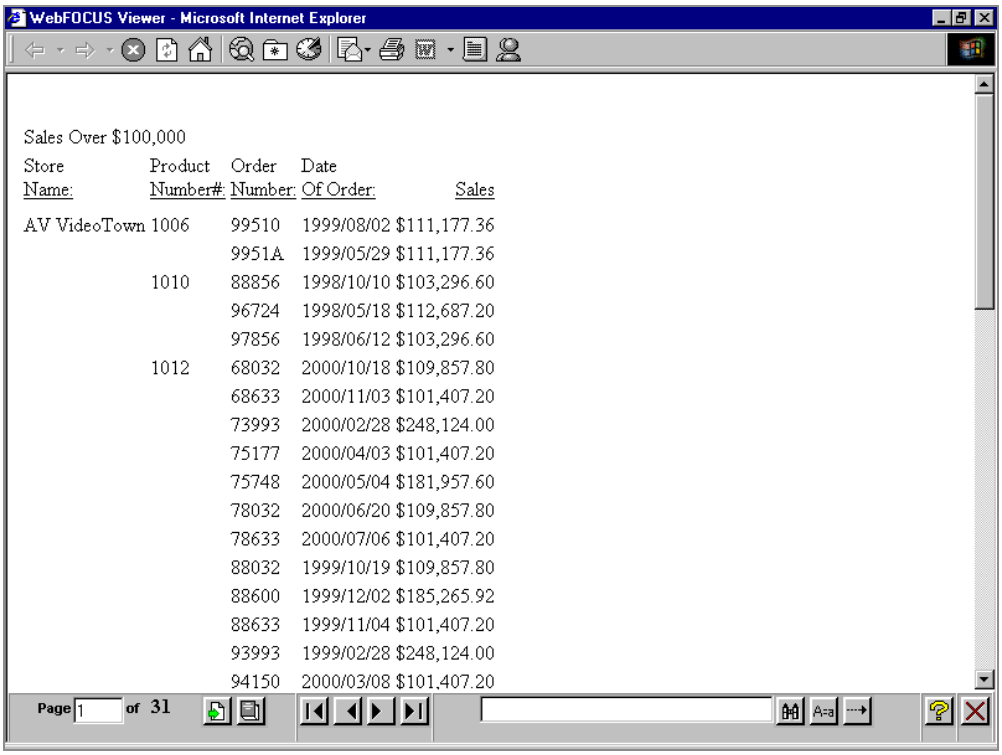
# Navigating a Multi-Page Report With the WebFOCUS Viewer

Normally, a web server returns an entire HTML report to a browser, which waits for all of the report before displaying it. On-demand paging, implemented in the WebFOCUS Viewer, returns one page of a report to a browser instead of the entire report. The web server holds the remaining pages until the user requests them. This feature shortens the time the user waits to see the first page and is especially useful for long reports. It also contains navigational features that enable you to move quickly among the pages of the report. Viewer" />

The WebFOCUS Viewer does not support the table of contents (BYTOC) option because the table of contents option requires all of the data to be on the same HTML page, even though it then filters and only exposes part of the page at a time. The WebFOCUS Viewer splits the output into many pages, only one of which is downloaded to the browser at a time. Accordion reports are also not supported with the WebFOCUS Viewer.

Note that you can use the HFREEZE StyleSheet option to display column titles on every page of output returned by the WebFOCUS Viewer.

The following is page 1 of a 31-page report displayed in the WebFOCUS Viewer.




Notice that the WebFOCUS Viewer is divided into two frames:

- The Report Frame is the larger upper frame that contains one page of a report.
- The Control Frame contains the controls used to navigate the report and to search for a string in the report. The navigational controls allow you to display the next or previous page, the first or last page, or a specific page.

  **Note:** You can control whether certain buttons display using SET commands. For more information, see *Controlling Button Display on the WebFOCUS Viewer* in the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

# Usage Notes for HTMLARCHIVE With the WebFOCUS Viewer

WebFOCUS interactive reporting features must have a connection to the WebFOCUS client in order to access the components required to operate successfully.

HTMLARCHVE can be used to create self-contained HTML pages with user-defined images when client access is not available.

To generate HTML pages containing user-defined images that can operate interactively, use one of the following commands:

```
SET HTMLEMBEDIMG=ON
SET HTMLARCHIVE=ON
```

Define BASEURL to point directly to the host machine where these files can be accessed using the following syntax:

```
SET BASEURL=http://{hostname:portnumber}
```

For more information on SET BASEURL, see Specifying a Base URL.

# Navigate in the WebFOCUS Viewer

The WebFOCUS Viewer Control Panel offers several ways to view pages in your report: Viewer" />

- To display the previous or the next page in sequence, click the **Previous** or **Next** arrow.
- To display the first or last page of the report, click the **First Page** or the **Last Page** arrow.
- To display a specific page:
  1. Enter a page number in the page input box.
  2. Click the **Go to Page** button.
- To download the entire report as a single document, click the **All Pages** button. The WebFOCUS Viewer displays the entire report without the Viewer Control Panel.

  You can return to viewing a single page of your report by clicking the **Back** button on the browser toolbar.
- To locate a text string, enter the text in the input box and click the **Find** button.

  To limit your search by case, toggle the **A=a** button.

  To control the direction of your search, toggle the **-->/<--** button.

# Using the WebFOCUS Viewer Search Option

The Viewer Control Panel contains controls that offer several ways to search your report. Using the Viewer search controls, you can select a string of information, such as a phrase that occurs in your report or a group of numbers, and search for each occurrence of that string. You can further customize your search by matching capitalization of words exactly (a case-sensitive search) or by controlling the direction of your search (either forward or backward from your starting point in the report). Viewer" /> Viewer search option" />

When using the Search option:

1. The first search starts at top of the document.
2. The second and subsequent searches start from the last successfully found search string in the direction selected in the Viewer Control Panel. Note that the direction control is to the right of the Search entry field used to specify a search string.

# Linking Report Pages

With a StyleSheet, you can insert one or more navigational hyperlinks in a multi-page HTML report. This feature makes it easy for you to link consecutive report pages together without creating individual hyperlinks for each page.  StyleSheets" /> StyleSheets" />

You can define any report component as a hyperlink.

# Link Report Pages

Use the following syntax in an HTML report

```
URL=#_destination, $
```

where:

**destination**

Is one of the following:

`#_next` goes to the top of the next report page.

`#_previous` goes to the top of the previous report page.

`#_top` goes to the top of the current report page.

`#_start` goes to the first page of the report.

`#_end` goes to the last page of the report.

**Note:** In order to use these destinations in a self service applications, the following command must be issued at the beginning of the FOCEXEC:

```
SET BASEURL=''
```

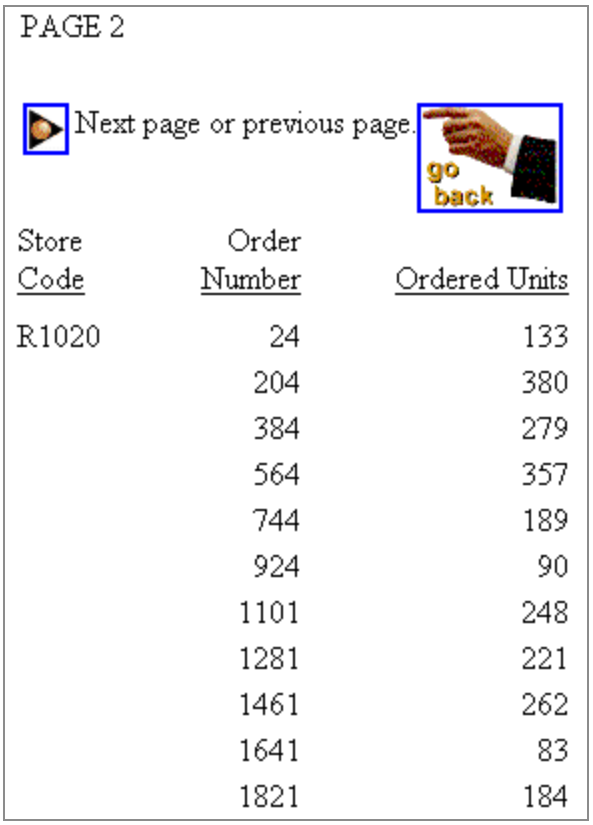
# Linking Report Pages Through Images in a Heading

This request displays two images in the page heading of a long report. It creates a link between BULLET.GIF and the next page of the report, and GOBACK.GIF and the previous page of the report.

```
TABLE FILE GGORDER
ON TABLE SUBHEAD
"COFFEE GRINDER SALES BY STORE"
" "
HEADING
"Next page or previous page."
PRINT QUANTITY AS 'Ordered Units' BY STORE_CODE BY PRODUCT NOPRINT
BY ORDER_NUMBER
WHERE PRODUCT EQ 'Coffee Grinder'
ON STORE_CODE PAGE-BREAK
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=TABHEADING, STYLE=BOLD,$
TYPE=HEADING, IMAGE=/IBI_APPS/IBI_HTML/GGDEMO/BULLET, URL=#_next,
IMAGEALIGN=LEFT,$
TYPE=HEADING, IMAGE=/IBI_APPs/IBI_HTML/GGDEMO/GOBACK, URL=#_previous,
IMAGEALIGN=RIGHT,$
ENDSTYLE
END
```

The images display in each page heading.

Click the image on the left of page 1 to display page 2.


PAGE 2

Next page or previous page.

go back

| Store Code | Order Number | Ordered Units |
|---|---|---|
| R1020 | 24 | 133 |
| | 204 | 380 |
| | 384 | 279 |
| | 564 | 357 |
| | 744 | 189 |
| | 924 | 90 |
| | 1101 | 248 |
| | 1281 | 221 |
| | 1461 | 262 |
| | 1641 | 83 |
| | 1821 | 184 |

Click the "go back" image on page 2 to redisplay page 1.

PAGE 1

COFFEE GRINDER SALES BY STORE

Next page or previous page.

go back

| Store Code | Order Number | Ordered Units |
|---|---|---|
| R1019 | 9 | 265 |
| | 189 | 148 |
| | 369 | 382 |
| | 549 | 325 |
| | 729 | 381 |
| | 909 | 41 |
| | 1086 | 295 |
| | 1266 | 221 |

For details on including and positioning images in a report, see Laying Out the Report Page.

Note that if this procedure is part of a self-service application, the following command must be issued at the start of the procedure:

```
SET BASEURL = ''
```

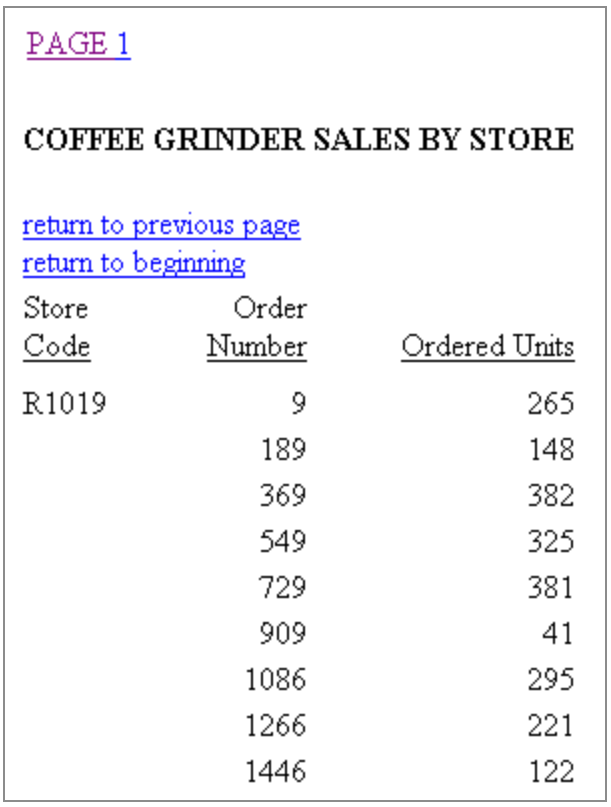
# Linking Pages Through Page Number and Heading Elements

This request creates hyperlinks from the page number to the next page in the report, and from the text of the page heading, which appears at the top of every report page, back to the previous page or to the first page.

```
TABLE FILE GGORDER
ON TABLE SUBHEAD
"COFFEE GRINDER SALES BY STORE"
```

```
" "
HEADING
"return to previous page"
"return to beginning"
PRINT QUANTITY AS 'Ordered Units' BY STORE_CODE BY PRODUCT NOPRINT
BY ORDER_NUMBER
WHERE PRODUCT EQ 'Coffee Grinder'
ON STORE_CODE PAGE-BREAK
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=TABHEADING, STYLE=BOLD,$
TYPE=PAGENUM, URL=#_next, $
TYPE=HEADING, LINE=1, URL=#_previous, $
TYPE=HEADING, LINE=2, URL=#_start, $
ENDSTYLE
END
```

The first page looks as follows:



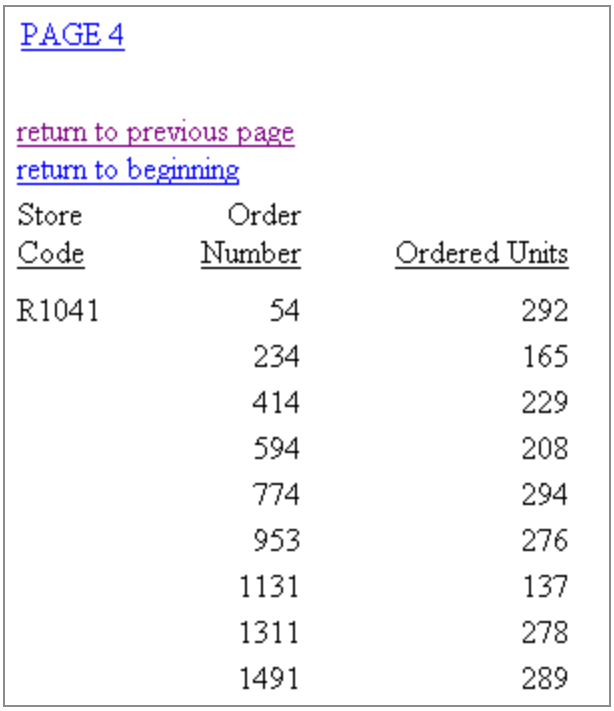
PAGE 1

**COFFEE GRINDER SALES BY STORE**

return to previous page
return to beginning

| Store Code | Order Number | Ordered Units |
|---|---|---|
| R1019 | 9 | 265 |
| | 189 | 148 |
| | 369 | 382 |
| | 549 | 325 |
| | 729 | 381 |
| | 909 | 41 |
| | 1086 | 295 |
| | 1266 | 221 |
| | 1446 | 122 |

Click the page number three times to move to PAGE 4.



PAGE 4

return to previous page
return to beginning

| Store Code | Order Number | Ordered Units |
|---|---|---|
| R1041 | 54 | 292 |
| | 234 | 165 |
| | 414 | 229 |
| | 594 | 208 |
| | 774 | 294 |
| | 953 | 276 |
| | 1131 | 137 |
| | 1311 | 278 |
| | 1491 | 289 |

Click **previous page** to return to PAGE 3. Click **return to beginning** to go directly to PAGE 1.

Note that if this procedure is part of a self-service application, the following command must be issued at the start of the procedure:

```
SET BASEURL = ''
```

# Bursting Reports Into Multiple HTML Files

Bursting separates a single report into multiple HTML files based on the value of the first sort field in your report.

## Bursting Reports Overview

When bursting separates a single report into multiple HTML files, each file contains all the requested information for one specific value of the sort field. By providing direct access to different sections of your report, this technique enables you to:

- Provide easier navigation of large reports. Bursting automatically creates an index file with direct links to each of the resulting files.
- Tailor the distribution of your report so that recipients can easily navigate to the section they need.
- Use standard heading and footing commands to label the index page and/or each of the resulting report files.

## Burst Reports Into Multiple HTML Files

```
ON sortfield PCSEND LOCATION dir [AS burstname] FORMAT HTML
```

where:

**sortfield**

Specifies the sort field based upon which bursting will occur. Each burst file will contain report output for only one sort group.

You can burst reports based on the value of the first sort field only. You cannot burst reports based on the value of subsequent sort fields.

You can burst a report into a maximum of 10,000 separate files. Therefore, you can burst a report only if the number of individual values of the first sort field does not exceed 10,000.

**PCSEND**

Initiates bursting. You can only use one PCSEND command in a request.

**dir**

Specifies the location on the web server where the HTML index file and report files are stored. The LOCATION parameter is required and must specify a directory from which the web server reads HTML files. There is no default.

On UNIX, Windows, and OpenVMS platforms, the directory value must specify a fully qualified directory path.

**Note for z/OS Web390 users:** On z/OS platforms, the directory value must specify the ddname of an allocated PDS. No dynamic allocation of datasets is provided. The PDS is allocated to a ddname other than the Web390 standard WWWHTM. The alternate ddname must be WWW*xxx*, where *xxx* are any three alphanumeric characters. The Web390 web server requires an entry in its mime table to recognize the allocated PDS as having HTML output.

If the LOCATION parameter specifies an invalid directory or specifies a directory that cannot be written to, an error message is returned.

**burstname**

Specifies the name of the HTML index file, which contains a list of hyperlinks to the bursted HTML report files. The hyperlinks to the bursted HTML report files will be numbered from 0 to 9999. If no file name is specified for the HTML index file, the default name is HOLD.

Each bursted HTML report file will use the first four characters of the index file name, followed by numerics 0000 through 9999.

**Note:** The report request can contain display fields with missing values. The report request can also contain NOPRINT fields. For details, see Handling Records With Missing Field Values.

# Rules for Headings and Footings on Index Pages and Bursted Reports

- To include a heading or footing on the HTML index page, use the commands:

  ```
  ON TABLE SUBHEAD
  ```

  and

  ```
  ON TABLE SUBFOOT
  ```

  These headings and footings can contain embedded fields. The heading or footing is not included in the HTML report output pages. Default styling is applied to the HTML index page.

- To include a standard heading or footing on all HTML report output pages, use the commands:

  ```
  HEADING
  ```

  and

  ```
  FOOTING
  ```

  These headings and footings can contain embedded fields. Default styling is applied to the HTML report output pages.

- To include headings and footings that change each time the sortfield changes, use the commands:

  ```
  ON sortfield SUBHEAD
  ```

  and

  ```
  ON sortfield SUBFOOT
  ```

  These subheadings or subfootings can include embedded fields, such as the sortfield used in the PCSEND command. Default styling is applied to the HTML report output pages.

For details on including heading and footings in reports, see Using Headings, Footings, Titles, and Labels.

# Bursting a Report

The following report procedure creates an HTML report output file for each different REGION value in the GGSALES data source. The report output files are named test0000.html, test0001.html, test0002.html, and so forth. The HTML index page is named test.html and contains a hyperlink for each REGION data value. The directory you select depends on where WebFOCUS is installed. In this example, the index page is stored in the directory e:\ibi\WebFOCUS82\temp.

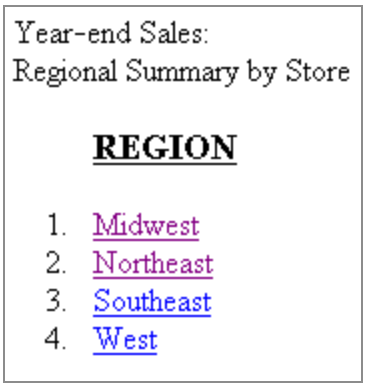
```
TABLE FILE GGSALES
HEADING
"Regional Report"
SUM UNITS AND DOLLARS
BY REGION BY STCD BY CATEGORY
ON TABLE SET PAGE NOPAGE
ON TABLE SUBHEAD
"Year-end Sales:"
"Regional Summary by Store"
ON REGION PCSEND LOCATION E:\IBI\WebFOCUS82\temp AS TEST FORMAT HTML
END
```

After running this request, no report output is returned, but the following message displays if the request was successful:

```
The bursted files were successfully created.
```

Separate HTML files are created for each value of the major sort field REGION and are stored in the location specified in the request.

The HTML index page created by the procedure follows:




Selecting the Midwest hyperlink displays the following HTML report:

| Regional Report | | | | |
|---|---|---|---|---|
| Region | Store ID | Category | Unit Sales | Dollar Sales |
| Midwest | R1019 | Coffee | 113253 | 1393610 |
| | | Food | 107615 | 1351523 |
| | | Gifts | 78869 | 969845 |
| | R1020 | Coffee | 109581 | 1398779 |
| | | Food | 118068 | 1522847 |

| | | | | |
|---|---|---|---|---|
| | | Gifts | 79932 | 1002775 |
| | R1250 | Coffee | 109943 | 1386124 |
| | | Food | 115731 | 1463901 |
| | | Gifts | 72053 | 911261 |

Notice that the headings specified in the ON TABLE SUBHEAD command are displayed on the HTML index page. See Bursting Reports Overview.

# Handling Records With Missing Field Values

Missing data is defined as data that is missing from a report because it is not relevant or does not exist in the data source. Report output that involves averaging and counting calculations or the display of parent segment instances may be affected by missing data. Data can be missing from reports and calculations for the following reasons:

- Data is not relevant to a particular row and column in a report. See Irrelevant Report Data.
- A field in a segment instance does not have a data value. See Missing Field Values.
- A parent segment instance does not have child instances (missing segment instances). See Handling a Missing Segment Instance.

**Note:** To run the examples in this topic, you must run the stored procedures EMPMISS and SALEMISS to add missing data to the EMPLOYEE and SALES data sources, respectively.

## Irrelevant Report Data

Data can be missing from a report row or column because it is not relevant. The missing or inapplicable value is indicated by the NODATA default character, a period (.).

**Tip:** You may specify a more meaningful NODATA value by issuing the SET NODATA command (see Setting the NODATA Character String).

## Irrelevant Report Data

The following request shows how the default NODATA character displays missing data in a report.

```
TABLE FILE EMPLOYEE
PRINT CURR_SAL
BY LAST_NAME
BY FIRST_NAME
```

```
ACROSS DEPARTMENT
END
```

The output is:

| LAST_NAME | FIRST_NAME | DEPARTMENT MIS | PRODUCTION |
|---|---|---|---|
| BANNING | JOHN | . | $29,700.00 |
| BLACKWOOD | ROSEMARIE | $21,780.00 | . |
| CROSS | BARBARA | $27,062.00 | . |
| GREENSPAN | MARY | $9,000.00 | . |
| IRVING | JOAN | . | $26,862.00 |
| JONES | DIANE | $18,480.00 | . |
| MCCOY | JOHN | $18,480.00 | . |
| MCKNIGHT | ROGER | . | $16,100.00 |
| ROMANS | ANTHONY | . | $21,120.00 |
| SMITH | MARY | $13,200.00 | . |
| | | . | $9,050.00 |
| STEVENS | ALFRED | . | $11,000.00 |

The salary for an employee working in the production department displays in the PRODUCTION column. The salary for an employee working in the MIS department displays in the MIS column. The corresponding value in the PRODUCTION or MIS column, respectively, is missing because the salary displays only under the department where the person is employed.

# Missing Field Values

Missing values within segment instances occur when the instances exist, but some of the fields lack values.

When fields in instances lack values, numeric fields are assigned the value 0, and alphanumeric fields, the value blank. These default values appear in reports and are used in all calculations performed by the SUM and COUNT display commands, DEFINE commands, and prefix operators such as MAX. and AVE.

To prevent the use of these default values in calculations (which might then give erroneous results), you can add the MISSING attribute to the field declaration in the Master File, for either a real or a virtual field. When the MISSING attribute is set to ON, the missing values are marked with a special internal code to distinguish them from blanks or zeros, and the missing values are ignored in calculations. In reports, the internal code is represented by the SET NODATA value, a period (.), by default. See Setting the NODATA Character String.

For example, missing data for a field in a segment instance may occur when the data values are unknown, as in the following scenario. Suppose that the employees recorded in the EMPLOYEE data source are due for a pay raise by a certain date, but the amount of the raise has not yet been determined. The company enters the date for each employee into the data source without the salary amounts; the salaries will be entered later. Each date is an individual instance in the salary history segment, but the new salary for each date instance is missing. Suppose further that a report request averages the SALARY field (SUM AVE.SALARY). The accuracy of the resulting average depends on whether the missing values for the SALARY field are treated as zeros (MISSING=OFF), or as internal codes (MISSING=ON).

**Note:** When all of the field values used in the calculation of a numeric summary value, such as a subtotal, are missing, the summary value is assigned the missing data value, *not* the value zero (0). This includes summary values produced by the operators ST. and CT. used in a subfooting.

# Counting With Missing Values

Suppose the CURR_SAL field appears in 12 segment instances. In three of those instances, the field was given no value. Nevertheless, the display command

```
COUNT CURR_SAL
```

counts 12 occurrences of the CURR_SAL field. This occurs because the MISSING attribute is OFF by default, so the missing values are included in the count. If you wanted to exclude the missing data from the count, you could set MISSING ON.

# Averaging With Missing Values

Suppose you have the following records of data for a field:

```
.
.
1
3
```

The numeric values in the first two records are missing (indicated by the periods). The last two records have values of 1 and 3. If you average these fields without the MISSING

attribute (MISSING OFF), the value 0 is supplied for the two records that are missing values. Thus, the average of the records is (0+0+1+3)/4, or 1. If you use the MISSING ON attribute, the two missing values are ignored, calculating the average as (1+3)/2, or 2.

# MISSING Attribute in the Master File

In some applications, the default values (blanks and zeros) may represent valid data rather than the absence of information. However, if this is *not* the case, you can include the MISSING attribute after the field format in the Master File declaration for the field with the missing values. The MISSING attribute can be used with an actual field in the data source, or a virtual field that you are defining in the Master File.

For example, the following field declaration specifies the MISSING attribute for the RETURNS field:

```
FIELDNAME=RETURNS, ALIAS=RTN, FORMAT=I4, MISSING=ON,$
```

The next declaration specifies the MISSING attribute for a virtual field called PROFIT:

```
DEFINE PROFIT/D7 MISSING ON NEEDS SOME DATA = RETAIL_COST - DEALER_
COST;$
```

To ensure that missing values are handled properly for virtual fields, you can set the MISSING attribute ON for the virtual field in the DEFINE command, and specify whether you want to apply the calculation if some or all values are missing. For related information on the SOME and ALL phrases, see Missing Field Values.

When the MISSING attribute is set to ON in a field declaration, the field containing no data is marked with a special internal code, rather than with blanks or zeros. During report generation, the SUM and COUNT commands and all prefix operators (for example, AVE., MAX., MIN.) exclude the missing data in their computations. For related information about the MISSING attribute and field declarations, see the *Describing Data With ibi™ WebFOCUS® Language* manual.

**Note:**

- You may add MISSING field attributes to the Master File at any time. However, MISSING attributes only affect data entered into the data source after the attributes were added.

- Key fields are needed to identify a record. Therefore, key fields should not be identified as missing.

# Handling Missing Values With the MISSING Attribute

This example illustrates the difference between a field with MISSING ON and one without. In it a virtual field, X_RETURNS, without the MISSING attribute, is set to equal a real field, RETURNS, with the MISSING attribute declared in the Master File. When the field with the MISSING attribute (RETURNS) is missing a value, the corresponding value of X_RETURNS is 0, since a data source field that is missing a value is evaluated as 0 (or blank) for the purpose of computation (see Missing Field Values).

The following request defines the virtual field:

```
DEFINE FILE SALES
X_RETURNS/I4 = RETURNS;
END
```

Now issue the following report request:

```
TABLE FILE SALES
SUM CNT.X_RETURNS CNT.RETURNS AVE.X_RETURNS AVE.RETURNS
END
```

Remember that the field X_RETURNS has the same value as RETURNS except when RETURNS is missing a value, in which case, the X_RETURNS value is 0.

The output is:

| X_RETURNS | RETURNS | AVE | AVE |
|---|---|---|---|
| COUNT | COUNT | X_RETURNS | RETURNS |
| 22 | 20 | 2 | 3 |

The count for the RETURNS field is lower than the count for X_RETURNS and the average for RETURNS is higher than for X_RETURNS because the missing values in RETURNS are not part of the calculations.

# MISSING Attribute in a DEFINE or COMPUTE Command

You can set the MISSING attribute ON in a DEFINE or COMPUTE command to enable a temporary field with missing values to be interpreted and represented correctly in reports.

An expression used to derive the values of the temporary field can contain real fields that have missing values. However, when used to derive the value of a temporary field, a data source field that is missing a value is evaluated as 0 or blank for computational purposes, even if the MISSING attribute has been set to ON for that field in the Master File.

To ensure that missing values are handled properly for temporary fields, you can set the MISSING attribute ON for the virtual field in the DEFINE or COMPUTE command, and specify whether you want to apply the calculation if some or all values are missing. See Missing Field Values.

# Specify Missing Values in a DEFINE or COMPUTE Command

```
field[/format] MISSING {ON|OFF} [NEEDS] {SOME|ALL} [DATA] = expression;
```

where:

**field**

Is the name of the virtual field created by the DEFINE command.

**/format**

Is the format of the virtual field. The default is D12.2.

**MISSING**

ON enables the value of the temporary field to be interpreted as missing (that is, distinguished by the special internal code from an intentionally entered zero or blank), and represented by the NODATA character in reports.

OFF treats missing values for numeric fields as zeros, and missing values for alphanumeric fields as blanks. This is the default value.

**NEEDS**

Is optional. It helps to clarify the meaning of the command.

**SOME**

Indicates that if at least one field in the expression has a value, the temporary field has a value (the missing values of the field are evaluated as 0 or blank in the calculation). If all of the fields in the expression are missing values, the temporary field is missing its value. SOME is the default value.

**ALL**

Indicates that if all the fields in the expression have values, the temporary field has a value. If at least one field in the expression has a missing value, the temporary field also has a missing value.

**DATA**

Is optional. It helps to clarify the meaning of the command.

**expression**

Is a valid expression from which the temporary field derives its value.

**Note**: You can also use the SET MISS_ON command to set a default value for MISSING ON in DEFINE and COMPUTE.

# Handling Missing Values for a Virtual Field With MISSING OFF

The following request illustrates the use of two fields, RETURNS and DAMAGED, to define the NO_SALE field. Both the RETURNS and DAMAGED fields have the MISSING attribute set to ON in the SALES Master File, yet whenever one of these fields is missing a value, that field is evaluated as 0.

```
DEFINE FILE SALES
NO_SALE/I4 = RETURNS + DAMAGED;
END
TABLE FILE SALES
PRINT RETURNS AND DAMAGED AND NO_SALE
BY CITY BY DATE BY PROD_CODE
END
```

The output is:

```
CITY            DATE   PROD_CODE  RETURNS  DAMAGED  NO_SALE
----            ----   ---------  -------  -------  -------
NEW YORK        10/17  B10              2        3        5
                       B17              2        1        3
                       B20              0        1        1
                       C13              .        6        6
                       C14              4        .        4
                       C17              0        0        0
                       D12              3        2        5
                       E1               4        7       11
                       E2               .        .        0
                       E3               4        2        6
NEWARK          10/18  B10              1        1        2
                10/19  B12              1        0        1
STAMFORD        12/12  B10             10        6       16
                       B12              3        3        6
                       B17              2        1        3
                       C13              3        0        3
                       C7               5        4        9
                       D12              0        0        0
                       E2               9        4       13
                       E3               8        9       17
UNIONDALE       10/18  B20              1        1        2
                       C7               0        0        0
```

Notice that the products C13, C14, and E2 in the New York section all show missing values for either RETURNS or DAMAGED, because the MISSING ON attribute has been set in the Master File. However, the calculation that determines the value of NO_SALE interprets these missing values as zeros, because MISSING ON has not been set for the virtual field.

# Handling Missing Values for Virtual Fields With SOME and ALL

The following request illustrates how to use the DEFINE command with the MISSING attribute to specify that if either some or all of the field values referenced in a DEFINE command are missing, the virtual field should also be missing its value.

The SOMEDATA field contains a value if either the RETURNS or DAMAGED field contains a value. Otherwise, SOMEDATA is missing its value. The ALLDATA field contains a value only if both the RETURNS and DAMAGED fields contain values. Otherwise, ALLDATA is missing its value.

```
DEFINE FILE SALES
SOMEDATA/I5 MISSING ON NEEDS SOME=RETURNS + DAMAGED;
ALLDATA/I5 MISSING ON NEEDS ALL=RETURNS + DAMAGED;
END
```

```
TABLE FILE SALES
PRINT RETURNS AND DAMAGED SOMEDATA ALLDATA
BY CITY BY DATE BY PROD_CODE
END
```

The output is:

| CITY | DATE | PROD_CODE | RETURNS | DAMAGED | SOMEDATA | ALLDATA |
|---|---|---|---|---|---|---|
| NEW YORK | 10/17 | B10 | 2 | 3 | 5 | 5 |
| | | B17 | 2 | 1 | 3 | 3 |
| | | B20 | 0 | 1 | 1 | 1 |
| | | C13 | . | 6 | 6 | . |
| | | C14 | 4 | . | 4 | . |
| | | C17 | 0 | 0 | 0 | 0 |
| | | D12 | 3 | 2 | 5 | 5 |
| | | E1 | 4 | 7 | 11 | 11 |
| | | E2 | . | . | . | . |
| | | E3 | 4 | 2 | 6 | 6 |
| NEWARK | 10/18 | B10 | 1 | 1 | 2 | 2 |
| | 10/19 | B12 | 1 | 0 | 1 | 1 |
| STAMFORD | 12/12 | B10 | 10 | 6 | 16 | 16 |
| | | B12 | 3 | 3 | 6 | 6 |
| | | B17 | 2 | 1 | 3 | 3 |
| | | C13 | 3 | 0 | 3 | 3 |
| | | C7 | 5 | 4 | 9 | 9 |
| | | D12 | 0 | 0 | 0 | 0 |
| | | E2 | 9 | 4 | 13 | 13 |
| | | E3 | 8 | 9 | 17 | 17 |
| UNIONDALE | 10/18 | B20 | 1 | 1 | 2 | 2 |
| | | C7 | 0 | 0 | 0 | 0 |

# Setting MISSING ON Behavior for DEFINE and COMPUTE

When a virtual field or calculated value can have missing values, you can specify whether all or some of the field values used in the expression that creates the DEFINE or COMPUTE field must be missing to make the result field missing. If you do not specify ALL or SOME for a DEFINE or COMPUTE with MISSING ON, the default value is SOME.

The SET parameter MISS_ON enables you to specify whether SOME or ALL should be used for MISSING ON in a DEFINE or COMPUTE that does not specify which to use.

```
SET MISS_ON = {SOME|ALL}
```

where:

**SOME**

Indicates that if at least one field in the expression has a value, the temporary field has a value (the missing values of the field are evaluated as 0 or blank in the calculation). If all of the fields in the expression are missing values, the temporary field has a missing value. SOME is the default value.

**ALL**

Indicates that if all the fields in the expression have values, the temporary field has a value. If at least one field in the expression has a missing value, the temporary field has a missing value.

# Setting a Default Value for MISSING ON in DEFINE and COMPUTE

The following request creates three virtual fields that all have MISSING ON. Field AAA has all missing values. Field BBB is missing only when the category is Gifts and has the value 100 otherwise. Field CCC is the sum of AAA and BBB.

```
SET MISS_ON = SOME
DEFINE FILE GGSALES
AAA/D20 MISSING ON = MISSING;
BBB/D20 MISSING ON = IF CATEGORY EQ 'Gifts' THEN MISSING ELSE 100;
CCC/D20 MISSING ON = AAA + BBB;
END
TABLE FILE GGSALES
SUM
AAA
BBB
CCC
BY CATEGORY
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
END
```

Running the request with SET MISS_ON=SOME (the default) shows that CCC has a value unless both AAA and BBB are missing.

| Category | AAA | BBB | CCC |
|---|---|---|---|
| Coffee | . | 144,000 | 144,000 |
| Food | . | 144,000 | 144,000 |
| Gifts | . | . | . |

Changing SET MISS_ON to ALL, produces the following output. CCC is assigned a missing value because one of the fields used to calculate it is always missing.

| Category | AAA | BBB | CCC |
|---|---|---|---|
| Coffee | . | 144,000 | . |
| Food | . | 144,000 | . |
| Gifts | . | . | . |

# Testing for Missing Values in IF-THEN-ELSE Expressions

In order to optimize the efficiency of IF-THEN-ELSE expression processing, the entire expression may not be parsed when the result (true or false) can be determined without parsing the entire expression. For example, consider the following IF-THEN-ELSE expression.

```
COMPUTE CCC/D9.1 MISSING ON = IF AAA EQ 0 OR BBB EQ 0 THEN 0 ELSE AAA /
BBB * 100;
```

**Note:**

- AAA is a missable field (MISSING ON) that is set to MISSING.
- BBB is a field with MISSING ON that is set to 100, so it has a value that is not MISSING.

For evaluation in expressions, a field that is MISSING is treated as zero (0).

CCC is a numeric field that has MISSING ON computed using an IF-THEN-ELSE expression. The IF clause contains two tests connected by the OR operator. If either one of these two

tests is TRUE, the value in the THEN clause will be passed to the final MISSING check. If neither is TRUE, the value in the ELSE clause will be passed to the MISSING check.

In this case, AAA EQ 0 is true (since MISSING is treated as 0 when used in a comparison). So the THEN value, which is zero, is accepted. Since CCC has MISSING ON, which defaults to NEEDS SOME values, at least one data value evaluated in the IF clause must *not* be missing.

Only AAA was evaluated to get the TRUE condition. BBB was not tested and, therefore, is not included in the fields that are checked for missing values. Since AAA is MISSING, CCC (since it NEEDS SOME and does not have any) must be set to MISSING. Note that this processing represents a change from the processing in prior releases and, while it increases processing efficiency, it may produce different results.

Since the test for a value and the test for existence or presence (MISSING) are not the same, the best practice is always to use the test that is appropriate. When testing for MISSING, using IS MISSING is preferred to using EQ 0, as it is more direct and does not result in the same behavior change from previous releases.

Consider the following request. CCC uses EQ 0 in the IF-THEN-ELSE test, and DDD uses IS MISSING.

```
DEFINE FILE GGSALES
AAA/D20 MISSING ON = MISSING;
BBB/D20 MISSING ON = 100;
END
TABLE FILE GGSALES
SUM
  AAA
  BBB
  COMPUTE CCC/D9.1 MISSING ON = IF AAA EQ 0 OR BBB EQ 0 THEN 0 ELSE AAA
/ BBB * 100;
  COMPUTE DDD/D9.1 MISSING ON = IF AAA IS MISSING OR BBB IS MISSING THEN
0 ELSE AAA / BBB * 100;
BY  CATEGORY
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
END
```

The output is shown in the following image. While CCC evaluates to a missing value, DDD evaluates to 0 because the both AAA and BBB were evaluated to get the TRUE condition and BBB is not missing, satisfying the NEEDS SOME VALUES definition for DDD.

| Category | AAA | BBB | CCC | DDD |
|---|---|---|---|---|
| Coffee | . | 144,000 | . | .0 |
| Food | . | 144,000 | . | .0 |
| Gifts | . | 143,700 | . | .0 |

# Using SET MISSINGTEST With IF-THEN-ELSE Expressions

In prior releases, by default, when an IF-THEN-ELSE expression was used to calculate a result and the IF expression evaluated to zero (for numeric expressions) or blank (for alphanumeric expressions), the left hand side was checked to see if it had MISSING ON. If it did, and only some values were needed (NEEDS SOME), the result of the IF expression was MISSING, not true or false. The outcome returned was also MISSING, not the result of evaluating the THEN or ELSE expression. The SET MISSINGTEST = NEW command eliminates the missing test for the IF expression so that either the THEN expression or the ELSE expression will be evaluated and returned as the result. This is the default behavior.

The syntax is:

```
SET MISSINGTEST = {NEW|OLD|SPECIAL}
```

where:

**NEW**

Excludes the IF expression from the missing values evaluation so that the IF expression results in either true or false, not MISSING. If it evaluates to true, the THEN expression is used to calculate the result. If it evaluates to false, the ELSE expression is used to calculate the result. This is the default value.

**OLD**

Includes the IF expression in the missing values evaluation. If the IF expression evaluates to MISSING and the missing field only needs some missing values, the result is also MISSING.

**SPECIAL**

Is required for passing parameters to RStat.

# Using SET MISSINGTEST With IF-THEN-ELSE Expressions

The following request defines a field named MISS_FIELD that contains a missing value for the country name Austria. In the TABLE request there are two calculated values, CALC1 and CALC2 that test this field in IF-THEN-ELSE expressions. Both of these fields have MISSING ON and need only some missing values to be missing:

```
SET MISSINGTEST = OLD
DEFINE FILE WF_RETAIL_LITE
MISS_FIELD/A10 MISSING ON = IF COUNTRY_NAME NE 'Austria' THEN
'DATAEXISTS' ELSE MISSING;
END

TABLE FILE WF_RETAIL_LITE
SUM COGS_US MISS_FIELD
COMPUTE CALC1/A7 MISSING ON = IF ((MISS_FIELD EQ '') OR (MISS_FIELD EQ
MISSING)) THEN 'THEN' ELSE 'ELSE';
COMPUTE CALC2/A7 MISSING ON = IF ((MISS_FIELD EQ MISSING) OR (MISS_FIELD
EQ '')) THEN 'THEN' ELSE 'ELSE';
BY COUNTRY_NAME
WHERE BUSINESS_REGION EQ 'EMEA'
WHERE COUNTRY_NAME LT 'E'
ON TABLE SET NODATA 'MISSING'
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

Running the request with MISSINGTEST=OLD produces the output shown in the following image:

| Customer Country | Cost of Goods | MISS_FIELD | CALC1 | CALC2 |
|---|---|---|---|---|
| Austria | $426,570.00 | MISSING | MISSING | THEN |
| Belgium | $3,800.00 | DATAEXISTS | ELSE | ELSE |
| China | $563.00 | DATAEXISTS | ELSE | ELSE |
| Denmark | $1,346.00 | DATAEXISTS | ELSE | ELSE |

Note that for Austria, MISS_FIELD is MISSING.

- In CALC1, the expression MISS_FIELD EQ ' ' is evaluated to true. MISS_FIELD IS MISSING is not evaluated at all because evaluation stops when it can be determined that the result of the expression is true. However, since the expression compared the field to blank, it is checked to see if the result field supports missing values. Since it does, the final result is MISSING.
- In CALC2, the expression MISS_FIELD EQ MISSING is true. MISS_FIELD EQ ' ' is not evaluated at all because evaluation stops when it can be determined that the result of the expression is true. No missing check is needed, so the result of the IF expression is TRUE, and the THEN expression is evaluated and returned as the result.

Changing the SET command to SET MISSINGTEST=NEW and rerunning the request produces the output shown in the following image. The IF expressions in CALC1 and CALC2 both evaluate to true because neither expression is checked to see if the result field supports missing, so the THEN expression is evaluated and returned as the result in both cases.

| Customer Country | Cost of Goods | MISS_FIELD | CALC1 | CALC2 |
|---|---|---|---|---|
| Austria | $426,570.00 | MISSING | THEN | THEN |
| Belgium | $3,800.00 | DATAEXISTS | ELSE | ELSE |
| China | $563.00 | DATAEXISTS | ELSE | ELSE |
| Denmark | $1,346.00 | DATAEXISTS | ELSE | ELSE |

# Testing for a Segment With a Missing Field Value

You can specify WHERE criteria to identify segment instances with missing field values.

You cannot use these tests to identify missing instances. See Handling a Missing Segment Instance.

# Test for a Segment With a Missing Field Value

To test for a segment with missing field values, the syntax is:

```
WHERE field {IS|EQ} MISSING
```

To test for the presence of field values, the syntax is:

```
WHERE field {NE|IS-NOT} MISSING
```

A WHERE criterion that tests a numeric field for 0 or an alphanumeric field for blanks also retrieves instances for which the field has a missing value.

# Testing for a Missing Field Value

The following request illustrates the use of MISSING to display grocery items (by code) for which the number of packages returned by customers is missing.

```
TABLE FILE SALES
PRINT RETURNS
BY CITY BY DATE BY PROD_CODE
WHERE RETURNS IS MISSING
END
```

The output is:

```
CITY            DATE   PROD_CODE  RETURNS
----            ----   ---------  -------
NEW YORK        10/17  C13              .
                       E2               .
```

# Testing for an Existing Field Value

The following request illustrates the use of MISSING to display only those grocery items for which the number of packages returned by customers is not missing.

```
TABLE FILE SALES
PRINT RETURNS
BY CITY BY DATE BY PROD_CODE
WHERE RETURNS IS-NOT MISSING
END
```

The output is:

| CITY | DATE | PROD_CODE | RETURNS |
|---|---|---|---|
| NEW YORK | 10/17 | B10 | 2 |
| | | B17 | 2 |
| | | B20 | 0 |
| | | C14 | 4 |
| | | C17 | 0 |
| | | D12 | 3 |
| | | E1 | 4 |
| | | E3 | 4 |
| NEWARK | 10/18 | B10 | 1 |
| | 10/19 | B12 | 1 |
| STAMFORD | 12/12 | B10 | 10 |
| | | B12 | 3 |
| | | B17 | 2 |
| | | C13 | 3 |
| | | C7 | 5 |
| | | D12 | 0 |
| | | E2 | 9 |
| | | E3 | 8 |
| UNIONDALE | 10/18 | B20 | 1 |
| | | C7 | 0 |

# Testing for a Blank or Zero

The following request displays grocery items that either were never returned or for which the number of returned packages was never recorded:

```
TABLE FILE SALES
PRINT RETURNS
BY CITY BY DATE BY PROD_CODE
WHERE RETURNS EQ 0
END
```

The output is:

| CITY | DATE | PROD_CODE | RETURNS |
|---|---|---|---|
| NEW YORK | 10/17 | B20 | 0 |
| | | C13 | . |
| | | C17 | 0 |
| | | E2 | . |
| STAMFORD | 12/12 | D12 | 0 |
| UNIONDALE | 10/18 | C7 | 0 |

# Excluding Missing Values From a Test

To display only those items that have not been returned by customers, you need two WHERE criteria. The first to restrict the number of returns to 0, the other to exclude missing values, as in the following request.

```
TABLE FILE SALES
PRINT RETURNS
BY CITY BY DATE BY PROD_CODE
WHERE RETURNS EQ 0
WHERE RETURNS IS-NOT MISSING
END
```

The output is:

| CITY | DATE | PROD_CODE | RETURNS |
|---|---|---|---|
| NEW YORK | 10/17 | B20 | 0 |
| | | C17 | 0 |
| STAMFORD | 12/12 | D12 | 0 |
| UNIONDALE | 10/18 | C7 | 0 |

# Preserving Missing Data Values in an Output File

The ability to distinguish between missing data and default values (blanks and zeros) in fields can be carried over into output files. If the retrieved and processed information displayed the NODATA string in a report, by default the NODATA string can be stored in the output file. Using the SET HNODATA command, you can change the NODATA value used for alphanumeric output files. You can also use the SET HOLDMISS command to store the missing values rather than the NODATA character in an output file. For related information, see Saving and Reusing Your Report Output.

# Distinguish Missing Data in an Extract File

```
ON TABLE {HOLD|SAVE|SAVB} MISSING {ON|OFF}
```

where:

**HOLD**

Creates an extract file for use in subsequent reports. The default for MISSING is ON.

**SAVE**

Creates a text extract file for use in other programs. The default for MISSING is OFF.

**SAVB**

Creates a binary extract file for use in other programs. The default for MISSING is OFF.

HOLD files can be created with both the MISSING and FORMAT ALPHA options, specified in any order. For example:

```
ON TABLE HOLD FORMAT ALPHA MISSING OFF
ON TABLE HOLD MISSING OFF FORMAT ALPHA
```

# Incorporating MISSING Values in an Extract File

The following request specifies MISSING ON in the HOLD phrase:

```
TABLE FILE SALES
SUM RETURNS AND HOLD FORMAT ALPHA MISSING ON
BY CITY BY DATE BY PROD_CODE
END
```

The MISSING=ON attribute for the RETURNS field is propagated to the HOLD Master File. In addition, the missing data symbols are propagated to the HOLD file for the missing field values:

```
FILENAME=HOLD    , SUFFIX=FIX     , $
  SEGMENT=HOLD, SEGTYPE=S3, $
    FIELDNAME=CITY, ALIAS=E01, USAGE=A15, ACTUAL=A15, $
    FIELDNAME=DATE, ALIAS=E02, USAGE=A4MD, ACTUAL=A04, $
    FIELDNAME=PROD_CODE, ALIAS=E03, USAGE=A3, ACTUAL=A03, $
    FIELDNAME=RETURNS, ALIAS=E04, USAGE=I3, ACTUAL=A03,
      MISSING=ON, $
```

With MISSING OFF in the HOLD phrase, the MISSING=ON attribute is not propagated to the HOLD Master File and the missing data symbols are replaced with default values.

# Store Missing Data in HOLD Files

```
SET HOLDMISS={ON|OFF}
ON TABLE SET HOLDMISS {ON|OFF}
```

where:

**ON**

Allows you to store missing data in a HOLD file. When TABLE generates a default value for data not found, it generates missing values.

**OFF**

Does not allow you to store missing data in a HOLD file. OFF is the default value.

# Usage Notes for Holding Missing Values

- Setting HOLDMISS ON adds the MISSING=ON attribute to every field in the extract file.
- Data is not found if:
  - ALL is set to ON.
  - The request is multi-path.
  - An ACROSS statement has been issued.

# Holding Missing Values Using HOLDMISS

```
SET HOLDMISS=ON
TABLE FILE MOVIES
 SUM WHOLESALEPR
```

```
BY CATEGORY ACROSS RATING
 ON TABLE HOLD AS HLDM
END
TABLE FILE HLDM
 PRINT *
 END
```

The output is:

```
CATEGORY  WHOLESALEPR  WHOLESALEPR  WHOLESALEPR  WHOLESALEPR
WHOLESALEPR
--------  -----------  -----------  -----------  -----------  ----------
-
ACTION              .            .        20.98            .
34.48
CHILDREN        54.49        51.38            .            .
.
CLASSIC         40.99       160.80            .            .
.
COMEDY              .            .        46.70        30.00
13.75
DRAMA               .            .            .            .
10.00
FOREIGN         13.25            .        62.00            .
70.99
MUSICALS        15.00            .        13.99         9.99
13.99
MYSTERY             .         9.00        18.00         9.00
80.97
SCI/FI              .            .            .        35.99
43.53
TRAIN/EX            .        60.98            .            .
.
```

# Propagating Missing Values to Reformatted Fields in a Request

When a field is reformatted in a request (for example, SUM field/format), an internal COMPUTE field is created to contain the reformatted field value and display on the report output. If the original field has a missing value, that missing value can be propagated to the internal field by setting the COMPMISS parameter ON. If the missing value is not

propagated to the internal field, it displays a zero (if it is numeric) or a blank (if it is alphanumeric). If the missing value is propagated to the internal field, it displays the missing data symbol on the report output.

# Control Missing Values in Reformatted Fields

```
SET COMPMISS = {ON|OFF}
```

where:

**ON**

Propagates a missing value to a reformatted field. ON is the default value.

**OFF**

Displays a blank or zero for a reformatted field.

**Note:** The COMPMISS parameter cannot be set in an ON TABLE command.

# Controlling Missing Values in Reformatted Fields

The following procedure prints the RETURNS field from the SALES data source for store 14Z. With COMPMISS OFF, the missing values display as zeros in the column for the reformatted field value.

**Note:** Before trying this example, you must make sure that the SALEMISS procedure, which adds missing values to the SALES data source, has been run.

```
SET COMPMISS = OFF
TABLE FILE SALES
PRINT RETURNS RETURNS/D12.2 AS 'REFORMATTED,RETURNS'
BY STORE_CODE
WHERE STORE_CODE EQ '14Z'
END
```

The output is:

```
                         REFORMATTED
STORE_CODE  RETURNS      RETURNS
----------  -------      -----------
14Z                2             2.00
                   2             2.00
                   0              .00
                   .              .00
                   4             4.00
                   0              .00
                   3             3.00
                   4             4.00
                   .              .00
                   4             4.00
```

With COMPMISS ON, the column for the reformatted version of RETURNS displays the missing data symbol when a value is missing:

```
SET COMPMISS = ON
TABLE FILE SALES
PRINT RETURNS RETURNS/D12.2 AS 'REFORMATTED,RETURNS'
BY STORE_CODE
WHERE STORE_CODE EQ '14Z'
END
```

The output is:

```
                         REFORMATTED
STORE_CODE  RETURNS      RETURNS
----------  -------      -----------
14Z                2             2.00
                   2             2.00
                   0              .00
                   .                .
                   4             4.00
                   0              .00
                   3             3.00
                   4             4.00
                   .                .
                   4             4.00
```

# Usage Notes for SET COMPMISS

If you create a HOLD file with COMPMISS ON, the HOLD Master File for the reformatted field indicates MISSING = ON (as does the original field). With COMPMISS = OFF, the reformatted field does NOT have MISSING = ON in the generated Master File.

# Handling a Missing Segment Instance

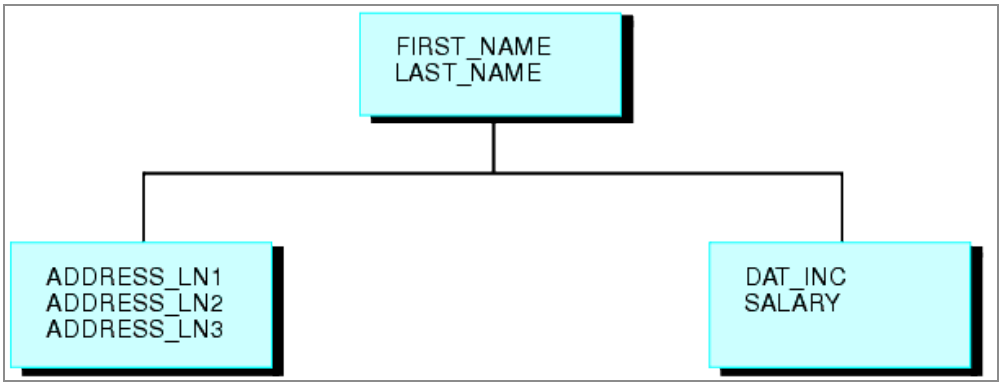
In multi-segment data sources, when an instance in a parent segment does not have descendant instances, the nonexistent descendant instances are called missing instances.

When you write a request from a data source that has missing segment instances, the missing instances affect the report. For example, if the request names fields in a segment and its descendants, the report omits parent segment instances that have no descendants. It makes no difference whether fields are display fields or sort fields.

When an instance is missing descendants in a child segment, the instance, its parent, the parent of its parent, and so on up to the root segment, is called a short path. Unique segments are never considered to be missing.

For example, consider the following subset of the EMPLOYEE data source.

- The top segment contains employee names.
- The left segment contains addresses.
- The right segment contains the salary history of each employee: the date the employee was granted a new salary, and the amount of the salary.



Suppose some employees are paid by an outside agency. None of these employees have a company salary history. Instances referring to these employees in the salary history segment are missing.

Nonexistent descendant instances affect whether parent segment instances are included in report results. The SET ALL parameter and the ALL. prefix enable you to include parent segment data in reports.

For illustrations of how missing segment instances impact reporting, see Reporting Against Segments Without Descendant InstancesThe following request displays the salary histories for each employee. TABLE FILE EMPLOYEE PRINT SALARY BY LAST_NAME BY FIRST_NAME BY DAT_INC ENDHowever, two employees, Davis and Gardner, are omitted from the following report because the LAST_NAME and FIRST_NAME fields belong to the root segment, and the DAT_INC and SALARY fields belong to the descendant salary history segment. Since Davis and Gardner have no descendant instances in the salary history segment, they are omitted from the report.The output is:LAST_NAME FIRST_NAME DAT_INC SALARY --------- ---------- ------- ------ BANNING JOHN 82/08/01 $29,700.00 BLACKWOOD ROSEMARIE 82/04/01 $21,780.00 CROSS BARBARA 81/11/02 $25,775.00 82/04/09 $27,062.00 GREENSPAN MARY 82/04/01 $8,650.00 82/06/11 $9,000.00 IRVING JOAN 82/01/04 $24,420.00 82/05/14 $26,862.00 JONES DIANE 82/05/01 $17,750.00 82/06/01 $18,480.00 MCCOY JOHN 82/01/01 $18,480.00 MCKNIGHT ROGER 82/02/02 $15,000.00 82/05/14 $16,100.00 ROMANS ANTHONY 82/07/01 $21,120.00 SMITH MARY 82/01/01 $13,200.00 RICHARD 82/01/04 $9,050.00 82/05/14 $9,500.00 STEVENS ALFRED 81/01/01 $10,000.00 82/01/01 $11,000.00 and Reporting Against Segments With Descendant InstancesThe following request displays the course codes and expenses for employees in the EMPDATA and TRAIN2 data sources. The report output displays all employees that have instances in the COURSECODE or EXPENSES fields. The employees that are missing instances for either of those fields are omitted from the report. For those employees that have instances for only one of the fields, the designator for missing data displays in the respective column. In this example, Henry Chisolm has taken two courses but only has expenses for one. Therefore, the designator for missing instances displays in the EXPENSES column. JOIN EMPDATA.PIN IN EMPDATA TO ALL TRAINING.PIN IN TRAIN2 AS JOIN1 TABLE FILE EMPDATA PRINT LASTNAME AND FIRSTNAME AND COURSECODE AND EXPENSES BY PIN ENDThe output is:PINLASTNAMEFIRSTNAMECOURSECODEEXPENSES000000010VALINODANIELPDR7402,300.00000000030CASSANOVALOISNAMA7302,600.00 CASSANOVALOISEDP0902,300.00. . . 000000350FERNSTEINERWINSSI2201,850.00 FERNSTEINERWINMC901,730.00 FERNSTEINERWINUMI7203,350.00000000360CHISOLMHENRYEDP090.00 CHISOLMHENRYEDP6903,000.00000000370WANGJOHNUMI7102,050.00000000380ELLNERDAVIDEDP090. ELLNERDAVIDUNI7803,350.00000000410CONTIMARSHALLEDP6903,100.00Note: The report output has been truncated for demonstration purposes..

# Reporting Against Segments Without Descendant Instances

The following request displays the salary histories for each employee.

```
TABLE FILE EMPLOYEE
PRINT SALARY
BY LAST_NAME BY FIRST_NAME
BY DAT_INC
END
```

However, two employees, Davis and Gardner, are omitted from the following report because the LAST_NAME and FIRST_NAME fields belong to the root segment, and the DAT_INC and SALARY fields belong to the descendant salary history segment. Since Davis and Gardner have no descendant instances in the salary history segment, they are omitted from the report.

The output is:

```
LAST_NAME        FIRST_NAME   DAT_INC          SALARY
---------        ----------   -------          ------
BANNING          JOHN         82/08/01      $29,700.00
BLACKWOOD        ROSEMARIE    82/04/01      $21,780.00
CROSS            BARBARA      81/11/02      $25,775.00
                              82/04/09      $27,062.00
GREENSPAN        MARY         82/04/01       $8,650.00
                              82/06/11       $9,000.00
IRVING           JOAN         82/01/04      $24,420.00
                              82/05/14      $26,862.00
JONES            DIANE        82/05/01      $17,750.00
                              82/06/01      $18,480.00
MCCOY            JOHN         82/01/01      $18,480.00
MCKNIGHT         ROGER        82/02/02      $15,000.00
                              82/05/14      $16,100.00
ROMANS           ANTHONY      82/07/01      $21,120.00
SMITH            MARY         82/01/01      $13,200.00
                 RICHARD      82/01/04       $9,050.00
                              82/05/14       $9,500.00
STEVENS          ALFRED       81/01/01      $10,000.00
                              82/01/01      $11,000.00
```

# Reporting Against Segments With Descendant Instances

The following request displays the course codes and expenses for employees in the EMPDATA and TRAIN2 data sources. The report output displays all employees that have instances in the COURSECODE or EXPENSES fields. The employees that are missing instances for either of those fields are omitted from the report. For those employees that have instances for only one of the fields, the designator for missing data displays in the respective column. In this example, Henry Chisolm has taken two courses but only has expenses for one. Therefore, the designator for missing instances displays in the EXPENSES column.

```
JOIN EMPDATA.PIN IN EMPDATA TO ALL TRAINING.PIN IN TRAIN2 AS JOIN1
TABLE FILE EMPDATA
PRINT LASTNAME AND FIRSTNAME AND COURSECODE AND EXPENSES
BY PIN
END
```

The output is:

| PIN | LASTNAME | FIRSTNAME | COURSECODE | EXPENSES |
|---|---|---|---|---|
| 000000010 | VALINO | DANIEL | PDR740 | 2,300.00 |
| 000000030 | CASSANOVA | LOIS | NAMA730 | 2,600.00 |
| | CASSANOVA | LOIS | EDP090 | 2,300.00 |
| . . . | | | | |

| | | | | |
|---|---|---|---|---|
| 000000350 | FERNSTEIN | ERWIN | SSI220 | 1,850.00 |
| | FERNSTEIN | ERWIN | MC90 | 1,730.00 |
| | FERNSTEIN | ERWIN | UMI720 | 3,350.00 |
| 000000360 | CHISOLM | HENRY | EDP090 | .00 |
| | CHISOLM | HENRY | EDP690 | 3,000.00 |
| 000000370 | WANG | JOHN | UMI710 | 2,050.00 |
| 000000380 | ELLNER | DAVID | EDP090 | . |
| | ELLNER | DAVID | UNI780 | 3,350.00 |
| 000000410 | CONTI | MARSHALL | EDP690 | 3,100.00 |

**Note:** The report output has been truncated for demonstration purposes.

# Including Missing Instances in Reports With the ALL. Prefix

If a request excludes parent segment instances that lack descendants, you can include the parent instances by attaching the ALL. prefix to one of the fields in the parent segment.

Note that if the request contains WHERE or IF criteria that screen fields in segments that have missing instances, the report omits parent instances even when you use the ALL. prefix. To include these instances, use the SET ALL=PASS command described in Including Missing Segment Instances With the ALL. PrefixThe following request displays the salary history of each employee. Although employees Elizabeth Davis and David Gardner have no salary histories, they are included in the report. TABLE FILE EMPLOYEE PRINT SALARY BY ALL.LAST_NAME BY FIRST_NAME BY DAT_INC ENDThe output is:LAST_NAME FIRST_NAME DAT_INC SALARY --------- ---------- ------- ------ BANNING JOHN 82/08/01 $29,700.00 BLACKWOOD ROSEMARIE 82/04/01 $21,780.00 CROSS BARBARA 81/11/02 $25,775.00 82/04/09 $27,062.00 DAVIS ELIZABETH . . GARDNER DAVID . . GREENSPAN MARY 82/04/01 $8,650.00 82/06/11 $9,000.00 IRVING JOAN 82/01/04 $24,420.00 82/05/14 $26,862.00 JONES DIANE 82/05/01 $17,750.00 82/06/01 $18,480.00 MCCOY JOHN 82/01/01 $18,480.00 MCKNIGHT ROGER 82/02/02 $15,000.00 82/05/14 $16,100.00 ROMANS ANTHONY 82/07/01 $21,120.00 SMITH MARY 82/01/01 $13,200.00 RICHARD 82/01/04 $9,050.00 82/05/14 $9,500.00 STEVENS ALFRED 81/01/01 $10,000.00 82/01/01 $11,000.00.

# Including Missing Segment Instances With the ALL. Prefix

The following request displays the salary history of each employee. Although employees Elizabeth Davis and David Gardner have no salary histories, they are included in the report.

```
TABLE FILE EMPLOYEE
PRINT SALARY
BY ALL.LAST_NAME BY FIRST_NAME
BY DAT_INC
END
```

The output is:

```
LAST_NAME       FIRST_NAME   DAT_INC          SALARY
---------       ----------   -------          ------
BANNING         JOHN        82/08/01      $29,700.00
BLACKWOOD       ROSEMARIE   82/04/01      $21,780.00
CROSS           BARBARA     81/11/02      $25,775.00
                            82/04/09      $27,062.00
DAVIS           ELIZABETH          .               .
GARDNER         DAVID              .               .
GREENSPAN       MARY        82/04/01       $8,650.00
```

```
                          82/06/11        $9,000.00
IRVING          JOAN      82/01/04       $24,420.00
                          82/05/14       $26,862.00
JONES           DIANE     82/05/01       $17,750.00
                          82/06/01       $18,480.00
MCCOY           JOHN      82/01/01       $18,480.00
MCKNIGHT        ROGER     82/02/02       $15,000.00
                          82/05/14       $16,100.00
ROMANS          ANTHONY   82/07/01       $21,120.00
SMITH           MARY      82/01/01       $13,200.00
                RICHARD   82/01/04        $9,050.00
                          82/05/14        $9,500.00
STEVENS         ALFRED    81/01/01       $10,000.00
                          82/01/01       $11,000.00
```

# Including Missing Instances in Reports With the SET ALL Parameter

You can control how parent instances with missing descendants are processed by issuing the SET ALL command before executing the request. In a join, issuing the SET ALL = ON command controls left outer join processing.

**Note:** A request with WHERE or IF criteria, which screen fields in a segment that has missing instances, omits instances in the parent segment even if you use the SET ALL=ON command. To include these instances, use the SET ALL=PASS command.

In [[[Undefined variable ibi-productNames.App_Name]]], the command SET ALL = ON or JOIN LEFT_OUTER specifies a left outer join. With a left outer join, all records from the host file display on the report output. If a cross-referenced segment instance does not exist for a host segment instance, the report output displays missing values for the fields from the cross-referenced segment.

If there is a screening condition on the dependent segment, those dependent segment instances that do not satisfy the screening condition are omitted from the report output, and so are their corresponding host segment instances. With missing segment instances, tests for missing values fail because the fields in the segment have not been assigned missing values.

When a relational engine performs a left outer join, it processes host records with missing cross-referenced segment instances slightly differently from the way [[[Undefined variable

ibi-productNames.App_Name]]] processes those records when both of the following conditions apply:

- There is a screening condition on the cross-referenced segment.
- A host segment instance does not have a corresponding cross-referenced segment instance. This is called a **short path**.

When these two conditions are true, [[[Undefined variable ibi-productNames.App_Name]]] omits the host record from the report output, while relational engines supply null values for the fields from the dependent segment and then apply the screening condition. If the missing values pass the screening condition, the entire record is retained on the report output. This type of processing is useful for finding or counting all host records that do not have matching records in the cross-referenced file or for creating a DEFINE-based join from the cross-referenced segment with the missing instance to another dependent segment.

If you want [[[Undefined variable ibi-productNames.App_Name]]] to assign null values to the fields in a missing segment instance when a left outer join is in effect, you can issue the command SET SHORTPATH=SQL.

# Include a Parent Instance With Missing Descendants

```
SET ALL= {OFF|ON|PASS}
```

where:

**OFF**

Omits parent instances that are missing descendants from the report. OFF is the default value.

**ON**

Includes parent instances that are missing descendants in the report. However, if a test on a missing segment fails, this causes the parent to be omitted from the output. It is comparable to the ALL. prefix.

**PASS**

Includes parent instances that are missing descendants, even if WHERE or IF criteria exist to screen fields in the descendant segments that are missing instances (that is, a test on a missing segment passes).

# Including Missing Segment Instances With SET ALL

The following request displays all employees, regardless of whether they have taken a course or not since the ALL=PASS command is set.

If the ALL=ON command had been used, employees that had not taken courses would have been omitted because of the WHERE criteria.

```
JOIN EMPDATA.PIN IN EMPDATA TO ALL TRAINING.PIN IN TRAINING AS JOIN1
SET ALL = PASS
TABLE FILE EMPDATA
PRINT LASTNAME AND FIRSTNAME AND COURSECODE AND EXPENSES
BY PIN
WHERE EXPENSES GT 3000
END
```

The output is:

| PIN | LASTNAME | FIRSTNAME | COURSECODE | EXPENSES |
|---|---|---|---|---|
| 000000020 | BELLA | MICHAEL | . | . |
| 000000040 | ADAMS | RUTH | EDP750 | 3,400.00 |
| 000000050 | ADDAMS | PETER | UMI720 | 3,300.00 |
| 000000060 | PATEL | DORINA | . | . |
| 000000070 | SANCHEZ | EVELYN | . | . |
| 000000080 | SO | PAMELA | EDP690 | 3,200.00 |
| | SO | PAMELA | BIT420 | 3,350.00 |
| 000000090 | PULASKI | MARIANNE | . | . |
| 000000100 | ANDERSON | TIM | NAMA930 | 3,100.00 |
| 000000130 | CVEK | MARCUS | . | . |
| 000000140 | WHITE | VERONICA | BIT420 | 3,600.00 |
| 000000150 | WHITE | KARL | UNI780 | 3,400.00 |
| 000000170 | MORAN | WILLIAM | . | . |
| 000000190 | MEDINA | MARK | EDP690 | 3,150.00 |
| 000000220 | LEWIS | CASSANDRA | . | . |
| 000000230 | NOZAWA | JIM | . | . |
| 000000300 | SOPENA | BEN | . | . |
| 000000340 | GOTLIEB | CHRIS | SSI670 | 3,300.00 |
| | GOTLIEB | CHRIS | EDP750 | 3,450.00 |
| 000000350 | FERNSTEIN | ERWIN | UMI720 | 3,350.00 |
| 000000380 | ELLNER | DAVID | UNI780 | 3,350.00 |
| 000000390 | GRAFF | ELAINE | . | . |
| 000000400 | LOPEZ | ANNE | . | . |
| 000000410 | CONTI | MARSHALL | EDP690 | 3,100.00 |

# Control Short Path Processing In a Left Outer Join

```
SET SHORTPATH = {FOCUS|SQL}
```

where:

**FOCUS**

Omits a host segment from the report output when it has no corresponding cross-referenced segment and the report has a screening condition on the cross-referenced segment.

**SQL**

Supplies missing values for the fields in a missing cross-referenced segment in an outer join. Applies screening conditions against this record and retains the record on the report output if it passes the screening test.

**Note:** There must be an outer join in effect, either as a result of the SET ALL=ON command or a JOIN LEFT_OUTER command (either inside or outside of the Master File).

# Usage Notes for SET SHORTPATH = SQL

A FOCUS data source is supported as the host file in a join used with SET SHORTPATH = SQL, but not as the cross-referenced file.

# Controlling Outer Join Processing

The following procedure creates two Oracle tables, ORAEMP and ORAEDUC, that will be used in a join.

```
TABLE FILE EMPLOYEE
SUM LAST_NAME FIRST_NAME CURR_SAL CURR_JOBCODE DEPARTMENT
BY EMP_ID
ON TABLE HOLD AS ORAEMP FORMAT SQLORA
END
```

```
-RUN
TABLE FILE EDUCFILE
SUM COURSE_CODE COURSE_NAME
BY EMP_ID BY DATE_ATTEND
ON TABLE HOLD AS ORAEDUC FORMAT SQLORA
END
```

The following request joins the two Oracle tables and creates a left outer join (SET ALL = ON).

```
JOIN EMP_ID IN ORAEMP TO ALL EMP_ID IN ORAEDUC AS J1
SET ALL = ON
TABLE FILE ORAEMP
PRINT COURSE_CODE COURSE_NAME
BY EMP_ID
END
```

Since the join is an outer join, all ORAEMP rows display on the report output. ORAEMP rows with no corresponding ORAEDUC row display the missing data symbol for the fields from the ORAEDUC table.

```
EMP_ID     COURSE_CODE     COURSE_NAME
------     -----------     -----------
071382660  101             FILE DESCRPT & MAINT
112847612  101             FILE DESCRPT & MAINT
           103             BASIC REPORT PREP FOR PROG
117593129  101             FILE DESCRPT & MAINT
           103             BASIC REPORT PREP FOR PROG
           201             ADVANCED TECHNIQUES
           203             FOCUS INTERNALS
119265415  108             BASIC RPT NON-DP MGRS
119329144  .               .
123764317  .               .
126724188  .               .
219984371  .               .
326179357  104             FILE DESC & MAINT NON-PROG
           106             TIMESHARING WORKSHOP
           102             BASIC REPORT PREP NON-PROG
           301             DECISION SUPPORT WORKSHOP
           202             WHAT'S NEW IN FOCUS
451123478  101             FILE DESCRPT & MAINT
543729165  .               .
818692173  107             BASIC REPORT PREP DP MGRS
```

The following request adds a screening condition on the ORAEDUC segment. To satisfy the screening condition, the course name must either contain the characters **BASIC** or be missing.

```
JOIN CLEAR
JOIN EMP_ID IN ORAEMP TO ALL EMP_ID IN ORAEDUC AS J1
SET ALL = ON
TABLE FILE ORAEMP
PRINT COURSE_CODE COURSE_NAME
BY EMP_ID
WHERE COURSE_NAME CONTAINS 'BASIC' OR COURSE_NAME IS MISSING
END
```

However, with SET ALL = ON, the rows with missing values are not retained on the report output.

```
EMP_ID     COURSE_CODE     COURSE_NAME
------     -----------     -----------
112847612  103             BASIC REPORT PREP FOR PROG
117593129  103             BASIC REPORT PREP FOR PROG
119265415  108             BASIC RPT NON-DP MGRS
326179357  102             BASIC REPORT PREP NON-PROG
818692173  107             BASIC REPORT PREP DP MGRS
```

The following request adds the SET SHORTPATH = SQL command.

```
JOIN CLEAR
JOIN EMP_ID IN ORAEMP TO ALL EMP_ID IN ORAEDUC AS J1
SET ALL = ON
SET SHORTPATH=SQL
TABLE FILE ORAEMP
PRINT COURSE_CODE COURSE_NAME
BY EMP_ID
WHERE COURSE_NAME CONTAINS 'BASIC' OR COURSE_NAME IS MISSING
END
```

The report output now displays both the records containing the characters **BASIC** and those with missing values.

```
EMP_ID     COURSE_CODE     COURSE_NAME
------     -----------     -----------
112847612  103             BASIC REPORT PREP FOR PROG
117593129  103             BASIC REPORT PREP FOR PROG
```

```
119265415  108             BASIC RPT NON-DP MGRS
119329144  .               .
123764317  .               .
126724188  .               .
219984371  .               .
326179357  102             BASIC REPORT PREP NON-PROG
543729165  .               .
818692173  107             BASIC REPORT PREP DP MGRS
```

# Finding Host Records That Have No Matching Cross-Referenced Records

The following request counts and lists those employees who have taken no courses.

```
JOIN LEFT_OUTER EMP_ID IN ORAEMP TO ALL EMP_ID IN ORAEDUC AS J1
SET ALL = ON
SET SHORTPATH=SQL
TABLE FILE ORAEMP
COUNT EMP_ID
LIST EMP_ID LAST_NAME FIRST_NAME
WHERE COURSE_NAME IS MISSING
END
```

The output is:

```
EMP_ID
COUNT    LIST  EMP_ID     LAST_NAME        FIRST_NAME
------   ----  ------     ---------        ----------
     5      1  119329144  BANNING          JOHN
            2  123764317  IRVING           JOAN
            3  126724188  ROMANS           ANTHONY
            4  219984371  MCCOY            JOHN
            5  543729165  GREENSPAN        MARY
```

# Testing for Missing Instances in FOCUS Data Sources

You can use the ALL PASS parameter to produce reports that include only parent instances with missing descendant values. To do so, write the request to screen out all existing instances in the segment with missing instances. After you set the ALL parameter to PASS, the report displays only the parent instances that are missing descendants.

# Testing for a MISSING Instance in a FOCUS Data Source

The following request tests for missing instances in the COURSECODE field. Since no COURSECODE can equal 'XXXX', only employees with missing instances in COURSECODE display in the report output.

```
JOIN EMPDATA.PIN IN EMPDATA TO ALL TRAINING.PIN IN TRAINING AS JOIN1
SET ALL = PASS
TABLE FILE EMPDATA
PRINT LASTNAME AND FIRSTNAME AND COURSECODE AND EXPENSES
BY PIN
WHERE COURSECODE EQ 'XXXX'
END
```

The output is:

| PIN | LASTNAME | FIRSTNAME | COURSECODE | EXPENSES |
|---|---|---|---|---|
| 000000020 | BELLA | MICHAEL | . | . |
| 000000060 | PATEL | DORINA | . | . |

| | | | | |
|---|---|---|---|---|
| 000000070 | SANCHEZ | EVELYN | . | . |
| 000000090 | PULASKI | MARIANNE | . | . |
| 000000130 | CVEK | MARCUS | . | . |
| 000000170 | MORAN | WILLIAM | . | . |
| 000000220 | LEWIS | CASSANDRA | . | . |
| 000000230 | NOZAWA | JIM | . | . |
| 000000300 | SOPENA | BEN | . | . |
| 000000390 | GRAFF | ELAINE | . | . |
| 000000400 | LOPEZ | ANNE | . | . |

# Setting the NODATA Character String

In a report, the NODATA character string indicates no data or inapplicable data. The default NODATA character is a period. However, you can change this character designation.

# Set the NODATA String

```
SET NODATA = string
```

where:

**string**

Is the character string used to indicate missing data in reports. The default string is a period (.). The string may be a maximum of 11 characters. Common choices are NONE, N/A, and MISSING.

# Setting NODATA Not to Display Characters

If you do not want any characters, issue the command:

```
SET NODATA = ' '
```

# Setting the NODATA Character String

In the following request, the NODATA character string is set to MISSING. The word MISSING displays on the report instead of the default period.

```
SET NODATA=MISSING

TABLE FILE EMPLOYEE
PRINT CURR_SAL BY LAST_NAME BY FIRST_NAME
ACROSS DEPARTMENT
END
```

The output is:

| LAST_NAME | FIRST_NAME | DEPARTMENT MIS | PRODUCTION |
|---|---|---|---|
| BANNING | JOHN | MISSING | $29,700.00 |
| BLACKWOOD | ROSEMARIE | $21,780.00 | MISSING |
| CROSS | BARBARA | $27,062.00 | MISSING |
| GREENSPAN | MARY | $9,000.00 | MISSING |
| IRVING | JOAN | MISSING | $26,862.00 |
| JONES | DIANE | $18,480.00 | MISSING |
| MCCOY | JOHN | $18,480.00 | MISSING |
| MCKNIGHT | ROGER | MISSING | $16,100.00 |
| ROMANS | ANTHONY | MISSING | $21,120.00 |
| SMITH | MARY | $13,200.00 | MISSING |
| | RICHARD | MISSING | $9,500.00 |
| STEVENS | ALFRED | MISSING | $11,000.00 |

# Joining Data Sources

You can join two or more related data sources to create a larger integrated data structure from which you can report in a single request. The joined structure is virtual. It is a way of accessing multiple data sources as if they were a single data source. Up to 1022 joins can be in effect at one time, for a total of 1023 segments, depending on the number of active segments and the number and length of the fields (there is a 32K limit on the length of all fields).

For details about data sources you can use in a join, see Types of Joins.

# Types of Joins

When you join two data sources, some records in one of the files may lack corresponding records in the other file. When a report omits records that are not in both files, the join is called an inner join. When a report displays all matching records, plus all records from the host file that lack corresponding cross-referenced records, the join is called a left outer join. When a report displays all matching records plus all records from both files that lack corresponding records in the other file, the join is called a full outer join. Full outer joins are supported for relational data sources only.

The SET ALL command globally determines how all joins are implemented. If the SET ALL=ON command is issued, all joins are treated as outer joins. With SET ALL=OFF, the default, all joins are treated as inner joins.

Each JOIN command can specify explicitly which type of join to perform, locally overruling the global setting. This syntax is supported for FOCUS, XFOCUS, Relational, VSAM, IMS, and Adabas. If you do not specify the type of join in the JOIN command, the ALL parameter setting determines the type of join to perform.

You can also join data sources using one of two techniques for determining how to match records from the separate data sources. The first technique is known as an equijoin and the second is known as a conditional join. When deciding which of the two join techniques to use, it is important to know that when there is an equality condition between two data sources, it is more efficient to use an equijoin rather than a conditional join.

You can use an equijoin structure when you are joining two or more data sources that have two fields, one in each data source, with formats (character, numeric, or date) and values in common. Joining a product code field in a sales data source (the host file) to the product code field in a product data source (the cross-referenced file) is an example of an equijoin. For more information on using equijoins, see Creating an Equijoin.

The conditional join uses WHERE-based syntax to specify joins based on WHERE criteria, not just on equality between fields. Additionally, the host and cross-referenced join fields do not have to contain matching formats. Suppose you have a data source that lists employees by their ID number (the host file), and another data source that lists training courses and the employees who attended those courses (the cross-referenced file). Using a conditional join, you could join an employee ID in the host file to an employee ID in the cross-referenced file to determine which employees took training courses in a given date range (the WHERE condition). For more information on conditional joins, see Using a Conditional Join.

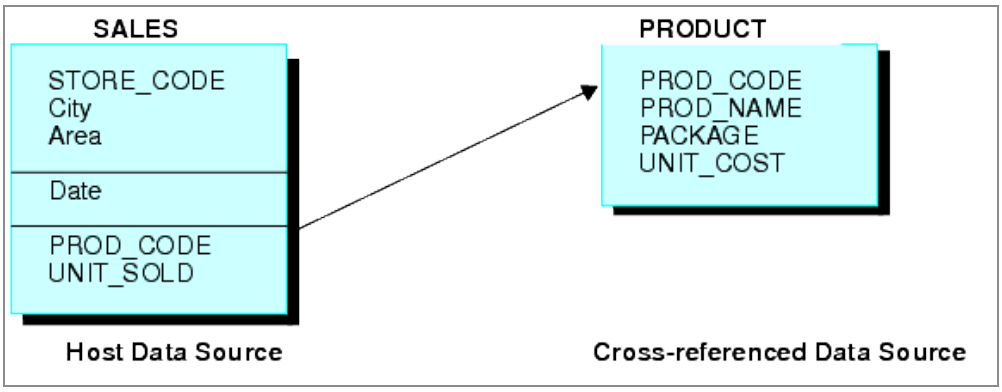
Joins can also be unique or non-unique. A unique, or one-to-one, join structure matches one value in the host data source to one value in the cross-referenced data source. Joining an employee ID in an employee data source to an employee ID in a salary data source is an example of a unique equijoin structure.

A non-unique, or one-to-many, join structure matches one value in the host data source to multiple values in the cross-referenced field. Joining an employee ID in a company's employee data source to an employee ID in a data source that lists all the training classes offered by that company results in a listing of all courses taken by each employee, or a joining of the one instance of each ID in the host file to the multiple instances of that ID in the cross-referenced file.

For more information on unique and non-unique joins, see Unique and Non-Unique Joined Structures.

# Joined Data Structure

Consider the SALES and PRODUCT data sources. Each store record in SALES may contain many instances of the PROD_CODE field. It would be redundant to store the associated product information with each instance of the product code. Instead, PROD_CODE in the SALES data source is joined to PROD_CODE in the PRODUCT data source. PRODUCT contains a single instance of each product code and related product information, thus saving space and making it easier to maintain product information. The joined structure, which is an example of an equijoin, is illustrated below:




# Data Sources You Can and Cannot Join

The use of data sources as host files and cross-referenced files in joined structures depends on the types of data sources you are joining:

- Typically, joins can be established between any FOCUS-readable files.
- Data sources protected by DBA security may be joined, with certain restrictions. For details, see Notes on DBA Security for Joined Data Structures.
- Conditional joins are supported only for FOCUS, VSAM, ADABAS, IMS, and all relational data sources.

# Notes on DBA Security for Joined Data Structures

- You can join a data source with DBA protection to another data source with DBA protection, as long as they use the same password.
- In addition, you can join DBA protected data sources with different passwords by adding the DBAFILE attribute to your security definition. The DBAFILE attribute names a central Master File that contains different passwords and restrictions for several Master Files. If you use a DBAFILE, a user can set separate passwords for each file using the syntax:

```
SET PASS = pswd1 IN file1, pswd2 IN file2
```

Individual DBA information remains in effect for each file in the JOIN. For details about the DBAFILE attribute, see the *Describing Data With ibi™ WebFOCUS® Language* manual.

- You can also join a DBA-protected host file to an unprotected cross-referenced file. The DBA information is taken from the host file.

# Unique and Non-Unique Joined Structures

In a unique joined structure, one value in the host field corresponds to one value in the cross-referenced field. In a non-unique joined structure, one value in the host field corresponds to multiple values in the cross-referenced field.

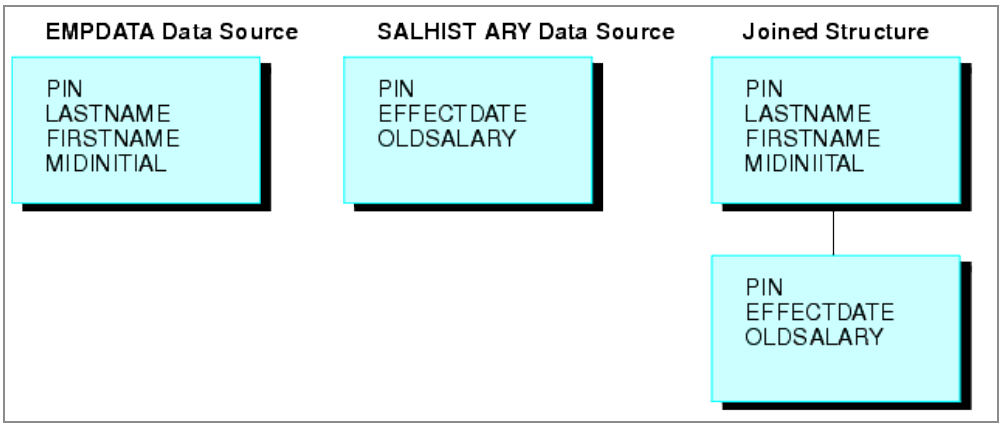
The ALL parameter in a JOIN command indicates that the joined structure is non-unique.

- Omit the ALL parameter only when you are sure that the joined structure is unique. Omitting the ALL parameter reduces overhead.
- The ALL parameter does not interfere with the proper creation of the joined structure even if it is unique. Use the ALL parameter if you are not sure whether the joined structure is unique. This ensures that your reports contain all relevant data from the cross-referenced file, regardless of whether the structure is unique.

# A Unique Equijoin Structure

The following example illustrates a unique joined structure. Two FOCUS data sources are joined together: an EMPDATA data source and a SALHIST data source. Both data sources are organized by PIN, and they are joined on a PIN field in the root segments of both files. Each PIN has one segment instance in the EMPDATA data source, and one instance in the SALHIST data source. To join these two data sources, issue this JOIN command:

```
JOIN PIN IN EMPDATA TO PIN IN SALHIST
```




# A Non-Unique Equijoin Structure

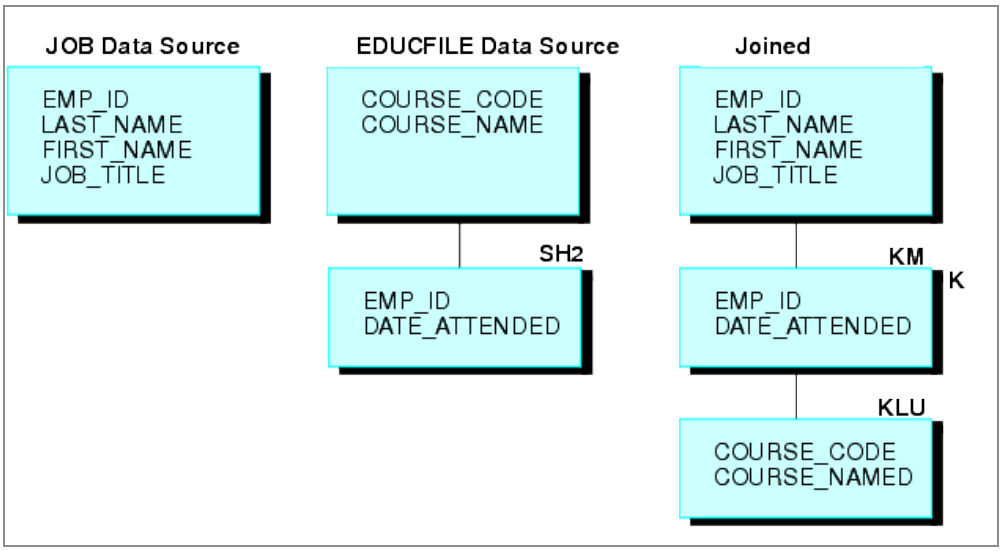
If a field value in the host file can appear in many segment instances in the cross-referenced file, then you should include the ALL phrase in the JOIN syntax. This structure is called a non-unique joined structure.

For example, assume that two FOCUS data sources are joined together: the JOB data source and an EDUCFILE data source which records employee attendance at in-house courses. The joined structure is shown in the following diagram.

The JOB data source is organized by employee, but the EDUCFILE data source is organized by course. The data sources are joined on the EMP_ID field. Since an employee has one position but can attend several courses, the employee has one segment instance in the JOB data source but can have as many instances in the EDUCFILE data source as courses attended.

To join these two data sources, issue the following JOIN command, using the ALL phrase:

```
JOIN EMP_ID IN JOB TO ALL EMP_ID IN EDUCFILE
```




# Correct for Lagging Values With a Unique Join

If a parent segment has two or more unique child segments that each have multiple children, the report may incorrectly display a missing value. The remainder of the child values may then be misaligned in the report. These misaligned values are called lagging values. The JOINOPT parameter ensures proper alignment of your output by correcting for lagging values.

```
SET JOINOPT={NEW|OLD|GNTINT}
```

where:

**NEW**

Specifies that segments be retrieved from left to right and from top to bottom, which results in the display of all data for each record, properly aligned. Missing values only occur when they exist in the data.

**OLD**

Specifies that segments be retrieved as unique segments, which results in the display of missing data in a report where all records should have values. This might cause lagging values. OLD is the default value.

**GNTINT**

Specifies that segments be retrieved from left to right and from top to bottom, which results in the display of all data for each record, properly aligned. Missing values only occur when they exist in the data.

**Note:** The value GNTINT both corrects for lagging values and enables joins between different numeric data types, as described in Joining Fields With Different Numeric Data Types.

# Correcting for Lagging Values in a Procedure With Unique Segments and Multiple Children

This example is a hypothetical scenario in which you would use the JOINOPT parameter to correct for lagging values. Lagging values display missing data such that each value appears off by one line.

A single-segment host file (ROUTES) is joined to two files (ORIGIN and DEST), each having two segments. The files are joined to produce a report that shows each train number, along with the city that corresponds to each station.

The following request prints the city of origin (OR_CITY) and the destination city (DE_CITY). Note that missing data is generated, causing the data for stations and corresponding cities to lag, or be off by one line.

```
TABLE FILE ROUTES
PRINT TRAIN_NUM
OR_STATION OR_CITY
DE_STATION DE_CITY
END
```

The output is:

```
TRAIN_NUM   OR_STATION   OR_CITY    DE_STATION   DE_CITY
---------   ----------   -------    ----------   -------
101         NYC          NEW YORK   ATL          .
202         BOS          BOSTON     BLT          ATLANTA
303         DET          DETROIT    BOS          BALTIMORE
404         CHI          CHICAGO    DET          BOSTON
505         BOS          BOSTON     STL          DETROIT
505         BOS          .          STL          ST. LOUIS
```

Issuing SET JOINOPT=NEW enables segments to be retrieved in the expected order (from left to right and from top to bottom), without missing data.

```
SET JOINOPT=NEW
TABLE FILE ROUTES
PRINT TRAIN_NUM
OR_STATION OR_CITY
DE_STATION DE_CITY
END
```

The correct report has only 5 lines instead of 6, and the station and city data is properly aligned. The output is:

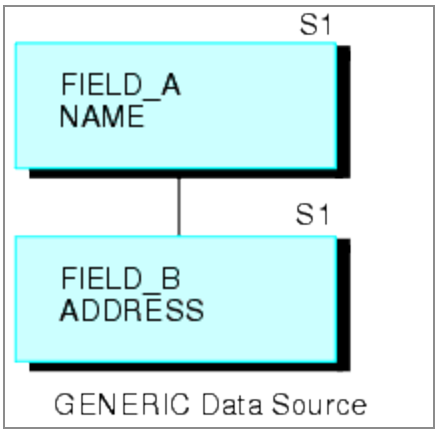
```
TRAIN_NUM   OR_STATION    OR_CITY    DE_STATION   DE_CITY
---------   ----------    -------    ----------   -------
101         NYC           NEW YORK   ATL          ATLANTA
202         BOS           BOSTON     BLT          BALTIMORE
303         DET           DETROIT    BOS          BOSTON
404         CHI           CHICAGO    DET          DETROIT
505         BOS           BOSTON     STL          ST. LOUIS
```

# Recursive Joined Structures

You can join a FOCUS or IMS data source to itself, creating a recursive structure. In the most common type of recursive structure, a parent segment is joined to a descendant segment, so that the parent becomes the child of the descendant. This technique (useful for storing bills of materials, for example) enables you to report from data sources as if they have more segment levels than is actually the case.

## Understanding Recursive Joined Structures

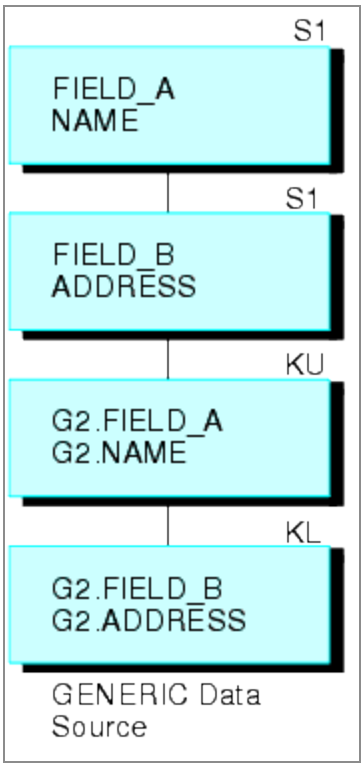
For example, the GENERIC data source shown below consists of Segments A and B.




The following request creates a recursive structure:

```
JOIN FIELD_B IN GENERIC TAG G1 TO FIELD_A IN GENERIC TAG G2 AS RECURSIV
```

This results in the joined structure (shown below).




Note that the two segments are repeated on the bottom. To refer to the fields in the repeated segments (other than the field to which you are joining), prefix the tag names to the field names and aliases and separate them with a period, or append the first four characters of the JOIN name to the field names and aliases. In the above example, the

JOIN name is RECURSIV. You should refer to FIELD_B in the bottom segment as G2.FIELD_B (or RECUFIELD_B). For related information, see Usage Notes for Recursive Joined Structures.

# Usage Notes for Recursive Joined Structures

- You must either specify a unique JOIN name, or use tag names in the JOIN command. Otherwise, you will not be able to refer to the fields in the repeated segments at the bottom of the join structure.
- If you use tag names in a recursive joined structure, note the following guidelines:
  - If tag names are specified in a recursive join, duplicate field names must be qualified with the tag name.
  - If a join name is specified and tag names are not specified in a recursive join, duplicate field names must be prefixed with the first four characters of the join name.
  - If both a join name and a tag name are specified in a recursive join, the tag name must be used as a qualifier.
  - The tag name must be used as the field name qualifier in order to retrieve duplicate field names in a non-recursive join. If you do not qualify the field name, the first occurrence is retrieved.
- You may use a DEFINE-based join (see Join From a Virtual Field to a Real Field) to join a virtual field in a descendant segment to a field in the parent segment.
- You can extend a recursive structure by issuing multiple JOIN commands from the bottom repeat segment in the structure to the parent segment, creating a structure up to 16 levels deep.
- For FOCUS data sources, the field in the parent segment to which you are joining must be indexed.
- For IMS data sources, the following applies:
  - The parent segment must be the root segment of the data source.
  - The field to which you are joining must be both a key field and a primary or secondary index.

- You need a duplicate PCB in the PSB for every recursive join you create.

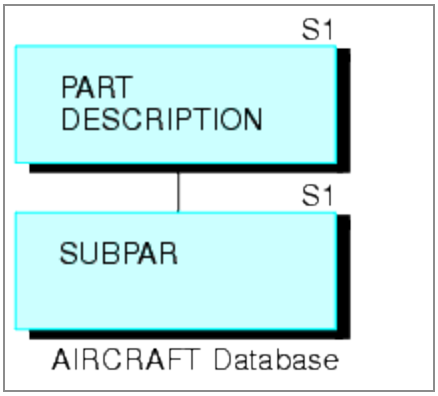
# Using Recursive Joined Structures

This example explains how to use recursive joins to store and report on a bill of materials. Suppose you are designing a data source called AIRCRAFT that contains the bill of materials for an aircraft manufactured by a company. The data source records data on three levels of airplane parts:

- Major divisions, such as the cockpit or cabin.
- Parts of divisions, such as instrument panels and seats.
- Subparts, such as nuts and bolts.

The data source must record each part, the part description, and the smaller parts composing the part. Some parts, such as nuts and bolts, are common throughout the aircraft. If you design a three-segment structure, one segment for each level of parts, descriptions of common parts are repeated in every place they are used.

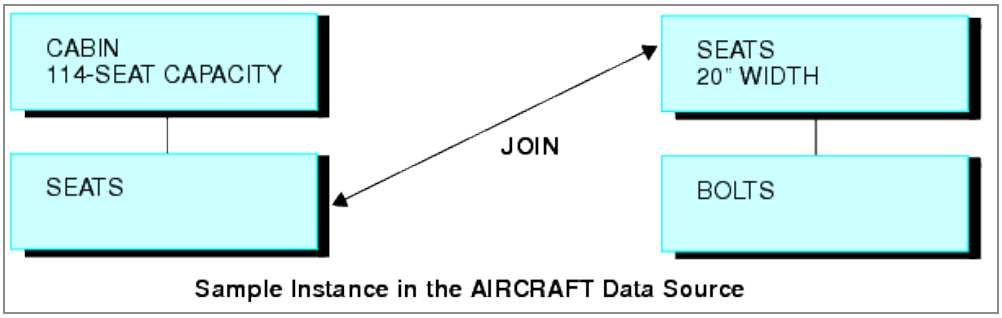
To reduce this repetition, design a data source that has only two segments (shown in the following diagram). The top segment describes each part of the aircraft, large and small. The bottom segment lists the component parts without descriptions.




Every part (except for the largest divisions) appears in both the top segment, where it is described, and in the bottom segment, where it is listed as one of the components of a larger part. (The smallest parts, such as nuts and bolts, appear in the top segment without an instance of a child in the bottom segment.) Note that each part, no matter how often it is used in the aircraft, is described only once.

If you join the bottom segment to the top segment, the descriptions of component parts in the bottom segment can be retrieved. The first-level major divisions can also be related to third-level small parts, going from the first level to the second level to the third level. Thus, the structure behaves as a three-level data source, although it is actually a more efficient two-level source.

For example, CABIN is a first-level division appearing in the top segment. It lists SEATS as a component in the bottom segment. SEATS also appears in the top segment. It lists BOLTS as a component in the bottom segment. If you join the bottom segment to the top segment, you can go from CABIN to SEATS and from SEATS to BOLTS.

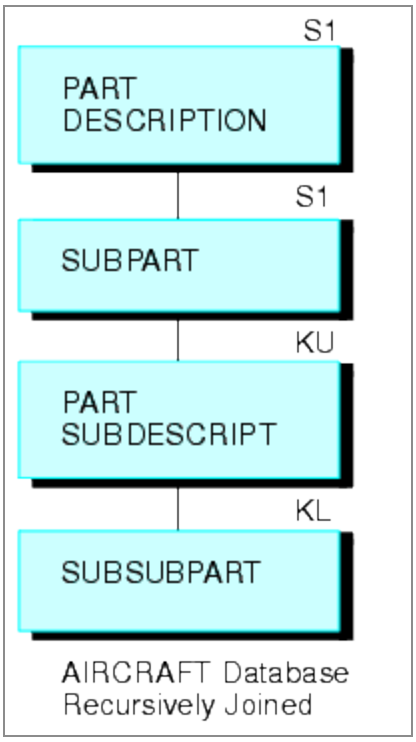


Sample Instance in the AIRCRAFT Data Source

Join the bottom segment to the top segment with this JOIN command:

```
JOIN SUBPART IN AIRCRAFT TO PART IN AIRCRAFT AS SUB
```

This creates the following recursive structure.




You can then produce a report on all three levels of data with this TABLE command (the field SUBDESCRIPT describes the contents of the field SUBPART):

```
TABLE FILE AIRCRAFT
PRINT SUBPART BY PART BY SUBPART BY SUBDESCRIPT
END
```

# How the JOIN Command Works

The JOIN command enables you to report from two or more related data sources with a single request. Joined data sources remain physically separate, but are treated as one. Up to 1022 joins can be in effect at any one time.

When two data sources are joined, one is called the host file; the other is called the cross-referenced file. Each time a record is retrieved from the host file, the corresponding fields in the cross-referenced file are identified if they are referenced in the report request. The records in the cross-referenced file containing the corresponding values are then retrieved.

Two data sources can be joined using a conditional join whenever you can define an expression that determines how to relate records in the host file to records in the cross-referenced file. Two data sources can be joined using an equijoin when they have fields in

each data source with formats (character, numeric, or date) and values in common. The common formats ensure proper interpretation of the values. For example, suppose that you need to read data from two data sources: one named JOB, containing job information, and a second named SALARY, containing salary information. You can join these two data sources if each has a field identifying the same group of employees in the same way: by last name, serial number, or social security number. The join becomes effective when common values (for example, common social security numbers) are retrieved for the joined fields.

After you issue the JOIN command, you can issue a single TABLE, TABLEF, MATCH FILE, or GRAPH request to read the joined data source. You only need to specify the first data source (host file) to produce a report from two or more data sources. For example, assume you are writing a report from the JOB and SALARY data sources. You execute the following equijoin:

```
JOIN EMP_ID IN JOB TO ALL EMP_ID IN SALARY
```

This command joins the field EMP_ID in the JOB file to the field EMP_ID in the SALARY file. JOB is the host file and SALARY is the cross-referenced file. You then execute this report request:

```
TABLE FILE JOB
PRINT SALARY AND JOB_TITLE BY EMP_ID
END
```

The first record retrieved is a JOB file record for employee #071382660. Next, all records in the SALARY data source containing employee #071382660 are retrieved. This process continues until all the records have been read.

You can base your join on:

- Real fields that have been declared in the Master Files of the host and cross-referenced data sources, respectively. See Join Real Fields.
- A virtual field in the host data source (that has either been defined in the Master File or with a DEFINE command) and a real field that has been declared in the Master File of the cross-referenced data source. See Join From a Virtual Field to a Real Field.
- A condition you specify in the JOIN command itself. See Create a Conditional JOIN.

# Increasing Retrieval Speed in Joined Data Sources

You can increase retrieval speed in joined structures by using an external index. However, the target segment for the index cannot be a cross-referenced segment. For related information, see Improving Report Processing.

# Creating an Equijoin

The most common joined structures are based on real fields that have been declared in the Master Files of the host and cross-referenced data sources, respectively.

# Join Real Fields

The following JOIN syntax requires that the fields you are using to join the files are real fields declared in the Master File. This join may be a simple one based on one field in each file to be joined, or a multi-field join for data sources that support this type of behavior. The following syntax describes the simple and multi-field variations:

```
JOIN [LEFT_OUTER|RIGHT_OUTER|INNER] hfld1 [AND hfld2 ...] IN hostfile
[TAG tag1]
     TO [UNIQUE|MULTIPLE]
     crfield [AND crfld2 ...] IN crfile [TAG tag2] [AS joinname]
END
```

where:

**JOIN hfld1**

Is the name of a field in the host file containing values shared with a field in the cross-referenced file. This field is called the host field.

**AND hfld2...**

Can be an additional field in the host file, with the caveats noted below. The phrase beginning with AND is required when specifying multiple fields.

- For adapters that support multi-field and concatenated joins, and FOCUS or XFOCUS data sources when SET NFOC=ON (the default), you can specify up to 128 fields. See your data adapter documentation for specific information about supported join features for each adapter.
- When you are joining two FOCUS data sources, and SET NFOC=OFF, you can specify up to four alphanumeric fields in the host file that, if concatenated, contain values shared with the cross-referenced file. You may not specify more than one field in the cross-referenced file when the suffix of the file is FOC. For example, assume the cross-referenced file contains a phone number field with an area code-prefix-exchange format. The host file has an area code field, a prefix field, and an exchange field. You can specify these three fields to join them to the phone number field in the cross-referenced file. The JOIN command treats the three fields as one. Other data sources do not have this restriction on the cross-referenced file.

**INNER**

Specifies an inner join. If you do not specify the type of join in the JOIN command, the ALL parameter setting determines the type of join to perform.

**LEFT_OUTER**

Specifies a left outer join. If you do not specify the type of join in the JOIN command, the ALL parameter setting determines the type of join to perform.

Note that in a left outer join, host records with a missing cross-referenced instance are included in the report output. To control how tests against missing cross-referenced segment instances are processed, use the SET SHORTPATH command described in Handling Records With Missing Field Values.

**RIGHT_OUTER**

Specifies a right outer join. This option is available for relational data sources that support this type of join. Using this option requires that you issue the SET SHORTPATH = SQL command.

Note that in a right outer join, cross-referenced records with a missing host instance are included in the report output.

**IN hostfile**

Is the name of the host file.

**TAG tag1**

Is a tag name of up to 66 characters (usually the name of the Master File), which is used as a unique qualifier for fields and aliases in the host file.

The tag name for the host file must be the same in all the JOIN commands of a joined structure.

**TO [UNIQUE|MULTIPLE] crfld1**

Is the name of a field in the cross-referenced file containing values that match those of *hfld1* (or of concatenated host fields). This field is called the cross-referenced field.

**Note:** Unique returns only one instance and, if there is no matching instance in the cross-referenced file, it supplies default values (blank for alphanumeric fields and zero for numeric fields).

Use the MULTIPLE parameter when *crfld1* may have multiple instances in common with one value in *hfld1*. Note that ALL is a synonym for MULTIPLE, and omitting this parameter entirely is a synonym for UNIQUE. See Unique and Non-Unique Joined Structures for more information.

**AND crfld2...**

Is the name of a field in the cross-referenced file with values in common with *hfld2*.

**Note:***crfld2* may be qualified. This field is only available for data adapters that support multi-field joins.

**IN crfile**

Is the name of the cross-referenced file.

**TAG tag2**

Is a tag name of up to 66 characters (usually the name of the Master File), which is used as a unique qualifier for fields and aliases in cross-referenced files. In a recursive join structure, if no tag name is provided, all field names and aliases are prefixed with the first four characters of the join name. For related information, see Usage Notes for Recursive Joined Structures.

The tag name for the host file must be the same in all the JOIN commands of a joined structure.

**AS joinname**

Is an optional name of up to eight characters that you may assign to the join structure. You must assign a unique name to a join structure if:

- You want to ensure that a subsequent JOIN command does not overwrite it.
- You want to clear it selectively later.
- The structure is recursive. See Recursive Joined Structures.

**Note:** If you do not assign a name to the join structure with the AS phrase, the name is assumed to be blank. A join without a name overwrites an existing join without a name.

**END**

Required when the JOIN command is longer than one line. It terminates the command. It must be on a line by itself.

# Creating a Simple Unique Joined Structure

An example of a simple unique join is shown below:

```
JOIN JOBCODE IN EMPLOYEE TO JOBCODE IN JOBFILE AS JJOIN
```

# Creating an Inner Join

The following procedure creates three FOCUS data sources:

- EMPINFO, which contains the fields EMP_ID, LAST_NAME, FIRST_NAME, and CURR_JOBCODE from the EMPINFO segment of the EMPLOYEE data source.
- JOBINFO, which contains the JOBCODE and JOB_DESC fields from the JOBFILE data source.
- EDINFO, which contains the EMP_ID, COURSE_CODE, and COURSE_NAME fields from the EDUCFILE data source.

The procedure then adds an employee to EMPINFO named Fred Newman who has no matching record in the JOBINFO or EDINFO data sources.

```
TABLE FILE EMPLOYEE
SUM LAST_NAME FIRST_NAME CURR_JOBCODE
BY EMP_ID
ON TABLE HOLD AS EMPINFO FORMAT FOCUS INDEX EMP_ID CURR_JOBCODE
END
-RUN

TABLE FILE JOBFILE
SUM JOB_DESC
BY JOBCODE
ON TABLE HOLD AS JOBINFO FORMAT FOCUS INDEX JOBCODE
END
-RUN

TABLE FILE EDUCFILE
SUM COURSE_CODE COURSE_NAME
BY EMP_ID
ON TABLE HOLD AS EDINFO FORMAT FOCUS INDEX EMP_ID
END
-RUN

MODIFY FILE EMPINFO
FREEFORM EMP_ID LAST_NAME FIRST_NAME CURR_JOBCODE
MATCH EMP_ID
ON NOMATCH INCLUDE
ON MATCH REJECT
DATA
111111111, NEWMAN, FRED, C07,$
END
```

The following request prints the contents of EMPINFO. Note that Fred Newman has been added to the data source:

```
TABLE FILE EMPINFO
PRINT *
END
```

The output is:

```
EMP_ID     LAST_NAME        FIRST_NAME  CURR_JOBCODE
------     ---------        ----------  ------------
071382660  STEVENS          ALFRED      A07
112847612  SMITH            MARY        B14
117593129  JONES            DIANE       B03
119265415  SMITH            RICHARD     A01
```

```
119329144  BANNING          JOHN        A17
123764317  IRVING           JOAN        A15
126724188  ROMANS           ANTHONY     B04
219984371  MCCOY            JOHN        B02
326179357  BLACKWOOD        ROSEMARIE   B04
451123478  MCKNIGHT         ROGER       B02
543729165  GREENSPAN        MARY        A07
818692173  CROSS            BARBARA     A17
111111111  NEWMAN           FRED        C07
```

The following JOIN command creates an inner join between the EMPINFO data source and the JOBINFO data source.

```
JOIN CLEAR *
JOIN INNER CURR_JOBCODE IN EMPINFO TO MULTIPLE JOBCODE IN JOBINFO AS J0
```

Note that the JOIN command specifies a multiple join. In a unique join, the cross-referenced segment is never considered missing, and all records from the host file display on the report output. Default values (blank for alphanumeric fields and zero for numeric fields) display if no actual data exists.

The following request displays fields from the joined structure:

```
TABLE FILE EMPINFO
PRINT LAST_NAME FIRST_NAME JOB_DESC
END
```

Fred Newman is omitted from the report output because his job code does not have a match in the JOBINFO data source:

```
LAST_NAME  FIRST_NAME  JOB_DESC
---------  ----------  --------
STEVENS    ALFRED      SECRETARY
SMITH      MARY        FILE QUALITY
JONES      DIANE       PROGRAMMER ANALYST
SMITH      RICHARD     PRODUCTION CLERK
BANNING    JOHN        DEPARTMENT MANAGER
IRVING     JOAN        ASSIST.MANAGER
ROMANS     ANTHONY     SYSTEMS ANALYST
MCCOY      JOHN        PROGRAMMER
BLACKWOOD  ROSEMARIE   SYSTEMS ANALYST
MCKNIGHT   ROGER       PROGRAMMER
```

```
GREENSPAN  MARY         SECRETARY
CROSS      BARBARA      DEPARTMENT MANAGER
```

# Creating a Left Outer Join

The following JOIN command creates a left outer join between the EMPINFO data source and the EDINFO data source:

```
JOIN CLEAR *
JOIN LEFT_OUTER EMP_ID IN EMPINFO TO MULTIPLE EMP_ID IN EDINFO AS J1
```

The following request displays fields from the joined structure:

```
TABLE FILE EMPINFO
PRINT LAST_NAME FIRST_NAME COURSE_NAME
END
```

All employee records display on the report output. The records for those employees with no matching records in the EDINFO data source display the missing data character (.) in the COURSE_NAME column. If the join were unique, blanks would display instead of the missing data character.

```
LAST_NAME  FIRST_NAME  COURSE_NAME
---------  ----------  -----------
STEVENS    ALFRED      FILE DESCRPT & MAINT
SMITH      MARY        BASIC REPORT PREP FOR PROG
JONES      DIANE       FOCUS INTERNALS
SMITH      RICHARD     BASIC RPT NON-DP MGRS
BANNING    JOHN        .
IRVING     JOAN        .
ROMANS     ANTHONY     .
MCCOY      JOHN        .
BLACKWOOD  ROSEMARIE   DECISION SUPPORT WORKSHOP
MCKNIGHT   ROGER       FILE DESCRPT & MAINT
GREENSPAN  MARY        .
CROSS      BARBARA     HOST LANGUAGE INTERFACE
NEWMAN     FRED        .
```

# Creating a Right Outer Join

The following requests generate two Microsoft SQL Server tables to join, and then issues a request against the join.

The following request generates the WF_SALES table. The field ID_PRODUCT will be used in the right outer join command.

```
TABLE FILE WF_RETAIL_LITE
SUM GROSS_PROFIT_US PRODUCT_CATEGORY PRODUCT_SUBCATEG
BY ID_PRODUCT
WHERE ID_PRODUCT FROM 2150 TO 4000
ON TABLE HOLD AS WF_SALES FORMAT SQLMSS
END
```

The following request generates the WF_PRODUCT table. The field ID_PRODUCT will be used in the right outer join command.

```
TABLE FILE WF_RETAIL_LITE
SUM PRICE_DOLLARS PRODUCT_CATEGORY PRODUCT_SUBCATEG PRODUCT_NAME
BY ID_PRODUCT
WHERE ID_PRODUCT FROM 3000 TO 5000
ON TABLE HOLD AS WF_PRODUCT FORMAT SQLMSS
END
```

The following request issues the SET SHORTPATH=SQL and JOIN commands and displays values from the joined tables:

```
SET SHORTPATH = SQL
JOIN RIGHT_OUTER ID_PRODUCT IN WF_PRODUCT TAG T1 TO ALL ID_PRODUCT IN
WF_SALES TAG T2
END
TABLE FILE WF_PRODUCT
PRINT T1.ID_PRODUCT AS 'Product ID'
PRICE_DOLLARS AS Price
T2.ID_PRODUCT AS 'Sales ID'
GROSS_PROFIT_US
BY T1.ID_PRODUCT NOPRINT
ON TABLE SET PAGE NOPAGE
ON TABLE SET STYLE *
GRID=OFF,$
```

```
ENDSTYLE
END
```

You can generate a trace that shows the resulting SQL by adding the following commands.

```
SET TRACEUSER=ON
SET TRACESTAMP=OFF
SET TRACEOFF=ALL
SET TRACEON = STMTRACE//CLIENT
```

The trace shows that the request was optimized as a right outer join to the RDBMS.

```
SELECT
T1."ID_PRODUCT",
T1."PRICE_DOLLARS",
T2."ID_PRODUCT",
T2."GROSS_PROFIT_US"
FROM
( WF_PRODUCT T1
RIGHT OUTER JOIN
WF_SALES T2
ON T2."ID_PRODUCT" = T1."ID_PRODUCT" )
ORDER BY
T1."ID_PRODUCT";
```

The output, shown in the following image, has a row for each ID_PRODUCT value that is in the WF_PRODUCT table. The columns from WF_SALES rows that do not have a matching ID_PRODUCT value display the NODATA symbol.

| Product ID | Price | Sales ID | Gross Profit |
|---|---|---|---|
| . | . | 2151 | $7,172.24 |
| . | . | 2152 | $6,766.45 |
| . | . | 2153 | $7,291.10 |
| . | . | 2154 | $19,913.65 |
| . | . | 2155 | $12,472.93 |
| . | . | 2156 | $14,484.75 |
| . | . | 2157 | $6,223.34 |
| . | . | 2158 | $11,267.75 |
| . | . | 2159 | $9,015.75 |
| . | . | 2160 | $7,194.15 |
| . | . | 2161 | $8,683.00 |
| . | . | 2162 | $9,197.81 |
| . | . | 2163 | $21,347.98 |
| . | . | 2164 | $5,615.33 |
| . | . | 2165 | $8,540.53 |
| . | . | 2166 | $12,469.45 |
| . | . | 2167 | $6,771.26 |
| 3001 | 47,988.00 | 3001 | $12,786.30 |
| 3002 | 34,990.00 | 3002 | $5,586.10 |
| 3003 | 30,591.00 | 3003 | $12,399.15 |
| 3004 | 44,187.00 | 3004 | $8,434.95 |
| 3005 | 30,057.00 | 3005 | $8,987.80 |
| 3006 | 25,348.05 | 3006 | $6,422.59 |
| 3007 | 23,607.00 | 3007 | $8,354.60 |
| 3008 | 42,898.57 | 3008 | $18,469.01 |
| 3009 | 48,139.00 | 3009 | $22,542.75 |
| 3010 | 44,850.00 | 3010 | $16,722.15 |
| 3011 | 28,078.44 | 3011 | $18,204.82 |
| 3012 | 31,146.00 | 3012 | $19,739.45 |
| 3013 | 27,208.00 | 3013 | $17,983.00 |
| 3014 | 23,968.59 | 3014 | $19,996.09 |
| 3015 | 29,061.45 | 3015 | $17,420.72 |

# Creating Two Inner Joins With a Multipath Structure

The following JOIN commands create an inner join between the EMPINFO and JOBINFO data sources and an inner join between the EMPINFO and EDINFO data sources:

```
JOIN CLEAR *
JOIN INNER CURR_JOBCODE IN EMPINFO TO MULTIPLE JOBCODE IN JOBINFO AS J0
JOIN INNER EMP_ID IN EMPINFO TO MULTIPLE EMP_ID IN EDINFO AS J1
```

The structure created by the two joins has two independent paths:

```
          SEG01
 01       S1
**************
*EMP_ID       **I
*CURR_JOBCODE**I
*LAST_NAME    **
```

```
*FIRST_NAME  **
*            **
***************
 **************
       I
       +-----------------+
       I                 I
       I SEG01           I SEG01
 02    I KM        03    I KM
...............    ...............
:EMP_ID      ::K  :JOBCODE     ::K
:COURSE_CODE ::   :JOB_DESC    ::
:COURSE_NAME ::   :            ::
:            ::   :            ::
:            ::   :            ::
:............::   :............::
 ..............:    ..............:
 JOINED  EDINFO    JOINED  JOBINFO
```

The following request displays fields from the joined structure:

```
SET MULTIPATH=SIMPLE
TABLE FILE EMPINFO
PRINT LAST_NAME FIRST_NAME IN 12 COURSE_NAME JOB_DESC
END
```

With MULTIPATH=SIMPLE, the independent paths create independent joins. All employee records accepted by either join display on the report output. Only Fred Newman (who has no matching record in either of the cross-referenced files) is omitted:

```
LAST_NAME  FIRST_NAME  COURSE_NAME                    JOB_DESC
---------  ----------  -----------                    --------
STEVENS    ALFRED      FILE DESCRPT & MAINT           SECRETARY
SMITH      MARY        BASIC REPORT PREP FOR PROG     FILE QUALITY
JONES      DIANE       FOCUS INTERNALS                PROGRAMMER
ANALYST
SMITH      RICHARD     BASIC RPT NON-DP MGRS          PRODUCTION CLERK
BANNING    JOHN        .                              DEPARTMENT
MANAGER
IRVING     JOAN        .                              ASSIST.MANAGER
ROMANS     ANTHONY     .                              SYSTEMS ANALYST
MCCOY      JOHN        .                              PROGRAMMER
BLACKWOOD  ROSEMARIE   DECISION SUPPORT WORKSHOP      SYSTEMS ANALYST
MCKNIGHT   ROGER       FILE DESCRPT & MAINT           PROGRAMMER
```

```
GREENSPAN  MARY        .                                SECRETARY
CROSS      BARBARA     HOST LANGUAGE INTERFACE          DEPARTMENT
MANAGER
```

With MULTIPATH=COMPOUND, only employees with matching records in both of the cross-referenced files display on the report output:

```
LAST_NAME  FIRST_NAME  COURSE_NAME                      JOB_DESC
---------  ----------  -----------                      --------
STEVENS    ALFRED      FILE DESCRPT & MAINT             SECRETARY
SMITH      MARY        BASIC REPORT PREP FOR PROG       FILE QUALITY
JONES      DIANE       FOCUS INTERNALS                  PROGRAMMER
ANALYST
SMITH      RICHARD     BASIC RPT NON-DP MGRS            PRODUCTION CLERK
BLACKWOOD  ROSEMARIE   DECISION SUPPORT WORKSHOP        SYSTEMS ANALYST
MCKNIGHT   ROGER       FILE DESCRPT & MAINT             PROGRAMMER
CROSS      BARBARA     HOST LANGUAGE INTERFACE          DEPARTMENT
MANAGER
```

# Requirements for Cross-Referenced Fields in an Equijoin

The cross-referenced fields used in a JOIN must have the following characteristics in specific data sources:

- In relational data sources and in a CA-DATACOM/DB data source, the cross-referenced field can be any field.
- In FOCUS and XFOCUS data sources, the cross-referenced field must be indexed. Indexed fields have the attribute FIELDTYPE=I or INDEX=I or INDEX=ON in the Master File. If the cross-referenced field does not have this attribute, append the attribute to the field declaration in the Master File and rebuild the file using the REBUILD utility with the INDEX option. This adds an index to your FOCUS or XFOCUS data source.

  **Note:** The indexed fields can be external. See the *Describing Data With ® Language* manual for more information about indexed fields and the Rebuild tool.
- In IMS data sources, the cross-referenced field must be a key field in the root segment. It can be a primary or secondary index.

- In fixed format or delimited sequential files, any field can be a cross-referenced field. However, both the host and cross-referenced file must be retrieved in ascending order on the named (key) fields, if the command ENGINE INT CACHE SET OFF is in effect. In this situation, if the data is not in the same sort order, errors are displayed and a many-to-many join is not supported. However, if ENGINE INT CACHE SET ON is in effect, the files do not have to be in ascending order and a many-to-many join is supported. ON is the default value. A delimited file used as the cross-referenced file in the join must consist of only one segment. If the join is based on multiple fields, a fixed format sequential file must consist of a single segment. If the cross-referenced fixed format sequential file contains only one segment, the host file must have a segment declaration.

# Restrictions on Group Fields

When group fields are used in a joined structure, the group in the host file and the group in the cross-referenced file must have the same number of elements:

- In ISAM data sources, the field must be the full primary key if you issue a unique join, or an initial subset of the primary key if you issue a non-unique join. In the Master File, the primary key is described by a key GROUP; the initial subset is the first field in that group.
- In VSAM KSDS data sources, the field must be the full primary or alternate key if you issue a unique join, or an initial subset of the primary or alternate key if you issue a non-unique join. In the Master File, the primary key is described by a key GROUP. The initial subset is the first field in that group.

  In VSAM ESDS data sources, the field can be any field, as long as the file is already sorted on that field.
- In Model 204 data sources, the field must be a key field. In the Access File, the types of key fields are alphanumeric (KEY), ordered character (ORA), ordered numeric (ORN), numeric range (RNG), invisible (IVK), and invisible range (IVR).
- In ADABAS data sources, the field must be a descriptor field, a superdescriptor defined with the .SPR or .NOP field name suffix, or a subdescriptor defined with the .NOP field name suffix. The field description in the Master File must contain the attribute FIELDTYPE=I.

  In the Access File, the cross-referenced segment must specify ACCESS=ADBS and either CALLTYPE=FIND or CALLTYPE=RL. If CALLTYPE=RL, the host field can be joined

to the high-order portion of a descriptor, superdescriptor, or subdescriptor, if the high-order portion is longer than the host field.

- In CA-IDMS/DB data sources, the field must be an indexed field on a network record identified by the attribute FIELDTYPE=I in the Master File, a CA-IDMS/DB CALC field on a network record identified by the CLCFLD phrase in the Access File, or any field on an LRF or ASF record.
- For a partial key join using fixed format or delimited sequential files, the setting ENGINE INT CACHE SET OFF must be in effect.

# Usage Notes for Inner and Outer JOIN Command Syntax

- The SET ALL and SET CARTESIAN commands are ignored by the syntax.
- The ALL. parameter is not supported. If the ALL. parameter is used, the following message displays:

```
(FOC32452) Use of ALL. with LEFT_OUTER/INNER not allowed
```

- If you define multiple joins, the resulting structure can be a single path or multi-path data source.
    - If the setting MULTIPATH=SIMPLE is in effect and the report is based on multiple paths, each of the individual joins is constructed separately without regard to the other joins, and the matching records from each of the separate paths displays on the report output. Therefore, the output can contain records that would have been omitted if only one of the joins was in effect.
    - If the setting MULTIPATH=COMPOUND is in effect with a multi-path report, or if the report displays data only from a single path, the report output displays only those records that satisfy all of the joins.

# Joining From a Virtual Field to a Real Field Using an Equijoin

You can use DEFINE-based JOIN syntax to create a virtual host field that you can join to a real cross-referenced field. The DEFINE expression that creates the virtual host field may contain only fields in the host file and constants. (It may not contain fields in the cross-referenced file.) You can do more than one join from a virtual field.

You can create the virtual host field in a separate DEFINE command or in a Master File. For information on Master Files, see the *Describing Data With ibi™ WebFOCUS® Language* manual.

The same report request can use JOIN-based virtual fields, and virtual fields unrelated to the join.

Note that if you are creating a virtual field in a DEFINE command, you must issue the DEFINE after the JOIN command, but before the TABLE request since a JOIN command clears all fields created by DEFINE commands for the host file and the joined structure. Virtual fields defined in Master Files are not cleared.

**Tip:** If a DEFINE command precedes the JOIN command, you can set KEEPDEFINES to ON or ALL to reinstate virtual fields during the parsing of a subsequent JOIN command. For more information, see Preserving Virtual Fields Using KEEPDEFINES.

# Join From a Virtual Field to a Real Field

The DEFINE-based JOIN command enables you to join a virtual field in the host file to a real field in the cross-referenced file. The syntax is:

```
JOIN [LEFT_OUTER|RIGHT_OUTER|INNER] deffld WITH host_field ...
     IN hostfile [TAG tag1]
     TO [UNIQUE|MULTIPLE]
     cr_field IN crfile [TAG tag2] [AS joinname]
END
```

where:

**JOIN deffld**

Is the name of a virtual field for the host file (the host field). The virtual field can be defined in the Master File or with a DEFINE command. For related information, see Notes on Using Virtual Fields With Joined Data Sources.

**WITH host_field**

Is the name of any real field in the host segment with which you want to associate the virtual field. This association is required to locate the virtual field.

**Note:** The WITH field referenced in the JOIN command must be in the same segment as the WITH field referenced in the DEFINE that creates the virtual field or no output will be produced.

The WITH phrase is required unless the KEEPDEFINES parameter is set to ON or ALL and *deffld* was defined prior to issuing the JOIN command.

To determine which segment contains the virtual field, use the ? DEFINE query after issuing the DEFINE command. See the *ibi™ WebFOCUS® Developing Reporting Applications* manual for details about Query commands.

**INNER**

Specifies an inner join. If you do not specify the type of join in the JOIN command, the ALL parameter setting determines the type of join to perform.

**LEFT_OUTER**

Specifies a left outer join. If you do not specify the type of join in the JOIN command, the ALL parameter setting determines the type of join to perform.

**RIGHT_OUTER**

Specifies a right outer join. This option is available for relational data sources that support this type of join. The SET SHORTPATH = SQL command must be in effect in order to issue a right outer join.

**IN hostfile**

Is the name of the host file.

**TAG tag1**

Is a tag name of up to 66 characters (usually the name of the Master File), which is used as a unique qualifier for fields and aliases in host files.

The tag name for the host file must be the same in all JOIN commands of a joined structure.

**TO [UNIQUE|MULTIPLE] crfld1**

Is the name of a real field in the cross-referenced data source whose values match those of the virtual field. This must be a real field declared in the Master File.

**Note:** UNIQUE returns only one instance and, if there is no matching instance in the cross-referenced file, it supplies default values (blank for alphanumeric fields and zero for numeric fields).

Use the MULTIPLE parameter when *crfld1* may have multiple instances in common with one value in *hfld1*. Note that ALL is a synonym for MULTIPLE, and omitting this parameter entirely is a synonym for UNIQUE. See Unique and Non-Unique Joined Structures for more information.

**IN crfile**

Is the name of the cross-referenced file.

**TAG tag2**

Is a tag name of up to 66 characters (usually the name of the Master File), which is used as a unique qualifier for fields and aliases in cross-referenced files. In a recursive joined structure, if no tag name is provided, all field names and aliases are prefixed with the first four characters of the join name. For related information, see Unique and Non-Unique Joined Structures.

The tag name for the host file must be the same in all JOIN commands of a joined structure.

**AS joinname**

Is an optional name of up to eight characters that you may assign to the joined structure. You must assign a unique name to a join structure if:

- You want to ensure that a subsequent JOIN command does not overwrite it.
- You want to clear it selectively later.
- The structure is recursive, and you do not specify tag names. See Recursive Joined Structures.

If you do not assign a name to the joined structure with the AS phrase, the name is assumed to be blank. A join without a name overwrites an existing join without a name.

**END**

Required when the JOIN command is longer than one line. It terminates the command. It must be on a line by itself.

# Notes on Using Virtual Fields With Joined Data Sources

Requests reading joined data sources can contain virtual fields that are defined either:

- In the Master File of the host data source.
- In a DEFINE command, in which the syntax

  ```
  DEFINE FILE hostfile
  ```

  identifies the host data source in the joined structure.

  **Note:** The expression defining the host field for the join can use only host fields and constants.

  All other virtual fields can contain real fields from the host file and the cross-referenced file.

  **Tip:** Since issuing the JOIN command clears all DEFINE commands for the host file and the joined structure, you must issue the DEFINE command after the JOIN or turn KEEPDEFINES to ON or ALL to preserve the virtual fields. For more information, see Preserving Virtual Fields During Join Parsing.

# Creating a Virtual Host Field for a Joined Structure

Suppose that a retail chain sends four store managers to attend classes. Each person, identified by an ID number, manages a store in a different city. The stores and the cities in which they are located are contained in the SALES data source. The manager IDs, the classes, and dates the managers attended are contained in the EDUCFILE data source.

The following procedure lists the courses that the managers attended, identifying the managers by the cities in which they work. Note the three elements in the procedure:

- The JOIN command joins the SALES data source to the EDUCFILE data source, based on the values common to the ID_NUM field (which contains manager IDs) in SALES and the EMP_ID field in EDUCFILE. Note that the ID_NUM field does not exist yet and will be created by the DEFINE command.
- The DEFINE command creates the ID_NUM field, assigning to it the IDs of the managers working in the four cities.
- The TABLE command produces the report.

The procedure is:

```
JOIN ID_NUM WITH CITY IN SALES TO ALL EMP_ID IN EDUCFILE AS SALEDUC
```

```
DEFINE FILE SALES
ID_NUM/A9 = DECODE CITY ('NEW YORK' 451123478 'NEWARK' 119265415
                         'STAMFORD' 818692173 'UNIONDALE' 112847612);
END
```

```
TABLE FILE SALES
PRINT DATE_ATTEND BY CITY BY COURSE_NAME
END
```

The output is:

```
CITY                    COURSE_NAME                DATE_ATTEND
----                    -----------                -----------
NEW YORK                FILE DESCRPT & MAINT          81/11/15
NEWARK                  BASIC RPT NON-DP MGRS         82/08/24
STAMFORD                BASIC REPORT PREP DP MGRS     82/08/02
                        HOST LANGUAGE INTERFACE       82/10/21
UNIONDALE               BASIC REPORT PREP FOR PROG    81/11/16
                        FILE DESCRPT & MAINT          81/11/15
```

# Join Modes in an Equijoin

The JOIN_LENGTH_MODE (JOINLM) parameter controls processing of equality joined field pairs for record-based non-SQL Adapters, such as DFIX, VSAM, and FIX. This setting controls processing when two alphanumeric fields of different lengths or two numeric fields of different data types and precisions are joined.

For SQL data sources, joins are normally either optimized (sent to the SQL engine for processing) or managed to comply with SQL processing rules.

There are two supported modes of handling compatible, but not identical, joined fields:

- **SQL compliance mode.** The JOIN command processor assures strict value equality of joined fields. Detected truncation of significant characters during host to cross-referenced conversion generates a*target not found* condition, in which case the join is not done. If a shorter host field is joined to a longer cross-referenced file, the shorter host field value is extended to the length of the cross-referenced field with non-significant characters, according to the data type, and the join is processed.
- **FOCUS reporting mode.** The JOIN command processor assures partial value equality of joined fields.
    - When joining a shorter to a longer field, a search range is created to find all cross-referenced values that are prefixed with the host value.
    - When joining a longer to a shorter field, the host value is unconditionally truncated to the cross referenced field length. If the truncation removes non-blank characters, the match will not be done and the comparison will fail, rejecting the records.

# Control the Join Mode for Record-Based Data Sources

```
SET JOIN_LENGTH_MODE|JOINLM} = {SQL|RANGE}
```

where:

**SQL**

Sets SQL compliant mode. which assures strict equality between host and cross-referenced field values. This is the default value.

**RANGE**

Sets FOCUS reporting mode, which supports partial key joins.

# Data Formats of Shared Fields

Generally, the fields containing the shared values in the host and cross-referenced files must have the same data formats.

If you specify multiple host file fields, the JOIN command treats the fields as one concatenated field. Add the field format lengths to obtain the length of the concatenated field. You must observe the following rules:

- If the host field is alphanumeric, the cross-referenced field must also be alphanumeric and have the same length.

  The formats may have different edit options.

  Note that a text field cannot be used to join data sources.

- If the host field is a numeric field, the host field format, as specified by the USAGE (or FORMAT) attribute in the Master File, must agree in type (I, P, F, or D) with the format of the cross-referenced field as specified by the USAGE (or FORMAT) attribute. For details, see Joining Fields With Different Numeric Data Types.

  The edit options may differ. The length may also differ, but with the following effect:

  - If the format of the host field (as specified by the USAGE attribute) is packed decimal (P) or integer (I) and is longer than the cross-referenced field format (specified by the USAGE attribute for FOCUS data sources or the ACTUAL attribute for other data sources), only the length of the cross-referenced field format is compared, using only the right-most digits of the shorter field. For example, if a five-digit packed decimal format field is joined to a three-digit packed decimal format field, when a host record with a five-digit number is retrieved, all cross-referenced records with the last three digits of that number are also retrieved.

  - If the format of the host field is double precision (D), the left-most eight bytes of each field are compared.

- If the host field is a date field, the cross-referenced field must also be a date field. Date and date-time fields must have the same components, not necessarily in the same order.

- The host and cross-referenced fields can be described as groups in the Master File if they contain the same number of component fields. The corresponding component fields in each group (for example, the first field in the host group and the first field in the cross-referenced group) must obey the above rules. For related information, see

Restrictions on Group Fields.

If the host field is not a group field, the cross-referenced field can still be a group. If the host field is a group, the cross-referenced field must also be a group.

# Joining Fields With Different Numeric Data Types

You can join two or more data sources containing different numeric data types. For example, you can join a field with a short packed decimal format to a field with a long packed decimal format, or a field with an integer format to a field with a packed decimal format. This provides enormous flexibility for creating reports from joined data sources.

- When joining a shorter field to a longer field, the cross-referenced value is padded to the length of the host field, adding spaces (for alpha fields) or hexadecimal zeros (for numeric fields). This new value is used for searches in the cross-referenced file.
- When joining a longer field to a shorter field, the FROM value is truncated. If part of your value is truncated due to the length of the USAGE in the cross-referenced file, only records matching the truncated value will be found in the cross-referenced file.

**Note:**

- For comparison on packed decimal fields to be accomplished properly, all signs for positive values are converted to hex C and all signs for negative values are converted to hex D.
- The JOINOPT parameter also corrects for lagging values in a unique join. For information, see Correct for Lagging Values With a Unique Join.

# Enable Joins With Data Type Conversion

To enable joins with data type conversion, issue the command

```
SET JOINOPT = [GNTINT|OLD]
```

where:

**GNTINT**

Enables joins with data type conversion.

**OLD**

Disables joins with data type conversion. This value is the default.

# Issuing Joins With Data Type Conversion

Since you can join a field with a short packed decimal format to a field with a long packed decimal format, a join can be defined in the following Master Files:

```
FILE=PACKED,SUFFIX=FIX,$
  SEGNAME=ONE,SEGTYPE=S0
   FIELD=FIRST,,P8,P4,INDEX=I,$
```

```
FILE=PACKED2,SUFFIX=FIX,$
  SEGNAME=ONE,SEGTYPE=S0
   FIELD=PFIRST,,P31,P16,INDEX=I,$
```

The JOIN command might look like this:

```
JOIN FIRST IN PACKED TO ALL PFIRST IN PACKED2 AS J1
```

When joining packed fields, the preferred sign format of X'C' for positive values and X'D' for negative values is still required. All other non-preferred signs are converted to either X'C' or X'D'.

# Using a Conditional Join

Using conditional JOIN syntax, you can establish joins based on conditions other than equality between fields. In addition, the host and cross-referenced join fields do not have to contain matching formats, and the cross-referenced field does not have to be indexed.

The conditional join is supported for FOCUS and for VSAM, ADABAS, IMS, IDMS, and all relational data sources. Because each data source differs in its ability to handle complex WHERE criteria, the optimization of the conditional JOIN syntax differs depending on the specific data sources involved in the join and the complexity of the WHERE criteria.

The standard ? JOIN command lists every join currently in effect, and indicates any that are based on WHERE criteria.

# Create a Conditional JOIN

The syntax of the conditional (WHERE-based) JOIN command is

```
JOIN [LEFT_OUTER|RIGHT_OUTER|INNER] FILE hostfile AT hfld1     [WITH
hfld2] [TAG tag1]
     TO {UNIQUE|MULTIPLE}
     FILE crfile AT crfld [TAG tag2] [AS joinname]
     [WHERE expression1;
     [WHERE expression2;
     ...]
END
```

where:

**INNER**

Specifies an inner join. If you do not specify the type of join in the JOIN command, the ALL parameter setting determines the type of join to perform.

**LEFT_OUTER**

Specifies a left outer join. If you do not specify the type of join in the JOIN command, the ALL parameter setting determines the type of join to perform.

**RIGHT_OUTER**

Specifies a right outer join. The command SET SHORTPATH = SQL must be in effect.

**hostfile**

Is the host Master File.

**AT**

Links the correct parent segment or host to the correct child or cross-referenced segment. The field values used as the AT parameter are not used to cause the link. They are simply used as segment references.

**hfld1**

Is a field name in the host Master File whose segment will be joined to the cross-referenced data source. The field name must be at the lowest level segment in its data source that is referenced.

**tag1**

Is the optional tag name of up to 66 characters that is used as a unique qualifier for fields and aliases in the host data source.

**hfld2**

Is a data source field with which to associate a DEFINE-based conditional JOIN. For a DEFINE-based conditional join, the KEEPDEFINES setting must be ON or ALL, and you must create the virtual fields before issuing the JOIN command.

**MULTIPLE**

Specifies a one-to-many relationship between *hostfile* and *crfile*. Note that ALL is a synonym for MULTIPLE.

**UNIQUE**

Specifies a one-to-one relationship between *hostfile* and *crfile*. Note that ONE is a synonym for UNIQUE.

**Note:** Regardless of the character of the JOIN—INNER or LEFT_OUTER—the join to UNIQUE will return only one instance of the cross-referenced file, and if this instance does not match based on the evaluation of the WHERE expression, default values (spaces for alphanumeric fields and 0 for numerical fields) are returned. There are never short paths or missing values in the cross-referenced file.

**crfile**

Is the cross-referenced Master File.

**crfld**

Is a field name in the cross-referenced Master File. It can be any field in the segment.

**tag2**

Is the optional tag name of up to 66 characters that is used as a unique qualifier for fields and aliases in the cross-referenced data source.

**joinname**

Is the name associated with the joined structure.

**expression1, expression2**

Are any expressions that are acceptable in a DEFINE FILE command. All fields used in the expressions must lie on a single path.

You must include the connection between the tables in the WHERE conditions. The AT references do not actually perform a JOIN between the fields as with a standard JOIN.

If you do not include any WHERE conditions in the join, a cartesian product is generated.

**END**

The END command is required to terminate the command and must be on a line by itself.

**Note:** Single line JOIN syntax is not supported.

# Using a Conditional Join

The following example joins the VIDEOTRK and MOVIES data sources on the conditions that:

- The transaction date (in VIDEOTRK) is more than ten years after the release date (in MOVIES).
- The movie codes match in both data sources.

The join is performed at the segment that contains MOVIECODE in the VIDEOTRK data source, because the join must occur at the lowest segment referenced.

The following request displays the title, most recent transaction date, and release date for each movie in the join, and computes the number of years between this transaction date and the release date:

```
JOIN FILE VIDEOTRK AT MOVIECODE TAG V1 TO ALL
     FILE MOVIES   AT RELDATE   TAG M1 AS JW1
  WHERE DATEDIF(RELDATE, TRANSDATE,'Y') GT 10;
  WHERE V1.MOVIECODE EQ M1.MOVIECODE;
END
```

```
TABLE FILE VIDEOTRK
 SUM TITLE/A25 AS 'Title'
     TRANSDATE AS 'Last,Transaction'
     RELDATE AS 'Release,Date'
 COMPUTE YEARS/I5 = (TRANSDATE - RELDATE)/365;  AS 'Years,Difference'
 BY TITLE NOPRINT
 BY HIGHEST 1 TRANSDATE NOPRINT
END
```

The output is:

```
                          Last         Release   Years
Title                     Transaction  Date      Difference
-----                     -----------  -------   ----------
ALICE IN WONDERLAND       91/06/22     51/07/21         39
ALIEN                     91/06/18     80/04/04         11
ALL THAT JAZZ             91/06/25     80/05/11         11
ANNIE HALL                91/06/24     78/04/16         13
BAMBI                     91/06/22     42/07/03         49
BIRDS, THE                91/06/23     63/09/27         27
CABARET                   91/06/25     73/07/14         17
CASABLANCA                91/06/27     42/03/28         49
CITIZEN KANE              91/06/22     41/08/11         49
CYRANO DE BERGERAC        91/06/20     50/11/09         40
DEATH IN VENICE           91/06/26     73/07/27         17
DOG DAY AFTERNOON         91/06/23     76/04/04         15
EAST OF EDEN              91/06/20     55/01/12         36
GONE WITH THE WIND        91/06/24     39/06/04         52
JAWS                      91/06/27     78/05/13         13
MALTESE FALCON, THE       91/06/19     41/11/14         49
MARTY                     91/06/19     55/10/26         35
NORTH BY NORTHWEST        91/06/21     59/02/09         32
ON THE WATERFRONT         91/06/24     54/07/06         36
PHILADELPHIA STORY, THE   91/06/21     40/05/06         51
PSYCHO                    91/06/17     60/05/16         31
REAR WINDOW               91/06/17     54/12/15         36
SHAGGY DOG, THE           91/06/25     59/01/09         32
SLEEPING BEAUTY           91/06/24     75/08/30         15
TIN DRUM, THE             91/06/17     80/03/01         11
VERTIGO                   91/06/27     58/11/25         32
```

# Full Outer Joins

The WebFOCUS join command and conditional join command have a FULL OUTER join option.

A full outer join returns all rows from the source data source and all rows from the target data source. Where values do not exist for the rows in either data source, null values are returned. WebFOCUS substitutes default values on the report output (blanks for alphanumeric columns, the NODATA symbol for numeric columns).

Full outer joins and right outer joins are supported whether or not the underlying data source supports them. When the underlying data source has support for these joins, the join processing is passed to the database engine. When it does not support them, all necessary data is returned and the join processing is handled by WebFOCUS.

**Note:** The command SET SHORTPATH = SQL must be in effect in order to issue a full outer join.

# Specify a Full Outer Join

The following syntax generates a full outer equijoin based on real fields:

```
JOIN FULL_OUTER hfld1 [AND hfld2 ...] IN table1 [TAG tag1] TO
{UNIQUE|MULTIPLE} cfld [AND cfld2 ...] IN table2 [TAG tag2] [AS
joinname]
END
```

where:

**hfld1**

Is the name of a field in the host table containing values shared with a field in the cross-referenced table. This field is called the host field.

**AND hfld2...**

Can be an additional field in the host table. The phrase beginning with AND is required when specifying multiple fields.

- For relational adapters that support multi-field and concatenated joins, you can

specify up to 20 fields. See your adapter documentation for specific information about supported join features.

**IN table1**

Is the name of the host table.

**TAG tag1**

Is a tag name of up to 66 characters (usually the name of the Master File), which is used as a unique qualifier for fields and aliases in the host table.

The tag name for the host table must be the same in all the JOIN commands of a joined structure.

**TO [UNIQUE|MULTIPLE] crfld1**

Is the name of a field in the cross-referenced table containing values that match those of *hfld1* (or of concatenated host fields). This field is called the cross-referenced field.

**Note:** UNIQUE returns only one instance and, if there is no matching instance in the cross-referenced table, it returns null values.

Use the MULTIPLE parameter when *crfld1* may have multiple instances in common with one value in *hfld1*. Note that ALL is a synonym for MULTIPLE, and omitting this parameter entirely is a synonym for UNIQUE.

**AND crfld2...**

Is the name of a field in the cross-referenced table with values in common with *hfld2*.

**Note:***crfld2* may be qualified. This field is only available for adapters that support multi-field joins.

**IN crfile**

Is the name of the cross-referenced table.

**TAG tag2**

Is a tag name of up to 66 characters (usually the name of the Master File), which is used as a unique qualifier for fields and aliases in cross-referenced tables. In a recursive join structure, if no tag name is provided, all field names and aliases are prefixed with the first four characters of the join name.

The tag name for the host table must be the same in all the JOIN commands of a joined structure.

**AS joinname**

Is an optional name of up to eight characters that you may assign to the join structure. You must assign a unique name to a join structure if:

- You want to ensure that a subsequent JOIN command does not overwrite it.
- You want to clear it selectively later.
- The structure is recursive.

**Note:** If you do not assign a name to the join structure with the AS phrase, the name is assumed to be blank. A join without a name overwrites an existing join without a name.

**END**

Required when the JOIN command is longer than one line. It terminates the command and must be on a line by itself.

The following syntax generates a DEFINE-based full outer join:

```
JOIN FULL_OUTER deffld WITH host_field ...
     IN table1 [TAG tag1]
     TO [UNIQUE|MULTIPLE]
     cr_field IN table2 [TAG tag2] [AS joinname]
END
```

where:

**deffld**

Is the name of a virtual field for the host file (the host field). The virtual field can be defined in the Master File or with a DEFINE command.

**WITH host_field**

Is the name of any real field in the host segment with which you want to associate the virtual field. This association is required to locate the virtual field.

The WITH phrase is required unless the KEEPDEFINES parameter is set to ON or ALL and *deffld* was defined prior to issuing the JOIN command.

To determine which segment contains the virtual field, use the ? DEFINE query after issuing the DEFINE command.

**IN table1**

Is the name of the host table.

**TAG tag1**

Is a tag name of up to 66 characters (usually the name of the Master File), which is used as a unique qualifier for fields and aliases in host tables.

The tag name for the host table must be the same in all JOIN commands of a joined structure.

**TO [UNIQUE|MULTIPLE] crfld1**

Is the name of a real field in the cross-referenced table whose values match those of the virtual field. This must be a real field declared in the Master File.

**Note:** UNIQUE returns only one instance and, if there is no matching instance in the cross-referenced table, it returns null values.

Use the MULTIPLE parameter when *crfld1* may have multiple instances in common with one value in *hfld1*. Note that ALL is a synonym for MULTIPLE, and omitting this parameter entirely is a synonym for UNIQUE.

**IN crfile**

Is the name of the cross-referenced table.

**TAG tag2**

Is a tag name of up to 66 characters (usually the name of the Master File), which is used as a unique qualifier for fields and aliases in cross-referenced tables. In a recursive joined structure, if no tag name is provided, all field names and aliases are prefixed with the first four characters of the join name.

The tag name for the host file must be the same in all JOIN commands of a joined structure.

**AS joinname**

Is an optional name of up to eight characters that you may assign to the joined structure. You must assign a unique name to a join structure if:

- You want to ensure that a subsequent JOIN command does not overwrite it.
- You want to clear it selectively later.

- The structure is recursive, and you do not specify tag names.

If you do not assign a name to the joined structure with the AS phrase, the name is assumed to be blank. A join without a name overwrites an existing join without a name.

**END**

Required when the JOIN command is longer than one line. It terminates the command and must be on a line by itself.

The following syntax generates a full outer conditional join:

```
JOIN FULL_OUTER FILE table1 AT hfld1 [WITH hfld2] [TAG tag1]
     TO {UNIQUE|MULTIPLE}
     FILE table2 AT crfld [TAG tag2] [AS joinname]
     [WHERE expression1;
     [WHERE expression2;
     ...]
END
```

where:

**table1**

Is the host Master File.

**AT**

Links the correct parent segment or host to the correct child or cross-referenced segment. The field values used as the AT parameter are not used to cause the link. They are used as segment references.

**hfld1**

Is the field name in the host Master File whose segment will be joined to the cross-referenced table. The field name must be at the lowest level segment in its data source that is referenced.

**tag1**

Is the optional tag name that is used as a unique qualifier for fields and aliases in the host table.

**hfld2**

Is a table column with which to associate a DEFINE-based conditional JOIN. For a DEFINE-based conditional join, the KEEPDEFINES setting must be ON or ALL, and you must create the virtual fields before issuing the JOIN command.

**MULTIPLE**

Specifies a one-to-many relationship between *table1* and *table2*. Note that ALL is a synonym for MULTIPLE.

**UNIQUE**

Specifies a one-to-one relationship between *table1* and *table2*. Note that ONE is a synonym for UNIQUE.

**Note:** The join to UNIQUE will return only one instance of the cross-referenced table, and if this instance does not match based on the evaluation of the WHERE expression, null values are returned.

**crfile**

Is the cross-referenced Master File.

**crfld**

Is the join field name in the cross-referenced Master File. It can be any field in the segment.

**tag2**

Is the optional tag name that is used as a unique qualifier for fields and aliases in the cross-referenced table.

**joinname**

Is the name associated with the joined structure.

**expression1, expression2**

Are any expressions that are acceptable in a DEFINE FILE command. All fields used in the expressions must lie on a single path.

**END**

The END command is required to terminate the command and must be on a line by itself.

# Optimizing a Full Outer Join of Microsoft SQL Server Tables

The following requests generate two Microsoft SQL Server tables to join, and then issues a request against the join. The tables are generated using the wf_retail sample that you can create using the WebFOCUS - Retail Demo tutorial in the server Web Console.

The following request generates the WF_SALES table. The field ID_PRODUCT will be used in the full outer join command. The generated table will contain ID_PRODUCT values from 2150 to 4000:

```
TABLE FILE WF_RETAIL_LITE
SUM GROSS_PROFIT_US PRODUCT_CATEGORY PRODUCT_SUBCATEG
BY ID_PRODUCT
WHERE ID_PRODUCT FROM 2150 TO 4000
ON TABLE HOLD AS WF_SALES FORMAT SQLMSS
END
```

The following request generates the WF_PRODUCT table. The field ID_PRODUCT will be used in the full outer join command. The generated table will contain ID_PRODUCT values from 3000 to 5000:

```
TABLE FILE WF_RETAIL_LITE
SUM PRICE_DOLLARS PRODUCT_CATEGORY PRODUCT_SUBCATEG PRODUCT_NAME
BY ID_PRODUCT
WHERE ID_PRODUCT FROM 3000 TO 5000
ON TABLE HOLD AS WF_PRODUCT FORMAT SQLMSS
END
```

The following request issues the SET SHORTPATH = SQL and JOIN commands and displays values from the joined tables:

```
SET SHORTPATH = SQL
SET TRACEUSER=ON
SET TRACESTAMP=OFF
SET TRACEOFF=ALL
SET TRACEON = STMTRACE//CLIENT
JOIN FULL_OUTER ID_PRODUCT IN WF_PRODUCT TAG T1
 TO ALL ID_PRODUCT IN WF_SALES TAG T2
END
```

```
TABLE FILE WF_PRODUCT
PRINT T1.ID_PRODUCT AS 'Product ID'
PRICE_DOLLARS AS Price
T2.ID_PRODUCT AS 'Sales ID'
GROSS_PROFIT_US
BY T1.ID_PRODUCT NOPRINT
ON TABLE SET PAGE NOPAGE
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The trace shows that the full outer join was optimized (translated to SQL) so that SQL Server could process the join:

```
SELECT
T1."ID_PRODUCT",
T1."PRICE_DOLLARS",
T2."ID_PRODUCT",
T2."GROSS_PROFIT_US"
FROM
( WF_PRODUCT T1
FULL OUTER JOIN
WF_SALES T2
ON T2."ID_PRODUCT" = T1."ID_PRODUCT" )
ORDER BY
T1."ID_PRODUCT";
```

The output has a row for each ID_PRODUCT value that is in either table. Rows with ID_PRODUCT values from 2150 to 2167 are only in the WF_SALES table, so the columns from WF_PRODUCT display the NODATA symbol. Rows with ID_PRODUCT values above 4000 are only in the WF_PRODUCT table, so the columns from WF_SALES display the NODATA symbol. Rows with ID_PRODUCT values from 2000 to 4000 are in both tables, so all columns have values, as shown in the following image.

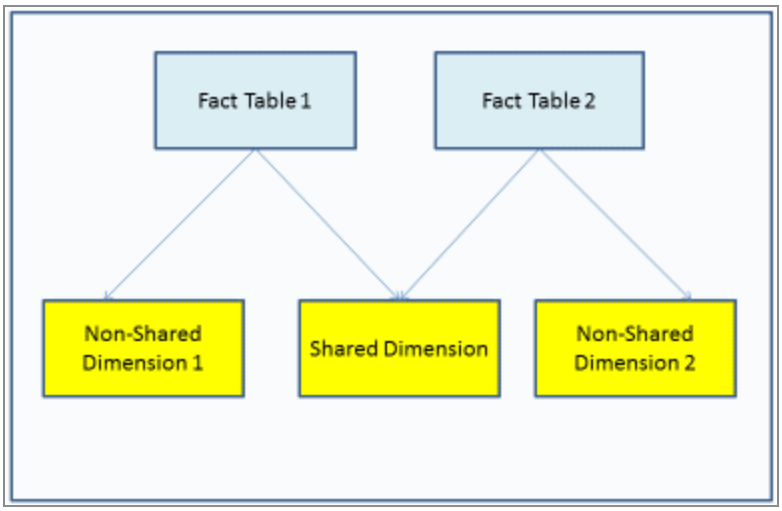
| Product ID | Price | Sales ID | Gross Profit |
|---|---|---|---|
| . | . | 2151 | $7,172.24 |
| . | . | 2152 | $6,766.45 |
| . | . | 2153 | $7,291.10 |
| . | . | 2154 | $19,913.65 |
| . | . | 2155 | $12,472.93 |
| . | . | 2156 | $14,484.75 |
| . | . | 2157 | $6,223.34 |
| . | . | 2158 | $11,267.75 |
| . | . | 2159 | $9,015.75 |
| . | . | 2160 | $7,194.15 |
| . | . | 2161 | $8,683.00 |
| . | . | 2162 | $9,197.81 |
| . | . | 2163 | $21,347.98 |
| . | . | 2164 | $5,615.33 |
| . | . | 2165 | $8,540.53 |
| . | . | 2166 | $12,469.45 |
| . | . | 2167 | $6,771.26 |
| 3001 | 47,988.00 | 3001 | $12,786.30 |
| 3002 | 34,990.00 | 3002 | $5,586.10 |
| 3003 | 30,591.00 | 3003 | $12,399.15 |
| 3004 | 44,187.00 | 3004 | $8,434.95 |
| 3005 | 30,057.00 | 3005 | $8,987.80 |
| 3006 | 25,348.05 | 3006 | $6,422.59 |
| 3007 | 23,607.00 | 3007 | $8,354.60 |
| 3008 | 42,898.57 | 3008 | $18,469.01 |
| 3009 | 48,139.00 | 3009 | $22,542.75 |
| 3010 | 44,850.00 | 3010 | $16,722.15 |
| 3011 | 28,078.44 | 3011 | $18,204.82 |
| 3012 | 31,146.00 | 3012 | $19,739.45 |
| 3013 | 27,208.00 | 3013 | $17,983.00 |
| 3014 | 23,968.59 | 3014 | $19,996.09 |
| 3015 | 29,061.45 | 3015 | $17,420.72 |
| 4012 | 43,998.35 | . | . |
| 4013 | 24,749.89 | . | . |
| 4014 | 33,966.00 | . | . |
| 4015 | 20,998.95 | . | . |
| 4016 | 32,899.06 | . | . |

# Reporting Against a Multi-Fact Cluster Synonym

A cluster synonym is a synonym in which each segment is added to the cluster by reference using a CRFILE attribute that points to the base synonym. Child segments are joined to their parents using a JOIN WHERE attribute. A cluster Master File can have multiple root segments. In this case, the root segments are usually fact tables and the child segments are usually dimension tables, as found in a star schema. This type of structure is called a multi-fact cluster.

A dimension table can be a child of multiple fact tables (called a shared dimension) or be a child of a single fact table (called a non-shared dimension). In most cases, the fact tables are used for aggregation and the dimension tables are used for sorting.

The following image shows a simple multi-fact structure.




For information about creating a multi-fact cluster Master File, see the *Describing Data With ibi™ WebFOCUS® Language* manual.

The following list shows the rules for creating a report request against a multi-fact cluster Master File.

- You can report against only the fact tables, as long as you aggregate (SUM) at least one fact from each fact table and have at most one sort phrase.
- The first sort field in the request must be from a shared dimension.
- Any number of shared dimensions can be referenced in the request.
- Multiple non-shared dimensions can be included in the request, as long as they have the same parent. More than one non-shared dimension from different parents cannot be referenced in a request.
- The MATCH FILE command is not supported for reporting against a multi-fact synonym.

# Reporting Against a Multi-Fact Cluster Synonym

The following request against the WF_RETAIL_LITE multi-fact cluster synonym sums the COGS_US measure from the WF_RETAIL_SALES segment and the DAYSDELAYED measure from the WF_RETAIL_SHIPMENTS segment. The first BY field, BRAND, is in the shared dimension WF_RETAIL_PRODUCT. The second BY field, TIME_QTR, is from the non-shared dimension WF_RETAIL_TIME_DELIVERED.

```
TABLE FILE WF_RETAIL_LITE
SUM COGS_US DAYSDELAYED
BY BRAND
BY WF_RETAIL_TIME_DELIVERED.TIME_QTR
WHERE BRAND EQ 'Denon' OR 'Grado'
WHERE DAYSDELAYED GT 1
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
INCLUDE=IBFS:/FILE/IBI_HTML_DIR/ibi_themes/Warm.sty,$
END
```

The output is shown in the following image. The sum of DAYSDELAYED is totaled for each value of the shared dimension and, within each value of the shared dimension, for each value of the non-shared dimension.

| Brand | Cost of Goods | Quarter | Days Delayed |
|---|---|---|---|
| Denon | $25,970.00 | | 12 |
| | | 1 | 3 |
| | | 2 | 4 |
| | | 3 | 5 |
| Grado | $21,930.00 | | 5 |
| | | 2 | 5 |

# Adding a New Fact To Multi-Fact Synonyms: JOIN AS_ROOT

The JOIN AS_ROOT command adds a new fact table as an additional root to an existing fact-based cluster (star schema). The source Master File has a parent fact segment and at least one child dimension segment. The JOIN AS_ROOT command supports a unique join from a child dimension segment (at any level) to an additional fact parent.

# Add an Additional Parent Segment

```
JOIN AS_ROOT sfld1 [AND sfld2 ...] IN [app1/]sfile TO UNIQUE tfld1 [AND
tfld2 ...] IN [app2/]tfile AS jname
END
```

where:

**sfld1 [AND sfld2 ...]**

Are fields in the child (dimension) segment of the source file that match values of fields in the target file.

**[app1/]sfile**

Is the source file.

**TO UNIQUE tfld1 [AND tfld2 ...]**

Are fields in the target file that match values of fields in the child segment of the source file. The join must be unique.

**[app2/]tfile**

Is the target file.

**jname**

Is the join name.

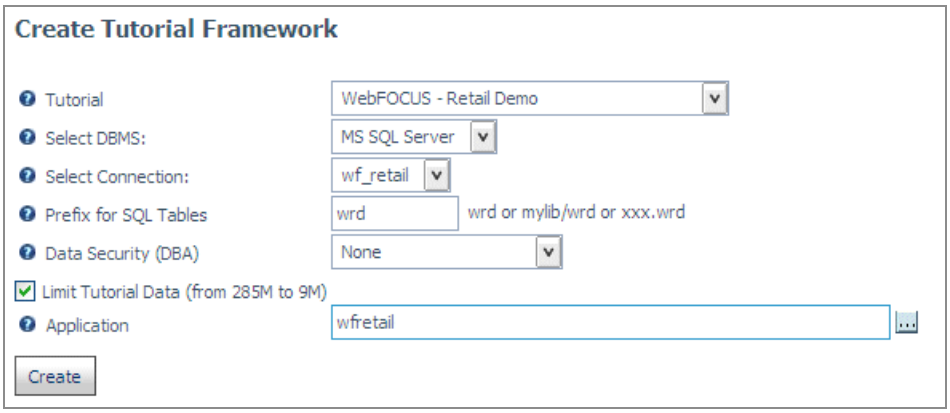
**END**

Is required to end the JOIN command.

# Joining AS_ROOT From the WebFOCUS Retail Data Source to an Excel File

The following request joins the product category and product subcategory fields in the WebFOCUS Retail data source to an Excel file named PROJECTED.

To generate the WebFOCUS Retail data source in the Web Console, click **Tutorials** from the Applications page.




Select **WebFOCUS - Retail Demo**. Select your configured relational adapter (or select the flat file option if you do not have a relational adapter configured), check **Limit Tutorial Data**, and then click **Create**.

The Master File for the Excel File is:

```
FILENAME=PROJECTED, SUFFIX=DIREXCEL,
 DATASET=app2/projected.xlsx, $
  SEGMENT=PROJECTED, SEGTYPE=S0, $
    FIELDNAME=PRODUCT_CATEGORY, ALIAS='Product  Category', USAGE=A16V,
ACTUAL=A16V,
      MISSING=ON,
      TITLE='Product  Category',
      WITHIN='*PRODUCT', $
    FIELDNAME=PRODUCT_SUBCATEGORY, ALIAS='Product     Subcategory',
USAGE=A25V, ACTUAL=A25V,
      MISSING=ON,
      TITLE='Product     Subcategory',
      WITHIN=PRODUCT_CATEGORY, $
    FIELDNAME=PROJECTED_COG, ALIAS='              Projected COG',
USAGE=P15.2C, ACTUAL=A15,
      MISSING=ON,
      TITLE='              Projected COG', MEASURE_GROUP=PROJECTED,
      PROPERTY=MEASURE,  $
    FIELDNAME=PROJECTED_SALE_UNITS, ALIAS='             Projected Sale
Units', USAGE=I9, ACTUAL=A11,
      MISSING=ON,
      TITLE='             Projected Sale Units', MEASURE_
GROUP=PROJECTED,
      PROPERTY=MEASURE,  $
 MEASUREGROUP=PROJECTED, CAPTION='PROJECTED', $
 DIMENSION=PRODUCT, CAPTION='Product', $
  HIERARCHY=PRODUCT, CAPTION='Product', HRY_DIMENSION=PRODUCT, HRY_
STRUCTURE=STANDARD, $
```

The following image shows the data in the Excel file.

| | A | B | C | D |
|---|---|---|---|---|
| 1 | Product Category | Product Subcategory | Projected COG | Projected Sale Units |
| 2 | Accessories | Charger | $2,068,508.00 | 75,279 |
| 3 | Accessories | Headphones | $52,061,301.00 | 163,152 |
| 4 | Accessories | Universal Remote Controls | $36,297,267.00 | 127,286 |
| 5 | Camcorder | Handheld | $20,733,053.00 | 178,704 |
| 6 | Camcorder | Professional | $35,440,708.00 | 9,095 |
| 7 | Camcorder | Standard | $49,442,067.00 | 137,489 |
| 8 | Computers | Smartphone | $44,420,201.00 | 146,858 |
| 9 | Computers | Tablet | $26,047,885.00 | 105,053 |
| 10 | Media Player | Blu Ray | $182,459,862.00 | 485,131 |
| 11 | Media Player | DVD Players | $3,756,254.00 | 13,346 |
| 12 | Media Player | DVD Players - Portable | $306,576.00 | 3,981 |
| 13 | Media Player | Streaming | $5,108,342.00 | 48,630 |
| 14 | Stereo Systems | Boom Box | $840,373.00 | 6,687 |
| 15 | Stereo Systems | Home Theater Systems | $56,829,817.00 | 285,041 |
| 16 | Stereo Systems | Receivers | $40,620,030.00 | 107,537 |
| 17 | Stereo Systems | Speaker Kits | $81,962,756.00 | 174,036 |
| 18 | Stereo Systems | iPod Docking Station | $26,310,783.00 | 221,723 |
| 19 | Televisions | CRT TV | $1,928,416.00 | 3,268 |
| 20 | Televisions | Flat Panel TV | $59,540,624.00 | 66,119 |
| 21 | Televisions | Portable TV | $545,348.00 | 5,696 |
| 22 | Video Production | Video Editing | $40,380,803.00 | 142,594 |

The following request joins from the wf_retail_product segment of the wf_retail data source to the excel file as a new root and reports from both parent segments:

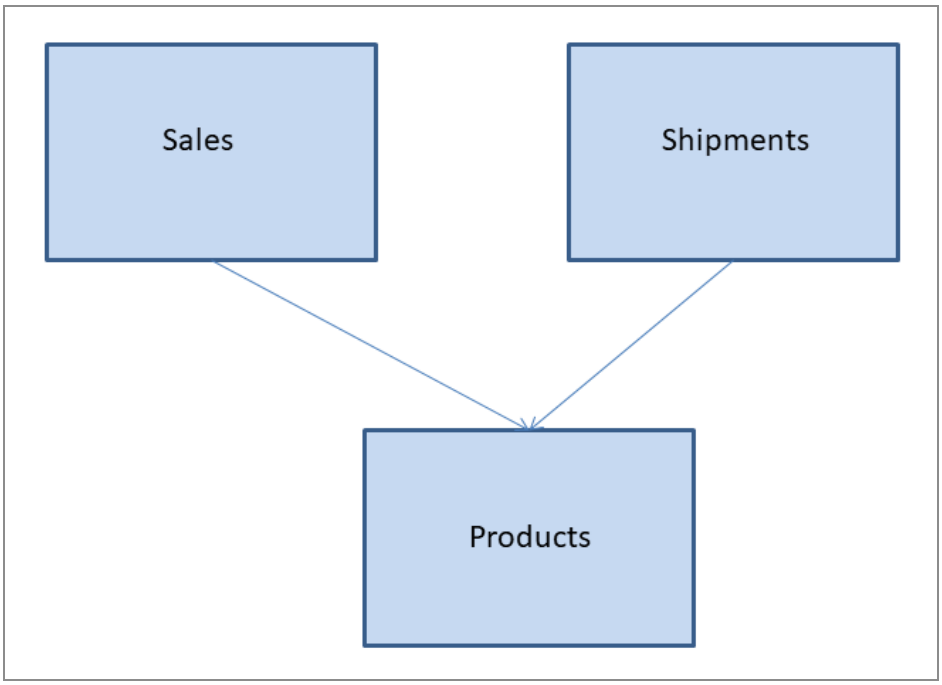
```
JOIN AS_ROOT PRODUCT_CATEGORY AND PRODUCT_SUBCATEG IN WF_RETAIL
  TO UNIQUE PRODUCT_CATEGORY AND PRODUCT_SUBCATEGORY IN PROJECTED
  AS J1
END
TABLE FILE WF_RETAIL
SUM PROJECTED_SALE_UNITS REVENUE_US
BY PRODUCT_CATEGORY
ON TABLE SET PAGE NOPAGE
END
```

The output is:

| Product Category | Projected Sale Units | Revenue |
|---|---|---|
| Accessories | 365717 | $41,817.34 |
| Camcorder | 325288 | $49,768.33 |
| Computers | 251911 | $18,298.75 |
| Media Player | 551088 | $118,615.17 |
| Stereo Systems | 795024 | $111,768.71 |
| Televisions | 75083 | $27,209.29 |
| Video Production | 142594 | $25,837.37 |

# Generating Outer Joins of Cluster Synonym Contexts

Reporting against multiple root segments and a shared dimension generates multiple contexts in a cluster synonym. For example, in the following image Sales and Products form one context, while Shipments and Products form a second context.

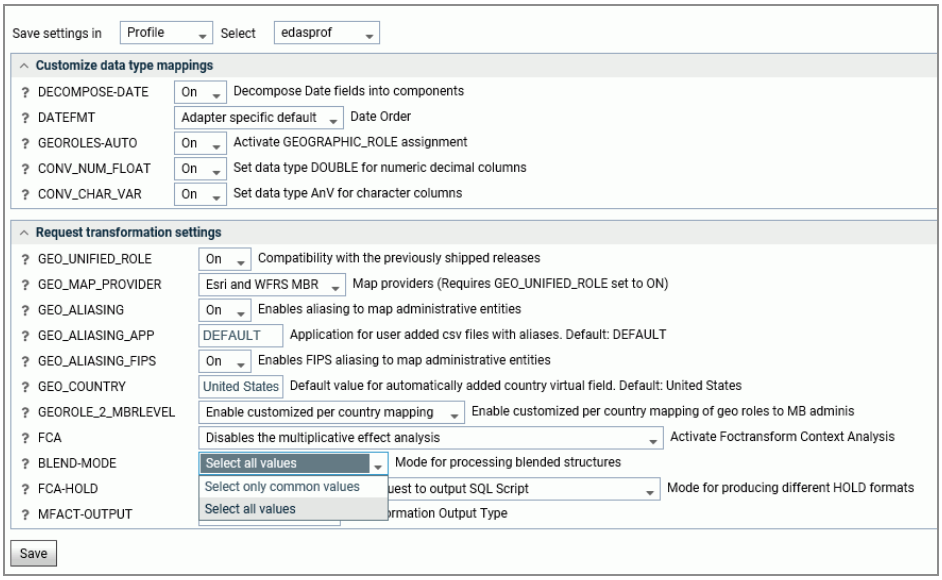


When a request contains fields from both contexts, by default, an inner join is passed to the SQL engine. This retrieves only matching values of the shared dimension fields from both contexts.

You can use the BLEND-MODE parameter to generate a full outer join instead of an inner join and retrieve all values from both contexts.

# Control Join Processing of Cluster Synonym Contexts

You can set the blend mode parameter from the server Web Console and store the setting in a profile or procedure. On the Adapters page, click **Change Common Adapter Settings** on the ribbon, and select **Select all values** from the BLEND-MODE drop-down list in the Request Transformation Settings section, as shown in the following image.




You can also use the following syntax to set the blend mode parameter.

```
ENGINE INT SET BLEND-MODE {COMMON-VALUES|ALL-VALUES}
```

where:

**COMMON-VALUES**

Generates an inner join of cluster synonym contexts and returns only matching values of the shared dimension fields. This is the default value.

**ALL-VALUES**

Generates a full outer join of cluster synonym contexts and returns all values of the shared dimension fields. Missing values are returned for fields from contexts that do not have a matching value of the shared dimension fields.

# Controlling Join Processing of Cluster Synonym Contexts

The following Excel file (excelroot.xlsx) will be uploaded to the server using the Adapter for Excel and joined as a root to the WF_RETAIL Master File, creating two contexts. A report request will then be issued against the two roots and the shared dimension.

| | A | B | C | D |
|---|---|---|---|---|
| 1 | Product Category | Product Subcategory | Projected COG | Projected Sale Units |
| 2 | Accessories | Charger | $2,068,508.00 | 75,279 |
| 3 | Accessories | Headphones | $52,061,301.00 | 163,152 |
| 4 | Accessories | Universal Remote Controls | $36,297,267.00 | 127,286 |
| 5 | Computers | Smartphone | $44,420,201.00 | 146,858 |
| 6 | Computers | Tablet | $26,047,885.00 | 105,053 |
| 7 | Media Player | Blu Ray | $182,459,862.00 | 485,131 |
| 8 | Media Player | DVD Players | $3,756,254.00 | 13,346 |
| 9 | Media Player | DVD Players - Portable | $306,576.00 | 3,981 |
| 10 | Media Player | Streaming | $5,108,342.00 | 48,630 |
| 11 | Displays | CRT TV | $1,928,416.00 | 3,268 |
| 12 | Televisions | Flat Panel TV | $59,540,624.00 | 66,119 |
| 13 | Televisions | Portable TV | $545,348.00 | 142,594 |

Note that this file has no data for product categories Camcorder, Stereo Systems, and Video Production. It has a product category named Displays that does not exist in WF_RETAIL.

The following is the Master File generated for this Excel file.

```
FILENAME=EXCELROOT, SUFFIX=DIREXCEL,
 DATASET=ibisamp/excelroot.xlsx, $
  SEGMENT=EXCELROOT, SEGTYPE=S0, $
    FIELDNAME=PRODUCT_CATEGORY, ALIAS='Product Category', USAGE=A15V,
ACTUAL=A15V,
      MISSING=ON,
      TITLE='Product Category', $
    FIELDNAME=PRODUCT_SUBCATEGORY, ALIAS='Product Subcategory',
USAGE=A31V, ACTUAL=A31V,
      MISSING=ON,
      TITLE='Product Subcategory', $
```

```
    FIELDNAME=PROJECTED_COG, ALIAS='Projected COG', USAGE=D15.2:C,
ACTUAL=A64V,
      MISSING=ON,
      TITLE='Projected COG',
      CURRENCY_DISPLAY=LEFT_FLOAT,  CURRENCY_ISO_CODE=USD,  $
    FIELDNAME=PROJECTED_SALE_UNITS, ALIAS='Projected Sale Units',
USAGE=I9, ACTUAL=A11V,
      MISSING=ON,
      TITLE='Projected Sale Units', $
```

The following request joins the Excel file as a root and generates a report that contains fields from both roots and the shared dimension. Using the default value for BLEND-MODE produces an inner join that returns only common values of PRODUCT_CATEGORY.

```
JOIN AS_ROOT PRODUCT_CATEGORY AND PRODUCT_SUBCATEG IN ibisamp/WF_RETAIL
  TO PRODUCT_CATEGORY AND PRODUCT_SUBCATEGORY IN ibisamp/EXCELROOT
  AS J1
  END
TABLE FILE ibisamp/WF_RETAIL
SUM COGS_US PROJECTED_SALE_UNITS
BY PRODUCT_CATEGORY
ON TABLE SET PAGE NOPAGE
ON TABLE SET STYLE *
GRID=OFF,$
END
```

The output is shown in the following image.

| Product Category | Cost of Goods | Projected Sale Units |
|---|---|---|
| Accessories | $342,877.00 | 365717 |
| Computers | $109,281.00 | 251911 |
| Media Player | $779,593.00 | 551088 |
| Televisions | $227,820.00 | 208713 |

The following version of the request issues the ENGINE INT SET BLEND-MODE ALL-VALUES command to produce a full outer join that returns all values of PRODUCT_CATEGORY.

```
ENGINE INT SET BLEND-MODE ALL-VALUES
JOIN AS_ROOT PRODUCT_CATEGORY AND PRODUCT_SUBCATEG IN ibisamp/WF_RETAIL
  TO PRODUCT_CATEGORY AND PRODUCT_SUBCATEGORY IN ibisamp/EXCELROOT
  AS J1
```

```
  END
TABLE FILE ibisamp/WF_RETAIL
SUM COGS_US PROJECTED_SALE_UNITS
BY PRODUCT_CATEGORY
ON TABLE SET PAGE NOPAGE
ON TABLE SET STYLE *
GRID=OFF,$
END
```

The output is shown in the following image. Note the missing value indicators:

- For the Projected Sale Units field in the rows that correspond to product categories Camcorder, Stereo Systems, and Video Production, which are not represented in the Excel file.
- For the Cost of Goods field in the row that corresponds to product category Displays, which is not represented in the WF_RETAIL data source.

| Product Category | Cost of Goods | Projected Sale Units |
|---|---|---|
| Accessories | $89,753,898.00 | 1964918 |
| Camcorder | $104,866,857.00 | . |
| Computers | $69,807,664.00 | 2519110 |
| Displays | . | 3268 |
| Media Player | $190,240,481.00 | 10585039 |
| Stereo Systems | $205,113,863.00 | . |
| Televisions | $61,551,109.00 | 1033209 |
| Video Production | $40,105,657.00 | . |

# Joining From a Multi-Fact Synonym

Multi-parent synonyms are now supported as the source for a join to a single segment in a target synonym.

A join from a multi-parent synonym is subject to the following conditions:

- Conditional joins are not supported (JOIN WHERE).
- The join must be unique. That is, the TO ALL or TO MULTIPLE phrase is not

supported.

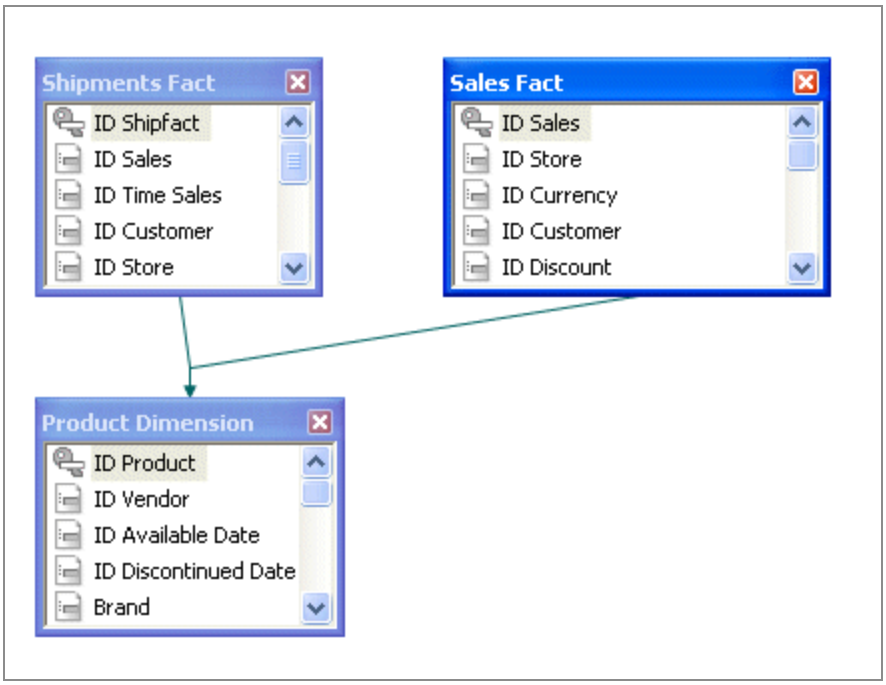
- The target of the join cannot be a multi-parent synonym.
- The target of the JOIN must be a single segment, either in a single segment synonym or one segment in a single parent, multi-segment synonym.
- All fields in the JOIN must be FROM/TO a single segment. Any single segment in the source synonym can be used in the join.

## Joining From a Multi-Fact Synonym

The following Master File describes a multi-parent structure based on the WebFOCUS Retail tutorial. The two fact tables wf_retail_sales and wf_retail_shipments are parents of the dimension table wf_retail_product.

```
FILENAME=WF_RETAIL_MULTI_PARENT, $
  SEGMENT=WF_RETAIL_SHIPMENTS, CRFILE=WFRETAIL/FACTS/WF_RETAIL_
SHIPMENTS, CRINCLUDE=ALL,
    DESCRIPTION='Shipments Fact', $
  SEGMENT=WF_RETAIL_SALES, PARENT=., CRFILE=WFRETAIL/FACTS/WF_RETAIL_
SALES, CRINCLUDE=ALL,
    DESCRIPTION='Sales Fact', $
  SEGMENT=WF_RETAIL_PRODUCT, CRFILE=WFRETAIL/DIMENSIONS/WF_RETAIL_
PRODUCT, CRINCLUDE=ALL,
    DESCRIPTION='Product Dimension', $
   PARENT=WF_RETAIL_SHIPMENTS, SEGTYPE=KU,
    JOIN_WHERE=WF_RETAIL_SHIPMENTS.ID_PRODUCT EQ WF_RETAIL_PRODUCT.ID_
PRODUCT;, $
   PARENT=WF_RETAIL_SALES, SEGTYPE=KU,
    JOIN_WHERE=WF_RETAIL_SALES.ID_PRODUCT EQ WF_RETAIL_PRODUCT.ID_
PRODUCT;, $
```

The following image shows the joins between these tables in the Synonym Editor of the Data Management Console (DMC).




The following request joins the product segment to the dimension table wf_retail_vendor based on the vendor ID and issues a request against the joined structure:

```
JOIN ID_VENDOR IN WF_RETAIL_MULTI_PARENT TO ID_VENDOR IN WF_RETAIL_
VENDOR AS J1
TABLE FILE WF_RETAIL_MULTI_PARENT
SUM COGS_US DAYSDELAYED
BY PRODUCT_CATEGORY
BY VENDOR_NAME
WHERE PRODUCT_CATEGORY LT 'S'
ON TABLE SET PAGE NOPAGE
END
```

The output is:

| Product Category | Vendor Name | Cost of Goods | Days Delayed |
|---|---|---|---|
| Accessories | Audio Technica | $38,000.00 | 28 |
| | Denon | $25,970.00 | 17 |
| | Grado | $21,930.00 | 15 |
| | Logitech | $61,432.00 | 114 |
| | Niles Audio | $73,547.00 | 150 |
| | Pioneer | $16,720.00 | 71 |
| | Samsung | $5,405.00 | 83 |
| | Sennheiser | $78,113.00 | 128 |
| | Sony | $21,760.00 | 157 |
| Camcorder | Canon | $110,219.00 | 97 |
| | JVC | $72,292.00 | 75 |
| | Panasonic | $22,356.00 | 91 |
| | Sanyo | $31,590.00 | 179 |
| | Sony | $216,748.00 | 333 |
| Computers | Samsung | $33,129.00 | 156 |
| | Sony | $76,152.00 | 186 |
| Media Player | JVC | $87,057.00 | 267 |
| | LG | $3,830.00 | 13 |
| | Panasonic | $143,600.00 | 171 |
| | Pioneer | $169,810.00 | 206 |
| | Roku | $10,248.00 | 85 |
| | Samsung | $151,620.00 | 191 |
| | Sharp | $66,024.00 | 157 |
| | Sony | $142,190.00 | 121 |
| | Toshiba | $5,214.00 | 7 |

# Navigating Joins Between Cluster Synonyms

By default, when joining cluster synonyms, a hierarchy of segments is constructed from all of the joined files, and the resulting hierarchy is navigated in top-to-bottom, left-to-right order.

Therefore, if a left outer join is specified from a host synonym to a cluster that has an inner join, the inner join will be performed last and may remove rows from the host file, counteracting the purpose of the left outer join. Using the SET FOCTRANSFORM = NESTED_CLUSTERS/ON command, you can force the joins in the target cluster to be performed prior to the join between the host and target synonyms. When you use this setting, SQL scripts are used to join the tables in the target cluster prior to implementing the join to the host file. The left outer join will be performed last and will retain all rows in the host synonym.

The syntax is:

```
SET FOCTRANSFORM = {NESTED_CLUSTERS/OFF|NESTED_CLUSTERS/ON}
```

where:

**NESTED_CLUSTERS/OFF**

Maintains the left-to-right, top-to-bottom order of segment navigation. This is the default value.

**NESTED_CLUSTERS/ON**

Performs the joins in the target cluster synonym prior to joining the host synonym to the result.

# Usage Notes for Joins to Cluster Synonyms

- Using the SET FOCTRANSFORM = NESTED_CLUSTERS feature requires that the joins be optimized. The command SET SHORTPATH = SQL must be in effect for combinations of inner and outer joins with the setting FOCTRANSFORM = NESTED_CLUSTERS/OFF, in order for the request to be optimized. The SHORTPATH = SQL setting has no effect on optimization with the setting FOCTRANSFORM = NESTED_CLUSTERS/ON.
- You cannot join to a non-root segment of a cluster synonym. If you issue a join to a non-root segment, the following message displays and the request terminates:

```
(FOC906) JOIN TO NON-ROOT SEGMENT segname IS NOT ALLOWED FOR
NESTED_CLUSTERS
```

# Navigating Joins Between Cluster Synonyms

This example uses SQL Server data sources generated from a file of citibike trips uploaded from https://www.citibikenyc.com/system-data, and from a file of zip codes for the stations used for the trips (you can download this file from https://techsupport.informationbuilders.com/public/station_zip.csv).

A cluster synonym named station_trip_cls joins the station zip data source to a data source containing partial trip data (with only a few rows). The following shows the inner join defined in the cluster synonym:

```
FILENAME=STATION_TRIP_CLS, $
  SEGMENT=STATION_ZIP_OLEDB, CRFILE=CITIBIKE/STATION_ZIP_OLEDB,
CRINCLUDE=ALL, $
  SEGMENT=CITIBIKE_PARTIAL_OLEDB, SEGTYPE=KU, PARENT=STATION_ZIP_OLEDB,
    CRFILE=CITIBIKE/CITIBIKE_PARTIAL_OLEDB, CRINCLUDE=ALL,
CRJOINTYPE=INNER,
    JOIN_WHERE=STATION_ID EQ START_STATION_ID;, $
```

The following request issues a left outer join from a larger version of the trip data file to the cluster:

```
SET FOCTRANSFORM = NESTED_CLUSTERS/&VALUE
SET SHORTPATH = SQL
JOIN LEFT_OUTER START_STATION_ID IN CITIBIKE_TRIPDATA TAG T1 TO ALL
STATION_ID IN STATION_TRIP_CLS TAG T2 AS J1
TABLE FILE CITIBIKE_TRIPDATA
" NESTED_CLUSTERS/&VALUE"
" "
SUM CNT.T1.START_STATION_ID AS T1,Station CNT.ZIP_CODE CNT.T2.START_
STATION_ID AS T2,Station
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

Running the request with &VALUE set to OFF generates the following trace:

```
SELECT
   COUNT(T1."START_STATION_ID"),
```

```
   COUNT(T2."ZIP_CODE"),
   COUNT(T3."START_STATION_ID")
   FROM
   ( ( citibike_tripdata_mssqloledb T1
   LEFT OUTER JOIN
   station_zip_oledb T2
   ON T2."STATION_ID" = T1."START_STATION_ID" )
   INNER JOIN
   citibike_partial_msoledb T3
   ON (T3."START_STATION_ID" = T2."STATION_ID") );
```

The output is shown in the following image. The inner join was done last, reducing the number of stations in the host file to the same number as in the cluster.

NESTED_CLUSTERS/OFF

| T1 Station | ZIP_CODE COUNT | T2 Station |
|---|---|---|
| 165 | 158 | 165 |

Running the request with &VALUE set to ON generates the following trace. Two SQL scripts are generated, one for the host file and one for the join in the cluster. Then, the left outer join is performed against the result of the inner join:

```
SELECT
   T1."START_STATION_ID" AS "SK001_START_STATION_ID",
    COUNT(T1."START_STATION_ID") AS "VB001_CNT_START_STATION_ID"
    FROM
   citibike_tripdata_mssqloledb T1
    GROUP BY
   T1."START_STATION_ID";
   (FOC2546) SQL SCRIPT __CITIBIKE_TRIPDATA_OLEDB_CITIBIKE_TRIPDATA_
OLEDB.SQL CREATED SUCCESSFULLY (BUT NOT EXECUTED)
   _EDATEMP/__citibike_tripdata_oledb_citibike_tripdata_oledb HELD AS
SQL_SCRIPT
    SELECT
  T1."STATION_ID" AS "SK001_STATION_ID",
    COUNT(T1."ZIP_CODE") AS "VB001_CNT_ZIP_CODE",
    COUNT(T2."START_STATION_ID") AS "VB002_CNT_START_STATION_ID"
    FROM
   station_zip_oledb T1,
   citibike_partial_msoledb T2
    WHERE
   (T2."START_STATION_ID" = T1."STATION_ID")
```

```
    GROUP BY
   T1."STATION_ID";
  (FOC2546) SQL SCRIPT __CITIBIKE_TRIPDATA_OLEDB_STATION_PARTIAL_OLEDB_
CLS.SQL CREATED SUCCESSFULLY (BUT NOT EXECUTED)
  _EDATEMP/__citibike_tripdata_oledb_station_partial_oledb_cls HELD AS
SQL_SCRIPT
```

```
    SELECT
    SUM(T1."VB001_CNT_START_STATION_ID"),
    SUM(T2."VB001_CNT_ZIP_CODE"),
    SUM(T2."VB002_CNT_START_STATION_ID")
    FROM
   (
   ( /* vvv */
      SELECT
     T1."START_STATION_ID" AS "SK001_START_STATION_ID",
      COUNT(T1."START_STATION_ID") AS
     "VB001_CNT_START_STATION_ID"
      FROM
     citibike_tripdata_mssqloledb T1
      GROUP BY
     T1."START_STATION_ID"
   ) /* ^^^ */ T1
    LEFT OUTER JOIN
   ( /* vvv */
      SELECT
     T1."STATION_ID" AS "SK001_STATION_ID",
      COUNT(T1."ZIP_CODE") AS "VB001_CNT_ZIP_CODE",
      COUNT(T2."START_STATION_ID") AS
     "VB002_CNT_START_STATION_ID"
      FROM
     station_zip_oledb T1,
     citibike_partial_msoledb T2
      WHERE
     (T2."START_STATION_ID" = T1."STATION_ID")
      GROUP BY
     T1."STATION_ID"
   ) /* ^^^ */ T2
    ON T2."SK001_STATION_ID" = T1."SK001_START_STATION_ID" );
```

The output is shown in the following image. The left outer join was done last, maintaining the original number of stations in the host file.

NESTED_CLUSTERS/ON

| T1 Station | ZIP_CODE COUNT | T2 Station |
|---|---|---|
| 6680 | 8 | 9 |

# Cross Database Join Optimization

Retrieval performance has been optimized under certain conditions when you join tables from different Relational database systems.

One type of performance optimization results from extracting data from the cross-referenced table prior to performing the join, or issuing a sub-select. You can disable this optimization process by issuing the following command:

```
SQL SET HOLDSQLJOIN = OFF
END
```

By default, this parameter is ON.

The following performance optimization procedures have been implemented:

- For a non-aggregated query, the cross-referenced (TO) table is saved as a file in an internal binary format. This is faster than joining to a table in a different database system.
- For an aggregated query, for the cross-referenced table joined from any aggregation functions (min, max, sum, avg, count), the retrieval is passed to the relational database in a sub-select. This can result in retrieving a much smaller answer set, which improves performance.
- For a request with a clause that tests if two columns are equal or both are NULL, the TO table is held in an internal binary format, also improving performance.

You can view the generated query in either the Session Log or the trace file.

The following SQL request joins a Microsoft SQL Server named citibike_mssql table to a MySQL table named station_zip_mysql.

```
SQL
SELECT
```

```
   T1.TRIPDURATION,
   T1.START_STATION_NAME ,
   T1.END_STATION_NAME ,
   T1.BIKEID ,
   T1.BIRTH_YEAR ,
   T1.GENDER ,
   T1.STARTTIME ,
   T1.STOPTIME ,
   T1.USERTYPE ,   T2.ZIP_CODE ,
   T2.COUNTY ,
   T2.CITY
FROM
   citibike.citibike_mssql T1
     INNER JOIN /*Join 1*/
    citibike.station_zip_mysql T2
       ON
      T1.START_STATION_ID = T2.STATION_ID
;
TABLE
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

When this request is run, the Session Log shows the generated request. First the station_zip_mysql table is held in an internal format:

```
TABLEF FILE STATION_ZIP_MYSQL
 PRINT
   ZIP_CODE
   COUNTY
   CITY
   STATION_ID
ON TABLE SET CARTESIAN ON
ON TABLE SET ASNAMES ON
ON TABLE SET HOLDLIST PRINTONLY
 ON TABLE HOLD
  AS SQLHLD01
  FORMAT DATREC
END
```

Next, the citibike_mssql table is joined to the HOLD file.

```
JOIN INNER
   CITIBIKE_MSSQL2.START_STATION_ID
  IN CITIBIKE_MSSQL
 TO ALL
   E04
  IN SQLHLD01
 AS SQLJNM01
END
```

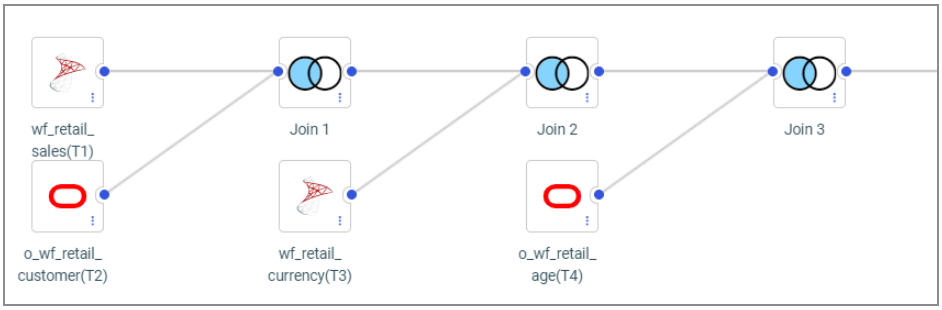
Finally, the joined structure is queried to produce the output.

```
TABLEF FILE CITIBIKE_MSSQL
 PRINT
   CITIBIKE_MSSQL.TRIPDURATION
   CITIBIKE_MSSQL.START_STATION_NAME
   CITIBIKE_MSSQL.END_STATION_NAME
   CITIBIKE_MSSQL.BIKEID
   CITIBIKE_MSSQL.BIRTH_YEAR
   CITIBIKE_MSSQL.GENDER
   CITIBIKE_MSSQL.STARTTIME
   CITIBIKE_MSSQL.STOPTIME
   CITIBIKE_MSSQL.USERTYPE
   SQLHLD01.E01
   SQLHLD01.E02
   SQLHLD01.E03
   SQLHLD01.E04 NOPRINT
ON TABLE SET CARTESIAN ON
ON TABLE SET ASNAMES ON
ON TABLE SET HOLDLIST PRINTONLY
END
```

Additional performance improvements result from the following conversions:

- If there is more than one cluster of tables from the same DBMS in the FROM clause, joins between those tables are passed to the corresponding DBMS.
- If there is a WHERE condition on fields from the outer table in a left or right outer join, and this condition always fails for null values, that join is converted to an inner join.
- If there is WHERE condition on fields from the left, right, or both tables in a full outer join, and this condition always fails for null values, that join is converted to a left, right, or inner join.
- Merge sub-select phrases *if from*, *where*, *group by*, and *having* are the same and re-use the temporary table created for the merge sub-select statement.

For example, following flow creates three left outer joins between Microsoft SQL Server tables and Oracle tables. The Oracle synonyms start with the characters *o_*.




The following SQL statement corresponds to the joins generated by the flow.

```
SQL
SELECT
   T1.ID_SALES ,
   T1.ID_STORE ,
   T1.ID_CURRENCY ,
   T1.ID_CUSTOMER ,
   T1.ID_DISCOUNT ,
   T1.ID_PRODUCT ,
   T1.ID_TIME ,
   T1.COGS_LOCAL ,
   T1.COGS_US ,
   T1.DISCOUNT_LOCAL ,
   T1.DISCOUNT_US ,
   T1.GROSS_PROFIT_LOCAL ,
   T1.GROSS_PROFIT_US ,
   T1.MSRP_LOCAL ,
   T1.MSRP_US ,
   T1.QUANTITY_SOLD ,
   T1.REVENUE_LOCAL ,
   T1.REVENUE_US ,
   T2.ID_AGE ,
   T2.ID_EDUCATION ,
   T2.ID_GEOGRAPHY ,
   T2.ID_INCOME ,
   T2.ID_INDUSTRY ,
   T2.ID_MARITAL_STATUS ,
   T2.ID_OCCUPATION ,
   T2.ID_TIME_MIN ,
   T2.ID_TIME_MAX ,
   T2.EMAIL_ADDRESS ,
   T2.FIRSTNAME ,
   T2.FULLNAME ,
   T2.GENDER ,
```

```
   T2.LASTNAME ,
   T2.INCOME ,
   T3.CURRENCY_NAME ,
   T3.CURRENCY_RATE ,
   T4.AGE ,
   T4.AGE_RANGE ,
   T4.AGE_GROUP
```

```
FROM
   ((("ibisamp/facts".wf_retail_sales T1
     LEFT OUTER JOIN /*Join 1*/
    "ibisamp/dimensions".o_wf_retail_customer T2
       ON
      T1.ID_CUSTOMER = T2.ID_CUSTOMER )
     LEFT OUTER JOIN /*Join 2*/
    "ibisamp/dimensions".wf_retail_currency T3
       ON
      T1.ID_CURRENCY = T3.ID_CURRENCY )
     LEFT OUTER JOIN /*Join 3*/
    "ibisamp/dimensions".o_wf_retail_age T4
       ON
      T2.ID_AGE = T4.ID_AGE )
 WHERE
   T1.REVENUE_US > 600  AND
   T2.LASTNAME LIKE 'C%'  AND
   T3.CURRENCY_NAME = 'US Dollar'  AND
   T4.AGE  BETWEEN 35 AND 40
;
END
```

The Session Log shows the joins that were generated. The left outer joins were converted to inner joins, as shown in the following partial listing.

```
JOIN INNER
   SQLAPP01.ID_AGE
  IN 'ibisamp/dimensions/o_wf_retail_customer' TAG SQLAPP01
 TO ALL
   ID_AGE
  IN 'ibisamp/dimensions/o_wf_retail_age' TAG SQLJTG01
 AS SQLJNM01
END
DEFINE FILE 'ibisamp/dimensions/o_wf_retail_customer' TEMP
 SQLDEF01/I1 WITH SQLJTG01.O_WF_RETAIL_AGE.ID_AGE = 1;
END
TABLEF FILE 'ibisamp/dimensions/o_wf_retail_customer'
```

```
 PRINT
   SQLAPP01.ID_AGE
   SQLAPP01.ID_EDUCATION
   SQLAPP01.ID_GEOGRAPHY
   SQLAPP01.ID_INCOME
   SQLAPP01.ID_INDUSTRY
   SQLAPP01.ID_MARITAL_STATUS
   SQLAPP01.ID_OCCUPATION
   SQLAPP01.ID_TIME_MIN
   SQLAPP01.ID_TIME_MAX
   SQLAPP01.EMAIL_ADDRESS
   SQLAPP01.FIRSTNAME
   SQLAPP01.FULLNAME
   SQLAPP01.GENDER
   SQLAPP01.LASTNAME
   SQLAPP01.INCOME
   SQLJTG01.AGE
   SQLJTG01.AGE_RANGE
   SQLJTG01.AGE_GROUP
   SQLAPP01.ID_CUSTOMER
   SQLDEF01 AS (,'SQL$$HIDDEN01',)
   SQLJTG01.ID_AGE NOPRINT
```

```
WHERE ( SQLAPP01.LASTNAME LIKE 'C%' ) ;
 WHERE (  ( SQLJTG01.AGE FROM 35 TO 40
 AND SQLJTG01.AGE NE MISSING) ) ;
ON TABLE SET HOLDATTRS ON
ON TABLE SET CARTESIAN ON
ON TABLE SET ASNAMES MIXED
ON TABLE SET HOLDLIST PRINTONLY
 ON TABLE HOLD
  AS SQLHLD01
  FORMAT DATREC
END
```

In addition, joins that use the same DBMS are passed to that DBMS, as shown in the following partial listing.

```
    SELECT
  T1."ID_CUSTOMER",
  T1."ID_AGE",
  T1."ID_EDUCATION",
  T1."ID_GEOGRAPHY",
  T1."ID_INCOME",
  T1."ID_INDUSTRY",
```

```
T1."ID_MARITAL_STATUS",
T1."ID_OCCUPATION",
T1."ID_TIME_MIN",
T1."ID_TIME_MAX",
T1."EMAIL_ADDRESS",
T1."FIRSTNAME",
T1."FULLNAME",
T1."GENDER",
T1."LASTNAME",
T1."INCOME",
T2."ID_AGE",
T2."AGE",
T2."AGE_RANGE",
T2."AGE_GROUP"
 FROM
wf_retail_customer_t T1,
wf_retail_age_t T2
 WHERE
(T2."ID_AGE" = T1."ID_AGE") AND
(T1."LASTNAME" LIKE 'C%') AND
(T2."AGE" IS NOT NULL) AND
(T2."AGE" BETWEEN 35 AND 40);
```

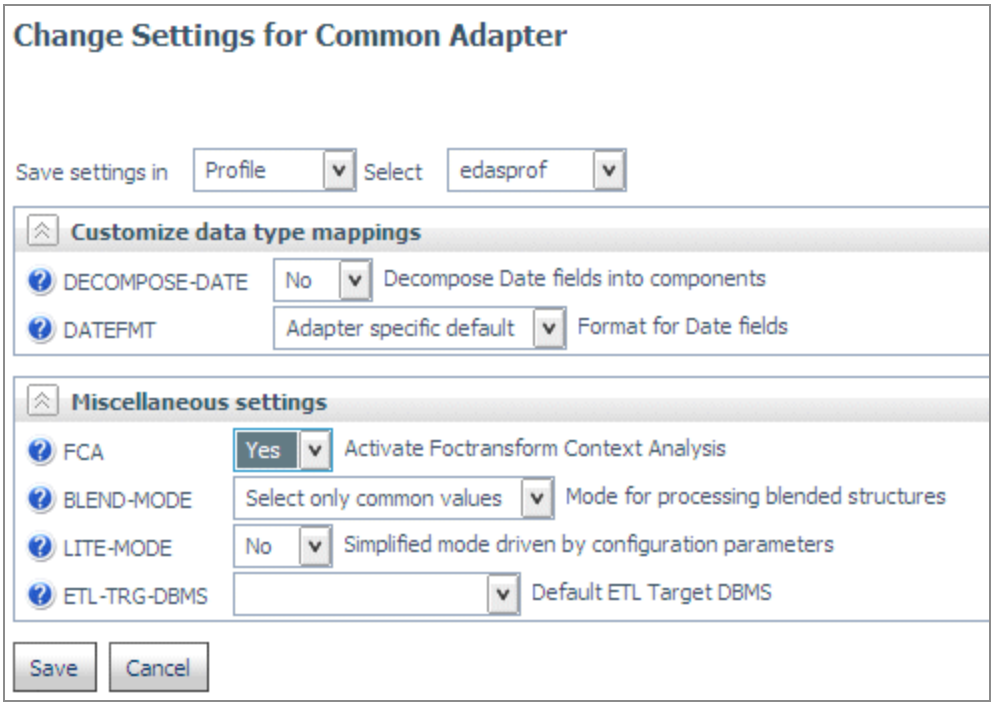
# Invoking Context Analysis for a Star Schema With a Fan Trap

When a star schema contains a segment with aggregated facts and a lower-level segment with the related detail-level facts, a request that performs aggregation on both levels and returns them sorted by the higher level can experience the multiplicative effect. This means that the fact values that are already aggregated may be re-aggregated and, therefore, return multiplied values.

When the adapter detects the multiplicative effect, it turns optimization off in order to handle the request processing and circumvent the multiplicative effect. However, performance is degraded when a request is not optimized.

A new context analysis process has been introduced in this release that detects the multiplicative effect and generates SQL script commands that retrieve the correct values for each segment context. These scripts are then passed to the RDBMS as subqueries in an optimized SQL statement.

To activate the context analysis feature, click **Change Common Adapter Settings** on the Adapters page of the Web Console. Then select **Yes** for the **FCA** parameter in the **Miscellaneous Settings** section and click **Save**, as shown in the following image.




# Adding DBA Restrictions to the Join Condition: SET DBAJOIN

When DBA restrictions are applied to a request on a multi-segment structure, by default, the restrictions are added as WHERE conditions in the report request. When the DBAJOIN parameter is set ON, DBA restrictions are treated as internal to the file or segment for which they are specified, and are added to the join syntax.

**Note:** DBA restrictions with DBAJOIN OFF apply to the entire record instance that is being retrieved. Therefore, the entire record instance is suppressed when any part of that instance is restricted. DBAJOIN ON applies the DBA only to the segment where the data value appears, allowing the rest of the record instance to be displayed, if applicable.

This difference is important when the file or segment being restricted has a parent in the structure and the join is an outer or unique join.

When restrictions are treated as report filters, lower-level segment instances that do not satisfy them are omitted from the report output, along with their host segments. Since host segments are omitted, the output does not reflect a true outer or unique join.

When the restrictions are treated as join conditions, lower-level values from segment instances that do not satisfy them are displayed as missing values, and the report output displays all host rows.

# Add DBA Restrictions to the Join Condition

```
SET DBAJOIN = {OFF|ON}
```

where:

**OFF**

Treats DBA restrictions as WHERE filters in the report request. OFF is the default value.

**ON**

Treats DBA restrictions as join conditions.

# Using the DBAJOIN Setting With Relational Tables

The following request creates two tables, EMPINFOSQL and EDINFOSQL:

```
TABLE FILE EMPLOYEE
SUM LAST_NAME FIRST_NAME CURR_JOBCODE
BY EMP_ID
ON TABLE HOLD AS EMPINFOSQL FORMAT SQLMSS
END
-RUN
TABLE FILE EDUCFILE
SUM COURSE_CODE COURSE_NAME
BY EMP_ID
ON TABLE HOLD AS EDINFOSQL FORMAT SQLMSS
END
```

Add the following DBA attributes to the end of the generated EMPINFOSQL Master File. With the restrictions listed, USER2 cannot retrieve course codes of 300 or above:

```
END
DBA=USER1,$
USER=USER2, ACCESS = R, $
FILENAME=EDINFOSQL,$
USER=USER2, ACCESS = R, RESTRICT = VALUE, NAME=SYSTEM, VALUE=COURSE_CODE
LT 300;,$
```

Add the following DBA attributes to the end of the generated EDINFOSQL Master File:

```
END
DBA=USER1,DBAFILE=EMPINFOSQL,$
```

Issue the following request:

```
SET USER=USER2
SET DBAJOIN=OFF
JOIN LEFT_OUTER EMP_ID IN EMPINFOSQL TO MULTIPLE EMP_ID IN EDINFOSQL AS
J1
TABLE FILE EMPINFOSQL
PRINT LAST_NAME FIRST_NAME COURSE_CODE COURSE_NAME
ON TABLE SET PAGE NOPAGE
ON TABLE SET STYLE *
GRID=OFF,$
END
```

On the report output, all host and child rows with course codes 300 or above have been omitted, as shown in the following image:

| LAST_NAME | FIRST_NAME | COURSE_CODE | COURSE_NAME |
|---|---|---|---|
| STEVENS | ALFRED | 101 | FILE DESCRPT & MAINT |
| SMITH | MARY | 103 | BASIC REPORT PREP FOR PROG |
| JONES | DIANE | 203 | FOCUS INTERNALS |
| SMITH | RICHARD | 108 | BASIC RPT NON-DP MGRS |
| MCKNIGHT | ROGER | 101 | FILE DESCRPT & MAINT |

In the generated SQL the DBA restriction has been added to the WHERE predicate in the SELECT statement:

```
SELECT
  T1."EID",
  T1."LN",
  T1."FN",
```

```
  T2."CC",
  T2."CD"
   FROM
  EMPINFOSQL T1,
  EDINFOSQL T2
   WHERE
  (T2."EID" = T1."EID") AND
  (T2."CC" < '300;');
```

Rerun the request with SET DBAJOIN=ON. The output now displays all host rows, with missing values substituted for lower-level segment instances that did not satisfy the DBA restriction, as shown on the following image:

| LAST_NAME | FIRST_NAME | COURSE_CODE | COURSE_NAME |
|---|---|---|---|
| STEVENS | ALFRED | 101 | FILE DESCRPT & MAINT |
| SMITH | MARY | 103 | BASIC REPORT PREP FOR PROG |
| JONES | DIANE | 203 | FOCUS INTERNALS |
| SMITH | RICHARD | 108 | BASIC RPT NON-DP MGRS |
| BANNING | JOHN | . | . |
| IRVING | JOAN | . | . |
| ROMANS | ANTHONY | . | . |
| MCCOY | JOHN | . | . |
| BLACKWOOD | ROSEMARIE | . | . |
| MCKNIGHT | ROGER | 101 | FILE DESCRPT & MAINT |
| GREENSPAN | MARY | . | . |
| CROSS | BARBARA | . | . |

In the generated SQL, the DBA restriction has been added to the join, and there is no WHERE predicate:

```
SELECT
  T1."EID",
  T1."LN",
  T1."FN",
  T2."EID",
  T2."CC",
  T2."CD"
   FROM
  ( EMPINFOSQL T1
   LEFT OUTER JOIN EDINFOSQL T2
   ON T2."EID" = T1."EID" AND
      (T2."CC" < '300;') );
```

# Preserving Virtual Fields During Join Parsing

There are two ways to preserve virtual fields during join parsing. One way is to use KEEPDEFINES, and the second is to use DEFINE FILE SAVE and DEFINE FILE RETURN.

# Preserving Virtual Fields Using KEEPDEFINES

The KEEPDEFINES parameter determines if a virtual field created by the DEFINE command for a host or joined structure is retained or cleared after the JOIN command is run. It applies when the DEFINE command precedes the JOIN command.

The prior virtual fields constitute what is called a context. Each new context creates a new layer or command environment. When you first enter the new environment, all virtual fields defined in the previous layer are available in the new layer. Overwriting or clearing a virtual field definition affects only the current layer. When you return to the previous layer, its virtual field definitions are intact.

New DEFINE fields issued after the JOIN command constitute another context, and by so doing generate a stack of contexts. In each context, all virtual fields of all prior contexts are accessible.

- By default the KEEPDEFINES setting is OFF. With this setting, a JOIN command removes prior virtual fields.
- After KEEPDEFINES is set to ON, subsequent virtual fields are reinstated during the parsing of a JOIN command.
- When KEEPDEFINES is set to ALL, all subsequent virtual fields, as well as any prior virtual fields, are reinstated during the parsing of JOIN commands.

A JOIN CLEAR *as_name* command removes all the contexts that were created after the JOIN *as_name* was issued.

For DEFINE-based conditional joins, the KEEPDEFINES setting must be ON. You then must create all virtual fields before issuing the DEFINE-based conditional JOIN command. This differs from traditional DEFINE-based joins in which the virtual field is created after the JOIN command. In addition, a virtual field may be part of the JOIN syntax or WHERE syntax.

DEFINE commands issued after the JOIN command do not replace or clear the virtual fields created before the join, since a new file context is created.

# Use KEEPDEFINES

```
SET KEEPDEFINES = {ON|OFF|ALL}
```

where:

**ON**

Retains subsequent virtual fields after a JOIN command is run.

**OFF**

Clears the virtual field after a JOIN command is run. OFF is the default value.

**ALL**

Retains all prior and subsequent virtual fields in the request after a JOIN command is run.

# Usage Notes for KEEPDEFINES

- Virtual fields defined prior to setting KEEPDEFINES ON are not preserved after a JOIN command. Set KEEPDEFINES to ALL to preserve any previously defined virtual fields.
- If you are using the KEEPDEFINES command with virtual fields and nested JOINs, make sure you assign a unique name to each join structure. Adding a unique AS name to each JOIN ensures that the subsequent JOIN will not overwrite the previous JOIN or DEFINE statements.

# Preserving Virtual Fields During Join Parsing With KEEPDEFINES

The first virtual field, DAYSKEPT, is defined prior to issuing any joins, but after setting KEEPDEFINES to ON. DAYSKEPT is the number of days between the return date and rental date for a videotape:

```
SET KEEPDEFINES = ON
DEFINE FILE VIDEOTRK
DAYSKEPT/I5 = RETURNDATE - TRANSDATE;
END
```

The ? DEFINE query command shows that this is the only virtual field defined at this point:

```
? DEFINE
```

```
FILE     FIELD NAME                  FORMAT  SEGMENT   VIEW       TYPE
VIDEOTRK DAYSKEPT                    I5            4
```

The following request prints all transactions in which the number of days kept is two:

```
TABLE FILE VIDEOTRK
PRINT MOVIECODE TRANSDATE RETURNDATE DAYSKEPT
COMPUTE ACTUAL_DAYS/I2 = RETURNDATE-TRANSDATE;
WHERE DAYSKEPT EQ 2
END
```

The first few lines of output show that each return date is two days after the transaction date:

```
MOVIECODE  TRANSDATE  RETURNDATE  DAYSKEPT  ACTUAL_DAYS
---------  ---------  ----------  --------  -----------
001MCA     91/06/27   91/06/29           2            2
692PAR     91/06/27   91/06/29           2            2
259MGM     91/06/19   91/06/21           2            2
```

Now, the VIDEOTRK data source is joined to the MOVIES data source. The ? DEFINE query shows that the join did not clear the DAYSKEPT virtual field:

```
JOIN  MOVIECODE IN VIDEOTRK TO ALL MOVIECODE IN MOVIES AS J1
? DEFINE
```

```
FILE     FIELD NAME                  FORMAT  SEGMENT   VIEW       TYPE
VIDEOTRK DAYSKEPT                    I5            4
```

Next a new virtual field, YEARS, is defined for the join between VIDEOTRK and MOVIES:

```
DEFINE FILE VIDEOTRK
YEARS/I5 = (TRANSDATE - RELDATE)/365;
END
```

The ? DEFINE query shows that the virtual field created prior to the join was not cleared by this new virtual field because it was in a separate context:

```
? DEFINE
```

```
FILE     FIELD NAME                    FORMAT  SEGMENT   VIEW     TYPE
VIDEOTRK DAYSKEPT                      I5            4
VIDEOTRK YEARS                         I5            5
```

Next, the field DAYSKEPT is re-defined so that it is the number of actual days plus one:

```
DEFINE FILE VIDEOTRK
DAYSKEPT/I5 = RETURNDATE - TRANSDATE + 1;
END
```

The ? DEFINE query shows that there are two versions of the DAYSKEPT virtual field. However, YEARS was cleared because it was in the same context (after the join) as the new version of DAYSKEPT, and the DEFINE command did not specify the ADD option:

```
? DEFINE
```

```
FILE     FIELD NAME                    FORMAT  SEGMENT   VIEW     TYPE
VIDEOTRK DAYSKEPT                      I5            4
VIDEOTRK DAYSKEPT                      I5            4
```

The same request now uses the new definition for DAYSKEPT. Note that the number of days between the return date and transaction date is actually one day, not two because of the change in the definition of DAYSKEPT:

```
MOVIECODE  TRANSDATE  RETURNDATE  DAYSKEPT  ACTUAL_DAYS
---------  ---------  ----------  --------  -----------
040ORI     91/06/20   91/06/21           2            1
505MGM     91/06/21   91/06/22           2            1
710VES     91/06/26   91/06/27           2            1
```

Now, J1 is cleared. The redefinition for DAYSKEPT is also cleared:

```
JOIN CLEAR J1
? DEFINE
```

```
FILE     FIELD NAME                    FORMAT  SEGMENT   VIEW
TYPE
VIDEOTRK DAYSKEPT                      I5            4
```

The report output shows that the original definition for DAYSKEPT is now in effect:

```
MOVIECODE  TRANSDATE  RETURNDATE  DAYSKEPT  ACTUAL_DAYS
---------  ---------  ----------  --------  -----------
001MCA     91/06/27   91/06/29           2            2
692PAR     91/06/27   91/06/29           2            2
259MGM     91/06/19   91/06/21           2            2
```

# Preserving Virtual Fields Using DEFINE FILE SAVE and RETURN

The DEFINE FILE SAVE command forms a new context for virtual fields, which can then be removed with DEFINE FILE RETURN. For details, see Creating Temporary Fields.

# Preserving Virtual Fields With DEFINE FILE SAVE and RETURN

The following command enables you to preserve virtual fields within a file context:

```
SET KEEPDEFINES=ON
```

The following command defines virtual field A for the VIDEOTRK data source and places it in the current context:

```
DEFINE FILE VIDEOTRK
 A/A5='JAWS';
 END
```

The following command creates a new context and saves virtual field B in this context:

```
DEFINE FILE VIDEOTRK SAVE
 B/A5='ROCKY';
 END
? DEFINE
```

The output of the ? DEFINE query lists virtual fields A and B:

```
FILE     FIELD NAME                FORMAT  SEGMENT   VIEW         TYPE
VIDEOTRK A                         A5
VIDEOTRK B                         A5
```

The following DEFINE command creates virtual field C. All previously defined virtual fields are cleared because the ADD option was not used in the DEFINE command:

```
DEFINE FILE VIDEOTRK
 C/A10='AIRPLANE';
 END
? DEFINE
```

The output of the ? DEFINE query shows that C is the only virtual field defined:

```
FILE     FIELD NAME                FORMAT  SEGMENT   VIEW         TYPE
VIDEOTRK C                         A10
```

The following JOIN command creates a new context. Because KEEPDEFINES is set to ON, virtual field C is not cleared by the JOIN command:

```
JOIN MOVIECODE IN VIDEOTRK TAG V1 TO MOVIECODE IN MOVIES TAG M1 AS J1
? DEFINE
```

The output of the ? DEFINE query shows that field C is still defined:

```
FILE     FIELD NAME                 FORMAT  SEGMENT   VIEW         TYPE
VIDEOTRK C                          A10
```

The next DEFINE command creates virtual field D in the new context created by the JOIN command:

```
DEFINE FILE VIDEOTRK SAVE
 D/A10='TOY STORY';
 END
? DEFINE
```

The output of the ? DEFINE query shows that virtual fields C and D are defined:

```
FILE     FIELD NAME                FORMAT  SEGMENT   VIEW         TYPE
VIDEOTRK C                         A10
VIDEOTRK D                         A10
```

The DEFINE FILE RETURN command clears virtual field D created in the current context (after the JOIN):

```
DEFINE FILE VIDEOTRK RETURN
END
? DEFINE
```

The output of the ? DEFINE query shows that virtual field D was cleared, but C is still defined:

```
FILE     FIELD NAME                FORMAT  SEGMENT   VIEW         TYPE
VIDEOTRK C                         A10
```

The following DEFINE FILE RETURN command does not clear virtual field C because field C was not created using a DEFINE FILE SAVE command:

```
DEFINE FILE VIDEOTRK RETURN
END
? DEFINE
```

The output of the ? DEFINE query shows that virtual field C is still defined:

```
FILE     FIELD NAME                FORMAT  SEGMENT   VIEW         TYPE
VIDEOTRK C                         A10
```

**Note:** DEFINE FILE RETURN is only activated when a DEFINE FILE SAVE is in effect.

# Screening Segments With Conditional JOIN Expressions

The conditional JOIN command can reference any and all fields in the joined segment and any and all fields in the parent segment, or higher on the parent's path.

When active, these join expressions screen the segment on which they reside (the child or joined segment). That is, if no child segment passes the test defined by the expression, the join follows the rules of SET ALL=OFF, or SET ALL=ON when no child segment exists. Unlike WHERE phrases in TABLE commands, JOIN_WHERE screening does not automatically screen the parent segment when SET ALL=ON.

# Parsing WHERE Criteria in a Join

WHERE criteria take effect in a join only when a TABLE request reference is made to a cross-referenced segment or its children. If no such reference is made, the WHERE has no effect.

The AT attribute is used to link the correct parent segment or host to the correct child or cross-referenced segment. The field values used as the AT parameter are not used to cause the link. They are used simply as segment references.

**Note:** If no WHERE criteria are in effect, you receive a Cartesian product.

# Displaying Joined Structures

When you join two data sources together, they are subsequently treated as one logical structure. This structure results from appending the structure of the cross-referenced file to the structure of the host file. The segment in the cross-referenced file containing the shared value field becomes the child of the segment in the host file with the shared value field.

# Display a Joined Structure

To display the joined structure, issue the following command:

```
CHECK FILE hostfile PICTURE
```

where:

**hostfile**

Is the name of the host file.

# Displaying a Joined Structure

Notice that the segments belonging to the host file appear as regular segments outlined by asterisks. The segments belonging to the cross-referenced file appear as virtual segments outlined by dots. The segments of the cross-referenced file are also labeled with the cross-referenced file name below each segment.

```
JOIN PIN IN EMPDATA TO PIN IN SALHIST
CHECK FILE EMPDATA PICTURE
0 NUMBER OF ERRORS=     0
  NUMBER OF SEGMENTS=   2  ( REAL=    1  VIRTUAL=   1 )
  NUMBER OF FIELDS=    14  INDEXES=   1  FILES=     2
  NUMBER OF DEFINES=    1
  TOTAL LENGTH OF ALL FIELDS=  132
1SECTION 01.01
              STRUCTURE OF FOCUS    FILE EMPDATA  ON 03/05/01 AT
12.22.49
```

```
          EMPDATA
  01      S1
 **************
 *PIN         **I
 *LASTNAME    **
 *FIRSTNAME   **
 *MIDINITIAL  **
 *            **
 ***************
  **************
        I
        I
        I
        I SLHISTRY
  02    I KU
 ..............
```

```
:PIN         :K
:EFFECTDATE  :
:OLDSALARY   :
:            :
:            :
:............:
 JOINED  SALHIST
```

The top segment of the cross-referenced file structure is the one containing the shared-value field. If this segment is not the root segment, the cross-referenced file structure is inverted, as in an alternate file view.

The cross-referenced file segment types in the joined structure are the following:

- In unique join structures, the top cross-referenced file segment has the segment type KU. Its unique child segments have segment type KLU. Non-unique child segments have segment type KL.
- In non-unique join structures, the top cross-referenced file segment has the segment type KM. Its unique child segments have segment type KLU. Non-unique child segments have segment type KL.

The host file structure remains unchanged. The cross-referenced file may still be used independently.

# List Joined Structures

To display a list of joined data sources, issue the following command:

```
? JOIN
```

This displays every JOIN command currently in effect. For example:

```
  JOINS CURRENTLY ACTIVE

HOST                        CROSSREFERENCE
FIELD      FILE      TAG    FIELD      FILE     TAG    AS       ALL  WH
-----      ----      ---    -----      ----     ---    --       ---  --
JOBCODE    EMPLOYEE         JOBCODE    JOBFILE                   N    N
```

If the joined structure has no join name, the AS phrase is omitted. If two data sources are joined by multiple JOIN commands, only the first command you issued is displayed. The N in the WH column indicates that the join is not conditional. A Y indicates that the join is conditional.

# Clearing Joined Structures

You can clear specific join structures, or all existing structures. Clearing deactivates the designated joins. If you clear a conditional join, all joins issued subsequently to that join using the same host file are also cleared.

**Tip:** If you wish to list the current joins before clearing or see details about all active joined structures, issue the query command ? JOIN. For details and illustrations, see List Joined Structures.

# Clear a Join

To clear a joined structure, issue this command:

```
JOIN CLEAR {joinname|*}
```

where:

**joinname**

Is the AS name of the joined structure you want to clear.

*****

Clears all joined structures.

# Clearing a Conditional Join

You can clear a join by issuing the JOIN CLEAR command. The effect of the JOIN CLEAR command depends on whether any conditional join exists.

- If conditional joins are found and were issued after the join you wish to clear, or if

the join you wish to clear is a conditional join, then the JOIN CLEAR *as_name* command removes all joins issued after the specified join.

- If no conditional joins were issued after the join you wish to clear, only the join you specify is cleared. Any virtual fields saved in the context of a join that is cleared are also cleared. Normal joins may or may not be cleared, depending on the position of the conditional join. The JOIN CLEAR * command clears every join issued, along with its associated virtual fields. However, all virtual fields in the null context remain untouched.

**Note:** The null context is the context of the data source prior to any joins being issued.

# Clearing Joins

The following request creates three joins using VIDEOTRK as the host data source. The first two are conditional (JW1, JW2), and the third join is unconditional (J1):

```
JOIN FILE VIDEOTRK AT PRODCODE TO ALL
     FILE GGSALES  AT PCD AS JW1
WHERE PRODCODE NE PCD;
END
JOIN  FILE VIDEOTRK AT TRANSDATE TO ALL
      FILE MOVIES   AT RELDATE   AS JW2
WHERE (TRANSDATE - RELDATE)/365 GT 10;
END
JOIN MOVIECODE IN VIDEOTRK TO MOVIECODE IN MOVIES AS J1
```

The next request creates a conditional join (JW3) using MOVIES as the host data source:

```
JOIN  FILE MOVIES   AT MOVIECODE TO ONE
      FILE VIDEOTRK AT TRANSDATE AS JW3
WHERE (TRANSDATE - RELDATE)/365 LT 2;
END
```

The last request creates a third conditional join (JW4) that uses VIDEOTRK as the host data source:

```
JOIN  FILE VIDEOTRK AT LASTNAME  TO ALL
      FILE EMPLOYEE AT LAST_NAME AS JW4
WHERE LASTNAME GE LAST_NAME;
END
```

Following is the output of the ? JOIN query after executing these joins:

```
? JOIN
 JOINS CURRENTLY ACTIVE

HOST                          CROSSREFERENCE
FIELD       FILE     TAG    FIELD       FILE      TAG   AS      ALL  WH
-----       ----     ---    -----       ----      ---   --      ---  --
PRODCODE    VIDEOTRK        PCD         GGSALES         JW1      Y    Y
TRANSDATE   VIDEOTRK        RELDATE     MOVIES          JW2      Y    Y
MOVIECODE   VIDEOTRK        MOVIECODE   MOVIES          J1       N    N
MOVIECODE   MOVIES          TRANSDATE   VIDEOTRK        JW3      N    Y
LASTNAME    VIDEOTRK        LAST_NAME   EMPLOYEE        JW4      Y    Y
```

Clearing JW2 clears all joins that were issued after JW2 and that use the same host data source. JW1 remains because it was issued prior to JW2, and JW3 remains because it uses a different host data source:

```
JOIN CLEAR JW2
? JOIN
 JOINS CURRENTLY ACTIVE

HOST                          CROSSREFERENCE
FIELD        FILE     TAG    FIELD        FILE     TAG      AS   ALL WH
-----        ----     ---    -----        ----     ---      --   --- --
PRODCODE     VIDEOTRK        PCD          GGSALES          JW1   Y   Y
MOVIECODE    MOVIES          TRANSDATE    VIDEOTRK         JW3   N   Y
```

# Merging Data Sources

You can gather data for your reports by merging the contents of data structures with the MATCH command, or concatenating data sources with the MORE phrase, and reporting from the combined data.

# Merging Data

You can merge two or more data sources, and specify which records to merge and which to sort out, using the MATCH command. The command creates a new data source (a HOLD file), into which it merges fields from the selected records. You can report from the new data source and use it as you would use any other HOLD file.

You select the records to be merged into the new data source by specifying sort fields in the MATCH command. You specify one set of sort fields (using the BY phrase), for the first data source, and a second set of sort fields for the second data source. The MATCH command compares all sort fields that have been specified in common for both data sources, and then merges all records from the first data source whose sort values match those in the second data source into the new HOLD file. You can specify up to 128 sort sets. This includes the number of common sort fields.

In addition to merging data source records that share values, you can merge records based on other relationships. For example, you can merge all records in each data source whose sort values are not matched in the other data source. Yet another type of merge combines all records from the first data source with any matching records from the second data source.

You can merge up to 16 sets of data in one Match request. For example, you can merge different data sources, or data from the same data source.

**Note:** The limit of 16 applies to the most complex request. Simpler requests may be able to merge more data sources.

# Merge Data Sources

The syntax of the MATCH command is similar to that of the TABLE command:

```
MATCH FILE file1
.
.
.
RUN
FILE file2
.
.
.
[AFTER MATCH merge_phrase]
RUN
FILE file3
.
.
.
[AFTER MATCH merge_phrase]
END
```

where:

**file1**

Is the first data source from which MATCH retrieves requested records.

**merge_phrase**

Specifies how the retrieved records from the files are to be compared. For details, see Merge Phrases.

**file2/file3**

Are additional data sources from which MATCH retrieves requested records.

Note that a RUN command must follow each AFTER MATCH command (except for the last one). The END command must follow the final AFTER MATCH command.

MATCH generates a HOLD file. You can print the contents of the HOLD file using the PRINT command with the wildcard character (*).

# Types of MATCH Processing

There are two types of MATCH processing, grouped and ungrouped. Grouped processing is the newer type of MATCH processing, and is the processing used by default. Ungrouped processing is the legacy MATCH processing. If you need to invoke legacy processing, you can use the SET MATCHCOLUMNORDER = UNGROUPED command.

In all MATCH requests:

- The two sides of the merge, the OLD and the NEW, are matched together based on their common high-order BY fields. In order for actual matching to take place between the OLD and NEW files, the high-order BY fields have to be the same. If there are no common high-order BY fields, the records are concatenated on a record-by-record basis.
- The output selected from the OLD and NEW sides is based on the AFTER MATCH command.

The output stage of the MATCH differs for grouped and ungrouped processing.

- With grouped processing, the output file has each common sort key (BY field) followed its display fields in the order specified in the request. As a result, ungrouped processing is limited to flat file output.
- In contrast, with grouped processing, fields in the request are grouped with their highest common sort fields in the output file. This enables you to generate multi-segment hierarchical output files in FOCUS or XFOCUS format by using multiple display commands on each side of the merge. In fact, you can create the output file using any format that has a corresponding Master File.

For standard MATCH requests that use the same sort keys on both sides of the MATCH (OLD and NEW), grouped and ungrouped processing produce the same output.

However, in requests that use multiple display commands or differing sort fields on each side of the merge, the grouping of fields with their sort keys can produce output files in which the field order is different from the legacy processing. In any case where the new behavior generates output that is different from previous results and not desireable, the SET MATCHCOLUMNORDER command is available to return the legacy results.

For example, if you use MATCH to create output that includes a list of products with columns of aggregations based on differing sorts, MATCHCOLUMNORDER=UNGROUPED will ensure that the sequence of the column output will remain what it was in the past.

The way MATCH merges data depends on the order in which you name data sources in the request, the BY fields, display commands, the type of processing, and the merge phrases you use. In general, however, processing is as follows:

1. MATCH retrieves requested records from the first data source you name, and writes them to a temporary work area.
2. MATCH retrieves requested records from the second data source you name, and writes them to a temporary work area.
3. It compares the common high-order sort fields from the retrieved records as specified in the merge phrase (for example, OLD-OR-NEW). For more information, see Merge Phrases.
4. If the default grouped processing is in effect, it may re-order the fields to group them under their common sort fields.
5. It writes the merged results of the comparison to a temporary data source (if there are more MATCH operations). It cycles through all data sources named until END is encountered.
6. It writes final records to the HOLD file.

# Controlling MATCH Processing

```
SET MATCHCOLUMNORDER = {GROUPED|UNGROUPED}
```

where:

**GROUPED**

Groups fields in the output file under their common high-order sort fields. This is the default value.

**UNGROUPED**

Does not group fields in the output file with their common hig-order sort fields, but lays them out as specified in the MATCH request.

# Usage Notes for Match Requests

- With ungrouped processing, you cannot specify a format for the HOLD file generated by MATCH. It will be created as a single-segment BINARY or ALPHA HOLD file, depending on the value of the HOLDFORMAT parameter. The merge process does not change the original data sources.
- Alias names are assigned sequentially (E01, E02, ...) in the HOLD Master File that results from the MATCH request. When the same field name is used mutliple times in the MATCH, users distinguish between them in requests against the HOLD file by referencing these alias names instead of the field names.

  With grouped processing, fields are rearranged in the Master File, and this causes the alias names to represent different fields from the same alias names assigned with ungrouped processing. This can produce different results if you switch from one type of processing to the other.

  To avoid using alias names, use the AS phrase in your MATCH request to create distinct field names (except for the common high-order BY fields, which have to be the same), and use those field names in requests against the HOLD file.
- The ACROSS, BY HIGHEST/LOWEST *n*, IN-GROUPS-OF, WHERE TOTAL, and IF TOTAL phrases, and the COMPUTE command, are not permitted in a MATCH request. You can, however, use the DEFINE command.
- Up to 128 BY phrases and the maximun number of display fields can be used in each MATCH request. The count of sort sets includes the number of common sort fields. The maximum number of display fields is determined by a combination of factors.

  For details, see Displaying Report Data.
- You must specify at least one BY field for each file used in the MATCH request.
- When used with MATCH, the SET HOLDLIST parameter behaves as if HOLDLIST were set to ALL.
- The following prefix operators are not supported in MATCH requests: DST., DST.CNT., RNK., ST., and CT.

# Merging Data Sources

In the following request, the high-order sort field is the same for both files, so the result is the same using grouped and ungrouped processing.

```
MATCH FILE EDUCFILE
SUM COURSE_CODE
BY EMP_ID
RUN
FILE EMPLOYEE
SUM LAST_NAME AND FIRST_NAME
BY EMP_ID BY CURR_SAL
AFTER MATCH HOLD OLD-OR-NEW
END
-*****************************
-*  PRINT CONTENTS OF HOLD FILE
-*****************************
TABLE FILE HOLD
PRINT *
END
```

The merge phrase used in this example was OLD-OR-NEW. This means that records from both the first (old) data source plus the records from the second (new) data source appear in the HOLD file.

The output is:

```
EMP_ID     COURSE_CODE         CURR_SAL  LAST_NAME        FIRST_NAME
------     -----------         --------  ---------        ----------
071382660  101              $11,000.00  STEVENS          ALFRED
112847612  103              $13,200.00  SMITH            MARY
117593129  203              $18,480.00  JONES            DIANE
119265415  108               $9,500.00  SMITH            RICHARD
119329144                   $29,700.00  BANNING          JOHN
123764317                   $26,862.00  IRVING           JOAN
126724188                   $21,120.00  ROMANS           ANTHONY
212289111  103                   $.00
219984371                   $18,480.00  MCCOY            JOHN
315548712  108                   $.00
326179357  301              $21,780.00  BLACKWOOD        ROSEMARIE
451123478  101              $16,100.00  MCKNIGHT         ROGER
543729165                    $9,000.00  GREENSPAN        MARY
818692173  302              $27,062.00  CROSS            BARBARA
```

# Comparing Grouped and Ungrouped Processing

The following MATCH request has two SUM commands and one PRINT command for each file, with all sort fields common to both files. The SET MATCHCOLUMNORDER =

UNGROUPED command is issued to invoke legacy processing.

```
SET MATCHCOLUMNORDER = UNGROUPED
MATCH FILE GGSALES
SUM DOLLARS
BY ST
SUM BUDDOLLARS BY ST BY CITY
PRINT UNITS BY ST BY CITY BY CATEGORY
RUN
FILE GGSALES
SUM DOLLARS
BY ST
SUM BUDDOLLARS BY ST BY CITY
PRINT BUDUNITS BY ST BY CITY BY CATEGORY
AFTER MATCH HOLD OLD-OR-NEW
END
TABLE FILE HOLD
PRINT *
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, SIZE=9,$
ENDSTYLE
END
```

The HOLD Master File follows. Since the sort fields are common to both files, the two files were merged based on those fields. However, note that the order of fields in the Master File follows the order in the request, the highest-level sort field followed by its display field, then the next sort field followed by its display fields, and so on.

```
FILENAME=HOLD, SUFFIX=FIX     , IOTYPE=BINARY, $
  SEGMENT=HOLD, SEGTYPE=S1, $
    FIELDNAME=ST, ALIAS=E01, USAGE=A02, ACTUAL=A04, $
    FIELDNAME=DOLLARS, ALIAS=E02, USAGE=I08, ACTUAL=I04, $
    FIELDNAME=CITY, ALIAS=E03, USAGE=A20, ACTUAL=A20, $
    FIELDNAME=BUDDOLLARS, ALIAS=E04, USAGE=I08, ACTUAL=I04, $
    FIELDNAME=CATEGORY, ALIAS=E05, USAGE=A11, ACTUAL=A12, $
    FIELDNAME=UNITS, ALIAS=E06, USAGE=I08, ACTUAL=I04, $
    FIELDNAME=DOLLARS, ALIAS=E07, USAGE=I08, ACTUAL=I04, $
    FIELDNAME=BUDDOLLARS, ALIAS=E08, USAGE=I08, ACTUAL=I04, $
    FIELDNAME=BUDUNITS, ALIAS=E09, USAGE=I08, ACTUAL=I04, $
```

The partial output is shown in the following image.

| ST | DOLLARS | CITY | BUDDOLLARS | CATEGORY | UNITS | DOLLARS | BUDDOLLARS | BUDUNITS |
|---|---|---|---|---|---|---|---|---|
| CA | 7642261 | Los Angeles | 3669484 | Coffee | 1667 | 7642261 | 3669484 | 1464 |
| CA | 7642261 | Los Angeles | 3669484 | Coffee | 1663 | 7642261 | 3669484 | 1464 |
| CA | 7642261 | Los Angeles | 3669484 | Coffee | 1519 | 7642261 | 3669484 | 1464 |
| CA | 7642261 | Los Angeles | 3669484 | Coffee | 1452 | 7642261 | 3669484 | 1520 |
| CA | 7642261 | Los Angeles | 3669484 | Coffee | 1663 | 7642261 | 3669484 | 1463 |
| CA | 7642261 | Los Angeles | 3669484 | Coffee | 1508 | 7642261 | 3669484 | 1539 |
| CA | 7642261 | Los Angeles | 3669484 | Coffee | 1615 | 7642261 | 3669484 | 1759 |
| CA | 7642261 | Los Angeles | 3669484 | Coffee | 1449 | 7642261 | 3669484 | 1494 |
| CA | 7642261 | Los Angeles | 3669484 | Coffee | 1208 | 7642261 | 3669484 | 1038 |
| CA | 7642261 | Los Angeles | 3669484 | Coffee | 1272 | 7642261 | 3669484 | 1512 |

Changing the UNGROUPED setting to GROUPED produces the following Master File. The fields that have the same common sort fields from both files are moved to be under those sort fields in the Master File.

```
FILENAME=HOLD, SUFFIX=FIX     , IOTYPE=BINARY, $
  SEGMENT=HOLD, SEGTYPE=S1, $
    FIELDNAME=ST, ALIAS=E01, USAGE=A02, ACTUAL=A04, $
    FIELDNAME=DOLLARS, ALIAS=E02, USAGE=I08, ACTUAL=I04, $
    FIELDNAME=DOLLARS, ALIAS=E03, USAGE=I08, ACTUAL=I04, $
    FIELDNAME=CITY, ALIAS=E04, USAGE=A20, ACTUAL=A20, $
    FIELDNAME=BUDDOLLARS, ALIAS=E05, USAGE=I08, ACTUAL=I04, $
    FIELDNAME=BUDDOLLARS, ALIAS=E06, USAGE=I08, ACTUAL=I04, $
    FIELDNAME=CATEGORY, ALIAS=E07, USAGE=A11, ACTUAL=A12, $
    FIELDNAME=UNITS, ALIAS=E08, USAGE=I08, ACTUAL=I04, $
    FIELDNAME=BUDUNITS, ALIAS=E09, USAGE=I08, ACTUAL=I04, $
```

The partial output is shown in the following image.

| ST | DOLLARS | DOLLARS | CITY | BUDDOLLARS | BUDDOLLARS | CATEGORY | UNITS | BUDUNITS |
|---|---|---|---|---|---|---|---|---|
| CA | 7642261 | 7642261 | Los Angeles | 3669484 | 3669484 | Coffee | 1667 | 1464 |
| CA | 7642261 | 7642261 | Los Angeles | 3669484 | 3669484 | Coffee | 1663 | 1464 |
| CA | 7642261 | 7642261 | Los Angeles | 3669484 | 3669484 | Coffee | 1519 | 1464 |
| CA | 7642261 | 7642261 | Los Angeles | 3669484 | 3669484 | Coffee | 1452 | 1520 |
| CA | 7642261 | 7642261 | Los Angeles | 3669484 | 3669484 | Coffee | 1663 | 1463 |
| CA | 7642261 | 7642261 | Los Angeles | 3669484 | 3669484 | Coffee | 1508 | 1539 |
| CA | 7642261 | 7642261 | Los Angeles | 3669484 | 3669484 | Coffee | 1615 | 1759 |
| CA | 7642261 | 7642261 | Los Angeles | 3669484 | 3669484 | Coffee | 1449 | 1494 |
| CA | 7642261 | 7642261 | Los Angeles | 3669484 | 3669484 | Coffee | 1208 | 1038 |
| CA | 7642261 | 7642261 | Los Angeles | 3669484 | 3669484 | Coffee | 1272 | 1512 |

For the request that uses the GROUPED value for MATCHCOLUMNORDER, you can change the HOLD command to produce a FORMAT FOCUS output file, as follows.

```
AFTER MATCH HOLD FORMAT FOCUS OLD-OR-NEW
```

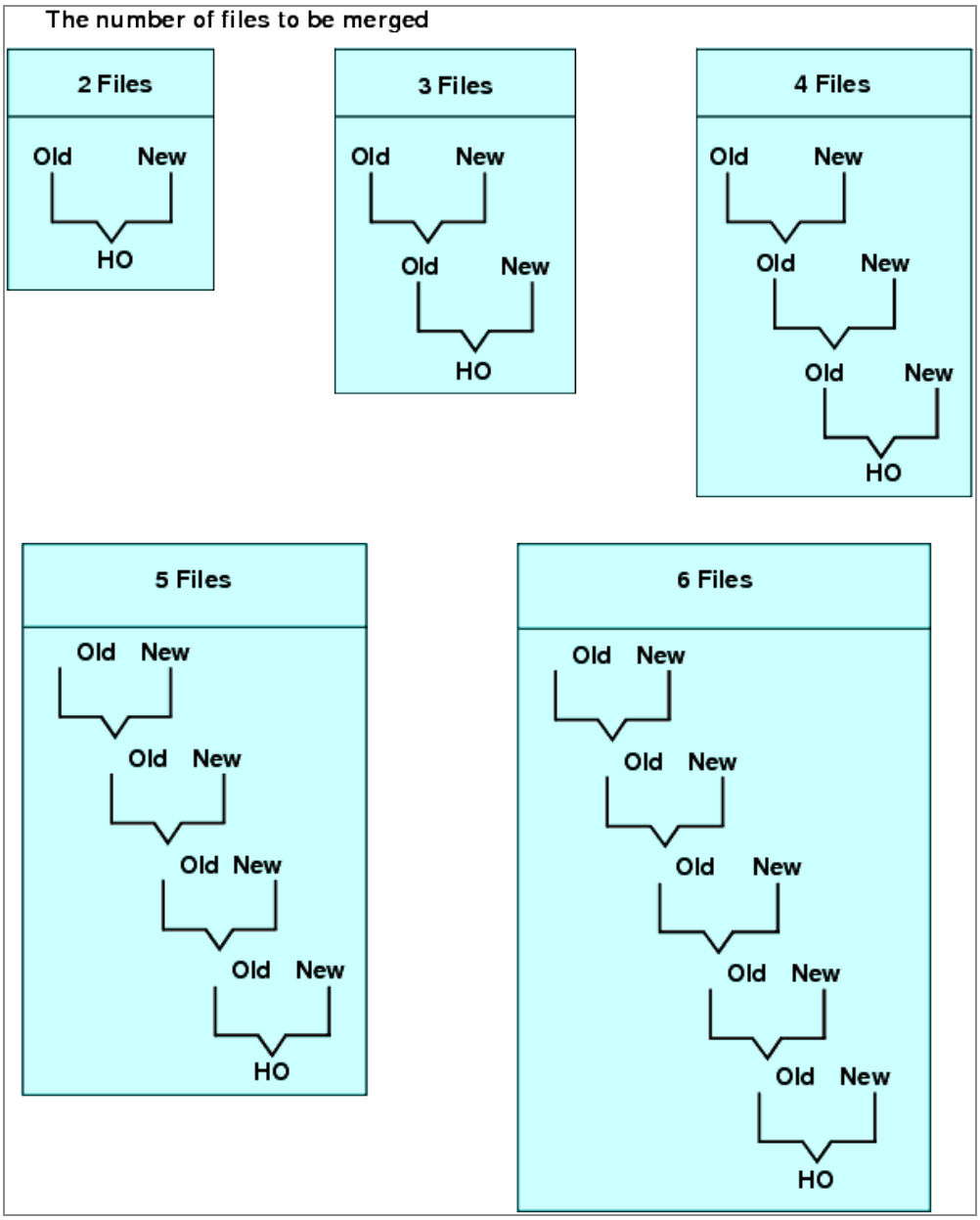
The following hierarchical multi-segment Master File is generated.

```
FILENAME=HOLD    , SUFFIX=FOC     , $
  SEGMENT=SEG01, SEGTYPE=S1, $
    FIELDNAME=ST, ALIAS=E01, USAGE=A02,
      TITLE='State', DESCRIPTION='State', $
    FIELDNAME=DOLLARS, ALIAS=E02, USAGE=I08,
      TITLE='Dollar Sales', DESCRIPTION='Total dollar amount of reported
sales', $
    FIELDNAME=DOLLARS, ALIAS=E03, USAGE=I08,
      TITLE='Dollar Sales', DESCRIPTION='Total dollar amount of reported
sales', $
  SEGMENT=SEG02, SEGTYPE=S1, PARENT=SEG01, $
    FIELDNAME=CITY, ALIAS=E04, USAGE=A20,
      TITLE='City', DESCRIPTION='City', $
    FIELDNAME=BUDDOLLARS, ALIAS=E05, USAGE=I08,
      TITLE='Budget Dollars', DESCRIPTION='Total sales quota in
dollars', $
    FIELDNAME=BUDDOLLARS, ALIAS=E06, USAGE=I08,
      TITLE='Budget Dollars', DESCRIPTION='Total sales quota in
dollars', $
  SEGMENT=SEG03, SEGTYPE=S2, PARENT=SEG02, $
    FIELDNAME=CATEGORY, ALIAS=E07, USAGE=A11,
      TITLE='Category', DESCRIPTION='Product category', $
    FIELDNAME=FOCLIST, ALIAS=E08, USAGE=I5, $
    FIELDNAME=UNITS, ALIAS=E09, USAGE=I08,
      TITLE='Unit Sales', DESCRIPTION='Number of units sold', $
  SEGMENT=SEG04, SEGTYPE=S1, PARENT=SEG03, $
    FIELDNAME=FOCLIST, ALIAS=E10, USAGE=I5, $
    FIELDNAME=BUDUNITS, ALIAS=E11, USAGE=I08,
      TITLE='Budget Units', DESCRIPTION='Number of units budgeted', $
```

# Merge Phrases

MATCH logic depends on the concept of old and new data sources. Old refers to the first data source named in the request, and new refers to the second data source. The result of each merge creates a HOLD file until the END command is encountered.

The following diagram illustrates the general merge process:




# Specify Merge Phrases

```
AFTER MATCH HOLD [AS 'name'] mergetype
```

where:

**AS 'name'**

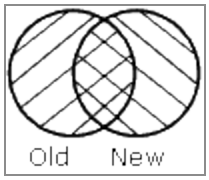
Specifies the name of the extract data source created by the MATCH command. The default is HOLD.

**mergetype**

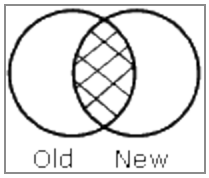
Specifies how the retrieved records from the files are to be compared.

The results of each phrase are graphically represented using Venn diagrams. In the diagrams, the left circle represents the old data source, the right circle represents the new data source, and the shaded areas represent the data that is written to the HOLD file.

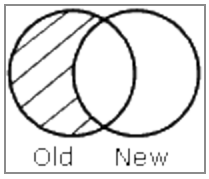
`OLD-OR-NEW` specifies that all records from both the old data source and the new data source appear in the HOLD file. This is the default if the AFTER MATCH line is omitted.



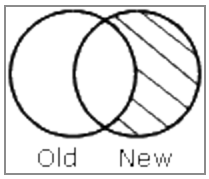

`OLD-AND-NEW` specifies that records that appear in both the old and new data sources appear in the HOLD file. (The intersection of the sets.)



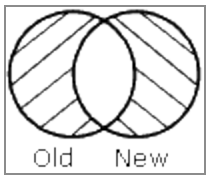

`OLD-NOT-NEW` specifies that records that appear only in the old data source appear in the HOLD file.



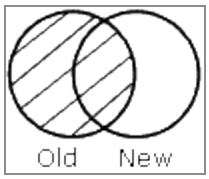

`NEW-NOT-OLD` specifies that records that appear only in the new data source appear in the HOLD file.



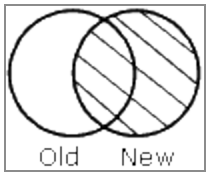

OLD-NOR-NEW specifies that only records that are in the old data source but not in the new data source, or in the new data source but not in the old, appear in the HOLD file (the complete set of non-matching records from both data sources).




OLD specifies that all records from the old data source, and any matching records from the new data source, are merged into the HOLD file.




NEW specifies that all records from the new data source, and any matching records from the old data source, are merged into the HOLD file.




# MATCH Processing With Common High-Order Sort Fields

When you construct your MATCH so that the first sort (BY) field (called the common high-order sort field) used for both data sources is the same, the match compares the values of the common high-order sort fields. If the entire sequence of sort fields is common to both files, all are compared.

At least one pair of sort fields is required. Field formats must be the same. In some cases, you can redefine a field format using the DEFINE command. If the field names differ, use the AS phrase to rename the second sort field to match the first. When the AS phrase is used in a MATCH request, the specified field is automatically renamed in the resulting HOLD file.

When you are merging files with common sort fields, the following assumptions are made:

- If one of the sort fields is a subset of the other, a one-to-many relationship is assumed.
- If neither of the sort fields is a subset of the other, a one-to-one relationship is assumed. At most, one matching record is retrieved.

# MATCH Processing With Common High-Order Sort Fields

To understand common high-order sort fields more clearly, consider some of the data from the following data sources

| **EMPLOYEE Data Source** | | **EDUCFILE Data Source** | |
|---|---|---|---|
| **EMP_ID** | **LAST_NAME** | **EMP_ID** | **COURSE_CODE** |
| 071382660 | STEVENS | 071382660 | 101 |
| 119329144 | BANNING | 212289111 | 103 |
| 112847612 | SMITH | 112847612 | 103 |

and this MATCH request:

```
MATCH FILE EMPLOYEE
SUM LAST_NAME BY EMP_ID
RUN
FILE EDUCFILE
SUM COURSE_CODE BY EMP_ID
AFTER MATCH HOLD OLD-OR-NEW
END
```

MATCH processing occurs as follows:

- Since there is a common high-order sort field (EMP_ID), the MATCH logic begins by matching the EMP_ID values in records from the EMPLOYEE and EDUCFILE files.
- There are records from both files with an EMP_ID value of 071382660. Since there is a match, this record is written to the HOLD file:

  ```
  Record n: 071382660 STEVENS 101
  ```

- There are records from both files with an EMP_ID value of 112847612. Since there is a match, this record is written to the HOLD file:

  ```
  Record n: 112847612 SMITH 103
  ```

- The records do not match where a record from the EMPLOYEE file has an EMP_ID value of 119329144 and a record from the EDUCFILE file has an EMP_ID value of 212289111. The record with the lower value is written to the HOLD file and a space is inserted for the missing value:

  ```
  Record n: 119329144 BANNING
  ```

- Similarly, the 212289111 record exists only in the EDUCFILE file, and is written as:

  ```
  Record n: 212289111 103
  ```

The following code produces a report of the records in the HOLD file:

```
TABLE FILE HOLD
PRINT *
END
```

The output is:

| EMP_ID | LAST_NAME | COURSE_ CODE |
|---|---|---|

| | | |
|---|---|---|
| 071382660 | STEVENS | 101 |
| 112847612 | SMITH | 103 |
| 117593129 | JONES | 203 |
| 119265415 | SMITH | 108 |
| 119329144 | BANNING | |
| 123764317 | IRVING | |
| 126724188 | ROMANS | |
| 212289111 | | 103 |
| 219984371 | MCCOY | |
| 315548712 | | 108 |
| 326179357 | BLACKWOOD | 301 |
| 451123478 | MCKNIGHT | 101 |

| | | |
|---|---|---|
| 543729165 | GREENSPAN | |
| 818692173 | CROSS | 302 |

# Merging With a Common High-Order Sort Field

This request combines data from the EMPLOYEE and EMPDATA data sources. The sort fields are EID and PIN.

```
MATCH FILE EMPLOYEE
PRINT LN FN DPT
BY EID
RUN
FILE EMPDATA
PRINT LN FN DEPT
BY PIN
AFTER MATCH HOLD OLD-OR-NEW
END

TABLE FILE HOLD
PRINT *
END
```

# Merging Without a Common High-Order Sort Field

If there are no common high-order sort fields, a match is performed on a record-by-record basis. The following request matches the data and produces the HOLD file:

```
MATCH FILE EMPLOYEE
PRINT LAST_NAME AND FIRST_NAME
BY EMP_ID
RUN
FILE EMPDATA
PRINT PIN
BY LASTNAME
BY FIRSTNAME
```

```
AFTER MATCH HOLD OLD-OR-NEW
END

TABLE FILE HOLD
PRINT *
END
```

The retrieved records from the two data sources are written to the HOLD file; no values are compared. The output is:

| EMP_ID | LAST_NAME | FIRST_NAME | LASTNAME | FIRSTNAME | PIN |
|---|---|---|---|---|---|
| 071382660 | STEVENS | ALFRED | ADAMS | RUTH | 000000040 |
| 112847612 | SMITH | MARY | ADDAMS | PETER | 000000050 |
| 117593129 | JONES | DIANE | ANDERSON | TIM | 000000100 |
| 119265415 | SMITH | RICHARD | BELLA | MICHAEL | 000000020 |
| 119329144 | BANNING | JOHN | CASSANOVA | LOIS | 000000030 |
| 123764317 | IRVING | JOAN | CASTALANETTA | MARIE | 000000270 |

| | | | | | |
|---|---|---|---|---|---|
| 126724188 | ROMANS | ANTHONY | CHISOLM | HENRY | 000000360 |
| 219984371 | MCCOY | JOHN | CONRAD | ADAM | 000000250 |
| 326179357 | BLACKWOOD | ROSEMARIE | CONTI | MARSHALL | 000000410 |
| 451123478 | MCKNIGHT | ROGER | CVEK | MARCUS | 000000130 |
| 543729165 | GREENSPAN | MARY | DONATELLO | ERICA | 000000320 |
| 818692173 | CROSS | BARBARA | DUBOIS | ERIC | 000000210 |
| | | | ELLNER | DAVID | 000000380 |
| | | | FERNSTEIN | ERWIN | 000000350 |
| | | | GORDON | LAURA | 000000180 |

| | | | | | |
|---|---|---|---|---|---|
| | | | GOTLIEB | CHRIS | 000000340 |
| | | | GRAFF | ELAINE | 000000390 |
| | | | HIRSCHMAN | ROSE | 000000160 |
| | | | KASHMAN | YOLANDA | 000000240 |
| | | | LASTRA | KAREN | 000000200 |
| | | | LEWIS | CASSANDRA | 000000220 |
| . . . | | | | | |

# Fine-Tuning MATCH Processing

You can fine-tune the MATCH process using the PRINT and SUM commands. To understand their difference, you should have an understanding of the one-to-many relationship: SUM generates one record from many, while PRINT displays each individual record. Through proper choices of BY fields, it is possible to use only the SUM command and get the same result that PRINT would produce.

# Using Display Commands in MATCH Processing

To illustrate the effects of PRINT and SUM on the MATCH process, consider data sources A and B and the series of requests that follow:

```
      A                B

F1  F2  F3       F1  F4  F5

1   x   100      1   a   10
2   y   200      1   b   20
                 2   c   30
                 2   d   40
```

**Request 1:** This request sums the fields F2 and F3 from file A, sums the fields F4 and F5 from file B, and uses F1 as the common high-order sort field.

```
MATCH FILE A
SUM F2 AND F3 BY F1
RUN
FILE B
SUM F4 AND F5 BY F1
AFTER MATCH HOLD OLD-OR-NEW
END
```

The HOLD file contains the following data:

```
F1   F2   F3   F4   F5

1    x    100  b    30
2    y    200  d    70
```

Note that the resulting file contains only 1 record for each common high-order sort field.

**Request 2:** This request sums fields F2 and F3 from file A, prints fields F4 and F5 from file B, and uses F1 as the common high-order sort field.

```
MATCH FILE A
SUM F2 AND F3 BY F1
RUN
FILE B PRINT F4 AND F5 BY F1
```

```
AFTER MATCH HOLD OLD-OR-NEW
END
```

The HOLD file contains:

```
F1   F2   F3   F4   F5

1    x    100  a    10
1    x    100  b    20
2    y    200  c    30
2    y    200  d    40
```

Note that the records from file A are duplicated for each record from file B.

**Request 3:** This request prints fields F2 and F3 from file A, sums fields F4 and F5 from file B, and uses F1 as the common high-order sort field.

```
MATCH FILE A
PRINT F2 AND F3 BY F1
RUN
FILE B
SUM F4 AND F5 BY F1
AFTER MATCH HOLD OLD-OR-NEW
END
```

The HOLD file contains:

```
F1   F2   F3   F4   F5

1    x    100  b    30
2    y    200  d    70
```

Note that each record from file A is included, but only the last record from file B for each common high-order sort field is included.

**Request 4:** This request prints fields F2 and F3 from file A, prints fields F4 and F5 from file B, and uses F1 as the common high-order sort field.

```
MATCH FILE A
PRINT F2 AND F3 BY F1
RUN
FILE B PRINT F4 AND F5 BY F1
```

```
AFTER MATCH HOLD OLD-OR-NEW
END
```

The HOLD file contains:

```
F1   F2   F3   F4   F5

1    x    100  a    10
1         0    b    20
2    y    200  c    30
2         0    d    40
```

Note the blank value for F2 and the 0 for F3.

**Request 5:** This request sums the fields F2 and F3 from file A, sums the field F5 from file B and sorts it by field F1, the common high-order sort field, and by F4.

```
MATCH FILE A
SUM F2 AND F3 BY F1
RUN
FILE B
SUM F5 BY F1 BY F4
AFTER MATCH HOLD OLD-OR-NEW
END
```

The HOLD file contains:

```
F1   F2   F3   F4   F5

1    x    100  a    10
1    x    100  b    20
2    y    200  c    30
2    y    200  d    40
```

Note that the records for file A are printed for every occurrence of the record in file B.

# Universal Concatenation

With universal concatenation, you can retrieve data from unlike data sources in a single request; all data, regardless of source, appears to come from a single file. The MORE phrase can concatenate all types of data sources (such as, FOCUS, DB2, IMS, and VSAM), provided

they share corresponding fields with the same format. You can use WHERE and IF selection tests in conjunction with MORE. For related information, see Selecting Records for Your Report.

To use MORE, you must divide your request into:

- One main request that retrieves the first data source and defines the data fields, sorting criteria, and output format for all data.
- Subrequests that define the data sources and fields to be concatenated to the data of the main request. The fields printed and sorted by the main request must exist in each concatenated data source. If they do not, you must create them as virtual fields.

During retrieval, data is gathered from each data source in turn, then all data is sorted and the output formatted as specified in the main request.

# Concatenate Data Sources

The MORE phrase, which is accessible within the TABLE and MATCH commands, specifies how to concatenate data from sources with dissimilar Master Files.

```
{TABLE|MATCH}  FILE file1main request
MORE
FILE file2
  subrequest
MORE
FILE file3
  subrequest
MORE
   .
   .
   .
{END|RUN}
```

where:

**TABLE|MATCH**

Begins the request that concatenates the data sources.

**file1**

Is the name of the first data source.

**main request**

Is a request, without END or RUN, that retrieves the first data source and defines the data fields, sorting criteria, and output format for all data. WHERE and IF criteria in the main request apply only to *file1*.

When concatenating files within the TABLE command, you can also define calculated values for the first data source.

**MORE**

Begins a subrequest. There is no limit to the number of subrequests, other than available memory.

**FILE file2**

Defines *file2* as the second data source for concatenation.

**subrequest**

Is a subrequest. Subrequests can only include WHERE and IF phrases.

**END|RUN**

Ends the request.

# Concatenating Data Sources

Both the EMPLOYEE and the EXPERSON data sources contain employee information. You can concatenate their common data into a single file:

- EMPLOYEE contains the field values EMP_ID=123456789 and CURR_SAL=50.00.
- EXPERSON contains the field values SSN=987654321 and WAGE=100.00.

The following annotated request concatenates the two data sources:

```
   DEFINE FILE EXPERSON
1. EMP_ID/A9 = SSN;
   CURR_SAL/D12.2 = WAGE;
   END
2. TABLE FILE EMPLOYEE
   PRINT CURR_SAL
   BY EMP_ID
3. MORE
```

```
FILE EXPERSON
END
```

1. The request must re-map the field names and formats in the EXPERSON data source to match those used in the main request.
2. The main request names the first data source in the concatenation, EMPLOYEE. It also defines the print and sort fields for both data sources.
3. The MORE phrase starts the subrequest that concatenates the next data source, EXPERSON. No display commands are allowed in the subrequest. IF and WHERE criteria are the only report components permitted in a subrequest.

# Field Name and Format Matching

All fields referenced in the main request must either exist with the same names and formats in all the concatenated files, or be remapped to those names and formats using virtual fields. Referenced fields include those used in COMPUTE commands, headings, aggregation phrases, sort phrases, and the PRINT, LIST, SUM, COUNT, WRITE, or ADD commands.

A successful format match means that:

| Usage Format Type | Correspondence |
|---|---|
| A | Format type and length must be equal. |
| I, F, D | Format type must be the same. |
| P | Format type and scale must be equal. |
| DATE (new) | Format information (type, length, components, and order) must always correspond. |
| DATE (old) | Edit options must be the same. |
| DATE -TIME | Format information (type, length, components, and order) must always correspond. |

Text (TX) fields and CLOB fields (if supported) cannot be concatenated.

# Matching Field Names and Formats

The following annotated example concatenates data from the EMPDATA and SALHIST data sources.

```
   DEFINE FILE EMPDATA
1. NEWID/A11=EDIT (ID,'999-99-9999');
   END

   DEFINE FILE SALHIST
2. NEWID/A11=EDIT (ID,'999-99-9999');
   CSAL/D12.2M=OLDSALARY;
   END

3. TABLE FILE EMPDATA
   HEADING
   "EMPLOYEE SALARIES"
   " "
   PRINT CSAL
   BY NEWID
4. WHERE CSAL GT 65000
5. MORE
   FILE SALHIST
6. WHERE OLDSALARY GT 65000
   END
```

1. Defines NEWID in the EMPDATA data source with the same name and format as the sort field referenced in the main request.
2. Defines NEWID in the SALHIST data source with the same name and format as the sort field referenced in the main request.
3. The main request. This contains all the formatting for the resulting report and names the first file to be concatenated. It also contains all printing and sorting information. The fields printed and the sort fields must exist as real or DEFINE fields in each file.
4. The WHERE criterion in the main request applies only to the EMPDATA data source.
5. The MORE phrase concatenates the SALHIST data source to the EMPDATA data source.
6. This WHERE criterion applies only to the SALHIST data source. Notice that it

references a field that is not defined in the EMPDATA data source.

The output is:

| EMPLOYEE SALARIES | |
|---|---|
| | |
| NEWID | SALARY |
| 000-00-0030 | $70,000.00 |
| | $70,000.00 |
| 000-00-0070 | $83,000.00 |
| | $83,000.00 |
| | $79,100.00 |
| 000-00-0200 | $115,000.00 |
| | $115,000.00 |
| | $102,500.00 |

| | |
|---|---|
| | $89,500.00 |
| 000-00-0230 | $80,500.00 |
| | $80,500.00 |
| | $75,000.00 |
| | $70,800.00 |
| 000-00-0300 | $79,000.00 |
| | $79,000.00 |
| | $75,000.00 |
| | $70,000.00 |

When you concatenate data, record sets are simply appended, not grouped or aggregated across files. Therefore, if duplicate sort fields exist, they show up twice in the report output.

# Merging Concatenated Data Sources

You can use the MORE phrase in a MATCH request to merge up to 16 sets of concatenated data sources.

You must meet all MATCH requirements in the main request. All data sources to be merged must be sorted by at least one field with a common format.

The MATCH request results in a HOLD file containing the merged data. You can specify how you want each successive file merged using an AFTER MATCH command. For example, you can retain:

- All records from both files (OLD-OR-NEW). This is the default.
- Only records common to both files (OLD-AND-NEW).
- Records from the first file with no match in the second file (OLD-NOT-NEW).
- Records from the second file with no match in the first file (NEW-NOT-OLD).
- All non-matching records from both files; that is, records that were in either one of the files but not in both (OLD-NOR-NEW).
- All records from the first file with all matching records from the second file (OLD).
- All records from the second file with all matching records from the first file (NEW).

# Merge Concatenated Data Sources

```
1. MATCH FILE file1main request
   MORE
2. FILE file2subrequest
   MORE
3. FILE file3subrequest
   RUN
4. FILE file4main request
5. [AFTER MATCH merge_phrase]
   MORE
6. FILE file5subrequest
   MORE
7. FILE file6subrequest
   RUN
8. FILE file7main request
9. [AFTER MATCH merge_phrase]
   MORE
10.FILE file8subrequest
   MORE
11.FILE file9subrequest
   END
```

1. Starts the first answer set in the MATCH. File1 is the first data source in the first answer set.
2. Concatenates file2 to file1 in the first MATCH answer set.
3. Concatenates file3 to file1 and file2 in the first MATCH answer set.
4. Starts the second answer set in the MATCH. File4 is the first data source in the second answer set.
5. All data concatenated in the first answer set is merged with the data concatenated in the second answer set using the AFTER MATCH merge_phrase in the second answer set.
6. Concatenates file5 to file4 in the second MATCH answer set.
7. Concatenates file6 to file4 and file5 in the second MATCH answer set.
8. Starts the third answer set in the MATCH. File7 is the first data source in the third answer set.
9. All merged data from the first and second answer sets, now a HOLD file, is merged with the data concatenated in the third answer set using the AFTER MATCH merge_phrase in the third answer set. This final set of merged data is stored in a HOLD file.
10. Concatenates file8 to file7 in the third MATCH answer set.
11. Concatenates file9 to file7 and file8 in the third MATCH answer set.

# Using Sort Fields in MATCH Requests

If the data sources in the MATCH share common high-order sort fields with identical names and formats, the MATCH process merges records with matching sort field values from each of the files. If the two data sources in the MATCH have the same sort field with different names, you can change one of the names with an AS phrase.

If the files in the MATCH do not share a high-order sort field, the fields are not compared. Instead, the fields from the first record in each data source are merged to create the first record in the HOLD file, and so on for all remaining records.

# Merging Concatenated Data Sources With Common High-Order Sort Fields

The following annotated sample stored procedure illustrates MATCH with MORE, using a common sort field:

```
1. DEFINE FILE EMPDATA
   CURR_SAL/D12.2M = CSAL;
   FIRST_NAME/A10 = FN;
   EID/A9 = PIN;
   END

   -*Start MATCH.

2. MATCH FILE EMPLOYEE
      SUM CURR_SAL AS 'CURRENT'
          FIRST_NAME AS 'FIRST'
      BY EID AS 'SSN'
   -*Concatenate file EMPDATA to EMPLOYEE to form first MATCH answer
set.
3.    MORE
      FILE EMPDATA
      RUN
   -*Second MATCH answer set:

4. FILE TRAINING
      PRINT EXPENSES
5.    BY PIN AS 'SSN'
6.    AFTER MATCH HOLD OLD-OR-NEW
   END

   -*Print merged file:

7. TABLE FILE HOLD
      PRINT *
   END
```

1. Defines the EMPDATA fields needed for concatenating it to EMPLOYEE.
2. Starts the MATCH and the main request in the concatenation. The main request defines all printing and sorting for the concatenated files. The sort field is called SSN in the resulting file.

3. Concatenates file EMPDATA to EMPLOYEE. This concatenated file becomes the OLD file in the MATCH.
4. Creates the NEW file in the MATCH.
5. Uses an AS phrase to change the name of the sort field in the NEW file to the same name as the sort field in the OLD file.
6. Defines the merge procedure. All records from the NEW file, the OLD file, and both files are included in the final HOLD file.
7. Prints the values from the merged file.

The first page of output is:

```
SSN               CURRENT  FIRST        EXPENSES
---               -------  -----        --------
000000010       $55,500.00  DANIEL       2,300.00
000000020       $62,500.00  MICHAEL             .
000000030       $70,000.00  LOIS         2,600.00
000000030       $70,000.00  LOIS         2,300.00
000000040       $62,500.00  RUTH         3,400.00
000000050       $54,100.00  PETER        3,300.00
000000060       $55,500.00  DORINA              .
000000070       $83,000.00  EVELYN              .
000000080       $43,400.00  PAMELA       3,200.00
000000080       $43,400.00  PAMELA       3,350.00
000000090       $33,000.00  MARIANNE            .
000000100       $32,400.00  TIM          3,100.00
000000110       $19,300.00  ANTHONY      1,800.00
000000110       $19,300.00  ANTHONY      2,500.00
000000110       $19,300.00  ANTHONY      2,400.00
000000120       $49,500.00  KATE         2,200.00
000000130       $62,500.00  MARCUS              .
```

# Merging Concatenated Data Sources Without a Common Sort Field

In this example, the merged data sources do not share a sort field:

```
DEFINE FILE EMPDATA
CURR_SAL/D12.2M = CSAL;
```

```
FIRST_NAME/A10 = FN;
EID/A9 = PIN;
END

-*Start MATCH

MATCH FILE EMPLOYEE
SUM CURR_SAL AS 'CURRENT'
    FIRST_NAME AS 'FIRST'
BY EID AS 'SSN'

-*Concatenate EMPDATA to EMPLOYEE to form the first MATCH answer set

MORE
FILE EMPDATA
RUN

-*Second MATCH answer set:

FILE TRAINING
PRINT EXPENSES
BY PIN AS 'EID'
AFTER MATCH HOLD OLD-OR-NEW
END

-*Print merged file:

TABLE FILE HOLD
PRINT *
END
```

The AS phrase changes the answer set. Since the sort fields no longer have the same names, the fields are merged with no regard to matching records.

The first page of output is:

```
SSN               CURRENT  FIRST       EID         EXPENSES
---               -------  -----       ---         --------
000000010       $55,500.00  DANIEL      000000010   2,300.00
000000020       $62,500.00  MICHAEL     000000030   2,600.00
000000030       $70,000.00  LOIS        000000030   2,300.00
000000040       $62,500.00  RUTH        000000040   3,400.00
000000050       $54,100.00  PETER       000000050   3,300.00
000000060       $55,500.00  DORINA      000000080   3,200.00
000000070       $83,000.00  EVELYN      000000080   3,350.00
000000080       $43,400.00  PAMELA      000000100   3,100.00
```

```
000000090       $33,000.00  MARIANNE    000000110   1,800.00
000000100       $32,400.00  TIM         000000110   2,500.00
000000110       $19,300.00  ANTHONY     000000110   2,400.00
000000120       $49,500.00  KATE        000000120   2,200.00
000000130       $62,500.00  MARCUS      000000140   3,600.00
000000140       $62,500.00  VERONICA    000000150   3,400.00
000000150       $40,900.00  KARL        000000160   1,000.00
000000160       $62,500.00  ROSE        000000180   1,250.00
000000170       $30,800.00  WILLIAM     000000190   3,150.00
```

# Cartesian Product

Cartesian product enables you to generate a report containing all combinations of non-related records or data instances in a multi-path request. This means that if a parent segment has three child instances on one path and two child instances on another path, when CARTESIAN is ON a request that references the parent segment and both children generates 16 records. When CARTESIAN is OFF, the same request generates only three records.

For related information about controlling how selection tests are applied to child segments on independent paths, see Selecting Records for Your Report.

# Enable/Disable Cartesian Product

```
SET CARTESIAN = {OFF|ON}
```

where:

**OFF**

Disables Cartesian product. OFF is the default setting.

**ON**

Enables Cartesian product and generates all possible combinations of non-related records.

SET CARTESIAN may also be issued within a request.

# Usage Notes for Cartesian Product

- Cartesian product is performed on the lowest segment common to all paths, whether or not a field in that segment is referenced.
- Short paths do not display in requests with Cartesian product.
- The SET CARTESIAN parameter is disabled when ACROSS is specified, and a warning message is issued.
- The SUM display command and the TOT. prefix operator have no effect on Cartesian product.
- SUM, COMPUTE, and WITHIN in combination with the PRINT display command are performed on the Cartesian product.
- ON TABLE COLUMN-TOTAL is automatically generated on the Cartesian product.
- NOSPLIT is disabled if specified in combination with the SET CARTESIAN parameter, and no warning message is issued.
- MATCH is not supported with the SET CARTESIAN parameter. A warning message is not issued if MATCH is requested, and the request is processed as if CARTESIAN is set to OFF.
- TABLEF is not supported with the SET CARTESIAN parameter.

# Reporting With Cartesian Product

When CARTESIAN is set to ON, the following multi-path request produces a report containing all possible combinations of models and standards for each car:

```
SET CARTESIAN=ON
TABLE FILE CAR
PRINT MODEL STANDARD
BY CAR
IF CAR EQ 'JAGUAR'
END
```

The output in an ASCII environment is:

| CAR | MODEL | STANDARD |
|---|---|---|
| JAGUAR | V12XKE AUTO | 4 WHEEL DISC BRAKES |
| | V12XKE AUTO | POWER STEERING |
| | V12XKE AUTO | RECLINING BUCKET SEATS |
| | V12XKE AUTO | WHITEWALL RADIAL PLY TIRES |
| | V12XKE AUTO | WRAP AROUND BUMPERS |
| | XJ12L AUTO | 4 WHEEL DISC BRAKES |
| | XJ12L AUTO | POWER STEERING |
| | XJ12L AUTO | RECLINING BUCKET SEATS |
| | XJ12L AUTO | WHITEWALL RADIAL PLY TIRES |

| | | |
|---|---|---|
| | XJ12L<br>AUTO | WRAP AROUND BUMPERS |

When CARTESIAN is set to OFF (the default), the same request results in a report from the CAR data source containing a list of models and standards without logical relationships.

The output in an ASCII environment is:

| CAR | MODEL | STANDARD |
|---|---|---|
| JAGUAR | V12XKE<br>AUTO | 4 WHEEL DISC BRAKES |
| | XJ12L<br>AUTO | POWER STEERING |
| | . | RECLINING BUCKET<br>SEATS |
| | . | WHITEWALL RADIAL PLY<br>TIRES |
| | . | WRAP AROUND BUMPERS |

# Formatting Reports: An Overview

To create an effective report, you need to account for:

- **Content.** The data in your report.
- **Formatting.** How to present that content to a reader in a way that achieves maximum impact.

There are many formatting options that you can use to give your report a professional appearance and affect how people read and interpret it. For example, you can control:

- The appearance of the data, which you can change to emphasize important values.
- The headings, footings, and other text with which you "frame" the data to give it context.
- The layout of the report on the page or screen, which you can adjust for different display environments and for audiences with different vision needs.

The following topics provide an overview of formatting tabular reports (including Financial Modeling Language reports) and free-form reports. For information about formatting graphs, see Creating a Graph.

# What Kinds of Formatting Can I Do?

There are many kinds of formatting that you can apply to a report:

- **The appearance of the report data,** such as its font, size, style (italic, bold, or underlined), color (of the foreground and the background), position, and justification. You can also draw boxes or lines around data. You can use these properties to emphasize critical values and to draw attention to important data relationships.

  You can also select which character to use to mark decimal position, using either a period (.) or a comma (,), to match the convention of the country in which the report will be read. You can even choose which character to use to represent a null value and missing data. For more information, see Formatting Report Data.

- **Providing context for data by "framing" it** with headings, footings, and

customized column titles. You can include fields and images within headings and footings. As with data, you can specify a heading, footing, and column title font, size, style, color, position, and justification, as well as enclose it within boxes or lines. You can use these framing devices to explain the context of the data and to engage the interest of the reader. For more information, see Using Headings, Footings, Titles, and Labels.

- **Laying out the report** on the screen or printed page. You can choose the report margins, where to place headings and footings, where to place background images (watermarks), and how to arrange the report columns (adjusting the space around and between columns, adjusting column width and column order, and even stacking one column above another to reduce report width). You can visually distinguish between different columns, rows, or sort groups using color and lines. If you wish, you can draw borders around parts of a report or around the entire report.

  You can lay out the report to optimize it for different display environments such as screens of different sizes and resolutions, and printed pages of different sizes. You can create multiple report panes on a single page to print labels. You can even combine several reports into a single file to display or print them as a group. For more information, see Laying Out the Report Page.

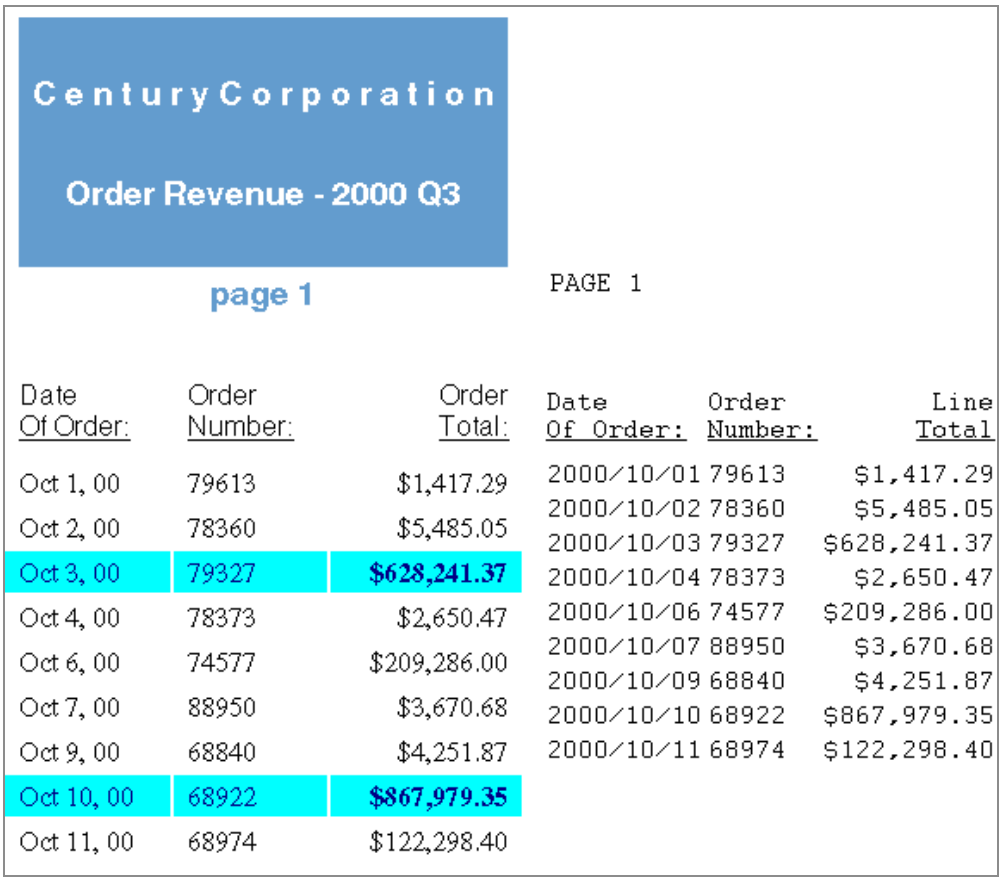
- **Conditionally formatting** a report based on the report data. You specify a condition that, at run time, is automatically evaluated for each instance of the report component you specify, such as each value of a sort column. The formatting option is applied to each instance of the report component for which the condition is true. For example, in a sales report, you can draw attention to sales staff who exceeded quota by making their names bold and using a different color. For more information, see Controlling Report Formatting.

- **Choosing a display format, such as HTML (the default),** PDF (Adobe Acrobat Portable Document Format), Excel 2000, or PostScript, to suit the viewing and processing needs of the readers. For more information and a list of all the display formats available to you, see Choosing a Styled Display Format.

- **Making a report accessible to all users** regardless of their physical abilities, their browser type, or their screen settings. For example, you can design a report fonts, colors, layout, and other formatting to make it easier to read by audiences with special vision needs, and provide text descriptions of tables and graphics to make their information accessible to people who use speech-based or Braille-based browsers. You can ensure that a report conforms to any accessibility guidelines, such as Section 508 of the U.S. Rehabilitation Act, to which the report is subject.

# Advantages of Formatting a Report

The following pair of reports shows order number, order date, and total order revenue for Century Corporation in the third quarter of 2000. Compare the formatted version (on the left) with the unformatted version (on the right):



Century Corporation

Order Revenue - 2000 Q3

page 1

| Date Of Order: | Order Number: | Order Total: |
|---|---|---|
| Oct 1, 00 | 79613 | $1,417.29 |
| Oct 2, 00 | 78360 | $5,485.05 |
| Oct 3, 00 | 79327 | $628,241.37 |
| Oct 4, 00 | 78373 | $2,650.47 |
| Oct 6, 00 | 74577 | $209,286.00 |
| Oct 7, 00 | 88950 | $3,670.68 |
| Oct 9, 00 | 68840 | $4,251.87 |
| Oct 10, 00 | 68922 | $867,979.35 |
| Oct 11, 00 | 68974 | $122,298.40 |

PAGE 1

| Date Of Order: | Order Number: | Line Total |
|---|---|---|
| 2000/10/01 | 79613 | $1,417.29 |
| 2000/10/02 | 78360 | $5,485.05 |
| 2000/10/03 | 79327 | $628,241.37 |
| 2000/10/04 | 78373 | $2,650.47 |
| 2000/10/06 | 74577 | $209,286.00 |
| 2000/10/07 | 88950 | $3,670.68 |
| 2000/10/09 | 68840 | $4,251.87 |
| 2000/10/10 | 68922 | $867,979.35 |
| 2000/10/11 | 68974 | $122,298.40 |

Consider how the formatting applied to the version on the left:

- **Catches the interest of the reader** with a heading and use of color.
- **Makes the significance of the report clearer** using the heading, and by changing the last column title from the default "Line Total" to "Order Total."
- **Makes the report easier and more appealing to read** by increasing the space between rows, by reformatting the order date, and by using proportional fonts.
- **Draws the attention of the reader to important data.** In this case, to orders exceeding $500,000, by conditionally formatting these rows with background color,

font color, and (for the order total) bold font style.

# How to Specify Formatting in a Report

You can specify your report formatting using a style sheet. A style sheet is a set of declarations that defines the appearance of a report. For some types of formatting, you may need to supplement style sheets with other features, such as SET parameters and TABLE commands. In each case, this manual describes everything required to achieve a given kind of formatting.

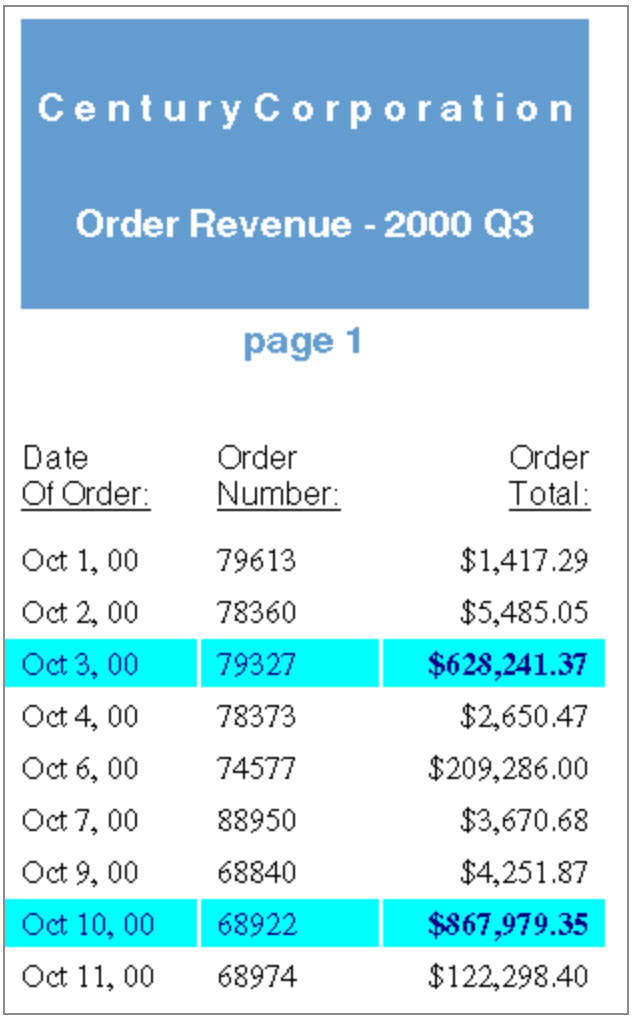
**Benefits of using style sheets.** For some types of formatting you can choose between using a style sheet or a different feature. Style sheets are usually preferred because they enable you to centralize and reuse formatting logic. This provides you with several advantages:

- **Productivity.** By using just a few lines of code (a single style sheet), you can format dozens of reports, reducing the development time of each report.
- **Easy maintenance.** You can change formatting for dozens of reports at one time by editing a single style sheet.
- **Consistent appearance.** Your enterprise can guarantee a consistent look for its reports by assigning the same style sheet(s) to them.
- **Rapid reformatting.** You can change the appearance of a report quickly and easily by switching the style sheet assigned to it.
- **Prioritizing.** You can focus on your first priority (report content), because you can quickly address report presentation by applying an existing style sheet.

There are different kinds of style sheets that you can use to format a report. You can learn about them and how to choose between them in How to Choose a Type of Style Sheet.

# Specifying Formatting for the Order Revenue Report

This report displays the order number, order date, and total order revenue for Century Corporation for the third quarter of 2000:



Century Corporation

Order Revenue - 2000 Q3

page 1

| Date Of Order: | Order Number: | Order Total: |
|---|---|---|
| Oct 1, 00 | 79613 | $1,417.29 |
| Oct 2, 00 | 78360 | $5,485.05 |
| Oct 3, 00 | 79327 | $628,241.37 |
| Oct 4, 00 | 78373 | $2,650.47 |
| Oct 6, 00 | 74577 | $209,286.00 |
| Oct 7, 00 | 88950 | $3,670.68 |
| Oct 9, 00 | 68840 | $4,251.87 |
| Oct 10, 00 | 68922 | $867,979.35 |
| Oct 11, 00 | 68974 | $122,298.40 |

The report is formatted by a WebFOCUS StyleSheet and by formatting commands in the report procedure itself. The procedure, Revenue.fex, is shown below, followed by the StyleSheet file, OrderRev.sty:

**Revenue.fex**

```
   TABLE FILE CENTORD
1.HEADING
1. " "
1. "C e n t u r y C o r p o r a t i o n"
1. " "
1. "Order Revenue - 2000 Q3"
1. " "
1. "page <TABPAGENO"
1. " "
2. SUM ORDER_DATE/MtDY ORDER_NUM LINEPRICE AS 'Order,Total:'
```

```
   BY LOWEST 9 ORDER_DATE NOPRINT
   WHERE (ORDER_DATE GE '2000/10/01') AND (ORDER_DATE LE '2000/12/31');
   ON TABLE SET ONLINE-FMT PDF
3. ON TABLE SET SQUEEZE ON
4. ON TABLE SET STYLESHEET OrderRev
   END
```

**OrderRev.sty**

```
5. TYPE=Report, GRID=Off, UNITS=Inches, TOPGAP=0.06, BOTTOMGAP=0.06, $
6. TYPE=Data, FONT='Times', $
7. TYPE=Data, BACKCOLOR=Aqua, COLOR=Navy,
7.      WHEN=LinePrice GT 500000, $
7. TYPE=Data, COLUMN=LINEPRICE, BACKCOLOR=Aqua, COLOR=Navy, STYLE=Bold,
7.      WHEN=LinePrice GT 500000, $
8. TYPE=Title, FONT='Helvetica', $
9. TYPE=Heading, FONT='Helvetica', STYLE=Bold, SIZE=14, JUSTIFY=Center,
9.                       BACKCOLOR=Dark Turquoise, COLOR=White, $
9. TYPE=Heading, LINE=6, BACKCOLOR=White, COLOR=Dark Turquoise, $
9. TYPE=Heading, LINE=7, BACKCOLOR=White, $
```

1. Adds a page heading to the report.
2. Reformats the order date from (for example) 2000/10/07 to Oct. 7, 00.
3. Aligns the heading with the report margins instead of the page margins.
4. Identifies a StyleSheet file to format the report.
5. Increases spacing between report lines.
6. Uses a proportional serif font for the report data.
7. Highlights each order that totals more than $500,000 by applying a navy font and an aqua background, and by bolding the order total.
8. Uses a proportional sans serif font for the report column titles.
9. Formats the report heading by centering it, applying a larger sans serif font, coloring most of it with a dark turquoise background and white lettering, and applying the inverse coloring to the page number (the sixth line of the heading).

This is only a summary of what these formatting instructions do. You can find complete explanations in the topics that describe each formatting feature.

The formatting logic that you apply to your own reports may be briefer or more extensive than this example, depending on the report and on what formatting you choose to apply.

# How to Choose a Type of Style Sheet

You can choose between two types of style sheets to format a report:  StyleSheets" />

- **WebFOCUS StyleSheets** (often abbreviated to "StyleSheets"), the native WebFOCUS style sheet language. These provide you with the flexibility to format reports in many display formats, including HTML, PDF, Excel 2000, and PostScript. You can choose between saving the StyleSheet as a separate file, which you can assign to multiple reports, or saving it within one report request.

  If you are generating a report in HTML format, you can boost its performance, and increase the number of formatting options available to it, by having the WebFOCUS StyleSheet dynamically generate an "internal" cascading style sheet (CSS). (CSS is the standard style sheet language designed for HTML documents. The *internal* CSS generated by WebFOCUS is internal to the report output, instead of being saved as a separate file.) For more information about generating an internal cascading style sheet, see Generating an Internal Cascading Style Sheet for HTML Reports.

- **External cascading style sheets**, the standard style sheet language designed for HTML documents. You can apply an external cascading style sheet to any WebFOCUS report in HTML format. (An *external* cascading style sheet is one that is saved as a separate file, instead of within the document it formats, and so is "external" to the document.)

How do you choose between the two types of style sheets? Consider choosing:

- **A WebFOCUS StyleSheet** if:

  **You want to display a report in different display formats**, such as PDF and Excel 2000. WebFOCUS StyleSheets are supported for many kinds of display formats, but cascading style sheets work for reports in HTML format only.

- **An external cascading style sheet** for any of the following reasons:

  **Your enterprise already uses cascading style sheets** to format HTML documents, and it wants reports to conform to these same presentation guidelines.

  **You want to apply the same formatting to other kinds of HTML documents** in your enterprise.

# Standard and Legacy Formatting

New releases of WebFOCUS often introduce improved ways of formatting reports. Some of these new features are advances over earlier features that performed similar formatting, but with fewer options or less functionality. The new feature becomes the standard, and the earlier one is then considered a "legacy" feature.

When you create a new application and have a choice between using a standard or a legacy feature, we encourage you to use the standard feature. When you are maintaining an earlier application that incorporates a legacy feature, you may choose to retain the legacy feature to save time, or to convert the application to the standard feature in order to leverage its new functionality.

As an example of the difference between standard and legacy formatting, consider the standard and legacy methods of laying out a report on a page:

- **The standard way** is to specify the page margins using TOPMARGIN, BOTTOMMARGIN, LEFTMARGIN, and RIGHTMARGIN. (You can apply these keywords as StyleSheet attributes or SET command parameters.) You can specify the margins in inches, centimeters, or points, as determined by UNITS (which you can also issue as a StyleSheet attribute or a SET command parameter). This is simple, and enables you to design reports the same way that you design other kinds of documents.
- **The legacy way** is to specify the height of the report output on the page, measured in report lines (using the LINES parameter of the SET command); and the width of the report, measured in characters (using the WIDTH parameter of the SET command). The top and bottom margins will each be half the difference of the page height and the report height, measured in character lines; the left and right margins will each be half the difference of the page width and the report width, measured in characters. This legacy method limits you to using a monospace font, such as Courier.

# Techniques for Quick and Easy Formatting

You can apply several formatting techniques to save yourself time and effort. Most of these techniques enable you to use code provided for you by WebFOCUS, or to leverage code that you write yourself:

- **Inheritance and overrides.** Each report component inherits StyleSheet attributes

from its "parent" report component. This powerful feature lets you define common formatting in a single declaration for a parent component, and lets descendant components automatically inherit the formatting, while enabling you to override the inherited values when you wish. By designing your StyleSheet to take advantage of inheritance, you can write less code and can quickly update formatting for multiple report components.

For example, if you declare all the report data to be blue, all data in all columns will be displayed as blue. If you also declare all vertical sort (BY) columns to be orange, this will override the blue for sort columns, which will be displayed as orange. If you also declare the EMP_ID sort column green, it will override the orange and be displayed as green. For more information, see WebFOCUS StyleSheet Attribute Inheritance.

- **Macros.** If you are going to specify the same attribute and value in several declarations in a StyleSheet, you can create a "macro" that enables you to apply the attribute repeatedly throughout the StyleSheet without coding it each time. Then, if you ever need to change the value, you can change it once (in the macro), and have the change applied automatically throughout the StyleSheet.

  For example, if there are several parts of a report that you wish to emphasize (such as, titles of important columns, data values that exceed a threshold, and sort headings), and you want all of these to be bold and purple, you could define a macro that sets font style to bold and color to purple, and then apply the macro to all of these report components. For more information, see Reusing WebFOCUS StyleSheet Declarations With Macros.

- **Defaults.** Many WebFOCUS StyleSheet attributes have default values. Instead of explicitly specifying every StyleSheet attribute, you can omit some and accept their defaults. For example, you can accept the default font instead of specifying a font. You can find each default value of an attribute documented where its syntax is described.

# Navigating From a Report to Other Resources

You can enable someone reading a report to navigate to other reports and Internet resources, and even to navigate within the report itself. Although navigation is not considered formatting, you can support some kinds of navigation by using a StyleSheet.

You can enable someone reading a report to:

- **Drill down** to a related report. For more information, see Linking to Another Report.
- **Link to a webpage,** compose and send an email message, and connect to other kinds of Internet resources. For more information, see Linking to a URL.
- **Execute JavaScript functions** to perform additional analysis of report data. For more information, see Linking to a JavaScript Function.
- **Use a table of contents to jump** directly to the data that interests that reader. The report generates the table of contents dynamically based on sort values, and enables the reader to see any report section, or the entire report, simply by selecting it from the table of contents. For more information, see Navigating Sort Groups From a Table of Contents.
- **Jump from one report page to the next,** to the top of the current report page, or to the beginning or end of the report. For more information, see Linking Report Pages.

# Creating and Managing a WebFOCUS StyleSheet

A StyleSheet enables you to format and produce attractive reports that highlight key information. With StyleSheets, you can specify various characteristics of your report and format report components individually.  StyleSheets" />

You can use a StyleSheet to:

- Format report components individually.
- Incorporate graphical elements.
- Define dynamic hyperlinks.
- Format data that meets specified conditions.
- Create macros that enable you to streamline your formatting specifications.

You can also use external cascading style sheets and you can enable internal cascading style sheets for HTML reports. For details, see Using an External Cascading Style Sheet and Controlling Report Formatting.

Unless otherwise noted, all StyleSheet references in this chapter refer to WebFOCUS StyleSheets.

# Creating a WebFOCUS StyleSheet

You can create a StyleSheet:  StyleSheets" /> StyleSheets" />

- **Within a report request,** as an inline StyleSheet. This is useful when you need to apply a StyleSheet to only one report. For details, see Creating a WebFOCUS StyleSheet.
- **Outside of a report request,** as a separate file. This enables you to apply one StyleSheet to multiple reports. For details, see Creating and Applying a WebFOCUS StyleSheet File.

**Note:** You can also include a StyleSheet file in another StyleSheet. This enables you to apply the styles in the included StyleSheet file, but override specific attributes. For information, see Include a StyleSheet File in Another StyleSheet.

# Creating a WebFOCUS StyleSheet Within a Report Request

You can create a StyleSheet within a report request. This enables you to create and maintain the formatting for your report directly in the report request. This type of StyleSheet is known as an inline StyleSheet.  StyleSheets" /> StyleSheets" />

# Create a WebFOCUS StyleSheet Within a Report Request

```
ON TABLE SET STYLE[SHEET] *
declaration
[declaration]
.
.
.
[ENDSTYLE]
```

where:

**SHEET**

Can be omitted to make the command shorter, and has no effect on its behavior. StyleSheets" /> StyleSheets" />

**declaration**

Is a StyleSheet declaration. StyleSheet declarations usually specify the report component you want to format and the formatting you want to apply. For more information about declarations, see General WebFOCUS StyleSheet Syntax.

**ENDSTYLE**

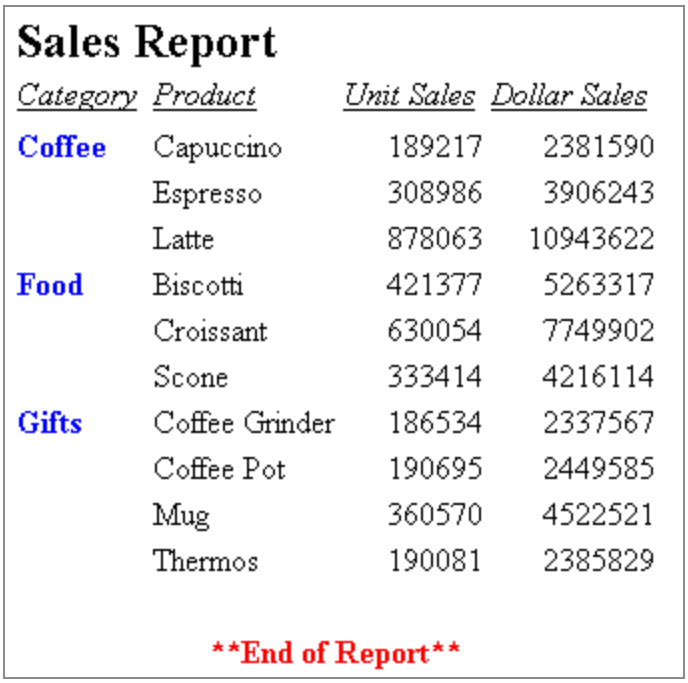
Indicates the end of an inline StyleSheet. You can omit ENDSTYLE if it is followed immediately by END in the report request.

# Creating a WebFOCUS StyleSheet Within a Report Request

The following illustrates an inline StyleSheet. The StyleSheet is highlighted in the request.

```
TABLE FILE GGSALES
SUM UNITS DOLLARS BY CATEGORY BY PRODUCT
HEADING
"Sales Report"
FOOTING CENTER
"**End of Report**"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=HEADING, FONT=ARIAL, SIZE=12, STYLE=BOLD, $
TYPE=TITLE, STYLE=ITALIC, $
TYPE=DATA, COLUMN=N1, STYLE=BOLD, COLOR=BLUE, $
TYPE=FOOTING, COLOR=RED, STYLE=BOLD, $
ENDSTYLE
END
```

The output is:



**Sales Report**

| *Category* | *Product* | *Unit Sales* | *Dollar Sales* |
|---|---|---|---|
| **Coffee** | Capuccino | 189217 | 2381590 |
| | Espresso | 308986 | 3906243 |
| | Latte | 878063 | 10943622 |
| **Food** | Biscotti | 421377 | 5263317 |
| | Croissant | 630054 | 7749902 |
| | Scone | 333414 | 4216114 |
| **Gifts** | Coffee Grinder | 186534 | 2337567 |
| | Coffee Pot | 190695 | 2449585 |
| | Mug | 360570 | 4522521 |
| | Thermos | 190081 | 2385829 |

****End of Report****

# Include a StyleSheet File in Another StyleSheet

```
INCLUDE = stysheet,$
```

where:

**stysheet**

Is the StyleSheet file to include.

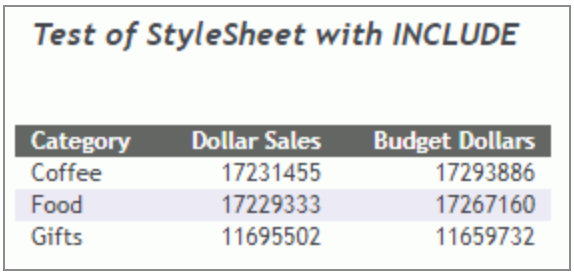
StyleSheet declarations are applied in the order in which they are found in the StyleSheet. Therefore, if you want to include a StyleSheet file and then override some of the attributes within it, place the INCLUDE statement first, then the declarations that override specific attributes below it.

# Including a StyleSheet File in Another StyleSheet

The following request includes one of the distributed WebFOCUS StyleSheet Sin the inline report StyleSheet and overrides the heading style to be bold and italic.

```
HEADING CENTER
"Test of Stylesheet with Include"
" "
SUM DOLLARS BUDDOLLARS
BY CATEGORY
ON TABLE HOLD AS STYLE2 FORMAT HTML
ON TABLE SET STYLE *
INCLUDE=IBFS:/FILE/IBI_HTML_DIR/javaassist/intl/EN/ENIADefault_combine.sty,$
TYPE=HEADING, STYLE = BOLD+ITALIC,$
END
```

The output is shown in the following image.



*Test of StyleSheet with INCLUDE*

| Category | Dollar Sales | Budget Dollars |
|---|---|---|
| Coffee | 17231455 | 17293886 |
| Food | 17229333 | 17267160 |
| Gifts | 11695502 | 11659732 |

# Creating and Applying a WebFOCUS StyleSheet File

You can create a StyleSheet as a separate file and apply it to as many reports as you wish. A StyleSheet file contains only declarations and optional comments. Unlike an inline StyleSheet, a StyleSheet file does not contain the ON TABLE SET STYLESHEET and ENDSTYLE commands. You can apply a StyleSheet file to a report using the SET STYLESHEET command, as described in Creating a WebFOCUS StyleSheet. For information about StyleSheet declarations, see General WebFOCUS StyleSheet Syntax.  StyleSheet files" />

As an alternative to creating a new StyleSheet file, you can use one of the sample StyleSheet files provided with WebFOCUS as a template.

Whether you create a StyleSheet file, or copy and customize an existing one, you need to store it in the correct location, as described in Creating a WebFOCUS StyleSheet.

# Naming and Storing a WebFOCUS StyleSheet File

When you create a StyleSheet file to be used in:

- **WebFOCUS,** upload the file to the WebFOCUS repository to a folder in which you are permitted to create content, and that users running procedures that reference the StyleSheet are permitted to read.

  If you create a StyleSheet for a self-service application, you can deploy your StyleSheet file to the apps\baseapp directory where it can be shared by multiple applications. You can also deploy the StyleSheet file to the same location as the report procedure it works with if you are only applying the file to that particular procedure.  StyleSheet files" /> StyleSheet files" />

You should name a StyleSheet file *filename*.sty, where *filename* can include letters, numbers, and underscores (_), and otherwise must be valid for the operating environments on which it resides.

# Apply a WebFOCUS StyleSheet File to a Report

To apply your StyleSheet file at the beginning of your report request, use StyleSheet files" />

```
SET STYLE[SHEET] = stylesheet
```

To apply your StyleSheet file within your report request use

```
ON TABLE SET STYLE[SHEET] stylesheet
```

where:

**SHEET**

Can be omitted to make the command shorter, and has no effect on its behavior.

**stylesheet**

Is the name of the StyleSheet file. Do not include the file extension.

# General WebFOCUS StyleSheet Syntax

A StyleSheet consists of declarations that identify the report components you wish to format and the formatting you wish to apply. A declaration usually begins with the TYPE attribute and is followed by the *attribute=value* pairs you assign to the report component. You can also include comments that provide context for your StyleSheet. Comments do not affect StyleSheet behavior. For details, see Adding a Comment to a WebFOCUS StyleSheet. style sheets" /> StyleSheets" />

For information about identifying a report component, see Identifying a Report Component in a WebFOCUS StyleSheet.

# Specify a WebFOCUS StyleSheet Declaration

Each StyleSheet declaration specifies a series of attributes in the form StyleSheet declarations" />

```
attribute = value, [attribute = value, ...] $
```

where:

**attribute**

Is the attribute you are specifying, such as TYPE, COLUMN, COLOR, or FONT.

**value**

Is the value you assign to the attribute.

# Sample WebFOCUS StyleSheet

Following is a request that includes an inline StyleSheet. The StyleSheet begins with ON TABLE SET STYLE * and ends with ENDSTYLE.  StyleSheets" /> style sheets" />

```
TABLE FILE CENTORD
HEADING
" "
"C e n t u r y  C o r p o r a t i o n"
```

```
" "
"Order Revenue - 2000 Q3"
" "
"page <TABPAGENO"
" "
SUM ORDER_DATE/MtDY ORDER_NUM LINEPRICE AS 'Order,Total:'
BY LOWEST 9 ORDER_DATE NOPRINT
WHERE (ORDER_DATE GE '2000/10/01') AND (ORDER_DATE LE '2000/12/31');
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET HTMLCSS ON

ON TABLE SET STYLESHEET *
TYPE=Report, GRID=Off, UNITS=Inches, $
TYPE=Data, FONT='Times', $
TYPE=Data, BACKCOLOR=Aqua, COLOR=Navy,
     WHEN=LinePrice GT 500000, $
TYPE=Data, COLUMN=LinePrice, BACKCOLOR=Aqua, COLOR=Navy, STYLE=Bold,
     WHEN=LinePrice GT 500000, $
TYPE=Title, FONT='Helvetica', $
TYPE=Heading, FONT='Helvetica', STYLE=Bold, SIZE=14, JUSTIFY=Center,
     COLOR=White, BACKCOLOR=Dark Turquoise, $
TYPE=Heading, LINE=6, BACKCOLOR=White, COLOR=Dark Turquoise, $
TYPE=Heading, LINE=7, BACKCOLOR=White, $
ENDSTYLE

END
```

# Improving WebFOCUS StyleSheet Readability

There are many ways to structure your StyleSheet declarations in order to make the StyleSheet easy to read. You can do any one, or a combination, of the following: StyleSheet declarations" />

- Begin a declaration in any column using blank spaces or tabs.
- Include blank lines between declarations.
- Create declarations in all uppercase, all lowercase, or mixed case.
- Use more than one declaration to format a single report component.
- Include blank spaces or tabs in between the attribute, equal sign (=), value, comma, and dollar sign ($).

- Split a single declaration across a line. The declaration will continue to be processed until the terminating dollar sign. For example, you can split a declaration like this:

```
TYPE=HEADING, FONT=ARIAL,
SIZE=14, STYLE=BOLD, $
```

- Split an *attribute=value* pair across a line. Use the backslash (\) character as continuation syntax at the end of the first line if you are splitting an attribute or value in a declaration across a line. For example:

```
TYPE=TITLE, COLUMN=N2, STY\
LE=BOLD+ITALIC, COLOR=BLUE, $
```

# Adding a Comment to a WebFOCUS StyleSheet

You can add comments to a StyleSheet to give context to a declaration. Comments do not affect StyleSheet behavior.  style sheets" /> StyleSheets" /> StyleSheets" />

You can add a comment:

- **On a declaration line.** Add the desired text after the dollar sign ($). For example,

```
TYPE=HEADING, STYLE=BOLD, COLOR=BLUE, SIZE=14, $ Sample comment
```

- **On its own line.** Begin the line with either a dollar sign ($), or a hyphen and an asterisk (-*), followed by the desired text. For example,

```
-* This is a sample comment
$ This is another sample comment
```

**Note:** You can add comments anywhere in your request, not only in StyleSheets.

# Reusing WebFOCUS StyleSheet Declarations With Macros

If you frequently use a group of attributes within a StyleSheet declaration, you can create a StyleSheet macro that groups the sequence of attributes together, enabling you to apply them repeatedly throughout the StyleSheet without recoding them.  StyleSheets macros" /> StyleSheet declarations" />

# Defining a WebFOCUS StyleSheet Macro

A StyleSheet macro must be defined in the StyleSheet that references it and the macro definition must precede its use in the StyleSheet.

To define a macro, use the DEFMACRO attribute followed by the desired styling attributes. macros StyleSheets" />

# Define a WebFOCUS StyleSheet Macro

```
DEFMACRO = macroname, attribute1 = value1, [attribute2 = value2,]... $
```

where:  macros StyleSheets" />

**macroname**

Is the name you assign to the macro you are creating.

**attribute**

Is any StyleSheet attribute, such as an attribute to format a report component, insert a graphic, define a hyperlink, or apply a condition for conditional formatting (WHEN).

**value**

Is the value you want to assign to the attribute.

# Applying a WebFOCUS StyleSheet Macro

A StyleSheet macro applies all the formatting defined in the macro to the report component specified in the declaration. To apply a macro, use the MACRO attribute. You can apply one macro per declaration.

When applying a StyleSheet macro to a report component, you can override any attribute defined in the macro by specifying the same attribute with the new value in that declaration, following the MACRO attribute.

# Apply a WebFOCUS StyleSheet Macro

```
TYPE=type, [subtype,] MACRO=macroname, [condition,] $
```

where: macros StyleSheets" />

**type**

Is the report component you wish to affect. You can specify any report component.

**subtype**

Are any additional attributes, such as COLUMN, ACROSS, or ITEM, that are needed to identify the report component to which you are applying the macro. For information about how to specify different types of report components, see Identifying a Report Component in a WebFOCUS StyleSheet.

**macroname**

Is the name of the macro to apply to the specified report component. The macro must be defined in the same StyleSheet.

**condition**

Is an optional WHEN attribute that you can specify if you wish to make this declaration conditional. For information about conditional declarations, see Controlling Report Formatting.

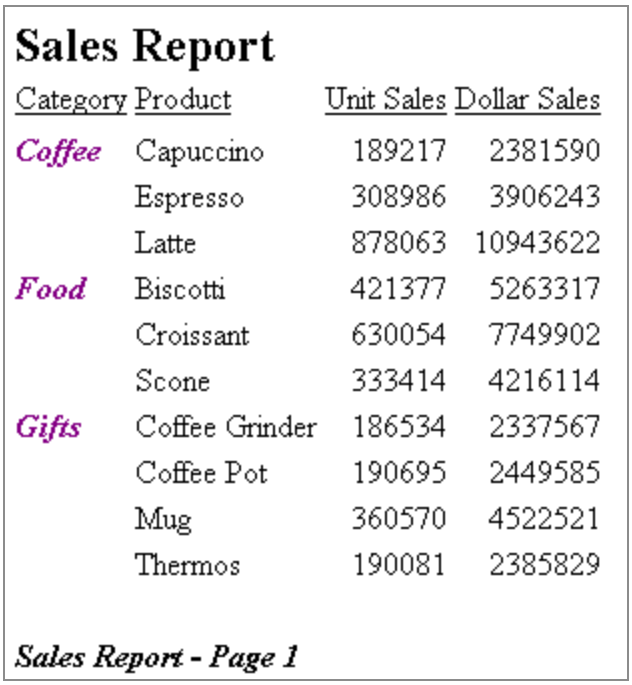
# Defining, Applying, and Overriding a WebFOCUS StyleSheet Macro

The following annotated example illustrates how to define, apply, and override macros in your StyleSheet:

```
   TABLE FILE GGSALES
    SUM UNITS DOLLARS
    BY CATEGORY BY PRODUCT
    HEADING
    "Sales Report"
    FOOTING
    "Sales Report - Page <TABPAGENO"
    ON TABLE SET STYLE *
    TYPE=REPORT, GRID=OFF,$
1.  DEFMACRO=A, STYLE=BOLD, SIZE=12, $
2.  DEFMACRO=BI, STYLE=BOLD+ITALIC, COLOR=PURPLE, $
3.  TYPE=HEADING, MACRO=A, $
4.  TYPE=FOOTING, MACRO=BI, COLOR=BLACK, $
5.  TYPE=DATA, COLUMN=N1, MACRO=BI, $
   ENDSTYLE
   END
```

1. Defines the A macro.
2. Defines the BI macro.
3. Illustrates how the A macro is applied to the heading.
4. Illustrates how the BI macro is applied to the footing and is partially overridden by the attribute value pair COLOR=BLACK.
5. Illustrates how the BI macro is applied to the data in the BY sort field CATEGORY (specified by TYPE=DATA, COLUMN=N1).

The output is:



**Sales Report**

| Category | Product | Unit Sales | Dollar Sales |
|---|---|---|---|
| *Coffee* | Capuccino | 189217 | 2381590 |
| | Espresso | 308986 | 3906243 |
| | Latte | 878063 | 10943622 |
| *Food* | Biscotti | 421377 | 5263317 |
| | Croissant | 630054 | 7749902 |
| | Scone | 333414 | 4216114 |
| *Gifts* | Coffee Grinder | 186534 | 2337567 |
| | Coffee Pot | 190695 | 2449585 |
| | Mug | 360570 | 4522521 |
| | Thermos | 190081 | 2385829 |

*Sales Report - Page 1*

# WebFOCUS StyleSheet Attribute Inheritance

Each report component inherits StyleSheet attributes from its parent component. You can override an inherited attribute by explicitly specifying the same attribute with a different value in the declaration for the child component. Since each component inherits automatically, you need specify only those attributes that differ from, or that augment, the inherited attributes of a component. inheritance StyleSheets" /> style sheets" />

Inheritance enables you to define common formatting in a single declaration, and to apply it automatically to all child components, except for those components for which you specify different attribute values to override the inherited values. You benefit from less coding and a more concise StyleSheet.

For example, you could specify that all report titles should be blue and bold:

```
TYPE=TITLE, COLOR=BLUE, STYLE=BOLD, $
```

Each column title will inherit this formatting, appearing in blue and bold by default. However, you can choose to format one column differently, allowing it to inherit the blue color, but specifying that it override the bold style and that it add a yellow background color:

```
TYPE=TITLE, COLUMN=N2, STYLE=-BOLD, BACKCOLOR=YELLOW, $
```

# WebFOCUS StyleSheet Inheritance Hierarchy

Report components inherit StyleSheet attributes according to a hierarchy. The root of the hierarchy is the entire report, specified in a StyleSheet declaration by TYPE=REPORT. Declarations that omit TYPE default to TYPE=REPORT and are also applied to the entire report. Attributes that are unspecified for the entire report default to values that are determined according to the display format of the report, such as HTML or PDF. inheritance StyleSheets" /> style sheets" />

Each report component inherits from its parent component. Component X is a parent of component Y if X is specified by a subset of all the "type" attributes that specify Y, and if those shared type attributes have the same values. For example,

- A component specified by TYPE=*x*, *subtype=y*, *elementtype=z* is a child of the component specified by TYPE=*x*, *subtype=y* and inherits attributes from it.
- The component specified by TYPE=*x*, *subtype=y* is a child of the component specified by TYPE=*x*, and inherits from it.
- The component specified by TYPE=*x*, where *x* is any value other than REPORT, is a child of the entire report (TYPE=REPORT) and inherits from it.
- The component specified by TYPE=DATA, *subtype=z* does not inherit from TYPE=REPORT, *subtype=z*. The rule is that a style for individual components (*subtype=z*) can only inherit from a style with the same type. The only exception is that any style can inherit from the top-level TYPE=REPORT component (the default style that has only TYPE=REPORT, with no other components, such as COLUMN, and so on).

  For example, in the following syntax, by defining specific styling for the column at the DATA level, the overall style from TYPE=REPORT will be applied (FONT=TAHOMA), but not TYPE=REPORT, COLUMN=N2 (COLOR=GREEN). To apply the color green to the data in column 2, you have to explicitly make it green.

  ```
  TYPE=REPORT, FONT=TAHOMA, $
  TYPE=REPORT, COLUMN=N2, COLOR=GREEN, $
  TYPE=DATA, COLUMN=N2, STYLE=+UNDERLINE+BOLD, $
  ```

When you use an external cascading style sheet (CSS), a report component inherits formatting from parent HTML elements, not from a parent report component. For more information, see Inheritance and External Cascading Style Sheets.

# Augmenting Inherited WebFOCUS StyleSheet Attributes

The following illustrates how to augment inherited StyleSheet attributes. The StyleSheet declarations discussed in this example are highlighted in the report request. inheritance StyleSheets" />

The page heading in this report has two lines. The first StyleSheet declaration identifies the report component HEADING to be formatted in bold and have 12-point font size. This will format both lines of the heading with these styles.

To augment the format for the second line of the heading, a second declaration has been added that specifies the heading line number and the additional style characteristic. In this case we have added the declaration TYPE=HEADING, LINE=2, STYLE=ITALIC. The second line of the heading will inherit the bold style and 12-point font size from the first HEADING declaration, and will also receive the italic style defined in the second declaration.

```
TABLE FILE GGSALES
SUM UNITS DOLLARS
BY CATEGORY BY PRODUCT
HEADING
"Sales Report:"
"First Quarter"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=HEADING, STYLE=BOLD, SIZE=12, $
TYPE=HEADING, LINE=2, STYLE=ITALIC, $
ENDSTYLE
END
```

The output is:

**Sales Report:**
*First Quarter*

| Category | Product | Unit Sales | Dollar Sales |
|---|---|---|---|
| Coffee | Capuccino | 189217 | 2381590 |
| | Espresso | 308986 | 3906243 |
| | Latte | 878063 | 10943622 |
| Food | Biscotti | 421377 | 5263317 |
| | Croissant | 630054 | 7749902 |
| | Scone | 333414 | 4216114 |
| Gifts | Coffee Grinder | 186534 | 2337567 |
| | Coffee Pot | 190695 | 2449585 |
| | Mug | 360570 | 4522521 |
| | Thermos | 190081 | 2385829 |

# Overriding Inherited WebFOCUS StyleSheet Attributes

The following illustrates how to override StyleSheet inheritance. The StyleSheet declarations discussed in this example are highlighted in the report request.

```
   TABLE FILE GGSALES
HEADING
"Sales Report"
SUM UNITS DOLLARS
BY CATEGORY BY PRODUCT BY DATE NOPRINT
WHERE DATE GE 19960101 AND DATE LE 19960401
ON TABLE SET STYLEMODE PAGED
ON TABLE SET LINES 20
FOOTING
"Page <TABPAGENO of <TABLASTPAGE"
ON TABLE SET STYLE *
   TYPE=REPORT, GRID=OFF, $
1. TYPE=REPORT, BACKCOLOR=BLUE, COLOR=WHITE, $
2. TYPE=HEADING, BACKCOLOR=WHITE, COLOR=BLACK, STYLE=BOLD, SIZE=12, $
3. TYPE=FOOTING, SIZE=11, STYLE=BOLD+ITALIC, BACKCOLOR=WHITE,
    COLOR=BLACK, $
4. TYPE=FOOTING, OBJECT=FIELD, ITEM=1, STYLE=-ITALIC, $
```

```
ENDSTYLE
END
```

1. Formats the entire report (all components) to appear with a blue background and white font.
2. Overrides the inherited format for the page heading (defined in the TYPE=REPORT declaration) by specifying the background color as white and the font as black.
3. Formats the page footing as font size 11, with a bold and italic style and overrides the report color by specifying BACKCOLOR=WHITE and COLOR=BLACK.
4. Since the <TABPAGENO system variable is part of the page footing, it inherits all of the formatting specified in the first TYPE=FOOTING declaration. This declaration overrides the inherited format for the page footing by specifying OBJECT=FIELD, ITEM=1, and removing the italic style (STYLE=-ITALIC). Note that ITEM=1 needs to be specified since there are two embedded fields in the footing.

The output is:

**Sales Report**

| Category | Product | Unit Sales | Dollar Sales |
|---|---|---|---|
| Coffee | Capuccino | 5507 | 71728 |
| | | 5219 | 67429 |
| | | 6343 | 87290 |
| | | 4170 | 58692 |
| | Espresso | 14499 | 182900 |
| | | 14015 | 169023 |
| | | 14871 | 184474 |
| | | 11613 | 156396 |
| | Latte | 31469 | 401873 |
| | | 38725 | 490645 |
| | | 42717 | 520948 |
| | | 36374 | 468137 |

***Page 1 of 4***

# Creating Reports With the ENWarm StyleSheet

The ENWarm StyleSheet (ENWarm.sty) is the new default style sheet for the WebFOCUS toolset. Using a clean and simple layout and design, you can take advantage of this style sheet when working with styling options for your reports and charts. Consistent text and color schemes, as well as a common look and feel, provide you with predictability across all of your reporting and charting activities.

In addition, there is an ENFlat StyleSheet, which offers the look and feel of ENWarm, with a different color scheme. It is recommend that you use this StyleSheet with active reports.

This section explains the specifications of the ENWarm StyleSheet and how it applies to report styling, and active reports.

# Report Styling

The following topic explains the specifications of the ENWarm StyleSheet and how it apples to report styling.

# Data, Report, and Title Styling

Styling for the data, report, and title elements are shown in the following image.

| Product Category | Product Subcategory | Revenue | Quantity Sold | Gross Profit |
|---|---|---|---|---|
| Accessories | Charger | $4,022,834.91 | 105,257 | $1,970,123.91 |
| | Headphones | $76,186,587.97 | 228,349 | $24,523,023.97 |
| | Universal Remote Controls | $49,398,915.65 | 178,061 | $13,361,292.65 |
| Camcorder | Handheld | $41,970,570.97 | 250,167 | $21,393,654.97 |
| | Professional | $44,053,830.75 | 12,872 | $8,835,522.75 |
| | Standard | $68,441,300.52 | 192,205 | $19,369,667.52 |

**Title**

- Bold

**Report**

- Arial
- 9 pt
- Font color: RGB (20, 20, 20)
- Title line skip
- Hyperlink color: RGB (51, 102, 255)
- Page color: White

**Data**

- Top border: RGB (219, 219, 219)
- Bottom border: RGB (219, 219, 219)
- Top gap: .05
- Bottom gap: .05

# Headings and Footings Styling

The headers and footers are defined in your report and pages, as shown in the following image.

| Product Category | Product Subcategory | Revenue | Quantity Sold | Gross Profit |
|---|---|---|---|---|
| Accessories | Charger | $4,022,834.91 | 105,257 | $1,970,123.91 |
| | Headphones | $76,186,587.97 | 228,349 | $24,523,023.97 |
| | Universal Remote Controls | $49,398,915.65 | 178,061 | $13,361,292.65 |
| Camcorder | Handheld | $41,970,570.97 | 250,167 | $21,393,654.97 |
| | Professional | $44,053,830.75 | 12,872 | $8,835,522.75 |
| | Standard | $68,441,300.52 | 192,205 | $19,369,667.52 |

The ENWarm StyleSheet style settings are as follows:

**Heading**

- 14 pt
- Bold

- Font color: RGB (75, 75, 75)
- Left justify

**Page Heading**

- 12 pt
- Bold
- Font color: RGB (75, 75, 75)
- Left justify

**Page Footing**

- 10 pt
- Font color: RGB (102, 102, 102)

**Report Footing**

- 10 pt
- Font color: RGB (102, 102, 102)

# Subheading and Subfooting Styling

Styling for the subheading element is shown in the following image.

| Product Subcategory | Revenue | Quantity Sold | Gross Profit |
|---|---|---|---|
| Subhead: **Accessories** | | | |
| Charger | $4,022,834.91 | 105,257 | $1,970,123.91 |
| Headphones | $76,186,587.97 | 228,349 | $24,523,023.97 |
| Universal Remote Controls | $49,398,915.65 | 178,061 | $13,361,292.65 |
| Subhead: **Camcorder** | | | |
| Handheld | $41,970,570.97 | 250,167 | $21,393,654.97 |
| Professional | $44,053,830.75 | 12,872 | $8,835,522.75 |
| Standard | $68,441,300.52 | 192,205 | $19,369,667.52 |

**Subheading**

- Background color: RGB (246, 246, 246)
- Top border: RGB (219, 219, 219)

**Subheading Data**

- Bold

Styling for the subfooting element is shown in the following image.

| Product Subcategory | Revenue | Quantity Sold | Gross Profit |
|---|---|---|---|
| Charger | $4,022,834.91 | 105,257 | $1,970,123.91 |
| Headphones | $76,186,587.97 | 228,349 | $24,523,023.97 |
| Universal Remote Controls | $49,398,915.65 | 178,061 | $13,361,292.65 |
| Subfoot: **Accessories** | | | |
| Handheld | $41,970,570.97 | 250,167 | $21,393,654.97 |
| Professional | $44,053,830.75 | 12,872 | $8,835,522.75 |
| Standard | $68,441,300.52 | 192,205 | $19,369,667.52 |
| Subfoot: **Camcorder** | | | |

**Subfooting Data**

- Bold

# Across Styling

Across styling for a report is shown in the following image.

| | Sale,Year | 2009 | | | | |
|---|---|---|---|---|---|---|
| | Sale,Quarter | 1 | 2 | 3 | 4 | TOTAL |
| Product Category | Product Subcategory | | | | | |
| Accessories | Charger | $5,181.41 | $4,589.43 | $5,317.37 | $1,951.83 | **$17,040.04** |
| | Headphones | $74,057.43 | $80,921.68 | $101,399.64 | $40,590.68 | **$296,969.43** |
| | Universal Remote Controls | $62,536.37 | $54,652.87 | $51,125.55 | $17,227.14 | **$185,541.93** |
| **Subtotal: Accessories** | | **$141,775.21** | **$140,163.98** | **$157,842.56** | **$59,769.65** | **$499,551.40** |
| Media Player | Blu Ray | $295,079.56 | $277,242.69 | $286,701.67 | $109,739.83 | **$968,763.75** |
| | DVD Players | $23,668.08 | . | . | . | **$23,668.08** |
| | Streaming | $5,059.35 | $4,343.45 | $4,855.37 | $3,100.56 | **$17,358.73** |
| **Subtotal: Media Player** | | **$323,806.99** | **$281,586.14** | **$291,557.04** | **$112,840.39** | **$1,009,790.56** |
| Stereo Systems | Home Theater Systems | $110,372.82 | $111,928.78 | $103,813.67 | $40,813.60 | **$366,928.87** |
| | Receivers | $57,633.53 | $71,127.68 | $64,601.26 | $30,004.08 | **$223,366.55** |
| | Speaker Kits | $131,257.54 | $142,409.55 | $114,713.56 | $65,217.46 | **$453,598.11** |
| | iPod Docking Station | $52,944.39 | $56,255.68 | $46,783.34 | $16,516.95 | **$172,500.36** |
| **Subtotal: Stereo Systems** | | **$352,208.28** | **$381,721.69** | **$329,911.83** | **$152,552.09** | **$1,216,393.89** |
| TOTAL | | **$817,790.48** | **$803,471.81** | **$779,311.43** | **$325,162.13** | **$2,725,735.85** |

### Across Title

- Right justify on outer BY field

### Across Data

- Center justify

### Row Total Data

- Bold

# Subtotal and Column Total Styling

### Subtotal

- Bold

### Column Total

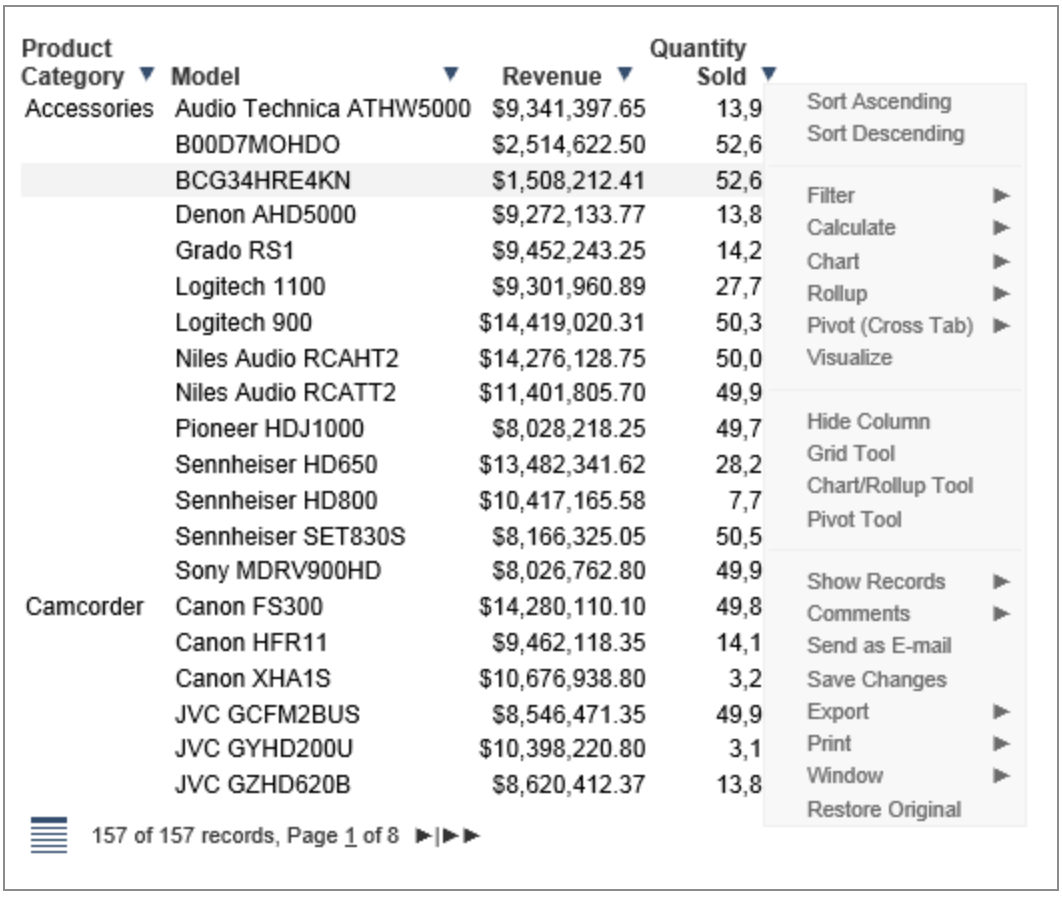
- Bold
- Top Border: RGB (102, 102, 102)

# Active Reports

The following topic explains the specifications of the ENWarm StyleSheet and how it apples to active reports.

# Pagination, Menu, and Hover Text Styling in WebFOCUS Active Reports

Styling for pagination, menu, and hover text elements in WebFOCUS active reports are shown in the following image.




**Pagination**

- Location: Bottom
- Background color: None

- Left justify

**Menu**

- Text color: RGB (#6B6B6B)
- Background color: RGB (#F8F8F8)
- Hover text color: RGB (#495263)
- Hover background color: RGB (#DFDFDF)

**Hover**

- Background color: RGB (243, 243, 243)

**AR Iconset**

- Blue

# Usage Notes for ENWarm.sty

- AHTML does not support borders.
- Sort objects can contain multiple BY fields. In procedures where the sort object is the first BY field, the ENWarm StyleSheet defines attributes specifically for the first BY field and, therefore, is not supported.
- Sort Objects are not supported with any reference to a BY column in the StyleSheet. ENWarm styles the first BY subhead to distinguish a break.
- Horizontal borders are used to distinguish each data row. When borders are present in a report, the following behavior will change:
  - Blank line between heading and titles.
  - Blank line between end of data and footing.
- FML bar will not show the bar line.

**Note:** For scenarios involving these usage notes, use the endeflt StyleSheet as an alternative to the ENWarm StyleSheet.

# Controlling Report Formatting

When you format a report, you can control *how* the formatting is applied. You can:

- **Generate an internal cascading style sheet for HTML reports.** This improves performance and provides more formatting options.
- **Apply formatting conditionally.** You can make the appearance of a report conditional based on the report values. You can also make its links to other reports and Internet resources conditional. For example, in a monthly order report, you can specify that all unpaid orders be displayed in red and be linked to a recent payment history report of a customer.
- **Select a scale for specifying measurements,** such as the size of a report top margin. You can select an inch, centimeter, or point as the unit of measure.
- **Control the display of empty reports.** If a report request returns no records, you can choose to display the report without data, or to display a message stating there is no output.

# Generating an Internal Cascading Style Sheet for HTML Reports

When you create a report in HTML format, code is generated that specifies how the report is formatted. You can set up your report to generate an internal cascading style sheet as part of this HTML code. This will:

- **Improve performance** by significantly reducing the size of the HTML file, decreasing transmission bandwidth, and displaying large reports more quickly.
- **Provide more formatting options** for your HTML report. Some WebFOCUS StyleSheet attributes are supported for HTML display format only in reports that generate an internal cascading style sheet.

  Internal cascading style sheets enable HTML support for the UNITS, BOTTOMMARGIN, TOPMARGIN, LEFTMARGIN, RIGHTMARGIN, SIZE, POSITION, WRAP, and PAGECOLOR attributes. It also enables you to add and remove underlines from most report

components and specify the starting position and size of an image. For details on the UNITS attribute, see Selecting a Unit of Measurement. For more information on all other attributes, see Laying Out the Report Page.

You can generate an internal cascading style sheet and apply an external cascading style sheet in the same report request. If any formatting instructions conflict, the internal cascading style sheet should override the external cascading style sheet.

**Note:** In most cases, you should not specify native WebFOCUS StyleSheet attributes and external CSS classes in the same report or style sheet. For more information, see Using an External Cascading Style Sheet.

# Generate an Internal Cascading Style Sheet

You can have an internal cascading style sheet created as part of the HTML code that is generated for a report in HTML format. To do so:

**Outside of a report request**, use

```
SET HTMLCSS = {ON|OFF}
```

**Within a report request**, use

```
ON TABLE SET HTMLCSS {ON|OFF}
```

where:

**ON**

Generates an internal cascading style sheet in the HTML output to control most aspects of the report appearance. ON is the default value.

**OFF**

Turns off the generation of an internal cascading style sheet. Instead, formatting tags are placed in each HTML table cell used to create the report.

# Requirements for Internal Cascading Style Sheets

If you wish to display a report formatted via an internal cascading style sheet (CSS), you must have a web browser that supports cascading style sheets. Microsoft Internet Explorer Version 5.0 or higher, support cascading style sheets.

Note that how an internal cascading style sheet formats your report is determined entirely by your web browser support and implementation of cascading style sheets, not by WebFOCUS. Some web browsers may not fully support the latest CSS version, or may implement a CSS feature in a different way.

# Selecting a Unit of Measurement

You can select the unit of measurement for page margins and column width for HTML reports that generate an internal cascading style sheet, as well as PDF and PostScript reports. In addition, you can also select the unit of measurement for column position in PDF and PS reports. You can select inches, centimeters, or points as the unit of measure.

If you change the unit of measure, all existing measurements are automatically converted to the new scale. For example, if the unit of measure is inches and the top margin for the report is set to 1, and you later change the unit of measure to centimeters, the size of the top margin is automatically converted to 1 centimeter.

You can set the unit of measure using a:

- **StyleSheet** by using the UNITS attribute.
- **SET command** by using the UNITS parameter.

# Set the Unit of Measurement

To set a unit of measurement:

**In a StyleSheet,** add the following attribute

```
UNITS = units
```

**Outside** of a report request, use

```
SET UNITS = units
```

**Within** a report request, use

```
ON TABLE SET UNITS units
```

where:

**units**

Is the unit of measure. Values can be:

- **INCHES,** that specifies the unit of measure as inches. This is the default value.
- **CM,** that specifies the unit of measure as centimeters.
- **PTS,** that specifies the unit of measure as points. Points is a common measurement scale for typefaces.

# Conditionally Formatting, Displaying, and Linking in a StyleSheet

You can conditionally format report components, display a graphic, and include links in your report based on the values in your report. Using conditional styling, you can: StyleSheets" /> StyleSheets and conditional styling" /> StyleSheets" />

- Draw attention to particular items in the report.
- Emphasize differences between significant values.
- Customize the resources to which an end user navigates from different parts of the report.

To conditionally format reports, add the WHEN attribute to a StyleSheet declaration. The WHEN attribute specifies a condition that is evaluated for each instance of a report component (that is, for each cell of a tabular report column, each element in a graph, or each free-form report page). The StyleSheet declaration is applied to each instance that satisfies the condition, and is ignored by each instance that fails to satisfy the condition.

You can also apply sequential conditional formatting.

**Note:** The variables TABPAGENO and TABLASTPAGE cannot be used to define styling with conditional styling (WHEN).

# Applying Sequential Conditional Formatting

You can apply sequential conditional logic to a report component by creating a series of declarations, each with a different condition. This is the StyleSheet equivalent of a sequence of nested IF-THEN-ELSE statements. When several conditional declarations specify the same report component (for example, the same column) *and* evaluate the same field in the condition, they are processed together as a group. For each instance of the report component (for example, for each cell of a column):

1. The conditional declarations in the "group" are evaluated, in the order in which they are found in the StyleSheet, until one of the conditions is satisfied. That declaration is then applied to that instance of the report component. The other conditional declarations in the "group," and any non-conditional declarations that specify the same report component and the same attributes, are ignored for that instance.
2. If, however, none of the conditional declarations have been satisfied for that instance, then the first unconditional declaration for that report component that specifies the same attribute(s) is applied to that instance.
3. Any unconditional declarations for that report component that specify other attributes (that is, attributes that have not already been applied to the instance in Steps 1 or 2) are now applied to the instance.
4. The entire process is repeated for the next instance of the report component (for example, for the next cell of the column).

# Conditionally Format, Display, or Link in a StyleSheet

```
TYPE=type, [subtype,] attributes, WHEN=field1 operator {field2|value},$
```

or

```
TYPE=type, [subtype,] attributes, WHEN=FORECAST, $
```

where:  StyleSheets" /> StyleSheets and conditional styling" />

**type**

Is the value of the TYPE attribute. You can specify any report component. For details, see Identifying a Report Component in a WebFOCUS StyleSheet.

**subtype**

Are any additional attributes, such as COLUMN, ACROSS, or ITEM, that are needed to identify the report component to which you are applying the declaration.

**attributes**

Are the attributes in the StyleSheet declaration that are made conditional by the WHEN attribute. They can include most formatting, graphic images, and hyperlink attributes.

**field1, field2**

Identifies the report fields that are being compared. Each one can be:

- The name of a display field or vertical or horizontal sort field in a graph or tabular report. ACROSS values can be used as part of the conditional expressions used to define styling attributes for each cell in the table.
- A column reference in a graph or tabular report.
- The name of an embedded field in the heading or footing of a free-form report.

If you wish to use a field that you do not want to display in the report, you can specify the field in the report request, and use the NOPRINT option to prevent the field from being displayed (for example, PRINT *fieldname* NOPRINT).

To apply a prefix operator to a field in a report, you can:

- Use the same prefix operator in the WHEN attribute. You must refer to the field by name in the WHEN attribute (for example, WHEN=AVE.PRICE GT 300).
- Refer to the field in the WHEN attribute by column position and omit the prefix operator (for example, WHEN=N3 GT 300). This is not supported for the ST. and CT. prefix operators.
- You cannot use compound boolean expressions with the WHEN attribute.

The field cannot be a packed (P) numeric field.

**operator**

Defines how the condition is satisfied. You can use these relational operators:

EQ where the condition is satisfied if the values on the left and right are equal. If the values being compared are alphanumeric, their case (uppercase, lowercase, or mixed case) must match.

NE where the condition is satisfied if the values on the left and right are not equal.

LT where the condition is satisfied if the value on the left is less than the value on the right.

LE where the condition is satisfied if the value on the left is less than or equal to the value on the right.

GT where the condition is satisfied if the value on the left is greater than the value on the right.

GE where the condition is satisfied if the value on the left is greater than or equal to the value on the right.

**value**

Is a constant, such as a number, character string, or date. You must enclose non-numeric constants, such as character strings and dates, in single quotation marks.

Although you cannot use functions or operators here to specify the value, you can define a temporary field (COMPUTE or DEFINE) using functions and operators, use the temporary field in the report, and specify it here instead of a constant.

**FORECAST**

Identifies fields that are generated using the FORECAST command.

# Using Sequential Conditional Formatting

This example illustrates how to apply sequential conditional formatting to a report. This report uses sequential conditional logic to format each row based on its order total (LINEPRICE).  StyleSheets" /> StyleSheets and conditional styling" />

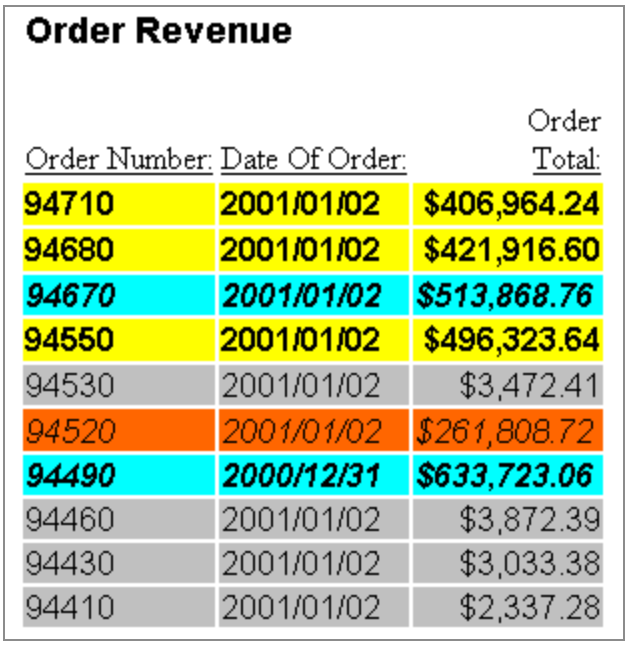
```
TABLE FILE CENTORD
HEADING
"Order Revenue"
```

```
   " "
   SUM ORDER_DATE LINEPRICE AS 'Order,Total:'
   BY HIGHEST 10 ORDER_NUM
   ON TABLE SET PAGE-NUM OFF

   ON TABLE SET STYLESHEET *
   TYPE=REPORT, GRID=OFF, $
1. TYPE=DATA, BACKCOLOR=AQUA, STYLE=BOLD+ITALIC,
   WHEN=LINEPRICE GT 500000, $
2. TYPE=DATA, BACKCOLOR=YELLOW, STYLE=BOLD,
   WHEN=LINEPRICE GT 400000, $
3. TYPE=DATA, BACKCOLOR=ORANGE, STYLE=ITALIC,
   WHEN=LINEPRICE GT 100000, $
4. TYPE=DATA, BACKCOLOR=SILVER, FONT='Arial', $
   TYPE=HEADING, FONT='Arial', STYLE=BOLD, SIZE=11, $
   ENDSTYLE

   END
```

Notice that:

1. The first conditional declaration formats any rows whose order total is greater than 500,000.
2. The second conditional declaration formats any rows whose order total is greater than 400,000 and less than or equal to 500,000. This is because rows with an order total greater than 500,000 would have already been formatted by the first conditional declaration.
3. The third conditional declaration formats any rows whose order total is greater than 100,000 and less than or equal to 400,000. This is because rows with an order total greater than 400,000 would have already been formatted by one of the first two conditional declarations.
4. The unconditional declaration following the conditional declarations specifies:
   - Background color, which is also specified by the conditional declarations. It applies background color (silver) to any rows whose order total is less than or equal to 100,000, since those rows have not already been formatted by the conditional declarations.
   - Font, which is *not* specified by the conditional declarations. It applies font (Arial) to all data rows.

The output is:



**Order Revenue**

| Order Number: | Date Of Order: | Order Total: |
|---|---|---|
| 94710 | 2001/01/02 | $406,964.24 |
| 94680 | 2001/01/02 | $421,916.60 |
| *94670* | *2001/01/02* | *$513,868.76* |
| 94550 | 2001/01/02 | $496,323.64 |
| 94530 | 2001/01/02 | $3,472.41 |
| *94520* | *2001/01/02* | *$261,808.72* |
| *94490* | *2000/12/31* | *$633,723.06* |
| 94460 | 2001/01/02 | $3,872.39 |
| 94430 | 2001/01/02 | $3,033.38 |
| 94410 | 2001/01/02 | $2,337.28 |

# Applying Basic Conditional Formatting

This example illustrates how to apply conditional formatting to a report. The conditional formatting draws attention to orders that total more than 200,000.  StyleSheets" /> StyleSheets and conditional styling" />

Notice that because a particular column is not specified in the declaration, the formatting is applied to the entire row.

```
TABLE FILE CENTORD
HEADING
"Order Revenue"
" "
SUM ORDER_DATE LINEPRICE AS 'Order,Total:'
BY HIGHEST 10 ORDER_NUM
ON TABLE SET PAGE-NUM OFF

ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
TYPE=DATA, BACKCOLOR=AQUA, STYLE=BOLD, WHEN=LINEPRICE GT 200000, $
TYPE=HEADING, FONT='Arial', STYLE=BOLD, SIZE=11, $
ENDSTYLE

END
```

The output is:

**Order Revenue**

| Order Number: | Date Of Order: | Order Total: |
|---|---|---|
| **94710** | **2001/01/02** | **$406,964.24** |
| **94680** | **2001/01/02** | **$421,916.60** |
| **94670** | **2001/01/02** | **$513,868.76** |
| **94550** | **2001/01/02** | **$496,323.64** |
| 94530 | 2001/01/02 | $3,472.41 |
| **94520** | **2001/01/02** | **$261,808.72** |
| **94490** | **2000/12/31** | **$633,723.06** |
| 94460 | 2001/01/02 | $3,872.39 |
| 94430 | 2001/01/02 | $3,033.38 |
| 94410 | 2001/01/02 | $2,337.28 |

# Applying Conditional Formatting to a Column

This example illustrates how you can use conditional formatting to draw attention to columns that are not specified in the condition. The WHEN condition states that the order number for orders exceeding 200,000 should display in boldface with an aqua background. StyleSheets" /> StyleSheets and conditional styling" />

Notice that the column that is evaluated in the WHEN condition (LINEPRICE) is different from the column that is formatted (ORDER_NUM); they do not need to be the same.

```
TABLE FILE CENTORD
HEADING
"Order Revenue"
" "
SUM ORDER_DATE LINEPRICE AS 'Order,Total:'
BY HIGHEST 10 ORDER_NUM
ON TABLE SET PAGE-NUM OFF

ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
TYPE=DATA, COLUMN=ORDER_NUM,
```

```
   BACKCOLOR=AQUA, STYLE=BOLD, WHEN=LINEPRICE GT 200000, $
TYPE=HEADING, FONT='Arial', STYLE=BOLD, SIZE=11, $
ENDSTYLE

END
```

The output is:

**Order Revenue**

| Order Number: | Date Of Order: | Order Total: |
|---|---|---|
| 94710 | 2001/01/02 | $406,964.24 |
| 94680 | 2001/01/02 | $421,916.60 |
| 94670 | 2001/01/02 | $513,868.76 |
| 94550 | 2001/01/02 | $496,323.64 |
| 94530 | 2001/01/02 | $3,472.41 |
| 94520 | 2001/01/02 | $261,808.72 |
| 94490 | 2000/12/31 | $633,723.06 |
| 94460 | 2001/01/02 | $3,872.39 |
| 94430 | 2001/01/02 | $3,033.38 |
| 94410 | 2001/01/02 | $2,337.28 |

# Conditionally Styling an ACROSS Value

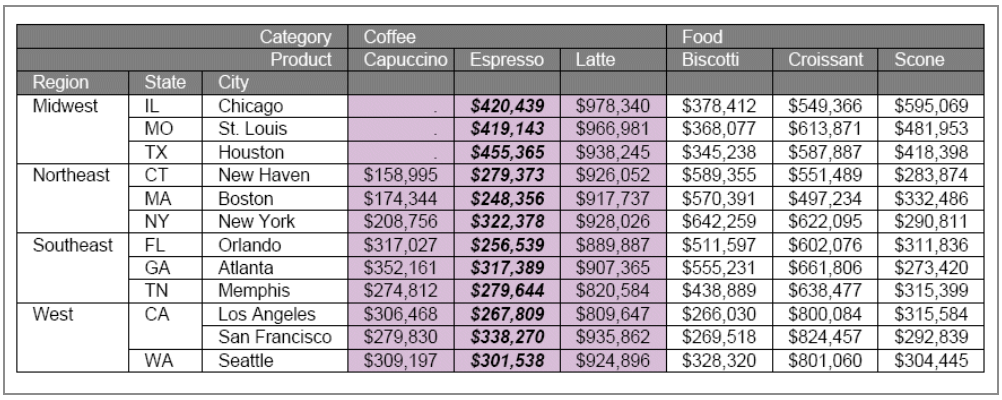
The example below demonstrates how an ACROSS value can be referenced using either the ACROSS field name or the ACROSS column designator (A1, A2).

In this example, the ACROSS values are used in conditional styling to set a unique backcolor for all ACROSS columns in the Category Coffee, and additional font styling for the Espresso ACROSS column.

```
SET ACROSSTITLE=SIDE
TABLE FILE GGSALES
SUM DOLLARS/I8M AS ''
BY REGION
BY ST
```

```
BY CITY
ACROSS CATEGORY
ACROSS PRODUCT
WHERE CATEGORY EQ 'Coffee' OR 'Food';
ON TABLE SET PAGE-NUM NOPAGE
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
SQUEEZE=ON,UNITS=IN,ORIENTATION=PORTRAIT,$
TYPE=REPORT,FONT='ARIAL',SIZE=10,BORDER=LIGHT,$
TYPE=ACROSSTITLE,COLOR=WHITE, BACKCOLOR=GREY,$
TYPE=ACROSSVALUE,COLOR=WHITE, BACKCOLOR=GREY,$
TYPE=TITLE,COLOR=WHITE, BACKCOLOR=GREY,$
TYPE=DATA, ACROSSCOLUMN=DOLLARS, BACKCOLOR=THISTLE, WHEN=CATEGORY EQ
'Coffee',$
TYPE=DATA, ACROSSCOLUMN=DOLLARS, STYLE=BOLD+ITALIC, WHEN=A2 EQ
'Espresso', $
ENDSTYLE
END
```

The output is:



| | | Category | Coffee | | | Food | | |
|---|---|---|---|---|---|---|---|---|
| | | Product | Capuccino | Espresso | Latte | Biscotti | Croissant | Scone |
| Region | State | City | | | | | | |
| Midwest | IL | Chicago | . | ***$420,439*** | $978,340 | $378,412 | $549,366 | $595,069 |
| | MO | St. Louis | . | ***$419,143*** | $966,981 | $368,077 | $613,871 | $481,953 |
| | TX | Houston | . | ***$455,365*** | $938,245 | $345,238 | $587,887 | $418,398 |
| Northeast | CT | New Haven | $158,995 | ***$279,373*** | $926,052 | $589,355 | $551,489 | $283,874 |
| | MA | Boston | $174,344 | ***$248,356*** | $917,737 | $570,391 | $497,234 | $332,486 |
| | NY | New York | $208,756 | ***$322,378*** | $928,026 | $642,259 | $622,095 | $290,811 |
| Southeast | FL | Orlando | $317,027 | ***$256,539*** | $889,887 | $511,597 | $602,076 | $311,836 |
| | GA | Atlanta | $352,161 | ***$317,389*** | $907,365 | $555,231 | $661,806 | $273,420 |
| | TN | Memphis | $274,812 | ***$279,644*** | $820,584 | $438,889 | $638,477 | $315,399 |
| West | CA | Los Angeles | $306,468 | ***$267,809*** | $809,647 | $266,030 | $800,084 | $315,584 |
| | | San Francisco | $279,830 | ***$338,270*** | $935,862 | $269,518 | $824,457 | $292,839 |
| | WA | Seattle | $309,197 | ***$301,538*** | $924,896 | $328,320 | $801,060 | $304,445 |

# Conditionally Formatting a Data Visualization Bar Graph

This example illustrates how to apply conditional formatting to a data visualization bar graph. This report request incorporates a data visualization bar chart to graphically represent the data in the LINEPRICE column. It uses conditional formatting to draw attention to orders that total more than 200,000. It conditionally applies that formatting

StyleSheets" /> StyleSheets and conditional styling" />

Note that data visualization is only supported for HTML reports.

```
TABLE FILE CENTORD
HEADING
"Order Revenue"
" "
SUM ORDER_DATE LINEPRICE AS 'Order,Total:'
BY HIGHEST 10 ORDER_NUM
ON TABLE SET PAGE-NUM OFF

ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
TYPE=DATA, BACKCOLOR=AQUA, STYLE=BOLD, WHEN=LINEPRICE GT 200000, $
GRAPHTYPE=DATA, COLUMN=LINEPRICE, $
GRAPHTYPE=DATA, GRAPHCOLOR=AQUA, WHEN=LINEPRICE GT 200000,$
TYPE=HEADING, FONT='Arial', STYLE=BOLD, SIZE=11, $
ENDSTYLE

END
```

The output is:

**Order Revenue**

| Order Number: | Date Of Order: | Order Total: |
|---|---|---|
| 94710 | 2001/01/02 | $406,964.24 |
| 94680 | 2001/01/02 | $421,916.60 |
| 94670 | 2001/01/02 | $513,868.76 |
| 94550 | 2001/01/02 | $496,323.64 |
| 94530 | 2001/01/02 | $3,472.41 |
| 94520 | 2001/01/02 | $261,808.72 |
| 94490 | 2000/12/31 | $633,723.06 |
| 94460 | 2001/01/02 | $3,872.39 |
| 94430 | 2001/01/02 | $3,033.38 |
| 94410 | 2001/01/02 | $2,337.28 |

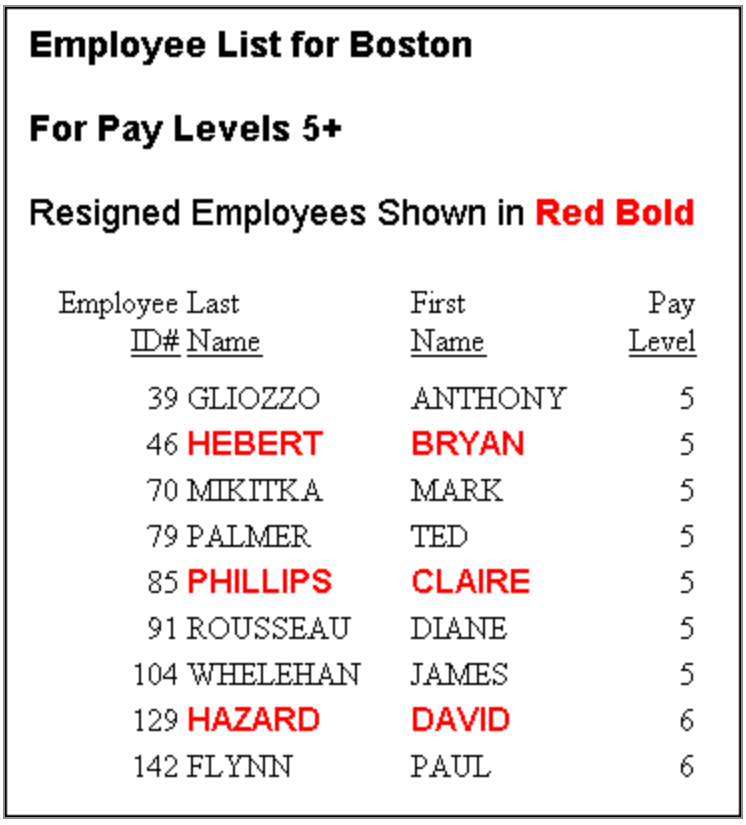
# Applying Conditional Formatting Based on Hidden (NOPRINT) Field Values

This example illustrates how to apply conditional formatting based on the values of a hidden (NOPRINT) field. This report uses conditional formatting to draw attention to those employees who have resigned.  StyleSheets" /> StyleSheets and conditional styling" />

Notice that the WHEN attribute condition evaluates a field (STATUS) that is hidden in the report. Although the field that is evaluated in the condition must be included in the report request, you can prevent it from displaying in the report by using the NOPRINT option, as shown in the following request.

```
TABLE FILE CENTHR
HEADING
"Employee List for Boston"
" "
"For Pay Levels 5+"
" "
"Resigned Employees Shown in <0>Red Bold"
" "
PRINT LNAME FNAME PAYSCALE STATUS NOPRINT
BY ID_NUM
WHERE PLANT EQ 'BOS' AND PAYSCALE GE 5
ON TABLE SET PAGE-NUM OFF

ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
TYPE=DATA, COLUMN=LNAME,
   COLOR=RED, FONT='Arial', STYLE=BOLD, WHEN=STATUS EQ 'RESIGNED', $
TYPE=DATA, COLUMN=FNAME,
   COLOR=RED, FONT='Arial', STYLE=BOLD, WHEN=STATUS EQ 'RESIGNED', $
TYPE=HEADING, FONT='Arial', STYLE=BOLD, SIZE=11, $
TYPE=HEADING, LINE=5, STYLE=-BOLD, $
TYPE=HEADING, LINE=5, ITEM=2, STYLE=BOLD, COLOR=RED, $
ENDSTYLE

END
```

The output is:



**Employee List for Boston**

**For Pay Levels 5+**

Resigned Employees Shown in **Red Bold**

| Employee ID# | Last Name | First Name | Pay Level |
|---|---|---|---|
| 39 | GLIOZZO | ANTHONY | 5 |
| 46 | **HEBERT** | **BRYAN** | 5 |
| 70 | MIKITKA | MARK | 5 |
| 79 | PALMER | TED | 5 |
| 85 | **PHILLIPS** | **CLAIRE** | 5 |
| 91 | ROUSSEAU | DIANE | 5 |
| 104 | WHELEHAN | JAMES | 5 |
| 129 | **HAZARD** | **DAVID** | 6 |
| 142 | FLYNN | PAUL | 6 |

# Applying Conditional Formatting to a Sort Group

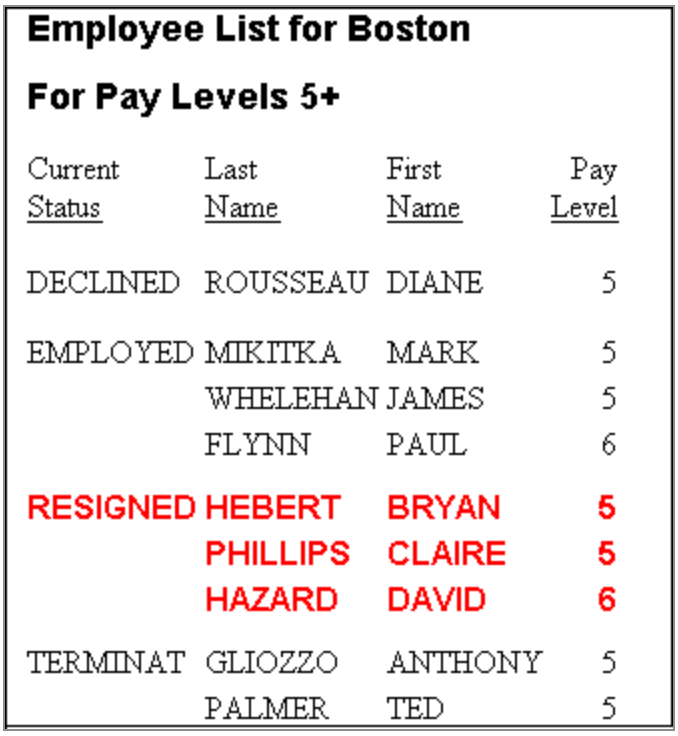
This example illustrates how to apply conditional formatting to a sort group. This report uses conditional formatting to draw attention to those employees who have resigned. StyleSheets" /> StyleSheets and conditional styling" />

Notice that one conditional declaration can apply formatting to all the sort group rows. You can accomplish this by evaluating the sort field (STATUS) in the WHEN attribute condition.

```
TABLE FILE CENTHR
HEADING
"Employee List for Boston"
" "
"For Pay Levels 5+"
" "
PRINT LNAME FNAME PAYSCALE
BY STATUS SKIP-LINE
WHERE PLANT EQ 'BOS' AND PAYSCALE GE 5
```

```
ON TABLE SET PAGE-NUM OFF

ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
TYPE=DATA,
   COLOR=RED, FONT='Arial', STYLE=BOLD, WHEN=STATUS EQ 'RESIGNED',$
TYPE=HEADING, FONT='Arial', STYLE=BOLD, SIZE=11, $
ENDSTYLE

END
```

The output is:



**Employee List for Boston**

**For Pay Levels 5+**

| Current Status | Last Name | First Name | Pay Level |
|---|---|---|---|
| DECLINED | ROUSSEAU | DIANE | 5 |
| EMPLOYED | MIKITKA | MARK | 5 |
| | WHELEHAN | JAMES | 5 |
| | FLYNN | PAUL | 6 |
| RESIGNED | HEBERT | BRYAN | 5 |
| | PHILLIPS | CLAIRE | 5 |
| | HAZARD | DAVID | 6 |
| TERMINAT | GLIOZZO | ANTHONY | 5 |
| | PALMER | TED | 5 |

In order to apply the same conditional formatting to only two columns, instead of all the columns, this version of the report request uses two declarations, each specifying a different column (LNAME and FNAME):

```
TABLE FILE CENTHR
HEADING
"Employee List for Boston"
" "
"Pay Levels 5+"
" "
```

```
PRINT LNAME FNAME PAYSCALE
BY STATUS SKIP-LINE
WHERE PLANT EQ 'BOS' AND PAYSCALE GE 5
ON TABLE SET PAGE-NUM OFF

ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
TYPE=DATA, COLUMN=LNAME,
   COLOR=RED, FONT='Arial', STYLE=BOLD, WHEN=STATUS EQ 'RESIGNED', $
TYPE=DATA, COLUMN=FNAME,
   COLOR=RED, FONT='Arial', STYLE=BOLD, WHEN=STATUS EQ 'RESIGNED', $
TYPE=HEADING, FONT='Arial', STYLE=BOLD, SIZE=11, $
ENDSTYLE

END
```

The output is:

**Employee List for Boston**

**For Pay Levels 5+**

| Current Status | Last Name | First Name | Pay Level |
|---|---|---|---|
| DECLINED | ROUSSEAU | DIANE | 5 |
| EMPLOYED | MIKITKA | MARK | 5 |
| | WHELEHAN | JAMES | 5 |
| | FLYNN | PAUL | 6 |
| RESIGNED | HEBERT | BRYAN | 5 |
| | PHILLIPS | CLAIRE | 5 |
| | HAZARD | DAVID | 6 |
| TERMINAT | GLIOZZO | ANTHONY | 5 |
| | PALMER | TED | 5 |

# Applying Conditional Formatting to Forecasted Values

The following illustrates how you can apply conditional formatting to forecasted values in a report.

```
DEFINE FILE GGSALES
SDATE/YYM = DATE;
SYEAR/Y = SDATE;
SMONTH/M = SDATE;
PERIOD/I2 = SMONTH;
END

TABLE FILE GGSALES
SUM UNITS DOLLARS
BY CATEGORY BY PERIOD
WHERE SYEAR EQ 97 AND CATEGORY EQ 'Coffee'
ON PERIOD RECAP MOVAVE/D10.1= FORECAST(DOLLARS,1,3,'MOVAVE',3);
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=REPORT, BACKCOLOR=SILVER, WHEN=FORECAST, $
ENDSTYLE
END
```

The output is:

| Category | PERIOD | Unit Sales | Dollar Sales | MOVAVE |
|---|---|---|---|---|
| Coffee | 1 | 61666 | 801123 | 801,123.0 |
| | 2 | 54870 | 682340 | 741,731.5 |
| | 3 | 61608 | 765078 | 749,513.7 |
| | 4 | 57050 | 691274 | 712,897.3 |
| | 5 | 59229 | 720444 | 725,598.7 |
| | 6 | 58466 | 742457 | 718,058.3 |
| | 7 | 60771 | 747253 | 736,718.0 |
| | 8 | 54633 | 655896 | 715,202.0 |
| | 9 | 57829 | 730327 | 711,158.7 |
| | 10 | 57012 | 724412 | 703,545.0 |
| | 11 | 51110 | 620264 | 691,667.7 |
| | 12 | 58981 | 762328 | 702,334.7 |
| | 13 | 0 | 0 | 694,975.6 |
| | 14 | 0 | 0 | 719,879.4 |
| | 15 | 0 | 0 | 705,729.9 |

# Including Summary Lines, Underlines, Skipped Lines, and Page Breaks

You can include sort-based options such as subtotals and other summary lines, sort headings and footings, underlines, skipped lines, and page breaks, as well as restart page numbering, by using the ON phrase in your report request. The ON phrase specifies an option that can be triggered by the change in a sort field or display field. The sort-based option (summary line, underline, skipped line, or page break) is applied to each sort group.

To make report requests flexible, options may be included that are not needed in every situation. User selections then control the options used for each execution of the request.

By default, if the field referenced in the ON phrase is not present in the request, or if the option is not supported with the type of field specified, the following message is generated and processing terminates:

```
(FOC013) The 'ON FIELDNAME' FIELD IS NOT A SORT FIELD: sortfield
```

You can use the SET ONFIELD =IGNORE command to instruct WebFOCUS to ignore ON phrases that reference absent fields or fields that are not supported by the specified option.

Note that any field used must be present in the Master File for the data source or the following message is generated and execution terminates:

```
(FOC003) THE FIELDNAME IS NOT RECOGNIZED: field
```

# Display Summary Lines, Underlines, Skipped lines, and Page Breaks

```
{BY|ON} sortfieldoption [[AND] option ...]
```

where:

**BY|ON**

These are functionally identical. The only difference is syntactic (BY enables you to specify the sort-based feature as part of the sort phrase, while ON enables you to specify it separately from the sort phrase). For more information, see the documentation for the *sortfield* option you are using.

**sortfield**

Is the name of a vertical sort (BY) field.

**option**

Is one of the following sort-based features: PAGE-BREAK, PAGE-BREAK REPAGE, RECAP, RECOMPUTE, SKIP-LINE, SUBFOOT, SUBHEAD, SUBTOTAL, SUB-TOTAL, SUMMARIZE, UNDER-LINE.

**AND**

Can be included between two sets of *sortfield* options to enhance readability.

# Control Processing of ON Phrases

```
SET ONFIELD = {ALL|IGNORE}
```

```
ON TABLE SET ONFIELD {ALL|IGNORE}
```

where:

**ALL**

Issues a message and terminates execution when a field referenced in an ON phrase is not present in the request. ALL is the default value.

**IGNORE**

Ignores ON phrases that reference fields that are not present in the request, as well as ON phrases that include options not supported by the type of field specified.

# Ignoring ON Phrases for Absent Fields

The following request against the EMPDATA data source has ON phrases for the fields DEPT, DIV, and PIN. PIN is a sort field, but the other sort field must be entered at run time as the amper variable &F1:

```
SET USER = EUSER
 TABLE FILE EMPDATA
   SUM SALARY
   BY &F1
   BY PIN
      ON DEPT SKIP-LINE NOSPLIT
      ON &F1  SUBTOTAL
      ON DIV   PAGE-BREAK
      ON TABLE SET ONFIELD ALL
 END
```

Run the request supplying the value **DEPT** for the variable &F1. The following messages are generated:

```
 ERROR AT OR NEAR LINE      8  IN PROCEDURE IGNORE3 FOCEXEC *
(FOC013) THE 'ON FIELDNAME' FIELD IS NOT A SORT FIELD: DIV
```

```
 BYPASSING TO END OF COMMAND
(FOC009) INCOMPLETE REQUEST STATEMENT
```

Now change the value of the ONFIELD parameter to IGNORE and run the request again, supplying the value **DEPT** for the variable &F1. The partial output is:

```
DEPT                 PIN                 SALARY
----                 ---                 ------

ACCOUNTING           000000070       $83,000.00
                     000000100       $32,400.00
                     000000300       $79,000.00
                     000000370       $62,500.00
                     000000400       $26,400.00

*TOTAL ACCOUNTING                   $283,300.00


ADMIN SERVICES       000000170       $30,800.00
                     000000180       $25,400.00

*TOTAL ADMIN SERVICES                $56,200.00
```

# Conditionally Including Summary Lines, Underlines, Skipped Lines, and Page Breaks

You can conditionally include sort-based options such as subtotals and other summary lines, sort headings and footings, underlines, skipped lines, and page breaks, as well as conditionally restart page numbering, by using the WHEN phrase in your report request. The WHEN phrase specifies a condition that is evaluated for each value of a vertical sort (BY) field. The sort-based option (summary line, underline, skipped line, or page break) is applied to each sort group that satisfies the condition, and is ignored by sort groups that do not satisfy the condition.

The WHEN phrase is an extension of the ON *sortfield* and BY *sortfield* phrases. You can specify a WHEN phrase for each *sortfield* phrase. For example:

```
ON ORDER_NUM UNDER-LINE WHEN QUANTITY GT 5
ON COUNTRY PAGE-BREAK WHEN LINEPRICE GT 200000
```

If a *sortfield* phrase includes several sort-related options, you can specify a different WHEN phrase for each option. For example:

```
ON ORDER_NUM SKIP-LINE WHEN QUANTITY GT 5; UNDER-LINE WHEN QUANTITY GT
10
```

# Conditionally Display Summary Lines, Underlines, Skipped lines, and Page Breaks

```
{BY|ON} sortfield [option WHEN condition [;] [AND]]...
```

where:

**BY|ON**

These are functionally identical. The only difference is syntactic (BY enables you to specify the sort-based feature as part of the sort phrase, while ON enables you to specify it separately from the sort phrase). For more information, see the documentation for the *sortfield* option you are using.

**sortfield**

Is the name of a vertical sort (BY) field.

**option**

Is one of the following sort-based features: PAGE-BREAK, PAGE-BREAK REPAGE, RECAP, RECOMPUTE, SKIP-LINE, SUBFOOT, SUBHEAD, SUBTOTAL, SUB-TOTAL, SUMMARIZE, UNDER-LINE.

If you specify SUBHEAD or SUBFOOT, you must place the WHEN phrase on the line following the text of the heading or footing.

**condition**

Is a logical expression. For more information, see Using Expressions.

You must enclose non-numeric constants, such as character strings and dates, in single quotation marks.

If the condition evaluates a numeric detail field, it evaluates the *sum* of the detail field values within each sort group, not the individual detail values. For example, in the request

```
TABLE FILE CENTHR
PRINT ID_NUM SALARY
BY PLANT
ON PLANT UNDER-LINE
WHEN SALARY GT 2000000
END
```

the condition evaluates the sum of the SALARY values within each PLANT value.

If the condition evaluates an alphanumeric field that appears multiple times in a sort group, it evaluates the last value of the field in each sort group.

You can apply a prefix operator to a field in the condition (for example, WHEN AVE.PRICE GT 300) even if the operator and the field are not used in the report. The aggregation is performed for each value of the sort field.

If the BY or ON phrase includes several options, the WHEN condition applies only to the option that immediately precedes it.

**;**

Is required if WHEN phrases are being included for several options in this BY or ON phrase. In all other situations it is optional and just enhances readability.

**AND**

Can be included between two sets of *sortfield* options to enhance readability.

# Using a WHEN Condition for a Sort Option

This example illustrates how to conditionally display a sub footing in a report. This report uses a conditional sort footing to draw attention to orders that total less than 200,000.

```
TABLE FILE CENTORD
HEADING
"Order Revenue"
" "
SUM ORDER_DATE LINEPRICE AS 'Order,Total:'
BY HIGHEST 5 ORDER_NUM
```

```
ON ORDER_NUM
    SUBFOOT
       "--- Order total is less than $200,000 ---"
       " "
       WHEN LINEPRICE LT 200000

ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The output is:

Order Revenue

| Order Number: | Date Of Order: | Order Total: |
|---|---|---|
| 94710 | 2001/01/02 | $406,964.24 |
| 94680 | 2001/01/02 | $421,916.60 |
| 94670 | 2001/01/02 | $513,868.76 |
| 94550 | 2001/01/02 | $496,323.64 |
| 94530 | 2001/01/02 | $3,472.41 |

--- Order total is less than $200,000 ---

# Using WHEN Conditions for Multiple Sort Options

This example illustrates how to apply multiple conditions to a report component. This report uses conditional sort footings to distinguish between orders that total more than 200,000 and less than 200,000.

Notice that one sort phrase (ON ORDER_NUM) specifies several sort-related options (two different SUBFOOT phrases), and that each option has its own WHEN phrase.

```
TABLE FILE CENTORD
HEADING
"Order Revenue"
" "
```

```
SUM ORDER_DATE LINEPRICE AS 'Order,Total:'
BY HIGHEST 5 ORDER_NUM
ON ORDER_NUM
   SUBFOOT
      "--- Order total is less than $200,000 ---"
      " "
      WHEN LINEPRICE LT 200000;
   SUBFOOT
      "+++ Order total is greater than or equal to $200,000 +++"
      " "
      WHEN LINEPRICE GE 200000;

ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The output is:

Order Revenue

| Order Number: | Date Of Order: | Order Total: |
|---|---|---|
| 94710 | 2001/01/02 | $406,964.24 |
| +++ Order total is greater than or equal to $200,000 +++ | | |
| 94680 | 2001/01/02 | $421,916.60 |
| +++ Order total is greater than or equal to $200,000 +++ | | |
| 94670 | 2001/01/02 | $513,868.76 |
| +++ Order total is greater than or equal to $200,000 +++ | | |
| 94550 | 2001/01/02 | $496,323.64 |
| +++ Order total is greater than or equal to $200,000 +++ | | |
| 94530 | 2001/01/02 | $3,472.41 |
| --- Order total is less than $200,000 --- | | |

# Controlling the Display of Empty Reports

If a report request returns no records (for example, because no records satisfy its selection criteria, or because the data source has no records), you can choose to display or print:

- **An empty report**, that is, the report without data but including column titles, a report heading (if one was specified in the report request), and a page heading (if one was specified).

  To do this, set the EMPTYREPORT parameter to ON.

- **A message** stating that there is no report output.

  This is the default. You can return to the default by setting the EMPTYREPORT parameter to OFF.

This applies to tabular reports, not to free-form reports and graphs.

SET EMPTYREPORT = OFF is not supported with DOC format.

If you have created a report that contains a WHERE TOTAL statement and the test yields zero records, an empty report will display.

# Control the Display of an Empty Report

You can control what is displayed (or printed) when a report request returns no records, using the EMPTYREPORT parameter. To issue the SET command:

**Outside** of a report request, use the syntax

```
SET EMPTYREPORT = {ANSI|ON|OFF}
```

**Within** a report request, use the syntax

```
ON TABLE SET EMPTYREPORT {ANSI|ON|OFF}
```

where:

**ANSI**

Produces a single-line report and displays the missing data character or a zero if a COUNT is requested. In each case, &RECORDS will be 0, and &LINES will be 1.

If the SQL Translator is invoked, ANSI automatically replaces OFF as the default setting for EMPTYREPORT.

**ON**

Specifies that the report will be displayed without data but with column titles, a report heading (if one was specified in the report request), and a page heading (if one was specified).

**OFF**

Specifies that a message will be displayed indicating that there is no report output. OFF is the default value.

# Controlling the Display of Empty Reports

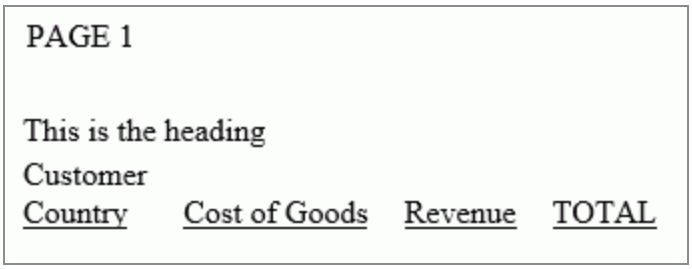
The following request does not retrieve any records and sets the EMPTYREPORT parameter to OFF.

```
SET EMPTYREPORT=OFF
TABLE FILE WF_RETAIL_LITE
HEADING
"This is the heading"
SUM COGS_US REVENUE_US COLUMN-TOTAL ROW-TOTAL
BY COUNTRY_NAME
WHERE COUNTRY_NAME EQ 'Louisiana'
FOOTING
"This is the footing"
ON TABLE SET STYLE *
GRID=OFF,$
END
```

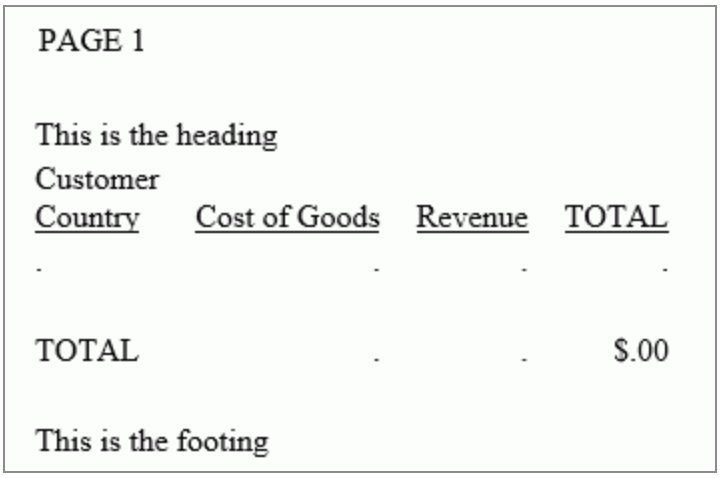
The following output is produced.

```
0 NUMBER OF RECORDS IN TABLE=        0  LINES=      0
```

Changing the EMPTYREPORT setting to ON produces the output shown in the following image.




Changing the EMPTYREPORT setting to ANSI produces the output shown in the following image.




# Formatting a Report Using Only StyleSheet Defaults

You can format a report using only default StyleSheet values. This does not permit you to specify specific formatting, and does not access a StyleSheet.

Each display format, such as HTML or PDF, has its own set of defaults. For example, HTML defaults to a proportional font, while PDF defaults to a monospace font. For information on the default value of a specific StyleSheet attribute, see the documentation for that attribute.

# Format a Report Using Only StyleSheet Defaults

To use only default StyleSheet values to format:

- **All report requests within a procedure.** Issue the following command at the beginning of the procedure.

```
SET STYLE[SHEET] = ON
```

- **One report request.** Issue the following command within the request.

```
ON TABLE SET STYLE[SHEET] ON
```

where:

**SHEET**

Can be omitted to make the command shorter, and has no effect on its behavior.

# Identifying a Report Component in a WebFOCUS StyleSheet

A report consists of several types of components, each of which you can identify in a StyleSheet in order to format it.

Report components are subject to StyleSheet inheritance. For details, see Creating and Managing a WebFOCUS StyleSheet.

For information about identifying components in a graph, see Creating a Graph.

Unless otherwise noted, all StyleSheet references in this chapter refer to WebFOCUS StyleSheets.

## Identifying an Entire Report, Column, or Row

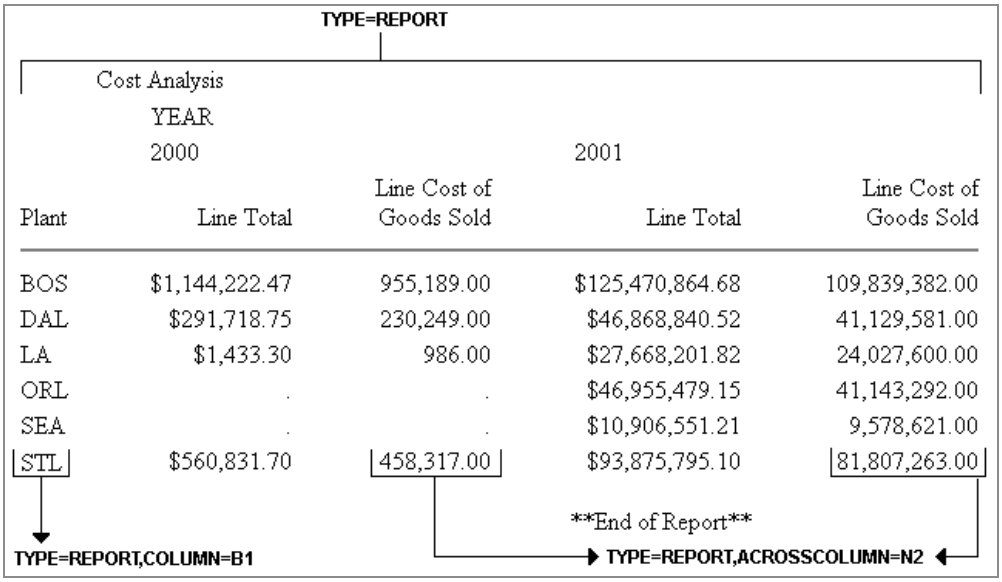
You can apply formatting to an:

- **Entire report**. For more information, see Identifying an Entire Report, Column, or Row.
- **Entire column** within a report, both its title and data (including ROW-TOTAL columns). For more information, see Identifying an Entire Report, Column, or Row.
- **Entire row** within a report, either an FML (Financial Modeling Language) row, or a total or subtotal row, comprising the labeling text and data of the row. For more information, see Identify an Entire Financial Modeling Language (FML) Row, and Identifying an Entire Report, Column, or Row.

  You can also identify an entire horizontal sort (ACROSS) title or value row in a StyleSheet, although each of these rows contains only a single kind of information. For details, see Identifying a Heading, Footing, Title, or FML Free Text.

The following illustrates where the REPORT component and the COLUMN and ACROSSCOLUMN attributes appear in a report, and which TYPE values you use to identify them. Although in this example the value for COLUMN is B1 and the value for ACROSSCOLUMN is N2, these are not the only values you can use to identify these components.

```
TABLE FILE CENTORD
SUM LINEPRICE LINE_COGS AS 'Line Cost of,Goods Sold'
BY PLANT AS 'Plant'
ACROSS YEAR
WHERE YEAR EQ 2000 or 2001
HEADING
"Cost Analysis"
FOOTING CENTER
"**End of Report**"
ON TABLE SET PAGE-NUM OFF
END
```




**Note:** Since this request simply illustrates where the components appear in a report, it omits a StyleSheet.

# Identify an Entire Report

To identify an entire report in a StyleSheet, use this attribute and value:

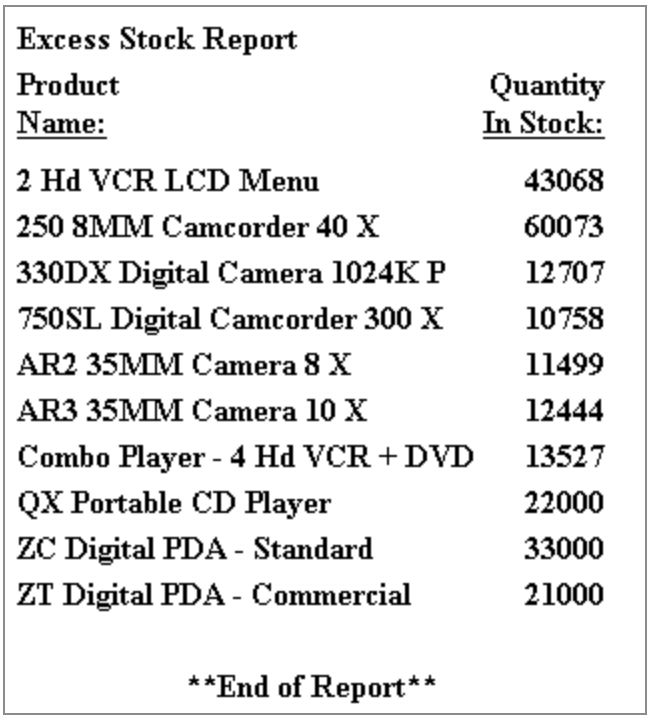
```
TYPE=REPORT
```

# Identifying an Entire Report

The following illustrates how to identify and apply formatting to an entire report. The relevant StyleSheet declarations are highlighted in the request.

```
TABLE FILE CENTINV
HEADING
"Excess Stock Report"
SUM QTY_IN_STOCK
BY PRODNAME
WHERE QTY_IN_STOCK GT 10000
FOOTING CENTER
"**End of Report**"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF,$
TYPE=REPORT, STYLE=BOLD,$
ENDSTYLE
END
```

The output is:



Excess Stock Report

| Product Name: | Quantity In Stock: |
|---|---|
| 2 Hd VCR LCD Menu | 43068 |
| 250 8MM Camcorder 40 X | 60073 |
| 330DX Digital Camera 1024K P | 12707 |
| 750SL Digital Camcorder 300 X | 10758 |
| AR2 35MM Camera 8 X | 11499 |
| AR3 35MM Camera 10 X | 12444 |
| Combo Player - 4 Hd VCR + DVD | 13527 |
| QX Portable CD Player | 22000 |
| ZC Digital PDA - Standard | 33000 |
| ZT Digital PDA - Commercial | 21000 |

**End of Report**

# Identify an Entire Column

```
TYPE=REPORT, coltype=column
```

where:

**coltype**

Specifies the type of column. It can be:

- **COLUMN,** which specifies a sort column (generated by BY), a display column (generated by PRINT, LIST, SUM, or COUNT), a computed column (generated by COMPUTE), or a column of row totals (generated by ROW-TOTAL).
- **ACROSSCOLUMN,** which specifies every instance of a column that is repeated across a horizontal sort (ACROSS) row. This also applies the formatting to the horizontal sort (ACROSS) values that appear above the column titles.

**column**

Specifies one or more columns. If you are identifying an ACROSSCOLUMN, the only valid identifiers are N*n* and P*n*, and these only count ACROSS fields, not display fields.

Options for identifying columns in a StyleSheet are:

| Identifier | Description |
|---|---|
| `Nn` | Identifies a column by its position in the report. To determine this value, count vertical sort (BY) fields, display fields, and ROW-TOTAL fields, from left to right, including NOPRINT fields. For ACROSSCOLUMN, only ACROSS fields are counted. |
| `Pn` | Identifies a column by its position in the report. To determine the value of *n*, count vertical sort (BY) fields, display fields, and ROW-TOTAL fields from left to right. Do not count NOPRINT fields. For ACROSSCOLUMN, only ACROSS fields are counted. |
| `Cn` | Identifies a display column by its position in the report. To determine the value of *n*, count only display fields from left to right, including NOPRINT fields. Do not count vertical sort (BY) |

| Identifier | Description |
|---|---|
| | fields or ROW-TOTAL fields.<br>To select all display fields use C*. |
| `Bn` | Identifies a vertical sort (BY) column by its position in the report. To determine the value of *n*, count only vertical sort (BY) fields, including NOPRINTs, from left to right.<br>To select all BY fields use B*. |
| `field` | Identifies a column by its field name.<br>When a field occurs more than once, use field(*n*) to select a particular occurrence or field(*) to select all occurrences of the field. |
| `ROWTOTAL` | Identifies a column of row totals generated using ROW-TOTAL. When used with ACROSS and multiple display commands, ROWTOTAL generates multiple total columns. Use ROWTOTAL(*n*) to select a particular total column. Use ROWTOTAL(*field*) to select the row total column for a particular field.<br>Use ROWTOTAL(*) to select all row total columns in the report. |

**Note:** Within a StyleSheet, all columns must be specified in the same way, either by field name or positional reference.

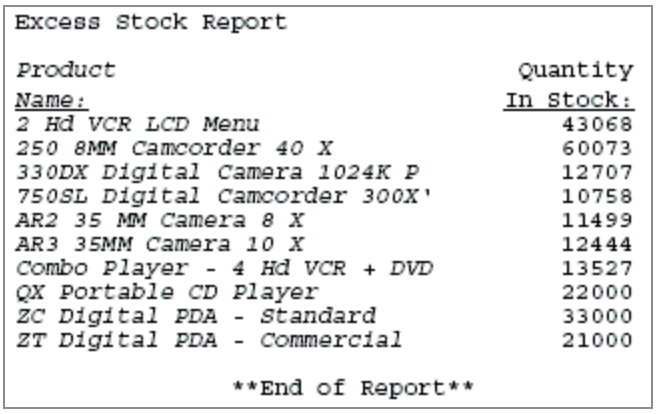
# Identifying an Entire Column

The following illustrates how to identify an entire column, which consists of the column data and the column title, in a report. The relevant StyleSheet declaration is highlighted in the request.

**Note:** To produce the same results you can, alternatively, use the values P1, B1, or the fieldname (PRODNAME) for the COLUMN attribute in the StyleSheet declaration.

```
TABLE FILE CENTINV
HEADING
"Excess Stock Report"
SUM QTY_IN_STOCK
BY PRODNAME
WHERE QTY_IN_STOCK GT 10000
FOOTING CENTER
"**End of Report**"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF,$
TYPE=REPORT, COLUMN=N1, STYLE=ITALIC,$
ENDSTYLE
END
```

The output is:



Excess Stock Report

| Product Name: | Quantity In Stock: |
|---|---|
| 2 Hd VCR LCD Menu | 43068 |
| 250 8MM Camcorder 40 X | 60073 |
| 330DX Digital Camera 1024K P | 12707 |
| 750SL Digital Camcorder 300X' | 10758 |
| AR2 35 MM Camera 8 X | 11499 |
| AR3 35MM Camera 10 X | 12444 |
| Combo Player - 4 Hd VCR + DVD | 13527 |
| QX Portable CD Player | 22000 |
| ZC Digital PDA - Standard | 33000 |
| ZT Digital PDA - Commercial | 21000 |

**End of Report**

# Identifying an Entire Horizontal (ACROSS) Column

The following illustrates how to identify a horizontal (ACROSS) column. When you identify and format an ACROSSCOLUMN, all data values, the column title, and any horizontal sort (ACROSS) values associated with the field are formatted for every instance of the column in the report output. The relevant StyleSheet declarations are highlighted in the request.

**Note:** To produce the same results you can alternatively use the values P1 and P2, respectively, for the ACROSSCOLUMN attribute.

```
TABLE FILE CENTORD
SUM LINEPRICE LINE_COGS AS 'Line Cost of,Goods Sold'
BY PLANT AS 'Plant'
```

```
ACROSS YEAR
WHERE YEAR EQ 2000 OR 2001
HEADING
"Cost Analysis"
FOOTING CENTER
"**End of Report**"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF,$
TYPE=REPORT, ACROSSCOLUMN=N1, STYLE=ITALIC,$
TYPE=REPORT, ACROSSCOLUMN=N2, STYLE=BOLD,$
ENDSTYLE
END
```

The output is:

```
Cost Analysis
     YEAR
     2000                                  2001
                          Line cost of                        Line cost of
Plant          Line Total   Goods Sold       Line Total        Goods Sold
-----------------------------------------------------------------------
BOS        $1,144,222.47   955,189.00   $125,470,864.68   109,839,382.00
DAL          $291,718.75   230,249.00    $46,868,840.52    41,129,581.00
LA             $1,433.30       986.00    $27,668,201.82    24,027,600.00
ORL                    .            .    $46,955,479.15    41,143,292.00
SEA                    .            .    $10,906,551.21     9,578,621.00
STL          $560,831.70   458,317.00    $93,875,795.10    81,807,263.00

                        **End of Report**
```

# Identify an Entire Financial Modeling Language (FML) Row

```
TYPE=REPORT, LABEL=label
```

where:

**label**

Is an explicit row label.

# Identifying an Entire FML Row

The following illustrates how to identify an entire FML row, consisting of the row label and the row data. The relevant StyleSheet declarations are highlighted in the request.

```
TABLE FILE LEDGER
SUM AMOUNT FOR ACCOUNT
1010 AS 'CASH ON HAND' LABEL COH OVER
1020 AS 'DEMAND DEPOSITS' LABEL DD OVER
1030 AS 'TIME DEPOSITS' LABEL TD OVER
BAR OVER
RECAP TOTCASH = R1 + R2 + R3; AS 'TOTAL CASH'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=REPORT, LABEL=COH, STYLE=ITALIC, $
TYPE=REPORT, LABEL=DD, STYLE=ITALIC, $
TYPE=REPORT, LABEL=TD, STYLE=ITALIC, $
ENDSTYLE
END
```

The output is:

| | AMOUNT |
|---|---|
| *CASH ON HAND* | *8,784* |
| *DEMAND DEPOSITS* | *4,494* |
| *TIME DEPOSITS* | *7,961* |
| TOTAL CASH | 21,239 |

# Identify an Entire Total or Subtotal Row

```
TYPE=type, [BY=sortcolumn]
```

where:

**type**

Identifies a subtotal or total. Select from:

GRANDTOTAL which is a grand total (generated by COLUMN-TOTAL, SUBTOTAL, SUB-TOTAL, RECOMPUTE, or SUMMARIZE).

SUBTOTAL which is a subtotal (generated by SUBTOTAL, SUB-TOTAL, RECOMPUTE, or SUMMARIZE).

RECAP which is a subtotal calculation (generated by ON *sortfield* RECAP or ON *sortfield* COMPUTE).

**BY**

When there are several subtotal commands, each associated with a different vertical sort (BY) column, this enables you to identify which of the subtotal commands you wish to format.

**sortcolumn**

Specifies the vertical sort (BY) column associated with one of the several subtotal in the report commands. Use the field name to identify the sort column.

# Identifying an Entire Total Row

The following illustrates how to identify an entire COLUMN-TOTAL row in a StyleSheet. The relevant StyleSheet declaration is highlighted in the request.

```
TABLE FILE SALES
SUM RETURNS DAMAGED AND ROW-TOTAL AND COLUMN-TOTAL
BY PROD_CODE
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=GRANDTOTAL, STYLE=BOLD, SIZE=12, $
ENDSTYLE
END
```

The output is:

| PROD_CODE | RETURNS | DAMAGED | TOTAL |
|---|---|---|---|
| B10 | 13 | 10 | 23 |
| B12 | 4 | 3 | 7 |
| B17 | 4 | 2 | 6 |
| B20 | 1 | 2 | 3 |
| C13 | 3 | 0 | 3 |
| C17 | 0 | 0 | 0 |
| C7 | 5 | 4 | 9 |
| D12 | 3 | 2 | 5 |
| E1 | 4 | 7 | 11 |
| E2 | 9 | 4 | 13 |
| E3 | 12 | 11 | 23 |
| **TOTAL** | **58** | **45** | **103** |

# Identifying a Row Total

The following illustrates how to identify a row total. The relevant StyleSheet declaration is highlighted in the request. Note that if you want to format an instance of row-total, you can add a WHEN statement to your StyleSheet. For details, see Controlling Report Formatting.

```
TABLE FILE SALES
SUM RETURNS DAMAGED AND ROW-TOTAL
BY PROD_CODE AS 'PRODUCT,CODE'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=REPORT, COLUMN=ROWTOTAL, STYLE=BOLD, $
ENDSTYLE
END
```

The output is:

| PRODUCT CODE | RETURNS | DAMAGED | TOTAL |
|---|---|---|---|
| B10 | 13 | 10 | **23** |
| B12 | 4 | 3 | **7** |
| B17 | 4 | 2 | **6** |
| B20 | 1 | 2 | **3** |
| C13 | 3 | 0 | **3** |
| C17 | 0 | 0 | **0** |
| C7 | 5 | 4 | **9** |
| D12 | 3 | 2 | **5** |
| E1 | 4 | 7 | **11** |
| E2 | 9 | 4 | **13** |
| E3 | 12 | 11 | **23** |

# Identifying Tags for SUBTOTAL and GRANDTOTAL Lines

The **tag** is the text that is displayed in the leftmost portion of each SUBTOTAL and GRANDTOTAL row in a report. The tag is used to identify the type of data represented within this row. The text used to generate this tag can be customized by adding an AS name to the SUBTOTAL syntax.

You can define styling for the subtotal and grand total tag separately from the rest of the row. Text attributes available for the tag, including font, color, size, and style, can be used to differentiate and highlight the tags. Additionally, styling can be applied that turns tags into drill-down links.

Styling is supported for text attributes only. Cell or column features, such as borders, background color, or justification are not supported.

This feature is available for PDF, DHTML, PS, HTML, AHTML, PPTX, XLSX, and EXL2K formats.

# Style Subtotal and Grand Total Tags

```
TYPE={SUBTOTAL|GRANDTOTAL}, OBJECT=TAG,
   [FONT=font], [SIZE=size], [STYLE=style],
   [COLOR={color|RGB({rgb|#hexcolor})],
   [drilltype=drillparms], $
```

where:

**font**

Is the name of the font.

**size**

Is the point size of the font.

**style**

Is the font style, for example bold, italic, or bold+italic.

**color**

Is a color name.

**rgb**

Specifies the font color using a mixture of red, green, and blue.

(r g b) is the desired intensity of red, green, and blue, respectively. The values are on a scale of 0 to 255, where 0 is the least intense and 255 is the most intense. Note that using the three color components in equal intensities results in shades of gray.

**#hexcolor**

Is the hexadecimal value for the color. For example, FF0000 is the hexadecimal value for red. The hexadecimal digits can be in uppercase or lowercase and must be preceded by a pound sign (#).

**drilltype**

Is any valid drill-down attribute, for example, URL= or FOCEXEC=. For more information about drill-down links, see Linking a Report to Other Resources.

**drillparms**

Are valid attribute values for the type of drill down.

# Styling SUBTOTAL and GRANDTOTAL Tags

The following request against the GGSALES data source generates subtotal and grand total rows. The tags for the subtotal rows are in italics and are white. The tag for the grand total row has a drill-down link to a URL:

```
TABLE FILE GGSALES
SUM UNITS/D8C DOLLARS/D12CM BUDUNIT/D8C BUDDOLLARS/D12CM
BY REGION
BY CATEGORY
ON REGION SUBTOTAL
HEADING
"Gotham Grinds Sales Report"
ON TABLE SET HTMLCSS ON
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET DROPBLNKLINE ALL
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
INCLUDE=IBFS:/FILE/IBI_HTML_DIR/javaassist/intl/EN/ENIADefault_combine.sty,$
TYPE=SUBTOTAL, OBJECT=TAG,STYLE=ITALIC,COLOR=WHITE,$
TYPE=GRANDTOTAL, BACKCOLOR='LIGHT GREY',$
TYPE=GRANDTOTAL, OBJECT=TAG,URL='http://www.informationbuilders.com',$
ENDSTYLE
END
```

The output is:

Gotham Grinds Sales Report

| Region | Category | Unit Sales | Dollar Sales | Budget Units | Budget Dollars |
|---|---|---|---|---|---|
| Midwest | Coffee | 332,777 | $4,178,513 | 335,526 | $4,086,032 |
| | Food | 341,414 | $4,338,271 | 339,263 | $4,220,721 |
| | Gifts | 230,854 | $2,883,881 | 232,318 | $2,887,620 |
| *TOTAL Midwest | | 905,045 | $11,400,665 | 907,107 | $11,194,373 |
| Northeast | Coffee | 335,778 | $4,164,017 | 335,920 | $4,252,462 |
| | Food | 353,368 | $4,379,994 | 351,431 | $4,453,907 |
| | Gifts | 227,529 | $2,848,289 | 227,008 | $2,870,552 |
| *TOTAL Northeast | | 916,675 | $11,392,300 | 914,359 | $11,576,921 |
| Southeast | Coffee | 350,948 | $4,415,408 | 355,693 | $4,431,429 |
| | Food | 349,829 | $4,308,731 | 351,509 | $4,409,288 |
| | Gifts | 234,455 | $2,986,240 | 235,045 | $2,967,254 |
| *TOTAL Southeast | | 935,232 | $11,710,379 | 942,247 | $11,807,971 |
| West | Coffee | 356,763 | $4,473,517 | 358,784 | $4,523,963 |
| | Food | 340,234 | $4,202,337 | 335,361 | $4,183,244 |
| | Gifts | 235,042 | $2,977,092 | 236,636 | $2,934,306 |
| *TOTAL West | | 932,039 | $11,652,946 | 930,781 | $11,641,513 |
| TOTAL | | 3,688,991 | $46,156,290 | 3,694,494 | $46,220,778 |

# Identifying Data

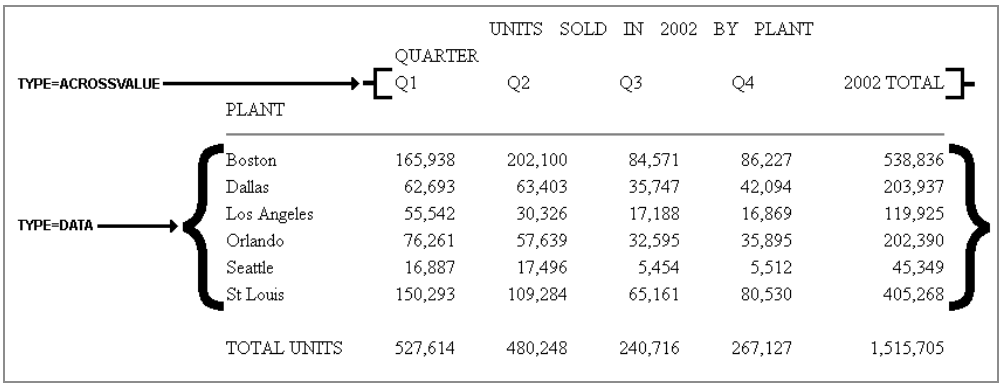
You can identify and format many categories of data in a report, including:

- **All of a report data**. For more information, see Identifying Data.
- **Columns of data**, including sort columns and display columns. For more information, see Identifying Data.
- **Sort rows** (that is, ACROSS field values). For more information, see Identify a Row of Horizontal Sort (ACROSS) Data.
- **Totals and subtotals**. For more information, see Identifying Data.

The following illustrates where the DATA and ACROSSVALUE components appear in a report, and which TYPE values you use to identify them.

```
TABLE FILE CENTORD
HEADING CENTER
"UNITS SOLD IN 2002 BY PLANT"
SUM QUANTITY AND ROW-TOTAL AS '2002 TOTAL'
ACROSS QUARTER
```

```
BY PLANTLNG AS 'PLANT'
WHERE YEAR EQ 2002
ON TABLE COLUMN-TOTAL AS 'TOTAL UNITS'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF,$
END
```




**Note:** Since this request simply illustrates where the components appear in a report, it omits a StyleSheet.

# Identify All Data

To identify all report data in a StyleSheet (except totals, grand totals, subtotals, and horizontal sort (ACROSS) values, which need to be identified separately) use this attribute and value:

```
TYPE = DATA
```

# Identifying All Data in a Report

The following illustrates how to identify all of the data in a report. The relevant StyleSheet declaration is highlighted in the request.

```
TABLE FILE CENTORD
HEADING CENTER
```

```
"UNITS SOLD IN 2002 BY PLANT"
SUM QUANTITY AND ROW-TOTAL AS '2002 TOTAL'
ACROSS QUARTER
BY PLANTLNG AS 'PLANT'
WHERE YEAR EQ 2002
ON TABLE COLUMN-TOTAL AS 'TOTAL UNITS'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=DATA, STYLE=BOLD, $
ENDSTYLE
END
```

The output is:

UNITS SOLD IN 2002 BY PLANT

| PLANT | QUARTER Q1 | Q2 | Q3 | Q4 | 2002 TOTAL |
|---|---|---|---|---|---|
| **Boston** | **165,938** | **202,100** | **84,571** | **86,227** | **538,836** |
| **Dallas** | **62,693** | **63,403** | **35,747** | **42,094** | **203,937** |
| **Los Angeles** | **55,542** | **30,326** | **17,188** | **16,869** | **119,925** |
| **Orlando** | **76,261** | **57,639** | **32,595** | **35,895** | **202,390** |
| **Seattle** | **16,887** | **17,496** | **5,454** | **5,512** | **45,349** |
| **St Louis** | **150,293** | **109,284** | **65,161** | **80,530** | **405,268** |
| TOTAL UNITS | 527,614 | 480,248 | 240,716 | 267,127 | 1,515,705 |

# Identify a Column of Data

```
TYPE=DATA, COLUMN=column
```

where:

**column**

Specifies one or more columns that you wish to format. For a list of values, see Identifying an Entire Report, Column, or Row.

# Identifying a Column of Data

The following illustrates how to identify a column of data. The relevant StyleSheet declaration is highlighted in the request.

Note that when identifying a column using N*n*, NOPRINT columns are counted. Even though the Product Name field is the first column in this report, it is identified with N2 because of the NOPRINT column.

```
TABLE FILE CENTORD
PRINT QUANTITY LINEPRICE LINE_COGS
BY ORDER_NUM NOPRINT
BY PRODNAME
WHERE ORDER_NUM EQ '48045'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF,$
TYPE=DATA, COLUMN=N2, STYLE=ITALIC,$
ENDSTYLE
END
```

The output is:

```
Cost Analysis
     YEAR
     2000                                    2001
                          Line cost of                          Line cost of
Plant          Line Total    Goods Sold       Line Total      Goods Sold
-------------------------------------------------------------------------
BOS        $1,144,222.47    955,189.00   $125,470,864.68  109,839,382.00
DAL          $291,718.75    230,249.00    $46,868,840.52   41,129,581.00
LA             $1,433.30       986.00    $27,668,201.82   24,027,600.00
ORL                    .            .    $46,955,479.15   41,143,292.00
SEA                    .            .    $10,906,551.21    9,578,621.00
STL          $560,831.70    458,317.00    $93,875,795.10   81,807,263.00

                        **End of Report**
```

# Identify a Row of Horizontal Sort (ACROSS) Data

```
TYPE=ACROSSVALUE, [ACROSS={fieldname|{N|A}n}]
```

where:

**ACROSS**

If you have a request with multiple ACROSS fields, you can identify each field using the ACROSS identifier. You only need to include the ACROSS identifier if you have multiple ACROSS fields in your request.

**fieldname**

Specifies a horizontal sort row by its field name.

**n**

Specifies a horizontal sort row by its position in the sequence of horizontal sort rows. Cannot be combined with a field name specification in the same StyleSheet.

# Identifying a Row of Horizontal Sort (ACROSS) Data

The following illustrates how to identify a row of horizontal sort data. The relevant StyleSheet declaration is highlighted in the request.

```
TABLE FILE CENTORD
HEADING
"Units Sold"
SUM QUANTITY
BY PRODNAME
ACROSS PLANT AS 'Manufacturing Plant'
WHERE PRODTYPE EQ 'Digital'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=HEADING, SIZE=12, $
TYPE=ACROSSVALUE, ACROSS=PLANT, STYLE=BOLD, $
ENDSTYLE
END
```

The output is:

Units Sold

| Product Name: | Manufacturing Plant BOS | DAL | LA | ORL | SEA | STL |
|---|---|---|---|---|---|---|
| 330DX Digital Camera 1024K P | 3,949 | 2,767 | 562 | 561 | 2 | 1,132 |
| 650DL Digital Camcorder 150 X | 44,930 | 14,548 | 7,995 | 17,972 | 4,967 | 31,436 |
| 750SL Digital Camcorder 300 X | 4,098 | 2 | 6 | 283 | 642 | 1,644 |
| Combo Player - 4 Hd VCR + DVD | 27,687 | 15,985 | 9,634 | 13,816 | 2,359 | 22,097 |
| DVD Upgrade Unit for Cent. VCR | 47,112 | 25,602 | 16,152 | 23,429 | 4,539 | 32,875 |
| QX Portable CD Player | 108,696 | 35,355 | 26,215 | 46,388 | 8,056 | 83,564 |
| R5 Micro Digital Tape Recorder | 188,384 | 73,255 | 41,169 | 63,120 | 15,385 | 142,714 |
| ZC Digital PDA - Standard | 45,890 | 13,154 | 4,664 | 10,249 | 6,439 | 30,213 |
| ZT Digital PDA - Commercial | 181,750 | 70,111 | 41,149 | 61,244 | 15,039 | 130,942 |

**Note:** To produce the same results you can alternatively use the value N1 for the ACROSS attribute in the StyleSheet declaration. For example, TYPE=ACROSSVALUE, ACROSS=N1, STYLE=BOLD, $.

# Identifying Row Totals (ACROSS-TOTAL) for Horizontal Sort Data

The following illustrates how to identify a row total (ACROSS-TOTAL) for horizontal sort (ACROSS) data using the ACROSSVALUE component and a numeric column reference (N*n*). The relevant StyleSheet declaration is highlighted in the request.

```
TABLE FILE CENTORD
SUM QUANTITY
BY PRODNAME
ACROSS PLANT AS 'Manufacturing Plant'
ACROSS-TOTAL AS 'Plant Totals'
WHERE PRODTYPE EQ 'Digital'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
```

```
TYPE=ACROSSVALUE, COLUMN=N8, STYLE=ITALIC, COLOR='RED', $
ENDSTYLE
END
```

The following image shows the output with the ACROSS-TOTAL value, Plant Totals, styled in red italics.

| | Manufacturing Plant | | | | | | |
|---|---|---|---|---|---|---|---|
| Product Name: | BOS | DAL | LA | ORL | SEA | STL | *Plant Totals* |
| 330DX Digital Camera 1024K P | 3,949 | 2,767 | 562 | 561 | 2 | 1,132 | 8,973 |
| 650DL Digital Camcorder 150 X | 44,930 | 14,548 | 7,995 | 17,972 | 4,967 | 31,436 | 121,848 |
| 750SL Digital Camcorder 300 X | 4,098 | 2 | 6 | 283 | 642 | 1,644 | 6,675 |
| Combo Player - 4 Hd VCR + DVD | 27,687 | 15,985 | 9,634 | 13,816 | 2,359 | 22,097 | 91,578 |
| DVD Upgrade Unit for Cent. VCR | 47,112 | 25,602 | 16,152 | 23,429 | 4,539 | 32,875 | 149,709 |
| QX Portable CD Player | 108,696 | 35,355 | 26,215 | 46,388 | 8,056 | 83,564 | 308,274 |
| R5 Micro Digital Tape Recorder | 188,384 | 73,255 | 41,169 | 63,120 | 15,385 | 142,714 | 524,027 |
| ZC Digital PDA - Standard | 45,890 | 13,154 | 4,664 | 10,249 | 6,439 | 30,213 | 110,609 |
| ZT Digital PDA - Commercial | 181,750 | 70,111 | 41,149 | 61,244 | 15,039 | 130,942 | 500,235 |

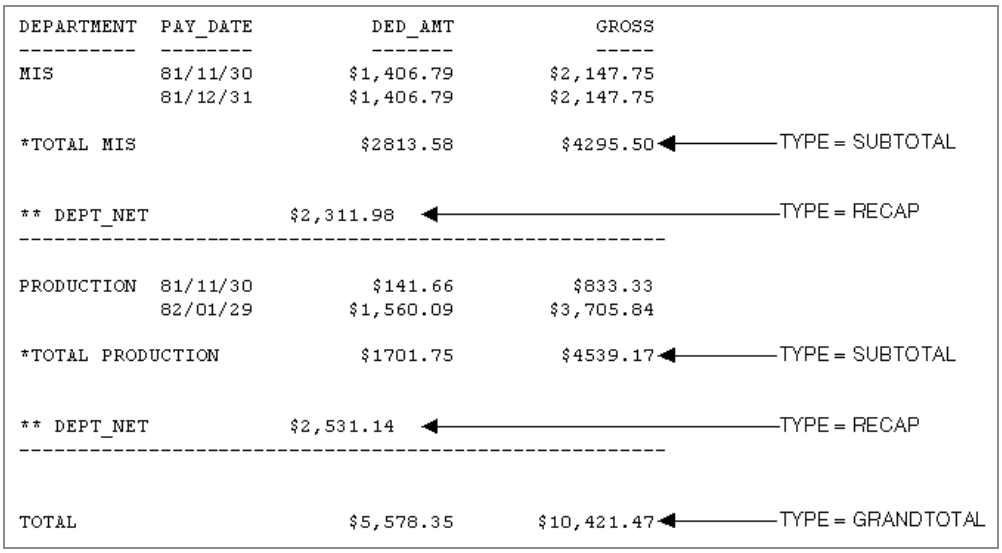
# Identifying Totals and Subtotals

Within a StyleSheet, you can identify the grand totals, subtotals, subtotal calculations (generated by ON *sortfield* RECAP or ON *sortfield* COMPUTE), column totals, and row totals of a report in order to format them. For details on identifying row totals, see Identifying an Entire Report, Column, or Row.

The following example illustrates where these components are in a report, and which TYPE values you use to identify them.

```
TABLE FILE EMPLOYEE
SUM DED_AMT AND GROSS
BY DEPARTMENT BY PAY_DATE
ON DEPARTMENT RECAP DEPT_NET/D8.2M = GROSS-DED_AMT;
WHEN PAY_DATE GT 820101
ON DEPARTMENT SUBTOTAL
END
```

The following figure shows each component:




**Note:** Since this request simply illustrates how to identify different types of totals and subtotals, it omits a StyleSheet.

# Identify a Grand Total, Subtotal, or Subtotal Calculation

```
TYPE=type, [BY=sortfield] [coltype=column]
```

where:

**type**

Identifies a subtotal or total. Select from:

GRANDTOTAL which is a grand total (generated by COLUMN-TOTAL, SUBTOTAL, SUB-TOTAL, RECOMPUTE, or SUMMARIZE). See Identifying a Grand TotalThe following illustrates how to identify a grand total in a report request. In this example, we only want to format the grand total value for the LINE_COGS field, so the COLUMN attribute is included in the StyleSheet declaration. The grand total in this request is generated by COLUMN-TOTAL. The relevant StyleSheet declaration is highlighted in the request. Note:To style the entire grand total row, remove the COLUMN attribute from the StyleSheet declaration. To produce the same results you can alternatively use the values N5, P5, or C3 for the COLUMN attribute in the StyleSheet declaration.TABLE FILE

CENTORD SUM QUANTITY LINEPRICE LINE_COGS AND COLUMN-TOTAL BY ORDER_NUM BY PRODNAME WHERE ORDER_NUM EQ '48053' OR '48798' ON TABLE SET PAGE-NUM OFF ON TABLE SET STYLE * TYPE=REPORT, GRID=OFF,$ TYPE=GRANDTOTAL, COLUMN=LINE_COGS, STYLE=BOLD, SIZE=11,$ ENDSTYLE ENDThe output is: for an example.

SUBTOTAL which is a subtotal (generated by SUBTOTAL, SUB-TOTAL, RECOMPUTE, or SUMMARIZE). See Identifying SubtotalsThe following illustrates how to identify subtotals in a report request. In this example, only subtotal values in the QUANTITY and LINE_COGS fields are formatted, so the COLUMN attribute is included in the StyleSheet declarations.Also, since there are two SUBTOTAL commands associated with two of the three BY fields (PLANT and ORDER_NO), the BY attribute is also included in each declaration to ensure the formatting is applied to the correct value. The relevant StyleSheet declarations are highlighted in the request. Note:To style an entire subtotal row, remove the COLUMN and BY attributes from the StyleSheet declaration.To produce the same results you can, alternatively, use the values COLUMN=N6, COLUMN=P6, or COLUMN=C3 for the COLUMN=LINE_COGS attribute.To produce the same results you can, alternatively, use the values COLUMN=N4, COLUMN=P4, or COLUMN=C1 for the COLUMN=QUANTITY attribute.TABLE FILE CENTORD SUM QUANTITY LINEPRICE LINE_COGS AS 'Line Cost of, Goods Sold' BY PLANT BY ORDER_NUM BY PRODNAME ON PLANT SUBTOTAL ON ORDER_NUM SUBTOTAL WHERE ORDER_NUM EQ '35774' OR '48041' WHERE PLANT EQ 'BOS' ON TABLE SET PAGE-NUM OFF ON TABLE SET STYLE * TYPE=REPORT, GRID=OFF,$ TYPE=SUBTOTAL, BY=PLANT, COLUMN=LINE_COGS, STYLE=BOLD+ITALIC, COLOR=BLUE,$ TYPE=SUBTOTAL, BY=ORDER_NUM, COLUMN=QUANTITY, STYLE=BOLD, SIZE=11,$ ENDSTYLE ENDThe output is: for an example.

RECAP which is a subtotal calculation (generated by ON *sortfield* RECAP or ON *sortfield* COMPUTE). See Identifying a Subtotal Calculation (RECAP/COMPUTE) for an example.

**BY**

If you have a request with multiple BY fields, and two or more have subtotal commands associated with them, you can identify each field using the BY identifier. This is helpful when you want to format each subtotal differently or when you want to format only one subtotal.

You only need to include the BY identifier if you have multiple BY fields in your request.

**sortfield**

Specifies the BY field associated with several subtotal commands of a report. Use the fieldname for the value (BY=*fieldname*).

**coltype**

Identifies a specific column to apply formatting. When you include the COLUMN or ACROSSCOLUMN identifier in your declaration, only the subtotal *values* receive the formatting, the labeling text will not. Values can be:

`COLUMN` which is a display column (generated by PRINT, LIST, SUM, or COUNT) or a computed column (generated by COMPUTE).

`ACROSSCOLUMN` where every instance of a display or computed column is repeated across a horizontal sort (ACROSS) row.

If there are several columns being totaled or subtotaled by one command, and you do not specify a column in the StyleSheet, the formatting will be applied to the totals or subtotals for *all* of the columns. It will also be applied to the labeling text for the total and subtotal values.

**column**

Specifies the column whose totals or subtotals you wish to format. For a list of values, see Identifying an Entire Report, Column, or Row.

# Identifying a Grand Total

The following illustrates how to identify a grand total in a report request. In this example, we only want to format the grand total value for the LINE_COGS field, so the COLUMN attribute is included in the StyleSheet declaration. The grand total in this request is generated by COLUMN-TOTAL. The relevant StyleSheet declaration is highlighted in the request.

**Note:**

- To style the entire grand total row, remove the COLUMN attribute from the StyleSheet declaration.
- To produce the same results you can alternatively use the values N5, P5, or C3 for the COLUMN attribute in the StyleSheet declaration.

```
TABLE FILE CENTORD
SUM QUANTITY LINEPRICE LINE_COGS AND COLUMN-TOTAL
BY ORDER_NUM BY PRODNAME
WHERE ORDER_NUM EQ '48053' OR '48798'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF,$
TYPE=GRANDTOTAL, COLUMN=LINE_COGS, STYLE=BOLD, SIZE=11,$
ENDSTYLE
END
```

The output is:

| Order Number: | Product Name: | Quantity: | Line Total | Line Cost Of Goods Sold |
|---|---|---|---|---|
| 48053 | 150 8MM Camcorder 20 X | 1 | $338.28 | 240.00 |
| | Combo Player - 4 Hd VCR + DVD | 1 | $415.73 | 289.00 |
| | DVD Upgrade Unit for Cent. VCR | 1 | $210.42 | 139.00 |
| | R5 Micro Digital Tape Recorder | 1 | $88.52 | 69.00 |
| | ZT Digital PDA - Commercial | 1 | $523.75 | 349.00 |
| 48798 | 150 8MM Camcorder 20 X | 1 | $319.89 | 240.00 |
| | Combo Player - 4 Hd VCR + DVD | 1 | $418.26 | 289.00 |
| | DVD Upgrade Unit for Cent. VCR | 1 | $200.63 | 139.00 |
| | R5 Micro Digital Tape Recorder | 1 | $92.09 | 69.00 |
| | ZT Digital PDA - Commercial | 1 | $483.52 | 349.00 |
| TOTAL | | 10 | $3,091.09 | **2,172.00** |

# Identifying Subtotals

The following illustrates how to identify subtotals in a report request. In this example, only subtotal values in the QUANTITY and LINE_COGS fields are formatted, so the COLUMN attribute is included in the StyleSheet declarations.

Also, since there are two SUBTOTAL commands associated with two of the three BY fields (PLANT and ORDER_NO), the BY attribute is also included in each declaration to ensure the formatting is applied to the correct value. The relevant StyleSheet declarations are highlighted in the request.

**Note:**

- To style an entire subtotal row, remove the COLUMN and BY attributes from the

StyleSheet declaration.

- To produce the same results you can, alternatively, use the values COLUMN=N6, COLUMN=P6, or COLUMN=C3 for the COLUMN=LINE_COGS attribute.
- To produce the same results you can, alternatively, use the values COLUMN=N4, COLUMN=P4, or COLUMN=C1 for the COLUMN=QUANTITY attribute.

```
TABLE FILE CENTORD
SUM QUANTITY LINEPRICE LINE_COGS AS 'Line Cost of, Goods Sold'
BY PLANT
BY ORDER_NUM
BY PRODNAME
ON PLANT SUBTOTAL
ON ORDER_NUM SUBTOTAL
WHERE ORDER_NUM EQ '35774' OR '48041'
WHERE PLANT EQ 'BOS'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF,$
TYPE=SUBTOTAL, BY=PLANT, COLUMN=LINE_COGS, STYLE=BOLD+ITALIC,
    COLOR=BLUE,$
TYPE=SUBTOTAL, BY=ORDER_NUM, COLUMN=QUANTITY, STYLE=BOLD, SIZE=11,$
ENDSTYLE
END
```

The output is:

| Manufacturing Plant | Order Number: | Product Name: | Quantity: | Line Total | Line Cost of Goods Sold |
|---|---|---|---|---|---|
| BOS | 35774 | 110 VHS-C Camcorder 20 X | 146 | $38,817.56 | 36,354.00 |
| | | 120 VHS-C Camcorder 40 X | 146 | $40,426.90 | 37,814.00 |
| | | 2 Hd VCR LCD Menu | 279 | $39,693.32 | 35,991.00 |
| | | 650DL Digital Camcorder 150 X | 146 | $116,907.15 | 103,660.00 |
| *TOTAL ORDER_NUM 35774 | | | **717** | $235,844.93 | 213,819.00 |
| | 48041 | 150 8MM Camcorder 20 X | 1 | $307.43 | 240.00 |
| | | Combo Player - 4 Hd VCR + DVD | 1 | $398.95 | 289.00 |
| | | DVD Upgrade Unit for Cent. VCR | 1 | $194.40 | 139.00 |
| | | R5 Micro Digital Tape Recorder | 1 | $93.91 | 69.00 |
| | | ZT Digital PDA - Commercial | 1 | $528.38 | 349.00 |
| *TOTAL ORDER_NUM 48041 | | | **5** | $1,523.07 | 1,086.00 |
| *TOTAL PLANT BOS | | | 722 | $237,368.00 | ***214,905.00*** |
| TOTAL | | | 722 | $237,368.00 | 214,905.00 |

# Identifying a Subtotal Calculation (RECAP/COMPUTE)

The following illustrates how to identify a subtotal calculation created with a RECAP or COMPUTE phrase. In this example, the subtotal calculation is generated with ON PLANT RECAP QTY/F6=QUANTITY. The relevant StyleSheet declaration is highlighted in the request.

**Note:** If there is more than one RECAP or COMPUTE field in your request, you can distinguish them by adding BY=*fieldname* to the StyleSheet declaration.

```
TABLE FILE CENTORD
SUM QUANTITY LINEPRICE LINE_COGS AS 'Line Cost of, Goods Sold'
BY PLANT BY ORDER_NUM
ON PLANT RECAP QTY/F6=QUANTITY;
WHERE PLANT EQ 'BOS'
WHERE ORDER_NUM LT '56098'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=RECAP, STYLE=BOLD+ITALIC, $
ENDSTYLE
END
```

The output is:

| Manufacturing Plant | Order Number | Quantity | Line Total | Line Cost of Goods Sold |
|---|---|---|---|---|
| BOS | 28004 | 6 | $2,023.62 | 1,395.00 |
| | 28011 | 597 | $125,556.08 | 125,306.00 |
| | 28024 | 597 | $144,012.51 | 125,306.00 |
| | 28035 | 5 | $1,541.26 | 986.00 |
| | 28036 | 542 | $129,859.27 | 109,331.00 |
| | 28037 | 675 | $166,729.48 | 135,574.00 |
| | 28040 | 5 | $1,659.77 | 1,086.00 |
| | 28041 | 5 | $1,642.86 | 1,086.00 |
| | 28042 | 5 | $1,724.17 | 1,086.00 |
| | 28043 | 4 | $2,020.11 | 1,347.00 |
| | 28045 | 1,142 | $260,105.24 | 227,651.00 |

** QTY 655661

# Identifying a Heading, Footing, Title, or FML Free Text

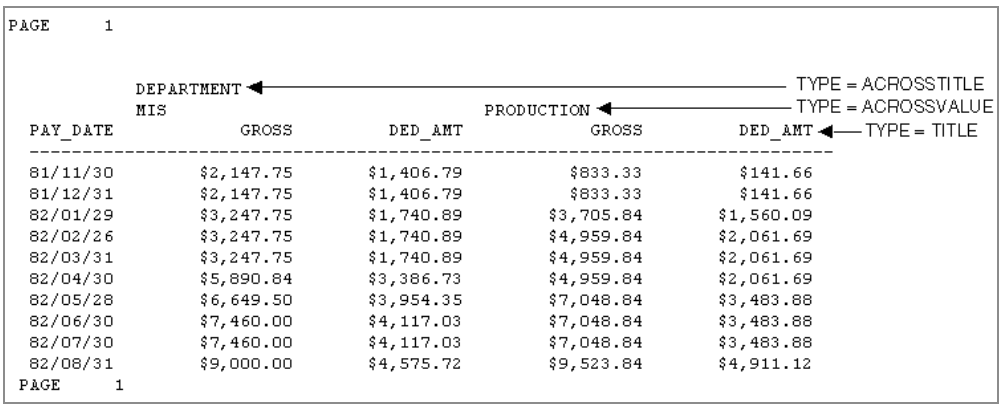
A report data is framed by headings, footings, and titles. These provide context for the data. You can identify and format many categories of headings, footings, and titles in a report, including:

- Report, page, and sort headings.
- Report, page, and sort footings.
- Column titles.
- Horizontal sort (ACROSS) titles and values.
- Free text in Financial Modeling Language (FML) reports.

# Identifying a Column or Row Title

Within a StyleSheet you can identify column titles and horizontal sort (ACROSS) values of a report in order to format them. The following example illustrates where column titles and horizontal sort values are in a report, and which TYPE values you use to identify them.

```
TABLE FILE EMPLOYEE
SUM GROSS AND DED_AMT
ACROSS DEPARTMENT BY PAY_DATE
END
```




**Note:** Since this request simply illustrates how to identify column titles and horizontal sort values in a report, it omits a StyleSheet.

# Identify a Column Title

```
TYPE=TITLE, [COLUMN=column]
```

where:

**COLUMN**

Is used to specify one or more column titles. If you omit this attribute and value, the formatting will be applied to all of the report column titles.

**column**

Specifies the column whose title you wish to format. For column values, see Identifying an Entire Report, Column, or Row.

# Identify a Horizontal Sort Title or Value

```
TYPE={ACROSSTITLE|ACROSSVALUE}, [ACROSS=column]
```

where:

**ACROSSTITLE**

Specifies a horizontal sort (ACROSS) title.

**ACROSSVALUE**

Specifies a horizontal sort (ACROSS) value.

Although horizontal sort values are not technically titles, they often function as titles that categorize the column titles appearing beneath them.

**ACROSS**

Is used to specify titles or values for a specific horizontal sort field. If you omit this attribute and value, the formatting will be applied to the titles or values of the horizontal sort fields of all reports.

**column**

Specifies the horizontal sort (ACROSS) field whose title or values you wish to format. For values you can assign to this attribute, see Identify a Row of Horizontal Sort (ACROSS) Data.

# Identifying Column Titles and Horizontal Sort (ACROSS) Values

This example illustrates how to identify vertical sort titles, horizontal sort titles, and horizontal sort values. The vertical sort titles (TYPE=TITLE) are Manufacturing Plant,

Quantity Sold and Product Cost, the horizontal sort title (TYPE=ACROSSTITLE) is Year, and the horizontal sort values (TYPE=ACROSSVALUE) are 2001, 2002, and TOTAL.

The following also demonstrates how to assign drill-down values to the individual ACROSS values of 2001 and 2002, and not the ROW-TOTAL value of TOTAL. The StyleSheet declarations in this request are shown in bold.

```
TABLE FILE CENTORD
SUM QUANTITY AS 'Quantity,Sold' LINE_COGS/I9 AS 'Product,Cost'
BY PLANT
ACROSS YEAR
WHERE YEAR EQ '2001' OR '2002'
HEADING
"Plant Production Cost Analysis"
ON TABLE ROW-TOTAL AS 'TOTAL'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF,$
TYPE=TITLE, STYLE=BOLD, $
TYPE=ACROSSTITLE, STYLE=BOLD, $
TYPE=ACROSSVALUE, STYLE=BOLD+ITALIC, COLOR=BLUE, FOCEXEC=DETAILS, $
TYPE=ACROSSVALUE, COLUMN=N4, STYLE=BOLD, COLOR=RED, $
TYPE=ACROSSVALUE, COLUMN=ROWTOTAL(1), COLOR='BLACK',FOCEXEC=NONE, $
ENDSTYLE
END
```

The following image shows the report output.

Plant Production Cost Analysis

| | YEAR | | | | | |
|---|---|---|---|---|---|---|
| | 2001 | | 2002 | | TOTAL | |
| Manufacturing Plant | Quantity Sold | Product Cost | Quantity Sold | Product Cost | Quantity Sold | Product Cost |
| BOS | 491,080 | 109839382 | 538,836 | 120518527 | 1,029,916 | 230357909 |
| DAL | 185,785 | 41129581 | 203,937 | 45147907 | 389,722 | 86277488 |
| LA | 109,326 | 24027600 | 119,925 | 26356066 | 229,251 | 50383666 |
| ORL | 184,519 | 41143292 | 202,390 | 45127226 | 386,909 | 86270518 |
| SEA | 41,331 | 9578621 | 45,349 | 10510177 | 86,680 | 20088798 |
| STL | 369,456 | 81807263 | 405,268 | 89734521 | 774,724 | 171541784 |

# Identify Free Text in an FML Report

```
TYPE=FREETEXT, LABEL={Rn|label}
```

where:

**n**

Is an implicit row label. To determine the value of *n*, count the number of rows up to and including the desired row.

**label**

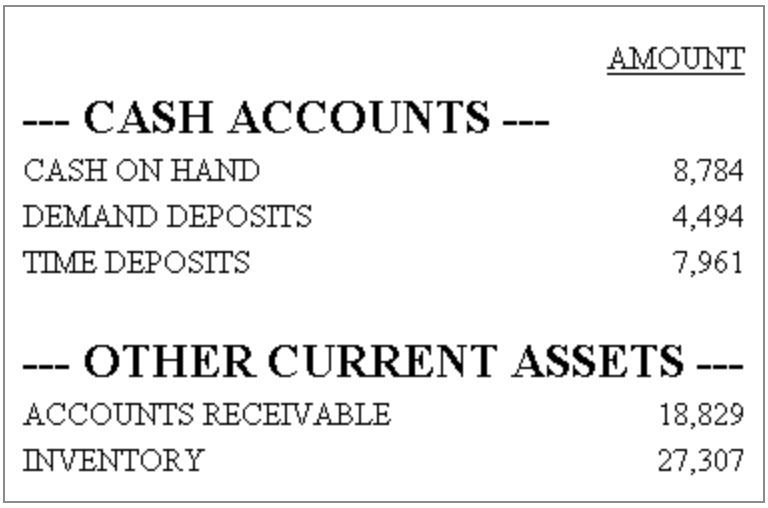
Is an explicit row label.

# Identifying Free Text in an FML Report

The following illustrates how to identify free text in an FML report. In this example, the free text are the rows "CASH ACCOUNTS" and "OTHER CURRENT ASSETS". The relevant StyleSheet declarations are displayed in bold.

```
TABLE FILE LEDGER
SUM AMOUNT FOR ACCOUNT
" --- CASH ACCOUNTS ---" LABEL CA            OVER
1010 AS 'CASH ON HAND'                        OVER
1020 AS 'DEMAND DEPOSITS'                     OVER
1030 AS 'TIME DEPOSITS'                       OVER
" "                                           OVER
" --- OTHER CURRENT ASSETS ---" LABEL OCA    OVER
1100 AS 'ACCOUNTS RECEIVABLE'                 OVER
1200 AS 'INVENTORY'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=FREETEXT, LABEL=CA, STYLE=BOLD, SIZE=12, $
TYPE=FREETEXT, LABEL=OCA, STYLE=BOLD, SIZE=12, $
ENDSTYLE
END
```

The output is:



| | AMOUNT |
|---|---|
| **--- CASH ACCOUNTS ---** | |
| CASH ON HAND | 8,784 |
| DEMAND DEPOSITS | 4,494 |
| TIME DEPOSITS | 7,961 |
| **--- OTHER CURRENT ASSETS ---** | |
| ACCOUNTS RECEIVABLE | 18,829 |
| INVENTORY | 27,307 |

# Identifying a Heading or Footing

Within a StyleSheet you can identify a report headings and footings, and the individual lines, text strings, and fields within them, in order to format them.

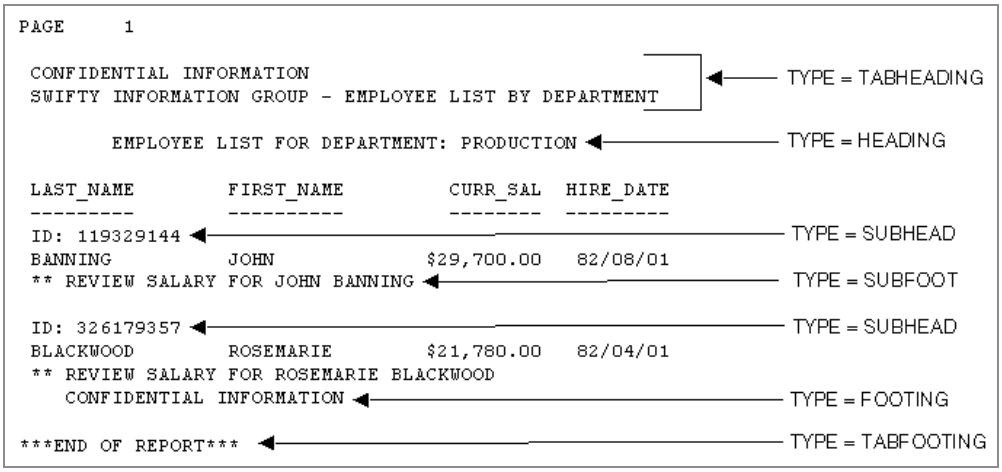
A TABLE request can have more than one page heading or footing. For each heading or footing, a WHEN clause against the data being retrieved can determine whether the heading or footing displays on the report output. The CONDITION StyleSheet attribute enables you to identify a specific WHEN clause so that you can style each heading or footing separately.

The following code and output examples illustrate where a report heading (TABHEADING), a page heading (HEADING), a sort heading (SUBHEAD), a sort footing (SUBFOOT), and a report footing (TABFOOTING) are in a report, and which TYPE values you use to identify them.

```
TABLE FILE EMPLOYEE
PRINT CURR_SAL HIRE_DATE
BY LAST_NAME
BY FIRST_NAME
ON TABLE SUBHEAD
"CONFIDENTIAL INFORMATION"
"SWIFTY INFORMATION GROUP - EMPLOYEE LIST BY DEPARTMENT"
HEADING CENTER
"</1>EMPLOYEE LIST FOR DEPARTMENT: <DEPARTMENT"
ON LAST_NAME SUBHEAD
"ID: <EMP_ID"
```

```
ON LAST_NAME SUBFOOT
"** REVIEW SALARY FOR <FIRST_NAME <LAST_NAME"
FOOTING
"CONFIDENTIAL INFORMATION"
ON TABLE SUBFOOT
"</1>***END OF REPORT***"
ON TABLE SET ONLINE-FMT STANDARD
END
```

The following output goes with the previous code example:




**Note:** Since this request simply illustrates how to identify different types of headings and footings, it omits a StyleSheet.

# Identify a Heading or Footing

```
TYPE=headfoot, [BY=sortcolumn]
```

where:

**headfoot**

Identifies a heading or footing. Select from:

- **TABHEADING,** which is a report heading. This appears once at the beginning of the report and is generated by ON TABLE SUBHEAD.

- **TABFOOTING**, which is a report footing. This appears once at the end of the report and is generated by ON TABLE SUBFOOT.
- **HEADING,** which is a page heading. This appears at the top of every report page and is generated by HEADING.
- **FOOTING,** which is a page footing. This appears at the bottom of every report page and is generated by FOOTING.
- **SUBHEAD,** which is a sort heading. This appears at the beginning of a vertical (BY) sort group (generated by ON *sortfield* SUBHEAD).
- **SUBFOOT,** which is a sort footing. This appears at the end of a vertical (BY) sort group (generated by ON *sortfield* SUBFOOT).

**BY**

When there are several sort headings or sort footings, each associated with a different vertical sort (BY) column, this enables you to identify which sort heading or sort footing you wish to format.

If there are several sort headings or sort footings associated with different vertical sort (BY) columns, and you omit this attribute and value, the formatting will be applied to all of the sort headings or footings.

**sortcolumn**

Specifies the vertical sort (BY) column associated with one of the report sort headings or sort footings.

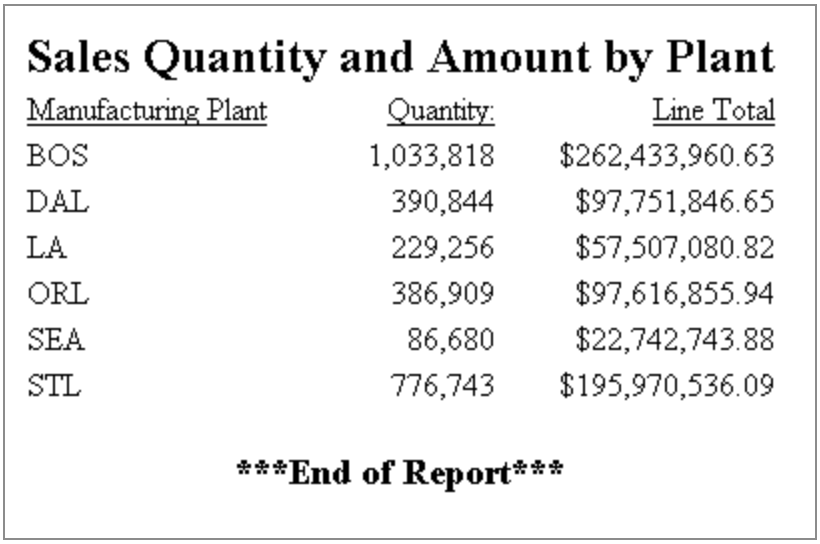
# Identifying a Page Heading and a Report Footing

The following illustrates how to identify a page heading, which appears at the top of every report page, and a report footing, which appears only on the last page of the report. The relevant StyleSheet declarations are highlighted in the request.

```
TABLE FILE CENTORD
HEADING
"Sales Quantity and Amount by Plant"
SUM QUANTITY LINEPRICE
BY PLANT
ON TABLE SUBFOOT
```

```
" "
"***End of Report***"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=HEADING, FONT=TIMES, SIZE=12, STYLE=BOLD,$
TYPE=TABFOOTING, JUSTIFY=CENTER, STYLE=BOLD, SIZE=11,$
ENDSTYLE
END
```

The output is:



**Sales Quantity and Amount by Plant**

| Manufacturing Plant | Quantity: | Line Total |
|---|---|---|
| BOS | 1,033,818 | $262,433,960.63 |
| DAL | 390,844 | $97,751,846.65 |
| LA | 229,256 | $57,507,080.82 |
| ORL | 386,909 | $97,616,855.94 |
| SEA | 86,680 | $22,742,743.88 |
| STL | 776,743 | $195,970,536.09 |

*****End of Report*****

# Identify an Individual Line in a Heading or Footing

```
TYPE=type, LINE=line_#
```

where:

**type**

Identifies a type of heading or footing. Select from HEADING, FOOTING, TABHEADING, TABFOOTING, SUBHEAD, or SUBFOOT. For details, see Identifying a Heading, Footing,

Title, or FML Free Text.

**line_#**

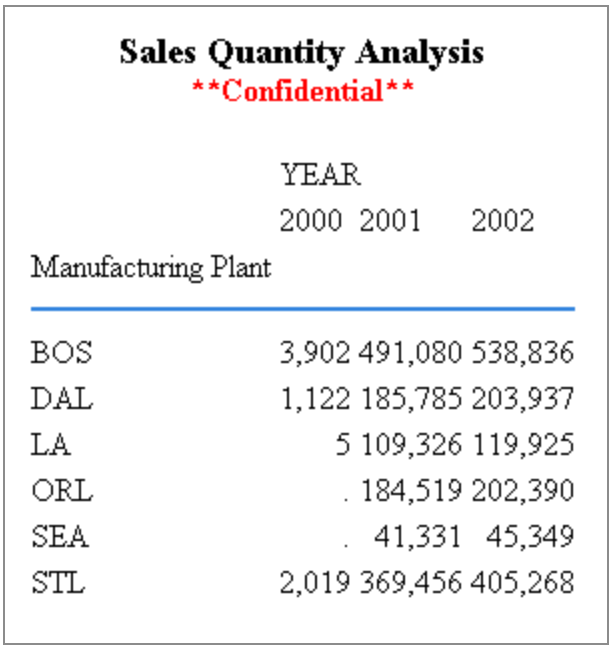
Identifies a line by its position in the heading or footing.

# Identifying an Individual Line in a Heading

The following example illustrates how to format individual lines in a heading. Heading line 1 (Sales Quantity Analysis) is formatted in bold, point-size 11. Heading line 2 (**Confidential**) is formatted in bold and red. The relevant StyleSheet declarations are highlighted in the request.

```
TABLE FILE CENTORD
HEADING
"Sales Quantity Analysis"
"**Confidential**"
" "
SUM QUANTITY
ACROSS YEAR
BY PLANT
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=HEADING, LINE=1, SIZE=11, STYLE=BOLD,$
TYPE=HEADING, LINE=2, COLOR=RED, STYLE=BOLD,$
TYPE=HEADING, JUSTIFY=CENTER,$
ENDSTYLE
END
```

The output is:



**Sales Quantity Analysis**
****Confidential****

| Manufacturing Plant | YEAR 2000 | 2001 | 2002 |
|---|---|---|---|
| BOS | 3,902 | 491,080 | 538,836 |
| DAL | 1,122 | 185,785 | 203,937 |
| LA | 5 | 109,326 | 119,925 |
| ORL | . | 184,519 | 202,390 |
| SEA | . | 41,331 | 45,349 |
| STL | 2,019 | 369,456 | 405,268 |

# Identify a Text String in a Heading or Footing

```
TYPE=type, [LINE=line_#], [OBJECT=TEXT], ITEM=item_#
```

where:

**type**

Identifies a type of heading or footing. Select from HEADING, FOOTING, TABHEADING, TABFOOTING, SUBHEAD, or SUBFOOT. For details, see Identifying a Heading, Footing, Title, or FML Free Text.

**line_#**

Identifies a line by its position in the heading or footing. You only need to include the LINE attribute if you have a multi-line heading or footing.

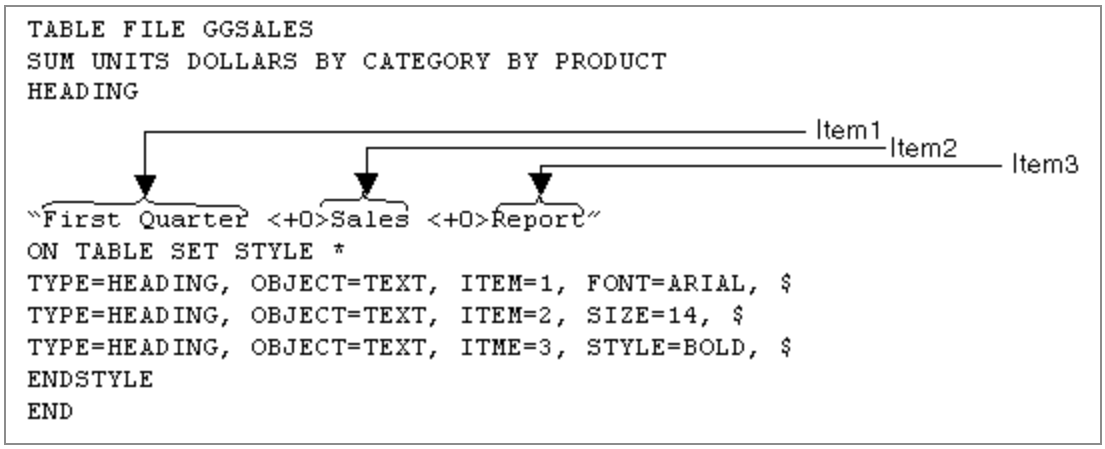
**TEXT**

Formats only text strings and Dialogue Manager variables (also known as &variables). It is not necessary to use OBJECT=TEXT in your declaration unless you are styling both text strings and embedded fields in the same heading or footing.

**item_#**

Identifies an item by its position in a line.

If you need to apply formatting to several parts of a continuous text string that displays on one line, you can break the header or footer into multiple parts using spot markers. Place the spot marker after the text string you wish to specify. The <+0> spot marker will not add any additional spaces to your heading or footing. When using spot markers, text is divided as follows:




**Note:** When a closing spot marker is immediately followed by an opening spot marker (><), a single space text item will be placed between the two spot markers (> <). This must be considered when applying formatting.

The position value also depends on whether you are using the OBJECT attribute or not. If you are using:

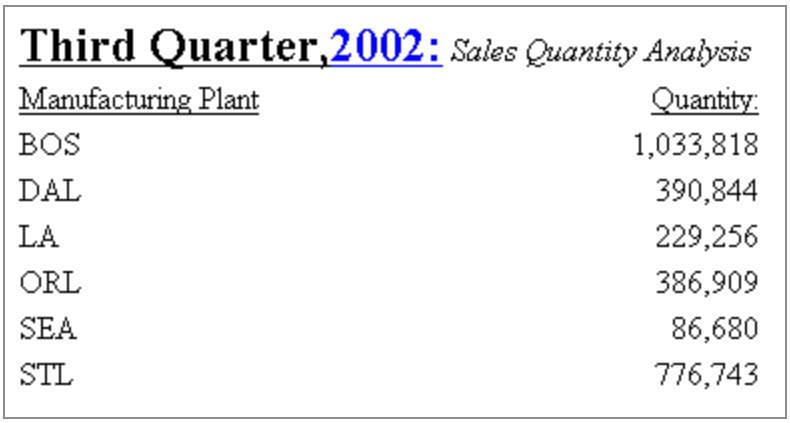
- OBJECT=TEXT, count only text strings from left to right.
- No OBJECT, count text strings and embedded field values from left to right.

# Identifying a Text String in a Heading Using Spot Markers

The following illustrates how to apply different formats to text strings in a heading using spot markers. The spot markers used in this example are <+0> since they do not add any spaces. The relevant StyleSheet declarations are highlighted in the request.

```
TABLE FILE CENTORD
HEADING
"Third Quarter,<+0>2002:<+0> Sales Quantity Analysis"
SUM QUANTITY  BY PLANT
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=HEADING, OBJECT=TEXT, ITEM=1, STYLE=BOLD+UNDERLINE, SIZE=12, $
TYPE=HEADING, OBJECT=TEXT, ITEM=2, COLOR=BLUE, SIZE=12,
     STYLE=BOLD+UNDERLINE, $
TYPE=HEADING, OBJECT=TEXT, ITEM=3, STYLE=ITALIC,$
ENDSTYLE
END
```

The output is:



**Third Quarter,2002:** *Sales Quantity Analysis*

| Manufacturing Plant | Quantity: |
|---|---|
| BOS | 1,033,818 |
| DAL | 390,844 |
| LA | 229,256 |
| ORL | 386,909 |
| SEA | 86,680 |
| STL | 776,743 |

# Identify an Embedded Field in a Heading or Footing

```
TYPE=type, [LINE=line_#], OBJECT=FIELD, [ITEM=item #]
```

where:

**type**

Identifies a type of heading or footing. Select from HEADING, FOOTING, TABHEADING, TABFOOTING, SUBHEAD, or SUBFOOT. For details, see Identifying a Heading, Footing,

Title, or FML Free Text.

**line_#**

Identifies a line by its position in the heading or footing. You only need to include the LINE attribute if you have a multi-line heading or footing.

**item_#**

Identifies an item by its position in a line.

If you have more than one embedded field in a heading or footing, you must specify the field you wish to format by giving the item number. Count items from left to right. Do not include text fields in the count. You do not need to specify the item number if there is only one embedded field in the heading or footing.

**Note:** BORDER options are not supported on specific ITEMS in a HEADING, FOOTING, SUBHEAD, SUBFOOT.

# Identifying Embedded Fields in a Heading

The following illustrates how to format an embedded field in a heading. Notice that the item number is not specified in the StyleSheet declaration since there is only one embedded field in the heading. The relevant StyleSheet declaration is highlighted in the request.

```
TABLE FILE CENTORD
HEADING
"Sales For <YEAR By Plant"
SUM QUANTITY  BY PLANT
WHERE YEAR EQ 2000
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=HEADING, OBJECT=TEXT, COLOR=BLUE,$
TYPE=HEADING, OBJECT=FIELD, COLOR=RED, STYLE=BOLD,$
ENDSTYLE
END
```

The output is:

Sales For 2000 By Plant

| Manufacturing Plant | Quantity: |
|---|---|
| BOS | 3,902 |
| DAL | 1,122 |
| LA | 5 |
| STL | 2,019 |

# Identify a Specific Heading or Footing Based on a WHEN Clause

```
TYPE = {HEADING|FOOTING}, CONDITION = n, ... ,$
```

where:

**n**

Is the number of the WHEN condition in the heading or footing from top to bottom. If not specified, formatting applies to all headings and footings.

# Styling Multiple Headings With WHEN

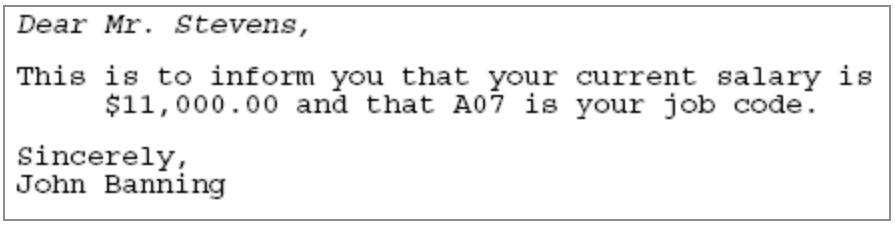
The following request displays a page for each employee with salary and job code information for that employee. The first WHEN condition applies if the employee is female. The second WHEN condition applies if the employee is male. The third WHEN condition applies if the department is MIS. The fourth WHEN condition applies if the department is PRODUCTION. The StyleSheet declarations include styling elements for the second and third conditions:

```
DEFINE FILE EMPLOYEE
GENDER/A1 = DECODE FIRST_NAME(ALFRED 'M' RICHARD 'M' JOHN 'M'
  ANTHONY 'M' ROGER 'M' MARY 'F' DIANE 'F' JOAN 'F' ROSEMARIE 'F'
  BARBARA 'F');
MIXEDNAME/A15 = LCWORD(15, LAST_NAME, MIXEDNAME);
NAME/A16 = MIXEDNAME||',';
```

```
END

TABLE FILE EMPLOYEE
PRINT LAST_NAME NOPRINT GENDER NOPRINT NAME NOPRINT
HEADING
"Dear Ms. <NAME"
   WHEN GENDER EQ 'F';
HEADING
"Dear Mr. <NAME>"
      WHEN GENDER EQ 'M';
HEADING
" "
HEADING
"This is to inform you that your current salary is "
"<CURR_SAL and <CURR_JOBCODE>is your job code."
" "
"Sincerely,"
HEADING
"Barbara Cross "
  WHEN DEPARTMENT EQ 'MIS';
HEADING
"John Banning   "
  WHEN DEPARTMENT EQ 'PRODUCTION' ;
WHERE LAST_NAME NE 'BANNING' OR 'CROSS'
BY EMP_ID NOPRINT PAGE-BREAK
ON TABLE SET PAGE NOPAGE
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=HEADING, CONDITION=2, STYLE=ITALIC,$
TYPE=HEADING, CONDITION=3, STYLE=BOLD,$
ENDSTYLE
END
```

In the StyleSheet for the request, heading lines displayed because of the first condition are in italics and heading lines displayed because of the third condition are in boldface.

The first page of output is for a male employee, so the greeting line is in italics:




The second page of output is for an employee in the MIS department, so the signature line is in boldface:

```
Dear Ms. Smith,

This is to inform you that your current salary is
     $13,200.00 and that B14 is your job code.

Sincerely,
Barbara Cross
```

# Identifying a Page Number, Underline, or Skipped Line

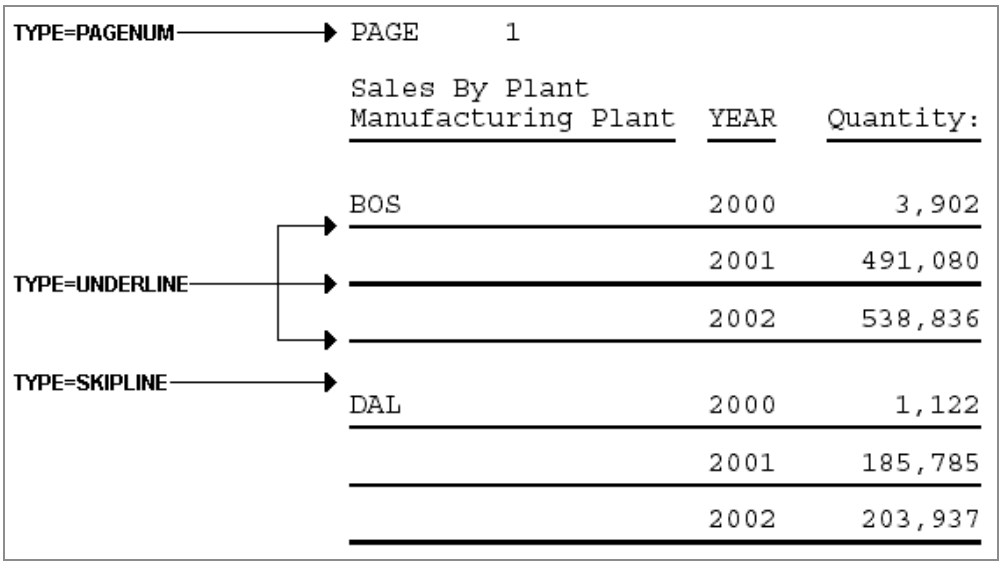
In a report you can identify and format page numbers, underlines, and skipped lines using the PAGENUM, SKIPLINE, and UNDERLINE attributes.

Note that although you can insert skipped lines and underlines in an HTML report, formatting is not supported.

The following code and output examples illustrate where the PAGENUM, UNDERLINE, and SKIPLINE components appear in a report, and which TYPE values you use to identify them.

```
SET ONLINE-FMT=PDF
TABLE FILE CENTORD
HEADING
"Sales By Plant"
SUM QUANTITY
BY PLANT BY YEAR
WHERE PLANT EQ 'BOS' OR 'DAL'
ON YEAR UNDER-LINE
ON PLANT SKIP-LINE
END
```

The following output goes with the previous code example.




**Note:** Since this request simply illustrates where the components appear in a report, it omits a StyleSheet.

# Identify a Page Number, Underline, or Skipped Line

```
TYPE=type
```

where:

**type**

Identifies the report component. Select from:

`PAGENUM` which identifies page numbers.

`SKIPLINE` which denotes skipped lines generated by ON *field* SKIP-LINE. This is not supported for reports in HTML format.

`UNDERLINE` which identifies underlines generated by ON *field* UNDER-LINE, or by BAR in a Financial Modeling Language (FML) report. This is not supported for reports in HTML format.

# Identifying Underlines and Page Numbers

The following illustrates how to identify underlines and page numbers in a report request. The relevant StyleSheet declarations appear in boldface in the request.

Note that this report is formatted in PDF since formatting is not supported for underlines in an HTML report.

```
SET ONLINE-FMT=PDF
TABLE FILE CENTORD
HEADING
"Sales By Plant"
SUM QUANTITY
BY PLANT BY YEAR
WHERE PLANT EQ 'BOS' OR 'DAL' OR 'LA'
ON PLANT UNDER-LINE SKIP-LINE
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=HEADING, OBJECT=TEXT, COLOR=BLUE, FONT=ARIAL,$
TYPE=PAGENUM, STYLE=ITALIC, SIZE=8,$
TYPE=UNDERLINE, COLOR=RED,$
ENDSTYLE
END
```

The output is:

PAGE 1

Sales By Plant

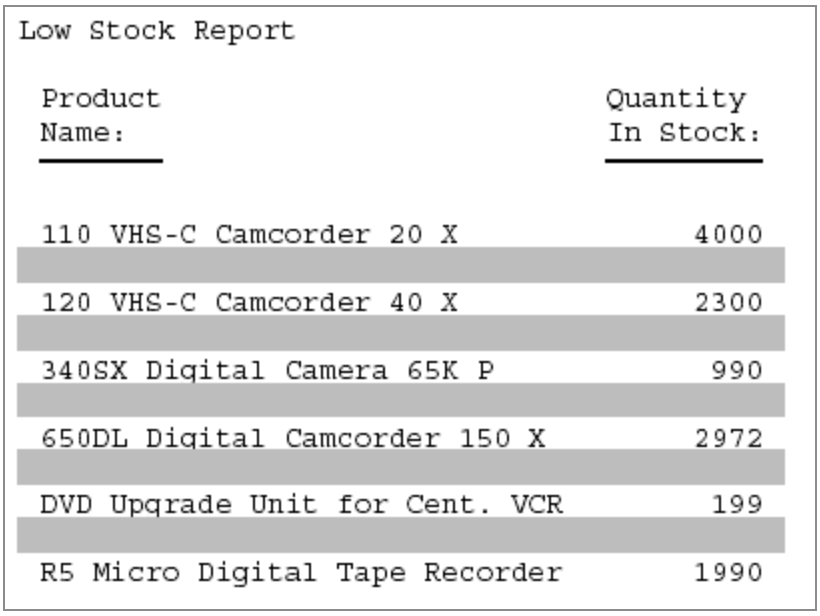
| Manufacturing Plant | YEAR | Quantity: |
|---|---|---|
| BOS | 2000 | 3,902 |
| | 2001 | 491,080 |
| | 2002 | 538,836 |
| DAL | 2000 | 1,122 |
| | 2001 | 185,785 |
| | 2002 | 203,937 |
| LA | 2000 | 5 |
| | 2001 | 109,326 |
| | 2002 | 119,925 |

# Identifying Skipped Lines

The following illustrates how to identify skipped lines in a report. The relevant StyleSheet declaration is highlighted in the request.

```
SET ONLINE-FMT=PDF
TABLE FILE CENTINV
HEADING
"Low Stock Report"
" "
SUM QTY_IN_STOCK
WHERE QTY_IN_STOCK LT 5000
BY PRODNAME
ON PRODNAME SKIP-LINE
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=SKIPLINE, BACKCOLOR=SILVER, $
ENDSTYLE
END
```

The output is:



Low Stock Report

| Product Name: | Quantity In Stock: |
|---|---|
| 110 VHS-C Camcorder 20 X | 4000 |
| 120 VHS-C Camcorder 40 X | 2300 |
| 340SX Digital Camera 65K P | 990 |
| 650DL Digital Camcorder 150 X | 2972 |
| DVD Upgrade Unit for Cent. VCR | 199 |
| R5 Micro Digital Tape Recorder | 1990 |

# Using an External Cascading Style Sheet

Cascading style sheets (CSS) provide a standard way of formatting HTML documents. To format WebFOCUS HTML report output using an external CSS, simply link the CSS to the report (using the WebFOCUS StyleSheet CSSURL attribute) and, optionally, apply the CSS classes to specific report components (using the CLASS attribute).

## What Is a Cascading Style Sheet?

Cascading style sheets (CSS) are an extension to HTML that allow you to specify formatting for an HTML document. You can use two kinds of CSS with WebFOCUS:

- **An internal cascading style sheet,** which is stored internally in the HTML document that it formats. For information about generating and using an internal CSS for a WebFOCUS report, see Generating an Internal Cascading Style Sheet for HTML Reports.
- **An external cascading style sheet,** which is stored in a separate file that can be shared by multiple documents. The external CSS file can reside on any web server accessible to the browser. You specify its location using the CSSURL WebFOCUS StyleSheet attribute, the CSSURL SET parameter, or (in special cases) the LINK element.

You can define classes in a cascading style sheet, and format a report component by assigning one of these CSS classes to it. Classes are described in What Are Cascading Style Sheet Rules and Classes?.

Cascading style sheets are called *cascading* because several different style sheets can be active for a single document at the same time. For example, one style sheet may be associated with the document itself, another style sheet may be linked to the first one, and yet another may be associated with the web browser on which the document is being displayed. When multiple style sheets are in effect, they are applied to the document in a pre-determined sequence set by the browser: their formatting instructions can be thought of as cascading from one style sheet to the next.

The benefits of using an external cascading style sheet to format a report are described in Why Use an External Cascading Style Sheet?.

You will find external cascading style sheets relevant if you:

- **Develop reports,** since you now have an improved way of formatting those reports.
- **Are responsible for presentation guidelines** for web documents, since you will now be able to apply your existing cascading style sheets to reports.

For information about *internal* cascading style sheets, see Generating an Internal Cascading Style Sheet for HTML Reports.

**Need more information about CSS?** This WebFOCUS documentation assumes that you have a working knowledge of cascading style sheets. Teaching about CSS is beyond the scope of this documentation, but many sources of information are available to you. A useful place to begin online is the World Wide Web Consortium's cascading style sheets home page (http://www.w3.org/Style/CSS/).

# What Are Cascading Style Sheet Rules and Classes?

A cascading style sheet (CSS) defines formatting in statements called *rules*. For example, this is a simple rule that makes the background color of the body of an HTML page yellow:

```
BODY {background: yellow}
```

Each rule has a *selector* (BODY in this example) and a *declaration* (background: yellow). A declaration has a property (background) and a value assigned to the property (yellow).

A declaration defines formatting, and a selector determines to what the formatting will be applied. A selector can be any HTML element. A selector can also be a *class*. You can define a class simply by creating a rule for it. By creating rules for classes of an element, you can define different formatting for the same element.

For example, you may wish to display text in a different color depending on whether it is in a sort column, aggregate column, or detail column in a report. To accomplish this you could create three classes of the BODY element, sortColumn, aggregateColumn, and detailColumn:

```
BODY.sortColumn {color: blue}
BODY.aggregateColumn {color: green}
BODY.detailColumn {color: black}
```

You can also define a generic class, that is, a class that is not limited to a single element. For example:

```
.pageFooting {font-weight: bolder}
```

You can use a generic class to specify formatting for any WebFOCUS report component.

Using external cascading style sheet rules and classes to format a report is described in Formatting a Report With an External Cascading Style Sheet.

# Why Use an External Cascading Style Sheet?

If you already use WebFOCUS StyleSheets to format reports, you can realize these additional benefits by combining them with external cascading style sheets:

- **Increased formatting options.** Almost any formatting that you can specify in a cascading style sheet you can apply to a report. This enables you to take advantage of formatting options that are unavailable via native WebFOCUS StyleSheet attributes. For example, you can use browser-based measurements so that the person who views the report can control the size of fonts, margins, and other elements whose size has been specified in the CSS in terms of *em*, a unit of relative measurement. You can also use CSS to control line height and letter spacing, and in general can use CSS to exercise more control over positioning items in a report.
- **Improved performance.** Cascading style sheets enable WebFOCUS to generate more concise HTML output. This reduces the bandwidth used by the network to return a report to a browser, and displays the report faster.
- **Reduced effort.** Enterprises that already use cascading style sheets can now also apply them to WebFOCUS reports, avoiding duplication of effort to specify and maintain formatting instructions.
- **Easier standards conformance.** You can ensure that reports conform to your enterprise's formatting guidelines, because now formatting instructions for all your Web documents can be specified in one set of cascading style sheets (instead of replicating some of them in WebFOCUS StyleSheets).

# Formatting a Report With an External Cascading Style Sheet

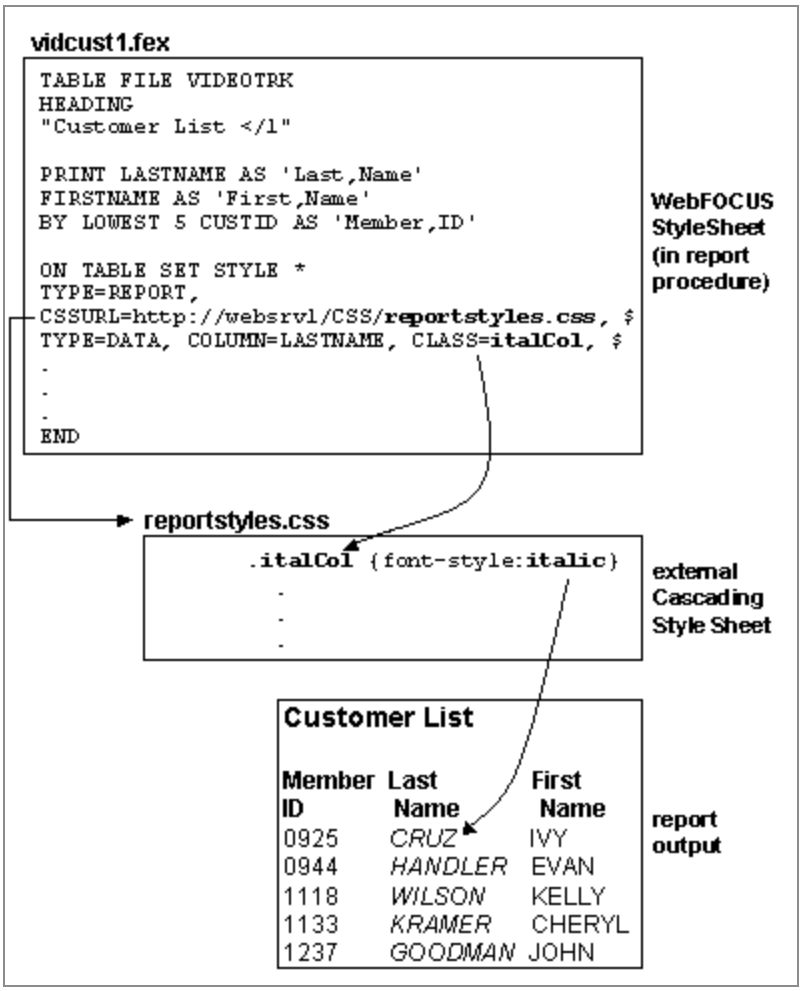
There are just three items required to format a report with an external cascading style sheet (CSS):

- **An external cascading style sheet** that specifies the formatting to be applied to the report. For more information, see Working With an External Cascading Style Sheet.
- **A WebFOCUS StyleSheet** in which you apply external CSS formatting to the components of your report. However, you do not need a WebFOCUS StyleSheet when you apply formatting to the *entire* report. For more information, see Applying External Cascading Style Sheet Formatting.

  (Although you can also use a WebFOCUS StyleSheet to specify additional formatting outside of the external CSS, this is subject to restrictions. For more information, see Combining an External CSS With Other Formatting Methods.)
- **A link to the external cascading style sheet** from the report. For more information, see Linking to an External Cascading Style Sheet.

To find out how to use these three items to format a report, see Format a Report Using an External Cascading Style Sheet.

For an example that demonstrates how these items work together, see Linking to the ReportStyles External Cascading Style Sheet and the following diagram:




# Format a Report Using an External Cascading Style Sheet

To format a report using an external cascading style sheet (CSS):

### Procedure

1. **Specify the report formatting in the CSS.** Determine which cascading style sheet you will use, which of its rules specify default formatting for your report, and which of its classes are suitable for you to apply to the report components. Alternatively, if you are creating a new CSS, or extending an existing one, define new rules to specify formatting for your report. To specify formatting for:

- **A report component,** you can use a rule for any generic class (that is, any class not declared for an element). For an example, see A CSS Rule for the ColumnTitle Class.

  Graphs differ from other types of reports: to specify formatting for the page in which the graph appears, or for the graph heading or footing, you can use a rule for the BODY element, but not a rule for a class. You cannot format other graph components.

- **The entire report,** use a rule for the BODY or TD elements (not a rule for a class of these elements), and skip Step 2. This is an effective way of specifying the default formatting of a report, and generates more efficient report output than does applying a CSS class to the entire report. For an example, see A CSS Rule for the TD Element.

  Graphs differ from other types of reports: you can use a rule for the BODY element, but not one for TD. A rule for BODY will format the page in which the graph appears, and its heading and footing, but not the graph itself.

For more information, see Working With an External Cascading Style Sheet.

2. **Assign classes to report components.** In a WebFOCUS StyleSheet, assign a cascading style sheet class to each report component that you want to format. Specify the class using the CLASS attribute. You can assign each component a different class, and you can assign the same class to multiple components.

   For an example, see Applying a CSS Class to ACROSS Values in a Report. For more information, see Applying External Cascading Style Sheet Formatting.

3. **Link to the CSS.** Link to the external cascading style sheet by assigning the CSS file URL to either the CSSURL WebFOCUS StyleSheet attribute or to the CSSURL SET parameter. For instructions, see Using the CSSURL Attribute and Parameter.

   There is one exception: if you embed the report output in an existing HTML page using the -HTMLFORM command, include a LINK element in that HTML page instead of setting CSSURL.

   For an example, see Linking to the ReportStyles External Cascading Style Sheet. For more information, see Linking to an External Cascading Style Sheet.

### Result

**Problems?** If you encounter problems, see Troubleshooting External Cascading Style Sheets.

# A CSS Rule for the ColumnTitle Class

This cascading style sheet (CSS) rule declares the ColumnTitle generic class (that is, a class not tied to an element):

```
.ColumnTitle {font-family:helvetica; font-weight:bold; color:blue;}
```

# A CSS Rule for the TD Element

This cascading style sheet (CSS) rule for the TD element specifies the element's font family:

```
TD {font-family:helvetica}
```

Because this rule is for the TD element, its formatting is applied to an entire report, not just a component of the report.

For a more comprehensive example of using a rule for the TD element to provide general report formatting, see Linking to the ReportStyles External Cascading Style Sheet.

# Applying a CSS Class to ACROSS Values in a Report

This WebFOCUS StyleSheet declaration formats ACROSS values by applying the formatting specified for the ColumnTitle class:  StyleSheet CLASS attribute" />

```
TYPE=AcrossValue, CLASS=ColumnTitle, $
```

# Linking to the ReportStyles External Cascading Style Sheet

This WebFOCUS StyleSheet declaration links to the ReportStyles external cascading style sheet:  StyleSheet CSSURL attribute" />

```
TYPE=REPORT, CSSURL=http://webserv1/css/reportstyles.css
```

or

```
TYPE=REPORT, CSSURL=IBFS:/WFC/Repository/css/reportstyles.css
```

You could accomplish the same thing using a SET command:

```
SET CSSURL=http://webserv1/css/reportstyles.css
```

Or within a request:

```
ON TABLE SET CSSURL=http://webserv1/css/reportstyles.css
```

Alternatively, if you want to embed your report output in an existing HTML page using -HTMLFORM, you would specify the link by coding the LINK element in the HTML page in which the report will be embedded, instead of setting CSSURL:

```
<HEAD>
<TITLE>Accounts Receivable Report</TITLE>
<LINK REL="STYLESHEET" HREF="http://srv3/css/reports.css"
TYPE="text/css">
</HEAD>
```

# Formatting a Report Using an External CSS

This report displays the products currently offered by Gotham Grinds, and is formatted using an external cascading style sheet (CSS). The report is formatted so that:

- Its default font family is Arial.

- The report heading overrides the default with a font family of Times New Roman. The heading is also in a larger font and center justified.
- All column titles are in a bolder font and have a light-blue background.
- When a product unit price is less than $27, the report displays the product row in green italics.

The report request and inline WebFOCUS StyleSheet are shown in the following procedure, curprods.fex. The external cascading style sheet, named report01.css, follows the procedure.

**curprods.fex**

```
    TABLE FILE GGPRODS
    HEADING
    "</1 Current Products</1"
    PRINT PRODUCT_DESCRIPTION UNIT_PRICE
    BY PRODUCT_ID
    ON TABLE SET PAGE-NUM OFF

1.  ON TABLE SET STYLE *
2.  TYPE=REPORT, CSSURL=http://websrv2/css/report01.css, $
3.  TYPE=HEADING, CLASS=headText, $
4.  TYPE=TITLE, CLASS=reportTitles, $
5.  TYPE=DATA, CLASS=lowCost, WHEN=N3 LT 27, $
6.  ENDSTYLE
    END
```

**Note:** To specify a path that points to a WebFOCUS repository that contains the report01.css file, use the following syntax for the CSSURL parameter on the TYPE=REPORT line in the request:

```
TYPE=REPORT, CSSURL=IBFS:/WFC/Repository/css/report01.css, $
```

Where *css* is the folder in the WebFOCUS repository where the report01.css file resides.

**report01.css**

```
7.  BODY  {font-family:Arial, sans-serif}
8.  TABLE {border:0}
8.  TD    {border:0}
9.  .reportTitles {font-weight:bolder; background:lightblue;}
10. .lowCost {color:green; font-style:italic;}
```

```
11. .headText {font-family:Times New Roman, serif; font-size:larger;
               text-align:center}
```

1. Begin the inline WebFOCUS StyleSheet.
2. Link to the external cascading style sheet, report01.css.
3. Format the report heading using the cascading style sheet rule for the headText class.
4. Format the report column titles using the CSS rule for the reportTitles class.
5. For each report row for which the product unit cost is less than $27, format that row using the CSS rule for the lowCost class.
6. End the inline WebFOCUS StyleSheet.
7. This CSS rule for the BODY element specifies the font family Arial and, if Arial is unavailable, the generic font family sans serif.

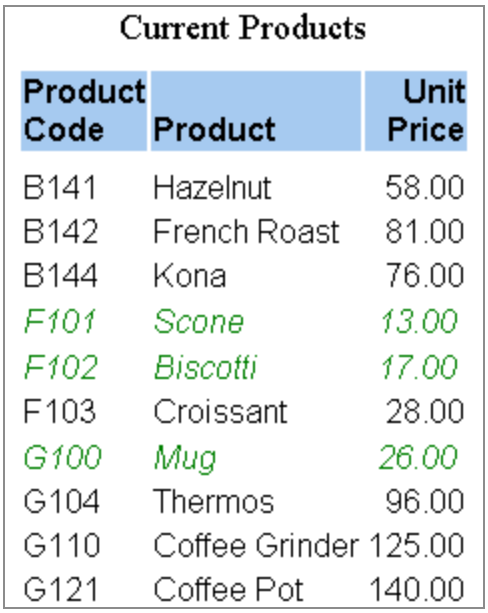
   Because this is a rule for BODY, it is applied to the entire report: all text in the report will default to Arial. You can override this for a particular report component by applying a rule for a generic class to that component, as is done in this procedure with the rule for the headText class (see line 11).
8. These CSS rules for the TABLE and TD elements remove the report default grid.
9. This CSS rule for the generic class reportTitles specifies a bolder relative font weight and a light blue background color.

   The WebFOCUS StyleSheet applies this to the report column titles (see line 4).
10. This CSS rule for the generic class lowCost specifies the text color green and the font style italic.

    The WebFOCUS StyleSheet applies this rule conditionally to report rows for which the product unit cost is less than $27 (see line 5).
11. The CSS rule for the generic class headText specifies the font family Times New Roman and, if Times New Roman is unavailable, the generic font family serif. It also specifies a larger relative font size and center justification.

    The WebFOCUS StyleSheet applies this rule to the report heading. It overrides the default font family specified in the rule for the BODY element (see line 7).

The procedure displays this report:



Current Products

| Product Code | Product | Unit Price |
|---|---|---|
| B141 | Hazelnut | 58.00 |
| B142 | French Roast | 81.00 |
| B144 | Kona | 76.00 |
| F101 | Scone | 13.00 |
| F102 | Biscotti | 17.00 |
| F103 | Croissant | 28.00 |
| G100 | Mug | 26.00 |
| G104 | Thermos | 96.00 |
| G110 | Coffee Grinder | 125.00 |
| G121 | Coffee Pot | 140.00 |

# Working With an External Cascading Style Sheet

When you work with an external cascading style sheet (CSS) to specify report formatting, you need to know about:

- Choosing an existing or new external CSS. For more information, see Choosing an External Cascading Style Sheet.
- Where an external CSS can reside. For more information, see External Cascading Style Sheet Location.
- How you can apply multiple cascading style sheets to one report. For more information, see Using Several External Cascading Style Sheets.
- Editing an external CSS. For more information, see Editing an External Cascading Style Sheet.
- Using CSS rules and classes to specify report formatting. For more information, see Choosing a Cascading Style Sheet Rule.
- Suggestions for naming cascading style sheet classes. For more information, see Naming a Cascading Style Sheet Class.
- Combining other formatting methods, such as WebFOCUS StyleSheets or TABLE

language instructions, with an external CSS. For more information, see Combining an External CSS With Other Formatting Methods.

# Choosing an External Cascading Style Sheet

To format a report using an external cascading style sheet (CSS), you can choose to:

- **Apply an existing CSS with no changes.** The external cascading style sheet can be one that you use for other documents, and can contain all kinds of rules, not only rules that format reports. For example, the CSS could include rules to format other elements in the webpages used by your WebFOCUS applications, as well as rules for other kinds of webpages. This enables you to use one cascading style sheet to format all of your web documents.
- **Edit an existing CSS** to add or modify rules. For example, you might edit a cascading style sheet to add new generic classes to format report components.
- **Create a new CSS.** You can create a new cascading style sheet to format your reports. See the recommendations in Naming a Cascading Style Sheet Class about naming classes.

To create an external cascading style sheet, use a text editor or a third-party web development tool.

# External Cascading Style Sheet Location

An external cascading style sheet (CSS) can reside on any web server platform. However, if CSSURL (the StyleSheet attribute or the SET parameter) specifies a relative URL, the cascading style sheet must reside on the web server used by WebFOCUS.

# Using Several External Cascading Style Sheets

Although each report procedure can link to only one external cascading style sheet (CSS), you can use several cascading style sheets to format a report by linking to one CSS that then imports several others. For information about importing one CSS into another, see your third-party CSS documentation.

# Editing an External Cascading Style Sheet

You can edit an external cascading style sheet (CSS) using a text editor or a third-party web development tool.

If the formatting of a report is specified entirely using a cascading style sheet, and you edit that CSS, the next time someone displays the report it will reflect the changes to the CSS without the report having to be rerun.

However, if the report does not reflect the changes, it may be because the web browser is continuing to use the old version of the CSS that it had stored in cache. The person displaying the report may need to reload the CSS file from the web server by clicking the Refresh button of the browser in Microsoft Internet Explorer to ensure that the browser uses the most current version of the CSS to format the report.

# Choosing a Cascading Style Sheet Rule

You can format different parts of a report using different types of rules.

| To format: | Use a rule for: |
|---|---|
| The entire report | BODY or TD |
| Any report component | A generic class (that is, one declared without an element) |

To choose between using a rule for BODY or for TD, note that a rule for:

- **BODY** will specify default formatting for the entire webpage in which the report appears, including the report itself. (Note that this relies upon CSS inheritance which, like all CSS behavior, is implemented by the web browser of each user and is browser-dependent.)

  Graphs differ from other types of reports: a rule for BODY will format the page in which the graph appears, and its heading and footing, but not the graph itself.

- **TD** will specify default formatting only for the report, and for any other table cells that you may have on the page. TD is the table data (that is, table cell) element. WebFOCUS generates most HTML report output as an HTML table, placing each

report item in a separate cell. This enables a rule for TD to format the entire report.

Graphs differ from other types of reports: to specify default formatting for a graph, use a rule for BODY, not for TD. See the previous note regarding formatting graphs using a rule for BODY.

When you use a rule for a class to format a report component, you must assign the class to the component in a WebFOCUS StyleSheet using the CLASS attribute, as described in Use the CLASS Attribute to Apply CSS Formatting.

If you wish to apply several CSS properties to a single report component, we recommend that you declare them in a single class. This generates more efficient output than does declaring one property per class.

The owner of each cascading style sheet should consider making available a list of all the classes in that CSS that can be used to format reports, so that everyone who develops reports knows from which classes they may choose.

For an example of a rule for:

- A generic class to format a report component, see A CSS Rule for the ColumnTitle Class.
- The TD element to format an entire report, see A CSS Rule for the TD Element.

# Naming a Cascading Style Sheet Class

When you provide a name for a new class, note that class names are case-sensitive (although some web browsers may not enforce case sensitivity).

When you create a new class, we recommend naming it after the function, not the appearance, of the report component to which you will be applying it. This ensures that the name remains meaningful even if you later change the appearance of the report component. For example, if you want all report titles to be red, the class you declare to format titles might be named Title, but not Red.

# Applying External Cascading Style Sheet Formatting

You can apply external cascading style sheet (CSS) formatting to:

- **A report component** (for example, to make a column italic). Assign a cascading style sheet class to the report component using the WebFOCUS StyleSheet CLASS attribute. For information about the CLASS attribute, see Use the CLASS Attribute to Apply CSS Formatting. For information about specifying different types of report components, see Identifying a Report Component in a WebFOCUS StyleSheet..

  When formatting a tabular or free-form report, you can format any report component by assigning a CSS class.

  When formatting a graph report, you can format the graph heading and footing, and can specify the background color and background image of the page in which the graph appears, in a rule for the BODY element. (Note that when formatting a graph heading or footing, you cannot format individual lines, strings, and field values. If you wish to center a heading or footing, it is recommended that you do so using the CENTER option of the HEADING or FOOTING command, not in a style sheet.)

  When working with the WebFOCUS StyleSheet CLASS attribute, you must edit the WebFOCUS StyleSheet using the WebFOCUS text editor.

- **An entire report** (for example, to make the entire report italic). You specify the formatting in the external CSS in a rule for the BODY or TD elements (for graphs, specify the formatting in a rule for the BODY element only. This will format the page in which the graph appears, and the graph heading and footing, but not the graph itself). You must also link the report to the CSS. You do not need a rule for a class of an element, and you do not need a WebFOCUS StyleSheet declaration. For an example, see A CSS Rule for the TD Element.

We recommend that when you use an external cascading style sheet to format a report, you do not also use a WebFOCUS StyleSheet to specify the report formatting, unless you also generate an internal cascading style sheet. For more information, see Combining an External CSS With Other Formatting Methods.

# Use the CLASS Attribute to Apply CSS Formatting

To apply an external cascading style sheet (CSS) class to a report component, use the following syntax in a WebFOCUS StyleSheet declaration

```
TYPE = type, [subtype,] CLASS = classname, [when,] [link,] $
```

where:

**type**

Identifies the report component to which you are applying the class formatting. For tabular and free-form reports, it can be any component, as described in Identifying a Report Component in a WebFOCUS StyleSheet. You cannot specify a component of a graph report: to format a graph's heading and footing, and the background color and background image of the page in which the graph appears, use a rule for the BODY element without a WebFOCUS StyleSheet declaration.

Each report component can be formatted by one class. If you specify several classes for a report component:

1. The classes that are in declarations with conditional formatting are evaluated first. For each cell in the report component, the first class whose condition is satisfied by the cell row is assigned to the cell.
2. If none of the conditions is satisfied, or if there are no conditional declarations, the class in the first unconditional declaration is assigned to the report component. All following declarations for that component are ignored.

**subtype**

Is an optional attribute and value needed to completely specify some kinds of report components. For example, COLUMN and a column identifier are needed to specify a particular report column.

**classname**

Is the name of the cascading style sheet class whose formatting you are applying to the report component. You can assign the same class to multiple report components.

Class names can be up to 511 characters and are case-sensitive: you must use the same case found in the class rule in the external cascading style sheet. (Note, however, that some web browsers may not enforce case sensitivity.)

**when**

Is an optional WHEN attribute and value. Supply this if you want to apply the formatting conditionally. For more information, see Formatting Reports: An Overview.

**link**

Is an optional FOCEXEC, URL, or JAVASCRIPT attribute and value. Supply this if you want to link the report component to another resource, such as a report to which the user can drill down. For more information, see Linking a Report to Other Resources.

For an example, see Applying a CSS Class to ACROSS Values in a Report.

# Combining an External CSS With Other Formatting Methods

When you use an external cascading style sheet (CSS) to format a report, you can use other formatting methods at the same time. Some of these other methods are subject to restrictions. The other methods that you can use with an external CSS are:

- **WebFOCUS StyleSheets.** An effective way of combining an external CSS with a WebFOCUS StyleSheet is to link to an external CSS to provide default formatting, and use a WebFOCUS StyleSheet to override those defaults for individual report components. Note that if you combine a WebFOCUS StyleSheet and an external cascading style sheet, you should generate an internal cascading style sheet to avoid reducing the performance benefits associated with an external CSS.

  Do not attempt to format the same property of the same report component using both an external CSS class (through the CLASS attribute) and a WebFOCUS StyleSheet attribute, since the two formatting instructions could conflict with each other.

  For complete instructions about using an external CSS with a WebFOCUS StyleSheet, see Combining an External CSS With a WebFOCUS StyleSheet.

- **TABLE language instructions.** You can use TABLE language (or GRAPH language) formatting instructions, such as HEADING CENTER, PAGE-BREAK, and spot markers (for example, </3). However, you should not apply both a TABLE (or GRAPH) language instruction, and an external cascading style sheet rule, to perform the same formatting on the same report component, because they might conflict with each other.

  For example, you should not specify *both* of the following for the same report:

  - HEADING CENTER in the report request.

- Text-align in an external CSS, applied to the report page heading.

Both of these will attempt to align the report page heading.

# Combining an External CSS With a WebFOCUS StyleSheet

When you use an external cascading style sheet (CSS) to format a report, you can use a WebFOCUS StyleSheet at the same time. You may do this with or without generating an internal cascading style sheet.

**An effective way of doing this** is to link to an external CSS to provide default formatting, and use a WebFOCUS StyleSheet to override those defaults for individual report components. The cascading style sheet BODY or TD rule will provide the default formatting for the report. If you wish, you can override the defaults for individual report components via native WebFOCUS StyleSheet attributes. This enables you to conform to your organization's formatting standards as they are implemented in a CSS, while allowing you to customize those standards for WebFOCUS reports using WebFOCUS StyleSheet attributes. For information about using a BODY or TD rule for default formatting, see Choosing a Cascading Style Sheet Rule. For an example, see Inheritance and External Cascading Style Sheets.

**Performance considerations.** Note that, unless you generate an internal cascading style sheet from the WebFOCUS StyleSheet, combining an external CSS and a WebFOCUS StyleSheet may reduce the performance benefits associated with the external CSS. This is because a report that uses *both* an external CSS *and* native WebFOCUS StyleSheet attributes generates more HTML code than the same report using an external CSS alone, although it still generates less code than if the report had used native WebFOCUS StyleSheet attributes alone. (Reducing the amount of generated HTML code can reduce network load and browser display time.) For information about generating an internal cascading style sheet, see Generating an Internal Cascading Style Sheet for HTML Reports.

**You cannot double-format.** You should not attempt to format the same property of the same report component using both an external CSS class (via the CLASS attribute) and a WebFOCUS StyleSheet attribute, since the class and the StyleSheet attribute could conflict with each other.

For example, you should not include the following declarations in the same StyleSheet because they would both try to assign a color to the Country column:

```
TYPE=Data, COLUMN=Country, COLOR=Orange, $
TYPE=Data, CLASS=TextColor, $
```

You can specify classes and WebFOCUS StyleSheet attributes that format different properties of the same report component, and that format different report components. For example, the following declarations are acceptable in the same StyleSheet:

```
1. TYPE=Heading, COLOR=Green, $
1. TYPE=Heading, CLASS=HeadingFontSize, $
2. TYPE=Data, Column=Country, BACKCOLOR=Yellow, $
2. TYPE=Data, Column=Car, CLASS=DataBackgroundColor, $  3. TYPE=Data,
Column=Model, FOCEXEC=NewSales(CarGroup=Car), $
```

1. These two declarations are compatible because they format different properties (color and font size).
2. These two declarations are compatible because they format different report components (the Country column and the Car column).
3. This declaration will be compatible with all CSS classes, since it does not format a report component, but instead defines a hyperlink.

# Linking to an External Cascading Style Sheet

To format a report using an external cascading style sheet (CSS), you must link the cascading style sheet to the report in one of the following ways:

- **For most report procedures,** assign the CSS file's URL to the CSSURL attribute or parameter. For more information, see Using the CSSURL Attribute and Parameter.
- **For report output that you are embedding** in an existing HTML page using the -HTMLFORM command, include a LINK element in the existing HTML page to point to the external CSS file. For example, if you are embedding a report from an output (HOLD) file that was generated in HTMTABLE format, use LINK. For more information, see your third-party CSS documentation. For an example, see Linking to the ReportStyles External Cascading Style Sheet.

# Using the CSSURL Attribute and Parameter

You can link an external cascading style sheet (CSS) to a report using the CSSURL WebFOCUS StyleSheet attribute *or* the CSSURL SET parameter. To choose between them, consider the advantages of:

- **An attribute.** Using CSSURL as a StyleSheet attribute enables you to specify:
  - **A longer URL**, since the maximum URL length is 255 characters in the attribute, compared with 69 characters in the parameter.
  - **All formatting information in one place**, since you can specify the link to the external CSS *and* the references to CSS classes within the WebFOCUS StyleSheet. This makes it easier for you to maintain your formatting logic.
- **A SET parameter.** Using CSSURL as a SET parameter enables you to quickly redirect a link (from one CSS to another) for many reports at once. You do this by putting the SET CSSURL command in its own procedure, and merging that into report procedures using a -INCLUDE Dialogue Manager statement in each report procedure.

If you specify CSSURL in several ways, the specification with the most local scope takes precedence. The order of precedence, from highest (1) to lowest (3), is:

For more information about the CSS attribute, see Use the CSSURL Attribute to Link to an External CSS. For more information about the CSS parameter, see Use the CSSURL Parameter to Link to an External CSS.

# Use the CSSURL Attribute to Link to an External CSS

To link an external cascading style sheet (CSS) to report using a WebFOCUS StyleSheet attribute, use the following syntax

```
[TYPE=REPORT,] CSSURL={url|ibfs}, $
```

where:

**TYPE=REPORT**

Specifies that this attribute is being applied to the entire report. If it is omitted, the StyleSheet declaration defaults to it.

**url**

Is the URL of the external cascading style sheet. If the external CSS resides on a web server platform that is case-sensitive, you must specify it using the correct case.

The URL can be up to 255 characters. If your external cascading style sheet URL exceeds this limit, you can shorten the URL by defining an alias (also known as a virtual directory) on the web server to represent part of the path.

You can specify an absolute or relative URL. If it is relative, the external CSS must reside on the web server used by WebFOCUS.

**ibfs**

Is a path that points to a WebFOCUS repository that contains the external cascading style sheet file. This path is internally converted to a web-accessible URL that points to the location of the .css file.

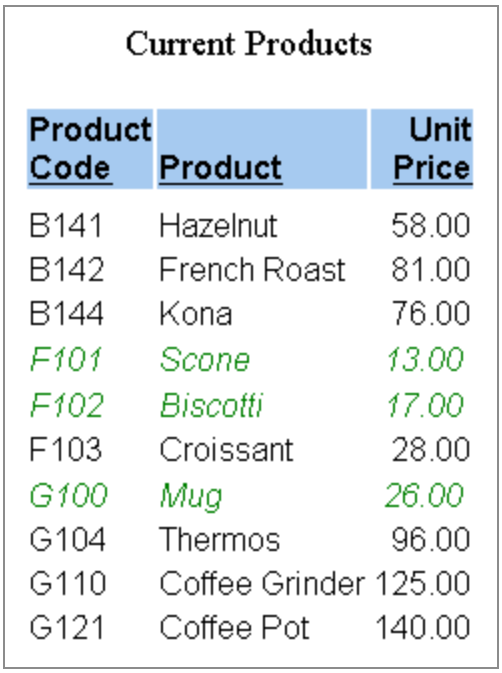
# Linking to an External Cascading Style Sheet Using the CSSURL Attribute

This report displays the products currently offered by Gotham Grinds. It is formatted using an external cascading style sheet (CSS), and links to the CSS using the CSSURL attribute in the WebFOCUS StyleSheet:

```
TABLE FILE GGPRODS
HEADING
"</1 Current Products</1"
PRINT PRODUCT_DESCRIPTION UNIT_PRICE
BY PRODUCT_ID
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE=REPORT, CSSURL=http://websrv2/css/report01.css, $
TYPE=HEADING, CLASS=headText, $
TYPE=TITLE, CLASS=reportTitles, $
TYPE=DATA, CLASS=lowCost, WHEN=N3 LT 27, $
ENDSTYLE
```

```
END
```

The request produces this report:



Current Products

| Product Code | Product | Unit Price |
|---|---|---|
| B141 | Hazelnut | 58.00 |
| B142 | French Roast | 81.00 |
| B144 | Kona | 76.00 |
| *F101* | *Scone* | *13.00* |
| *F102* | *Biscotti* | *17.00* |
| F103 | Croissant | 28.00 |
| *G100* | *Mug* | *26.00* |
| G104 | Thermos | 96.00 |
| G110 | Coffee Grinder | 125.00 |
| G121 | Coffee Pot | 140.00 |

**Note:** To specify a path that points to a WebFOCUS repository that contains the report01.css file, use the following syntax for the CSSURL parameter on the TYPE=REPORT line in the request:

```
TYPE=REPORT, CSSURL=IBFS:/WFC/Repository/css/report01.css, $
```

Where *css* is the folder in the WebFOCUS repository where the report01.css file resides.

# Use the CSSURL Parameter to Link to an External CSS

To link an external cascading style sheet (CSS) to a report using a SET parameter, issue the following SET command in a procedure

```
SET CSSURL = css_url
```

or the following ON TABLE SET command in a report request

```
ON TABLE SET CSSURL css_url
```

where:

**css_url**

Is the URL of the external cascading style sheet. If the external CSS resides on a web server platform that is case-sensitive, you must specify it using the correct case.

The URL can be up to:

- 69 characters long in a SET command.
- 57 characters long in an ON TABLE SET command.

If your external cascading style sheet URL exceeds this limit, you can shorten the URL by defining an alias (also known as a virtual directory) on the web server to represent part of the path.

You can specify an absolute or relative URL. If it is relative, the external CSS must reside on the web server used by WebFOCUS.

For an example, see Linking to the ReportStyles External Cascading Style Sheet.

If you specify CSSURL multiple times, the last value specified using ON TABLE SET overrides all the other values within that report request. If CSSURL is not specified within a report request, the last value specified using SET overrides all the others.

For general information about using SET commands, see *Customizing Your Environment* in the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

# Inheritance and External Cascading Style Sheets

In a report that is formatted using an external cascading style sheet (CSS), a report component inherits formatting from the TD element and from all elements that TD nests within, such as BODY. (Note that inheritance, like all CSS behavior, is implemented by the web browser of each user and is browser-dependent.)

This differs from a report that is formatted using a WebFOCUS StyleSheet, in which a report component inherits formatting from a higher-level component. When you format a report using external cascading style sheet classes, a class assigned to a report component *does not* inherit formatting from a class that has been assigned to a higher-level component.

# A Report Column Inheriting Formatting From the TD Element

This report displays a list of the vendors that supply products to Gotham Grinds. Its formatting instructions specify that:

- The entire report has an orange default background color. This is specified in a rule for the TD element.
- The report data is displayed in an italic Arial font. The report data inherits the orange background color from the rule for TD.
- The report PRODUCT_ID data has a yellow background color, overriding the default specified in the rule for TD.

  If the formatting of the report had been specified in a WebFOCUS StyleSheet instead of in an external CSS, PRODUCT_ID would inherit the italic Arial font from its parent report component (that is, from the report data). Instead, because its formatting is specified in an external CSS, PRODUCT_ID inherits formatting from the rule for the TD element, not from a higher-level report component, and so it does not inherit the italic Arial font.

The report request and inline WebFOCUS StyleSheet are shown in the following procedure, prodvend.fex. The external cascading style sheet, named report02.css, follows the procedure.

**prodvend.fex**

```
TABLE FILE GGPRODS
PRINT PRODUCT_DESCRIPTION VENDOR_NAME
BY PRODUCT_ID
ON TABLE SET PAGE-NUM OFF
```

```
ON TABLE SET STYLE *
TYPE=REPORT, CSSURL = http://websrv2/css/report02.css, $
TYPE=DATA, CLASS=Data, $
```

```
3. TYPE=DATA, COLUMN=PRODUCT_ID, CLASS=Sort, $
    ENDSTYLE
```

```
    END
```

**report02.css**

```
4. TD    {background:orange; border:0}
5. TABLE {border:0}
6. .Data {font-style:italic; font-family:Arial}
7. .Sort {background:yellow}
```

1. Set CSSURL to link to the external cascading style sheet report01.css.
2. Format the report data using the CSS rule for the Data class.
3. Format the report PRODUCT_ID data using the CSS rule for the Sort class. (This overrides the declaration for report data in general in line 2.)
4. This CSS rule for the TD element specifies an orange background. Because it is a rule for TD, it is applied to the entire report. You can override this for a particular report component by applying a rule for a generic class to that component, as is done in this procedure with the rule for the Sort class (see line 7).
5. These CSS rules for the TD and TABLE elements remove the default grid for the report.
6. This CSS rule for the generic class Data specifies an Arial font family and an italic font style. The WebFOCUS StyleSheet applies this to the report data (see line 2).

   This rule inherits background color from the rule for the TD element (line 4).
7. This CSS rule for the generic class Sort specifies a yellow background. The WebFOCUS StyleSheet applies this rule to data for PRODUCT_ID (see line 3).

   This rule overrides the default background color specified in line 4.

The procedure displays this report:

| Product Code | Product | Vendor Name |
|---|---|---|
| B141 | *Hazelnut* | *Coffee Connection* |
| B142 | *French Roast* | *European Specialities,* |
| B144 | *Kona* | *Evelina Imports, Ltd* |
| F101 | *Scone* | *Ridgewood Bakeries* |
| F102 | *Biscotti* | *Delancey Bakeries* |
| F103 | *Croissant* | *West Side Bakers* |
| G100 | *Mug* | *NY Ceramic Supply* |
| G104 | *Thermos* | *ThermoTech, Inc* |
| G110 | *Coffee Grinder* | *Appliance Craft* |
| G121 | *Coffee Pot* | *Appliance Craft* |

# Using External Cascading Style Sheets With Non-HTML Reports

You can use an external cascading style sheet (CSS) to format a report that is generated as HTML, but not one that is generated as a different output type, such as PDF. If you have a report that you will sometimes generate as HTML and sometimes generate as a different output type, and you wish to gain the benefits of cascading style sheets, we recommend that you use this technique:

- **Shared formatting.** Specify formatting that is shared by all output types in WebFOCUS StyleSheet macros. (For example, setting a font style to italic is something that can be applied to both HTML and PDF report output, so you would specify it in a macro.) Define two versions of each macro:
  - One version for HTML output. This version specifies formatting using a cascading style sheet class.
  - One version for non-HTML output. This version specifies formatting using native WebFOCUS StyleSheet attributes.
- **Unique formatting.** Specify formatting that is applicable only to HTML output, or only to non-HTML output, in standard WebFOCUS StyleSheet declarations. Place each of these declarations in the WebFOCUS StyleSheet section that contains macro definitions for that type of output. (For example, turning a grid on or off is applicable

to HTML output, but not to Excel 2000, so you would place it with the macro definitions for HTML.)

- **Branch** between the HTML and non-HTML declarations using Dialogue Manager.

You can see the basic code for this technique in Use an External CSS With Multiple Output Types.

# Use an External CSS With Multiple Output Types

If you have a report that you will sometimes generate as HTML and sometimes as other types of output, and you wish to gain the benefits of cascading style sheets (CSS), we recommend that you use this technique:

```
-DEFAULTS &FORMAT='output_type';
SET ONLINE-FMT = &FORMAT
    TABLE FILE datasource
     report_logic
```

```
    ON TABLE SET STYLE *
    TYPE=REPORT, CSSURL = CascadingStyleSheetURL, $
    -IF &FORMAT NE 'HTML' GOTO NONHTML;
    DEFMACRO=macro1, CLASS=class1, $
    DEFMACRO=macro2, CLASS=class2, $
     .
     .
     .
    TYPE=component3, CLASS=class3, $
     .
     .
     .
    -GOTO SHARED
    -NONHTML
    DEFMACRO=macro1, attribute1=value1, $
    DEFMACRO=macro2, attribute2=value2, $
     .
     .
     .
    TYPE=component4, attribute4=value4, $
     .
```

```
     .
     .
-SHARED
TYPE=component1, MACRO=macro1, $
TYPE=component2, MACRO=macro2, $
     .
     .
     .
ENDSTYLE
END
```

1. Assign the type of report output (for example, HTML, PDF, PS, or EXL2K) to the Dialogue Manager variable &FORMAT. You will use this variable to toggle the WebFOCUS StyleSheet between formatting for HTML output and formatting for non-HTML output, and also to provide a value for SET ONLINE-FMT.

   You can use forms and other presentation logic to enable the application user to select the type of report output.

2. Set the report output type to the value of &FORMAT. In this procedure, SET ONLINE-FMT sets the display type for the report. Alternatively, you could use ON TABLE HOLD to save the report as a file and set its file type.

3. Set CSSURL to link to the external cascading style sheet to be used for formatting the report HTML output. When the report generates non-HTML output, this command will be ignored.

4. Branch to the WebFOCUS StyleSheet declarations for the current type of report output (which is indicated by &FORMAT).

5. Define the HTML version of the WebFOCUS StyleSheet macros. These macros specify formatting that is shared by all output types.

   This HTML version of the macros is implemented using external cascading style sheet classes.

6. If there is any formatting that is applicable only to HTML output, specify it here, using external cascading style sheet classes.

7. Branch to the WebFOCUS StyleSheet declarations that apply the macros to the report components.

8. This label marks the beginning of the macro definitions and unique formatting declarations for non-HTML report output.

9. Define the non-HTML version of the WebFOCUS StyleSheet macros. These macros specify formatting that is shared by all output types.

   This non-HTML version of the macros is implemented using native WebFOCUS StyleSheet attributes.

10. If there is any formatting that is applicable only to non-HTML output, specify it here using native WebFOCUS StyleSheet attributes.

11. This label marks the beginning of the declarations that apply macros to the report.

12. These are the macros that were defined earlier and are being applied to the report.

# Using an External CSS With PDF and HTML Output

This report procedure (videorpt.fex) can generate both HTML and PDF output. When it generates HTML output, it uses an external cascading style sheet (reports.css) to format the report. When it generates PDF output, it uses an inline WebFOCUS StyleSheet. In both cases, the report provides a light blue background for the LASTNAME column and makes all column titles bold.

The procedure as shown is set to generate HTML output.

**videorpt.fex**

```
1.  -DEFAULTS &FORMAT='HTML';
2.  SET CSSURL = http://websrv2/css/reports.css
3. SET ONLINE-FMT = &FORMAT
    TABLE FILE VIDEOTRK
    PRINT LASTNAME AS 'Last Name' FIRSTNAME AS 'First Name'
    BY LOWEST 5 CUSTID AS 'Cust ID'
    ON TABLE SET PAGE-NUM OFF
    ON TABLE SET STYLE *
4.  -IF &FORMAT NE 'HTML' GOTO NONHTML;
5.  DEFMACRO=boldTitles, CLASS=bold, $
    DEFMACRO=blueColumn, CLASS=blueBack, $
6.  -GOTO SHARED
7.  -NONHTML
8.  DEFMACRO=boldTitles, STYLE=bold, $
    DEFMACRO=blueColumn, BACKCOLOR=light blue, $
9.  -SHARED
10. TYPE=DATA, COLUMN=LastName, MACRO=blueColumn, $
    TYPE=TITLE, MACRO=boldTitles, $
```

```
   ENDSTYLE
   END
```

**reports.css**

```
11. .bold {font-weight: bolder}
12. .blueBack {background: lightblue}
13. TABLE {border:0}
13. TD    {border:0}
```

1. Assign a default value to &FORMAT to toggle the WebFOCUS StyleSheet between formatting for HTML output and formatting for PDF output. It is currently set to HTML output.
2. Set CSSURL to link to the external cascading style sheet reports.css to format the HTML output of the report.
3. Set the display type of the report to the value of &FORMAT.
4. Branch to the WebFOCUS StyleSheet declarations for the current type of report output (HTML).
5. Define the HTML version of the WebFOCUS StyleSheet macros, which are implemented using external cascading style sheet classes.
6. Branch to the WebFOCUS StyleSheet declarations that apply the macros to the components for the report.
7. This label marks the beginning of the macro definitions for PDF report output.
8. These declarations define the PDF version of the WebFOCUS StyleSheet macros, which are implemented using native WebFOCUS StyleSheet attributes. These macro definitions will be ignored because &FORMAT is set to HTML.
9. This label marks the beginning of the declarations that apply macros to the report.
10. These are the macros that were defined earlier and are being applied to the report.
11. This cascading style sheet declaration makes text bolder than it had been.
12. This cascading style sheet declaration makes a background light blue.
13. These CSS rules for the TABLE and TD elements remove the default grid for the report.

The procedure displays this report:

| Cust ID | Last Name | First Name |
|---|---|---|
| 0925 | CRUZ | IVY |
| 0944 | HANDLER | EVAN |
| 1118 | WILSON | KELLY |
| 1133 | KRAMER | CHERYL |
| 1237 | GOODMAN | JOHN |

# Requirements for Using an External Cascading Style Sheet

When you use an external cascading style sheet (CSS) to format a report, be aware of the following requirements:

- **Generate HTML report output.** You can use an external cascading style sheet to format any report that you generate as HTML, whether you save the report output in a file or send it directly to a web browser. You cannot use an external CSS for a report generated in a different format, such as PDF or Excel.

  If you wish to use an external CSS with a report that you will sometimes generate as HTML and sometimes as a different format, such as PDF, see Using External Cascading Style Sheets With Non-HTML Reports.

- If you are not generating an internal cascading style sheet, do not specify external CSS classes (CLASS=) and native WebFOCUS StyleSheet attributes in the same WebFOCUS StyleSheet (other than the exceptions noted in the next paragraph). Doing so could create formatting conflicts.

  **Exceptions.** Even when specifying external CSS classes, you should use native WebFOCUS StyleSheet attributes to:

  - Create hyperlinks (using the FOCEXEC, JAVASCRIPT, and URL attributes). However, if you wish to format a hyperlink, you should do so using the cascading style sheet.
  - Make a WebFOCUS StyleSheet declaration conditional (using the WHEN attribute).
  - Embed an image (using the IMAGE attribute). However, if you wish to format the image (for example, to position it), you should do so using the cascading

style sheet.

For more information, see Combining an External CSS With Other Formatting Methods.

- **Do not specify the same formatting using TABLE/GRAPH and CSS.** You can use TABLE language (or GRAPH language) formatting instructions, such as HEADING CENTER, PAGE-BREAK, and spot markers (for example, </3). However, you should not apply both a TABLE (or GRAPH) language instruction, and an external cascading style sheet rule, to perform the same formatting on the same report component. For more information, see Combining an External CSS With Other Formatting Methods.
- **SET STYLEMODE.** If you wish to use cascading style sheets to format a report in the usual way, you can set STYLEMODE to FULL (the default) or PAGED. If you set it to FIXED and link to an external cascading style sheet, the report will inherit formatting from the BODY and PRE elements, but you will not be able to format the report using classes and the TD element.
- **Use a cascading style sheet-enabled web browser.** Each user who wishes to display a report formatted using a cascading style sheet must have a web browser that supports CSS. All versions of Microsoft Internet Explorer that are certified for use with WebFOCUS support cascading style sheets.

  Note that how a cascading style sheet rule formats your report is determined entirely by the support of your web browser and implementation of cascading style sheets, not by WebFOCUS. Some web browsers may not fully support the latest CSS version, or may implement a CSS feature in different ways.
- **Do not override the cascading style sheet specified for the report.** If a browser has been customized to ignore cascading style sheets or to employ the personal cascading style sheet of the user, and the user wishes to view reports as they were intended to be seen (with the specified cascading style sheet), the user must reset his or her browser to accept the cascading style sheet of each document.

  For instructions about checking or changing a browser setting, see the browser Help. For information about how conflicts between CSS rules are resolved (for example, between a rule specified in a CSS document and a rule specified in the reader web browser CSS), see your third-party CSS documentation.

# Usage Notes for External Cascading Style Sheets With SET HTMLCSS ON

- Styling only to the CLASS, referenced from the external cascading style sheet, is honored when internal and external styling is applied to multiple subtypes in an element. The internal styling applied to the element is ignored. With HTMLCSS OFF, only the internal styling applied to each subtype is honored.
- In a report with no borders specified in the external cascading style sheet, borders in the internal styling are respected and only grids are shown when HTMLCSS is OFF.
- Border style specified in the external cascading style sheet overrides that specified in the internal style sheet. With HTMLCSS OFF, both grids and the border style specified in the external cascading style sheet are displayed.
- Border weights are consistent in all elements of the report. With HTMLCSS OFF, different border weights are seen in different elements of the report.
- When the heading of the report contains multiple lines, the border outlines the entire heading. With HTMLCSS OFF, the border outlines each line in the heading.

# FAQ About Using External Cascading Style Sheets

This topic answers the most frequently asked questions (FAQ) about using external cascading style sheets (CSS) to format reports.

**Does it answer your question?** We invite you to send us *any* questions that you would like answered. Each question will get a response, and will also be considered for inclusion in a future release of FAQ. (We also invite your comments on anything in this document.)

**How do I specify a report default formatting using CSS?**

You can specify default formatting for an entire report in an external cascading style sheet rule for the BODY or TD element. For more information, see Choosing an External Cascading Style Sheet.

**Do I always need to use the CLASS attribute?**

No. You need the CLASS attribute in a WebFOCUS StyleSheet if you specify formatting for an individual report component. (You use CLASS to assign a rule for a generic class to the report component.) When you specify formatting for the entire report, you do so in a rule for the BODY or TD element, not a rule for a class, so you omit the CLASS attribute.

If you place a reference to a CSS class in your stylesheet, it will be applied to the <A> tag as well as the <TD> tag. For example, if you have the class "*.class1*" in your external CSS, WebFOCUS would generate the following HTML for a value with a drilldown:

```
<TD CLASS='class1'>
<A class='class1' HREF="...">ENGLAND</A>
</TD>
```

For example, if you want red hyperlinks without underlines, issue:

```
SET CSSURL=http://myserver/mycss.css
TABLE FILE CAR
SUM SALES BY COUNTRY
ON TABLE PCHOLD FORMAT HTML
ON TABLE SET STYLE *
type=data, column=country, focexec=fex1, class=class1, $
END
```

where mycss.css contains:

```
.class1 { color:red; text-decoration:none }
```

The output is:

For more information, see Applying External Cascading Style Sheet Formatting.

**Can I use a cascading style sheet and a WebFOCUS StyleSheet together?**

When you link to an external cascading style sheet, you can also specify native WebFOCUS StyleSheet attributes in a WebFOCUS StyleSheet. However, if you do not generate an internal cascading style sheet, you should not specify CSS classes (CLASS=) and native WebFOCUS StyleSheet attributes in the same WebFOCUS StyleSheet (except to specify a condition for conditional formatting, to specify a link to another resource, and to embed an image). For more information, see Combining an External CSS With Other Formatting Methods. For information about internal cascading style sheets, see Generating an Internal Cascading Style Sheet for HTML Reports.

**Which version of CSS does WebFOCUS support?**

Support for different versions of cascading style sheets (such as CSS2) is determined entirely by your web browser support and implementation of cascading style sheets, not by WebFOCUS. Note that some web browsers may not fully support the latest CSS version, or may implement a CSS feature in different ways. For more information, see Requirements for Using an External Cascading Style Sheet, and Troubleshooting External Cascading Style Sheets.

**Can I use CSS to format reports generated as PDF, PostScript, or Excel 2000?**

No, you can only use external cascading style sheets to format reports that are generated as HTML.

**Which types of reports can I format using an external cascading style sheet?**

You can format all types of reports using an external CSS:

- **Tabular reports**, including regular (column-oriented) reports and Financial Modeling Language (FML, also known as extended matrix or row-oriented) reports.
- **Graphs.** Note that, while you can format a graph heading and footing, and the background color and background image of the page in which the graph appears, the graph itself is generated using Java and so cannot be formatted using CSS.
- **Free-form reports.** Most people choose to generate free-form reports using output types other than HTML, making CSS a rarely-used option for formatting free form.

# Troubleshooting External Cascading Style Sheets

This topic will help you solve some common problems encountered when formatting reports with external cascading style sheets (CSS).

**Which problems have you needed to troubleshoot?** If you have troubleshooting suggestions that you think others will find helpful, we invite you to send them to us so that we can consider including them in a future release.

**Symptom: The report does not reflect recent changes to the cascading style sheet.**

- **Reason:** When you run a report that references an external cascading style sheet, your web browser stores the CSS file in its memory or disk cache. When you later edit the CSS and run the report again, your browser may continue to use the earlier version of the CSS file that it had stored.

  **Solution:** Click your browser Refresh button (Microsoft Internet Explorer) to reload the CSS file from the web server. This ensures that your web browser will use the most current version of the cascading style sheet to format the report.

**Symptom: The report is not using any of the cascading style sheet formatting.**

- **Reason 1:** You may have specified an incorrect URL when you attempted to link to the external cascading style sheet.

  **Solution 1:** Check the URL that specifies the link (in the CSSURL attribute or in the

SET CSSURL command, or if the report procedure uses -HTMLFORM, in the LINK element) and correct it, if necessary.

- **Reason 2:** Your web browser may not support cascading style sheets.

  **Solution 2:** All versions of Microsoft Internet Explorer that are certified for use with WebFOCUS support cascading style sheets. Check to be sure that your browser is certified. If it is not, install an appropriate version of Internet Explorer or Communicator.

- **Reason 3:** Your web browser may be set to ignore cascading style sheets.

  **Solution 3:** Reset your browser to accept a document cascading style sheet. For instructions about checking or changing a browser setting, see the browser Help.

- **Reason 4:** Some web browsers, if they do not support a single property specified in a rule, ignore the entire rule. If this is true of your web browser, and all of your report formatting is specified in a single rule (for example, a rule for TD or BODY), but the browser does not support one of the properties specified for the rule, none of the formatting will be applied to the report.

  **Solution 4:** Remove the unsupported property, or upgrade your browser to a version that supports the property.

- **Reason 5:** Some web browsers implement CSS inheritance rules for nested elements in ways that do not conform to the CSS standard. If you are using such a browser, and for example, you specify all formatting in a rule for the BODY element, your browser may not apply the rule to other elements nested within BODY.

  **Solution 5:** Specify the report formatting in a rule for a different element (for example, if the browser does not correctly implement inheritance from BODY, use a rule for TD), or else upgrade your browser to a version that correctly supports inheritance.

- **Reason 6:** The CSS file was not found on the server path when the report that references the .css file was run.

  **Solution 6:** Make sure the directory with the CSS file is on the server search path.

**Symptom: The report reflects some, but not all, of the CSS formatting.**

- **Reason 1:** How a cascading style sheet rule formats your report is determined entirely by your web browser support and implementation of cascading style sheets, not by WebFOCUS. You may be experiencing this symptom because your browser does not support the level of cascading style sheets that you are using, leaving some CSS features unimplemented.

**Solution 1:** Upgrade your browser to a version that supports all the CSS features used to format the report, or edit the cascading style sheet to remove features that are unsupported by some of the browsers that will be used to display the report.

- **Reason 2:** Your web browser may be set to use your personal cascading style sheet, and some of the rules you had specified there may override rules specified in the cascading style sheet assigned to the report. For information about how conflicts between rules in different cascading style sheets are resolved, see your third-party CSS documentation.

  **Solution 2:** Reset your browser to accept the cascading style sheet for each document, or edit the rules in the two cascading style sheets so that they no longer conflict.

- **Reason 3:** Some web browsers, if they do not support a property specified in a rule, ignore the entire rule. If this is true of your web browser, and the browser does not support one of the properties specified in the rule for one of the classes assigned to the report, none of the report components to which that rule has been assigned will be formatted.

  **Solution 3:** Remove the unsupported property, or upgrade your browser to a version that supports the property.

- **Reason 4:** Each report component can be assigned only one cascading style sheet class. If you have specified more than one class, only the first one specified is assigned to the component; the others are ignored.

  If a class has not yet been assigned to a report cell, and you specify conditional formatting for it, only the first class whose condition is satisfied by that row is assigned to the cell. The others are ignored.

  **Solution 4:** Do not assign more than one CSS class to each report component. If you need to apply multiple attributes, bundle them into a single class.

- **Reason 5:** Some web browsers implement CSS inheritance rules for nested elements in ways that do not conform to the CSS standard. If you are using such a browser, and for example, you specify some formatting in a rule for the BODY element, your browser may not apply the rule to other elements nested within BODY.

  **Solution 5:** Specify the report formatting in a rule for a different element (for example, if the browser does not correctly implement inheritance from BODY, use a rule for TD), or else upgrade your browser to a version that correctly supports inheritance.

- **Reason 6:** External cascading style sheets can be subject to certain restrictions when

used with other formatting methods. For example, if a WebFOCUS StyleSheet report does not generate an internal cascading style sheet, but it references external CSS classes and also specifies native WebFOCUS StyleSheet attributes, there may be a formatting conflict.

**Solution 6:** The solution depends on the kind of formatting conflict. In the example above, the solution is to generate an internal cascading style sheet. For a complete description of which formatting methods are compatible with an external CSS, and how to avoid formatting conflicts, see Combining an External CSS With Other Formatting Methods.

**Symptom: A report distributed with ReportCaster does not have the CSS styling, but it does have CSS styling when run interactively.**

- **Reason:** The mail server to which ReportCaster is distributing reports may not support externally referenced CSS files. For example, Gmail strips the CSS from HTML email, you must use an inline CSS for GMail.

  **Solution:** Issue the WebFOCUS command SET HTMLCSS=ON in your procedure, or issue the command ON TABLE SET HTMLCSS ON in your request. This creates reports with an inline CSS.

# Laying Out the Report Page

You can customize page layout using StyleSheet attributes. The page layout attributes available to you, like all other attributes, depend on the display format. For instance, some attributes support print-oriented display formats such as PDF, and they do not apply to HTML reports displayed in a browser. For details on display formats, see Choosing a Styled Display Format and Saving and Reusing Your Report Output.

A report page has default layout characteristics. However, you can change any of them to customize the layout. You control a report's appearance, including column arrangement on a page, page numbering, page breaks, use of grids and images, and much more.

You can use SET parameters in place of most StyleSheet attributes to define page layout characteristics. For details on SET, see the *TIBCO WebFOCUS® Developing Reporting Applications* manual.

# Selecting Page Size, Orientation, and Color

You can select the page size, page orientation (portrait or landscape), and page color for your report. The default page size is letter (8.5 x 11 inches), but you can select from many other sizes, including legal and envelopes.

# Page Size, Orientation, and Color Attributes

| Attribute | Description | Applies to |
|---|---|---|
| `PAGESIZE` | Sets page size. | In the Development environment:<br>• PDF<br>• PS |

| Attribute | Description | Applies to |
|---|---|---|
| | | • PPT<br>• PPTX |
| `ORIENTATION` | Sets page orientation. | In the Development environment:<br>• PDF<br>• PS<br>• EXL2K<br>• PPT<br>• PPTX |
| `PAGECOLOR` | Sets page color. | • HTML report with internal cascading style sheet<br>• PPTX<br>**Note:** The PAGECOLOR StyleSheet attribute is ignored in a report containing a template, in order to preserve the styles in the template. |

# Set Page Size

This syntax applies to a PDF, PS, PPT, or PPTX report.

```
[TYPE=REPORT,] PAGESIZE={size|LETTER}, $
```

where:

**TYPE=REPORT**

Applies the page size to the entire report. Not required, as it is the default value.

**size**

Is the page size. If printing a report, the value should match the size of the paper. Otherwise, the report may be cropped or printed with extra blank space.

Valid values are:

| Value | Description |
|---|---|
| `SCREEN` | Sets the page size so that the report fills the screen. Each print line is infinitely wide. The report width determines the page width. The number of lines per page depends on how many lines fit on the screen. This number varies, depending on the font and screen resolution. |
| `LETTER` | 8.5 x 11 inches. LETTER is the default value. |
| `LEGAL` | 8.5 x 14 inches. |
| `CUSTOM` | Enables you to set a custom page size for a DHTML, PDF, or PPTX report. If you use the CUSTOM option, you can specify the length and width values in the request using CUSTOM-PAGE-LENGTH=*number* and CUSTOM-PAGE-WIDTH=*number* through a SET command or StyleSheet attribute. The *number* value you specify depends on the UNITS parameter (inches, centimeters, points). The default is inches. |
| `TABLOID` | 11 x 17 inches. |

| Value | Description |
|---|---|
| `LEDGER` | 17 x 11 inches. |
| `WIDESCREEN` | 13.333 x 7.5 inches. |
| `C` | 17 x 22 inches. |
| `D` | 22 x 34 inches. |
| `E` | 34 x 44 inches. |
| `STATEMENT` | 5.5 x 8.5 inches. |
| `EXECUTIVE` | 7.5 x 10.5 inches. |
| `FOLIO` | 8.5 x 13 inches. |
| `10x14` | 10 x 14 inches. |
| `A3` | 297 x 420 millimeters. |
| `A4` | 210 x 297 millimeters. |

| Value | Description |
|---|---|
| A5 | 148 x 210 millimeters. |
| B4 | 250 x 354 millimeters. |
| B5 | 182 x 257 millimeters. |
| QUARTO | 215 x 275 millimeters. |
| ENVELOPE-9 | 3.875 x 8.875 inches. |
| ENVELOPE-10 | 4.125 x 9.5 inches. |
| ENVELOPE-11 | 4.5 x 10.375 inches. |
| ENVELOPE-12 | 4.5 x 11 inches. |
| ENVELOPE-14 | 5 x 11.5 inches. |
| ENVELOPE-MONARCH | 3.875 x 7.5 inches. |
| ENVELOPE-PERSONAL | 3.625 x 6.5 inches. |

| Value | Description |
|---|---|
| `ENVELOPE-DL` | 110 x 220 millimeters. |
| `ENVELOPE-C3` | 324 x 458 millimeters. |
| `ENVELOPE-C4` | 229 x 324 millimeters. |
| `ENVELOPE-C5` | 162 x 229 millimeters. |
| `ENVELOPE-C6` | 114 x 162 millimeters. |
| `ENVELOPE-C65` | 114 x 229 millimeters. |
| `ENVELOPE-B4` | 250 x 353 millimeters. |
| `ENVELOPE-B5` | 176 x 250 millimeters. |
| `ENVELOPE-B6` | 176 x 125 millimeters. |
| `ENVELOPE-ITALY` | 110 x 230 millimeters. |
| `US-STANDARD-FANFOLD` | 14.875 x 11 inches. |

| Value | Description |
| --- | --- |
| `GERMAN-STANDARD-FANFOLD` | 8.5 x 12 inches. |
| `GERMAN-LEGAL-FANFOLD` | 8.5 x 13 inches. |

# Set Page Orientation

This syntax applies to a PDF, PS, or EXL2K report.

```
[TYPE=REPORT,] ORIENTATION={PORTRAIT|LANDSCAPE}, $
```

where:

**TYPE=REPORT**

Applies the page orientation to the entire report. Not required, as it is the default.

**PORTRAIT**

Displays the report across the narrower dimension of a vertical page, producing a page that is longer than it is wide. PORTRAIT is the default value.

**LANDSCAPE**

Displays the report across the wider dimension of a horizontal page, producing a page that is wider than it is long.

# Setting Page Orientation

This request sets the page orientation of a PDF report to landscape.

```
SET ONLINE-FMT = PDF
TABLE FILE CENTQA
SUM CNT.PROBNUM AS 'Total Number, of Problems'
```

```
SUM CNT.PROBNUM AS 'Problems From, Each Plant' BY PLANT
SUM CNT.PROBNUM AS 'Problem by Product' BY PLANT BY PRODNAME
ON PLANT PAGE-BREAK
HEADING CENTER
"QA Report for Company, Plant, and Product"
" "
ON TABLE COLUMN-TOTAL
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, ORIENTATION=LANDSCAPE, $
ENDSTYLE
END
```

# Set Page Color

This syntax applies to an HTML report with internal cascading style sheet.

```
[TYPE=REPORT,] ... PAGECOLOR=color, ... , $
```

where:

**TYPE=REPORT**

The TYPE specification is optional with this feature. If omitted, TYPE defaults to REPORT.

**color**

Is a supported color. For a list of values, see Formatting Report Data.

# Setting Page Color

This request sets the page color of an HTML report with internal cascading style sheet to silver.

```
SET HTMLCSS = ON
TABLE FILE CENTORD
ON TABLE SUBHEAD
"SELECTED PRODUCT INVENTORY"
SUM QTY_IN_STOCK/D12 BY PROD_NUM BY SNAME BY STATE
```

```
WHERE PROD_NUM EQ '1004'
WHERE SNAME EQ 'eMart'
WHERE STATE EQ 'CA'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, PAGECOLOR=SILVER, GRID=OFF, $
ENDSTYLE
END
```

The output is:

SELECTED PRODUCT INVENTORY

| Product Number#: | Store Name: | State: | Quantity In Stock: |
|---|---|---|---|
| 1004 | eMart | CA | 689,088 |

# Setting Page Margins

You can set the page margins for your report. This includes the top, bottom, left, and right margins. You can also change the default unit of measurement (inches) to either centimeters or points. The unit of measurement applies to page margins, column width, and column position.

# Page Margin Attributes

| Attribute | Description | Applies to |
|---|---|---|
| `UNITS` | Sets unit of measurement.<br>Used when specifying margin size or other page characteristics. If you change the current unit of measurement, the new value is | PDF<br>PS<br>HTML report with internal cascading style |

| Attribute | Description | Applies to |
|---|---|---|
| | applied to all instances in which unit of measurement is used. | sheet |
| `TOPMARGIN`<br>`BOTTOMMARGIN`<br>`LEFTMARGIN`<br>`RIGHTMARGIN` | Sets size of top, bottom, left, and right margin. | PDF<br>PS<br>HTML report with internal cascading style sheet |

# Set the Unit of Measurement

This syntax applies to a PDF, PS, or HTML report with internal cascading style sheet.

In a StyleSheet, add the following attribute

```
UNITS = units
```

Outside of a report request, use

```
SET UNITS = units
```

Within a report request, use

```
ON TABLE SET UNITS units
```

where:

**units**

Is the unit of measure. Values can be:

- **INCHES,** which specifies the unit of measure as inches. This is the default value.
- **CM,** which specifies the unit of measure as centimeters.
- **PTS,** which specifies the unit of measure as points. Points is a common

measurement scale for typefaces.

# Set Margin Size

This syntax applies to a PDF, PS, or HTML report with internal cascading style sheet.

```
[TYPE=REPORT,] [TOPMARGIN={value|.25},] [BOTTOMMARGIN={value|.25},]
 [LEFTMARGIN={value|.25},] [RIGHTMARGIN={value|.25},] $
```

where:

**TYPE=REPORT**

Applies the margin size to the entire report. Not required, as it is the default.

**TOPMARGIN**

Sets the top boundary of the report content.

**BOTTOMMARGIN**

Sets the bottom boundary of the report content.

**LEFTMARGIN**

Sets the left boundary of the report content.

**RIGHTMARGIN**

Sets the right boundary of the report content.

**value**

Is the size of the specified margin. The report content displays inside the margin. If printing a report, specify a value compatible with the printer's print area. For example, if the print area has 0.25 inch margins all around, set the margins to 0.25 inches, or larger.

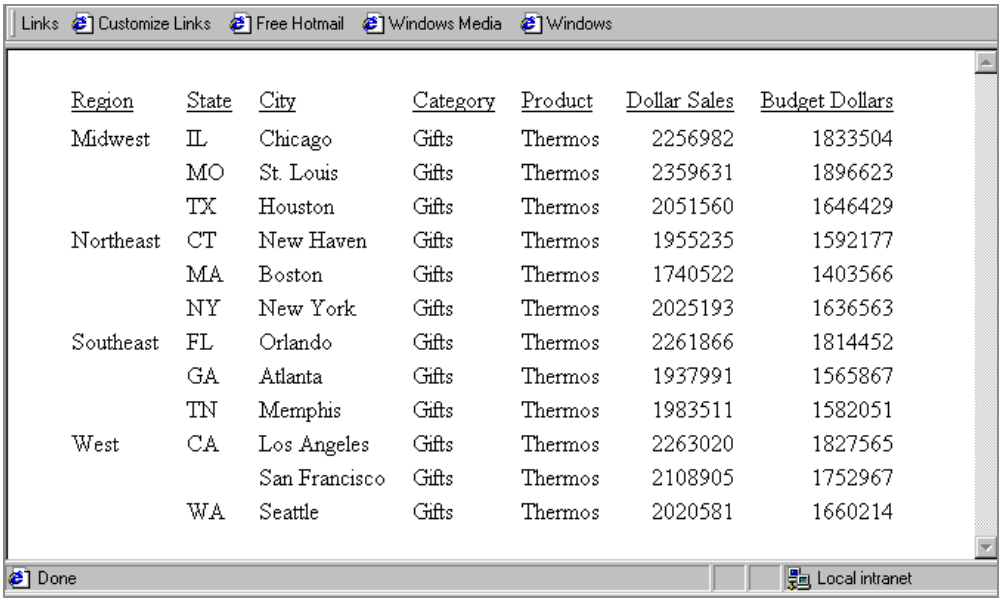
The default value for all margins is 0.25 inches.

# Setting the Left Margin

This request sets the left margin of an HTML report with internal cascading style sheet to one inch.

```
SET HTMLCSS = ON
TABLE FILE GGSALES
SUM CATEGORY PRODUCT DOLLARS BUDDOLLARS
BY REGION BY ST BY CITY
WHERE DOLLARS GT BUDDOLLARS
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
LEFTMARGIN = 1, $
ENDSTYLE
END
```

The output is:




| Region | State | City | Category | Product | Dollar Sales | Budget Dollars |
|---|---|---|---|---|---|---|
| Midwest | IL | Chicago | Gifts | Thermos | 2256982 | 1833504 |
| | MO | St. Louis | Gifts | Thermos | 2359631 | 1896623 |
| | TX | Houston | Gifts | Thermos | 2051560 | 1646429 |
| Northeast | CT | New Haven | Gifts | Thermos | 1955235 | 1592177 |
| | MA | Boston | Gifts | Thermos | 1740522 | 1403566 |
| | NY | New York | Gifts | Thermos | 2025193 | 1636563 |
| Southeast | FL | Orlando | Gifts | Thermos | 2261866 | 1814452 |
| | GA | Atlanta | Gifts | Thermos | 1937991 | 1565867 |
| | TN | Memphis | Gifts | Thermos | 1983511 | 1582051 |
| West | CA | Los Angeles | Gifts | Thermos | 2263020 | 1827565 |
| | | San Francisco | Gifts | Thermos | 2108905 | 1752967 |
| | WA | Seattle | Gifts | Thermos | 2020581 | 1660214 |

# Positioning a Report Component

A StyleSheet enables you to specify an absolute or relative starting position for a column, heading, or footing, or element in a heading or footing. You can also add blank space around a report component.

This topic addresses column positioning using the StyleSheet attribute POSITION. For details on the column positioning command IN, see Arranging Columns on a Page.

For details on positioning a heading or footing, or an element in a heading or footing, see Using Headings, Footings, Titles, and Labels.

# Positioning Attributes

| Attribute | Description | Applies to |
|---|---|---|
| `POSITION` | Sets absolute or relative starting position of a column.<br>An absolute position is the distance from the left margin of the printed paper.<br>A relative position is the distance from the default position. After the first column, the default position is the end of the preceding column. | PDF<br>PS |
| `TOPGAP`<br>`BOTTOMGAP` | Adds blank space to the top or bottom of a report line. | PDF<br>PS |
| `LEFTGAP`<br>`RIGHTGAP` | Adds blank space to the left or right of a report column. | PDF<br>PS |

# Specify the Starting Position of a Column

This syntax applies to a PDF or PS report.

```
TYPE=REPORT, COLUMN=identifier, POSITION={+|-}position, $
```

where:

**identifier**

Selects a single column and collectively positions the column title, data, and totals if applicable. For valid values, see Identifying a Report Component in a WebFOCUS StyleSheet.

**+**

Starts the column at the specified distance to the right of the default starting position.

By default, text items and alphanumeric fields are left-justified in a column, and numeric fields are right-justified in a column.

**-**

Starts the column at the specified distance to the left of the default starting position.

It is possible to create a report in which columns overlap. If this occurs, simply adjust the values.

**position**

Is the desired distance, in the unit of measurement specified with the UNITS attribute.

# Specifying an Absolute Starting Position for a Column

The following illustrates how to position a column in a printed report. It is specified in the request that the PRODUCT_DESCRIPTION field display three inches from the left margin of the PDF report.

```
SET ONLINE-FMT = PDF
TABLE FILE GGORDER
"PRODUCTS ORDERED ON 08/01/96"
SUM QUANTITY BY PRODUCT_DESCRIPTION
WHERE ORDER_DATE EQ '080196'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, COLUMN=PRODUCT_DESCRIPTION, POSITION=3, $
ENDSTYLE
END
```

The output is:

```
PRODUCTS ORDERED ON 08/01/96
                                                  Ordered
                                Product             Units
                                ------             -------

                                Biscotti              6140
                                Coffee Grinder        2493
                                Coffee Pot            3100
                                Croissant             7465
                                French Roast         12965
                                Hazelnut              4186
                                Kona                  2591
                                Mug                   5332
                                Scone                 5949
                                Thermos               2362
```

# Specifying a Relative Starting Position for a Column

This request positions the column title and data for the QUANTITY field two inches from the default position, in this case, two inches from the end of the preceding column.

```
SET ONLINE-FMT = PDF
TABLE FILE GGORDER
"PRODUCTS ORDERED ON 08/01/96"
SUM QUANTITY BY PRODUCT_DESCRIPTION
WHERE ORDER_DATE EQ '080196'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, COLUMN=PRODUCT_DESCRIPTION, POSITION=3, $
TYPE=REPORT, COLUMN=QUANTITY, POSITION=+2, $
ENDSTYLE
END
```

QUANTITY, titled Ordered Units in the report, is relatively positioned to Product:

```
PRODUCTS ORDERED ON 08/01/96
                                                  Ordered
                              Product             Units
                              ------             -------
                              Biscotti              6140
                              Coffee Grinder        2493
                              Coffee Pot            3100
                              Croissant             7465
                              French Roast         12965
                              Hazelnut              4186
                              Kona                  2591
                              Mug                   5332
                              Scone                 5949
                              Thermos               2362
```

# Add Blank Space Around a Report Component

This syntax applies to a PDF or PS report.

```
TYPE=REPORT, {TOPGAP|BOTTOMGAP}=gap, $
TYPE=type, [COLUMN=identifier,|ACROSSCOLUMN=acrosscolumn,]
 {LEFTGAP|RIGHTGAP}=gap, $
```

```
TYPE=type, [COLUMN=identifier,|ACROSSCOLUMN=acrosscolumn,]
 {LEFTGAP|RIGHTGAP}=gap, $
```

where:

**TOPGAP**

Indicates how much space to add above the report line.

**BOTTOMGAP**

Indicates how much space to add below the report line.

**gap**

Is the amount of blank space, in the unit of measurement specified with the UNITS attribute.

In the absence of grids or background color, the default value is 0. For RIGHTGAP, the default value is proportional to the size of the text font.

In the presence of grids or background color, the default value increases to provide space between the grid and the text or to extend the color beyond the text.

The gaps must be the same within a single column or row. That is, you cannot specify different left or right gaps for individual cells in the same column, or different top and bottom gaps for individual cells in the same row.

**type**

Identifies the report component. For valid values, see Identifying a Report Component in a WebFOCUS StyleSheet.

**identifier**

Selects one or more columns using the COLUMN attribute described in Identifying a Report Component in a WebFOCUS StyleSheet.

**acrosscolumn**

Selects the same column under every occurrence of an ACROSS sort field using the ACROSSCOLUMN attribute described in Identifying a Report Component in a WebFOCUS StyleSheet.

**LEFTGAP**

Indicates how much space to add to the left of a report column.

**RIGHTGAP**

Indicates how much space to add to the right of a report column.

**Note:** For TOPGAP, BOTTOMGAP, LEFTGAP, and RIGHT GAP, you must specify a value of at least 0.013889 (the decimal size of a point in inches). If you specify a value less than this, WebFOCUS will round down to the nearest point, which is zero.

# Adding Blank Space Above Data Values

This request generates one-tenth of an inch of blank space above every data value in a PDF report.

```
SET ONLINE-FMT = PDF
SET PAGE-NUM = OFF
TABLE FILE GGORDER
"PRODUCTS ORDERED ON 08/01/96"
```

```
" "
SUM QUANTITY BY PRODUCT_DESCRIPTION
WHERE ORDER_DATE EQ '080196'
ON TABLE SET STYLE *
TYPE=DATA, TOPGAP = 0.1, $
ENDSTYLE
END
```

The data is spaced for readability:

PRODUCTS ORDERED ON 08/01/96

| Product | Ordered Units |
|---|---|
| Biscotti | 6140 |
| Coffee Grinder | 2493 |
| Coffee Pot | 3100 |
| Croissant | 7465 |
| French Roast | 12965 |
| Hazelnut | 4186 |
| Kona | 2591 |
| Mug | 5332 |
| Scone | 5949 |
| Thermos | 2362 |

# Adding Blank Space to the Left of a Column

The following illustrates how to add blank space to the left of a report component. In this example, 1.5 inches of blank space are inserted to the left of the Product Category column.

```
SET ONLINE-FMT=PDF
TABLE FILE CENTORD
HEADING CENTER
"Summary Report for Digital Products"
" "
SUM    LINE_COGS/D12       AS 'Cost of Goods Sold'
BY     PRODTYPE            AS 'Product Type'
BY     PRODCAT             AS 'Product Category'
WHERE PRODTYPE EQ 'Digital';
```

```
ON TABLE COLUMN-TOTAL/D12
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, COLUMN=PRODCAT, LEFTGAP=1.5, $
ENDSTYLE
END
```

The output is:

Summary Report for Digital Products

| Product Type | Product Category | Cost of Goods Sold |
|---|---|---|
| Digital | CD Players | 30,519,126 |
| | Camcorders | 91,518,330 |
| | Cameras | 1,785,627 |
| | DVD | 47,275,593 |
| | Digital Tape Recorders | 36,157,863 |
| | PDA Devices | 202,123,656 |
| TOTAL | | 409,380,195 |

# Arranging Columns on a Page

How easily a user locates data depends on the arrangement of columns on a page. You have many design options. Using StyleSheet attributes or commands you can:

- Determine column width.
- Control the number of spaces between columns.
- Change the order of vertical sort (BY) columns.
- Stack columns to reduce report width, or to easily compare values in a report by creating a matrix.
- Specify the absolute or relative starting position for a column.

# Column Arrangement Features

| Feature | Description | Applies to |
|---|---|---|
| `SQUEEZE` | Sets column width. | HTML<br>PDF<br>PS |
| `SET SPACES` | Sets number of spaces between columns. | HTML |
| `SEQUENCE` | Sets column order. | PDF<br>PS<br>HTML<br>EXL2K (**Note:** Does not work with XLSX and EXL2K FORMULA) |
| `FOLD-LINE` | Reduces report width by stacking columns. | PDF<br>PS |
| `OVER` | Stacks columns by placing them over one another. | HTML<br>PDF<br>PS |
| `IN {n\|+n}` | Sets absolute or relative starting position of a column. | HTML<br>PDF<br>PS |

# Determining Column Width

The value of the SQUEEZE attribute in a StyleSheet determines column width in a report. You can use a SET parameter instead of a StyleSheet to set the value of SQUEEZE. If there are conflicting StyleSheet and SET values, the StyleSheet overrides the SET. For details on SET, see the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

When SQUEEZE is set to ON (the default), StyleSheet column width is ignored. Column width is determined using your browser's default settings.

When using SQUEEZE it may affect the way headings, footings, and column titles display in your report. For details, see Using Headings, Footings, Titles, and Labels.

# Determine Column Width (HTML)

This syntax applies to an HTML report. For the syntax for a PDF or PS report, see Determine Column Width (PDF or PS).

The sizing of tables and column width within a standard HTML report is done by browser processing, including the browser default settings and the size of the browser window or iframe. The columns are sized to fit the largest data value or column title, whichever is greater, and trailing spaces are automatically removed.

In standard HTML reports, the data is presented in a single table, so the column widths are fixed for all data rows.

In HFREEZE HTML reports, the data is presented with no wrapping in three tables containing the heading, data rows, and footing, to ensure the alignment of the column titles with the data rows.

```
[TYPE=REPORT,] SQUEEZE={ON|OFF}, $
```

where:

**TYPE=REPORT**

Applies the column width to the entire report. Not required, as it is the default.

**ON**

Determines column width based on the longest data value or column title, whichever is greater. ON is the default value.

For HTML reports, the web browser shrinks the column width to the shortest column title or field value.

**OFF**

Determines column width based on the longest data value or column title, whichever is greater. Blank spaces pad the column width up to the length of the column title or field format, whichever is greater.

**Note:**

- In an HTML report that sets SQUEEZE and uses conditional styling for some columns, use TYPE=DATA, COLUMN=*n*, not TYPE=REPORT, COLUMN=*n*.
- SQUEEZE is not supported for columns created with the OVER phrase.

# Using Default Column Width (HTML)

This request uses SQUEEZE=ON (the default) for an HTML report. Column width is based on the wider of the data value or column title.

```
SET PAGE-NUM = OFF
TABLE FILE GGSALES
SUM UNITS DOLLARS
BY CATEGORY BY PRODUCT
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, FONT=COURIER, $
ENDSTYLE
END
```

For Category, Unit Sales, and Dollar Sales, the column title is wider than the corresponding data values. For Product, the wider data values determine column width. The HTML report is:

| Category | Product | Unit Sales | Dollar Sales |
|---|---|---|---|
| Coffee | Capuccino | 189217 | 2381590 |
| | Espresso | 308986 | 3906243 |
| | Latte | 878063 | 10943622 |
| Food | Biscotti | 421377 | 5263317 |
| | Croissant | 630054 | 7749902 |
| | Scone | 333414 | 4216114 |
| Gifts | Coffee Grinder | 186534 | 2337567 |
| | Coffee Pot | 190695 | 2449585 |
| | Mug | 360570 | 4522521 |
| | Thermos | 190081 | 2385829 |

# Using Column Width Based on Field Format (HTML)

This request sets SQUEEZE to OFF for an HTML report. Column width is based on the longest data value or column title, whichever is greater.

```
SET PAGE-NUM = OFF
TABLE FILE GGSALES
SUM UNITS DOLLARS
BY CATEGORY BY PRODUCT
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, SQUEEZE=OFF, FONT=COURIER, $
ENDSTYLE
END
```

Blank spaces pad the column width up to the length of the field format for Category (A11) and Product (A16). The HTML report is:

| Category | Product | Unit Sales | Dollar Sales |
|---|---|---|---|
| Coffee | Capuccino | 189217 | 2381590 |
| | Espresso | 308986 | 3906243 |
| | Latte | 878063 | 10943622 |
| Food | Biscotti | 421377 | 5263317 |
| | Croissant | 630054 | 7749902 |
| | Scone | 333414 | 4216114 |
| Gifts | Coffee Grinder | 186534 | 2337567 |
| | Coffee Pot | 190695 | 2449585 |
| | Mug | 360570 | 4522521 |
| | Thermos | 190081 | 2385829 |

# Determine Column Width (PDF or PS)

This syntax applies to a PDF or PS report. For the syntax for an HTML report, see Determine Column Width (HTML).

```
[TYPE=REPORT,] COLUMN=identifier, SQUEEZE={ON|OFF|width}, $
```

where:

**TYPE=REPORT**

Applies the column width to the entire report. Not required, as it is the default.

**identifier**

Selects a column using the COLUMN attribute described in Identifying a Report Component in a WebFOCUS StyleSheet. If you omit a column identifier, the value for SQUEEZE applies to all columns in a report. You can also use SET SQUEEZE to set the width of all columns.

**ON**

Determines column width based on the widest data value or column title, whichever is greater.

**OFF**

Determines column width based on the longest data value or column title, whichever is greater. Blank spaces pad the column width up to the length of the column title or field format, whichever is greater. OFF is the default value.

**width**

Is a measurement for the column width, specified with the UNITS attribute.

If the widest data value exceeds the specified measurement:

| And the field is... | The following displays... |
|---|---|
| Alphanumeric | As much of the value as will fit in the specified width, followed by an exclamation mark (!) to indicate truncation. |
| Numeric | Asterisks (*) in place of the field value. |

**Note:** SQUEEZE is not supported for columns created with the OVER phrase.

# Determining Column Width (PDF)

This request uses SQUEEZE=2.5 to increase the default column width of the PRODUCT field in a PDF report. Note that this feature is used primarily for printed reports. Depending on your screen resolution, the column width may look different than how it will print.

```
SET ONLINE-FMT = PDF
TABLE FILE GGSALES
SUM UNITS
BY PRODUCT
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, COLUMN=PRODUCT, SQUEEZE=2.5, $
ENDSTYLE
END
```

The PDF report is:

| Product | Unit Sales |
|---|---|
| Biscotti | 421377 |
| Capuccino | 189217 |
| Coffee Grinder | 186534 |
| Coffee Pot | 190695 |
| Croissant | 630054 |
| Espresso | 308986 |
| Latte | 878063 |
| Mug | 360570 |
| Scone | 333414 |
| Thermos | 190081 |

# Controlling Column Spacing

By default, report columns are separated by one or two spaces, depending on the output width. The SET SPACES or ON TABLE SET SPACES parameter controls the number of spaces between columns in a report.

In a horizontal sort (ACROSS) phrase, the SPACES parameter determines the distance between horizontal sort sets. Within a set, the distance between columns is always one space and cannot be changed.

This feature applies to an HTML report. It requires you to set the STYLEMODE parameter to FIXED.

# Control Column Spacing

This syntax applies to an HTML report.

**For all report requests in a procedure**

```
SET SPACES = {n|AUTO}
```

**For one report request**

```
ON TABLE SET SPACES {n|AUTO}
```

where:

**n**

Is an integer between 1 and 8, indicating the number of spaces between report columns.

**AUTO**

Automatically separates report columns with one or two spaces. AUTO is the default value.

# Controlling Column Spacing Between Horizontal (ACROSS) Fields

This request uses ACROSS with ON TABLE SET SPACES. The ON TABLE SET STYLEMODE FIXED parameter is required for HTML.

```
TABLE FILE CENTORD
SUM QUANTITY LINEPRICE ACROSS ORDER_NUM BY PLANT AS 'Plant'
WHERE ORDER_NUM EQ '28003' OR '28004'
ON TABLE SET SPACES 7
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLEMODE FIXED
END
```

The ACROSS set consists of the fields titled Quantity and Line Total. The distance between each set is seven spaces:

| | Order Number: | | | |
|---|---|---|---|---|
| | 28003 | | 28004 | |
| Plant | Quantity: | Line Total | Quantity: | Line Total |
| BOS | . | . | 6 | $2,023.62 |
| LA | 5 | $1,688.47 | . | . |

# Changing Column Order

You can change the order in which vertical sort (BY) columns are displayed in a report. This feature does not apply to horizontal sort (ACROSS) rows or stacked (OVER) columns.

# Change Column Order

This syntax applies to PDF, PS, HTML, XLSX, and EXL2K reports. XLSX FORMULA and EXL2K FORMULA formats are not supported.

```
[TYPE=REPORT,] COLUMN=identifier, SEQUENCE=sequence, $
```

where:

**TYPE=REPORT**

Applies the column order to the entire report. Not required, as it is the default.

**identifier**

Selects a column using the COLUMN attribute described in Identifying a Report Component in a WebFOCUS StyleSheet.

**sequence**

Is a number that represents the order of the selected column.

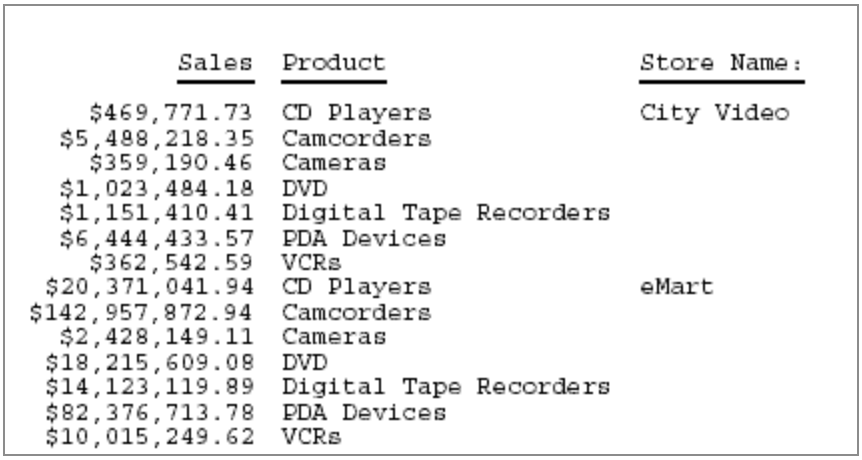
Numbers need not be in sequential order or in increments of one. The order of the columns is from lowest to highest. NOPRINT columns are not included.

# Changing Column Order

This request rearranges the order in which columns normally appear in the report, that is, with SNAME first, PRODCAT second, and LINEPRICE third.

```
SET ONLINE-FMT = PDF
TABLE FILE CENTORD
SUM LINEPRICE AS 'Sales'
BY SNAME BY PRODCAT AS 'Product'
WHERE SNAME EQ 'eMart' OR 'City Video'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, COLUMN=SNAME, SEQUENCE=3, $
TYPE=REPORT, COLUMN=PRODCAT, SEQUENCE=2, $
TYPE=REPORT, COLUMN=LINEPRICE, SEQUENCE=1, $
ENDSTYLE
END
```

LINEPRICE (Sales) is now the first column, PRODCAT (Product) is the second column (as it was by default), and SNAME (Store Name) is the third column. The PDF report is:



| Sales | Product | Store Name: |
|---|---|---|
| $469,771.73 | CD Players | City Video |
| $5,488,218.35 | Camcorders | |
| $359,190.46 | Cameras | |
| $1,023,484.18 | DVD | |
| $1,151,410.41 | Digital Tape Recorders | |
| $6,444,433.57 | PDA Devices | |
| $362,542.59 | VCRs | |
| $20,371,041.94 | CD Players | eMart |
| $142,957,872.94 | Camcorders | |
| $2,428,149.11 | Cameras | |
| $18,215,609.08 | DVD | |
| $14,123,119.89 | Digital Tape Recorders | |
| $82,376,713.78 | PDA Devices | |
| $10,015,249.62 | VCRs | |

# Stacking Columns

You can stack columns in a report to reduce report width, or to easily compare values in a report by creating a matrix. To stack columns, you can use:

- FOLD-LINE:
  - Reduces the use of space for a vertical sort (BY) column that changes infrequently. You can include up to 16 FOLD-LINE phrases in a request.
  - Is available for PDF, PS, and DHTML reports, but not cell-based formats, such as HTML, XLSX, and EXL2K.
  - Cell based styling features including BACKCOLOR and BORDERS are not supported.
  - Alternating back colors are not supported for stacked columns.
- OVER:
  - Stacks columns one over another, which increases readability, especially when you are sorting your report horizontally with ACROSS. OVER is useful when you are creating financial reports. For complete details, see Creating Financial Reports With Financial Modeling Language (FML).
  - Alternating back colors are not supported for stacked columns.

The difference between FOLD-LINE and OVER is that FOLD-LINE begins the second line (not the second column) just underneath the first line, but slightly indented. OVER literally stacks the values of one column directly over another. You can use FOLD-LINE and OVER in the same request.

# Stack Columns With FOLD-LINE

```
display_command fieldname ... FOLD-LINE fieldname ...
```

or

```
{ON|BY} fieldname FOLD-LINE
```

where:

**display_command**

Is a display command. There is no offset when a line is folded after a display field.

**fieldname**

Is a display field or sort field placed on a separate line when the value of the ON or BY field changes. When folded on a sort field, a line is offset by two spaces from the preceding line.

**ON|BY**

Is a vertical sort phrase. The terms are synonymous.

# Stacking Columns With FOLD-LINE

The following illustrates how to use FOLD-LINE to decrease the width of your report. In this example, columns are stacked when the value of the sort field CATEGORY changes.

```
TABLE FILE GGSALES
SUM UNITS BUDUNITS
BY CATEGORY
ON CATEGORY FOLD-LINE
ON TABLE SET ONLINE-FMT PDF
```

```
ON TABLE SET PAGE-NUM OFF
END
```

The report is:

```
Category

   Unit Sales  Budget Units

Coffee
      1376266       1385923
Food
      1384845       1377564
Gifts
       927880        931007
```

Without FOLD-LINE, the report looks like this:

| Category | Unit Sales | Budget Units |
|---|---|---|
| Coffee | 1376266 | 1385923 |
| Food | 1384845 | 1377564 |
| Gifts | 927880 | 931007 |

# Stack Columns With OVER

```
display_command fieldname1 OVER fieldname2 OVER fieldname3 ...
```

where:

**display_command**

Is a display command.

**fieldname1, fieldname2, fieldname3**

Is a display field or calculated value. A text field is not valid.

# Stacking Columns With OVER

This request contains an ACROSS phrase in an HTML report to sort horizontally by department. It uses two OVER phrases to stack columns.

```
TABLE FILE EMPLOYEE
SUM GROSS OVER DED_AMT OVER
COMPUTE NET/D8.2M = GROSS - DED_AMT;
ACROSS DEPARTMENT
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF,$
ENDSTYLE
END
```

With the use of OVER, the columns GROSS, DED_AMT, and NET are stacked for readability:

| | DEPARTMENT | |
|---|---|---|
| | MIS | PRODUCTION |
| GROSS | $50,499.09 | $50,922.38 |
| DED_AMT | $28,187.11 | $23,391.24 |
| NET | $22,311.98 | $27,531.14 |

Without the use of OVER, the HTML report looks like this:

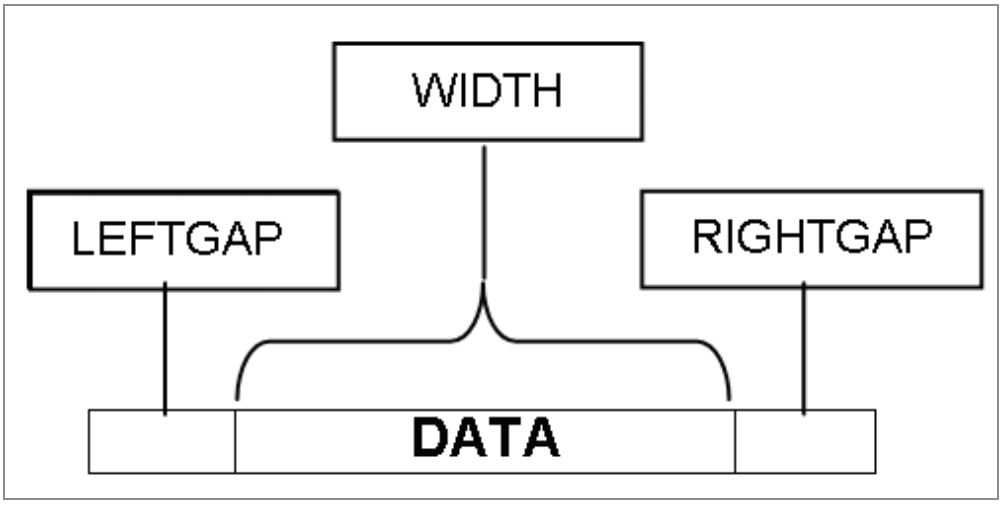
| DEPARTMENT | | | | | |
|---|---|---|---|---|---|
| MIS | | | PRODUCTION | | |
| GROSS | DED_AMT | NET | GROSS | DED_AMT | NET |
| $50,499.09 | $28,187.11 | $22,311.98 | $50,922.38 | $23,391.24 | $27,531.14 |

# Alignment of Fields in Reports Using OVER in PDF Report Output

When columns are placed on report output, they are separated by gaps. You can control the size of the gaps between columns with the LEFTGAP and RIGHTGAP StyleSheet attributes.

By default, the gaps between columns are placed outside of the boundaries reserved for the fields on the report output. Therefore, the width or squeeze value defined for a field

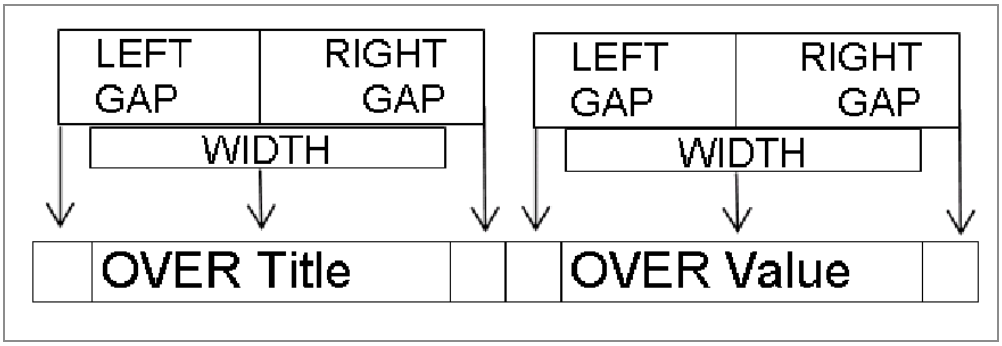
defines the size of the text area for the data value. It does not count the width of the gaps between columns. The bounding box used to define borders and background color is determined based on the data width plus the left gap plus the right gap.



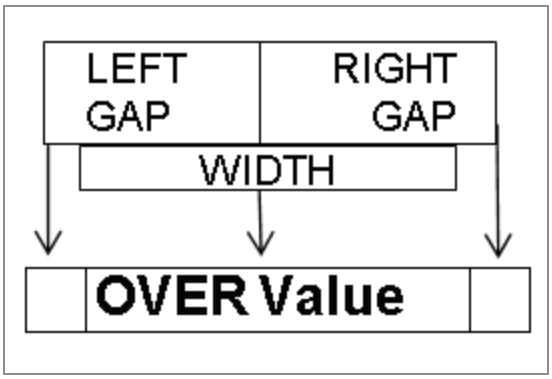

Gaps external to the column boundaries must be accounted for when you try to align fields in reports that use the OVER phrase.

This feature is designed to support the development of multi-row reports using blank AS names (column titles). Unless otherwise noted, these features work with non-blank titles, but they have not been designed to support alignment with non-blank column titles.

By default, column titles are placed to the left of the field values in a report using OVER. The OVER Title and the OVER Value each are measured by the combination of three parameters, LEFTGAP, WIDTH, and RIGHTGAP:




With OVER and blank AS names, each data value becomes a data cell that can be used to construct rows and columns within the data lines of the report. In order to align data values on a lower line with the columns above them, you must calculate widths for the lower level columns that take into account the widths of the data above them plus the widths of all of the left gaps and right gaps in between.




It can be complex to calculate how to size each column when aligning data and headings in reports using OVER. Each calculation of the column size must additionally account for the external left and right gap, and these gaps are cumulative as the number of columns on a given row increases.

Using the GAPINTERNAL=ON StyleSheet attribute, you can have the gaps placed within the column boundaries for PDF report output. This feature makes it much easier to align fields and headings in reports that use the OVER phrase to create multiple lines.

**Note:** OVER is now supported with SQUEEZE.

# Control GAP Placement on Reports

```
TYPE=REPORT, GAPINTERNAL={OFF|ON}
```

where:

**OFF**

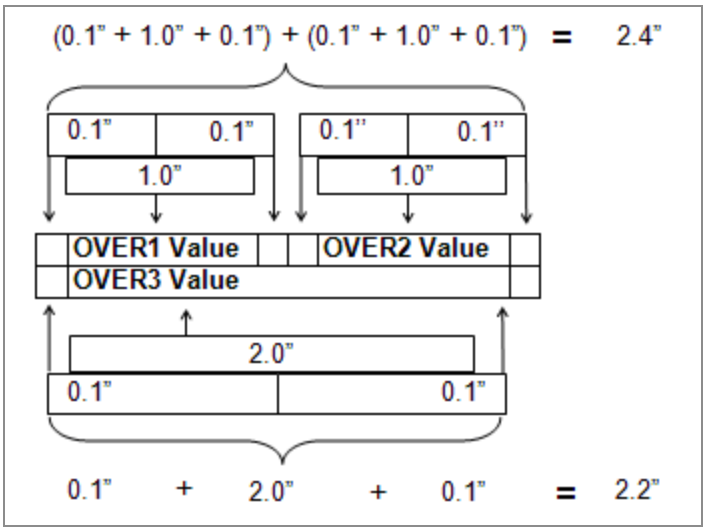
Places the left and right gaps outside the defined field width. OFF is the default value.

**ON**

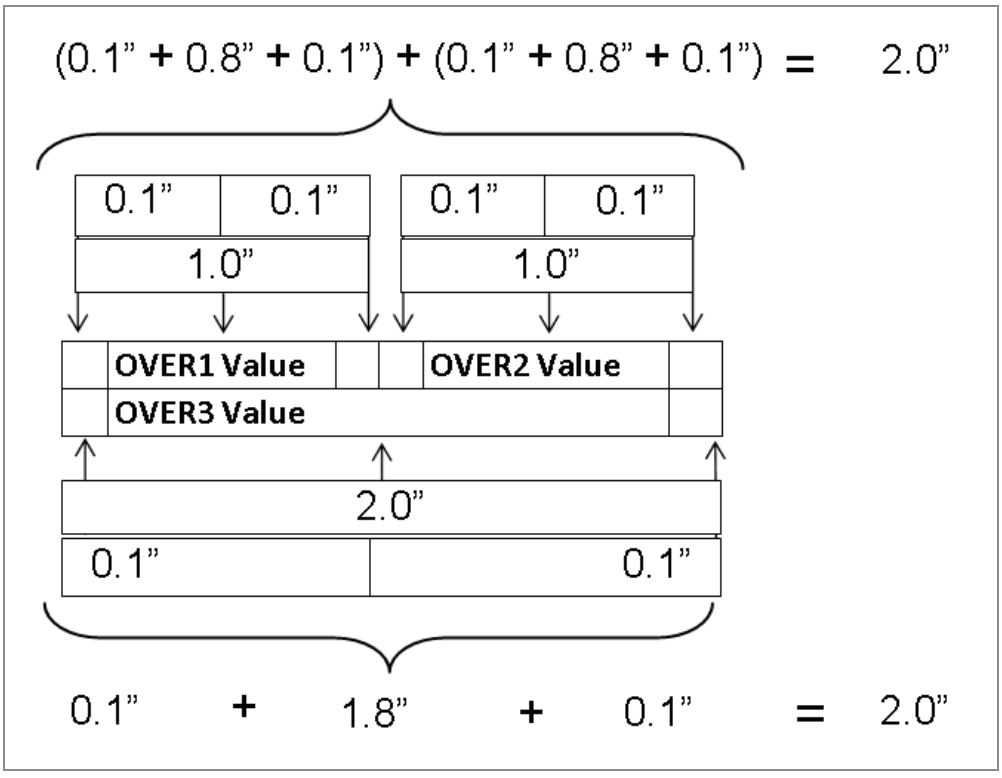
Places the left and right gaps internal to the defined field width.

# Comparing External Gaps With Internal Gaps

With GAPINTERNAL=OFF, you must account for the accumulation of left and right gaps as well as the field widths when defining widths of stacked columns.




With GAPINTERNAL=ON, the defined WIDTH represents the entire space used by the given data cell or column. This takes the cumulative effect out as the OVER values proceed across a row.

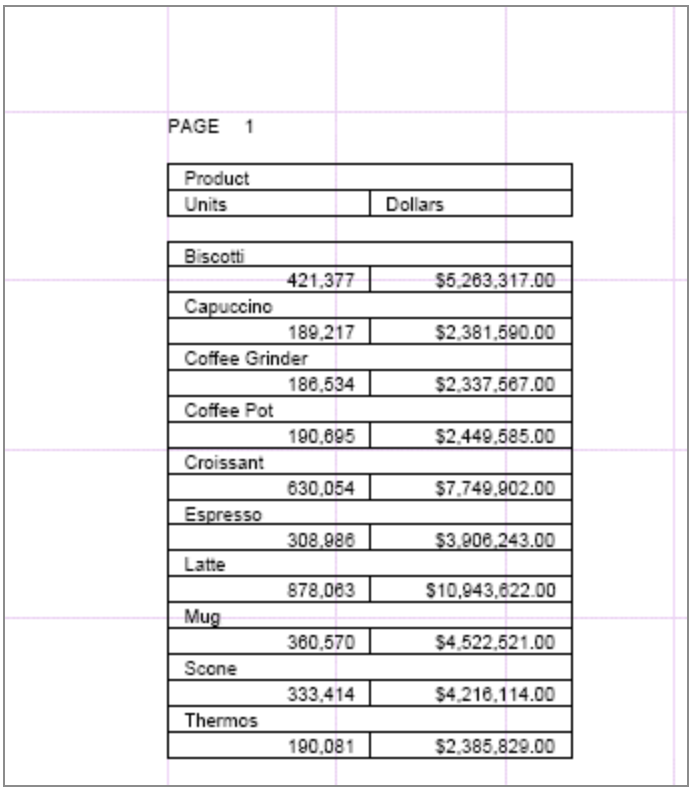


# Using GAPINTERNAL in a Report

The following request against the GGSALES data source places the PRODUCT field over the UNITS and DOLLARS fields and sets GAPINTERNAL to OFF:

```
SET LAYOUTGRID=ON
TABLE FILE GGSALES
"Product<+0>"
"Units<+0>Dollars"
SUM
PRODUCT AS ''
OVER
UNITS/D8C AS '' DOLLARS/D12.2CM AS ''
BY PRODUCT NOPRINT
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT, SQUEEZE=ON, FONT=ARIAL, SIZE=8, LEFTMARGIN=1, TOPMARGIN=1,
 LEFTGAP=.1, RIGHTGAP=.1, GAPINTERNAL=OFF, $
TYPE=REPORT, BORDER=ON, $
TYPE=HEADING, BORDERALL=ON, $
TYPE=HEADING, LINE=1, ITEM=1, POSITION = PRODUCT, $
TYPE=HEADING, LINE=2, ITEM=1, POSITION = UNITS, $
TYPE=HEADING, LINE=2, ITEM=2, POSITION = DOLLARS, $
TYPE=REPORT, COLUMN=PRODUCT(2),   SQUEEZE=2,  $
TYPE=REPORT, COLUMN=UNITS, SQUEEZE=1, $
TYPE=REPORT, COLUMN=DOLLARS, SQUEEZE=1, $
ENDSTYLE
END
```

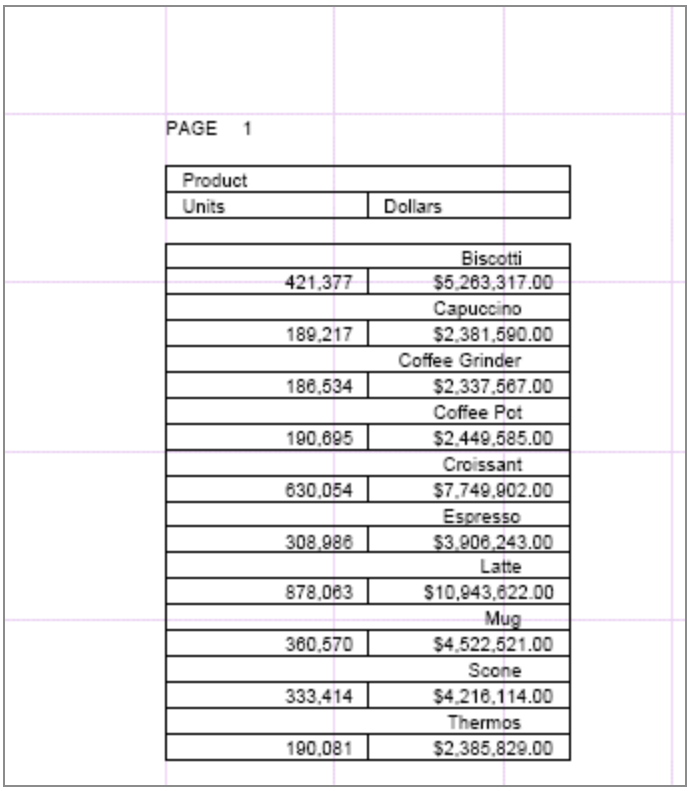
The widths specified for UNITS and DOLLARS are one inch each, while the PRODUCT field is specified to be two inches. With GAPINTERNAL=OFF, the LAYOUTGRID shows that the widths used to place the columns are greater than the widths specified in the request. The additional space presented by the external leftgap and rightgap accounts for this effect:



PAGE 1

| Product | |
|---|---|
| Units | Dollars |
| Biscotti | |
| 421,377 | $5,263,317.00 |
| Capuccino | |
| 189,217 | $2,381,590.00 |
| Coffee Grinder | |
| 186,534 | $2,337,567.00 |
| Coffee Pot | |
| 190,695 | $2,449,585.00 |
| Croissant | |
| 630,054 | $7,749,902.00 |
| Espresso | |
| 308,986 | $3,906,243.00 |
| Latte | |
| 878,063 | $10,943,622.00 |
| Mug | |
| 360,570 | $4,522,521.00 |
| Scone | |
| 333,414 | $4,216,114.00 |
| Thermos | |
| 190,081 | $2,385,829.00 |

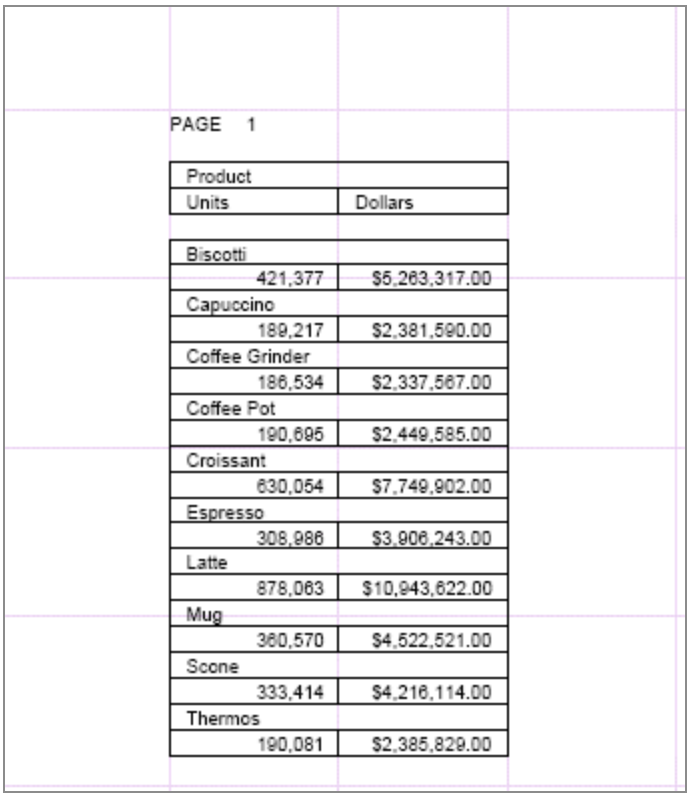
The heading borders are aligned on the right of the report because of the SQUEEZE=ON attribute in the StyleSheet. Extra space was added to the report to align the headings. If you change the StyleSheet declaration for the PRODUCTS field to JUSTIFY=RIGHT, you can see that the extra space prevents the product value from aligning with the dollar value:



PAGE 1

| Product | |
|---|---|
| Units | Dollars |
| | Biscotti |
| 421,377 | $5,263,317.00 |
| | Capuccino |
| 189,217 | $2,381,590.00 |
| | Coffee Grinder |
| 186,534 | $2,337,567.00 |
| | Coffee Pot |
| 190,695 | $2,449,585.00 |
| | Croissant |
| 630,054 | $7,749,902.00 |
| | Espresso |
| 308,986 | $3,906,243.00 |
| | Latte |
| 878,063 | $10,943,622.00 |
| | Mug |
| 360,570 | $4,522,521.00 |
| | Scone |
| 333,414 | $4,216,114.00 |
| | Thermos |
| 190,081 | $2,385,829.00 |

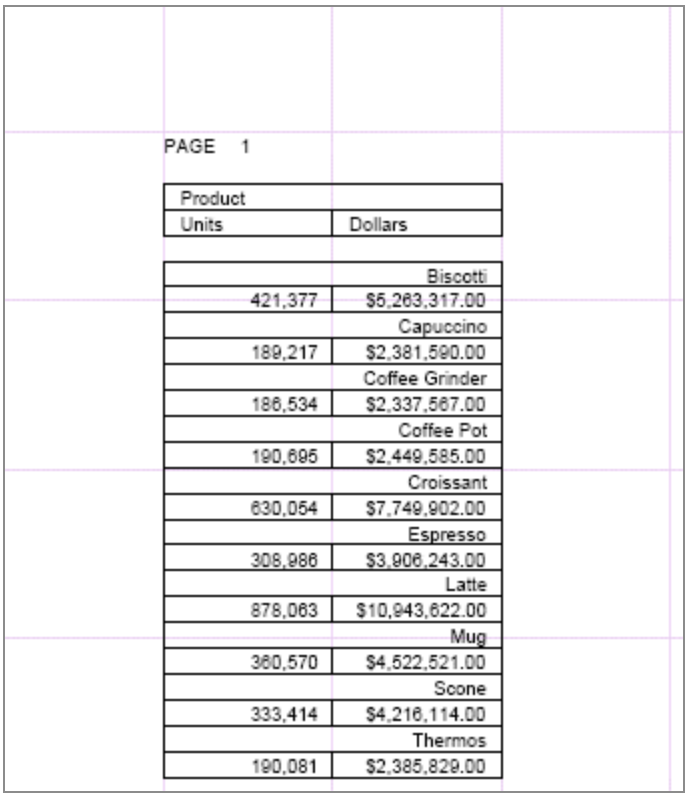
Changing the StyleSheet declaration to GAPINTERNAL=ON causes the specified widths to be used because the gaps are internal and are included in the specified values:



PAGE 1

| Product | |
|---|---|
| Units | Dollars |
| Biscotti | |
| 421,377 | $5,263,317.00 |
| Capuccino | |
| 189,217 | $2,381,590.00 |
| Coffee Grinder | |
| 186,534 | $2,337,567.00 |
| Coffee Pot | |
| 190,695 | $2,449,585.00 |
| Croissant | |
| 630,054 | $7,749,902.00 |
| Espresso | |
| 308,986 | $3,906,243.00 |
| Latte | |
| 878,063 | $10,943,622.00 |
| Mug | |
| 360,570 | $4,522,521.00 |
| Scone | |
| 333,414 | $4,216,114.00 |
| Thermos | |
| 190,081 | $2,385,829.00 |

The following report output demonstrates that the values align properly even if the PRODUCT values are defined with JUSTIFY=RIGHT:



PAGE 1

| Product | |
|---|---|
| Units | Dollars |
| | Biscotti |
| 421,377 | $5,263,317.00 |
| | Capuccino |
| 189,217 | $2,381,590.00 |
| | Coffee Grinder |
| 186,534 | $2,337,567.00 |
| | Coffee Pot |
| 190,695 | $2,449,585.00 |
| | Croissant |
| 630,054 | $7,749,902.00 |
| | Espresso |
| 308,986 | $3,906,243.00 |
| | Latte |
| 878,063 | $10,943,622.00 |
| | Mug |
| 360,570 | $4,522,521.00 |
| | Scone |
| 333,414 | $4,216,114.00 |
| | Thermos |
| 190,081 | $2,385,829.00 |

# Positioning a Column

You can specify the absolute or relative starting position for a column in a report. The relative starting position is the number of characters to the right of the last column.

When using this feature with an HTML report, set the STYLEMODE parameter to FIXED.

# Position a Column

```
field IN {n|+n}
```

where:

**field**

Is the column that is positioned.

**n**

Is a number indicating the absolute position of the column.

When used with ACROSS, *n* specifies the starting position of the ACROSS set.

When used with FOLD-LINE or OVER, *n* applies to the line on which the referenced field occurs.

**+n**

Is a number indicating the relative position of the column. The value of *n* is the number of characters to the right of the last column.

# Positioning Columns

This request specifies absolute positioning for the three columns in the report. The ON TABLE SET STYLEMODE FIXED parameter is required for HTML.

```
TABLE FILE CENTQA
SUM CNT.PROBNUM IN 1 AS 'Total #,Problems'
SUM CNT.PROBNUM IN 45 AS '# Problems,by Product'
BY PLANT NOPRINT BY PRODNAME IN 15
WHERE PLANT EQ 'ORL'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLEMODE FIXED
END
```

The columns are spaced for readability:

```
Total #       Product                          # Problems
Problems      Name:                            by Product
--------      -------                          ----------
      95      120 VHS-C Camcorder 40 X                  7
              2 Hd VCR LCD Menu                         6
              250 8MM Camcorder 40 X                   10
              650DL Digital Camcorder 150 X             6
              AR2 35MM Camera 8 X                      17
              AR3 35MM Camera 10 X                      9
              Combo Player - 4 Hd VCR + DVD            12
              DVD Upgrade Unit for Cent. VCR            9
              QX Portable CD Player                     9
              R5 Micro Digital Tape Recorder            3
              ZC Digital PDA - Standard                 7
```

# Positioning Horizontal Sort (ACROSS) Columns

This request uses the IN phrase with the horizontal sort field PLANT to specify the column starting position. It also uses relative positioning to add extra spaces between the PROBNUM columns. The ON TABLE SET STYLEMODE FIXED parameter is required for HTML reports.

```
TABLE FILE CENTQA
SUM PROBNUM IN +8
ACROSS PLANT IN 35
BY PROBLEM_CATEGORY
WHERE PLANT EQ 'BOS' OR 'ORL'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLEMODE FIXED
END
```

The ACROSS set starts in column 35, and there are eight extra spaces between the data columns in the ACROSS:

| | Plant | |
|---|---|---|
| | BOS | ORL |
| Problem Category | | |
| Incorrect Labeling | 39921 | 19877 |
| Mechanical Failure | 19564 | 13792 |
| Missing Component | 38285 | 18709 |
| Physical Damage | 65497 | 16175 |
| Power Failure | 41472 | 14277 |
| Remote Failure | 59655 | 8635 |

# Positioning Stacked (OVER) Columns

The following request uses OVER to stack columns and IN to position them.

```
TABLE FILE EMPLOYEE
SUM GROSS IN 40
OVER DED_AMT IN 40
BY DEPARTMENT BY LAST_NAME IN 20
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLEMODE FIXED
END
```

In the report, GROSS and DED_AMT are stacked, starting in column 40. LAST_NAME starts in column 20.

| DEPARTMENT | LAST_NAME | | |
|---|---|---|---|
| MIS | BLACKWOOD | GROSS | $9,075.00 |
| | | DED_AMT | $6,307.00 |
| | CROSS | GROSS | $22,013.75 |
| | | DED_AMT | $15,377.40 |
| | GREENSPAN | GROSS | $2,970.84 |
| | | DED_AMT | $505.04 |
| | JONES | GROSS | $6,099.50 |
| | | DED_AMT | $2,866.18 |
| | MCCOY | GROSS | $1,540.00 |
| | | DED_AMT | $458.69 |
| | SMITH | GROSS | $8,800.00 |
| | | DED_AMT | $2,672.80 |
| PRODUCTION | BANNING | GROSS | $2,475.00 |
| | | DED_AMT | $1,427.24 |
| | IRVING | GROSS | $17,094.00 |
| | | DED_AMT | $11,949.44 |
| | MCKNIGHT | GROSS | $9,130.00 |
| | | DED_AMT | $3,593.92 |
| | ROMANS | GROSS | $7,040.00 |
| | | DED_AMT | $3,507.88 |
| | SMITH | GROSS | $6,183.36 |
| | | DED_AMT | $1,104.96 |
| | STEVENS | GROSS | $9,000.02 |
| | | DED_AMT | $1,807.80 |

# Suppressing Column Display

A report request may include a field to create a certain result. For example, it may name a sort field by which to arrange data. However, you may not want to display the title or values of that field if they appear elsewhere in the report. The phrase NOPRINT (synonym SUP-PRINT) suppresses column display.

# Column Suppression Commands

| Command | Description | Applies to |
| --- | --- | --- |
| `NOPRINT or SUP-PRINT` | Suppresses column display. | HTML<br>PDF<br>PS |

# Suppress Column Display

```
display_command fieldname {NOPRINT|SUP-PRINT}
```

or

```
{ON|BY} fieldname {NOPRINT|SUP-PRINT}
```

where:

**display_command**

Is a display command.

**fieldname**

Is a display field or sort field. The field values are used but not displayed. A HOLD file will not contain the values of a suppressed BY field.

For a calculated value with NOPRINT, repeat AND COMPUTE before the next calculated value if applicable.

**NOPRINT|SUP-PRINT**

Suppresses column display. The terms are synonymous.

**ON|BY**

Is a vertical sort phrase. The terms are synonymous.

# Suppressing the Display of a Sort Field

This request sorts data by city. Since the page heading contains the name of the city, the sort field occurrence is suppressed.

```
TABLE FILE SALES
HEADING
"Page <TABPAGENO"
"SALES REPORT FOR <CITY"
PRINT UNIT_SOLD AND DELIVER_AMT
BY CITY PAGE-BREAK NOPRINT
BY PROD_CODE
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The page heading identifies the city to which the data applies:

```
Page 1
SALES REPORT FOR NEW YORK
PROD_CODE UNIT_SOLD DELIVER_AMT
B10               30          30
B17               20          40
B20               15          30
C17               12          10
D12               20          30
E1                30          25
E3                35          25


Page 2
SALES REPORT FOR NEWARK
PROD_CODE UNIT_SOLD DELIVER_AMT
B10               13          30
B12               29          30
```

Without NOPRINT, the report would unnecessarily repeat the city:

Page 1
SALES REPORT FOR NEW YORK

| CITY | PROD_CODE | UNIT_SOLD | DELIVER_AMT |
|---|---|---|---|
| NEW YORK | B10 | 30 | 30 |
| | B17 | 20 | 40 |
| | B20 | 15 | 30 |
| | C17 | 12 | 10 |
| | D12 | 20 | 30 |
| | E1 | 30 | 25 |
| | E3 | 35 | 25 |

Page 2
SALES REPORT FOR NEWARK

| CITY | PROD_CODE | UNIT_SOLD | DELIVER_AMT |
|---|---|---|---|
| NEWARK | B10 | 13 | 30 |
| | B12 | 29 | 30 |

# Suppressing Display of a Sort Field With Subtotal

This request generates a subtotal for each value of the sort field CATEGORY but suppresses the display of the sort field occurrence.

```
TABLE FILE GGSALES
SUM UNITS BY CATEGORY
BY PRODUCT
ON CATEGORY SUB-TOTAL SUP-PRINT PAGE-BREAK
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The default subtotal line identifies each category (for example, *TOTAL Coffee):

| Product | Unit Sales |
|---|---|
| Capuccino | 189217 |
| Espresso | 308986 |
| Latte | 878063 |
| *TOTAL Coffee | 1376266 |

| Product | Unit Sales |
|---|---|
| Biscotti | 421377 |
| Croissant | 630054 |
| Scone | 333414 |
| *TOTAL Food | 1384845 |

Without SUP-PRINT, the report would unnecessarily repeat the category:

| Category | Product | Unit Sales |
|---|---|---|
| Coffee | Capuccino | 189217 |
| | Espresso | 308986 |
| | Latte | 878063 |
| *TOTAL Coffee | | 1376266 |

| Category | Product | Unit Sales |
|---|---|---|
| Food | Biscotti | 421377 |
| | Croissant | 630054 |
| | Scone | 333414 |
| *TOTAL Food | | 1384845 |

# Sorting Alphabetically

This request sorts last names alphabetically but avoids duplication of data by suppressing the sort field occurrence of LAST_NAME.

```
TABLE FILE EMPLOYEE
PRINT LAST_NAME
BY LAST_NAME NOPRINT
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

Last names are arranged alphabetically:

```
LAST NAME
BANNING
BLACKWOOD
CROSS
GREENSPAN
IRVING
JONES
MCCOY
MCKNIGHT
ROMANS
SMITH
SMITH
STEVENS
```

# Inserting a Page Break

Use the PAGE-BREAK command to generate a new page each time the value of a specified vertical sort (BY) field changes. This helps to prevent related information from being presented over multiple pages. When you use a page break, column titles and any page headings appear at the top of each new page. When the request has a PAGE-BREAK, the GRANDTOTAL is on a page by itself.

PAGE-BREAK does not apply when report output is stored in a HOLD, SAVE, or SAVB file.

In an HTML report, PAGE-BREAK creates a new section of the report, with column titles and an incremented page number, on the same webpage. It does not, by itself, create a new webpage. To create multiple webpages in an HTML report:

- Burst the report, with each page corresponding to a different sort field value. For details, see Bursting Reports Into Multiple HTML Files.
- Use SET STYLEMODE=PAGED in conjunction with PAGE-BREAK. This is useful when you are distributing a report via ReportCaster.
- Use SET WEBVIEWER=ON, which accesses the WebFOCUS Viewer, in conjunction with PAGE-BREAK. For details, see the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

# Page Break Commands

| Command | Description | Applies to |
|---|---|---|
| `PAGE-BREAK` | Generates new page. | HTML<br>PDF<br>PS |
| `NOSPLIT` | Prevents undesirable page break. | PDF<br>PS |
| `SET LINES` | Synchronizes report page with browser page. | HTML |

# Working With Multi-Table HTML Reports

- You can control where a report breaks using SET LINES or PAGE-BREAK in the request.
- ON *sortfield* PAGE-BREAK or BY *sortfield* PAGE-BREAK overrides a SET LINES command and breaks a report into multiple HTML tables whenever the sort field value changes.
- Column titles are generated for every PAGE-BREAK or according to the SET LINES parameter.

- When a report is broken into multiple HTML tables, the browser displays each table according to its own algorithm. Set SQUEEZE to OFF and/or WRAP to OFF to ensure that HTML tables are aligned consistently across pages.

# Insert a Page Break

```
{ON|BY} fieldname PAGE-BREAK [REPAGE] [WHEN expression;]
```

where:

**ON|BY**

Is a vertical sort phrase. The terms are synonymous.

**fieldname**

Is the sort field on which the page break occurs. Specify the lowest level sort field at which the page break occurs. A page break occurs automatically whenever a higher level sort field changes.

**REPAGE**

Resets the page number to 1 at each page break or, if combined with WHEN, whenever the WHEN criteria are met.

**WHEN expression**

Specifies a conditional page break in the printing of a report as determined by a logical expression. See Controlling Report Formatting for details.

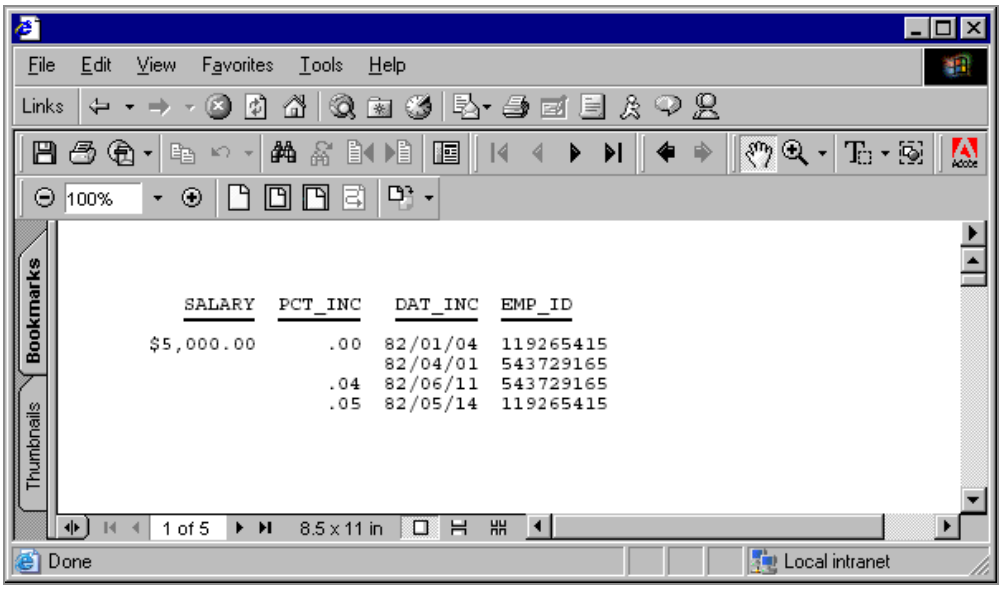
# Inserting a Page Break

This request generates a new page whenever the value of the sort field SALARY changes.

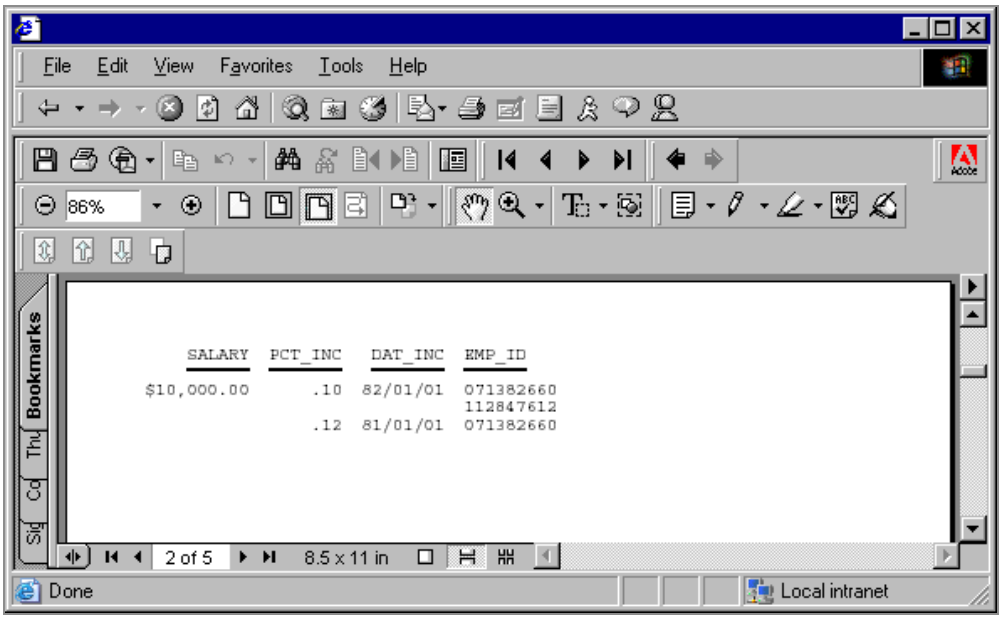
```
TABLE FILE EMPLOYEE
PRINT EMP_ID
BY SALARY IN-GROUPS-OF 5000
BY PCT_INC BY DAT_INC
ON SALARY PAGE-BREAK
ON TABLE SET ONLINE-FMT PDF
```

```
ON TABLE SET PAGE-NUM OFF
END
```

The first two pages of the report are displayed to illustrate where the page breaks occur:




The second page is:



# Displaying a Multiple-Table HTML Report

In this request, each page is returned to the browser as a separate HTML table. SQUEEZE is set to OFF for consistent alignment of tables across pages.

```
SET STYLEMODE = PAGED
SET LINES = 12
TABLE FILE CENTORD
HEADING
"SALES OVER $200,000"
PRINT LINEPRICE AS 'Sales'
BY SNAME BY ORDER_NUM
WHERE LINEPRICE GT 200000
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, SQUEEZE=OFF, $
ENDSTYLE
END
```

Two pages of the report follow, showing consistent alignment:

PAGE 10

SALES OVER $200,000

| Store Name: | Order Number: | Sales |
|---|---|---|
| Audio Expert | 59079 | $241,754.82 |
| | 59487 | $299,272.98 |
| | 59515 | $241,570.90 |
| | 74080 | $200,724.66 |
| | 74549 | $326,165.31 |
| | 74557 | $267,960.68 |

PAGE 11

SALES OVER $200,000

| Store Name: | Order Number: | Sales |
|---|---|---|
| Audio Expert | 74610 | $222,234.35 |
| | 76810 | $286,025.60 |
| | 77790 | $504,891.18 |
| City Video | 54691 | $256,552.45 |
| | 74691 | $250,675.75 |
| Consumer Merchandise | 37395 | $283,885.51 |

The same two pages illustrate inconsistent alignment with SQUEEZE set to ON:

PAGE 10

SALES OVER $200,000

| Store Name: | Order Number: | Sales |
|---|---|---|
| Audio Expert | 59079 | $241,754.82 |
| | 59487 | $299,272.98 |
| | 59515 | $241,570.90 |
| | 74080 | $200,724.66 |
| | 74549 | $326,165.31 |
| | 74557 | $267,960.68 |

PAGE 11

SALES OVER $200,000

| Store Name: | Order Number: | Sales |
|---|---|---|
| Audio Expert | 74610 | $222,234.35 |
| | 76810 | $286,025.60 |
| | 77790 | $504,891.18 |
| City Video | 54691 | $256,552.45 |
| | 74691 | $250,675.75 |
| Consumer Merchandise | 37395 | $283,885.51 |

# Preventing an Undesirable Split

A page break may occur in the middle of information logically grouped by a sort field, causing one or more group-related lines to appear by themselves on the next page or in the next window. Use the NOSPLIT option to avoid this kind of break. When the value of the sort field changes, the total number of lines related to the new value appear on a new page, including sort headings, sort footings, and subtotals if applicable.

This feature applies to a PDF or PS report.

If you use NOSPLIT with PAGE-BREAK, the PAGE-BREAK must apply to a higher-level sort field. Otherwise, NOSPLIT is ignored. NOSPLIT is also ignored when report output is stored in a HOLD, SAVE, or SAVB file. NOSPLIT is not compatible with the TABLEF command and generates an error message.

# Prevent an Undesirable Split

This syntax applies to a PDF or PS report. Use only one NOSPLIT per report request.

```
{ON|BY} fieldname NOSPLIT
```

where:

**ON|BY**

Is a vertical sort phrase. The terms are synonymous.

**fieldname**

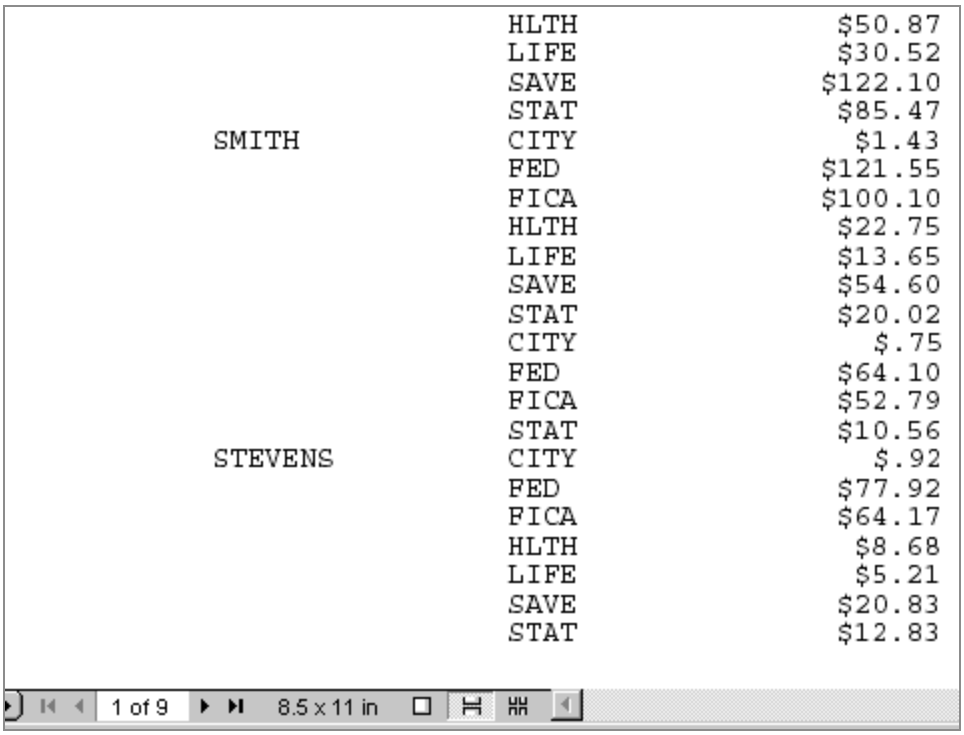
Is the name of the sort field for which sort groups are kept together on the same page.

# Preventing an Undesirable Split

This request uses NOSPLIT to keep related information on the same page:

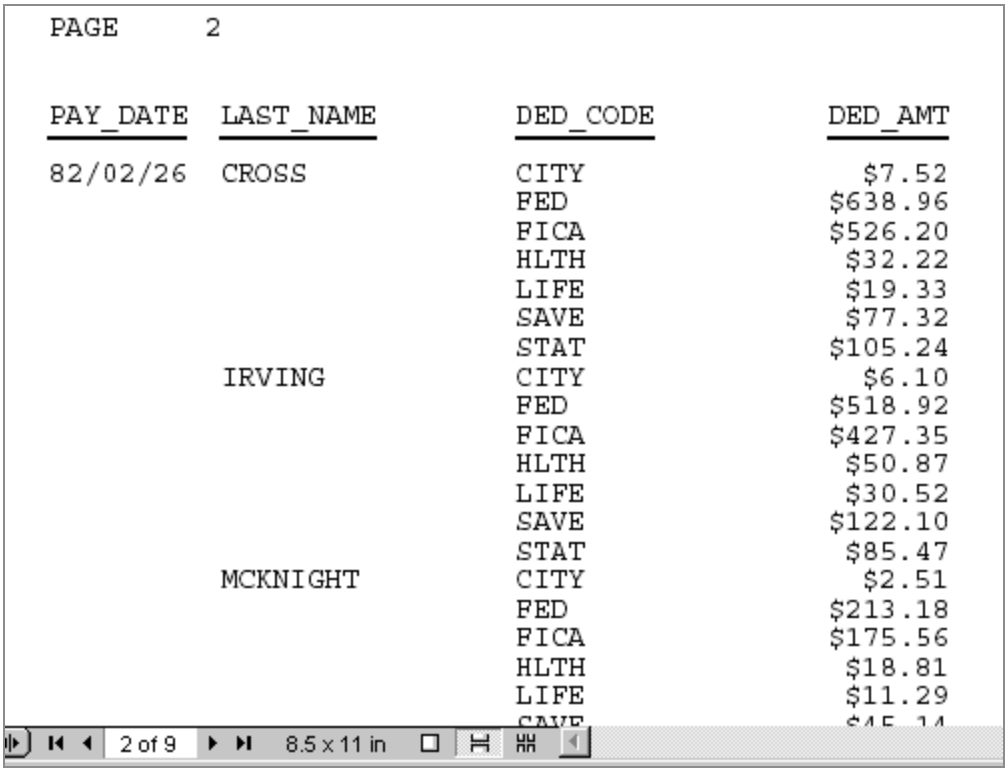
```
SET ONLINE-FMT = PDF
TABLE FILE EMPLOYEE
PRINT DED_CODE AND DED_AMT
BY PAY_DATE BY LAST_NAME
ON LAST_NAME NOSPLIT
END
```

When the value of LAST_NAME changes from STEVENS to CROSS, the lines related to CROSS do not fit on the current page. With NOSPLIT, they appear on the next page:



| | | |
|---|---|---|
| | HLTH | $50.87 |
| | LIFE | $30.52 |
| | SAVE | $122.10 |
| | STAT | $85.47 |
| SMITH | CITY | $1.43 |
| | FED | $121.55 |
| | FICA | $100.10 |
| | HLTH | $22.75 |
| | LIFE | $13.65 |
| | SAVE | $54.60 |
| | STAT | $20.02 |
| | CITY | $.75 |
| | FED | $64.10 |
| | FICA | $52.79 |
| | STAT | $10.56 |
| STEVENS | CITY | $.92 |
| | FED | $77.92 |
| | FICA | $64.17 |
| | HLTH | $8.68 |
| | LIFE | $5.21 |
| | SAVE | $20.83 |
| | STAT | $12.83 |

1 of 9 8.5 x 11 in

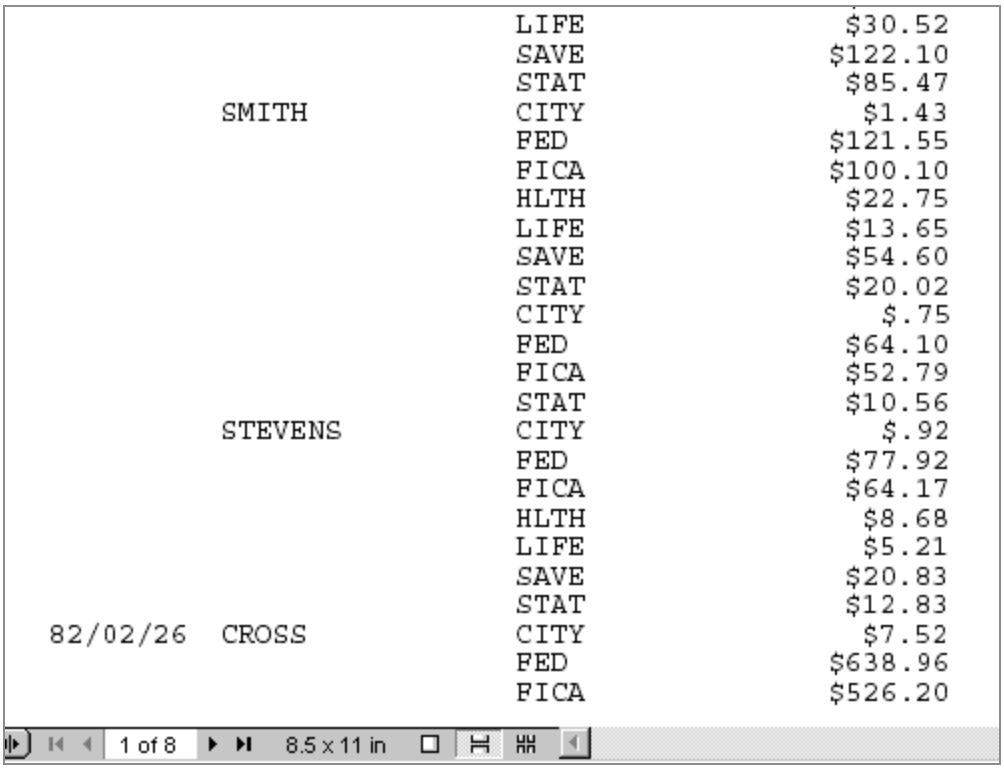


PAGE 2

| PAY_DATE | LAST_NAME | DED_CODE | DED_AMT |
|---|---|---|---|
| 82/02/26 | CROSS | CITY | $7.52 |
| | | FED | $638.96 |
| | | FICA | $526.20 |
| | | HLTH | $32.22 |
| | | LIFE | $19.33 |
| | | SAVE | $77.32 |
| | | STAT | $105.24 |
| | IRVING | CITY | $6.10 |
| | | FED | $518.92 |
| | | FICA | $427.35 |
| | | HLTH | $50.87 |
| | | LIFE | $30.52 |
| | | SAVE | $122.10 |
| | | STAT | $85.47 |
| | MCKNIGHT | CITY | $2.51 |
| | | FED | $213.18 |
| | | FICA | $175.56 |
| | | HLTH | $18.81 |
| | | LIFE | $11.29 |

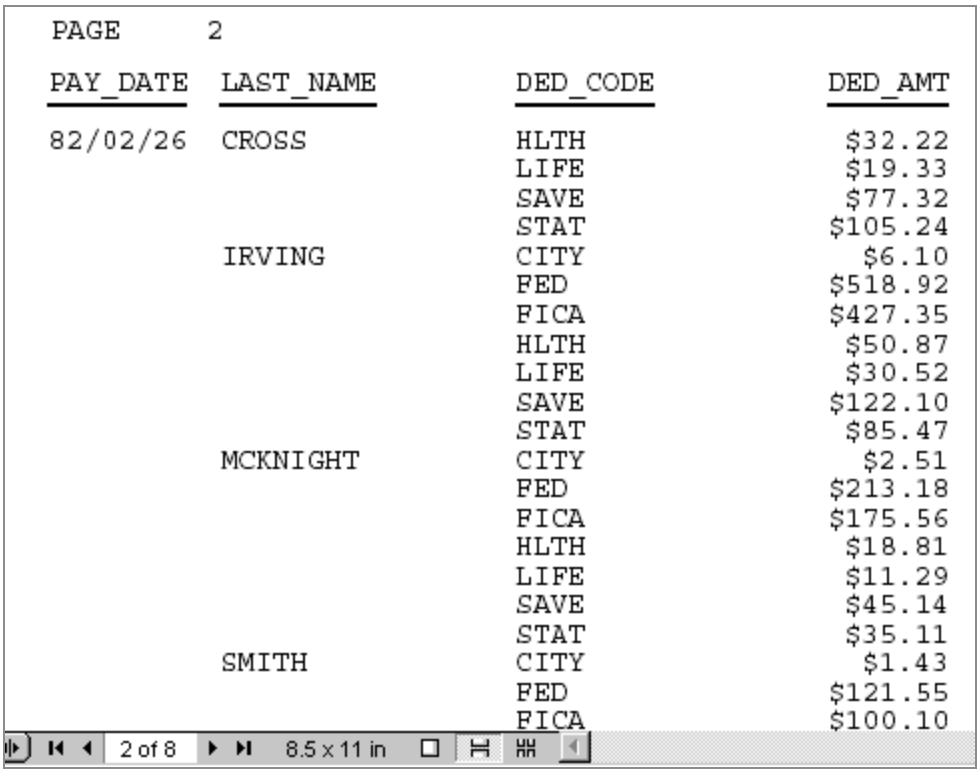
2 of 9 8.5 x 11 in

Without NOSPLIT, the information for CROSS falls on the first and second pages:



| | | | |
|---|---|---|---|
| | | LIFE | $30.52 |
| | | SAVE | $122.10 |
| | | STAT | $85.47 |
| | SMITH | CITY | $1.43 |
| | | FED | $121.55 |
| | | FICA | $100.10 |
| | | HLTH | $22.75 |
| | | LIFE | $13.65 |
| | | SAVE | $54.60 |
| | | STAT | $20.02 |
| | | CITY | $.75 |
| | | FED | $64.10 |
| | | FICA | $52.79 |
| | | STAT | $10.56 |
| | STEVENS | CITY | $.92 |
| | | FED | $77.92 |
| | | FICA | $64.17 |
| | | HLTH | $8.68 |
| | | LIFE | $5.21 |
| | | SAVE | $20.83 |
| | | STAT | $12.83 |
| 82/02/26 | CROSS | CITY | $7.52 |
| | | FED | $638.96 |
| | | FICA | $526.20 |

1 of 8 8.5 x 11 in



PAGE 2

| PAY_DATE | LAST_NAME | DED_CODE | DED_AMT |
|---|---|---|---|
| 82/02/26 | CROSS | HLTH | $32.22 |
| | | LIFE | $19.33 |
| | | SAVE | $77.32 |
| | | STAT | $105.24 |
| | IRVING | CITY | $6.10 |
| | | FED | $518.92 |
| | | FICA | $427.35 |
| | | HLTH | $50.87 |
| | | LIFE | $30.52 |
| | | SAVE | $122.10 |
| | | STAT | $85.47 |
| | MCKNIGHT | CITY | $2.51 |
| | | FED | $213.18 |
| | | FICA | $175.56 |
| | | HLTH | $18.81 |
| | | LIFE | $11.29 |
| | | SAVE | $45.14 |
| | | STAT | $35.11 |
| | SMITH | CITY | $1.43 |
| | | FED | $121.55 |
| | | FICA | $100.10 |

2 of 8 8.5 x 11 in

# Inserting Page Numbers

By default, the first two lines of a report page are reserved. The first line contains the page number in the top-left corner, and the second line is blank.

**Note:** The features in this section are not supported for Compound Reports.

You can:

- Change the position of the default page number with the system variable TABPAGENO, which contains the current page number.
- Insert the total page count using the TABLASTPAGE system variable.
- Assign any number to the first page using the FOCFIRSTPAGE parameter.
- Suppress the display of the default page number.

**Note:** The variables TABPAGENO and TABLASTPAGE cannot be used to define styling with conditional styling (WHEN).

If you enable Section 508 accessibility, a default page number is not included in the HTML table.

# Page Number Commands

| Command | Description | Applies to |
|---|---|---|
| `<BYLASTPAGE` | Used with REPAGE. Inserts the total page count within the sort group that has the REPAGE option. | HTML<br>PDF<br>PS<br>PPTX |
| `REPAGE` | Resets page number to one. | HTML<br>PDF<br>PS<br>PPTX |

| Command | Description | Applies to |
|---|---|---|
| `<TABPAGENO` | Inserts the current page number. TABPAGENO suppresses the default page number, and the top two lines of a page are blank. | HTML<br>PDF<br>PS<br>PPTX |
| `<TABLASTPAGE` | Inserts the total page count in the report. | HTML<br>PDF<br>PS<br>PPTX |
| `SET FOCFIRSTPAGE` | Assigns the designated page number to the first page. | HTML<br>PDF<br>PS<br>PPTX |
| `SET PAGE-NUM` | Controls page number display. | HTML<br>PDF<br>PS |

# Insert the Current Page Number

To add the current page number, add the following to your request.

```
<TABPAGENO
```

# Inserting the Current Page Number in a Sort Footing

This request generates a new page whenever the value of the sort field REGION changes. It uses TABPAGENO to insert a page number in the sort footing.

```
TABLE FILE GGSALES
SUM BUDDOLLARS
BY REGION BY ST BY CITY
ON REGION PAGE-BREAK SUBFOOT
"Sales Quota for <REGION Cities"
"Page <TABPAGENO"
ON TABLE SET ONLINE-FMT PDF
END
```

The first page of output is:

| Region | State | City | Budget Dollars |
|---|---|---|---|
| Midwest | IL | Chicago | 3866856 |
| | MO | St. Louis | 3646838 |
| | TX | Houston | 3680679 |

Sales Quota for Midwest Cities
Page 1

# Inserting the Total Page Count

You can use the <TABLASTPAGE system variable to insert the total page count into your report. For example, if you wanted to add a footing in your report that said "Page 1 of 5", you could use the <TABLASTPAGE system variable in conjunction with the <TABPAGENO system variable to do so.

# Insert the Total Page Count

To insert the total number of pages, add the following to your request:

```
<TABLASTPAGE
```

# Usage Notes for TABLASTPAGE

- TABLASTPAGE does not adjust for changes in FOCFIRSTPAGE or for the REPAGE command. For example, if the report has 10 pages and the user uses FOCFIRSTPAGE to set the first page number to 3 rather than 1, the value of TABLASTPAGE will still be 10.
- TABLASTPAGE is supported only for a single report, not compound reports. A separate page count is generated for each report in a compound report.
- TABLASTPAGE is supported only for styled reports such as HTML, PDF, and PS. it is not supported for EXL2K, WP, DOC, or HTML with STYLE=OFF and STYLEMODE=FIXED.
- TABLASTPAGE causes a second pass through the report results, first to calculate the last page then to print it with TABPAGENO (even when SQUEEZE=OFF).
- TABLASTPAGE does not support the system (external) sort.
- GRAPH FILE does not support TABLASTPAGE.
- TABLEF is not supported with TABLASTPAGE.

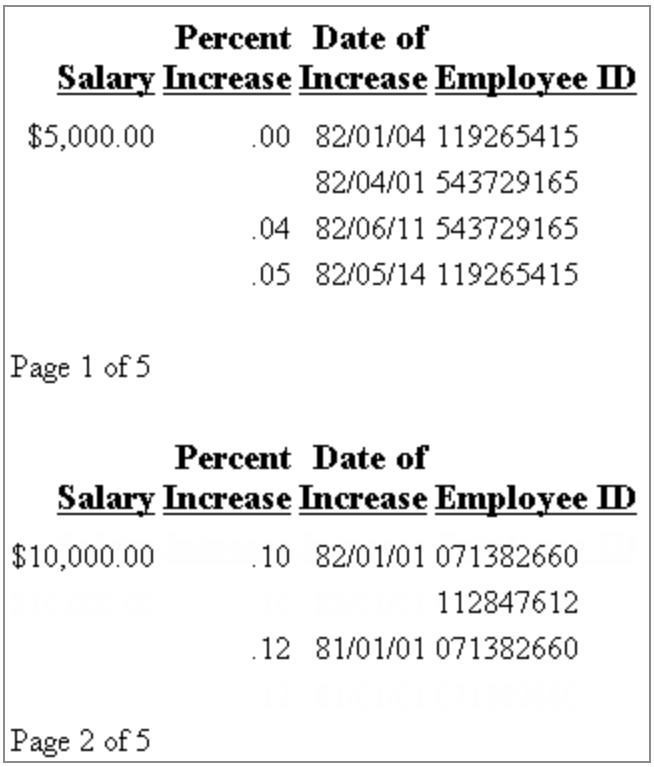
# Inserting the Current Page Number and the Total Page Count

The following illustrates how to add the current page number and the total page count to a report. The relevant syntax is highlighted in the request.

```
TABLE FILE EMPLOYEE
PRINT EMP_ID AS 'Employee ID'
BY SALARY IN-GROUPS-OF 5000 AS 'Salary'
BY PCT_INC AS 'Percent,Increase'
BY DAT_INC AS 'Date of,Increase'
ON SALARY PAGE-BREAK
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=TITLE, STYLE=BOLD, SIZE=11, $
ENDSTYLE
FOOTING
```

```
"Page <TABPAGENO of <TABLASTPAGE"
END
```

The first two pages of output are:



| Salary | Percent Increase | Date of Increase | Employee ID |
|---|---|---|---|
| $5,000.00 | .00 | 82/01/04 | 119265415 |
| | | 82/04/01 | 543729165 |
| | .04 | 82/06/11 | 543729165 |
| | .05 | 82/05/14 | 119265415 |

Page 1 of 5

| Salary | Percent Increase | Date of Increase | Employee ID |
|---|---|---|---|
| $10,000.00 | .10 | 82/01/01 | 071382660 |
| | | | 112847612 |
| | .12 | 81/01/01 | 071382660 |

Page 2 of 5

# Displaying the Total Page Count Within a Sort Group

The <BYLASTPAGE variable used in a heading or footing displays the number of pages of output within each sort group when a report uses the REPAGE option to reset the page numbers for each sort group. This variable can only be used with styled output formats.

If the REPAGE option is not used in the report, the total number of pages in the report (<TABLASTPAGE variable) is used for <BYLASTPAGE.

# Display the Total Number of Pages Within Each Sort Group

The request must have the following syntax and hold the output in a styled output format:

```
BY sortfield REPAGE
```

The heading or footing can use the following syntax to display “Page *x* of *y*”

```
{HEADING|FOOTING}
"Page <TABPAGENO of <BYLASTPAGE"
```

where:

**sortfield**

Is the sort field that has the REPAGE option. A PAGE-BREAK is required on the same sort field or a lower level sort field. PAGE-BREAK starts a new page for each sort break. REPAGE resets the page number to 1 for each sort break.

**<TABPAGENO**

Is the current page number.

**<BYLASTPAGE**

Is the last page number before the repage.

# Paginating Within a Sort Group

The following request against the GGSALES data source sorts by product, region, category, and city. It resets the pagination each time the product changes. The heading prints the current page number and the total within each product group.

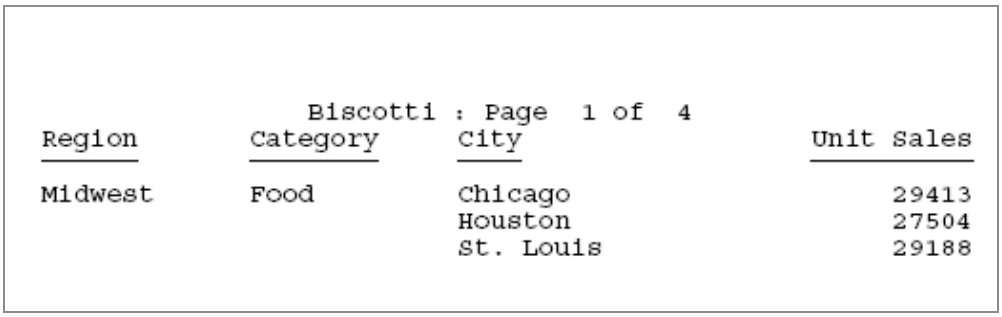
Note that by default, the TABPAGENO and BYLASTPAGE variables have format I5, which leaves a lot of blank space before the page numbers. Therefore, you can use spot markers or COMPUTE commands to move the page numbers to the left.

In the following example, a COMPUTE command creates a field named X that has the value of TABPAGENO but stores it as an I2 field, and the spot marker in the heading moves the

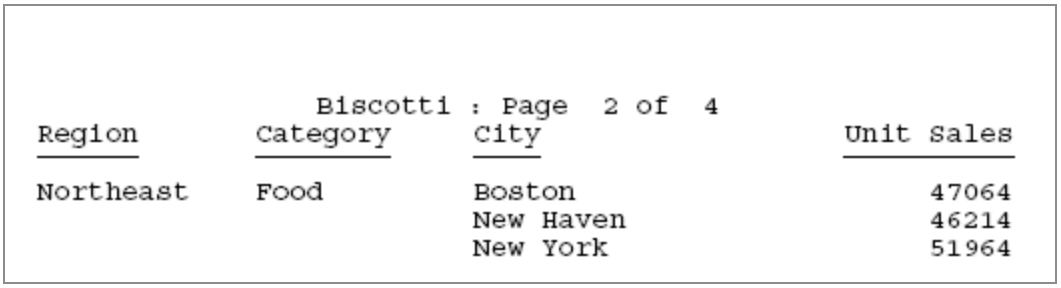
BYLASTPAGE page number four spaces to the left. The heading command must come after the COMPUTE command or the field named X will not be recognized:

```
TABLE FILE GGSALES
SUM UNITS
COMPUTE X/I2 = TABPAGENO;
BY PRODUCT NOPRINT REPAGE
BY REGION PAGE-BREAK
BY CATEGORY
BY CITY
HEADING CENTER
"<PRODUCT : Page <X of <-4> <BYLASTPAGE "
ON TABLE PCHOLD FORMAT PDF
END
```

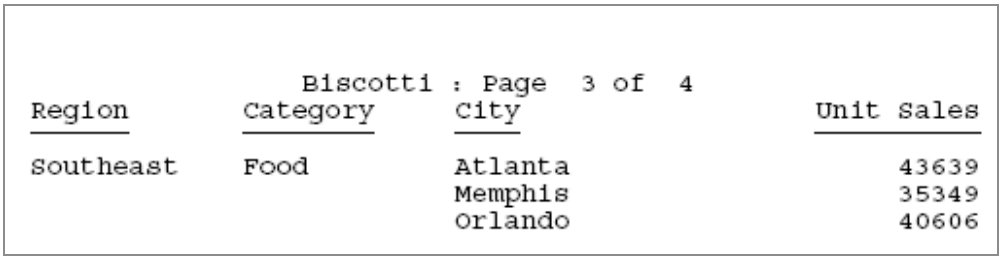
The following partial output shows that the page number resets to 1 when the product changes and that the BYLASTPAGE variable displays the total number of pages for each product:



```
                 Biscotti : Page  1 of  4
Region       Category     City                  Unit Sales
-------      --------     ----                  ----------
Midwest      Food         Chicago                    29413
                          Houston                    27504
                          St. Louis                  29188
```



```
                 Biscotti : Page  2 of  4
Region       Category     City                  Unit Sales
-------      --------     ----                  ----------
Northeast    Food         Boston                     47064
                          New Haven                  46214
                          New York                   51964
```



```
                 Biscotti : Page  3 of  4
Region       Category     City                  Unit Sales
-------      --------     ----                  ----------
Southeast    Food         Atlanta                    43639
                          Memphis                    35349
                          Orlando                    40606
```

```
                Biscotti : Page  4 of  4
Region       Category     City                    Unit Sales
West         Food         Los Angeles                  20773
                          San Francisco                22987
                          Seattle                      26676
```

```
                Capuccino : Page  1 of  3
Region       Category     City                     Unit Sales
Northeast    Coffee       Boston                        15358
                          New Haven                     12386
                          New York                      17041
```

# Assigning Any Page Number to the First Page

You can assign a page number to the first page of a report using the FOCFIRSTPAGE parameter. This feature is useful when a report is printed and assembled as part of another one.

You can also control the page numbering of multiple reports in the same procedure using the FOCFIRSTPAGE parameter with the &FOCNEXTPAGE variable.

If TABPAGENO is used, FOCFIRSTPAGE is ignored.

# Assign a Page Number to the First Page

**For all report requests in a procedure**

```
SET FOCFIRSTPAGE = {n|1|&FOCNEXTPAGE}
```

**For one report request**

```
ON TABLE SET FOCFIRSTPAGE {n|1|&FOCNEXTPAGE}
```

where:

**n**

Is an integer between 1 and 999999, which is the number assigned to the first page of the report.

**1**

Assigns the number 1 to the first page. 1 is the default value.

**&FOCNEXTPAGE**

Is a variable whose value is one more than the last page number of the previous report in a multiple request. The value is calculated at run time.

# Assigning a Page Number to the First Page

This request assigns the number 3 to the first page of the report.

```
SET FOCFIRSTPAGE = 3
TABLE FILE CENTORD
HEADING
"Sales By Store"
SUM LINEPRICE AS 'Sales'
BY SNAME
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The report is:

PAGE 3

Sales By Store

| Store Name: | Sales |
|---|---|
| AV VideoTown | $63,993,429.34 |
| Audio Expert | $247,093,518.58 |
| City Video | $15,299,051.29 |
| Consumer Merchandise | $30,080,503.15 |
| TV City | $83,041,182.81 |
| Web Sales | $4,027,582.48 |
| eMart | $290,487,756.36 |

# Controlling Page Numbers in Consecutive Reports

This procedure contains two report requests. The second request sets FOCFIRSTPAGE to the value of &FOCNEXTPAGE.

```
SET FOCFIRSTPAGE = 3
TABLE FILE CENTORD
HEADING
"Sales By Store"
SUM LINEPRICE AS 'Sales'
BY SNAME
WHERE SNAME EQ 'eMart'
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
-RUN
```

```
SET FOCFIRSTPAGE = &FOCNEXTPAGE
TABLE FILE CENTORD
HEADING
"Sales By Product"
SUM LINEPRICE AS 'Sales'
BY PRODCAT AS 'Product'
WHERE PRODCAT EQ 'VCRs'
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The first page of the second report is numbered 4, which is one more than the last page of the previous report:

# Controlling the Display of Page Numbers

By default, the first two lines of a report page are reserved. The first line displays the page number in the top-left corner, and the second line is blank. To suppress the default display, use the PAGE-NUM parameter.

# Control the Display of Page Numbers

**For all report requests in a procedure**

```
SET PAGE[-NUM] = num_display
```

**For one report request**

```
ON TABLE SET PAGE[-NUM] num_display
```

where:

**-NUM**

Is optional. PAGE and PAGE-NUM are synonymous.

**num_display**

Is one of the following:

ON displays page numbers in the top-left corner, followed by a reserved blank line. ON is the default value.

OFF suppresses default page numbers.

You can use the system variable TABPAGENO.

NOPAGE suppresses default page numbers and makes the top two lines of a page available for your use.

You can use the system variable TABPAGENO.

TOP or NOLEAD removes the line at the top of each page reserved for the page number, and the blank line after it. The first line of a report contains the report or page heading if specified, or column titles if there is no heading.

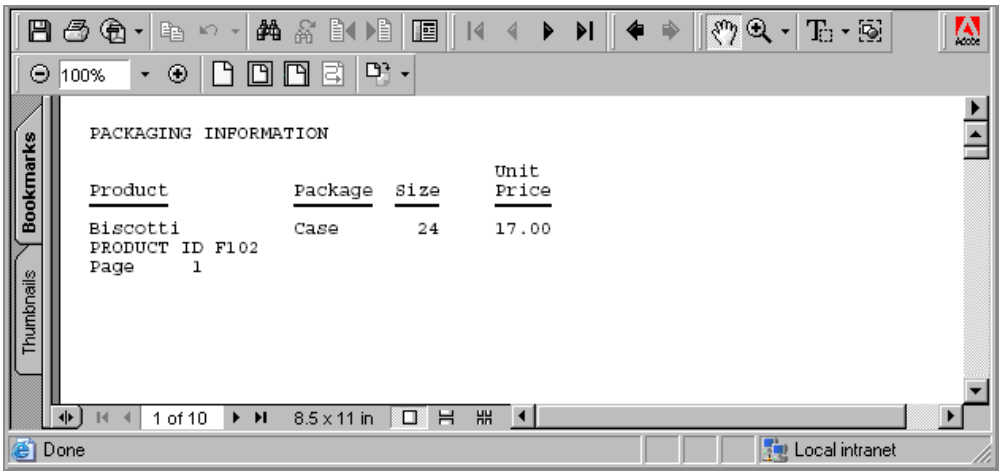
You can use the system variable TABPAGENO to show page numbers elsewhere in the report.

# Suppressing Default Page Numbers

This request uses SET PAGE-NUM = NOPAGE to suppress default page numbers. It uses the top line of the first page of the report for the report heading.

```
SET PAGE-NUM = NOPAGE
TABLE FILE GGPRODS
ON TABLE SUBHEAD
"PACKAGING INFORMATION"
" "
PRINT PACKAGE_TYPE AND SIZE AND UNIT_PRICE
BY PRODUCT_DESCRIPTION
ON PRODUCT_DESCRIPTION PAGE-BREAK SUBFOOT
"PRODUCT ID <PRODUCT_ID"
"Page <TABPAGENO "
ON TABLE SET ONLINE-FMT PDF
END
```

TABPAGENO inserts the page number in the sort footing. The first page of the report is:




# Setting the Number of Data Rows For Each Page in an AHTML Report Request

You can use the LINES-PER-PAGE StyleSheet attribute in an AHTML report request to set the number of data rows to display on each page in the report output.

# Set the Number of Data Rows For Each Page in an AHTML Report Request

To control the number of data rows to display on each page in the report output, use the following StyleSheet syntax:

```
TYPE=REPORT, LINES-PER-PAGE={n|UNLIMITED},$
```

where:

**n**

Specifies the number of data rows to display on each page. The default value is 57 rows.

**UNLIMITED**

Specifies that you want to show all the results on one page.

**Note:**

- In an AHTML report request, using the following SET command, you will see the same number of data rows as the LINES-PER-PAGE StyleSheet option:

  ```
  ON TABLE SET LINES {n|UNLIMITED}
  ```

- In an HTML report request, using either the LINES-PER-PAGE StyleSheet option or the SET LINES command, you will see the number of lines, as opposed to the number of data rows.

## Setting the Number of Data Rows For Each Report Page

The following example uses the default WebFOCUS StyleSheet and displays 20 data rows on each page of the report output.

```
TABLE FILE GGSALES
HEADING
"Sales Report"
SUM UNITS DOLLARS
BY CATEGORY BY PRODUCT BY DATE NOPRINT
WHERE DATE GE 19960101 AND DATE LE 19960401
ON TABLE PCHOLD FORMAT AHTML
ON TABLE SET STYLE *
INCLUDE=IBFS:/FILE/IBI_HTML_DIR/ibi_themes/Warm.sty,$
TYPE=REPORT, GRID=OFF, LINES-PER-PAGE = 20, $
ENDSTYLE
END
```

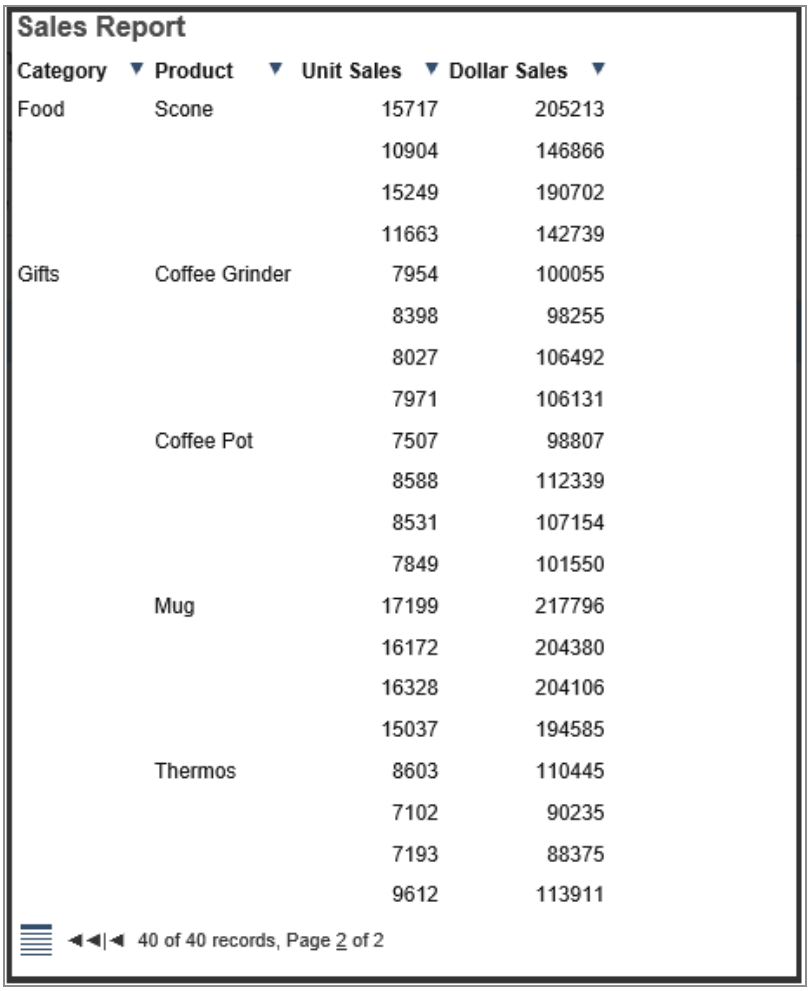
The following image shows the output for the first page.

**Sales Report**

| Category | Product | Unit Sales | Dollar Sales |
|---|---|---|---|
| Coffee | Capuccino | 5507 | 71728 |
| | | 5219 | 67429 |
| | | 6343 | 87290 |
| | | 4170 | 58692 |
| | Espresso | 14499 | 182900 |
| | | 14015 | 169023 |
| | | 14871 | 184474 |
| | | 11613 | 156396 |
| | Latte | 31469 | 401873 |
| | | 38725 | 490645 |
| | | 42717 | 520948 |
| | | 36374 | 468137 |
| Food | Biscotti | 18993 | 236698 |
| | | 18816 | 241975 |
| | | 15602 | 197254 |
| | | 17601 | 218437 |
| | Croissant | 22537 | 274926 |
| | | 29691 | 361053 |
| | | 30954 | 388868 |
| | | 27412 | 344197 |

40 of 40 records, Page 1 of 2 ►|►►

The following image shows the output for the second page.



Sales Report

| Category | Product | Unit Sales | Dollar Sales |
|---|---|---|---|
| Food | Scone | 15717 | 205213 |
| | | 10904 | 146866 |
| | | 15249 | 190702 |
| | | 11663 | 142739 |
| Gifts | Coffee Grinder | 7954 | 100055 |
| | | 8398 | 98255 |
| | | 8027 | 106492 |
| | | 7971 | 106131 |
| | Coffee Pot | 7507 | 98807 |
| | | 8588 | 112339 |
| | | 8531 | 107154 |
| | | 7849 | 101550 |
| | Mug | 17199 | 217796 |
| | | 16172 | 204380 |
| | | 16328 | 204106 |
| | | 15037 | 194585 |
| | Thermos | 8603 | 110445 |
| | | 7102 | 90235 |
| | | 7193 | 88375 |
| | | 9612 | 113911 |

◄◄|◄ 40 of 40 records, Page 2 of 2

# Adding Grids and Borders

By default, an HTML report contains horizontal and vertical grid lines. You can remove the grid lines or adjust their use on a horizontal (BY) sort field. Grid characteristics apply to an entire HTML report, not to individual components of a report.

You can emphasize headings, footings, and column titles in a report by adding borders and grid lines around them.

**Borders:** In a PDF, HTML, DHTML, XLSX, EXL2K, PPTX, PPT, or PS report, you can use BORDER attributes in a StyleSheet to specify the weight, style, and color of border lines. If you wish, you can specify formatting variations for the top, bottom, left, and right borders.

For an example, see Inserting and Formatting a BorderThis request generates an HTML report with a heavy red dotted line around the entire report heading. TABLE FILE GGSALES

SUM BUDUNITS UNITS BUDDOLLARS DOLLARS BY CATEGORY ON TABLE SUBHEAD "</1 Sales Report" "**CONFIDENTIAL**" "December 2002 </1" ON TABLE SET PAGE-NUM OFF ON TABLE SET ONLINE-FMT HTML ON TABLE SET HTMLCSS ON ON TABLE SET STYLESHEET * TYPE=REPORT, GRID=OFF, $  TYPE=TABHEADING, STYLE=BOLD, JUSTIFY=CENTER, BORDER=HEAVY, BORDER-COLOR=RED, BORDER-STYLE=DOTTED, $ ENDSTYLE ENDThe output is:Tip: You can use the same BORDER syntax to generate this output in a PDF or PS report..

The BORDERALL StyleSheet attribute supports a heading or footing grid with borders around each individual heading or footing cell in PDF, DHTML, HTML, XLSX, and PPTX report output. Using this attribute along with BORDER attributes for individual objects in a heading or footing enables you to create borders around individual items.

Currently, with SQUEEZE=ON, the right margin border for subheadings and subfootings is defined based on the maximum width of all heading, footing, subheading, and subfooting lines. The length of subheading and subfooting lines is tied to the lengths of the page heading and page footing, not to the size of the data columns in the body of the report. You can use the ALIGN-BORDERS=BODY attribute in a StyleSheet to align the subheadings and subfootings with the report body on PDF report output instead of the other heading elements.

**Grids:** In an HTML report, you can use the GRID attribute in a StyleSheet to turn grid lines on and off for the entire report. When used in conjunction with internal cascading style sheets, GRID produces a thin grid line rather than a thick double line (the HTML default). In PDF reports you can use the HGRID and VGRID attributes to add horizontal or vertical grid lines and adjust their density.

**Note:** The SET GRID parameter, which applies to graphs, is not the same as the GRID StyleSheet attribute.

# Grid Display Attributes

| Attribute | Description | Applies to |
|---|---|---|
| `GRID` | Controls grid display. | HTML<br>PDF<br>PS |

| Attribute | Description | Applies to |
|---|---|---|
| | | DHTML<br>PPTX<br>PPT |
| `HGRID` | Controls horizontal grid display and grid line density. | PDF<br>PS<br>DHTML<br>PPTX<br>PPT |
| `VGRID` | Control vertical grid display and grid line density. | PDF<br>PS<br>DHTML<br>PPTX<br>PPT |

**Note:** When viewing PDF reports with the Adobe Reader, GRID lines may appear thinner than specified if the view is not set to 100%. For example, if you view the document at the 50% setting, some GRID lines may be thinner than others.

# Control Grid Display in HTML Reports

```
[TYPE=REPORT,] GRID= option, $
```

where:

**TYPE=REPORT**

Applies the grid to the entire report. Not required, as it is the default.

**option**

Is one of the following:

ON applies a grid to a report. Does not apply grid lines to cells underneath a BY field value until the value changes. Column titles are not underlined. ON is the default value.

OFF disables the default grid. Column titles are underlined. You can include blank lines and underlines. You cannot wrap cell data. With this setting, a report may be harder to read.

FILL applies grid lines to all cells of a report. Column titles are not underlined.

# Add and Format Borders

To request a uniform border, use this syntax:

```
TYPE=type, BORDER=option, [BORDER-STYLE=line_style,]
    [BORDER-COLOR={color|RGB(r g b)},] $
```

To specify different characteristics for the top, bottom, left, and/or right borders, use this syntax:

```
TYPE=type, BORDER-position=option,
   [BORDER[-position]-STYLE=line_style,]
   [BORDER[-position]-COLOR={color|RGB(r g b)},] $
```

where:

**type**

Identifies the report component to which borders are applied. See Identifying a Report Component in a WebFOCUS StyleSheet for valid values.

**option**

Can be one of the following values:

ON turns borders on. ON generates the same line as MEDIUM.

**Note:** The MEDIUM line setting ensures consistency with lines created with GRID attributes.

OFF turns borders off. OFF is the default value.

LIGHT specifies a thin line.

MEDIUM identifies a medium line. ON sets the line to MEDIUM.

HEAVY identifies a thick line.

width specifies the line width in points, where 72 pts=1 inch. Note that this option is not supported with Excel 2003, which does not have an option for specifying a number to precisely set the border width (thickness) in points.

**Tip:** Line width specified in points is displayed differently in HTML and PDF output. For uniform appearance, regardless of display format, use LIGHT, MEDIUM, or HEAVY.

**position**

Specifies which border line to format. Valid values are: TOP, BOTTOM, LEFT, RIGHT.

You can specify a position qualifier for any of the BORDER attributes. This enables you to format line width, line style, and line color individually, for any side of the border.

**line_style**

Sets the style of the border line. WebFOCUS StyleSheets support all of the standard cascading style sheet line styles. Several 3-dimensional styles are available only in HTML, as noted by asterisks. Valid values are:

| Style | Description |
|---|---|
| NONE | No border is drawn. |
| SOLID | Solid line. |
| DOTTED | Dotted line. |
| DASHED | Dashed line. |

| Style | Description |
|---|---|
| DOUBLE | Double line. |
| GROOVE* | 3D groove. (Not supported with Excel 2003, which has no option for specifying this type of border.) |
| RIDGE* | 3D ridge. (Not supported with Excel 2003, which has no option for specifying this type of border.) |
| INSET* | 3D inset. |
| OUTSET* | 3D outset. |

**color**

Is one of the preset color values. The default value is BLACK.

If the display or output device does not support colors, it substitutes shades of gray. For a complete list of available color values, see Formatting Report Data.

**RGB**

Specifies the font color using a mixture of red, green, and blue.

**(r g b)**

Is the desired intensity of red, green, and blue, respectively. The values are on a scale of 0 to 255, where 0 is the least intense and 255 is the most intense. Using the three color components in equal intensities results in shades of gray.

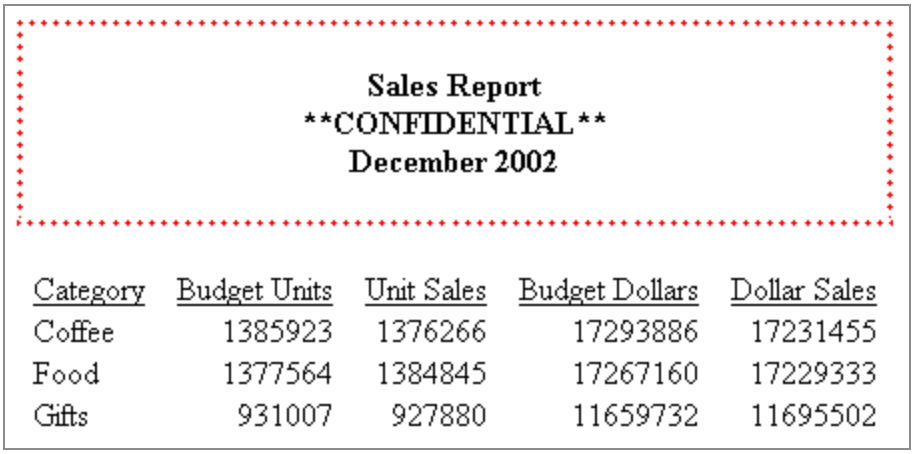
**Note:** Format EXL2K does not support the GRID=ON parameter.

# Inserting and Formatting a Border

This request generates an HTML report with a heavy red dotted line around the entire report heading.

```
TABLE FILE GGSALES
SUM BUDUNITS UNITS BUDDOLLARS DOLLARS
BY CATEGORY
ON TABLE SUBHEAD
"</1 Sales Report"
"**CONFIDENTIAL**"
"December 2002 </1"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
TYPE=TABHEADING, STYLE=BOLD, JUSTIFY=CENTER, BORDER=HEAVY,
     BORDER-COLOR=RED, BORDER-STYLE=DOTTED, $
ENDSTYLE
END
```

The output is:



Sales Report
**CONFIDENTIAL**
December 2002

| Category | Budget Units | Unit Sales | Budget Dollars | Dollar Sales |
|---|---|---|---|---|
| Coffee | 1385923 | 1376266 | 17293886 | 17231455 |
| Food | 1377564 | 1384845 | 17267160 | 17229333 |
| Gifts | 931007 | 927880 | 11659732 | 11695502 |

**Tip:** You can use the same BORDER syntax to generate this output in a PDF or PS report.

# Displaying the Default Grid on an HTML Report

This request uses the default setting GRID=ON.

```
TABLE FILE GGSALES
SUM UNITS DOLLARS
BY CATEGORY BY PRODUCT
ON TABLE SET PAGE-NUM OFF
END
```

The cells underneath the sort field CATEGORY do not have grid lines until the value changes (for example, from Coffee to Food):

| Category | Product | Unit Sales | Dollar Sales |
|---|---|---|---|
| Coffee | Capuccino | 189217 | 2381590 |
| | Espresso | 308986 | 3906243 |
| | Latte | 878063 | 10943622 |
| Food | Biscotti | 421377 | 5263317 |
| | Croissant | 630054 | 7749902 |
| | Scone | 333414 | 4216114 |
| Gifts | Coffee Grinder | 186534 | 2337567 |
| | Coffee Pot | 190695 | 2449585 |
| | Mug | 360570 | 4522521 |
| | Thermos | 190081 | 2385829 |

# Applying Grid Lines to All Cells of an HTML Report

This request uses GRID=FILL to apply grid lines to all cells, including those underneath the sort field CATEGORY.

```
TABLE FILE GGSALES
SUM UNITS DOLLARS
BY CATEGORY BY PRODUCT
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=FILL, $
ENDSTYLE
END
```

All cells have grid lines:

| Category | Product | Unit Sales | Dollar Sales |
|---|---|---|---|
| Coffee | Capuccino | 189217 | 2381590 |
| | Espresso | 308986 | 3906243 |
| | Latte | 878063 | 10943622 |
| Food | Biscotti | 421377 | 5263317 |
| | Croissant | 630054 | 7749902 |
| | Scone | 333414 | 4216114 |
| Gifts | Coffee Grinder | 186534 | 2337567 |
| | Coffee Pot | 190695 | 2449585 |
| | Mug | 360570 | 4522521 |
| | Thermos | 190081 | 2385829 |

# Removing a Grid From an HTML Report

This request uses GRID=OFF to remove the default grid from a report.

```
TABLE FILE GGSALES
SUM UNITS DOLLARS
BY CATEGORY BY PRODUCT
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

Column titles are underlined:

| Category | Product | Unit Sales | Dollar Sales |
|---|---|---|---|
| Coffee | Capuccino | 189217 | 2381590 |
| | Espresso | 308986 | 3906243 |
| | Latte | 878063 | 10943622 |
| Food | Biscotti | 421377 | 5263317 |
| | Croissant | 630054 | 7749902 |
| | Scone | 333414 | 4216114 |
| Gifts | Coffee Grinder | 186534 | 2337567 |
| | Coffee Pot | 190695 | 2449585 |
| | Mug | 360570 | 4522521 |
| | Thermos | 190081 | 2385829 |

# Adding Borders to Excel Report Output

Adding borders to Excel report output also may add blank rows.

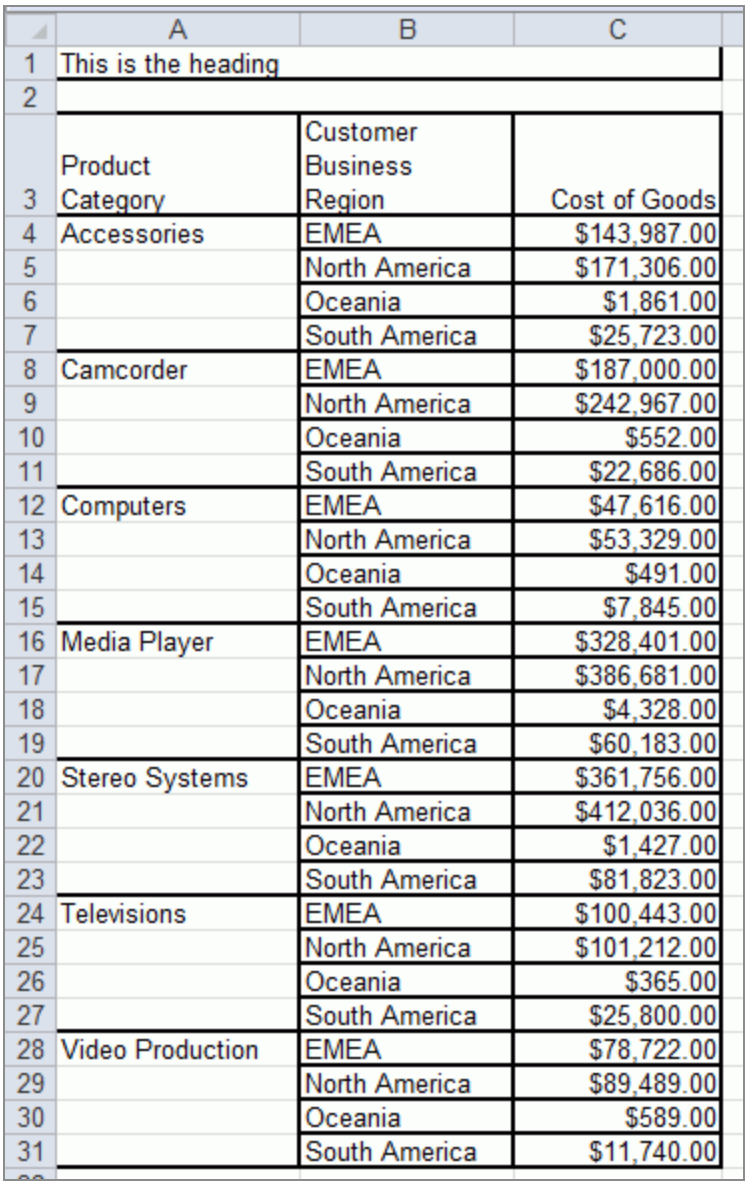
The presence of any BORDER syntax (even BORDERS=OFF), whether it is in the inline procedure or in the referenced StyleSheet, places the procedure in BORDER mode where the styling and spacing is adjusted and may result in extra blank rows.

# Adding Borders to FORMAT XLSX Report Output

The following request turns borders on and generates FORMAT XLSX report output.

```
TABLE FILE WF_RETAIL_LITE
SUM COGS_US
BY PRODUCT_CATEGORY
BY BUSINESS_REGION
HEADING
"This is the heading"
ON TABLE PCHOLD FORMAT XLSX
ON TABLE NOTOTAL
ON TABLE SET STYLE *
TYPE=REPORT,BORDER=ON,$
ENDSTYLE
END
```

The output is shown in the following image. A blank row has been added after the heading.



| | A | B | C |
|---|---|---|---|
| 1 | This is the heading | | |
| 2 | | | |
| 3 | Product Category | Customer Business Region | Cost of Goods |
| 4 | Accessories | EMEA | $143,987.00 |
| 5 | | North America | $171,306.00 |
| 6 | | Oceania | $1,861.00 |
| 7 | | South America | $25,723.00 |
| 8 | Camcorder | EMEA | $187,000.00 |
| 9 | | North America | $242,967.00 |
| 10 | | Oceania | $552.00 |
| 11 | | South America | $22,686.00 |
| 12 | Computers | EMEA | $47,616.00 |
| 13 | | North America | $53,329.00 |
| 14 | | Oceania | $491.00 |
| 15 | | South America | $7,845.00 |
| 16 | Media Player | EMEA | $328,401.00 |
| 17 | | North America | $386,681.00 |
| 18 | | Oceania | $4,328.00 |
| 19 | | South America | $60,183.00 |
| 20 | Stereo Systems | EMEA | $361,756.00 |
| 21 | | North America | $412,036.00 |
| 22 | | Oceania | $1,427.00 |
| 23 | | South America | $81,823.00 |
| 24 | Televisions | EMEA | $100,443.00 |
| 25 | | North America | $101,212.00 |
| 26 | | Oceania | $365.00 |
| 27 | | South America | $25,800.00 |
| 28 | Video Production | EMEA | $78,722.00 |
| 29 | | North America | $89,489.00 |
| 30 | | Oceania | $589.00 |
| 31 | | South America | $11,740.00 |

The following version of the request has no border attributes.

```
TABLE FILE WF_RETAIL_LITE
SUM COGS_US
BY PRODUCT_CATEGORY
BY BUSINESS_REGION
HEADING
"This is the heading"
ON TABLE PCHOLD FORMAT XLSX
```

```
ON TABLE NOTOTAL
END
```

The output is shown in the following image. There is no blank row between the report heading and report body.

| | A | B | C |
|---|---|---|---|
| 1 | This is the heading | | |
| 2 | Product Category | Customer Business Region | Cost of Goods |
| 3 | Accessories | EMEA | $143,987.00 |
| 4 | | North America | $171,306.00 |
| 5 | | Oceania | $1,861.00 |
| 6 | | South America | $25,723.00 |
| 7 | Camcorder | EMEA | $187,000.00 |
| 8 | | North America | $242,967.00 |
| 9 | | Oceania | $552.00 |
| 10 | | South America | $22,686.00 |
| 11 | Computers | EMEA | $47,616.00 |
| 12 | | North America | $53,329.00 |
| 13 | | Oceania | $491.00 |
| 14 | | South America | $7,845.00 |
| 15 | Media Player | EMEA | $328,401.00 |
| 16 | | North America | $386,681.00 |
| 17 | | Oceania | $4,328.00 |
| 18 | | South America | $60,183.00 |
| 19 | Stereo Systems | EMEA | $361,756.00 |
| 20 | | North America | $412,036.00 |
| 21 | | Oceania | $1,427.00 |
| 22 | | South America | $81,823.00 |
| 23 | Televisions | EMEA | $100,443.00 |
| 24 | | North America | $101,212.00 |
| 25 | | Oceania | $365.00 |
| 26 | | South America | $25,800.00 |
| 27 | Video Production | EMEA | $78,722.00 |
| 28 | | North America | $89,489.00 |
| 29 | | Oceania | $589.00 |
| 30 | | South America | $11,740.00 |

# Insert Inner and Outer Borders Within Headings or Footings

BORDERALL is the quickest way to add borders to the entire heading grid. This feature is supported in PDF, DHTML, HTML, XLSX, and PPTX formats. Individual borders can be removed by explicitly turning the border off in individual items using BORDER, BORDER-LEFT, BORDER-RIGHT, BORDER-TOP, and BORDER-BOTTOM. For a given item that is bordered by BORDERALL, BORDER-LEFT=OFF presents the item with no left border, but the defined border style is retained for top, bottom, and right borders.

Three levels of borders for headings and footings are supported:

1. Individual cell borders.

   BORDER-LEFT, BORDER-RIGHT, BORDER-TOP, and BORDER-BOTTOM can be used to set the individual components of the external border of the heading or a selected item or cell.

2. All outer borders.

   BORDER= is used to set the external borders within a heading or footing.

3. All outer and internal borders.

   BORDERALL is used to apply border characteristics to both the internal and external borders of the selected heading or footing.

**Note:** BORDERALL applies to the entire heading or footing element. It cannot be used for individual lines or items within a heading or footing element.

To turn on all external and internal borders (a border grid):

```
TYPE=headfoot, BORDERALL=option, [BORDER-STYLE=line_style,] [BORDER-
COLOR={color|RGB(rgb)},] $
```

where:

**headfoot**

Is the type of heading or footing. Valid values are TABHEADING, TABFOOTING, HEADING, FOOTING, SUBHEAD, and SUBFOOT.

**Note:** BORDERALL applies to the entire heading or footing element. It cannot be used for individual lines or items within a heading or footing element.

**option**

Can be one of the following values:

- **ON** turns borders on. ON generates the same line as MEDIUM.

  **Note:** The MEDIUM line setting ensures consistency with lines created with GRID attributes.

- **OFF** turns borders off. OFF is the default value.
- **LIGHT** specifies a thin line.
- **MEDIUM** identifies a medium line. ON sets the line to MEDIUM.
- **HEAVY** identifies a thick line.
- Entering a numeric value specifies the line width in points, where 72 pts=1 inch. Note that this option is not supported with Excel 2003, which does not have an option for specifying a number to precisely set the border width (thickness) in points.

  **Tip:** Line width specified in points is displayed differently in HTML and PDF output. For uniform appearance, regardless of display format, use LIGHT, MEDIUM, or HEAVY.

To request a uniform border, use this syntax:

```
TYPE=headfoot, BORDER=option
```

To specify different characteristics for the top, bottom, left, and/or right borders, use this syntax:

```
TYPE=headfoot, BORDER-position=option,
   [BORDER[-position]-STYLE=line_style,]
   [BORDER[-position]-COLOR={color|RGB(rgb)},] $
```

where:

**headfoot**

Identifies the heading, footing, subheading, or subfooting to which borders are applied.

**position**

Specifies which border line to format. Valid values are: TOP, BOTTOM, LEFT, RIGHT.

You can specify a position qualifier for any of the BORDER attributes. This enables you to format line width, line style, and line color individually, for any side of the border.

**option**

Can be one of the following values:

- **ON** turns borders on. ON generates the same line as MEDIUM.

  **Note:** The MEDIUM line setting ensures consistency with lines created with GRID attributes.

- **OFF** turns borders off. OFF is the default value.
- **LIGHT** specifies a thin line.
- **MEDIUM** identifies a medium line. ON sets the line to MEDIUM.
- **HEAVY** identifies a thick line.
- Entering a numeric value specifies the line width in points, where 72 pts=1 inch. Note that this option is not supported with Excel 2003, which does not have an option for specifying a number to precisely set the border width (thickness) in points.

  **Tip:** Line width specified in points is displayed differently in HTML and PDF output. For uniform appearance, regardless of display format, use LIGHT, MEDIUM, or HEAVY.

**line_style**

Sets the style of the border line. WebFOCUS StyleSheets support all of the standard cascading style sheet line styles. Several three-dimensional styles are available only in HTML, as noted by asterisks. Valid values are:

| Style | Description |
|---|---|
| **NONE** | No border is drawn. |
| **SOLID** | Solid line. |
| **DOTTED** | Dotted line. |
| **DASHED** | Dashed line. |

| Style | Description |
|---|---|
| **DOUBLE** | Double line. |
| **GROOVE*** | 3D groove. (Not supported with Excel 2003, which has no option for specifying this type of border.) |
| **RIDGE*** | 3D ridge. (Not supported with Excel 2003, which has no option for specifying this type of border.) |
| **INSET*** | 3D inset. |
| **OUTSET*** | 3D outset. |

**Note:** All line types supported for PDF, DHTML, and PPTX can be used for individual internal borders with HEADALIGN=BODY.

**color**

Is one of the preset color values. The default value is BLACK.

If the display or output device does not support colors, it substitutes shades of gray. For a complete list of available color values, see Specifying Font Format in a Report.

**RGB**

Specifies the font color using a mixture of red, green, and blue.

**(r g b)**

Is the desired intensity of red, green, and blue, respectively, separated by spaces. The values are on a scale of 0 to 255, where 0 is the least intense and 255 is the most intense. Using the three color components in equal intensities results in shades of gray.

# Controlling Borders Within Heading and Footing Elements in PDF Report Output

The following request against the EMPLOYEE data source has a page heading, a subheading, a subfooting, and a report footing:

```
TABLE FILE EMPLOYEE
HEADING
" Department Report Page <TABPAGENO "
PRINT LAST_NAME AS ''
FIRST_NAME AS ''
CURR_SAL AS ''
CURR_JOBCODE AS ''
BY DEPARTMENT AS ''
WHERE CURR_SAL NE 0.0
ON TABLE PCHOLD FORMAT PDF
ON DEPARTMENT SUBFOOT
" "
"Subtotal:<ST.CURR_SAL"
" "
ON DEPARTMENT SUBHEAD
"Department <+0>Last Name <+0>First Name <+0>Salary<+0>Jobcode <+0>"
ON TABLE SUBFOOT
"Grand Total:<ST.CURR_SAL"
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
TYPE=REPORT, FONT=ARIAL, BORDER=ON, SQUEEZE=ON, $
TYPE=REPORT, COLUMN=CURR_JOBCODE,SQUEEZE=.75, $
TYPE = SUBHEAD, HEADALIGN=BODY, BORDERALL=ON,$
TYPE = SUBFOOT, HEADALIGN=BODY,$
TYPE = SUBFOOT, LINE=2, ITEM=1, COLSPAN=3, JUSTIFY=RIGHT,$
TYPE = SUBFOOT, LINE=2, ITEM=2, JUSTIFY=RIGHT,$
TYPE = TABFOOTING, HEADALIGN=BODY,$
TYPE = TABFOOTING, ITEM=1, COLSPAN=3, JUSTIFY=RIGHT,$
TYPE = TABFOOTING, ITEM=2, JUSTIFY=RIGHT,$
ENDSTYLE
END
```

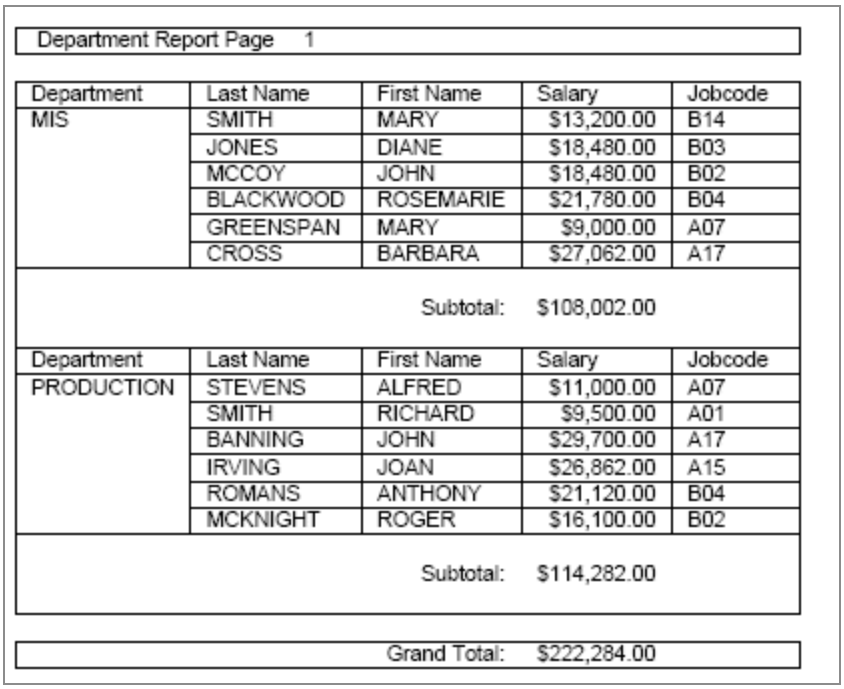
The REPORT component has BORDER=ON, so the page heading has an external border.

The subheading has BORDERALL=ON and HEADALIGN=BODY, so the subheading grid aligns with the body grid, and each item within the subhead is presented as fully bordered individual cells.

The StyleSheet aligns the subfooting elements with the body of the report, and has the salary subtotal on the second line aligned and justified with the CURR_SAL column.

The table footing has a border around the entire footing because the REPORT component specifies BORDER=ON. The grand total is aligned and justified with the CURR_SAL column on the report.

The output is:



Department Report Page 1

| Department | Last Name | First Name | Salary | Jobcode |
|---|---|---|---|---|
| MIS | SMITH | MARY | $13,200.00 | B14 |
| | JONES | DIANE | $18,480.00 | B03 |
| | MCCOY | JOHN | $18,480.00 | B02 |
| | BLACKWOOD | ROSEMARIE | $21,780.00 | B04 |
| | GREENSPAN | MARY | $9,000.00 | A07 |
| | CROSS | BARBARA | $27,062.00 | A17 |
| | | Subtotal: | $108,002.00 | |
| Department | Last Name | First Name | Salary | Jobcode |
| PRODUCTION | STEVENS | ALFRED | $11,000.00 | A07 |
| | SMITH | RICHARD | $9,500.00 | A01 |
| | BANNING | JOHN | $29,700.00 | A17 |
| | IRVING | JOAN | $26,862.00 | A15 |
| | ROMANS | ANTHONY | $21,120.00 | B04 |
| | MCKNIGHT | ROGER | $16,100.00 | B02 |
| | | Subtotal: | $114,282.00 | |

Grand Total: $222,284.00

# Align Subheading and Subfooting Margins With the Report Body

Currently, with SQUEEZE=ON, the right margin border for subheadings and subfootings is defined based on the maximum width of all heading, footing, subheading, and subfooting lines. The length of subheading and subfooting lines is tied to the lengths of the page heading and page footing, not to the size of the data columns in the body of the report.

You can use the ALIGN-BORDERS=BODY attribute in a StyleSheet to align the subheadings and subfootings with the report body on PDF report output instead of the other heading elements.

You can align subheading and subfooting margins with the report body either by adding the ALIGN-BORDERS=BODY attribute to the StyleSheet declaration for the REPORT component, or placing it in its own declaration without a TYPE attribute.

```
[TYPE=REPORT,] ALIGN-BORDERS={OFF|BODY} ,$
```

where:

**OFF**

Does not align the right margin of subheadings and subfootings with the report body.

**BODY**

Specifies that the width of subheading and subfooting lines is independent of heading, footing, tabheading, and tabfooting lines, and that the right border of the report body will be aligned by either extending subheading and subfooting lines (if they are narrower than the data columns) or extending the data columns (if the data columns are narrower than the maximum width of subheadings and subfootings).

# Considerations for Aligning Subheading and Subfooting Margins With the Report Body

Without the ALIGN-BORDERS=BODY attribute, the width of the subheading and subfooting lines is determined by the largest width of all of the headings and footings (report, page, subheadings, and subfootings).

The following image illustrates report output without the ALIGN-BORDERS=BODY attribute.

Report Heading

TYPE=REPORT, ALIGN-BORDERS=OFF, BORDER=ON, $

Page Heading

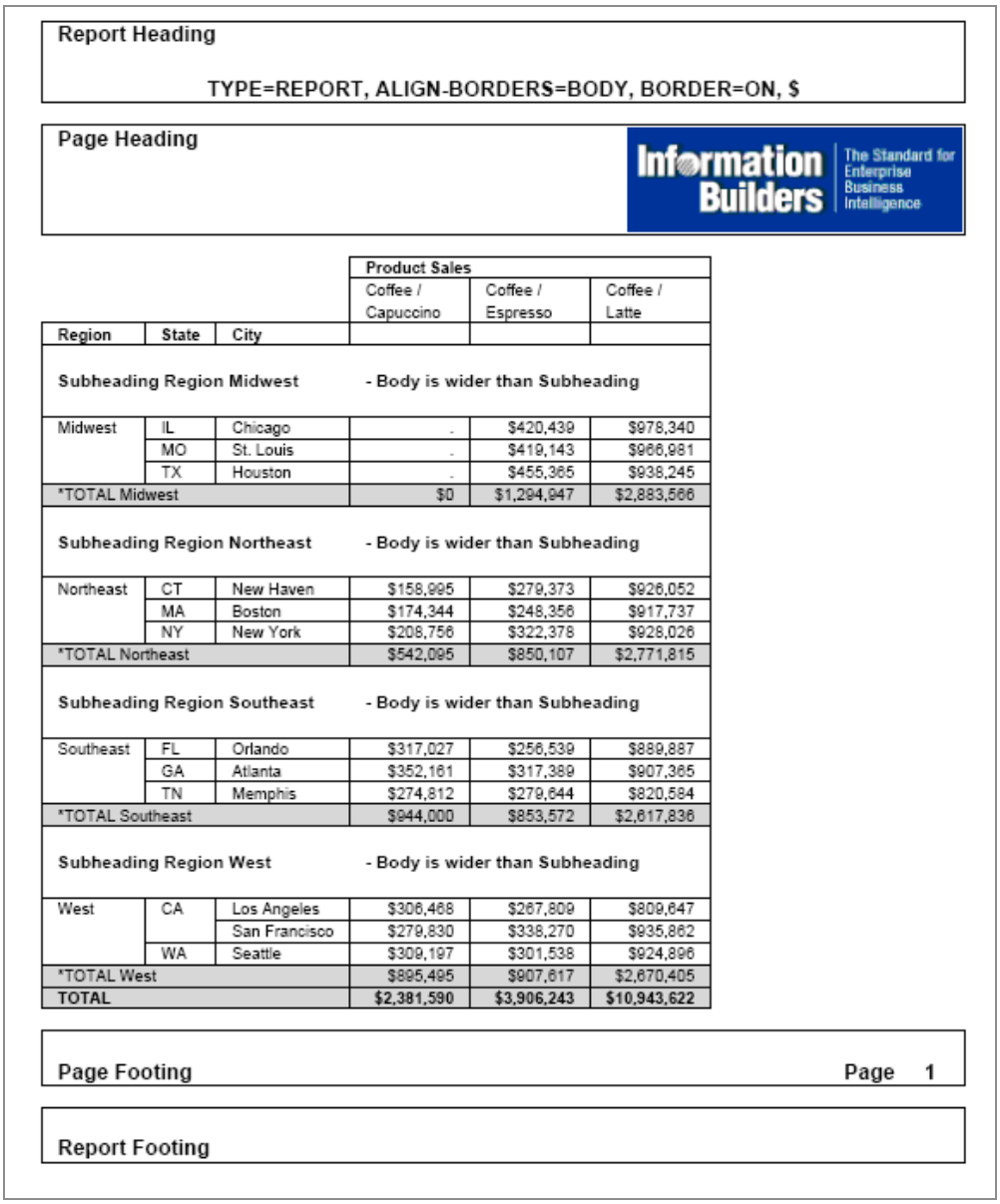
Information Builders The Standard for Enterprise Business Intelligence

| | | | Product Sales | | |
|---|---|---|---|---|---|
| | | | Coffee / Capuccino | Coffee / Espresso | Coffee / Latte |
| **Region** | **State** | **City** | | | |
| **Subheading Region Midwest** | | | | | |
| Midwest | IL | Chicago | . | $420,439 | $978,340 |
| | MO | St. Louis | . | $419,143 | $966,981 |
| | TX | Houston | . | $455,365 | $938,245 |
| *TOTAL Midwest | | | $0 | $1,294,947 | $2,883,566 |
| **Subheading Region Northeast** | | | | | |
| Northeast | CT | New Haven | $158,995 | $279,373 | $926,052 |
| | MA | Boston | $174,344 | $248,356 | $917,737 |
| | NY | New York | $208,756 | $322,378 | $928,026 |
| *TOTAL Northeast | | | $542,095 | $850,107 | $2,771,815 |
| **Subheading Region Southeast** | | | | | |
| Southeast | FL | Orlando | $317,027 | $256,539 | $889,887 |
| | GA | Atlanta | $352,161 | $317,389 | $907,365 |
| | TN | Memphis | $274,812 | $279,644 | $820,584 |
| *TOTAL Southeast | | | $944,000 | $853,572 | $2,617,836 |
| **Subheading Region West** | | | | | |
| West | CA | Los Angeles | $306,468 | $267,809 | $809,647 |
| | | San Francisco | $279,830 | $338,270 | $935,862 |
| | WA | Seattle | $309,197 | $301,538 | $924,896 |
| *TOTAL West | | | $895,495 | $907,617 | $2,670,405 |
| **TOTAL** | | | **$2,381,590** | **$3,906,243** | **$10,943,622** |

Page Footing Page 1

Report Footing

When the body lines are wider than the subheading and subfooting lines, the border and backcolor of the subheading and subfooting lines are expanded to match the width of the data lines, as shown on the following report output.



Report Heading

TYPE=REPORT, ALIGN-BORDERS=BODY, BORDER=ON, $

Page Heading

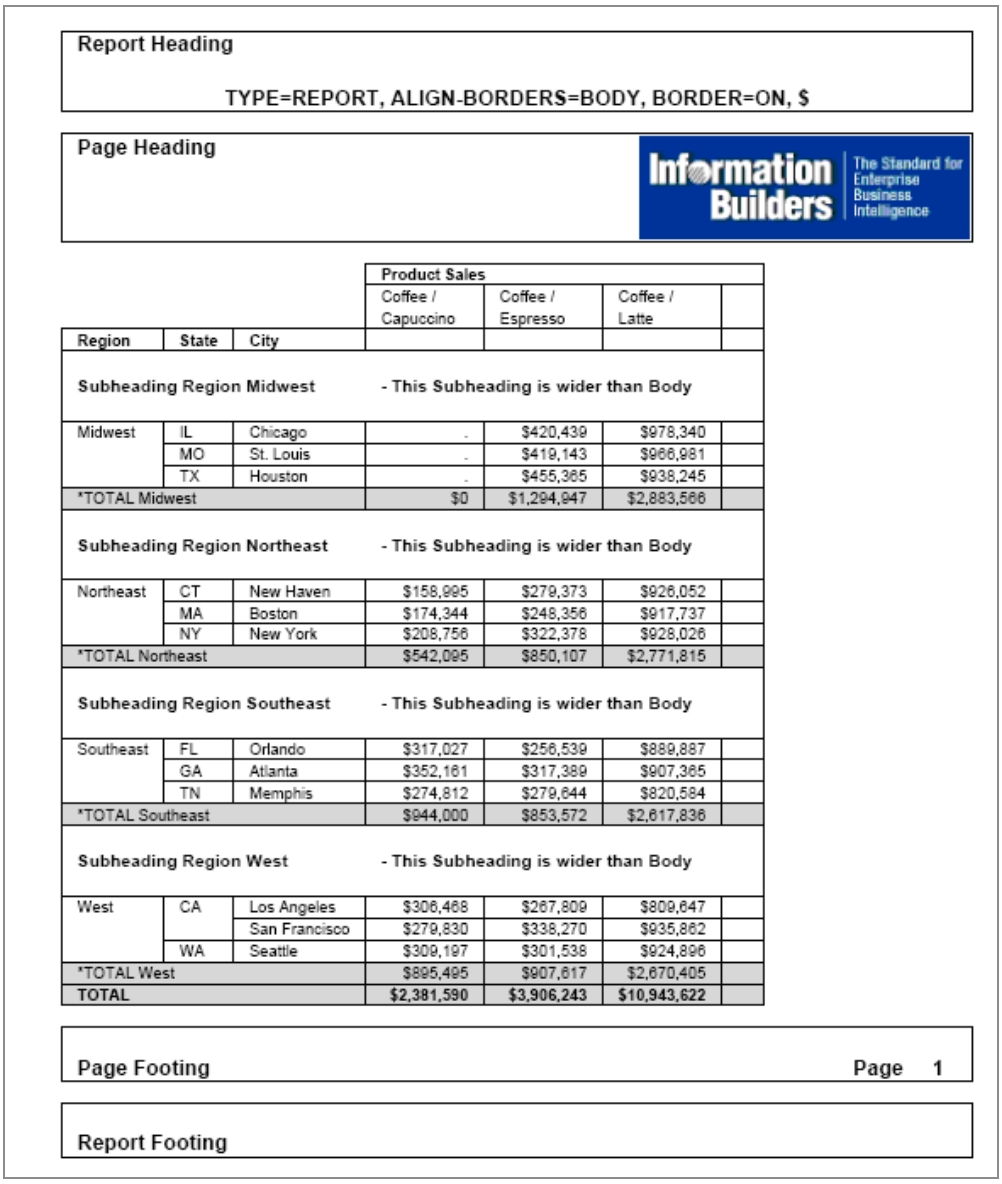
Information Builders — The Standard for Enterprise Business Intelligence

| | | | Product Sales | | |
|---|---|---|---|---|---|
| | | | Coffee / Capuccino | Coffee / Espresso | Coffee / Latte |
| **Region** | **State** | **City** | | | |
| **Subheading Region Midwest** | | | **- Body is wider than Subheading** | | |
| Midwest | IL | Chicago | . | $420,439 | $978,340 |
| | MO | St. Louis | . | $419,143 | $966,981 |
| | TX | Houston | . | $455,365 | $938,245 |
| *TOTAL Midwest | | | $0 | $1,294,947 | $2,883,566 |
| **Subheading Region Northeast** | | | **- Body is wider than Subheading** | | |
| Northeast | CT | New Haven | $158,995 | $279,373 | $926,052 |
| | MA | Boston | $174,344 | $248,356 | $917,737 |
| | NY | New York | $208,756 | $322,378 | $928,026 |
| *TOTAL Northeast | | | $542,095 | $850,107 | $2,771,815 |
| **Subheading Region Southeast** | | | **- Body is wider than Subheading** | | |
| Southeast | FL | Orlando | $317,027 | $256,539 | $889,887 |
| | GA | Atlanta | $352,161 | $317,389 | $907,365 |
| | TN | Memphis | $274,812 | $279,644 | $820,584 |
| *TOTAL Southeast | | | $944,000 | $853,572 | $2,617,836 |
| **Subheading Region West** | | | **- Body is wider than Subheading** | | |
| West | CA | Los Angeles | $306,468 | $267,809 | $809,647 |
| | | San Francisco | $279,830 | $338,270 | $935,862 |
| | WA | Seattle | $309,197 | $301,538 | $924,896 |
| *TOTAL West | | | $895,495 | $907,617 | $2,670,405 |
| **TOTAL** | | | **$2,381,590** | **$3,906,243** | **$10,943,622** |

Page Footing Page 1

Report Footing

If the subheading and subfooting lines are longer than the body lines, an additional filler cell is added to each data line to allow the defined borders and backcolor to fill the width defined by the subheading and subfooting lines, as shown on the following report output.



Report Heading

TYPE=REPORT, ALIGN-BORDERS=BODY, BORDER=ON, $

Page Heading

Information Builders — The Standard for Enterprise Business Intelligence

| | | | Product Sales | | | |
|---|---|---|---|---|---|---|
| | | | Coffee / Capuccino | Coffee / Espresso | Coffee / Latte | |
| Region | State | City | | | | |
| Subheading Region Midwest | | | - This Subheading is wider than Body | | | |
| Midwest | IL | Chicago | . | $420,439 | $978,340 | |
| | MO | St. Louis | . | $419,143 | $966,981 | |
| | TX | Houston | . | $455,365 | $938,245 | |
| *TOTAL Midwest | | | $0 | $1,294,947 | $2,883,566 | |
| Subheading Region Northeast | | | - This Subheading is wider than Body | | | |
| Northeast | CT | New Haven | $158,995 | $279,373 | $926,052 | |
| | MA | Boston | $174,344 | $248,356 | $917,737 | |
| | NY | New York | $208,756 | $322,378 | $928,026 | |
| *TOTAL Northeast | | | $542,095 | $850,107 | $2,771,815 | |
| Subheading Region Southeast | | | - This Subheading is wider than Body | | | |
| Southeast | FL | Orlando | $317,027 | $256,539 | $889,887 | |
| | GA | Atlanta | $352,161 | $317,389 | $907,365 | |
| | TN | Memphis | $274,812 | $279,644 | $820,584 | |
| *TOTAL Southeast | | | $944,000 | $853,572 | $2,617,836 | |
| Subheading Region West | | | - This Subheading is wider than Body | | | |
| West | CA | Los Angeles | $306,468 | $267,809 | $809,647 | |
| | | San Francisco | $279,830 | $338,270 | $935,862 | |
| | WA | Seattle | $309,197 | $301,538 | $924,896 | |
| *TOTAL West | | | $895,495 | $907,617 | $2,670,405 | |
| TOTAL | | | $2,381,590 | $3,906,243 | $10,943,622 | |

Page Footing Page 1

Report Footing

ALIGN-BORDERS=BODY has been designed to work on:

- Single panel reports (reports that do not panel horizontally).
- Paneled reports where HEADPANEL has been turned on for all of the subheadings and subfootings defined in the report.

  Setting HEADPANEL ON causes the headings and footings from the first page of a Paneled report to replicate on the subsequent panels. If HEADPANEL is not used, content can be placed in the Paneled headings by explicitly positioning items within the headings using the StyleSheet attribute POSITION. In these situations, ALIGN-BORDERS=BODY is ignored.

Therefore, if HEADPANEL is turned on at the REPORT level and not explicitly turned off for any of the individual subheadings or subfootings, or if it is explicitly turned on for all subheadings and subfootings, ALIGN-BORDERS=BODY will align the borders of all subheadings and subfootings to the data. Otherwise, the borders will continue to exhibit the default behavior of aligning with the page headings and footings.

# Aligning Subheading and Subfooting Margins in a Single Panel PDF Report

The following request against the GGSALES data source has a report heading, report footing, page heading, page footing, and a subheading for each region. The margins of the subheadings and subfootings are not aligned (ALIGN-BORDERS=OFF ,$):

```
DEFINE FILE GGSALES
SHOWCATPROD/A30 = CATEGORY || (' / ' | PRODUCT);
END
TABLE FILE GGSALES
SUM
     DOLLARS/I8M AS ''
BY REGION
BY ST
BY CITY
ACROSS SHOWCATPROD AS 'Product Sales'

ON REGION SUBHEAD
" "
"Subheading <+0>Region <REGION<+0> "
" "
ON REGION SUBTOTAL AS '*TOTAL'
ON TABLE SUBHEAD
"Report Heading"
" "
"TYPE=REPORT, ALIGN-BORDERS=OFF, BORDER=ON, $"
HEADING
"Page Heading "
" "
" "
" "
FOOTING
" "
"Page Footing<+0>Page <TABPAGENO "
ON TABLE SUBFOOT
```

```
" "
"Report Footing"
```

```
WHERE CATEGORY EQ 'Coffee';
ON TABLE SET PAGE-NUM OFF
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
    TYPE=REPORT,
     FONT='ARIAL',
     SIZE=9,
     LEFTMARGIN=.75,
     RIGHTMARGIN=.5,
     TOPMARGIN=.1,
     BOTTOMMARGIN=.1,
     ALIGN-BORDERS=OFF,
     BORDER=ON,
     SQUEEZE=ON,$
$
TYPE=TITLE,
     STYLE=BOLD,
$
TYPE=TABHEADING,
     SIZE=12,
     STYLE=BOLD,
$
TYPE=TABHEADING,
     LINE=3,
     JUSTIFY=CENTER,
$
TYPE=TABFOOTING,
     SIZE=12,
     STYLE=BOLD,
$
TYPE=HEADING,
     SIZE=12,
     STYLE=BOLD,
$
TYPE=HEADING,
     IMAGE=smplogo1.gif,
     POSITION=(+4.6000000 +0.03000000),
     JUSTIFY=RIGHT,
$
TYPE=FOOTING,
     SIZE=12,
     STYLE=BOLD,
```

```
$
TYPE=FOOTING,
   LINE=2,
   ITEM=2,
   OBJECT=TEXT,
   POSITION=6.3,
     SIZE=12,
     STYLE=BOLD,
```

```
$
TYPE=SUBHEAD,
     SIZE=10,
     STYLE=BOLD,
$
TYPE=SUBHEAD,
  LINE=2,
  ITEM=3,
  OBJECT=TEXT,
  POSITION=2.5,
$
TYPE=SUBFOOT,
     SIZE=10,
     STYLE=BOLD,
$
TYPE=SUBTOTAL,
     BACKCOLOR=RGB(210 210 210),
$
TYPE=ACROSSVALUE,
     SIZE=9,
     WRAP=ON,
$
TYPE=ACROSSTITLE,
     STYLE=BOLD,
$
TYPE=GRANDTOTAL,
     BACKCOLOR=RGB(210 210 210),
     STYLE=BOLD,
$
ENDSTYLE
END
```

The output shows that the subheading margins align with the heading, not with the report body.

Report Heading

TYPE=REPORT, ALIGN-BORDERS=OFF, BORDER=ON, $

Page Heading

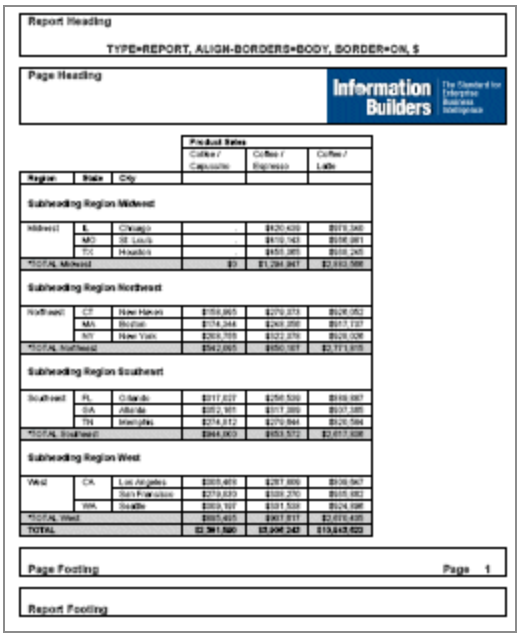
Information Builders — The Standard for Enterprise Business Intelligence

| | | | Product Sales | | |
|---|---|---|---|---|---|
| | | | Coffee / Capuccino | Coffee / Espresso | Coffee / Latte |
| **Region** | **State** | **City** | | | |
| **Subheading Region Midwest** | | | | | |
| Midwest | IL | Chicago | . | $420,439 | $978,340 |
| | MO | St. Louis | . | $419,143 | $966,981 |
| | TX | Houston | . | $455,365 | $938,245 |
| *TOTAL Midwest | | | $0 | $1,294,947 | $2,883,566 |
| **Subheading Region Northeast** | | | | | |
| Northeast | CT | New Haven | $158,995 | $279,373 | $926,052 |
| | MA | Boston | $174,344 | $248,358 | $917,737 |
| | NY | New York | $208,756 | $322,378 | $928,026 |
| *TOTAL Northeast | | | $542,095 | $850,107 | $2,771,815 |
| **Subheading Region Southeast** | | | | | |
| Southeast | FL | Orlando | $317,027 | $256,539 | $889,887 |
| | GA | Atlanta | $352,161 | $317,389 | $907,365 |
| | TN | Memphis | $274,812 | $279,644 | $820,584 |
| *TOTAL Southeast | | | $944,000 | $853,572 | $2,617,836 |
| **Subheading Region West** | | | | | |
| West | CA | Los Angeles | $306,468 | $267,809 | $809,647 |
| | | San Francisco | $279,830 | $338,270 | $935,862 |
| | WA | Seattle | $309,197 | $301,538 | $924,896 |
| *TOTAL West | | | $895,495 | $907,617 | $2,670,405 |
| **TOTAL** | | | **$2,381,590** | **$3,906,243** | **$10,943,622** |

Page Footing — Page 1

Report Footing

Now change the ALIGN-BORDERS attribute to ALIGN-BORDERS=BODY and rerun the request. The subheadings now align with the report body, as shown in the following image.




# Aligning Subheading and Subfooting Margins in a Multi-Panel Report

The following request has HEADPANEL=ON for all headings and footings. It also has the ALIGN-BORDERS=BODY attribute:

```
SET BYPANEL=ON
DEFINE FILE GGSALES
SHOWCATPROD/A30 = CATEGORY || (' / ' | PRODUCT);
END
TABLE FILE GGSALES
SUM
     DOLLARS/I8M AS ''
BY REGION
BY ST
BY CITY
ACROSS SHOWCATPROD AS 'Product Sales'

ON REGION SUBHEAD
" "
"Subheading <+0>Region <REGION<+0> "
" "
ON REGION SUBTOTAL AS '*TOTAL'
ON TABLE SUBHEAD
```

```
"Report Heading"
" "
"TYPE=REPORT, ALIGN-BORDERS=BODY, HEADPANEL=ON, BORDER=ON, $"
HEADING
"Page Heading "
" "
" "
" "
FOOTING
" "
"Page Footing<+0>Page <TABPAGENO "
ON TABLE SUBFOOT
" "
"Report Footing"
```

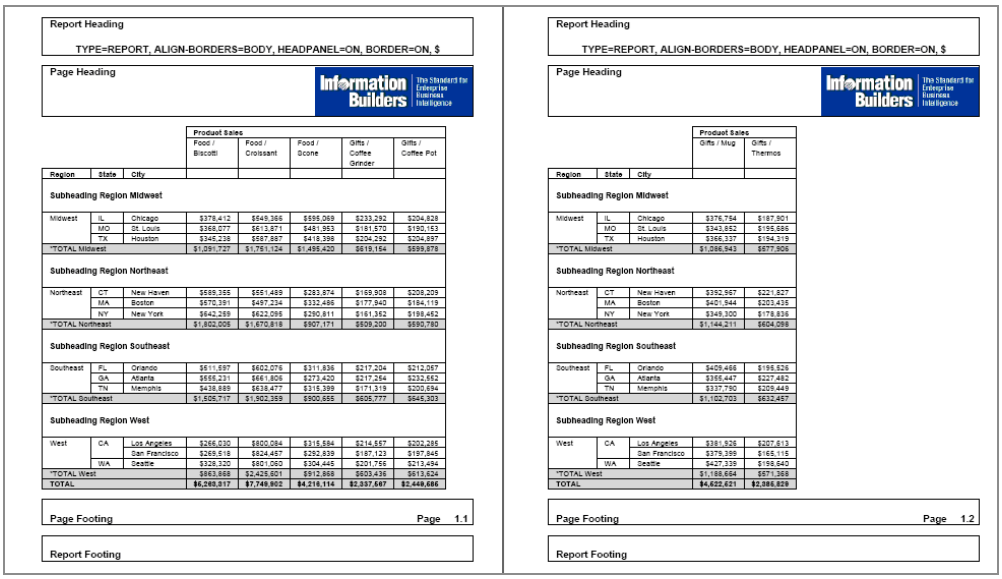
```
WHERE CATEGORY NE 'Coffee';
ON TABLE SET PAGE-NUM OFF
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
     UNITS=IN,
     SQUEEZE=ON,
     ORIENTATION=PORTRAIT,
$
TYPE=REPORT,
     FONT='ARIAL',
     SIZE=9,
     LEFTMARGIN=.75,
     RIGHTMARGIN=.5,
     TOPMARGIN=.1,
     BOTTOMMARGIN=.1,
     HEADPANEL=ON,
     ALIGN-BORDERS=BODY,
     BORDER=ON,
$
TYPE=TITLE,
     STYLE=BOLD,
$
TYPE=TABHEADING,
     SIZE=12,
     STYLE=BOLD,
$
TYPE=TABHEADING,
     LINE=3,
     JUSTIFY=CENTER,
$
```

```
TYPE=TABFOOTING,
     SIZE=12,
     STYLE=BOLD,
$
TYPE=HEADING,
     SIZE=12,
     STYLE=BOLD,
$
TYPE=HEADING,
     IMAGE=smplogo1.gif,
     POSITION=(+4.6000000 +0.03000000),
     JUSTIFY=RIGHT,
```

```
$
TYPE=FOOTING,
     SIZE=12,
     STYLE=BOLD,
$
TYPE=FOOTING,
   LINE=2,
   ITEM=2,
   OBJECT=TEXT,
   POSITION=6.3,
     SIZE=12,
     STYLE=BOLD,
$
TYPE=SUBHEAD,
     SIZE=10,
     STYLE=BOLD,
$
TYPE=SUBHEAD,
   LINE=2,
   ITEM=3,
   OBJECT=TEXT,
   POSITION=2.5,
$
TYPE=SUBFOOT,
     SIZE=10,
     STYLE=BOLD,
$
TYPE=SUBTOTAL,
     BACKCOLOR=RGB(210 210 210),
$
TYPE=ACROSSVALUE,
     SIZE=9,
     WRAP=ON,
```

```
$
TYPE=ACROSSTITLE,
     STYLE=BOLD,
$
TYPE=GRANDTOTAL,
     BACKCOLOR=RGB(210 210 210),
     STYLE=BOLD,
$
ENDSTYLE
END
```

The output shows that the subheadings are aligned with the data on each panel.




# Add and Adjust Grid Lines (PDF or PS)

This syntax applies to a PDF or PS report.

```
TYPE=type, {HGRID|VGRID}={ON|OFF|HEAVY}, $
```

where:

**type**

Identifies the report component to which grid lines are applied. See Identifying a Report Component in a WebFOCUS StyleSheet for valid values.

**HGRID**

Specifies horizontal grid lines.

**VGRID**

Specifies vertical grid lines.

**ON**

Applies light grid lines.

**OFF**

Suppresses grid lines. OFF is the default value.

**HEAVY**

Applies heavy grid lines.

# Applying Grid Lines to Report Data (PDF)

This request applies light, horizontal grid lines to report data.

```
SET ONLINE-FMT = PDF
TABLE FILE GGDEMOG
HEADING
"State Statistics"
" "
SUM HH AS 'Number of,Households' AVGHHSZ98 AS 'Avg.,Size'
MEDHHI98 AS 'Avg.,Income'
BY ST
WHERE ST EQ 'CA' OR 'FL' OR 'NY'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=DATA, HGRID=ON, $
ENDSTYLE
END
```

In the PDF report, the lines make it easier to distinguish the data by state:

State Statistics

| State | Number of Households | Avg. Size | Avg. Income |
|---|---|---|---|
| CA | 11478067 | 3 | 44925 |
| FL | 5968392 | 2 | 34264 |
| NY | 6799434 | 3 | 42023 |

# Defining Borders Around Boxes With PPTX and PDF Formats

In PPTX and PDF formats, the backcolor of a box may be defined independently of the border color.

**Borders Without Backcolor**

When the border color is defined and there is no backcolor, only the border or outline of the box is displayed in the border color specified, as shown in the example below.

```
TABLE FILE GGSALES
BY REGION NOPRINT
ON TABLE PCHOLD FORMAT PPTX
ON TABLE SET STYLE *
TYPE=REPORT, OBJECT=BOX, POSITION=(1 1), DIMENSION=(2 1), BORDER-
COLOR=GREEN,$
ENDSTYLE
END
```

The output is shown in the following image.

**Backcolor Without Borders**

In PPTX format, when a backcolor is defined and there is no border (BORDER-STYLE=NONE), the box retains the color defined for the backcolor.

```
TABLE FILE GGSALES
BY REGION NOPRINT
ON TABLE PCHOLD FORMAT PPTX
ON TABLE SET STYLE *
TYPE=REPORT, OBJECT=BOX, POSITION=(1 1), DIMENSION=(2 1),
BACKCOLOR=GREEN, BORDER-STYLE=NONE, $
ENDSTYLE
END
```

The output is shown in the following image.

In PDF format, a gray outline appears around the backcolor, as shown in the following image.

**Border Styles Supported**

Border styles, except 3D border styles such as ridged, groove, inset, and outset, are supported in PPTX and PDF formats.

```
TABLE FILE GGSALES
BY REGION NOPRINT
ON TABLE PCHOLD FORMAT PPTX
ON TABLE SET STYLE *
TYPE=REPORT, OBJECT=BOX, POSITION=(1 1), DIMENSION=(2 1), BORDER-
COLOR=GREEN, BORDER-STYLE=DASHED, $
ENDSTYLE
END
```

The output is shown in the following image.

**Note:** When OBJECT=BOX and BORDER-STYLE=DOUBLE is used with FORMAT PPTX and FORMAT PDF in StyleSheet syntax, a solid border, instead of a double border, is generated.

# Displaying Superscripts On Data, Heading, and Footing Lines

Superscript characters are supported as a text style in text objects using HTML markup tags. The superscript markup tag is now supported in data columns, headings, and footings in HTML, PDF, PPTX, and PS output formats. Superscript values can be defined within the data, added to virtual fields, or added to text strings displayed in headings and footings.

In order to activate the translation of the HTML markup tags, in the StyleSheet set MARKUP=ON for any report component that will display superscripts. Without this attribute, the markup tags will be treated as text, not tags.

**Note:** For XLSX output format, you can use superscript functionality in headings and footings using STYLE=SUPERSCRIPT syntax. STYLE=SUPERSCRIPT syntax is ignored for all other output formats.

# Display Superscripts on Report Data, Heading, and Footing Lines

If the tags are not within the data itself, create a field that contains the text to be used as a superscript. Also, turn markup tags on for the components that will display superscripts:

- In a DEFINE or COMPUTE command, define a field that contains the text to be displayed as a superscript.

  For a DEFINE FILE command, the syntax is:

  ```
  DEFINE FILE ...
  field/An = <sup>text</sup>;
  END
  ```

  For a COMPUTE command or a DEFINE in a Master File, the syntax is:

```
{COMPUTE|DEFINE} field/An = <sup>text</sup>;
```

where:

**n**

Is the length of the string defining the superscript, including the text to be used as the superscript and the opening and closing markup tags (<sup> and </sup>).

**text**

Is the text to be used as the superscript.

- In the StyleSheet, set MARKUP=ON for any report component that will display superscripts:

```
TYPE=component,MARKUP=ON ... ,$
```

where:

**component**

Is one of the following report components: DATA, HEADING, FOOTING, SUBHEAD, SUBFOOT, TABHEADING, TABFOOTING.

# Displaying Superscripts in Data and Footing Lines in PDF Output

The following request against the GGSALES data source defines two fields that will display as superscripts. SUP1 and SUP2 consist of the numbers 1 and 2, respectively. SUPCOPY consists of a copyright symbol. Note that the difference is the syntax as defined for a text value as opposed to a HEX value.

The COMPUTE command compares sales dollars to budgeted dollars. If the value calculated is less than a minimum defined, the superscript SUP1 is concatenated after the category name. If the value is greater, SUP2 is concatenated.

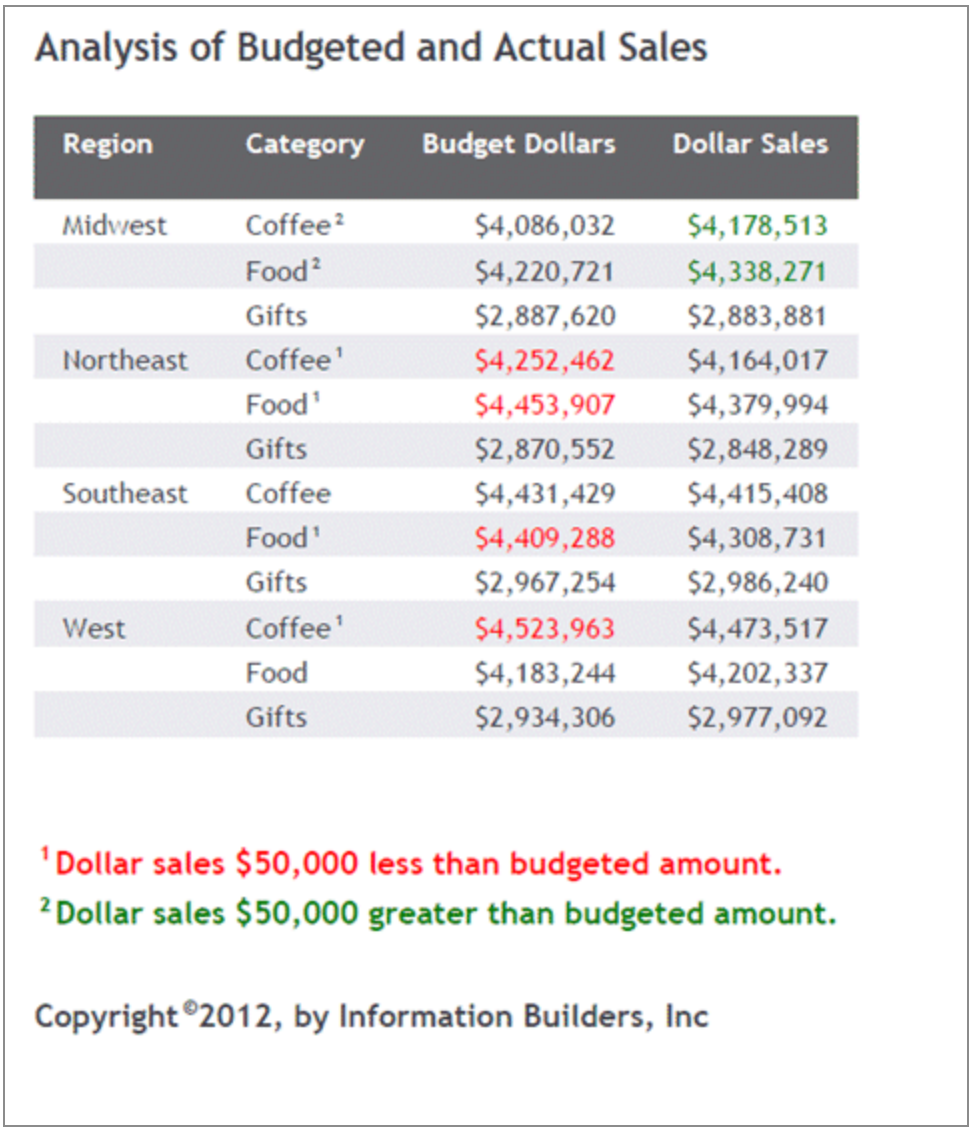
The superscript SUPCOPY is used to display the copyright symbol in the footing of the report.

The footing concatenates the superscript fields in front of their explanations.

In the StyleSheet, every component that will display a superscript has the attribute MARKUP=ON.

```
DEFINE FILE GGSALES
SUP1/A12= '<SUP>1</SUP>';
SUP2/A15= '<SUP>2</SUP>';
SUPCOPY/A20= '<SUP>'||HEXBYT(169,'A2')||'</SUP>';
END
TABLE FILE GGSALES
SUM
COMPUTE PROFIT/D12CM=DOLLARS-BUDDOLLARS; NOPRINT
COMPUTE SHOWCAT/A100=IF PROFIT LE -50000 THEN CATEGORY || SUP1
       ELSE IF PROFIT GT 50000 THEN CATEGORY || SUP2
           ELSE CATEGORY; AS Category
BUDDOLLARS/D12CM
DOLLARS/D12CM
BY REGION
BY CATEGORY NOPRINT
HEADING
"Analysis of Budgeted and Actual Sales"
FOOTING
""
"<SUP1 Dollar sales $50,000 less than budgeted amount."
"<SUP2 Dollar sales $50,000 greater than budgeted amount."
""
"Copyright<SUPCOPY 2012, by Information Builders, Inc "
ON TABLE SET HTMLCSS ON
ON TABLE SET SQUEEZE ON
ON TABLE SET PAGE-NUM OFF
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET STYLE *
INCLUDE=IBFS:/FILE/IBI_HTML_DIR/javaassist/intl/EN/ENIADefault_combine.sty,$
TYPE=DATA,MARKUP=ON,$
TYPE=DATA,COLUMN=N5, COLOR=RED, WHEN=PROFIT LT -50000,$
TYPE=DATA,COLUMN=N6, COLOR=GREEN, WHEN=PROFIT GT 50000,$
TYPE=HEADING, JUSTIFY=LEFT,$
TYPE=FOOTING, MARKUP=ON, JUSTIFY=LEFT,$
TYPE=FOOTING, LINE=2,JUSTIFY=LEFT, COLOR=RED,$
TYPE=FOOTING, LINE=3,JUSTIFY=LEFT, COLOR=GREEN,$
ENDSTYLE
END
```

The output is:



Analysis of Budgeted and Actual Sales

| Region | Category | Budget Dollars | Dollar Sales |
|---|---|---|---|
| Midwest | Coffee[2] | $4,086,032 | $4,178,513 |
| | Food[2] | $4,220,721 | $4,338,271 |
| | Gifts | $2,887,620 | $2,883,881 |
| Northeast | Coffee[1] | $4,252,462 | $4,164,017 |
| | Food[1] | $4,453,907 | $4,379,994 |
| | Gifts | $2,870,552 | $2,848,289 |
| Southeast | Coffee | $4,431,429 | $4,415,408 |
| | Food[1] | $4,409,288 | $4,308,731 |
| | Gifts | $2,967,254 | $2,986,240 |
| West | Coffee[1] | $4,523,963 | $4,473,517 |
| | Food | $4,183,244 | $4,202,337 |
| | Gifts | $2,934,306 | $2,977,092 |

[1] Dollar sales $50,000 less than budgeted amount.

[2] Dollar sales $50,000 greater than budgeted amount.

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# Displaying Superscripts in Heading and Footing Lines in XLSX Output

The following request against the GGSALES data source defines superscripts for trademark and copyright symbols in the heading and footing. COPYRIGHT consists of a copyright symbol. Note the STYLE = SUPERSCRIPT syntax in the heading and footing lines.

```
DEFINE FILE GGSALES
COPYRIGHT/A1= HEXBYT(169, 'A1');
```

```
END
TABLE FILE GGSALES
SUM UNITS BY CATEGORY
HEADING
"Company-Trademark<+0>TM"
" "
"Company-Copyright<+0><COPYRIGHT"
" "
FOOTING
"Company-Trademark<+0>TM"
" "
"Company-Copyright<+0><COPYRIGHT"
" "
ON TABLE PCHOLD FORMAT XLSX
ON TABLE SET STYLE *
TYPE=HEADING, WRAP=OFF, $
TYPE=HEADING, LINE=1, ITEM=2, OBJECT=TEXT,
STYLE='SUPERSCRIPT+BOLD+ITALIC', COLOR=RED, $
TYPE=HEADING, LINE=3, ITEM=1, OBJECT=FIELD, STYLE='SUPERSCRIPT+BOLD',
COLOR=GREEN, $
TYPE=FOOTING, LINE=1, ITEM=2, OBJECT=TEXT,
STYLE='SUPERSCRIPT+BOLD+ITALIC', COLOR=RED, $
TYPE=FOOTING, LINE=3, ITEM=1, OBJECT=FIELD, STYLE='SUPERSCRIPT+BOLD',
COLOR=GREEN, $
ENDSTYLE
END
```

The output is shown in the following image.

| | A | B |
|---|---|---|
| 1 | Company-Trademark™ | |
| 2 | | |
| 3 | Company-Copyright© | |
| 4 | | |
| 5 | Category | Unit Sales |
| 6 | Coffee | 1376266 |
| 7 | Food | 1384845 |
| 8 | Gifts | 927880 |
| 9 | Company-Trademark™ | |
| 10 | | |
| 11 | Company-Copyright© | |

# Adding Underlines and Skipped Lines

You can make a detailed tabular report easier to read by separating sections with blank lines or underlines.

You cannot add blank lines or underlines to an HTML report that displays a grid. You can add blank lines or underlines if you set the GRID attribute to OFF.

When inserting blank lines, the setting of the LINES parameter should be at least one less than the setting of the PAPER parameter to allow room for blanks after the display of data on a page.

A Financial Modeling Language (FML) report with columns of numbers includes, by default, an underline before a RECAP calculation for readability. In these types of reports, you can change the default underline from light to heavy (or single to double in a PDF report).

# Section Separation Features

| Feature | Description | Applies to |
|---|---|---|
| `SKIP-LINE*` | Adds a blank line. | HTML (requires GRID=OFF)<br>DHTML<br>PDF<br>PS<br>XLSX<br>EXL2K |
| `TYPE=SKIPLINE` | Formats a blank line. | DHTML<br>PDF<br>PS |
| `UNDER-LINE*` | Underlines a sort group. | HTML (requires GRID=OFF) |

| Feature | Description | Applies to |
|---|---|---|
| | | DHTML<br>PDF<br>PS |
| `TYPE=UNDERLINE` | Formats an underline. | DHTML<br>PDF<br>PS |
| `STYLE={+\|-}UNDERLINE*` | Adds an underline to a report component, or removes an underline from a report component other than a column title. | HTML<br>DHTML<br>PDF<br>PS<br>XLSX<br>EXL2K |
| `STYLE={+\|-}EXTUNDERLINE*` | Extends the underline to or removes the underline from the entire report column in a styled report. | DHTML<br>PDF<br>PS<br>PPT<br>PPTX |
| `BAR AS '{-\|=}'*` | Selects a single or double underline in an FML report.<br>For HTML, selects a light or heavy underline in an FML report. | HTML<br>DHTML<br>PDF<br>PS<br>XLSX<br>EXL2K |

* Not supported with border.

# Add a Blank Line

Use only one SKIP-LINE per report request.

```
display_command fieldname SKIP-LINE
```

or

```
{ON|BY} fieldname SKIP-LINE [WHEN expression;]
```

where:

**display_command**

Is a display command.

**fieldname**

Is the display or sort field after which a blank line is inserted.

SKIP-LINE used with a display field adds a blank line after every displayed line, in effect, double-spacing a report. Double-spacing is helpful when a report is reviewed, making it easy for the reader to write comments next to individual lines.

SKIP-LINE used with a sort field adds a blank line before every change in the value of that field. This is one of the only ON conditions that does not have to refer solely to a sort (BY) field.

**ON|BY**

Is a vertical sort phrase. The terms are synonymous.

**WHEN expression**

Specifies conditional blank lines in the display of a report as determined by a logical expression. See Using Expressions for details on expressions.

# Adding a Blank Line Between Sort Groups

This request inserts a blank line before every change in value of the sort field EMP_ID.

```
DEFINE FILE EMPLOYEE
INCREASE/D8.2M = .05*CURR_SAL;
CURR_SAL/D8.2M=CURR_SAL;
NEWSAL/D8.2M=CURR_SAL + INCREASE;
END

TABLE FILE EMPLOYEE
PRINT CURR_SAL OVER INCREASE OVER NEWSAL
BY LOWEST 4 EMP_ID BY LAST_NAME BY FIRST_NAME
ON EMP_ID SKIP-LINE
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT PDF
END
```

The data for each employee stands out and is easy to read:

| EMP_ID | LAST_NAME | FIRST_NAME | | |
|---|---|---|---|---|
| 071382660 | STEVENS | ALFRED | CURR_SAL | $11,000.00 |
| | | | INCREASE | $550.00 |
| | | | NEWSAL | $11,550.00 |
| 112847612 | SMITH | MARY | CURR_SAL | $13,200.00 |
| | | | INCREASE | $660.00 |
| | | | NEWSAL | $13,860.00 |
| 117593129 | JONES | DIANE | CURR_SAL | $18,480.00 |
| | | | INCREASE | $924.00 |
| | | | NEWSAL | $19,404.00 |
| 119265415 | SMITH | RICHARD | CURR_SAL | $9,500.00 |
| | | | INCREASE | $475.00 |
| | | | NEWSAL | $9,975.00 |

# Format a Blank Line

```
TYPE=SKIPLINE, attribute=value, $
```

where:

**attribute**

Is a valid StyleSheet attribute.

**value**

Is the value of the attribute.

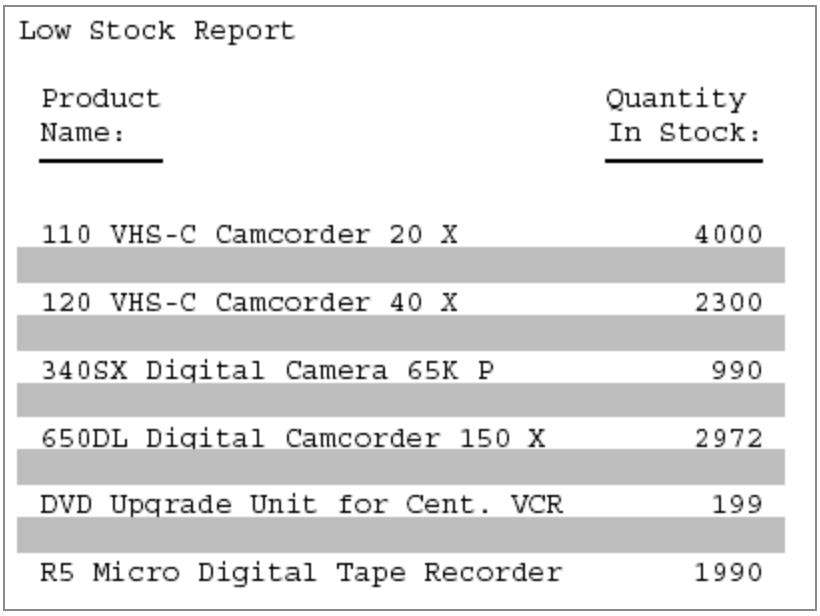
**Note:** This option is supported for PDF, PS, and HTML reports (when used in conjunction with internal cascading style sheets).

# Adding Color to Blank Lines

In this request, blank lines are formatted to display as silver in the output. The relevant StyleSheet declaration is highlighted in the request.

```
SET ONLINE-FMT=PDF
TABLE FILE CENTINV
HEADING
"Low Stock Report"
" "
SUM QTY_IN_STOCK
WHERE QTY_IN_STOCK LT 5000
BY PRODNAME
ON PRODNAME SKIP-LINE
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=SKIPLINE, BACKCOLOR=SILVER, $
ENDSTYLE
END
```

The report is:



```
Low Stock Report

 Product                                  Quantity
 Name:                                    In Stock:

 110 VHS-C Camcorder 20 X                      4000

 120 VHS-C Camcorder 40 X                      2300

 340SX Digital Camera 65K P                     990

 650DL Digital Camcorder 150 X                 2972

 DVD Upgrade Unit for Cent. VCR                 199

 R5 Micro Digital Tape Recorder                1990
```

# Underline a Sort Group

```
{ON|BY} fieldname UNDER-LINE [WHEN expression;]
```

where:

**ON|BY**

Is a vertical sort phrase. The terms are synonymous.

**fieldname**

Is the sort field to which the underline applies. UNDER-LINE adds an underline when the value of the sort field changes. An underline automatically displays after options such as RECAP or SUB-TOTAL but displays before page breaks.

**WHEN expression**

Specifies conditional underlines in the display of a report as determined by a logical expression. See Using Expressions for details on expressions.

# Underlining a Sort Group

This request adds an underline when the value of the sort field BANK_NAME changes. It sets the GRID attribute to OFF, as required by an HTML report.

```
TABLE FILE EMPLOYEE
PRINT EMP_ID AND BANK_ACCT AND LAST_NAME
BY BANK_NAME
ON BANK_NAME UNDER-LINE
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The data for each bank stands out and is easy to read:

| BANK NAME | EMP ID | BANK ACCT | LAST NAME |
|---|---|---|---|
| | 071382660 | | STEVENS |
| | 112847612 | | SMITH |
| | 119265415 | | SMITH |
| | 126724188 | | ROMANS |
| | 219984371 | | MCCOY |
| | 543729165 | | GREENSPAN |
| ASSOCIATED | 123764317 | 819000702 | IRVING |
| | 326179357 | 122850108 | BLACKWOOD |
| | 451123478 | 136500120 | MCKNIGHT |
| BANK ASSOCIATION | 818692173 | 163800144 | CROSS |
| BEST BANK | 119329144 | 160633 | BANNING |
| STATE | 117593129 | 40950036 | JONES |

# Format an Underline

```
TYPE=UNDERLINE ... COLOR={color|RGB} (r g b), $
```

where:

**UNDERLINE**

Denotes underlines generated by ON *fieldname* UNDER-LINE.

**COLOR**

Specifies the color of the underline. If the display or output device does not support colors, it substitutes shades of gray. The default value is black.

**color**

Is one of the supported color values. For a list of supported values, see Specifying Font Format in a Report.

**RGB**

Specifies the text color using a mixture of red, green, and blue.

**(r g b)**

Is the desired intensity of red, green, and blue, respectively. The values are on a scale of 0 to 255, where 0 is the least intense and 255 is the most intense.

Note that using the three-color components in equal intensities results in shades of gray.

**Note:** This option is supported for PDF, PS, and HTML reports (when used in conjunction with internal cascading style sheets).

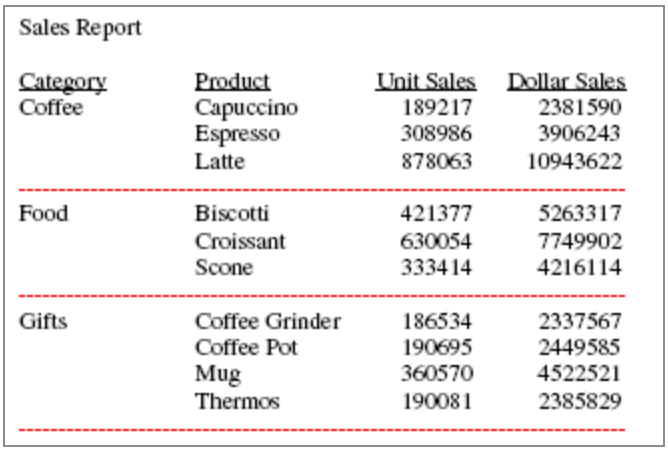
# Formatting a Sort Group Underline

This request uses UNDERLINE to change the default color of an underline from black to red.

```
SET ONLINE-FMT = PDF
TABLE FILE GGSALES
SUM UNITS DOLLARS
BY CATEGORY BY PRODUCT
HEADING
"Sales Report"
" "
ON CATEGORY UNDER-LINE
ON TABLE SET PAGE-NUM OFF
```

```
ON TABLE SET STYLE *
TYPE=UNDERLINE, COLOR=RED, $
ENDSTYLE
END
```

The result is an eye-catching separation between sort group values. The online PDF report is:



Sales Report

| Category | Product | Unit Sales | Dollar Sales |
|---|---|---|---|
| Coffee | Capuccino | 189217 | 2381590 |
| | Espresso | 308986 | 3906243 |
| | Latte | 878063 | 10943622 |
| Food | Biscotti | 421377 | 5263317 |
| | Croissant | 630054 | 7749902 |
| | Scone | 333414 | 4216114 |
| Gifts | Coffee Grinder | 186534 | 2337567 |
| | Coffee Pot | 190695 | 2449585 |
| | Mug | 360570 | 4522521 |
| | Thermos | 190081 | 2385829 |

# Add or Remove a Report Component Underline

```
TYPE=type, [subtype,] STYLE=[+|-]UNDERLINE, $
```

where:

**type**

Is the report component. For valid values, see Identifying a Report Component in a WebFOCUS StyleSheet.

**subtype**

Are additional attributes, such as COLUMN, ACROSS, or ITEM, needed to identify the report component. For valid values, see Identifying a Report Component in a WebFOCUS StyleSheet.

**+**

Adds an underline to the inherited text style or specifies a combination of text styles (for example, STYLE=BOLD+UNDERLINE). This is the default value.

**-**

Removes an underline from an inherited text style.

# Remove an Underline From a Column Title

This syntax applies to an HTML report with internal cascading style sheet.

```
TYPE=TITLE, [COLUMN=column,] STYLE=-UNDERLINE, $
```

where:

**COLUMN=column**

Specifies a column. For valid values, see Identifying a Report Component in a WebFOCUS StyleSheet.

# Adding Column Underlines and Removing Column Title Underlines

This request adds underlines to the values of the column CATEGORY and removes the default underlines from the column titles in an HTML report with internal cascading style sheet.

```
SET HTMLCSS = ON
TABLE FILE MOVIES
PRINT TITLE DIRECTOR
BY CATEGORY
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=TITLE, STYLE=-UNDERLINE, $
TYPE=REPORT, COLUMN=CATEGORY, STYLE=UNDERLINE, $
```

```
ENDSTYLE
END
```

The partial report is:

| CATEGORY | TITLE | DIRECTOR |
|---|---|---|
| ACTION | JAWS | SPIELBERG S. |
| | ROBOCOP | VERHOVEN P. |
| | TOTAL RECALL | VERHOVEN P. |
| | TOP GUN | SCOTT T. |
| | RAMBO III | MCDONALD P. |
| CHILDREN | SMURFS, THE | |
| | SHAGGY DOG, THE | BARTON C. |
| | SCOOBY-DOO-A DOG IN THE RUFF | |
| | ALICE IN WONDERLAND | GEROMINI |
| | SESAME STREET-BEDTIME STORIES AND SONGS | |
| | ROMPER ROOM-ASK MISS MOLLY | |
| | SLEEPING BEAUTY | DISNEY W. |
| | BAMBI | DISNEY W. |
| CLASSIC | EAST OF EDEN | KAZAN E. |
| | CITIZEN KANE | WELLES O. |
| | CYRANO DE BERGERAC | GORDON M. |
| | MARTY | MANN D. |
| | MALTESE FALCON, THE | HUSTON J. |
| | GONE WITH THE WIND | FLEMING V. |

# Extend an Underline to the Entire Report Column

By default, underlines for column titles on a report extend only from the beginning to the end of the column title text. You can extend the underline to the entire report column in styled report output using the EXTUNDERLINE option in your WebFOCUS StyleSheet. EXTUNDERLINE is an option of the STYLE attribute for the TITLE report component. It is supported for formats DHTML, PDF, PS, PPT, and PPTX.

```
 TYPE = TITLE, [COLUMN = colspec,] STYLE = [+|-]EXTUNDERLINE  ,$
```

where:

**colspec**

Is any valid column specification.

**+EXTUNDERLINE**

Adds the EXTUNDERLINE option to the inherited text style or specifies a combination of text styles (for example, STYLE=BOLD+UNDERLINE).

**-EXTUNDERLINE**

Removes the EXTUNDERLINE option from the inherited text style.

# Usage Notes for the EXTUNDERLINE Attribute

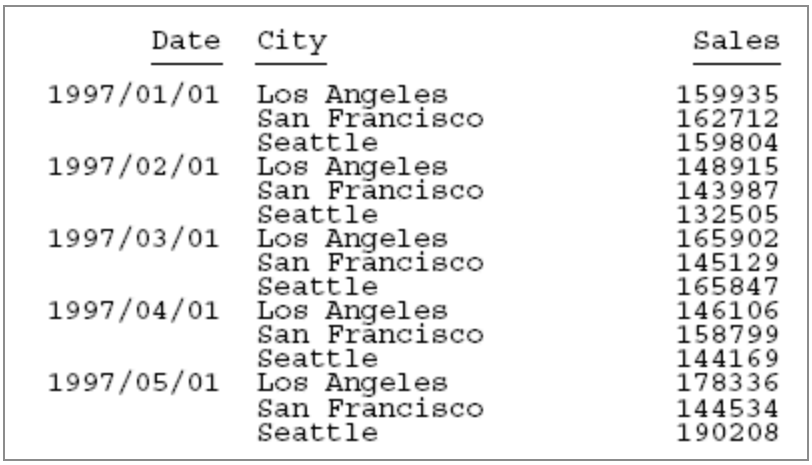
- HTML format is not supported because the browser calculates the column width and renders the report.
- GRID=ON and EXTUNDERLINE are mutually exclusive since the GRID line spans the width of the column. GRID overrides any styling specified for the column title underline.

# Extending an Underline to the Entire Report Column

The following request against the GGSALES data source sums dollar sales by city and by date:

```
DEFINE FILE GGSALES
YEAR/YY = DATE;
MONTH/M = DATE;
END
TABLE FILE GGSALES
SUM DOLLARS AS 'Sales'
BY DATE
BY CITY
WHERE YEAR EQ 1997
WHERE MONTH FROM 01 TO 05
WHERE CITY EQ 'Seattle' OR 'San Francisco' OR 'Los Angeles'
ON TABLE SET PAGE NOPAGE
ON TABLE PCHOLD FORMAT DHTML
END
```

The output shows that only the column titles are underlined:



| Date | City | Sales |
|---|---|---|
| 1997/01/01 | Los Angeles | 159935 |
| | San Francisco | 162712 |
| | Seattle | 159804 |
| 1997/02/01 | Los Angeles | 148915 |
| | San Francisco | 143987 |
| | Seattle | 132505 |
| 1997/03/01 | Los Angeles | 165902 |
| | San Francisco | 145129 |
| | Seattle | 165847 |
| 1997/04/01 | Los Angeles | 146106 |
| | San Francisco | 158799 |
| | Seattle | 144169 |
| 1997/05/01 | Los Angeles | 178336 |
| | San Francisco | 144534 |
| | Seattle | 190208 |

To underline entire columns, generate the output in a format that can be styled and use the EXTUNDERLINE option in the STYLE attribute for the TITLE component. For example, the following request creates DHTML output in which the column titles are in boldface and left justified, and the underline is extended to the entire report column:

```
DEFINE FILE GGSALES
YEAR/YY = DATE;
MONTH/M = DATE;
END
TABLE FILE GGSALES
SUM DOLLARS AS 'Sales'
BY DATE
BY CITY
WHERE YEAR EQ 1997
WHERE MONTH FROM 01 TO 05
WHERE CITY EQ 'Seattle' OR 'San Francisco' OR 'Los Angeles'
ON TABLE SET PAGE NOPAGE
ON TABLE PCHOLD FORMAT DHTML
ON TABLE SET STYLE *
TYPE=TITLE, STYLE= BOLD +EXTUNDERLINE, JUSTIFY=LEFT, $
ENDSTYLE
END
```

The output is:

| Date | City | Sales |
|---|---|---|
| 1997/01/01 | Los Angeles | 159935 |
| | San Francisco | 162712 |
| | Seattle | 159804 |
| 1997/02/01 | Los Angeles | 148915 |
| | San Francisco | 143987 |
| | Seattle | 132505 |
| 1997/03/01 | Los Angeles | 165902 |
| | San Francisco | 145129 |
| | Seattle | 165847 |
| 1997/04/01 | Los Angeles | 146106 |
| | San Francisco | 158799 |
| | Seattle | 144169 |
| 1997/05/01 | Los Angeles | 178336 |
| | San Francisco | 144534 |
| | Seattle | 190208 |

The following version of the request makes the EXTUNDERLINE and JUSTIFY=LEFT options the default for the TITLE component, then makes the Date column title bold and removes the extended underline from that column:

```
DEFINE FILE GGSALES
YEAR/YY = DATE;
MONTH/M = DATE;
END
TABLE FILE GGSALES
SUM DOLLARS AS 'Sales'
BY DATE
BY CITY
WHERE YEAR EQ 1997
WHERE MONTH FROM 01 TO 05
WHERE CITY EQ 'Seattle' OR 'San Francisco' OR 'Los Angeles'
ON TABLE SET PAGE NOPAGE
ON TABLE PCHOLD FORMAT DHTML
ON TABLE SET STYLE *
TYPE=TITLE,STYLE= EXTUNDERLINE, JUSTIFY=LEFT ,$
TYPE=TITLE,COLUMN= DATE, STYLE= -EXTUNDERLINE +BOLD ,$
ENDSTYLE
END
```

The output is:

| Date | City | Sales |
|---|---|---|
| 1997/01/01 | Los Angeles | 159935 |
| | San Francisco | 162712 |
| | Seattle | 159804 |
| 1997/02/01 | Los Angeles | 148915 |
| | San Francisco | 143987 |
| | Seattle | 132505 |
| 1997/03/01 | Los Angeles | 165902 |
| | San Francisco | 145129 |
| | Seattle | 165847 |
| 1997/04/01 | Los Angeles | 146106 |
| | San Francisco | 158799 |
| | Seattle | 144169 |
| 1997/05/01 | Los Angeles | 178336 |
| | San Francisco | 144534 |
| | Seattle | 190208 |

# Change Density of an Underline in a Financial Modeling Language (FML) Report

This syntax applies to an HTML report.

```
BAR [AS '{-|=}'] OVER
```

where:

**-**

Generates a light underline. Enclose the hyphen in single quotation marks. This is the default value.

**=**

Generates a heavy underline. Enclose the equal sign in single quotation marks.

# Changing the Default Underline in a Financial Modeling Language (FML) Report (HTML)

This request changes the default light underline to a heavy underline in an FML report.

```
TABLE FILE LEDGER
SUM AMOUNT FOR ACCOUNT
1010 AS 'CASH ON HAND'       OVER
1020 AS 'DEMAND DEPOSITS'    OVER
1030 AS 'TIME DEPOSITS'      OVER
BAR AS '='                   OVER
RECAP TOTCASH = R1 + R2 + R3;
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

A heavy underline separates total cash from the detail data, making it stand out:

| | AMOUNT |
|---|---|
| CASH ON HAND | 8,784 |
| DEMAND DEPOSITS | 4,494 |
| TIME DEPOSITS | 7,961 |
| TOTCASH | 21,239 |

# Changing the Default Underline in a Financial Modeling Language (FML) Report (PDF)

This request changes the default single underline in a PDF report to a double underline.

```
TABLE FILE LEDGER
SUM AMOUNT FOR ACCOUNT
1010 AS 'CASH ON HAND'       OVER
1020 AS 'DEMAND DEPOSITS'    OVER
1030 AS 'TIME DEPOSITS'      OVER
BAR AS '='                   OVER
RECAP TOTCASH = R1 + R2 + R3;
ON TABLE SET ONLINE-FMT PDF
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The output is:

| | AMOUNT |
|---|---|
| CASH ON HAND | 8,784 |
| DEMAND DEPOSITS | 4,494 |
| TIME DEPOSITS | 7,961 |
| TOTCASH | 21,239 |

# Removing Blank Lines From a Report

The DROPBLNKLINE parameter controls whether blank lines display in a WebFOCUS report. With the options provided, you can affect blank lines that are automatically generated in different locations within a report. You can choose to drop the blank lines around subtotals, subheadings and subfootings, as well as certain data lines that may be blank and appear as blank lines on the report output. Additionally, when using borders, you can select to remove blank lines inserted around the headings and footings. You can eliminate these blank lines from the report output using the SET DROPBLNKLINE options.

# Control Automatic Blank Lines on Report Output

```
SET DROPBLNKLINE={OFF|ON|BODY|HEADING|ALL}
```

or

```
ON TABLE SET DROPBLNKLINE {OFF|ON|BODY|HEADING|ALL}
```

where:

**OFF**

Inserts system-generated blank lines as well as empty data lines. OFF is the default value.

**ON|BODY**

Removes system-generated blank lines within the body of the report (for example, before and after subheads). In addition, certain data lines that may be blank and appear as blank lines on the report output will be removed from the output. BODY is a synonym for ON.

**HEADING**

Removes the blank lines between headings and titles and between the report body and the footing. Works in positioned formats (PDF, PS, DHTML, PPT, and PPTX) when a request has a border or backcolor StyleSheet attribute anywhere in the report.

**ALL**

Provides both the ON and HEADING behaviors.

# Usage Notes for SET DROPBLNKLINE=HEADING

- In the positioned report formats (PDF, PS, DHTML, PPT, and PPTX) with borders or backcolor, the system automatically generates a blank line below the heading and above the footing. This is done by design to make bordered lines work together. Generally, the rule is that each line is responsible for the border setting for its top and left border. Therefore, the bottom border of the heading is set by the top border of the row beneath it. To ensure that the bottom of the heading border is complete and does not interfere with the top of the column titles border, a blank filler line is automatically inserted. This filler line contains the defined bottom border of the heading as its top border. The same is true between the bottom of the data and the top of the footing.

  DROPBLNKLINE=HEADING removes the filler blank line by defining the height of the filler line to zero. This causes the bottom border of the heading to become the top border of the column titles. When backcolor is used without borders, this works well to close any blank gaps in color. However, WebFOCUS processing will not remediate between line styles, so using different border styles between different report elements may create some contention between the border styling definitions. To ensure that you have consistent border line styling between different report elements, use a single line style between the elements that present together in the report.

- DROPBLNKLINE=HEADING is not supported with:
  - Different border styles between the heading and the column titles or the data and the footing.
  - Reports that use the ACROSS sort phrase.
- Usage Considerations:
  - In some reports, FOOTING BOTTOM requires the space added by the system-generated blank line between the data and the footing in order to present the correct distance between the sections. In these instances, the top of the FOOTING BOTTOM may slightly overlap the bottom of the data grid. You can resolve this by adding a blank line to the top of your footing.
  - Applying borders for the entire report (TYPE=REPORT) is recommended to avoid certain known issues that arise when bordering report elements individually. In some reports that define backcolor and borders on only select elements, the backcolor applied to the heading is presenting with a different width than the backcolor applied to the column titles. This difference causes a ragged right edge to present between the headings and the titles. Additionally, if you can define the color of the border (BORDER-COLOR) for elements with backcolor to match the backcolor, the borders will blend into the backcolor and not be visible.

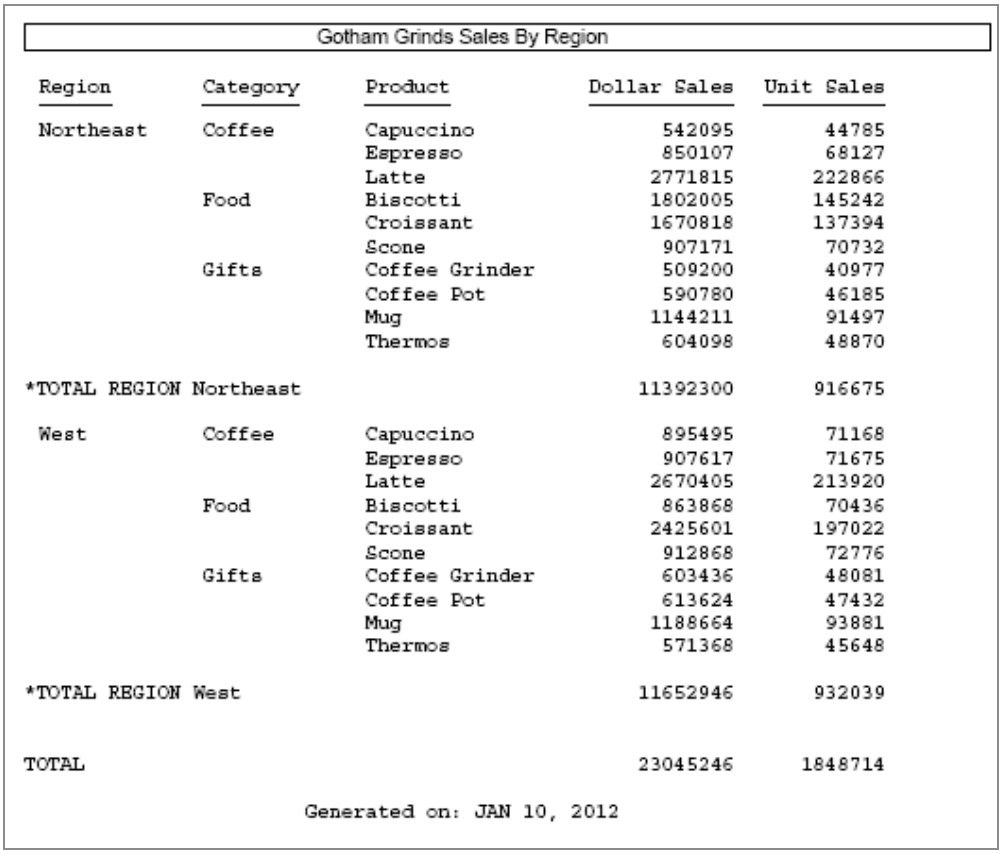
# Comparing DROPBLNKLINE Parameter Settings

The following request against the GGSALES data source has a heading, a footing, and a subtotal. Initially, DROPBLNKLINE is set to OFF.

```
TABLE FILE GGSALES
HEADING CENTER
"Gotham Grinds Sales By Region"
FOOTING CENTER
"Generated on: &DATETMDYY"
SUM DOLLARS UNITS
BY REGION SUBTOTAL
BY CATEGORY
BY PRODUCT
WHERE REGION EQ 'Northeast' OR 'West'
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET DROPBLNKLINE OFF
```

```
ON TABLE SET PAGE NOPAGE
ON TABLE SET STYLE *
SQUEEZE = ON,
FONT = ARIAL,
TYPE=HEADING, BORDER=LIGHT,
$
ENDSTYLE
END
```

The output has a blank line below the heading, above the footing, and above and below the subtotal lines and the grand total line.



Gotham Grinds Sales By Region

| Region | Category | Product | Dollar Sales | Unit Sales |
|---|---|---|---|---|
| Northeast | Coffee | Capuccino | 542095 | 44785 |
| | | Espresso | 850107 | 68127 |
| | | Latte | 2771815 | 222866 |
| | Food | Biscotti | 1802005 | 145242 |
| | | Croissant | 1670818 | 137394 |
| | | Scone | 907171 | 70732 |
| | Gifts | Coffee Grinder | 509200 | 40977 |
| | | Coffee Pot | 590780 | 46185 |
| | | Mug | 1144211 | 91497 |
| | | Thermos | 604098 | 48870 |
| *TOTAL REGION Northeast | | | 11392300 | 916675 |
| West | Coffee | Capuccino | 895495 | 71168 |
| | | Espresso | 907617 | 71675 |
| | | Latte | 2670405 | 213920 |
| | Food | Biscotti | 863868 | 70436 |
| | | Croissant | 2425601 | 197022 |
| | | Scone | 912868 | 72776 |
| | Gifts | Coffee Grinder | 603436 | 48081 |
| | | Coffee Pot | 613624 | 47432 |
| | | Mug | 1188664 | 93881 |
| | | Thermos | 571368 | 45648 |
| *TOTAL REGION West | | | 11652946 | 932039 |
| TOTAL | | | 23045246 | 1848714 |

Generated on: JAN 10, 2012

Changing the DROPBLNKLINE setting to HEADING produces the following output. The blank line below the heading and the blank line above the footing have been removed. The blank lines above and below the subtotal and grand total lines are still inserted.

Gotham Grinds Sales By Region

| Region | Category | Product | Dollar Sales | Unit Sales |
|---|---|---|---|---|
| Northeast | Coffee | Capuccino | 542095 | 44785 |
| | | Espresso | 850107 | 68127 |
| | | Latte | 2771815 | 222866 |
| | Food | Biscotti | 1802005 | 145242 |
| | | Croissant | 1670818 | 137394 |
| | | Scone | 907171 | 70732 |
| | Gifts | Coffee Grinder | 509200 | 40977 |
| | | Coffee Pot | 590780 | 46185 |
| | | Mug | 1144211 | 91497 |
| | | Thermos | 604098 | 48870 |
| *TOTAL REGION Northeast | | | 11392300 | 916675 |
| West | Coffee | Capuccino | 895495 | 71168 |
| | | Espresso | 907617 | 71675 |
| | | Latte | 2670405 | 213920 |
| | Food | Biscotti | 863868 | 70436 |
| | | Croissant | 2425601 | 197022 |
| | | Scone | 912868 | 72776 |
| | Gifts | Coffee Grinder | 603436 | 48081 |
| | | Coffee Pot | 613624 | 47432 |
| | | Mug | 1188664 | 93881 |
| | | Thermos | 571368 | 45648 |
| *TOTAL REGION West | | | 11652946 | 932039 |
| TOTAL | | | 23045246 | 1848714 |

Generated on: JAN 10, 2012

Changing the DROPBLNKLINE setting to ON (or BODY) produces the following output in which the blank lines above and below the subtotal and grand total lines have been removed, but the blank lines below the heading and above the footing are still inserted.

Gotham Grinds Sales By Region

| Region | Category | Product | Dollar Sales | Unit Sales |
|---|---|---|---|---|
| Northeast | Coffee | Capuccino | 542095 | 44785 |
| | | Espresso | 850107 | 68127 |
| | | Latte | 2771815 | 222866 |
| | Food | Biscotti | 1802005 | 145242 |
| | | Croissant | 1670818 | 137394 |
| | | Scone | 907171 | 70732 |
| | Gifts | Coffee Grinder | 509200 | 40977 |
| | | Coffee Pot | 590780 | 46185 |
| | | Mug | 1144211 | 91497 |
| | | Thermos | 604098 | 48870 |
| *TOTAL REGION Northeast | | | 11392300 | 916675 |
| West | Coffee | Capuccino | 895495 | 71168 |
| | | Espresso | 907617 | 71675 |
| | | Latte | 2670405 | 213920 |
| | Food | Biscotti | 863868 | 70436 |
| | | Croissant | 2425601 | 197022 |
| | | Scone | 912868 | 72776 |
| | Gifts | Coffee Grinder | 603436 | 48081 |
| | | Coffee Pot | 613624 | 47432 |
| | | Mug | 1188664 | 93881 |
| | | Thermos | 571368 | 45648 |
| *TOTAL REGION West | | | 11652946 | 932039 |
| TOTAL | | | 23045246 | 1848714 |

Generated on: JAN 10, 2012

Changing the DROPBLNKLINE setting to ALL produces the following output in which the blank lines around the subtotal and grandtotal lines as well as the blank lines below the heading and above the footing have been removed.

Gotham Grinds Sales By Region

| Region | Category | Product | Dollar Sales | Unit Sales |
|---|---|---|---|---|
| Northeast | Coffee | Capuccino | 542095 | 44785 |
| | | Espresso | 850107 | 68127 |
| | | Latte | 2771815 | 222866 |
| | Food | Biscotti | 1802005 | 145242 |
| | | Croissant | 1670818 | 137394 |
| | | Scone | 907171 | 70732 |
| | Gifts | Coffee Grinder | 509200 | 40977 |
| | | Coffee Pot | 590780 | 46185 |
| | | Mug | 1144211 | 91497 |
| | | Thermos | 604098 | 48870 |
| *TOTAL REGION Northeast | | | 11392300 | 916675 |
| West | Coffee | Capuccino | 895495 | 71168 |
| | | Espresso | 907617 | 71675 |
| | | Latte | 2670405 | 213920 |
| | Food | Biscotti | 863868 | 70436 |
| | | Croissant | 2425601 | 197022 |
| | | Scone | 912868 | 72776 |
| | Gifts | Coffee Grinder | 603436 | 48081 |
| | | Coffee Pot | 613624 | 47432 |
| | | Mug | 1188664 | 93881 |
| | | Thermos | 571368 | 45648 |
| *TOTAL REGION West | | | 11652946 | 932039 |
| TOTAL | | | 23045246 | 1848714 |

Generated on: JAN 10, 2012

# Adding an Image to a Report

With a StyleSheet you can add and position an image in a report. An image, such as a logo, gives corporate identity to a report, or provides visual appeal. You can add more than one image by creating multiple declarations.  StyleSheets and adding graphics" />

You can also add an image as background to a report. A background image is tiled or repeated, covering the entire area on which the report displays. An image attached to an entire report, or an image in a heading or footing, can appear with a background image.

Images must exist in a file format your browser supports, such as GIF (Graphic Interchange Format) or JPEG (Joint Photographic Experts Group, .jpg extension).

**Image support with WebFOCUS standard reporting formats**

- GIF and JPG images are supported in DHTML, HTML, PDF, PS, PPTX, XLSX, and PPT standard report formats. JPEG images are only supported with HTML standard report format. For other report formats, you can change the extension of the image name from .jpeg to .jpg, and the image will be displayed in the report output.
- PNG images are supported with DHTML, HTML, PPTX, and PDF standard report formats, while WebFOCUS generated SVG charts will display when inserted in HTML, PDF, and PS report formats.
- SVG images are supported only with HTML reports.
- Center and right justification of images in PDF reports is only reflected if the JUSTIFY=CENTER or JUSTIFY=RIGHT StyleSheet attribute is explicitly set on the image declaration attribute. By default, if JUSTIFY is not specified in the image declaration attribute, the image is left justified.
- Images are not supported in EXL2K standard report format.

**Image support in Compound Report syntax**

- GIF and JPG images are supported in DHTML, PDF, PPTX, and PPT Compound document syntax. JPEG images are not supported with any reporting format, but the images will work in these compound formats if the extension is changed from .jpeg to .jpg.
- PNG images are supported with DHTML, PPT, PPTX, and PDF Compound documents.
- SVG images are not supported with any WebFOCUS reporting format in Compound documents, while WebFOCUS generated SVG charts are supported only with PDF Compound documents.

- Images are not supported in EXL2K Compound documents.

**Note:** Images in report components in Compound documents are supported as described under *Image support with WebFOCUS standard reporting formats*. This section, *Image support in Compound Report syntax*, refers to images inserted in the PAGELAYOUT sections of the Compound syntax.

For PDF, HTML, and DHTML output against data sources that support the Binary Large Object (BLOB) data type (Microsoft SQL Server, DB2, Oracle, Informix, and PostgreSQL, using its BYTEA data type), an image can be stored in a BLOB field in the data source.

The image must reside on the WebFOCUS Reporting Server in a directory named on EDAPATH or APPPATH. If the file is not on the search path, supply the full path name.

**Note:** For JPEG files, currently only the .jpg extension is supported. The .jpeg extension is not supported.

# Browser and Device Support for Images in HTML Documents

Support for presenting images and graphs in HTML and DHTML formatted standard reports and compound documents is provided using an image embedding facility that allows 64-bit images to be encoded within a generated .htm file.

The SET HTMLEMBEDIMG command is designed to ensure that all WebFOCUS reports containing images can be accessed from any browser or device. By default, it is set to ON and embeds images within an .htm file.

```
SET HTMLEMBEDIMG={ON|OFF|AUTO}
```

where:

**ON**

Encodes images within the .htm file. ON is the default value, and overrides the HTMLARCHIVE settings.

**OFF**

Does not embed the image. If HTMLARCHIVE is set to ON, .mht files are generated.

**AUTO**

Determines which encoding algorithm to use, based on the browser of the client machine that submits the report request. Where the browser is identified as an Internet Explorer browser, or the browser is unknown (such as reports distributed by ReportCaster), WebFOCUS will continue to generate Web Archive files (.mht). For all other browsers, WebFOCUS will encode the image into an HTML file (.htm).

**Usage Notes for HTMLEMBEDIMG**

- When HTMLEMBEDIMG is set to ON (the default setting) and HTMLARCHIVE is set to ON, the HTMLEMBEDIMG ON setting overrides the HTMLARCHIVE ON setting, and an .htm file, in which the image is embedded, is generated.
- When HTMLEMBEDIMG is set to ON (the default setting) and HTMLARCHIVE is set to OFF, an .htm file is generated and the image is embedded.
- Setting HTMLEMBEDIMG to OFF and enabling HTMLARCHIVE generates an .mht file, which contain the encoded image.
- When HTMLEMBEDIMG and HTMLARCHIVE are set to OFF, an .html file is generated, but the image is not embedded.
- The encoding algorithm that uses 64-bit encoding supported for images less than 32K in size is supported by Internet Explorer 8. For Internet Explorer 8, Information Builders recommends continuing to use the .mht format generated by HTMLARCHIVE. In Internet Explorer 9 and higher and browsers other than Internet Explorer, the new algorithm is supported for images of any size. See the browser vendor information to confirm 64-bit encoding support.

# Image Attributes

| Attribute | Description |
|---|---|
| `IMAGE` | Adds an image. |
| `IMAGEALIGN` | Positions an image. This applies only to HTML reports. |

| Attribute | Description |
|---|---|
| POSITION | Positions an image. |
| IMAGEBREAK | Controls generation of a line break after an image. This applies only to HTML reports without internal cascading style sheets. |
| SIZE | Sizes an image. |
| ALT | Supplies a description of an image for compliance with Section accessibility (Workforce Investment Act of 1998). ALT only applies to HTML reports. |
| PRESERVERATIO | ON specifies that the aspect ratio (ratio of height to width) of the image should be preserved when it is scaled to the specified SIZE. This avoids distorting the appearance of the image. The image is scaled to the largest size possible within the bounds specified by SIZE for which the aspect ratio can be maintained. Supported for images in PDF and PostScript report output. |
| BACKIMAGE | Adds a background image. |

# Add an Image to an HTML Report

This syntax applies to an HTML report. For details on adding an image to a PDF, PS, or HTML report with an internal CSS, see Add an Image to a PDF, PS, or HTML Report With an Internal Cascading Style Sheet.

```
TYPE={REPORT|heading}, IMAGE={url|(column)} [,IMAGEALIGN=position]
     [,IMAGEBREAK={ON|OFF}] [,ALT='description'], $
```

where:  StyleSheets and graphics" /> StyleSheets" />

**REPORT**

Embeds an image in the body of a report. REPORT is the default value.

**Note:** The IMAGE=(column) option is not supported with TYPE=REPORT.

**heading**

Embeds an image in a heading or footing. Valid values are TABHEADING, TABFOOTING, HEADING, FOOTING, SUBHEAD, and SUBFOOT.

**url**

Is the URL for the image file. The image must exist in a separate file in a format that your browser supports, such as GIF or JPEG (.jpg). The file can be on your local web server, or on any server accessible from your network. For details, see Adding an Image to a Report.

**column**

Is an alphanumeric field in a request (for example, a display field or a BY field) whose value is a URL that points to an image file. Specify a value using the COLUMN attribute described in Identifying a Report Component in a WebFOCUS StyleSheet. Enclose *column* in parentheses.

This option enables you to add different images to a heading or footing, depending on the value of the field.

**IMAGEALIGN = position**

Is the position of the image.

**Note:** IMAGEALIGN is not supported with HTMLCSS=ON. With HTMLCSS=ON, you can position images within a heading or footing by using the POSITION attribute to specify a position relative to the upper-left corner of the heading or footing. For more information about the POSITION attribute, see Add an Image to a PDF, PS, or HTML Report With an Internal Cascading Style Sheet.

Valid values are:

`TOP` where the top right corner of the image aligns with heading or footing text. If the image is attached to the entire report, it appears on top of the report.

`MIDDLE` where the image appears in the middle of the heading or footing text. If the image is attached to the entire report, it appears in the middle of the report.

BOTTOM where the bottom right corner of the image aligns with heading or footing text. If the image is attached to the entire report, it appears at the bottom of the report.

LEFT where the image appears to the left of heading or footing text. If the image is attached to the entire report, it appears to the left of the report.

RIGHT where the image appears to the right of heading or footing text. If the image is attached to the entire report, it appears to the right of the report.

**IMAGEBREAK**

Controls generation of a line break after the image. Valid values are:

ON which generates a line break after the image so that an element following it (such as, report heading text) appears on the next line.

OFF which suppresses a line break after the image so that an element following it is on the same line. OFF is the default value.

**description**

Is a textual description of an image for compliance with Section 508 accessibility. Enclose the description in single quotation marks.

# Specifying a URL

The following guidelines are the same for IMAGE=*url* and IMAGE=(*column*) syntax. In the latter case, they apply to a URL stored in a data source field.

Specify a URL by:

- Supplying an absolute or relative address that points to an image file, for example:

```
TYPE=TABHEADING,IMAGE=http://www.tibco.com/images/logo_wf3.gif,$
TYPE=TABHEADING, IMAGE=/ibi_apps/ibi_html/ggdemo/gotham.gif,$
```

- Using the SET BASEURL parameter to establish a URL that is logically prefixed to all relative URLs in the request. With this feature, you can add an image by specifying just its file name in the IMAGE attribute. For example:

```
SET BASEURL=http://host:port/
.
```

```
.
.
TYPE=REPORT, IMAGE=gotham.gif,$
```

The following apply:

- A base URL must end with a slash (/).
- An absolute URL (which begins with http://) overrides a base URL.
- A URL is case-sensitive when referring to a UNIX server.
- If the name of the image file does not contain an extension, .GIF is used.

# Adding a GIF Image to an HTML Report Heading

This request adds the Gotham Grinds logo to a report heading. The logo is in a separate image file identified by a relative URL in the IMAGE attribute.

```
TABLE FILE GGORDER
ON TABLE SUBHEAD
"PRODUCTS ORDERED ON 08/01/96"
SUM QUANTITY AS 'Ordered Units' BY PRODUCT
WHERE PRODUCT EQ 'Coffee Grinder' OR 'Coffee Pot'
WHERE ORDER_DATE EQ '08/01/96'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=TABHEADING, IMAGE=/IBI_APPS/IBI_HTML/GGDEMO/GOTHAM.GIF,
IMAGEBREAK=ON, $
ENDSTYLE
END
```

IMAGEBREAK, set to ON, generates a line break between the logo and the heading text:

PRODUCTS ORDERED ON 08/01/96

| Product | Ordered Units |
|---|---|
| Coffee Grinder | 2493 |
| Coffee Pot | 3100 |

# Creating a Report Heading With an Embedded JPEG Image

```
TABLE FILE EMPLOYEE
ON TABLE SUBHEAD
"Employee Salary Information and Courses"
" "
" "
" "
" "
" "
" "
" "
" "
" "
PRINT CURR_SAL BY COURSE_NAME
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=TABHEADING, IMAGE=C:\IBI\APPS\IMAGES\Pencils.jpg,
POSITION=(.5 .5), SIZE=(.5 .5), $
ENDSTYLE
END
```

**Note:** The image used in this request is not distributed with WebFOCUS.

The output is:

EMPLOYEE SALARY INFORMATION AND SKILLS

| COURSE NAME | CURR SAL |
|---|---|
| ADVANCED TECHNIQUES | $18,480.00 |
| BASIC REPORT PREP DP MGRS | $27,062.00 |
| BASIC REPORT PREP FOR PROG | $13,200.00 |
| | $18,480.00 |
| BASIC REPORT PREP NON-PROG | $21,780.00 |
| BASIC RPT NON-DP MGRS | $9,500.00 |
| DECISION SUPPORT WORKSHOP | $21,780.00 |
| FILE DESC & MAINT NON-PROG | $21,780.00 |
| FILE DESCRPT & MAINT | $11,000.00 |
| | $13,200.00 |
| | $18,480.00 |
| | $16,100.00 |
| FOCUS INTERNALS | $18,480.00 |
| HOST LANGUAGE INTERFACE | $27,062.00 |
| TIMESHARING WORKSHOP | $21,780.00 |
| WHAT'S NEW IN FOCUS | $21,780.00 |

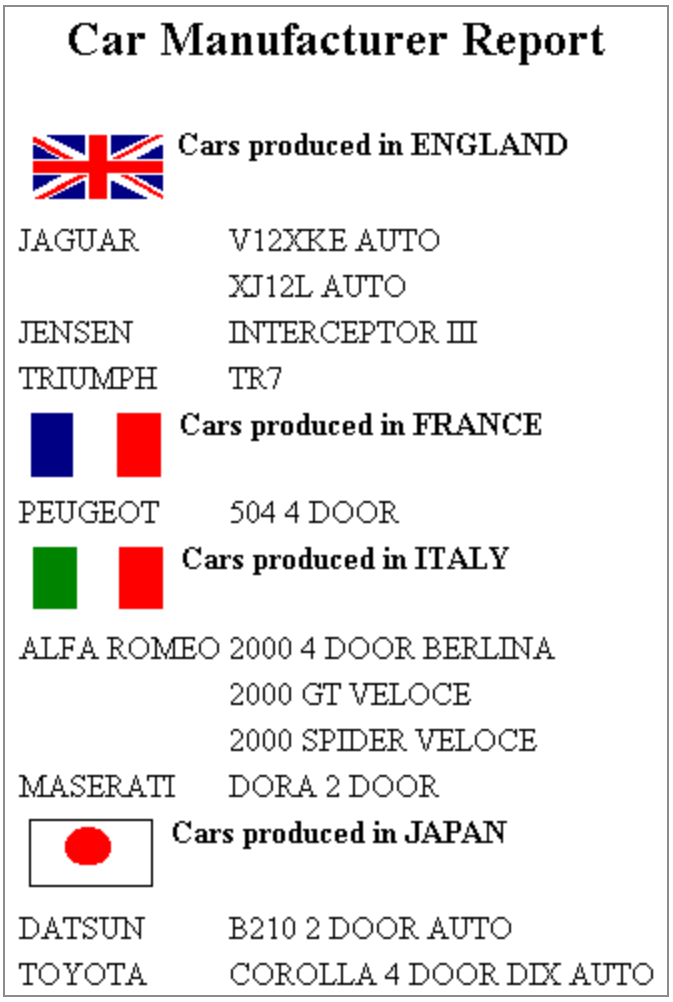
# Using a File Name in a Data Source Field in an HTML Report

The following illustrates how to embed an image in a SUBHEAD, and use a different image for each value of the BY field on which the SUBHEAD occurs.

```
DEFINE FILE CAR
FLAG/A12=
DECODE COUNTRY ( 'ENGLAND' 'uk' 'ITALY' 'italy'
   'FRANCE' 'france' 'JAPAN' 'japan' );
END
```

```
TABLE FILE CAR
PRINT FLAG NOPRINT AND MODEL AS '' BY COUNTRY NOPRINT AS '' BY CAR AS ''
WHERE COUNTRY EQ 'ENGLAND' OR 'FRANCE' OR 'ITALY' OR 'JAPAN'
ON COUNTRY SUBHEAD
"                    <+0>Cars produced in <ST.COUNTRY"
HEADING CENTER
"Car Manufacturer Report"
" "
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=SUBHEAD, IMAGE=(FLAG), $
TYPE=REPORT, GRID=OFF, $
TYPE=HEADING, SIZE=12, STYLE=BOLD, $
TYPE=SUBHEAD, STYLE=BOLD, $
ENDSTYLE
END
```

The output is:




# Supplying an Image Description Using the ALT Attribute

This request adds the Information Builders logo to a report footing. It uses the WebFOCUS StyleSheet ALT attribute to add descriptive text (Information Builders logo) that identifies the image.

```
TABLE FILE GGORDER
SUM QUANTITY AS 'Ordered Units'
BY PRODUCT
ON TABLE SUBHEAD
"PRODUCTS ORDERED"
FOOTING
```

```
" "
ON TABLE SET ACCESSHTML 508
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF,$
TYPE=FOOTING, IMAGE=/ibi_html/iblogo.gif, ALT='Information Builders
logo',$
ENDSTYLE
END
```

**Note:** If the request is located in the WebFOCUS repository and the WebFOCUS Client *Upload Images to be Embedded in Reports* Applications setting is selected, you need to either:

- Include the -MRNOEDIT command at the beginning of the line that references the IMAGE not located in the WebFOCUS repository.
- Include the fully qualified path in the IMAGE parameter.

The WebFOCUS Client *Upload Images to be Embedded in Reports* Applications setting specifies whether to upload Repository images to the WebFOCUS Reporting Server for embedding in reports and HTML pages. The default is to upload Repository images. For more information on the *Upload Images to be Embedded in Reports* Applications setting, see the *ibi™ WebFOCUS® Security and Administration* manual.

The -MRNOEDIT command instructs the WebFOCUS Client to not process the line of code. For more information on the -MRNOEDIT command, see the *ibi™ WebFOCUS® Business Intelligence Portal* manual.

When you run the request, the image displays below the report data, as shown in the following image.

PRODUCTS ORDERED

| Product | Ordered Units |
|---|---|
| Biscotti | 136045 |
| Coffee Grinder | 58703 |
| Coffee Pot | 61982 |
| Croissant | 204776 |
| French Roast | 285689 |
| Hazelnut | 100427 |
| Kona | 61498 |
| Mug | 117186 |
| Scone | 108359 |
| Thermos | 61778 |

When you hover the mouse over the image, the descriptive text displays in a box if your browser image loader is turned off or if the browser does not display images.

WebFOCUS generates the following HTML code for the image:

```
<IMG SRC="/ibi_html/ibilogo.gif"
ALT="Information Builders logo">
```

# Add a Background Image

This syntax applies to an HTML report.

```
[TYPE=REPORT,] BACKIMAGE=url, $
```

where:  StyleSheets and adding graphics" />

**TYPE=REPORT**

Applies the image to the entire report. Not required, as it is the default.

**url**

Is the URL of a GIF or JPEG file (.jpg). Specify a file on your local web server, or on a server accessible from your network.

The URL can be an absolute or relative address. See Adding an Image to a Report.

When specifying a GIF file, you can omit the file extension.

# Adding a Background Image

This request adds a background image to a report. The image file CALM_BKG.GIF resides in the relative address shown.

```
TABLE FILE GGSALES
SUM UNITS DOLLARS
BY CATEGORY BY PRODUCT
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, STYLE=BOLD, GRID=OFF, $
TYPE=REPORT, BACKIMAGE=/IBI_APPS/IBI_HTML/TEMPLATE/CALM_BKG.GIF, $
ENDSTYLE
END
```

The background is tiled across the report area:

| Category | Product | Unit Sales | Dollar Sales |
|---|---|---|---|
| Coffee | Capuccino | 189217 | 2381590 |
| | Espresso | 308986 | 3906243 |
| | Latte | 878063 | 10943622 |
| Food | Biscotti | 421377 | 5263317 |
| | Croissant | 630054 | 7749902 |
| | Scone | 333414 | 4216114 |
| Gifts | Coffee Grinder | 186534 | 2337567 |
| | Coffee Pot | 190695 | 2449585 |
| | Mug | 360570 | 4522521 |
| | Thermos | 190081 | 2385829 |

# Add an Image to a PDF, PS, or HTML Report With an Internal Cascading Style Sheet

This syntax applies to a PDF, PS, or HTML report with an internal cascading style sheet. The image can be in a separate file.  StyleSheets and graphics" />

A report with an Internal cascading style sheet is an HTML page with an HTML cascading style sheet (CSS) stored between the style tags within the HTML document.

```
TYPE={REPORT|heading}, IMAGE={url|file|(column)} [,BY=byfield]
[,POSITION=([+|-]x [+|-]y )] [,SIZE=(w h)] ,$
```

where:

**REPORT**

Embeds an image in the body of a report. The image appears in the background of the report. REPORT is the default value.

**heading**

Embeds an image in a heading or footing. Valid values are TABHEADING, TABFOOTING, FOOTING, HEADING, SUBHEAD, and SUBFOOT.

Provide sufficient blank space in the heading or footing so that the image does not overlap the heading or footing text. Also, you may want to place heading or footing text to the right of the image using spot markers or the POSITION attribute in the StyleSheet.

**url**

HTML report with internal cascading style sheet:

Is the absolute or relative address for the image file. The image must exist in a separate file in a format that your browser supports, such as GIF or JPEG (.jpg). The file can be on your local web server, or on any server accessible from your network. For details, see Adding an Image to a Report.

**file**

PDF or PS report:

Is the name of the image file. It must reside on the WebFOCUS Reporting Server in a directory named on EDAPATH or APPPATH. If the file is not on the search path, supply the full path name.

When specifying a GIF file, you can omit the file extension.

**column**

Is an alphanumeric field in the data source that contains the name of an image file. Use the COLUMN attribute described in Identifying a Report Component in a WebFOCUS StyleSheet. Enclose *column* in parentheses.

The field containing the file name or image must be a display field or BY field referenced in the request.

Note that the value of the field is interpreted exactly as if it were typed as the URL of the image in the StyleSheet. If you omit the suffix, .GIF is supplied by default. SET BASEURL can be useful for supplying the base URL of the images. If you do that, the value of the field does not have to include the complete URL.

This syntax is useful, for example, if you want to embed an image in a SUBHEAD, and you want a different image for each value of the BY field on which the SUBHEAD occurs.

**byfield**

Is the sort field that generated the subhead or subfoot.

**POSITION**

Is the starting position of the image.

**+|-**

Measures the horizontal or vertical distance from the upper-left corner of the report component in which the image is embedded.

**x**

Is the horizontal starting position of the image from the upper-left corner of the physical report page, expressed in the unit of measurement specified by the UNITS parameter.

Enclose the *x* and *y* values in parentheses. Do not include a comma between them.

**y**

Is the vertical starting position of the image from the upper-left corner of the physical report page, expressed in the unit of measurement specified by the UNITS parameter.

**SIZE**

Is the size of the image. By default, an image is added at its original size.

**w**

Is the width of the image, expressed in the unit of measurement specified by the UNITS parameter.

Enclose the *w* and *h* values in parentheses. Do not include a comma between them.

**h**

Is the height of the image, expressed in the unit of measurement specified by the UNITS parameter.

# Adding a GIF Image to an HTML Report With Internal Cascading Style Sheet

A URL locates the image file GOTHAM.GIF on a server named WEBSRVR1. The TYPE attribute adds the image to the report heading. POSITION places the image one-quarter inch horizontally and one-tenth inch vertically from the upper-left corner of the report page. The image is one inch wide and one inch high as specified by SIZE.

```
SET HTMLCSS = ON
TABLE FILE GGSALES
SUM UNITS BY PRODUCT
ON TABLE SUBHEAD
"REPORT ON UNITS SOLD"
" "
" "
" "
" "
" "
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=TABHEADING, IMAGE=HTTP://WEBSRVR1/IBI_APPS/IBI_
HTML/GGDEMO/GOTHAM.GIF,
     POSITION=(.25 .10), SIZE=(1 1), $
ENDSTYLE
END
```

The company logo is positioned and sized in the report heading:

REPORT ON UNITS SOLD

| Product | Unit Sales |
|---|---|
| Biscotti | 421377 |
| Capuccino | 189217 |
| Coffee Grinder | 186534 |
| Coffee Pot | 190695 |
| Croissant | 630054 |
| Espresso | 308986 |
| Latte | 878063 |
| Mug | 360570 |
| Scone | 333414 |
| Thermos | 190081 |

# Adding a GIF Image to a PDF Report

The image file for this example is GOTHAM.GIF. The POSITION attribute places the image one-quarter inch horizontally and one-quarter vertically from the upper-left corner of the report page. The image is one-half inch wide and one-half inch high as specified by SIZE.

```
SET ONLINE-FMT = PDF
TABLE FILE GGSALES
SUM UNITS BY PRODUCT
ON TABLE SUBHEAD
"Report on Units Sold"
" "
" "
" "
" "
" "
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=TABHEADING, IMAGE=GOTHAM.GIF, POSITION=(.25 .25), SIZE=(.5 .5), $
ENDSTYLE
END
```

The report is:

Report on Units Sold

| Product | Unit Sales |
|---|---|
| Biscotti | 421377 |
| Capuccino | 189217 |
| Coffee Grinder | 186534 |
| Coffee Pot | 190695 |
| Croissant | 630054 |
| Espresso | 308986 |
| Latte | 878063 |
| Mug | 360570 |
| Scone | 333414 |
| Thermos | 190081 |

# Adding a PNG Image to a PDF Report

The image file for this sample is Ibi_logo.png. The POSITION attribute places the image to the upper-left corner of the report page. The image is one inch wide and half an inch high, as specified by SIZE.

```
SET HTMLCSS = ON
TABLE FILE GGSALES
SUM UNITS BY PRODUCT
ON TABLE SUBHEAD
"REPORT ON UNITS SOLD"
" "
" "
" "
" "
" "
ON TABLE SET PAGE-NUM OFF
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=TABHEADING, IMAGE=Ibi_logo.png, POSITION=(0 .30), SIZE=(1 0.5), $
ENDSTYLE
END
```

The report is:

REPORT ON UNITS SOLD

| Product | Unit Sales |
|---|---|
| Biscotti | 421377 |
| Capuccino | 189217 |
| Coffee Grinder | 186534 |
| Coffee Pot | 190695 |
| Croissant | 630054 |
| Espresso | 308986 |
| Latte | 878063 |
| Mug | 360570 |
| Scone | 333414 |
| Thermos | 190081 |

# Add an Image From a BLOB Field to a PDF, DHTML, or HTML Report

For PDF, HTML, and DHTML output against data sources that support the Binary Large Object (BLOB) data type (Microsoft SQL Server, DB2, Oracle, Informix, and PostgreSQL using its BYTEA data type), an image can be stored in a BLOB field in the data source. StyleSheets and graphics" />

WebFOCUS StyleSheets used to produce report output in PDF, HTML, or DHTML format can access a BLOB field as an image source when an instance of the BLOB field contains an exact binary copy of a GIF or JPG image. HTML and DHTML reports also support PNG images. Images of different formats (GIF, JPG, PNG) can be mixed within the same BLOB field. WebFOCUS can determine the format from the header of the image. The image can be inserted in report columns, headings, footings, subheadings, and subfootings.

The BLOB field must be referenced in a PRINT or LIST command in the request (aggregation is not supported). Reports containing BLOB images are supported as components in Coordinated Compound Reports.

With the following SET commands, BLOB images will work for both HTML and DHTML in all browsers:

- SET HTMLEMBEDIMG=AUTO.
- SET HTMLARCHIVE=ON (required to support Internet Explorer with images larger than 32K).

- SET BASEURL='' (required to make embedded images work as it overrides the default setting sent from the WebFOCUS Client).
- SET HTMLCSS=ON (required for image positioning in subheads in HTML reports). Setting HTMLCSS=ON creates an HTML report with an Internal cascading style sheet. A report with an Internal cascading style sheet is an HTML page with an HTML cascading style sheet (CSS) stored between the style tags within the HTML document.

```
TYPE={REPORT|heading}, IMAGE={url|file|(column)} [,BY=byfield]
[,POSITION=([+|-]x [+|-]y )] [,SIZE=(w h)] [,PRESERVERATIO={ON|OFF}],$
```

```
TYPE=DATA, COLUMN=imagefield, IMAGE=(imagefield), SIZE=(wh)
[,PRESERVERATIO={ON|OFF}] ,$
```

where:

**REPORT**

Embeds an image in the body of a report. The image appears in the background of the report. REPORT is the default value (not supported for images stored in BLOB fields, which are supported for PDF output).

**heading**

Embeds an image in a heading or footing. Valid values are FOOTING, HEADING, SUBHEAD, and SUBFOOT.

If the image is to be embedded in a heading, subheading, footing, or subfooting rather than a column, the StyleSheet declaration is responsible for placing the image in the heading, subheading, footing, or subfooting. To make the BLOB image accessible to the StyleSheet, the BLOB field must be referenced in the PRINT or LIST command with the NOPRINT option. Do not reference the BLOB field name in the heading or footing itself.

Provide sufficient blank space in the heading or footing so that the image does not overlap the heading or footing text. Also, you may want to place heading or footing text to the right of the image using spot markers or the POSITION attribute in the StyleSheet.

**file**

Is the name of the image file. It must reside on the WebFOCUSWebFOCUS Reporting Server in a directory named on EDAPATH or APPPATH. If the file is not on the search path, supply the full path name.

When specifying a GIF file, you can omit the file extension.

**column**

Is a BLOB field in the data source that contains an exact binary copy of a GIF or JPG image. HTML and DHTML formats also support images in PNG format. Images of different formats (GIF, JPG, PNG) can be mixed within the same BLOB field. WebFOCUS can determine the format from the header of the image. The image can be inserted in report columns, headings, footings, subheadings and subfootings. Use the COLUMN attribute described in Identifying a Report Component in a WebFOCUS StyleSheet. Enclose *column* in parentheses.

The field containing the file name or image must be a display field or BY field referenced in the request.

**byfield**

Is the sort field that generated the subhead or subfoot.

**imagefield**

Is any valid column reference for the BLOB field that contains the image. Note that the BLOB field must be referenced in a PRINT or LIST command in the request.

If omitted, the default size is 1 inch by 1 inch. The width of the column and the spacing between the lines is automatically adjusted to accommodate the image.

**POSITION**

Is the starting position of the image.

**+|-**

Measures the horizontal or vertical distance from the upper-left corner of the report component in which the image is embedded.

**x**

Is the horizontal starting position of the image from the upper-left corner of the physical report page, expressed in the unit of measurement specified by the UNITS parameter.

Enclose the *x* and *y* values in parentheses. Do not include a comma between them.

**y**

Is the vertical starting position of the image from the upper-left corner of the physical report page, expressed in the unit of measurement specified by the UNITS parameter.

**SIZE**

Is the size of the image. By default, an image is added at its original size. Note that images stored in BLOB fields are supported only for PDF, HTML, and DHTML output.

**w**

Is the width of the image, expressed in the unit of measurement specified by the UNITS parameter.

Enclose the *w* and *h* values in parentheses. Do not include a comma between them.

**h**

Is the height of the image, expressed in the unit of measurement specified by the UNITS parameter.

If SIZE is omitted, the original dimensions of the image are used (any GIF, JPG, or PNG image has an original, unscaled size based on the dimensions of its bitmap).

**[PRESERVERATIO={ON|OFF}]**

Not supported for images in PNG format. PRESERVERATIO=ON specifies that the aspect ratio (ratio of height to width) of the image should be preserved when it is scaled to the specified SIZE. This avoids distorting the appearance of the image. The image is scaled to the largest size possible within the bounds specified by SIZE for which the aspect ratio can be maintained. Supported for PDF and PS output. OFF does not maintain the aspect ratio. OFF is the default value.

The actual size of an image stored in a BLOB field may vary from image to image, and scaling the images to a designated size allows them to better fit into a columnar report. **Note:** Images stored in a BLOB field are supported only for PDF, HTML, and DHTML output.

# Inserting an Image From a BLOB Field Into a Report Column

The Microsoft SQL Server data source named retaildetail contains product information for a sports clothing and shoe retailer. The Microsoft SQL Server data source named retailimage has the same product ID field as retaildetail and has an image of each product stored in a field named **prodimage** whose data type is BLOB.

The following Master File describes the Microsoft SQL Server data source named retaildetail.

```
FILENAME=RETAILDETAIL, SUFFIX=SQLMSS  , $
  SEGMENT=SEG01, SEGTYPE=S0, $
    FIELDNAME=FOCLIST, ALIAS=FOCLIST, USAGE=I5, ACTUAL=I4, $
    FIELDNAME=PRODUCTID, ALIAS=ProductId, USAGE=A5, ACTUAL=A5,
      MISSING=ON, $
    FIELDNAME=DEPARTMENT, ALIAS=Department, USAGE=A10, ACTUAL=A10,
      MISSING=ON, $
    FIELDNAME=CATEGORY, ALIAS=Category, USAGE=A30, ACTUAL=A30,
      MISSING=ON, $
    FIELDNAME=SPORTS, ALIAS=Sports, USAGE=A30, ACTUAL=A30,
      MISSING=ON, $
    FIELDNAME=GENDER, ALIAS=Gender, USAGE=A10, ACTUAL=A10,
      MISSING=ON, $
    FIELDNAME=BRAND, ALIAS=Brand, USAGE=A25, ACTUAL=A25,
      MISSING=ON, $
    FIELDNAME=STYLE, ALIAS=Style, USAGE=A25, ACTUAL=A25,
      MISSING=ON, $
    FIELDNAME=COLOR, ALIAS=Color, USAGE=A25, ACTUAL=A25,
      MISSING=ON, $
    FIELDNAME=NAME, ALIAS=Name, USAGE=A80, ACTUAL=A80,
      MISSING=ON, $
    FIELDNAME=DESCRIPTION, ALIAS=Description, USAGE=A1000, ACTUAL=A1000,
      MISSING=ON, $
    FIELDNAME=PRICE, ALIAS=Price, USAGE=D7.2, ACTUAL=D8,
      MISSING=ON, $
```

The following Master File describes the Microsoft SQL Server data source named retailimage, which has the same product ID field as retaildetail and has an image of each product stored in a field named **prodimage** whose data type is BLOB.

```
FILENAME=RETAILIMAGE, SUFFIX=SQLMSS  , $
  SEGMENT=RETAILIMAGE, SEGTYPE=S0, $
    FIELDNAME=PRODUCTID, ALIAS=PRODUCTID, USAGE=A5, ACTUAL=A5, $
    FIELDNAME=PRODIMAGE, ALIAS=F02BLOB50000, USAGE=BLOB, ACTUAL=BLOB,
      MISSING=ON, $
```

The following request joins the two data sources and prints product names and prices with the corresponding image. The output is generated in DHTML format.

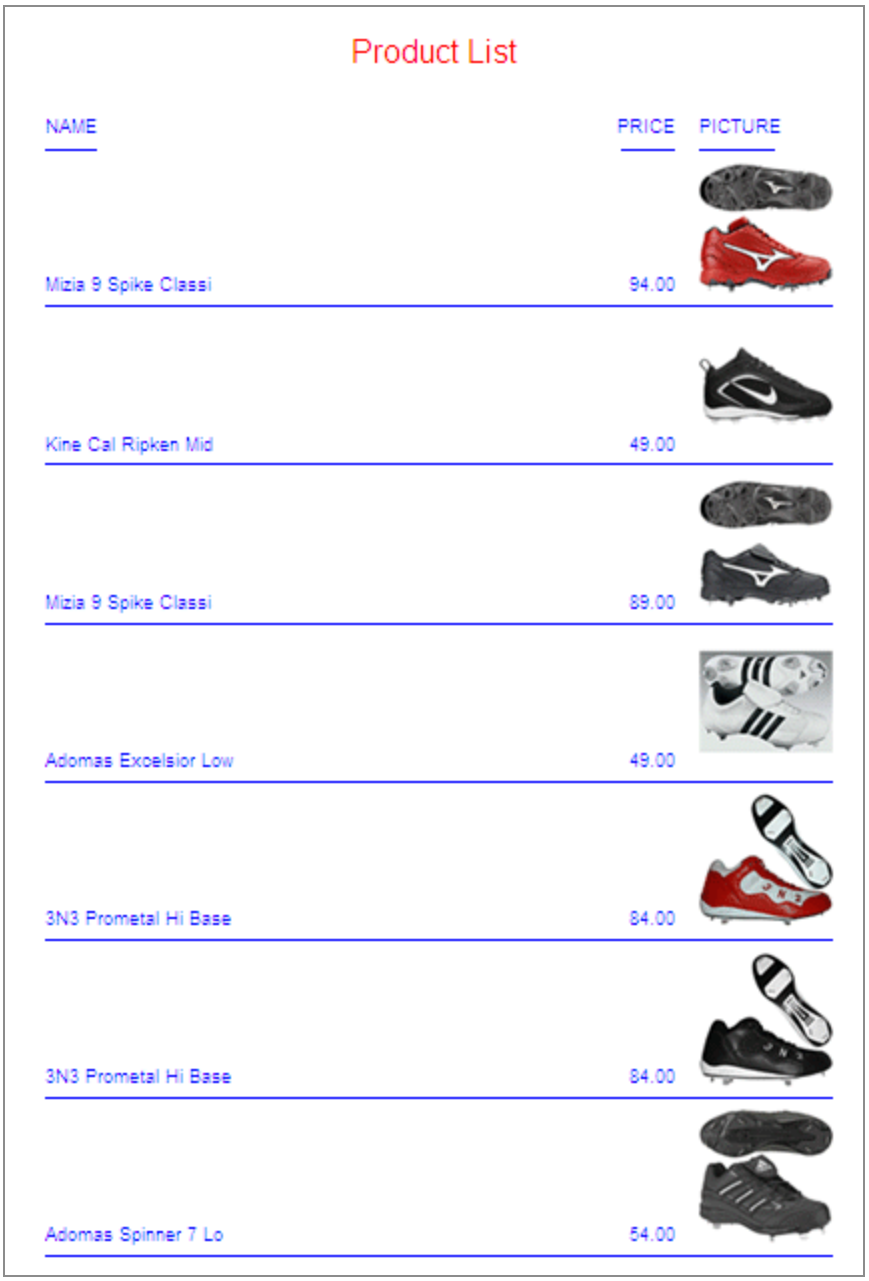
```
-* Rel 7705 DHTML and HTML supports including Image stored in
-* BLOB field in report column, heading, footing, subhead, or
```

```
-* subfoot
-* Rel 769 supports PDF format
JOIN PRODUCTID IN RETAILDETAIL TO PRODUCTID IN RETAILIMAGE
TABLE FILE RETAILDETAIL
HEADING CENTER
"Product List"
" "
PRINT NAME/A20 PRICE PRODIMAGE AS 'PICTURE'
BY PRODUCTID NOPRINT
BY NAME NOPRINT
ON NAME UNDER-LINE
ON TABLE SET PAGE NOPAGE
-*************************
-* Lines between asterisk lines required for BLOB image support
-* for HTML and DHTML formats.
ON TABLE SET HTMLEMBEDIMG AUTO
-* Required to support IE8 with images larger than 32K
ON TABLE SET HTMLARCHIVE ON
-*Required for image positioning in subheads in HTML reports
ON TABLE SET HTMLCSS ON
-*************************
ON TABLE PCHOLD FORMAT DHTML
ON TABLE SET STYLE *
TYPE=REPORT,COLOR=BLUE,FONT=ARIAL, GRID=OFF,$
TYPE=HEADING, SIZE = 18, COLOR=RED,$
TYPE=DATA,COLUMN=PRODIMAGE,IMAGE=(PRODIMAGE),SIZE=(1 1),$
ENDSTYLE
END
```

The image is placed in the report column using the following StyleSheet declaration, which names the image field, and establishes the size and position in the column for the image.

```
TYPE=DATA,COLUMN=PRODIMAGE,IMAGE=(PRODIMAGE),SIZE=(1 1),$
```

The partial output shows that DHTML format preserves the specified spacing.

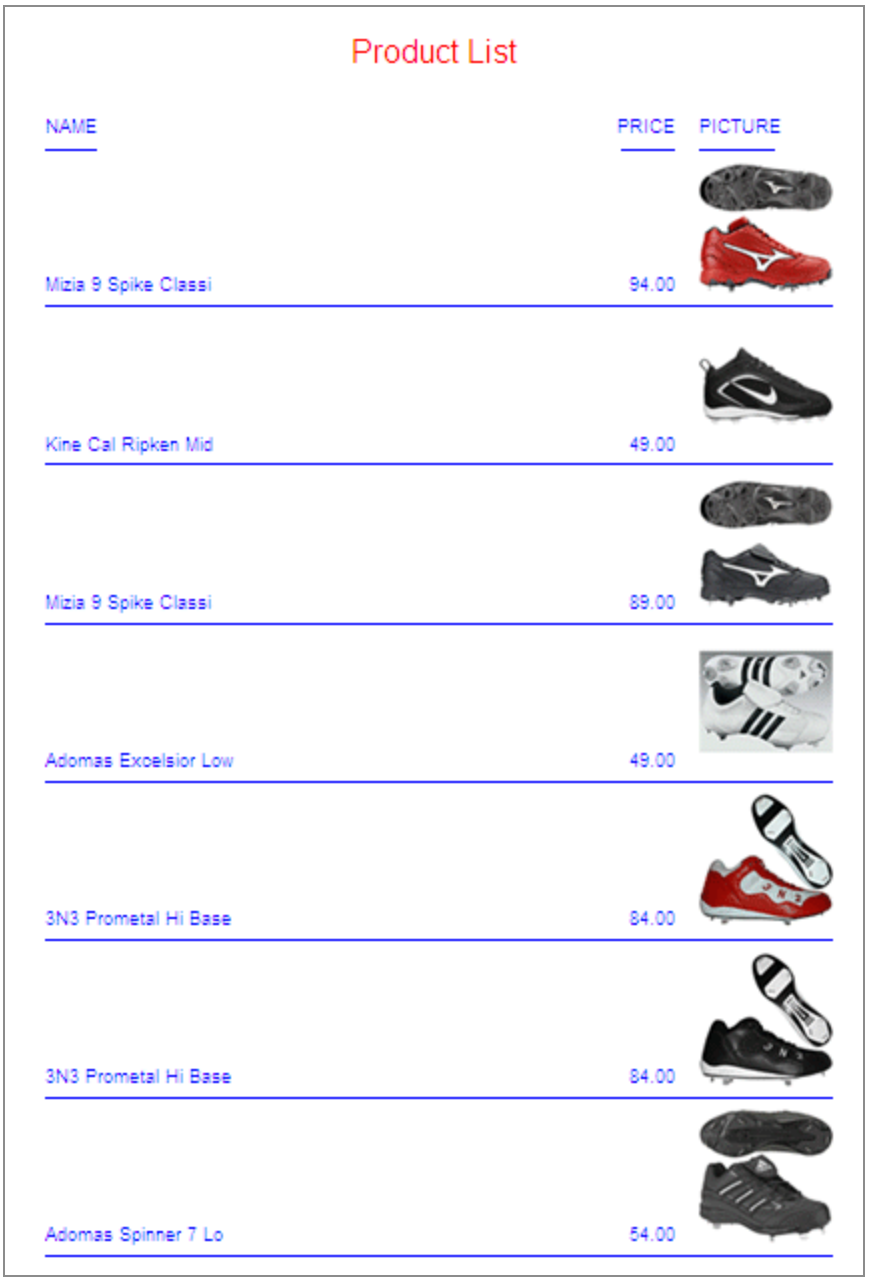



The following request generates the output in HTML format.

```
-* Rel 7705 DHTML and HTML supports including Image stored in
-* BLOB field in report column, heading, footing, subhead, or
-* subfoot
-* Rel 769 supports PDF format
JOIN PRODUCTID IN RETAILDETAIL TO PRODUCTID IN RETAILIMAGE
TABLE FILE RETAILDETAIL
```

```
HEADING CENTER
"Product List"
" "
PRINT NAME/A20 PRICE PRODIMAGE AS 'PICTURE'
BY PRODUCTID NOPRINT
BY NAME NOPRINT
ON NAME UNDER-LINE
ON TABLE SET PAGE NOPAGE
-*************************
-* Lines between asterisk lines required for BLOB image support
-* for HTML and DHTML formats.
ON TABLE SET HTMLEMBEDIMG AUTO
-* Required to support IE8 with images larger than 32K
ON TABLE SET HTMLARCHIVE ON
-*Required for image positioning in subheads in HTML reports
ON TABLE SET HTMLCSS ON
-*************************
ON TABLE PCHOLD FORMAT HTML
ON TABLE SET STYLE *
TYPE=REPORT,COLOR=BLUE, GRID=OFF, FONT=ARIAL,$
TYPE=HEADING, SIZE = 18, COLOR=RED,$
TYPE=DATA,COLUMN=PRODIMAGE,IMAGE=(PRODIMAGE),SIZE=(1 1),$
ENDSTYLE
END
```

The partial output shows that the spacing is different because the browser removes blank spaces for HTML report output.

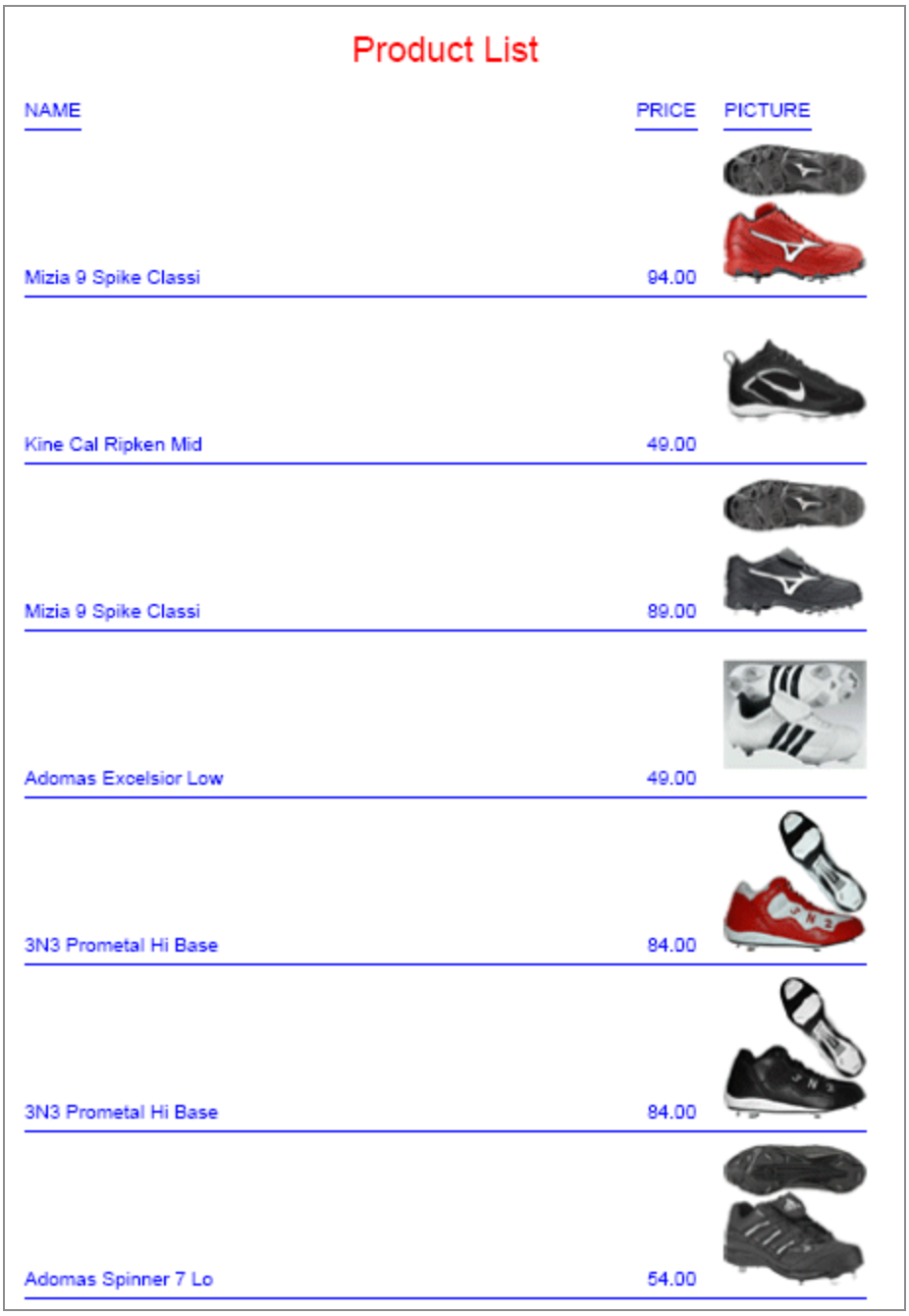



The following request generates the report output in PDF format.

```
-* Rel 7705 DHTML and HTML supports including Image stored in
-* BLOB field in report column, heading, footing, subhead, or
-* subfoot
-* Rel 769 supports PDF format
JOIN PRODUCTID IN RETAILDETAIL TO PRODUCTID IN RETAILIMAGE
TABLE FILE RETAILDETAIL
```

```
HEADING CENTER
"Product List"
" "
PRINT NAME/A20 PRICE PRODIMAGE AS 'PICTURE'
BY PRODUCTID NOPRINT
BY NAME NOPRINT
ON NAME UNDER-LINE
ON TABLE SET PAGE NOPAGE
-*************************
-* Lines between asterisk lines required for BLOB image support
-* for HTML and DHTML formats.
ON TABLE SET HTMLEMBEDIMG AUTO
-* Required to support IE8 with images larger than 32K
ON TABLE SET HTMLARCHIVE ON
-*Required for image positioning in subheads in HTML reports
ON TABLE SET HTMLCSS ON
-*************************
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT,COLOR=BLUE, GRID=OFF,$
TYPE=HEADING, SIZE = 18, FONT = ARIAL, COLOR=RED,$
TYPE=DATA,COLUMN=PRODIMAGE,IMAGE=(PRODIMAGE),SIZE=(1 1),$
ENDSTYLE
END
```

The PDF partial output preserves specified spacing providing results similar to DHTML output.




# Inserting an Image From a BLOB Field Into a Subheading

The Microsoft SQL Server data source named retaildetail contains product information for a sports clothing and shoe retailer. The Microsoft SQL Server data source named retailimage

has the same product ID field as retaildetail and has an image of each product stored in a field named **prodimage** whose data type is BLOB.

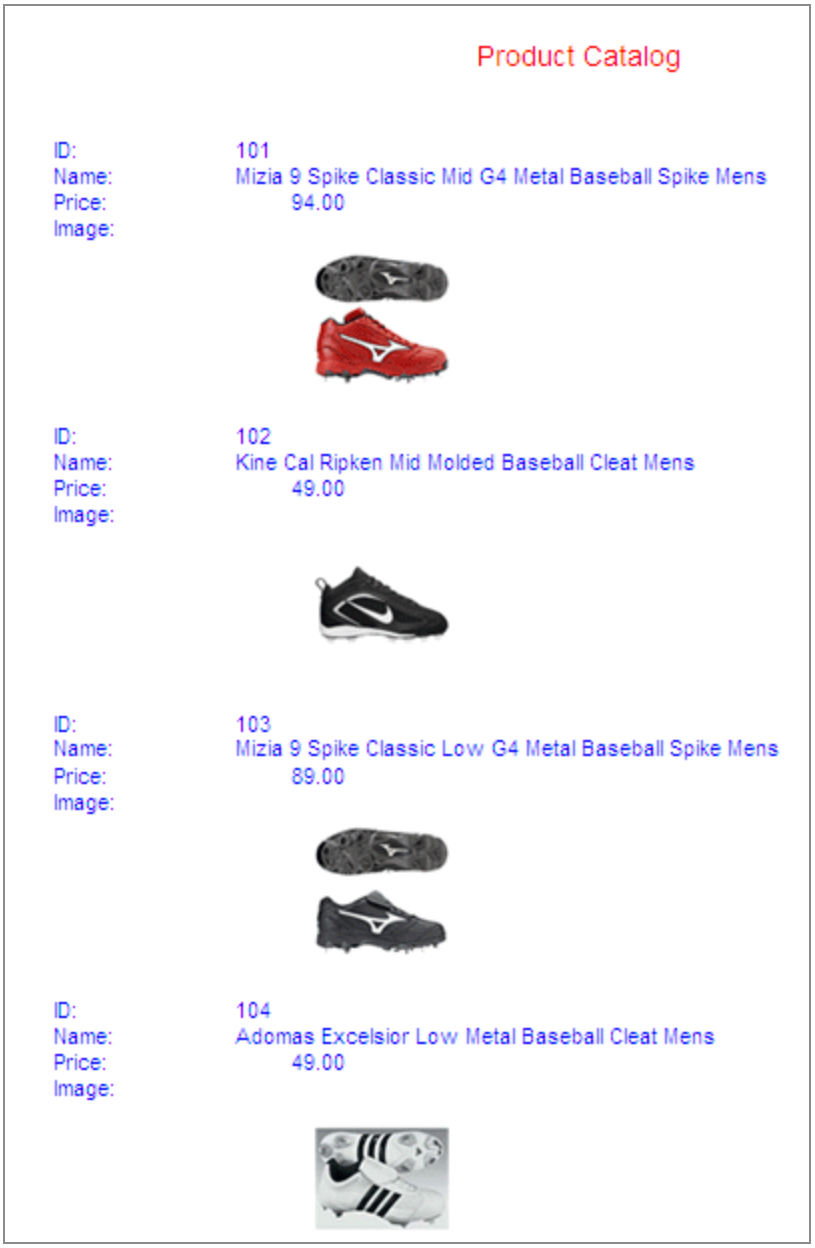
The following request joins the two data sources and prints product images in a subheading. The output is generated in DHTML format. It can also be generated in HTML or PDF format.

```
-* Rel 7705 DHTML and HTML supports including Image stored in
-* BLOB field in HTML report column, heading, footing, subhead,
-* or subfoot
-* Rel 769 supports PDF format
-*SET BASEURL='' - Required for embedded images to work. Overrides
default
-* setting from WF Client.
SET BASEURL=''
JOIN PRODUCTID IN RETAILDETAIL TO PRODUCTID IN RETAILIMAGE
TABLE FILE RETAILDETAIL
HEADING CENTER
"Product Catalog"
" "
PRINT NAME NOPRINT PRODIMAGE NOPRINT
BY PRODUCTID NOPRINT
ON PRODUCTID SUBHEAD
""
" ID: <10<PRODUCTID "
" Name: <10<NAME "
" Price: <7<PRICE "
" Image: "
""
""
""
""
""
ON TABLE SET PAGE NOPAGE
```

```
-*************************
-* Lines between asterisk lines required for BLOB image support
-* for HTML and DHTML formats.
ON TABLE SET HTMLEMBEDIMG AUTO
-* Required to support IE8 with images larger than 32K
ON TABLE SET HTMLARCHIVE ON
-*Required for image positioning in subheads in HTML reports
ON TABLE SET HTMLCSS ON
-*************************
ON TABLE PCHOLD FORMAT DHTML
```

```
ON TABLE SET STYLE *
TYPE=REPORT,COLOR=BLUE,FONT = ARIAL,$
TYPE=HEADING, COLOR = RED, SIZE = 16, JUSTIFY=CENTER,$
TYPE=SUBHEAD,BY=PRODUCTID,IMAGE=(PRODIMAGE),SIZE=(1 1), POSITION=(+2
+1),$
ENDSTYLE
END
```

The partial output is.



# Sizing an Image From a BLOB Field

The Microsoft SQL Server data source named retaildetail contains product information for a sports clothing and shoe retailer. The Microsoft SQL Server data source named retailimage has the same product ID field as retaildetail and has an image of each product stored in a field named **prodimage** whose data type is BLOB.

The following request joins the two data sources and displays the same image on three columns of output using different sizes and different PRESERVERATIO settings. Note that PRESERVERATIO=ON is not supported with images in PNG format.

The output is generated in DHTML format. It can also be generated in HTML or PDF format.

```
-* Rel 7705 DHTML and HTML supports including Image stored in
-* BLOB field in report column, heading, footing, subhead, or
-* subfoot
-* Rel 769 supports PDF format
JOIN PRODUCTID IN RETAILDETAIL TO PRODUCTID IN RETAILIMAGE
TABLE FILE RETAILDETAIL
PRINT PRODIMAGE AS '' PRODIMAGE AS '' PRODIMAGE AS ''
BY STYLE NOPRINT
WHERE NAME CONTAINS 'Pant' OR 'Tank'
ON STYLE UNDER-LINE
ON TABLE SET PAGE NOPAGE
-*************************
-* Lines between asterisk lines required for BLOB image support
-* for HTML and DHTML formats.
ON TABLE SET HTMLEMBEDIMG AUTO
-* Required to support IE8 with images larger than 32K
ON TABLE SET HTMLARCHIVE ON
-*Required for image positioning in subheads in HTML reports
ON TABLE SET HTMLCSS ON
-*************************
ON TABLE PCHOLD FORMAT DHTML
ON TABLE SET STYLE *
TYPE=REPORT,COLOR=BLUE,FONT = ARIAL,$
TYPE=DATA,COLUMN=P1,IMAGE=(PRODIMAGE),SIZE=(.75 .75),$
TYPE=DATA,COLUMN=P2,IMAGE=(PRODIMAGE),SIZE=(.75 1),PRESERVERATIO=ON,$
TYPE=DATA,COLUMN=P3,IMAGE=(PRODIMAGE),SIZE=(.75 1),PRESERVERATIO=OFF,$
ENDSTYLE
END
```

Note that PRESERVERATIO=OFF is specified for the second column to preserve the image height and width ratio for that column even though the styling SIZE height specifies a

different value than the first column image styling. In addition, PRESERVERATIO=OFF is specified for the third column, so for that column the image height to width ratio is not preserved and is rendered as specified by the styling SIZE height and width values specified in the request (FEX).

The partial output follows.

# Inserting an Image From a BLOB Field in a Summary Report

In order to insert an image from a BLOB field in a report that displays summary data, you must include two display commands in the request, a SUM command for the summary information and a PRINT or LIST command for displaying the image and any other detail data.

The Microsoft SQL Server data source named retaildetail contains product information for a sports clothing and shoe retailer. The Microsoft SQL Server data source named retailimage has the same product ID field as retaildetail and has an image of each product stored in a field named **prodimage** whose data type is BLOB.

The following request joins the two data sources. It contains two display commands, a SUM command and a PRINT command. The SUM command aggregates the total price for each category and displays this category name and total price in a subheading, The PRINT command displays the image for each item in the category along with its individual product number and price in a subfooting.

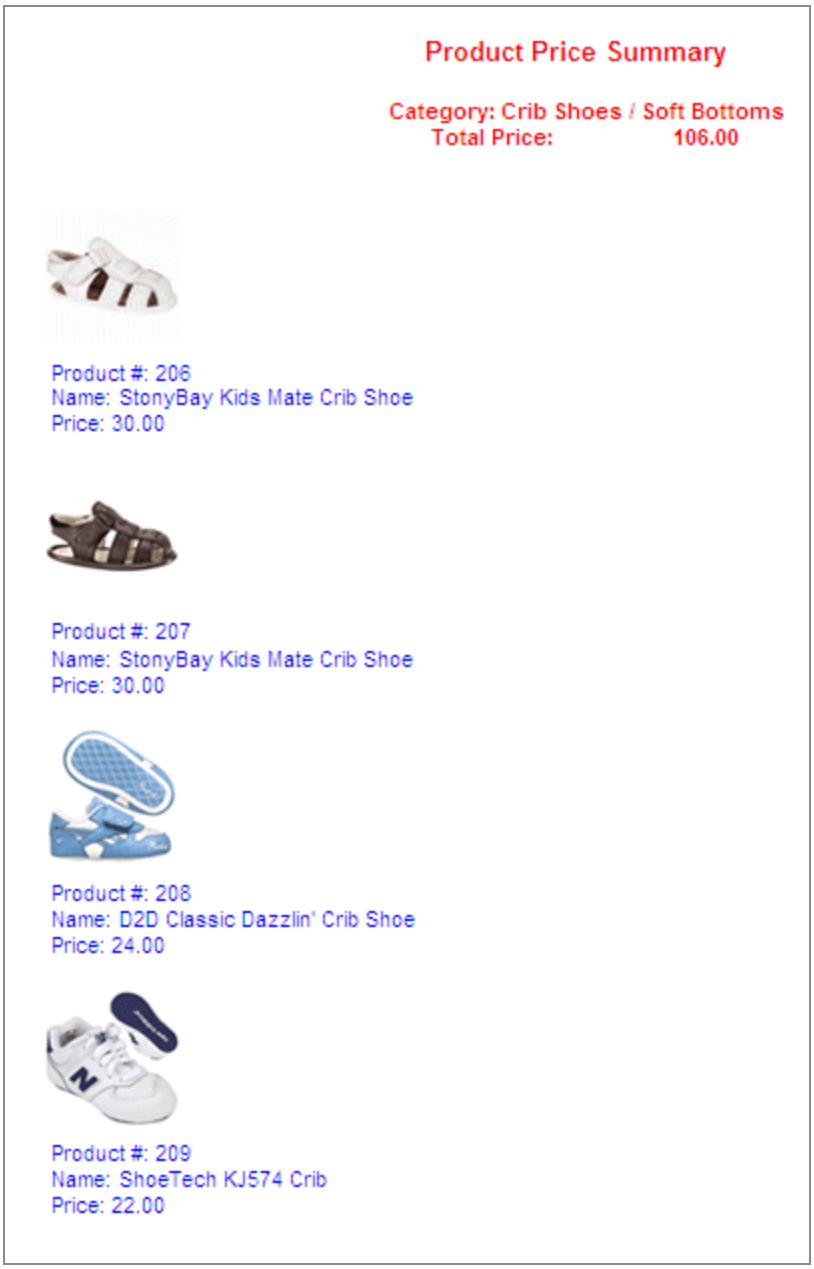
The output is generated in DHTML format. It can also be generated in HTML or PDF format.

```
-* Rel 7705 DHTML and HTML supports including images stored in
-* BLOB field in report column, heading, footing, subhead, or
-* subfoot
-* Rel 769 supports PDF format
SET PRINTPLUS=ON
JOIN PRODUCTID IN RETAILDETAIL TO PRODUCTID IN RETAILIMAGE
TABLE FILE RETAILDETAIL
HEADING CENTER
"Product Price Summary"
" "
SUM PRICE NOPRINT
BY CATEGORY NOPRINT
ON CATEGORY SUBHEAD
" Category: <CATEGORY "
" Total Price: <PRICE "
" "
```

```
PRINT PRICE NOPRINT PRODIMAGE NOPRINT
BY CATEGORY NOPRINT
```

```
BY PRODUCTID NOPRINT
ON PRODUCTID SUBFOOT
" "
" "
" "
" "
" "
" "
" Product #: <PRODUCTID "
" Name: <NAME "
" Price: <FST.PRICE "
ON TABLE SET PAGE NOPAGE
-*************************
-* Lines between asterisk lines required for BLOB image support
-* for HTML and DHTML formats.
ON TABLE SET HTMLEMBEDIMG AUTO
-* Required to support IE8 with images larger than 32K
ON TABLE SET HTMLARCHIVE ON
-*Required for image positioning in subheads in HTML reports]
ON TABLE SET HTMLCSS ON
-*************************
ON TABLE PCHOLD FORMAT DHTML
ON TABLE SET STYLE *
TYPE=REPORT,COLOR=BLUE,FONT=ARIAL,$
TYPE=HEADING, COLOR=RED, SIZE=14, STYLE=BOLD, JUSTIFY=CENTER,$
TYPE=SUBHEAD, COLOR=RED, SIZE=12, STYLE=BOLD, JUSTIFY=CENTER,$
TYPE=SUBFOOT,BY=PRODUCTID,IMAGE=(PRODIMAGE),SIZE=(1 1), POSITION=(0 0),$
TYPE=SUBFOOT,BY=PRODUCTID,OBJECT=FIELD, ITEM=1, WRAP=5,$
ENDSTYLE
END
```

The output for the first category is:




# File Size and Compression Considerations For Images in BLOB Fields

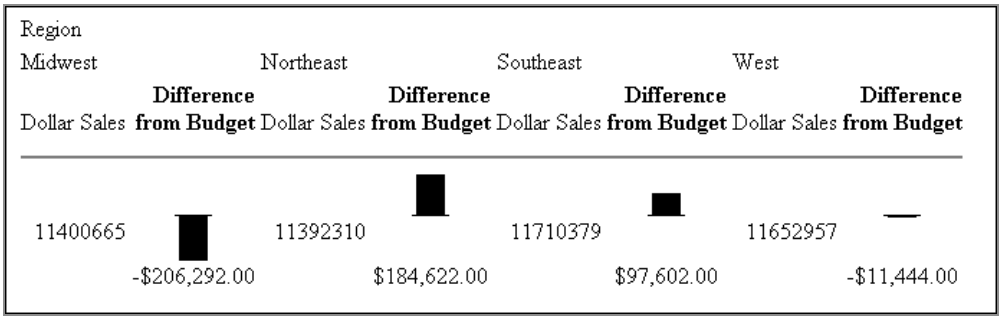
The actual size of an image stored in the BLOB field may vary from image to image, and scaling the images to a designated size allows them to better fit into a columnar report.

Files that contain many images can be large. Scaling the images to a smaller size using the SIZE attribute does not decrease the size of the file. Note also that using SET FILECOMPRESS=ON will not reduce the size of images in a PDF file, since images are already saved in compressed form.

# Associating Bar Graphs With Report Data

To make PDF, HTML, DHTML, PPTX, PPT, and PS reports more powerful, you can insert visual representations of selected data directly into the report output. These visual representations are in the form of vertical or horizontal bar graphs that make relationships and trends among data more obvious. You can add the following:  StyleSheets" /> StyleSheets and data visualization" />

- **Vertical Bar Graph.** You can apply a vertical bar graph to report columns associated with an ACROSS sort field. The report output displays a vertical bar graph in a new row above the associated data values, as shown in the following image.




  Bar graphs that emanate above the zero line represent positive values, while bar graphs that emanate below the zero line represent negative values.

  To see how each of these types of reports is generated, see the example following Associate Data Visualization Bar Graphs With Report Columns.

- **Horizontal Bar Graph.** You can apply a horizontal bar graph to report columns. The report output displays a horizontal bar graph in a new column to the right of the associated data values, as shown in the following image.

| City | Budget Dollars | Dollar Sales | DIFFERENCE |
|---|---|---|---|
| Atlanta | $4,247,597.00 | $4,100,107.00 | $147,490.00 |
| Boston | $3,818,397.00 | $3,707,986.00 | $110,411.00 |
| Chicago | $3,866,856.00 | $3,924,401.00 | -$57,545.00 |
| Houston | $3,680,679.00 | $3,714,978.00 | -$34,299.00 |
| Los Angeles | $3,669,484.00 | $3,772,014.00 | -$102,530.00 |
| Memphis | $3,689,979.00 | $3,687,057.00 | $2,922.00 |
| New Haven | $3,832,202.00 | $3,782,049.00 | $50,153.00 |
| New York | $3,926,333.00 | $3,902,275.00 | $24,058.00 |
| Orlando | $3,870,405.00 | $3,923,215.00 | -$52,810.00 |
| San Francisco | $3,916,863.00 | $3,870,258.00 | $46,605.00 |
| Seattle | $4,055,166.00 | $4,010,685.00 | $44,481.00 |
| St. Louis | $3,646,838.00 | $3,761,286.00 | -$114,448.00 |

Bar graphs that emanate to the right of the zero line represent positive values, while bar graphs that emanate to the left of the zero line represent negative values.

The length of each vertical or horizontal bar graph is proportional to the magnitude of its associated data value. The shortest bar graph is displayed for the value with the minimum magnitude, the longest bar graph for the value with the maximum magnitude, and bar graphs of varying length are displayed for each value within the minimum-maximum magnitude range. Notice in the figure above that a value of 147,490.00 produces a longer horizontal bar graph than a value of 50,153.00. Therefore, a complete row of vertical bar graphs or a complete column of horizontal bar graphs forms a bar chart.

You can only apply data visualization bar graphs to numeric report columns (integer, decimal, floating point single-precision, floating point double-precision, and packed). Bar graphs applied to alphanumeric, date, or text field formats are ignored. For details about assigning field formats, see the *Describing Data With ibi™ WebFOCUS® Language* manual.

You apply data visualization bar graphs to columns by adding a declaration to your WebFOCUS StyleSheet that begins with the GRAPHTYPE attribute. This attribute adds either a vertical or horizontal bar graph to the specified data.

**Note:** Data visualization bar graphs are not supported in a request that includes the OVER option.

# Formatting Options for Data Visualization Bar Graphs

You can specify optional formatting attributes for data visualization bar graphs in the GRAPHTYPE declaration, for example, graph color, length, and width. The following table lists the formatting attributes and a description of each:  StyleSheets and data visualization" /> StyleSheets" />

| Formatting Attribute | Description |
|---|---|
| GRAPHBASE | Sets whether the scale should start from zero or the minimum value. |
| GRAPHCOLOR | Sets the color of the bar graphs. |
| GRAPHCOLORNEG | Sets a color for the bar graphs that represent negative values. |
| GRAPHLENGTH | Sets the length of the longest bar graph. The value for GRAPHLENGTH determines the length in measurement units (inches, centimeters, and so on) of the longest bar graph in a vertical or horizontal bar graph.<br>The length value is expressed in the current units, which is set using the UNITS StyleSheet attribute. The GRAPHLENGTH value is then converted into pixels. |
| GRAPHSCALE | Specifies the relative bar graph scaling for multiple report columns under a common ACROSS sort field in which you have applied data visualization graphics. GRAPHSCALE is a report-level setting (TYPE=REPORT). |
| GRAPHWIDTH | Sets the width of the bar graphs. The width value is expressed in the current units. See GRAPHLENGTH, above, for more information about units. |

# Incorporate Data Visualization Formatting Attributes

```
TYPE=REPORT, [GRAPHSCALE={UNIFORM|DISTINCT}]
TYPE=DATA, GRAPHTYPE=DATA, [{COLUMN|ACROSSCOLUMN|FIELD}=identifier],
 [GRAPHBASE={ZERO|MINIMUM},]
 [GRAPHCOLOR={color|RGB({r g b|#hexcolor}},]
 [GRAPHNEGCOLOR={color|RGB({r g b|#hexcolor}},]
 [GRAPHLENGTH=lengthvalue,]
 [GRAPHWIDTH=widthvalue,] $
```

**Note:** TYPE=DATA, GRAPHTYPE=DATA is the equivalent of GRAPHTYPE=DATA.

where:  StyleSheets" /> StyleSheets and data visualization" />

**GRAPHBASE**

Specifies whether the scale should start at zero (the default) or the minimum value. GRAPHBASE=MINIMUM makes it easier to compare values that are not close to zero. If negative values are present, GRAPHBASE=MINIMUM is ignored and will not be enabled.

GRAPHBASE=MINIMUM is visually indicated in the graph with a break in the bar (the small piece of the bar before the break symbolizes the compressed space between 0 and the minimum value).

**Note:** The minimum value is identified by a double bar of equal heights. For all values greater than the minimum, the top bar grows proportionally taller. If the minimum value is actually zero, having this double bar may make it look as if the minimum value is not zero. Therefore, you should use the default (GRAPHBASE=ZERO) in your procedure if you expect to have zero values in the column.

**GRAPHCOLOR**

Specifies the color of the bar graphs. Black is the default color, if you omit this attribute from the declaration.

**color**

Is one of the supported color values. In addition to the supported named colors, HEX or RGB color values are valid options. For a list of supported values, see Specifying Font Format in a Report.

**RGB(r g b)**

Specifies the font color using a mixture of red, green, and blue. (*r g b*) is the desired intensity of red, green, and blue, respectively. The values are on a scale of 0 to 255, where 0 is the least intense and 255 is the most intense. Note that using the three color components in equal intensities results in shades of gray.

**RGB(#hexcolor)**

Is the hexadecimal value for the color. For example, FF0000 is the hexadecimal value for red. The hexadecimal digits can be in upper or lowercase, and must be preceded by a pound sign (#).

**GRAPHNEGCOLOR**

Defines a color for the bar graphs that represent negative values.

**GRAPHLENGTH**

Specifies the length of the longest bar graph. The default length is 60 pixels for a vertical bar graph and 80 pixels for a horizontal bar graph.

**lengthvalue**

Sets the value used to display the vertical or horizontal bar graph for the maximum data value in the associated report column. This value must be a positive number.

This value is initially expressed in the current units (using the UNITS attribute). This value is then converted into the corresponding number of pixels.

**GRAPHSCALE**

Specifies the relative bar graph scaling for multiple report columns under a common ACROSS sort field in which you have applied data visualization graphics. GRAPHSCALE is a report-level setting (TYPE=REPORT).

**UNIFORM**

Scales each vertical bar graph based on the minimum and maximum values of the entire set of values compiled from each ACROSS column in which you have applied data visualization graphics

**DISTINCT**

Scales each vertical bar graph based on the distinct minimum and maximum values for each ACROSS column in which you have applied data visualization graphics.

**GRAPHWIDTH**

Specifies the width of the bar graphs in a report.

**widthvalue**

Sets the value used to display the width of the bar graphs in a report. This value must be a positive number.

This value is initially expressed in the current units (defined by the UNITS attribute). This value is then converted into the corresponding number of pixels.

# Associate Data Visualization Bar Graphs With Report Columns

To add data visualization graphics to report output, add the following declaration to your WebFOCUS StyleSheet.  StyleSheets" /> StyleSheets and data visualization" /> StyleSheets" />

```
GRAPHTYPE=DATA, {COLUMN|ACROSSCOLUMN}=identifier, $
```

where:

**GRAPHTYPE=DATA**

Generates vertical or horizontal bar graphs for the data component of a report. Currently, you can only specify DATA as the report component.

**COLUMN**

Displays a horizontal bar graph to the right of the specified report column.

**ACROSSCOLUMN**

Displays a vertical bar graph above every occurrence of the data value associated with an ACROSS sort field.

**identifier**

Is any valid identifier. For details, see Identifying a Report Component in a WebFOCUS StyleSheet.

You can define WHEN conditions and bar graph features associated with those conditions using StyleSheet syntax. For details, see Formatting Report Data.

# Generating Data Visualization Bar Graphs in a Report

The following illustrates how to generate a bar graph for data in your report. Since this report is sorted with the BY field CITY, horizontal bar graphs display in the output. You can change this to vertical bars be changing the sort field to ACROSS CITY and the StyleSheet declaration to GRAPHTYPE=DATA, ACROSSCOLUMN=DIFFERENCE, $. Bar graphs that represent positive values display in the color blue. Bar graphs that represent negative values display in the color red.

```
DEFINE FILE GGSALES
DIFFERENCE/D7M=BUDDOLLARS-DOLLARS;
END

TABLE FILE GGSALES
BY CITY
SUM BUDDOLLARS/D7M DOLLARS/D7M DIFFERENCE
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
GRID=OFF, $
GRAPHTYPE=DATA, COLUMN=N4, GRAPHCOLOR=BLUE, GRAPHNEGCOLOR=RED, $
ENDSTYLE
END
```

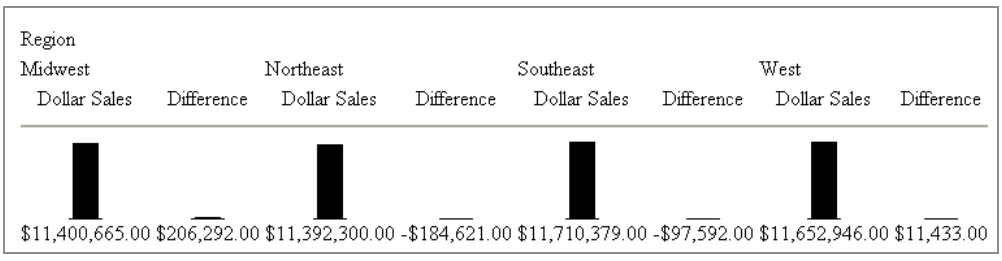
The output is:

| City | Budget Dollars | Dollar Sales | DIFFERENCE |
|---|---|---|---|
| Atlanta | $4,247,587 | $4,100,107 | $147,480 |
| Boston | $3,818,397 | $3,707,986 | $110,411 |
| Chicago | $3,866,856 | $3,924,401 | -$57,545 |
| Houston | $3,680,679 | $3,714,978 | -$34,299 |
| Los Angeles | $3,669,484 | $3,772,003 | -$102,519 |
| Memphis | $3,689,979 | $3,687,057 | $2,922 |
| New Haven | $3,832,202 | $3,782,049 | $50,153 |
| New York | $3,926,322 | $3,902,265 | $24,057 |
| Orlando | $3,870,405 | $3,923,215 | -$52,810 |
| San Francisco | $3,916,863 | $3,870,258 | $46,605 |
| Seattle | $4,055,166 | $4,010,685 | $44,481 |
| St. Louis | $3,646,838 | $3,761,286 | -$114,448 |

# Controlling Bar Graph Scaling in Horizontal (ACROSS) Sort Fields

You can apply vertical bar graphs to different columns above a common ACROSS sort field. The entire set of values for each column is grouped over an ACROSS sort field that has bar graphs applied. Therefore, the longest bar graph corresponds to the maximum value of the entire set of values.

This action is acceptable for separate column values that have ranges that are close. Many times, however, there is a marked discrepancy between the sets of values for separate columns. The following image illustrates such a discrepancy.




As you can see from the figure above, the values for the Dollar Sales field ($11,392,310.00 to $11,710,379.00) is much larger in magnitude than the set of values for the Difference

field ($206,292.00 to -$184,622.00). Also notice that the vertical bar graphs associated with the Difference values all but disappear when graphed against the entire set of values.

To display separate vertical bar graphs based on the set of values for each column, use the GRAPHSCALE StyleSheet attribute. This attribute modifies data visualization graphics to use the minimum and maximum values for each column below a common ACROSS sort field to construct a distinct vertical bar graph.

# Set Orientation for Visualization Bars

The VISBARORIENT parameter enables you to set horizontal or vertical orientation for visualization bars for ACROSS columns.

**Note:** This parameter is only supported for HTML report output.

```
SET VISBARORIENT = {H|V}
```

where:

**H**

Indicates horizontal bar orientation for visualization bars.

**V**

Indicates vertical bar orientation for visualization bars. This is the default value.

# Setting Orientation for Visualization Bars

The following report creates vertical bars for the ACROSS column values (DOLLARS, BUDDOLLARS, UNITS, BUDUNITS).

```
SET VISBARORIENT=V
TABLE FILE GGSALES
SUM DOLLARS BUDDOLLARS UNITS BUDUNITS
BY REGION
ACROSS CATEGORY
WHERE CATEGORY EQ 'Coffee' OR 'Food'
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
```

```
TYPE =REPORT , BORDER=light,$
GRAPHTYPE=DATA, ACROSSCOLUMN=DOLLARS, GRAPHCOLOR=GREEN,BACKCOLOR=RGB
(#ffff00), $
GRAPHTYPE=DATA, ACROSSCOLUMN=BUDDOLLARS, GRAPHCOLOR=RGB(255 0 0), $
GRAPHTYPE=DATA, ACROSSCOLUMN=UNITS, GRAPHCOLOR=blue, $
GRAPHTYPE=DATA, ACROSSCOLUMN=BUDUNITS, GRAPHCOLOR=thistle, $
ENDSTYLE
END
```

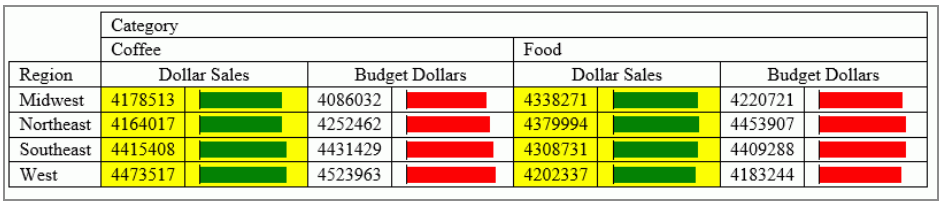
The output is:

| | Category | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Coffee | | | | Food | | | |
| Region | Dollar Sales | Budget Dollars | Unit Sales | Budget Units | Dollar Sales | Budget Dollars | Unit Sales | Budget Units |
| Midwest | 4178513 | 4086032 | 332777 | 335526 | 4338271 | 4220721 | 341414 | 339263 |
| Northeast | 4164017 | 4252462 | 335778 | 335920 | 4379994 | 4453907 | 353368 | 351431 |
| Southeast | 4415408 | 4431429 | 350948 | 355693 | 4308731 | 4409288 | 349829 | 351509 |
| West | 4473517 | 4523963 | 356763 | 358784 | 4202337 | 4183244 | 340234 | 335361 |

The following report creates horizontal bars for the ACROSS column values ( DOLLARS and BUDDOLLARS.

```
SET VISBARORIENT=H
TABLE FILE GGSALES
SUM DOLLARS BUDDOLLARS
BY REGION
ACROSS CATEGORY
WHERE CATEGORY EQ 'Coffee' OR 'Food'
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
TYPE =REPORT ,BORDER=light,$
GRAPHTYPE=DATA, ACROSSCOLUMN=DOLLARS, GRAPHCOLOR=GREEN,BACKCOLOR=RGB
(#ffff00), $
GRAPHTYPE=DATA, ACROSSCOLUMN=BUDDOLLARS, GRAPHCOLOR=RGB(255 0 0), $
ENDSTYLE
END
```

The output is:



| | Category | | | |
|---|---|---|---|---|
| | Coffee | | Food | |
| Region | Dollar Sales | Budget Dollars | Dollar Sales | Budget Dollars |
| Midwest | 4178513 | 4086032 | 4338271 | 4220721 |
| Northeast | 4164017 | 4252462 | 4379994 | 4453907 |
| Southeast | 4415408 | 4431429 | 4308731 | 4409288 |
| West | 4473517 | 4523963 | 4202337 | 4183244 |

# Applying Scaling to Data Visualization Bar Graphs

The GRAPHSCALE parameter specifies the relative bar graph scaling for multiple report columns under a common ACROSS sort field in which you have applied data visualization graphics. GRAPHSCALE can only be set for an entire report (TYPE=REPORT).

# Apply Scaling to Data Visualization Bar Graphs

```
TYPE=REPORT, GRAPHSCALE={UNIFORM|DISTINCT}
```

where:

**TYPE=REPORT**

Specifies that the declaration applies to the entire report, and not to a specific bar graph within the report.

**GRAPHSCALE**

Specifies the relative bar graph scaling for multiple report columns under a common ACROSS sort field in which you have applied data visualization graphics. GRAPHSCALE is a report-lever setting (TYPE=REPORT).

**UNIFORM**

Scales each vertical bar graph based on the minimum and maximum values of the entire set of values compiled from each ACROSS column in which you have applied data visualization graphics.

**DISTINCT**

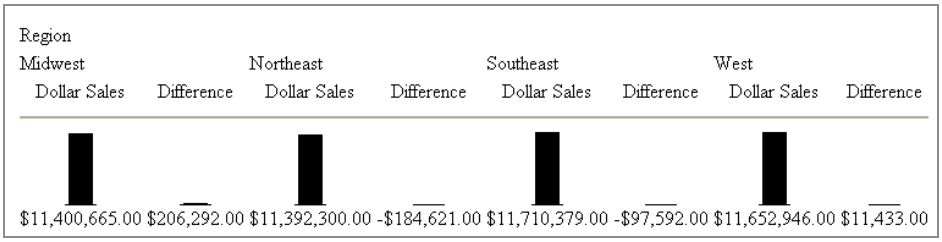
Scales each vertical bar graph based on the distinct minimum and maximum values for each ACROSS column in which you have applied data visualization graphics.

# Using GRAPHSCALE to Display Distinct Vertical Bar Graphs

The following report request displays vertical bar graphs for two columns (DOLLARS and DIFFERENCE) associated with a common ACROSS field (REGION):

```
DEFINE FILE GGSALES
Difference/D12.2M=DOLLARS-BUDDOLLARS;
END

TABLE FILE GGSALES
SUM DOLLARS/D12.2M Difference
ACROSS REGION
ON TABLE SET STYLE *
TYPE=REPORT,GRID=OFF,$
GRAPHTYPE=DATA, ACROSSCOLUMN=N1,$
GRAPHTYPE=DATA,ACROSSCOLUMN=N2,$
ENDSTYLE
END
```

This request produces the following report output:

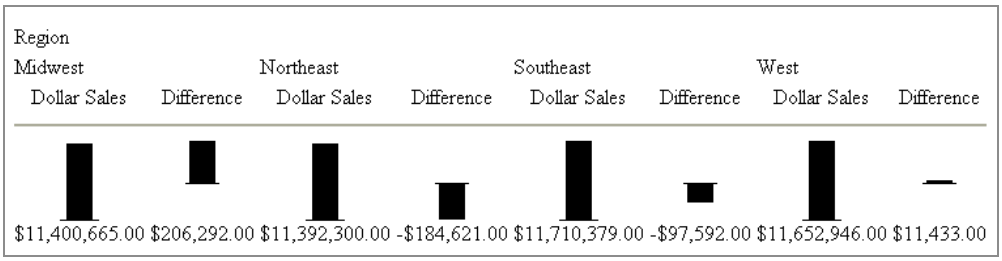



Since the GRAPHSCALE attribute is not specified, the default setting UNIFORM is applied to the report. This setting uses the entire set of values (values from Dollar Sales and Difference) to plot the bar graphs for both columns.

The following request is the same as the above request, except it has the GRAPHSCALE=DISTINCT attribute included in the StyleSheet.

```
DEFINE FILE GGSALES
Difference/D12.2M=DOLLARS-BUDDOLLARS;
END

TABLE FILE GGSALES
SUM DOLLARS/D12.2M Difference
ACROSS REGION
ON TABLE SET STYLE *
GRAPHTYPE=DATA, ACROSSCOLUMN=N1,$
GRAPHTYPE=DATA, ACROSSCOLUMN=N2,$
TYPE=REPORT, GRAPHSCALE=DISTINCT,$
ENDSTYLE
END
```

Notice the difference in the output:




Now each bar graph is plotted based on the set of values for each field.

# Working With Mailing Labels and Multi-Pane Pages

You can print sheets of laser printer mailing labels by dividing each page into a matrix of sub-pages, each corresponding to a single label. Each page break in the report positions the printer at the top of the next label.  StyleSheets and multi-pane reports" />

Multi-pane printing places a whole report on a single printed page. You can create columns or rows so that when text overflows on one page, it appears in the next column or row on the same page rather than on the next page.

These features apply to a PDF or PS report.

# Attributes for Mailing Labels and Multi-Pane Printing

In addition to the attributes in the table, you can use standard margin attributes (for example, LEFTMARGIN or TOPMARGIN) to position the entire sheet of labels at once, creating an identical margin for each sheet.

| Attribute | Description | Applies to |
|---|---|---|
| `PAGEMATRIX` | Sets the number of columns and rows of labels on a page. | PDF<br>PS |
| `ELEMENT` | Sets the width and height of each label, expressed in the unit of measurement specified by the UNITS parameter. | PDF<br>PS |
| `GUTTER` | Sets the horizontal and vertical distance between each label, expressed in the unit of measurement specified by the UNITS parameter. | PDF<br>PS |
| `MATRIXORDER` | Sets the order in which the labels are printed. | PDF<br>PS |
| `LABELPROMPT` | Sets the position of the first label on the mailing label sheet. | PDF<br>PS |

# Set Up a Report to Print Mailing Labels

**Procedure**

1. Create the label as a page heading.
2. Sort the labels but use NOPRINT to suppress sort field display. Only the fields embedded in the page heading will print.

3. Insert a page break on a sort field to place each new field value on a separate label.
4. Suppress default page numbers and associated blank lines from the beginning of each page (SET PAGE-NUM=NOPAGE).

# Print Mailing Labels or a Multi-Pane Report

```
[TYPE=REPORT,] PAGEMATRIX=(c r), ELEMENT=(w h), [GUTTER=(x y),]
  [MATRIXORDER={VERTICAL|HORIZONTAL},]  [LABELPROMPT={OFF|ON},] $
```

where:

**TYPE=REPORT**

Applies the settings to the entire report. Not required, as it is the default.

**c**

Is the number of columns of labels across the page.

Enclose the values *c* and *r* in parentheses, and do not include a comma between them.

**r**

Is the number of rows of labels down the page.

**w**

Is the width of each label.

Enclose the values *w* and *h* in parentheses, and do not include a comma between them.

**h**

Is the height of each label.

**GUTTER**

Is the distance between each label.

**x**

Is the horizontal distance between each label.

Enclose the values *x* and *y* in parentheses, and do not include a comma between them.

**y**

Is the vertical distance between each label.

**MATRIXORDER**

Is the order in which the labels are printed.

**VERTICAL**

Prints the labels down the page.

**HORIZONTAL**

Prints the labels across the page.

**LABELPROMPT**

Is the position of the first label on the mailing label sheet.

**OFF**

Starts the report on the first label on the sheet. OFF is the default value.

**ON**

Prompts you at run time for the row and column number at which to start printing. All remaining labels follow consecutively. This feature allows partially used sheets of labels to be re-used.

# Printing Mailing Labels

The following report prints on 81/2 x 11 sheets of address labels.

```
SET ONLINE-FMT = PDF
TABLE FILE EMPLOYEE
BY LAST_NAME NOPRINT BY FIRST_NAME NOPRINT
ON FIRST_NAME PAGE-BREAK
HEADING
"<FIRST_NAME <LAST_NAME"
"<ADDRESS_LN1"
"<ADDRESS_LN2"
"<ADDRESS_LN3"
ON TABLE SET PAGE-NUM NOPAGE
ON TABLE SET STYLE LABEMP
END
```

The labels have the following dimensions, defined in the StyleSheet LABEMP:

```
UNITS=IN, PAGESIZE=LETTER, LEFTMARGIN=0.256, TOPMARGIN=0.5,
PAGEMATRIX=(2 5), ELEMENT=(4 1), GUTTER=(0.188 0), $
```

The first page of labels prints as follows:

```
JOHN BANNING                    DIANE JONES
160 LOMBARDO AVE.
APT 4C                          235 MURRAY HIL PKWY
FREEPORT NY 11520               RUTHERFORD NJ 07073


ROSEMARIE BLACKWOOD             JOHN MCCOY
MRS. P. JONES                   ASSOCIATED
3704 FARRAGUT RD.               2 PENN PLAZA
BROOKLYN NY 11210               NEW YORK NY 10001


BARBARA CROSS                   ROGER MCKNIGHT
APT 2G                          APT 4D
147-15 NORTHERN BLD             117 HARRISON AVE.
FLUSHING NY 11354               ROSELAND NJ 07068


MARY GREENSPAN                  ANTHONY ROMANS

13 LINDEN AVE.                  271 PRESIDENT ST.
JERSEY CITY NJ 07300            FREEPORT NY 11520


JOAN IRVING                     MARY SMITH
APT 2J                          ASSOCIATED
123 E 32 ST.                    2 PENN PLAZA
NEW YORK NY 10001               NEW YORK NY 10001
```

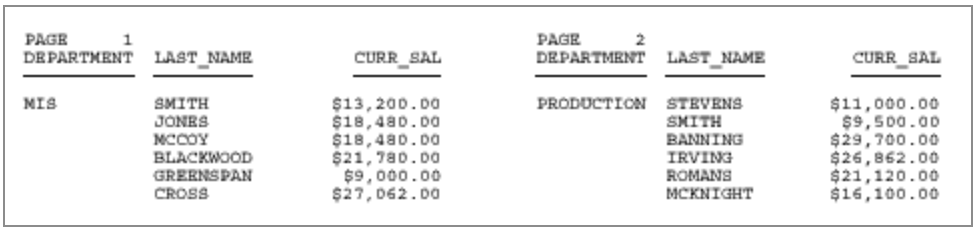
# Printing a Multi-Pane Report

This request divides the first report page in two columns so that the second report page appears in the second column of the first page. A PAGE-BREAK creates a multi-page report for the purpose of this example.  StyleSheets and multi-pane reports" />

```
SET ONLINE-FMT = PDF
TABLE FILE EMPLOYEE
PRINT LAST_NAME AND CURR_SAL BY
```

```
DEPARTMENT
ON DEPARTMENT PAGE-BREAK
HEADING
"PAGE <TABPAGENO"
ON TABLE SET STYLE *
UNITS=IN, PAGESIZE=LETTER, PAGEMATRIX=(2 1), ELEMENT=(3.5 8.0),
MATRIXORDER=VERTICAL, $
TYPE=REPORT, SIZE=8, $
ENDSTYLE
END
```

The report prints as:



PAGE 1

| DEPARTMENT | LAST_NAME | CURR_SAL |
|---|---|---|
| MIS | SMITH | $13,200.00 |
| | JONES | $18,480.00 |
| | MCCOY | $18,480.00 |
| | BLACKWOOD | $21,780.00 |
| | GREENSPAN | $9,000.00 |
| | CROSS | $27,062.00 |

PAGE 2

| DEPARTMENT | LAST_NAME | CURR_SAL |
|---|---|---|
| PRODUCTION | STEVENS | $11,000.00 |
| | SMITH | $9,500.00 |
| | BANNING | $29,700.00 |
| | IRVING | $26,862.00 |
| | ROMANS | $21,120.00 |
| | MCKNIGHT | $16,100.00 |

# Using Headings, Footings, Titles, and Labels

After you have selected the data for a report, you can make it more meaningful by adding headings, footings, titles, and labels. Headings and footings supply key information, such as the purpose of a report and its audience. They also provide structure, helping the user navigate to the detail sought. Titles and labels identify individual pieces of data, ensuring correct interpretation. These components supply context for data and enhance the visual appeal of a report.

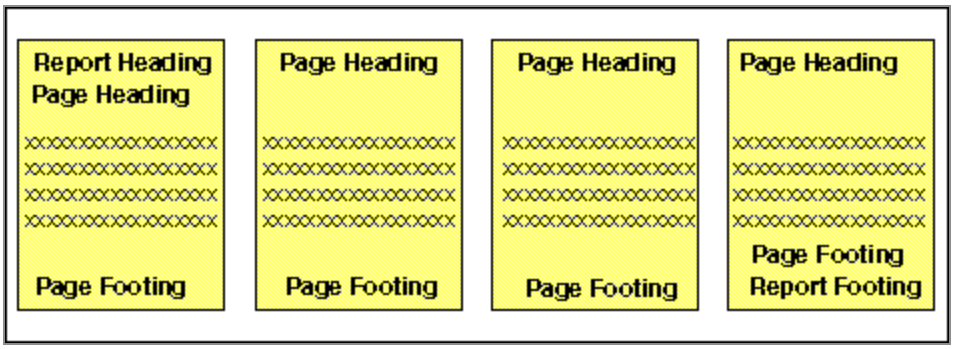
For information about adding contextual information to specialized report types, see Creating a Graph, Creating Financial Reports With Financial Modeling Language (FML), and Creating a Free-Form Report.

## Creating Headings and Footings

There are several types of headings and footings:

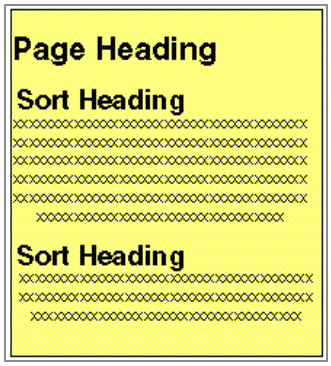
- Report titles. These are the titles you define that display in your browser's title bar when you run a report or graph in HTML or, as the worksheet tab name in an EXL2K report. For details see, Creating a Custom Report or Worksheet Title.
- A report heading, which appears at the top of the first page of a report and a report footing, which appears on the last page of a report. For details on report headings and footings, see Creating a Report Heading or Footing.
- A page heading, which appears at the top of every page of a report and a page footing, which appears at the bottom of every page of a report. For details on page headings and footings, see Creating a Page Heading or Footing.
- A sort heading, which appears in the body of a report to identify the beginning of a group of related data. And a sort footing, which appears in the body to identify the end of a group of related data. For details on sort headings and footings, see Creating Headings and Footings.

  The following sample report contains a report heading and a report footing. It also contains a page heading and page footing on every page of the report.

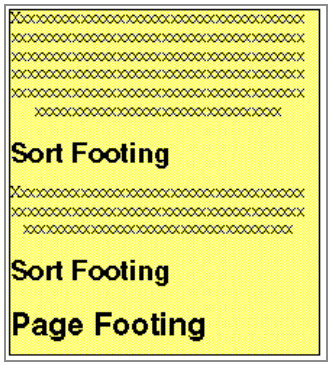



The following sample report contains sort headings and sort footings, as well as, a page heading and page footing for reference.

A sort heading looks like this:




A sort footing looks like this:




# Limits for Headings and Footings

The following limitations apply to report headings and footings, page headings and footings, and sort headings and footings:

- The space for headings, footings, subheadings, and subfootings are allocated dynamically. WebFOCUS imposes no limit on the amount of space used.
- The maximum number of sort headings plus sort footings in one request is 64.
- The maximum limit of nested headings is 64.
- If your code for a single heading or footing line is broken into multiple lines in the report request, you can indicate that they are all a single line of heading using the <0X spot marker. For more information, see Extending the Heading and Footing Code to Multiple Lines in a Report Request.

- For PDF and Postscript reports, the heading or footing lines must fit within the maximum report width to be displayed properly. Also, in order for the report body to be displayed, the number of heading or footing lines must leave room on the page for at least one detail line (including column titles).

# Extending the Heading and Footing Code to Multiple Lines in a Report Request

A single line heading or footing code, between double quotation marks, can be a maximum of 32K characters. However, in some editors the maximum length of a line of code in a procedure is 80 characters. In cases like this, you can use the <0X spot marker to continue your heading onto the next line. The heading or footing content and spacing appears exactly as it would if typed on a single line.

Even if you do not need to extend your code beyond the 80-character line limit, this technique offers convenience, since shorter lines may be easier to read on screen and to print on printers.

# Extend the Heading or Footing Code to Multiple Lines in a Report Request

To extend the length of a single-line heading or footing beyond 80 characters:

**Procedure**

1. Begin the heading or footing with double quotation marks (").
2. Split the heading or footing content into multiple lines of up to 76 characters each, using the <0X spot marker at any point up to the 76th character to continue your heading onto the next line. (The four remaining spaces are required for the spot marker itself, and a blank space preceding it.)
3. The heading or footing line can contain a maximum of 410 characters, with each line ending in an <0X spot marker.
4. Place the closing double quotation marks at the end of the final line of heading or

footing code.

**Result**

You can use this technique to create a report heading or footing, page heading or footing, or sort heading or footing of up to 410 characters.

# Extending the Heading and Footing Code to Multiple Lines in a Report Request

This request creates a sort heading coded on two lines. The <0X spot marker positions the first character on the continuation line, immediately to the right of the last character on the previous line. (No spaces are inserted between the spot marker and the start of a continuation line.)

```
SET ONLINE-FMT = HTML
SET PAGE-NUM = OFF
JOIN STORE_CODE IN CENTCOMP TO STORE_CODE IN CENTORD
```

```
TABLE FILE CENTCOMP
HEADING
"Century Corporation Orders Report"
PRINT PROD_NUM QUANTITY LINEPRICE
BY STORE_CODE NOPRINT
BY ORDER_NUM
ON STORE_CODE SUBHEAD
"Century Corporation orders for store <STORENAME <0X
    (store # <STORE_CODE|) in <STATE|."
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
TYPE=HEADING, FONT='ARIAL', STYLE=BOLD, $
TYPE=SUBHEAD, OBJECT=FIELD, ITEM=2, STYLE=ITALIC, $
TYPE=SUBHEAD, OBJECT=FIELD, ITEM=3, STYLE=BOLD, $
ENDSTYLE
END
```

The partial output is:

**Century Corporation Orders Report**

| Order Number: | Product Number#: | Quantity: | Line Total |
|---|---|---|---|
| Century Corporation orders for store Audio Expert (store # *1003CA*) in **CA**. | | | |
| 74610 | 1012 | 268 | $222,234.35 |
| | 1028 | 323 | $29,215.62 |
| | 1032 | 339 | $27,208.12 |
| | 1034 | 339 | $154,943.38 |
| | 1036 | 339 | $93,266.39 |
| Century Corporation orders for store Audio Expert (store # *1003CO*) in **CO**. | | | |
| 39274 | 1006 | 179 | $54,201.50 |
| | 1008 | 179 | $29,034.16 |
| | 1020 | 179 | $45,457.59 |
| | 1032 | 400 | $30,861.24 |
| | 1034 | 400 | $143,744.49 |
| Century Corporation orders for store Audio Expert (store # *1003CT*) in **CT**. | | | |
| 35995 | 1008 | 13 | $2,132.45 |
| | 1020 | 13 | $3,895.38 |
| | 1022 | 146 | $52,159.13 |
| | 1024 | 146 | $45,306.84 |
| | 1030 | 146 | $18,525.49 |

**Tip:** You can use this technique to create a heading of up to 410 characters. Although demonstrated here for a sort heading, you can use this technique with any heading or footing line.

# Creating a Custom Report or Worksheet Title

You can create a report title that:

- Overrides the default report title (FOCUS Report) that appears in the title bar of your browser in an HTML report or graph.
- Replaces the default worksheet tab name with the name that you specify in an EXL2K report.

The worksheet tab names for an Excel Table of Contents report are the BY field values that correspond to the data on the current worksheet. If the user specifies the TITLETEXT keyword in the style sheet, it is ignored.

- Excel limits the length of worksheet titles to 31 characters. The following special characters cannot be used: ':', '?', '*', and '/'.
- If you want to use date fields as the bursting BY field, you can include the - character instead of the / character. The - character is valid in an Excel tab title. However, if you do use the / character, WebFOCUS substitutes it with the - character.

# Create a Custom Report Title

Add the following declaration to your WebFOCUS StyleSheet:

```
TYPE=REPORT, TITLETEXT='title', $
```

where:

**title**

Is the text for your title.

The maximum number of characters for:

- The worksheet tab name in an EXL2K report is 31. Any text that exceeds 31 characters is truncated.
- The browser title for an HTML report or graph is 95. This is a limit imposed by the browser.

  Text specified in the title is placed in the file as is and is not encoded. Special characters, such as <, >, and &, should not be used since they have special meaning in HTML and may produce unpredictable results.

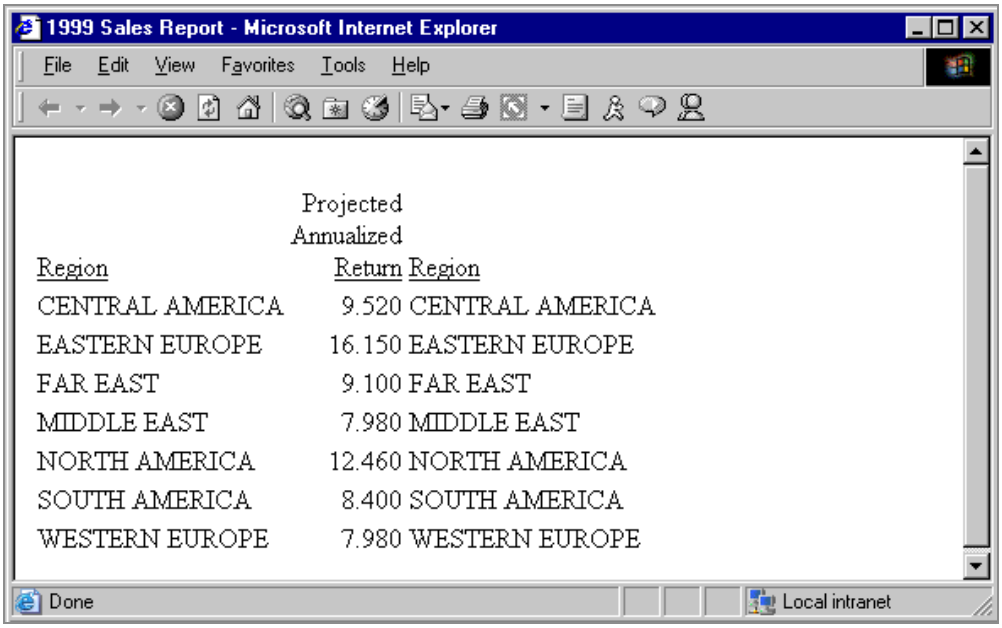
  **Note:** The words "Microsoft Internet Explorer" are always appended to any HTML report title.

# Creating a Custom Report Title in an HTML Report

The following illustrates how you can replace the default report title in an HTML report using the TITLETEXT attribute in your StyleSheet.

```
TABLE FILE SHORT
SUM PROJECTED REGION
BY REGION
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, TITLETEXT='1999 Sales Report', $
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The output is:



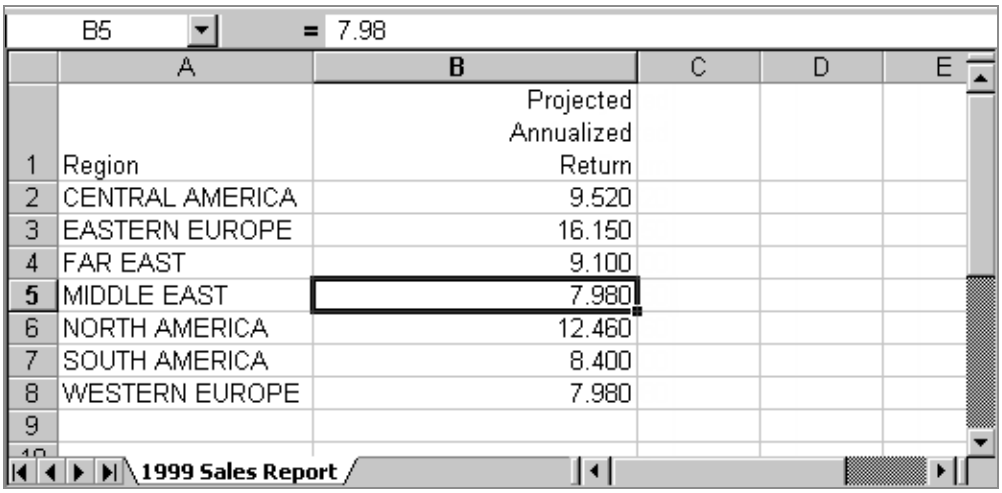

# Creating a Custom Report Title in an EXL2K Report

The following illustrates how you can replace the default worksheet tab name in an EXL2K report using the TITLETEXT attribute in your StyleSheet.

```
TABLE FILE SHORT
SUM PROJECTED_RETURN
BY REGION
ON TABLE PCHOLD FORMAT EXL2K
ON TABLE SET STYLE *
TYPE=REPORT, TITLETEXT='1999 Sales Report', $
```

```
ENDSTYLE
END
```

The output is:



| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Region | Projected Annualized Return | | | |
| 2 | CENTRAL AMERICA | 9.520 | | | |
| 3 | EASTERN EUROPE | 16.150 | | | |
| 4 | FAR EAST | 9.100 | | | |
| 5 | MIDDLE EAST | 7.980 | | | |
| 6 | NORTH AMERICA | 12.460 | | | |
| 7 | SOUTH AMERICA | 8.400 | | | |
| 8 | WESTERN EUROPE | 7.980 | | | |
| 9 | | | | | |



# Creating a Report Heading or Footing

A report heading appears before the first page and is one of the most important components of a report. It provides a unique name to a report and identifies its purpose or content. A short, single-line report heading may meet the needs of your user, or you may include multiple lines of appropriate information.

A report footing appears after the last page of a report. You might add a report footing to signal the end of data so the user knows that the report is complete. A report footing can also provide other information, such as the author of the report.

A report heading or footing can include text, fields, Dialogue Manager variables, images, and spot markers.

# Create a Report Heading

Include the following syntax in a request. Each heading or footing line must begin and end with a double quotation mark.

```
ON TABLE [PAGE-BREAK AND] SUBHEAD
 "content ... "
["content ... "]
.
.
.
["content ... "]
```

where:

**PAGE-BREAK**

Is an optional command that creates the report heading on the first page by itself, followed by the page or pages of data. If you do not use PAGE-BREAK, the report heading appears on the first page of the report, followed by a page heading if one is supplied, and column titles. For related information, see Placing a Report Heading or Footing on Its Own Page.

**SUBHEAD**

Is the command required to designate a report heading.

**content**

Heading or footing content can include the following elements, between double quotation marks. (If the ending quotation mark is omitted, all subsequent lines of the request are treated as part of the report heading.)

**text**

Is the text that appears on the first page of a report. You can include multiple lines of text.

The text must start on a line by itself, following the SUBHEAD command.

Text can be combined with variables and spot markers.

For related information, see Limits for Headings and Footings.

**variable**

It can be any one or a combination of the following:

`Fields` (real data source fields, virtual fields created with the DEFINE command in a Master File or report request, calculated values created with the COMPUTE command

in a request, or a system field such as TABPAGENO). You can qualify data source fields with certain prefix operators.

```
Dialogue Manager variables.
```

`Images.` You can include images in a heading or footing.

For details, see Including an Element in a Heading or Footing.

**spot marker**

Enables you to position items, to identify items to be formatted, and to extend code beyond the 80-character line limit of some text editors.

`<+0>` divides a heading or footing into items for formatting. For details, see Identifying a Heading, Footing, Title, or FML Free Text.

`</n` specifies skipped lines. For details, see Controlling the Vertical Positioning of a Heading or Footing.

`<-n` to position the next character on the line. For details, see Using Spot Markers to Refine Positioning.

`<0X` continues a heading or footing specification on the next line of the request. For details, see Extending the Heading and Footing Code to Multiple Lines in a Report Request.

**Note:** When a closing spot marker is immediately followed by an opening spot marker (><), a single space text item is placed between the two spot markers (> <). This must be considered when applying formatting.

**Blank lines**

If you omit all text, variables, and spot markers, you have a blank heading or footing line (for example, " ") which you can use to skip a line in the heading or footing. (You can also skip a line using a vertical spot marker, such as </1.)

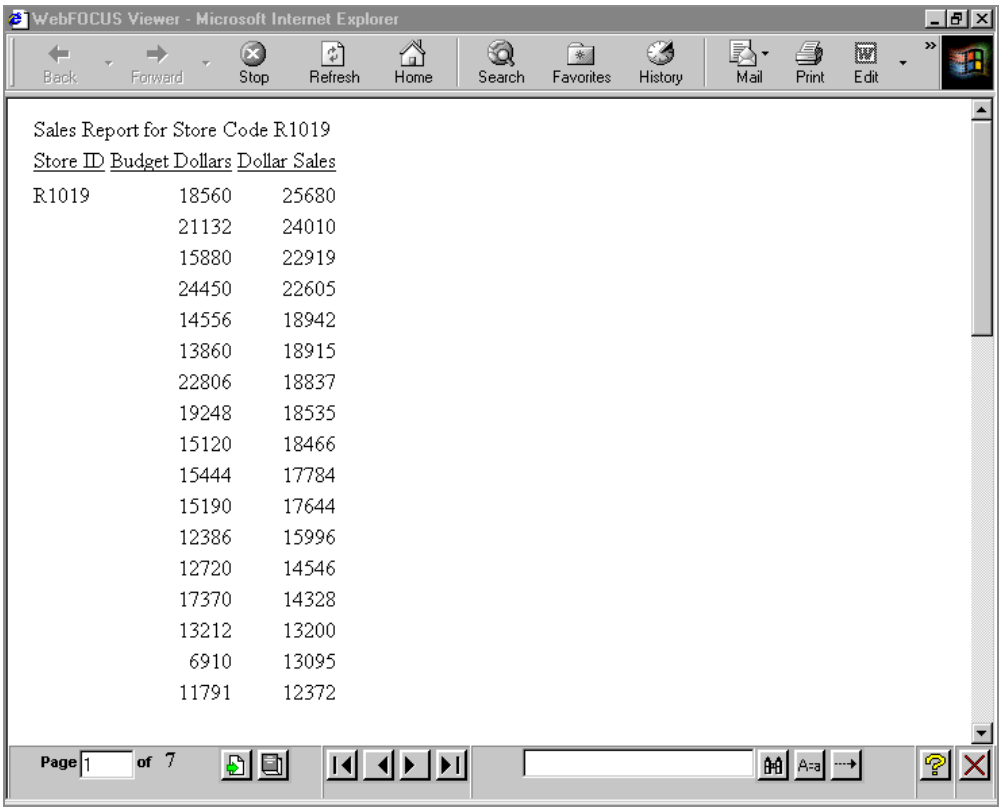
# Creating a Single-Line Report Heading

This request creates a single-line report heading that identifies the content of the report.

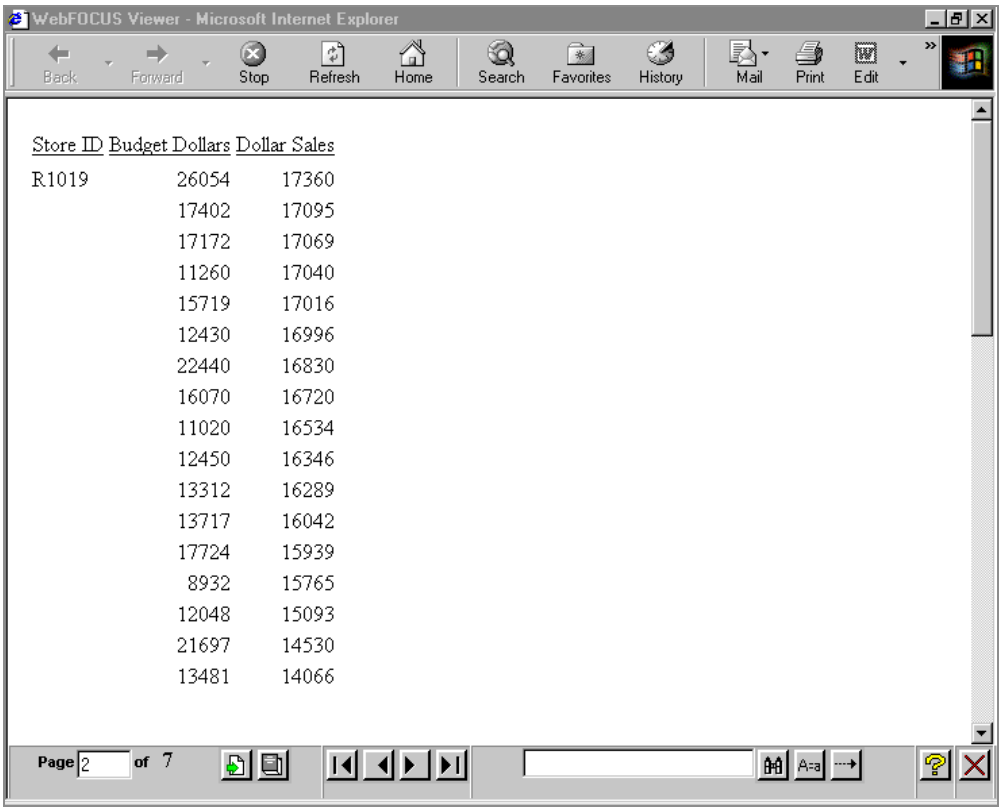
```
TABLE FILE GGSALES
PRINT BUDDOLLARS DOLLARS
```

```
BY STCD
WHERE STCD EQ 'R1019'
ON TABLE SUBHEAD
"Sales Report for Store Code R1019"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET WEBVIEWER ON
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF,$
ENDSTYLE
END
```

The output illustrates the placement of a report heading on a multi-page HTML report. The report heading is at the top of the first page.




Subsequent pages do not contain a heading.




**Tip:** If you do not see the navigation arrows, click the maximize button.

# Create a Report Footing

Include the following syntax in a request. Each heading or footing line must begin and end with a double quotation mark.

```
ON TABLE [PAGE-BREAK AND] SUBFOOT
 "content ... "
["content ... "]
.
.
.
["content ... "]
```

where:

**PAGE-BREAK**

Is an optional command that creates the report footing after the last page by itself. If you do not include PAGE-BREAK, the report footing appears as the last line of the report. For related information, see Placing a Report Heading or Footing on Its Own Page.

**SUBFOOT**

Is the command required to designate a report footing.

**content**

Heading or footing content can include the following elements, between double quotation marks. (If the ending quotation mark is omitted, all subsequent lines of the request are treated as part of the report footing unless you are using the <0X spot marker.)

**text**

Is text that appears on the last page of a report. You can include multiple lines of text.

The text must start on a line by itself, following the SUBFOOT command.

Text can be combined with variables and spot markers.

For related information, see Limits for Headings and Footings.

**variable**

It can be any one or a combination of the following:

`Fields` (real data source fields, virtual fields created with the DEFINE command in a Master File or report request, calculated values created with the COMPUTE command in a request, or a system field such as TABPAGENO). You can qualify data source fields with certain prefix operators.

```
Dialogue Manager variables.
```

`Images`. You can include images in a heading or footing.

For details, see Including an Element in a Heading or Footing.

**spot marker**

Enables you to position items, to identify items to be formatted, and to extend code beyond the 80-character line limit of the text editor.

`<+0>` divides a heading or footing into items for formatting. For details, see Identifying a Heading, Footing, Title, or FML Free Text.

`</n` specifies skipped lines. For details, see Controlling the Vertical Positioning of a Heading or Footing.

`<-n` to position the next character on the line. For details, see Using Spot Markers to Refine Positioning.

`<0X` continues a heading or footing specification on the next line of the request. For details, see Extending the Heading and Footing Code to Multiple Lines in a Report Request.

**Note:** When a closing spot marker is immediately followed by an opening spot marker (><), a single space text item is placed between the two spot markers (> <). This must be considered when applying formatting.

**Blank lines**

If you omit all text, variables, and spot markers, you have a blank heading or footing line (for example, " ") which you can use to skip a line in the heading or footing. (You can also skip a line using a vertical spot marker, such as </1.)

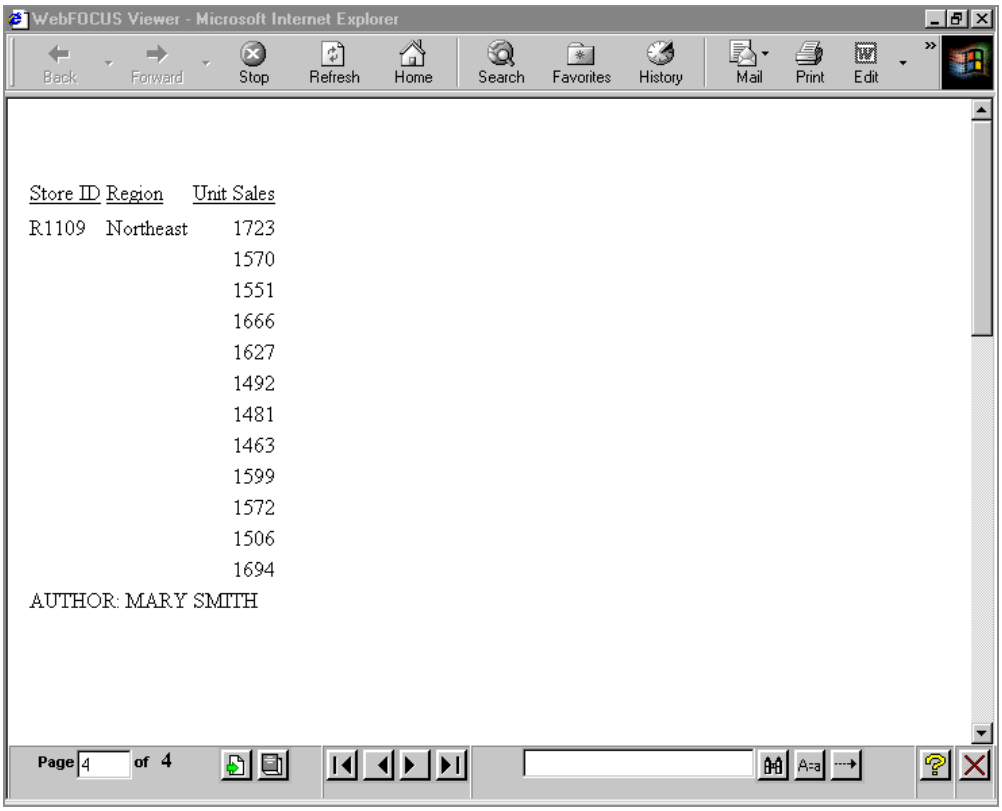
# Creating a Single-Line Report Footing

This request creates a single-line report footing that identifies the author of the report.

```
TABLE FILE GGSALES
PRINT UNITS
WHERE UNITS GE 1400
BY STCD BY REGION
WHERE REGION EQ 'Northeast'
ON TABLE SUBFOOT
"AUTHOR: MARY SMITH"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET WEBVIEWER ON
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF,$
```

```
ENDSTYLE
END
```

The output illustrates the placement of a report footing on a multi-page HTML report. The report footing follows the data on the last page.




**Tip:** If you do not see the navigation arrows, click the maximize button.

# Creating a Page Heading or Footing

A page heading appears at the top of every page of a report, and a page footing appears at the bottom of every page.

Add a page heading to identify and reinforce the report content and purpose from page to page, or include a variable that customizes the heading on each page. For example, consider a report with employee bank account information, arranged by department. Information for each department appears on a separate page. The page heading for this report identifies the department addressed on each page (for example, ACCOUNT REPORT FOR PRODUCTION DEPARTMENT).

Add a page footing to supply information that warrants repetition on each page, such as the date of the report, or a reminder that it is confidential. You can also use a page footing to supply descriptive information about a report, such as PRELIMINARY or DRAFT COPY.

A page heading or footing can include text, fields, Dialogue Manager variables, images, and spot markers.

In addition, you can use page heading and footing syntax to create a free-form (non-tabular) report, in which you position data on a page using a layout of your own design. See Creating a Free-Form Report for details.

A TABLE request can have more than one page heading or footing. For each heading or footing, a WHEN clause against the data being retrieved can determine whether the heading or footing displays on the report output.

In a heading, the data for the WHEN clause and data field values displayed in the heading are based on the first line on the page. In a footing, the data for the WHEN clause and the data field values displayed in the footing are based on the last line on the page.

The CONDITION StyleSheet attribute enables you to identify a specific WHEN clause so that you can style each heading or footing separately. For more information, see Identifying a Heading, Footing, Title, or FML Free Text.

# Create a Page Heading

Include the following syntax in a request. Each heading or footing line must begin and end with a double quotation mark.

```
[HEADING [CENTER]]
 "content ... "
["content ... "]
.
.
.
["content ... "]
```

where:

**HEADING**

Is an optional command if you place the text before the first display command (for example, PRINT or SUM); otherwise, it is required to identify the text as a page heading.

**CENTER**

Is an optional command that centers the page heading over the report data. For details, see Center a Page Heading or Footing Using Legacy Formatting.

**content**

Heading or footing content can include the following elements, between double quotation marks. (If the ending quotation mark is omitted, all subsequent lines of the request are treated as part of the page heading.)

**text**

Is text for the page heading. You can include multiple lines of text.

The text must start on a line by itself, following the HEADING command.

Text can be combined with variables and spot markers.

For related information, see Limits for Headings and Footings.

**variable**

It can be any one or a combination of the following:

`Fields` (real data source fields, virtual fields created with the DEFINE command in a Master File or report request, calculated values created with the COMPUTE command in a request, or a system field such as TABPAGENO). You can qualify data source fields with certain prefix operators.

```
Dialogue Manager variables.
```

`Images`. You can include images in a heading or footing.

For details, see Including an Element in a Heading or Footing.

**spot marker**

Enables you to position items, to identify items to be formatted, and to extend code beyond the 80-character line limit of the text editor.

`<+0>` divides a heading or footing into items for formatting. For details, see Identifying a Heading, Footing, Title, or FML Free Text.

`</n` specifies skipped lines. For details, see Controlling the Vertical Positioning of a Heading or Footing.

<-n to position the next character on the line. For details, see Using Spot Markers to Refine Positioning.

<0X continues a heading or footing specification on the next line of the request. For details, see Extending Heading and Footing Code to Multiple Lines in a Report Request.

**Note:** When a closing spot marker is immediately followed by an opening spot marker (><), a single space text item is placed between the two spot markers (> <). This must be considered when applying formatting.

**Blank lines**

If you omit all text, variables, and spot markers, you have a blank heading or footing line (for example, " ") which you can use to skip a line in the heading or footing. (You can also skip a line using a vertical spot marker, such as </1.)

# Creating a Single-Line Page Heading

This request omits the command HEADING since the page heading text precedes the display command PRINT. The page heading includes text and an embedded field.

```
TABLE FILE EMPLOYEE
"ACCOUNT REPORT FOR DEPARTMENT <DEPARTMENT"
PRINT CURR_SAL BY DEPARTMENT BY HIGHEST BANK_ACCT
BY EMP_ID
ON DEPARTMENT PAGE-BREAK
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF,$
ENDSTYLE
END
```

The output illustrates the placement of a page heading on a multi-page HTML report. The page heading appears on both pages of the report, identifying the department to which the data applies. See Including a Field Value in a Heading or Footing for information on embedded field values. The first page of data applies to the MIS department.

ACCOUNT REPORT FOR DEPARTMENT MIS

| DEPARTMENT | BANK_ACCT | EMP_ID | CURR_SAL |
|---|---|---|---|
| MIS | 163800144 | 818692173 | $27,062.00 |
| | 122850108 | 326179357 | $21,780.00 |
| | 40950036 | 117593129 | $18,480.00 |
| | | 112847612 | $13,200.00 |
| | | 219984371 | $18,480.00 |
| | | 543729165 | $9,000.00 |

The second page of data applies to the PRODUCTION department.

ACCOUNT REPORT FOR DEPARTMENT PRODUCTION

| DEPARTMENT | BANK_ACCT | EMP_ID | CURR_SAL |
|---|---|---|---|
| PRODUCTION | 819000702 | 123764317 | $26,862.00 |
| | 136500120 | 451123478 | $16,100.00 |
| | 160633 | 119329144 | $29,700.00 |
| | | 071382660 | $11,000.00 |
| | | 119265415 | $9,500.00 |
| | | 126724188 | $21,120.00 |

# Create a Page Footing

Include the following syntax in a request. Each heading or footing line must begin and end with a double quotation mark.

```
FOOTING [CENTER] [BOTTOM]
  "content ... "
["content ... "]
.
.
.
["content ... "]
```

where:

**FOOTING**

Is the required command that identifies the content as a page footing.

**CENTER**

Is an optional command that centers the page footing over the report data. For details on CENTER, see Center a Page Heading or Footing Using Legacy Formatting.

**BOTTOM**

Is an optional command that places the footing at the bottom of the page. If you omit BOTTOM, the page footing appears two lines below the report data. For details on BOTTOM, see Position a Page Footing at the Bottom of a Page.

**content**

Heading or footing content can include the following elements, between double quotation marks. (If the ending quotation mark is omitted, all subsequent lines of the request are treated as part of the footing unless you are using the <0X spot marker.)

**text**

Is text for the page footing. You can include multiple lines of text.

The text must start on a line by itself, following the FOOTING command.

Text can be combined with variables and spot markers.

For related information, see Limits for Headings and Footings.

**variable**

It can be any one of, or a combination of the following:

`Fields` (real data source fields, virtual fields created with the DEFINE command in a Master File or report request, calculated values created with the COMPUTE command in a request, or a system field such as TABPAGENO). You can qualify data source fields with certain prefix operators.

```
Dialogue Manager variables.
```

`Images.` You can include images in a heading or footing.

For details, see Including an Element in a Heading or Footing.

**spot marker**

Enables you to position items, to identify items to be formatted, and to extend code beyond the 80-character line limit of the text editor.

`<+0>` divides a heading or footing into items for formatting. For details, see Identifying a Heading, Footing, Title, or FML Free Text.

`</n` specifies skipped lines. For details, see Controlling the Vertical Positioning of a Heading or Footing.

`<-n` positions the next character on the line. For details, see Using Spot Markers to Refine Positioning.

`<0X` continues a heading or footing specification on the next line of the request. For details, see Extending Heading and Footing Code to Multiple Lines in a Report Request.

**Note:** When a closing spot marker is immediately followed by an opening spot marker (><), a single space text item is placed between the two spot markers (> <). This must be considered when applying formatting.

**Blank lines**

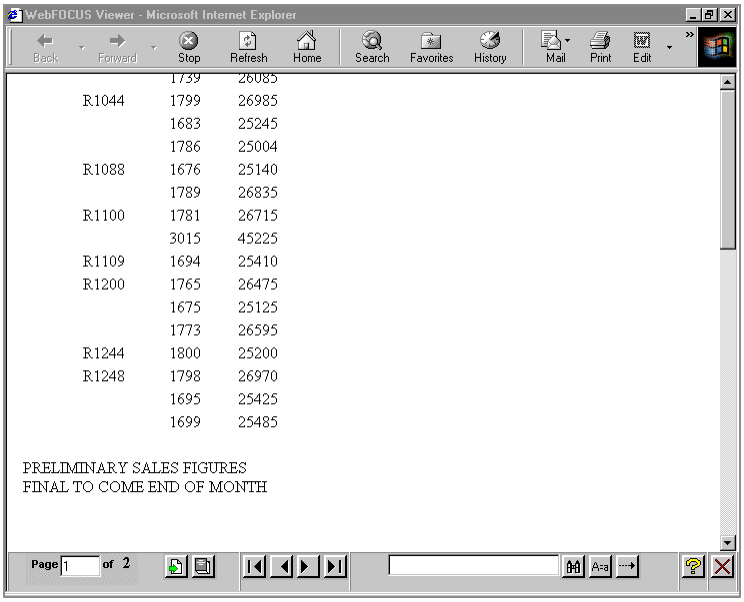
If you omit all text, variables, and spot markers, you have a blank heading or footing line (for example, " ") which you can use to skip a line in the heading or footing. (You can also skip a line using a vertical spot marker, such as </1.)

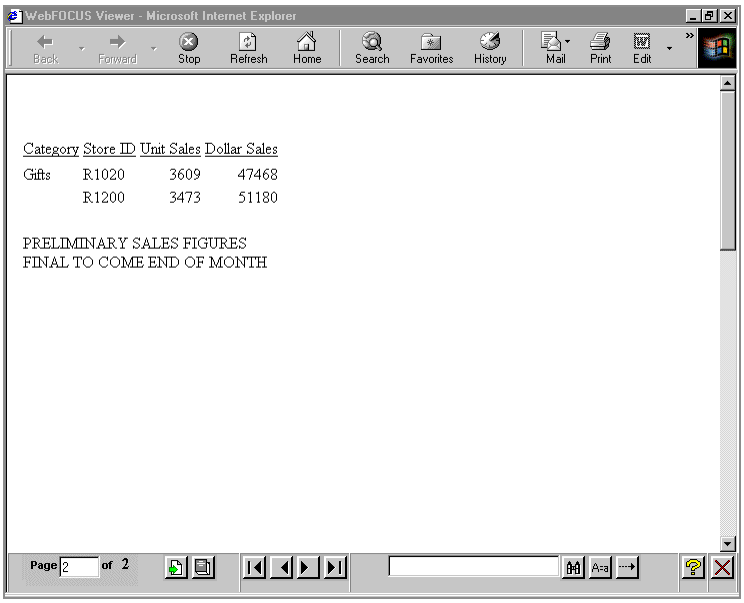
# Creating a Multiple-Line Page Footing

This request creates a two-line page footing that identifies the data as preliminary and indicates when the final report is available.

```
TABLE FILE GGSALES
PRINT UNITS DOLLARS
BY CATEGORY BY STCD
WHERE TOTAL DOLLARS GE 25000
FOOTING
"PRELIMINARY SALES FIGURES"
"FINAL TO COME END OF MONTH"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET WEBVIEWER ON
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF,$
ENDSTYLE
END
```

The partial output illustrates the placement of page footings on a multi-page HTML report. The page footing appears on both pages of the report.




**Tip:** If you do not see the navigation arrows, click the maximize button.

# Specify a Heading or Footing With a WHEN Clause

```
{HEADING [CENTER]|FOOTING}
"text_and_data1"
   .
   .
   .
"text_and_datan"
WHEN expression
```

where:

**text_and_data1, text_and_datan**

Is the text and data for each heading or footing line.

**expression**

Is an expression that resolves to TRUE or FALSE (1 or 0). If its value resolves to TRUE, the heading or footing is displayed. If the expression resolves to FALSE, the heading or footing is not displayed.

# Usage Notes for Multiple Headings

- HEADING CENTER and FOOTING CENTER apply only to the specific heading or footing in which they are specified.
- A request can have a total of 120 headings, 120 footings, 120 subheadings, and 120 subfootings.
- Once you use the BOTTOM option on a footing, all subsequent footings also go to the bottom of the page.

# Freezing HTML, AHTML, and XLSX Headings, Footings, and Column Titles

You may want to scroll the data in a report while freezing headings, column titles, and footings to see the context of the report output while scrolling.

Using StyleSheet attributes, you can set aside a scrollable area for HTML, AHTML, and XLSX report output.

# Usage Notes for HTMLARCHIVE With HFREEZE

WebFOCUS interactive reporting features must have a connection to the WebFOCUS client to access the components required to operate successfully.

HTMLARCHIVE can be used to create self-contained HTML pages with user-defined images when client access is not available.

To generate HTML pages containing user-defined images that can operate interactively, use one of the following commands:

```
SET HTMLEMBEDIMG=ON
SET HTMLARCHIVE=ON
```

Define BASEURL to point directly to the host machine where these files can be accessed using the following syntax:

```
SET BASEURL=http://{hostname:portnumber}
```

For more information on SET BASEURL, see Specifying a Base URL.

# Create a Scrollable Area in an HTML Report

```
TYPE=REPORT,HFREEZE={OFF|ON|TOP|BOTTOM},[SCROLLHEIGHT={AUTO|nn[.n]}], $
```

where:

**HFREEZE=OFF**

Does not freeze the heading, column titles, grand totals, and footing. OFF is the default.

**HFREEZE=ON**

Freezes the heading, column titles, grand totals, and footing.

**HFREEZE=TOP**

Freezes the heading and column titles.

**HFREEZE=BOTTOM**

Freezes the grand totals and footing.

**SCROLLHEIGHT=AUTO**

In an HFREEZE report, the output is responsive and automatically fit to the height of the output container when the size of the output container changes.

When AUTOFIT=ON, the report automatically fits to the size of the output container (both vertically and horizontally) when the size of the output container changes.

**Note:** The AUTOFIT=ON setting overrides the SCROLLHEIGHT setting.

**nn[.n]**

Is the height, in inches, of the scrollable area. The default for non-mobile devices is 4 inches.

# Create a Scrollable Area in an AHTML Report

```
TYPE=REPORT,HFREEZE={OFF|ON}, $
```

where:

**HFREEZE=OFF**

Does not freeze the heading, column titles, grand totals, and footing. OFF is the default value.

**HFREEZE=ON**

Freezes the heading, column titles, grand totals, and footing.

# Create a Scrollable Area in an XLSX Report

```
TYPE=REPORT,HFREEZE={OFF|ON}, $
```

where:

**HFREEZE=OFF**

Does not freeze the heading and column titles. OFF is the default value.

**HFREEZE=ON**

Freezes the heading and column titles.

You can also freeze columns in an XLSX report so that when you scroll to the right to view data in the worksheet, the designated columns remain on the screen without losing context. For more information, see Freezing Columns in an XLSX Report.

**Note:** Freezing can be applied to multiple worksheets in a workbook when the BYTOC option is used that renders multiple worksheets based on the sort field.

# HFREEZE With Blank Column Titles

The HTML HFREEZE reporting feature supports blank column titles. The vertical HFREEZE scroll bar is aligned with the first row of report data.

# Usage Notes for Freezing Areas of HTML Report Output

Report headers and footers can be frozen, while the data lines scroll in HTML, AHTML, and XLSX reports only. For all other output formats, the StyleSheet attribute HFREEZE is ignored. The request must include the setting ON TABLE SET HTMLCSS ON, which is the default.

The following HTML features are not supported with HFREEZE:

- HFREEZE does not support the placement of images in subheadings and subfootings

within the frozen area in Internet Explorer. HFREEZE does support the placement of images in subheadings and subfootings within the frozen area in Mozilla Firefox®, Google Chrome™, and Microsoft Edge®.

- Accordion reports
- WRAP StyleSheet attribute
- Custom HTML tags or JavaScript
- Compound Reports

# Usage Notes for Freezing Areas of AHTML Report Output

Report headers and footers can be frozen, while the data lines scroll in AHTML, HTML, and XLSX reports only. For all other output formats, the StyleSheet attribute HFREEZE is ignored. The request must include the setting ON TABLE SET HTMLCSS ON, which is the default.

The following AHTML features are not supported with HFREEZE:

- SET SUBTOTALS=ABOVE and SET SUBTOTALS=BELOW

  In a standard AHTML report, the subtotals display below the data lines and the grandtotal row is anchored at the bottom of the frozen frame. This behavior occurs regardless of whether the SET SUBTOTALS command is used.
- HFREEZE does not support the placement of images in subheadings and subfootings within the frozen area.
- Accordion reports

# Usage Notes for Freezing Areas of XLSX Report Output

Report headers and footers can be frozen, while the data lines scroll in XLSX, HTML, and AHTML reports only. For all other output formats, the StyleSheet attribute HFREEZE is

ignored. The request must include the setting ON TABLE SET HTMLCSS ON, which is the default.

The following XLSX features are not supported with HFREEZE:

- SET SUBTOTALS=ABOVE and SET SUBTOTALS=BELOW

  In a standard AHTML report, the subtotals display below the data lines and the grandtotal row is anchored at the bottom of the frozen frame. This behavior occurs regardless of whether the SET SUBTOTALS command is used.

- HFREEZE does not support the placement of images in subheadings and subfootings within the frozen area.

# Creating a Sort Heading or Footing

A sort heading is text that precedes a change in a sort field value, identifying the beginning of a group of related data. A sort footing is text that follows a change in a sort field value, identifying the end of a group of related data.

A sort heading or footing, which appears in the body of a report, helps you identify different areas of detail in a report. Sort headings or footings can include text, fields, Dialogue Manager variables, images, and spot markers.

By including a WHEN phrase in a request, you can generate a message, implemented as a sort heading or footing, for data that meets the criterion you define. For details on conditional formatting, see Controlling Report Formatting.

If you are using a RECAP command to create subtotal values in a calculation, you can replace the default RECAP label with a more meaningful sort footing by following the RECAP command for a field with a SUBFOOT command for that field. For details about the RECAP command, see Including Totals and Subtotals.

If one or more data fields are embedded in the sort footing, you can *omit* a display command from the report request since, by default, data fields in headings and footings are summed. If, however, a request does contain an explicit SUM command and a display field is also specified in the sort footing, the field in the sort footing is summed. You can omit the display command from other types of headings and footings as well. Note that the data for headings is taken from the first sort group and the data for footings is taken from the last sort group. For related information, see Limits for Headings and Footings.

By default, WebFOCUS generates a blank line before a subheading or subfooting. You can eliminate these automatic blank lines by issuing the SET DROPBLNKLINE=ON command.

# Alignment of Subheadings and Subfootings

By default, with SQUEEZE=ON, the right margin used for borders and backcolor for subheadings and subfootings is defined based on the maximum width of all heading, footing, subheading, and subfooting lines. The length of subheading and subfooting lines is tied to the lengths of the page heading and page footing, not to the size of the data columns in the body of the report. The ALIGN-BORDERS=BODY attribute in a StyleSheet allows you to align the subheadings and subfootings with the data/report body on PDF report output instead of the other heading elements.

# Create a Sort Heading

Each heading or footing line must begin and end with a double quotation mark, unless you are using the line continuation spot marker (<ox).

```
BY fieldname SUBHEAD [NEWPAGE]
 "content ... "
["content ... "]
.
.
.
["content ... "]
[WHEN expression;]
BY fieldname
ON fieldname SUBHEAD [NEWPAGE]
 "content ... "
["content ... "]
.
.
.
["content ... "]
[WHEN expression;]
```

OR

```
BY fieldname
ON fieldname SUBHEAD [NEWPAGE]
 "content ... "
["content ... "]
.
```

```
.
.
["content ... "]
[WHEN expression;]
```

where:

**fieldname**

Is the sort field before which the heading text appears.

**content**

Heading or footing content can include the following elements, between double quotation marks. (If the ending quotation mark is omitted, all subsequent lines of the request are treated as part of the heading.)

**text**

Is text for the sort heading. You can include multiple lines of text.

The text must start on a line by itself, following the SUBHEAD command.

Text can be combined with variables and spot markers.

For related information, see Limits for Headings and Footings.

**variable**

It can be any one of, or a combination of, the following:

`Fields` (real data source fields, virtual fields created with the DEFINE command in a Master File or report request, calculated values created with the COMPUTE command in a request, or a system field such as TABPAGENO). You can qualify data source fields with certain prefix operators.

```
Dialogue Manager variables.
```

`Images`. You can include images in a heading or footing.

For details, see Including an Element in a Heading or Footing.

**spot marker**

Enables you to position items, to identify items to be formatted, and to extend code beyond the 80-character line limit of the text editor.

<+0> divides a heading or footing into items for formatting. For details, see Identifying a Heading, Footing, Title, or FML Free Text.

</n specifies skipped lines. For details, see Controlling the Vertical Positioning of a Heading or Footing.

<-n to position the next character on the line. For details, see Using Spot Markers to Refine Positioning.

<0X continues a heading or footing specification on the next line of the request. For details, see Extending the Heading and Footing Code to Multiple Lines in a Report Request.

**Note:** When a closing spot marker is immediately followed by an opening spot marker (><), a single space text item is placed between the two spot markers (> <). This must be considered when applying formatting.

**WHEN expression**

Specifies a condition under which a sort heading is displayed, as determined by a logical expression. You must place the WHEN phrase on a line following the text.

For details on conditional formatting, see Controlling Report Formatting. For related information, see Using Expressions.

**Blank lines**

If you omit all text, variables, and spot markers, you have a blank heading or footing line (for example, " ") which you can use to skip a line in the heading or footing. (You can also skip a line using a vertical spot marker, such as </1.)

**NEWPAGE**

Inserts a new page after the sort heading. Column titles appear on every page.

You can use NEWPAGE with PDF reports.In HTML reports, blank space is added instead of a new page.

# Creating a Sort Heading When a Product Description Changes

This request displays a sort heading each time the product description changes. The sort heading includes text and an embedded field.

```
TABLE FILE GGPRODS
PRINT PACKAGE_TYPE AND UNIT_PRICE
WHERE UNIT_PRICE GT 50
BY PRODUCT_DESCRIPTION NOPRINT BY PRODUCT_ID
ON PRODUCT_DESCRIPTION SUBHEAD
"Summary for <PRODUCT_DESCRIPTION"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The sort heading identifies the product that the next line of data applies to.

| Product Code | Package | Unit Price |
|---|---|---|
| Summary for Coffee Grinder | | |
| G 110 | Case | 125.00 |
| Summary for Coffee Pot | | |
| G121 | Case | 140.00 |
| Summary for French Roast | | |
| B142 | Pounds | 81.00 |
| Summary for Hazelnut | | |
| B141 | Pounds | 58.00 |
| Summary for Kona | | |
| B144 | Pounds | 76.00 |
| Summary for Thermos | | |
| G104 | Case | 96.00 |

See Including an Element in a Heading or Footing for information on embedded field values.

# Creating a Conditional Sort Heading

This request displays a sort heading for a category only if its sales fall below $ 17,000,000.

```
TABLE FILE GGSALES
SUM DOLLARS
BY CATEGORY SUBHEAD
"<CATEGORY ALERT: SALES FALL BELOW $17,000,000"
WHEN DOLLARS LT 17000000;
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

Sales for the category Gifts fall below the specified amount, as the sort heading warns. No other category is preceded by a sort heading.

| Category | Dollar Sales |
|---|---|
| Coffee | 17231455 |
| Food | 17229333 |
| Gifts ALERT: SALES FALL BELOW $17,000,000 | |
| Gifts | 11695502 |

See Including a Field Value in a Heading or Footing for information on embedded field values.

# Create a Sort Footing

Each heading or footing line must begin and end with a double quotation mark.

For a single sort field, use the syntax

```
BY fieldname SUBFOOT [WITHIN] [MULTILINES] [NEWPAGE]
 "content ... "
["content ... "]
.
.
.
["content ... "]
[WHEN expression;]
BY fieldname
ON fieldname SUBFOOT [WITHIN] [MULTILINES] [NEWPAGE]
```

```
 "content ... "
["content ... "]
.
.
.
["content ... "]
[WHEN expression;]
```

For multiple sort fields, use the syntax

```
BY fieldname
ON fieldname SUBFOOT [MULTILINES] [NEWPAGE]
 "content ... "
["content ... "]
.
.
.
["content ... "]
[WHEN expression;]
```

where:

**fieldname**

Is the sort field after which the footing text appears.

**WITHIN**

Causes the fields in the SUBFOOT to be calculated within each value of fieldname. Without this option, a field in the SUBFOOT is taken from the last line of report output above the subfooting.

**MULTILINES**

Suppresses the sort footing when there is only one line of data for a sort field value. (MULTI-LINES is a synonym for MULTILINES.)

**content**

Heading or footing content can include the following elements, between double quotation marks. (If the ending quotation mark is omitted, all subsequent lines of the request are treated as part of the sort footing.)

**text**

Is text that appears on the first page of a report. You can include multiple lines of text.

The text must start on a line by itself, following the SUBFOOT command.

Text can be combined with variables and spot markers.

For related information, see Limits for Headings and Footings.

**variable**

It can be any one or a combination of the following:

`Fields` (real data source fields, a virtual field created with the DEFINE command in a Master File or report request, calculated values created with the COMPUTE command in a request, a system field such as TABPAGENO). You can qualify data source fields with certain prefix operators.

```
Dialogue Manager variables.
```

`Images`. You can include images in a heading or footing.

For details, see Including an Element in a Heading or Footing.

**spot marker**

Enables you to position items, to identify items to be formatted, and to extend code beyond the 80-character line limit of the text editor.

`<+0>` divides a heading or footing into items for formatting. For details, see Identifying a Heading, Footing, Title, or FML Free Text.

`</n` specifies skipped lines. For details, see Controlling the Vertical Positioning of a Heading or Footing.

`<-n` to position the next character on the line. For details, see Using Spot Markers to Refine Positioning.

`<0X` continues a heading or footing specification on the next line of the request. For details, see Extending Heading and Footing Code to Multiple Lines in a Report Request.

**Note:** When a closing spot marker is immediately followed by an opening spot marker (><), a single space text item is placed between the two spot markers (> <). This must be considered when applying formatting.

**WHEN expression**

Specifies a condition under which a sort footing is displayed, as determined by a logical expression. You must place the WHEN phrase on a line following the text.

For details on conditional formatting, see Controlling Report Formatting. For related information, see Using Expressions.

**Blank lines**

If you omit all text, variables, and spot markers, you have a blank heading or footing line (for example, " ") which you can use to skip a line in the heading or footing. (You can also skip a line using a vertical spot marker, such as </1.)

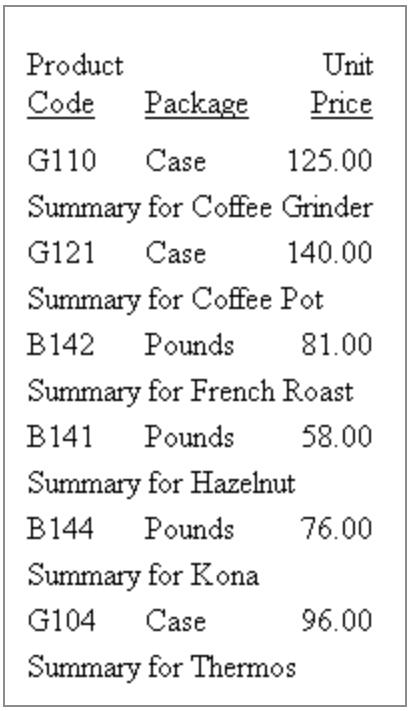
**NEWPAGE**

Inserts a new page before the sort footing.

# Creating a Sort Footing When a Product Description Changes

This request displays a sort footing each time the product description changes.

```
TABLE FILE GGPRODS
PRINT PACKAGE_TYPE AND UNIT_PRICE
WHERE UNIT_PRICE GT 50
BY PRODUCT_DESCRIPTION NOPRINT BY PRODUCT_ID
ON PRODUCT_DESCRIPTION SUBFOOT
"Summary for <PRODUCT_DESCRIPTION"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```



| Product Code | Package | Unit Price |
|---|---|---|
| G110 | Case | 125.00 |
| Summary for Coffee Grinder | | |
| G121 | Case | 140.00 |
| Summary for Coffee Pot | | |
| B142 | Pounds | 81.00 |
| Summary for French Roast | | |
| B141 | Pounds | 58.00 |
| Summary for Hazelnut | | |
| B144 | Pounds | 76.00 |
| Summary for Kona | | |
| G104 | Case | 96.00 |
| Summary for Thermos | | |

See Including a Field Value in a Heading or Footing for information on embedded field values.

# Creating a Conditional Sort Footing With Multiple Sort Options

This report lists orders, order dates, and order totals for the Century Corporation. It uses conditional sort footings to distinguish between orders that total more than $200,000 and less than $200,000.

Notice that one sort phrase (ON ORDER_NUM) specifies several sort-related options (two different SUBFOOT phrases), and that each option has its own WHEN phrase.

```
TABLE FILE CENTORD
HEADING
"Order Revenue"
" "
SUM ORDER_DATE LINEPRICE AS 'Order,Total:'
BY HIGHEST 5 ORDER_NUM
ON ORDER_NUM
   SUBFOOT
      "--- Order total is less than $200,000 ---"
```

```
      " "
      WHEN LINEPRICE LT 200000;
   SUBFOOT
      "+++ Order total is greater than or equal to $200,000 +++"
      " "
      WHEN LINEPRICE GE 200000;
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The following report appears.

Order Revenue

| Order Number: | Date Of Order: | Order Total: |
|---|---|---|
| 94710 | 2001/01/02 | $406,964.24 |
| +++ Order total is greater than or equal to $200,000 +++ | | |
| 94680 | 2001/01/02 | $421,916.60 |
| +++ Order total is greater than or equal to $200,000 +++ | | |
| 94670 | 2001/01/02 | $513,868.76 |
| +++ Order total is greater than or equal to $200,000 +++ | | |
| 94550 | 2001/01/02 | $496,323.64 |
| +++ Order total is greater than or equal to $200,000 +++ | | |
| 94530 | 2001/01/02 | $3,472.41 |
| --- Order total is less than $200,000 --- | | |

# Suppressing a Sort Footing

This request suppresses the sort footing for any product that has only one line of data (that is, a product that was only ordered one time on 01/01/96).

```
TABLE FILE GGORDER
PRINT QUANTITY
BY PRODUCT_CODE NOPRINT BY PRODUCT_DESCRIPTION
WHERE ORDER_DATE EQ '01/01/96'
WHERE STORE_CODE EQ 'R1019'
WHERE PRODUCT_DESCRIPTION EQ 'Hazelnut' OR 'Biscotti' OR 'Croissant'
ON PRODUCT_CODE SUBFOOT MULTILINES
"<PRODUCT_DESCRIPTION has multiple orders."
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

In the output, the sort footing for Biscotti is suppressed.

| Product | Ordered Units |
|---|---|
| Hazelnut | 300 |
| | 117 |
| Hazelnut has multiple orders. | |
| Biscotti | 399 |
| Croissant | 93 |
| | 433 |
| Croissant has multiple orders. | |

# Replacing the Default RECAP Label With a Sort Footing

In this request, a SUBFOOT command for the field DEPARTMENT follows a RECAP command for that field. The RECAP command creates subtotal values for the calculation.

```
TABLE FILE SHORT
SUM BALANCE AS 'Dollars' ENGLAND_POUND AS 'Sterling'
BY REGION
WHERE REGION EQ 'FAR EAST' OR 'CENTRAL AMERICA' OR 'WESTERN EUROPE';
BY COUNTRY NOPRINT
RECAP EURO/D16=BALANCE * 1.03;
```

```
SUBFOOT
" "
"Balance of investments for <COUNTRY> in Euros is <EURO>."
" "
END
```

The sort footing text (for example, "Balance of investments for FRANCE in Euros is 87,336,971.") replaces the default label for the RECAP value (** EURO 87,336,971).

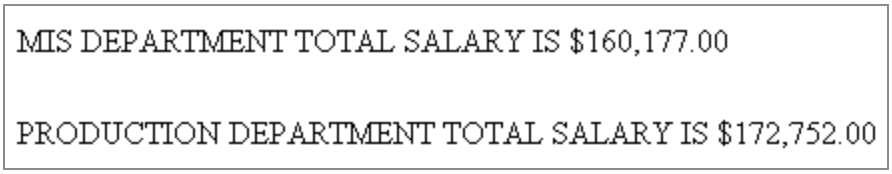
| Region | Dollars | Sterling |
|---|---|---|
| CENTRAL AMERICA | 727,810 | 443,964 |
| Balance of investments for GUATEMALA in Euros is 749,644 . | | |
| | 39,472,857 | 24,078,443 |
| Balance of investments for HONDURAS in Euros is 40,657,043 . | | |
| FAR EAST | 88,068,897 | 53,722,027 |
| Balance of investments for HONG KONG in Euros is 90,710,964 . | | |
| | 114,591,945 | 69,901,086 |
| Balance of investments for JAPAN in Euros is 118,029,703 . | | |
| WESTERN EUROPE | 125,757,198 | 76,711,891 |
| Balance of investments for ENGLAND in Euros is 129,529,914 . | | |
| | 84,793,176 | 51,723,837 |
| Balance of investments for FRANCE in Euros is 87,336,971 . | | |

# Omitting a Display Command in a Sort Footing

This request creates a complete report as a sort footing. It does not require a display command because the sort footing content contains the data fields DEPARTMENT and SALARY. By default, the field SALARY is summed in the sort footing.

```
TABLE FILE EMPLOYEE
BY DEPARTMENT NOPRINT SUBFOOT
"<DEPARTMENT DEPARTMENT TOTAL SALARY IS <SALARY"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The output is:




# Usage Notes for Subfoots

- SUBFOOT WITHIN is useful where a prefixed field within a sort break would result in a single value (for example, AVE., MIN, MAX). Use of PCT. or APCT. displays only the last value from the sort group.
- SUBFOOT WITHIN "<prefix.fieldname " does not result in the same value as SUBTOTAL prefix. The SUBFOOT WITHIN creates a display field that operates on the original input records. SUBTOTAL with a prefix operates on the internal matrix (so AVE. is the average of the SUMS or, if a display field had the prefix AVE., the average of the averages). SUBFOOT WITHIN "<AVE.field " generates an overall average.
- Prefix operators are not supported on alphanumeric fields in a WITHIN phrase.
- The ST. prefix operator is not supported in a SUBFOOT WITHIN phrase.

# Including an Element in a Heading or Footing

You can customize a heading or footing by including:

- A field value. See Including a Field Value in a Heading or Footing and Including a Text

Field in a Heading or Footing.

- A page number. See Including a Page Number in a Heading or Footing.
- A Dialogue Manager variable. See Including a Dialogue Manager Variable in a Heading or Footing.
- An image. See Including an Image in a Heading or Footing.

# Including a Field Value in a Heading or Footing

You can include a field name in heading or footing text. When the request is run, the output includes the field value. The result is a customized heading or footing with specific data identification for the user.

While you can use this technique in any report, it is essential if you are creating a free-form report. For details, see Creating a Free-Form Report.

For requests with multiple display and sort field sets, fields in a report heading or footing, or page heading or footing, are evaluated as if they were objects of the first display command. Fields in a sort heading or footing are evaluated as part of the first display command in which they are referenced. If a field is not referenced, it is evaluated as part of the last display command.

You can use a prefix operator to derive a field value in a heading or footing. However, the DST., MDE., and MDN. prefix operators are not supported in headings or footings in requests that have an ACROSS phrase or multiple display commands. For a list of operations you can perform with prefix operators, see Displaying Report Data.

Two operators are specifically designed for use with a sort footing:

- ST. produces a subtotal value of a numeric field at a sort break in a report.
- CT. produces a cumulative total of a numeric field.

# Include a Field Value in a Heading or Footing

```
<[prefix_operator]fieldname<fieldname[>]
```

or

```
<fieldname[>]
```

where:

**<fieldname**

Places the field value in the heading or footing, and suppresses trailing blanks in an alphanumeric field for all values of SET STYLEMODE.

**<fieldname>**

Places the field value in the heading or footing, and retains trailing blanks in an alphanumeric field if SET STYLEMODE = FIXED. Suppresses trailing blanks for all other values of SET STYLEMODE. PDF output retains trailing blanks regardless of the STYLEMODE setting.

**prefix_operator**

Performs a calculation directly on the value of a field. A prefix operator is applied to a single field, and affects only that field.

**Note:** To display the caret character (<) as text in a heading or footing, use two consecutive caret symbols (<<).

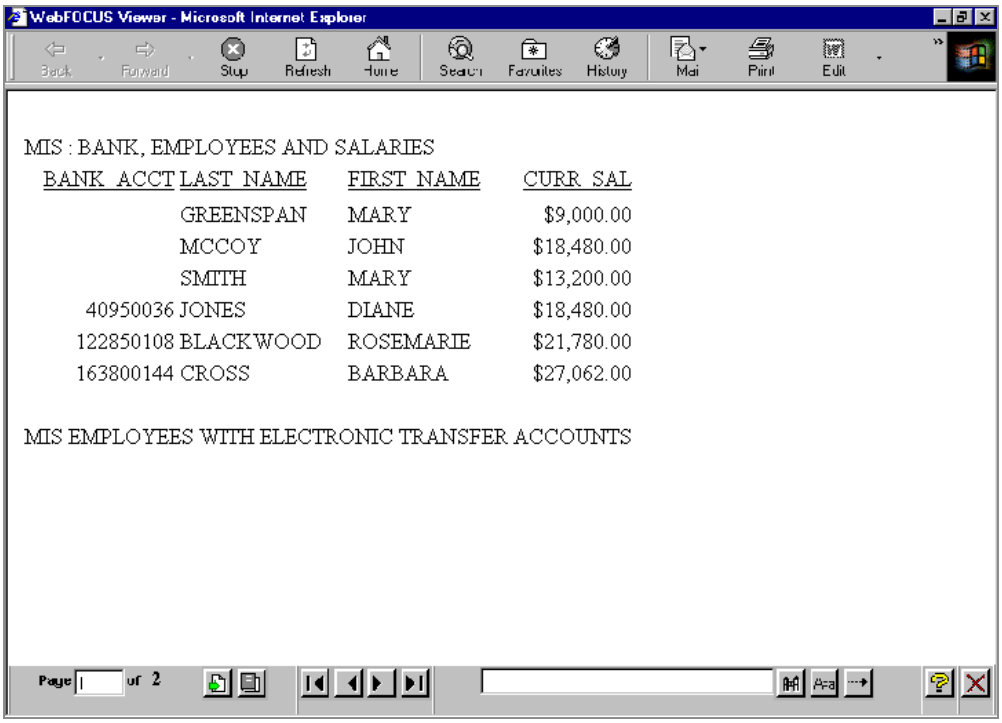
# Including the Department Name in a Page Heading and Footing

This request includes the field name DEPARTMENT in both the page heading and footing text. The command HEADING is not required in the request because the page heading text appears before the command PRINT.

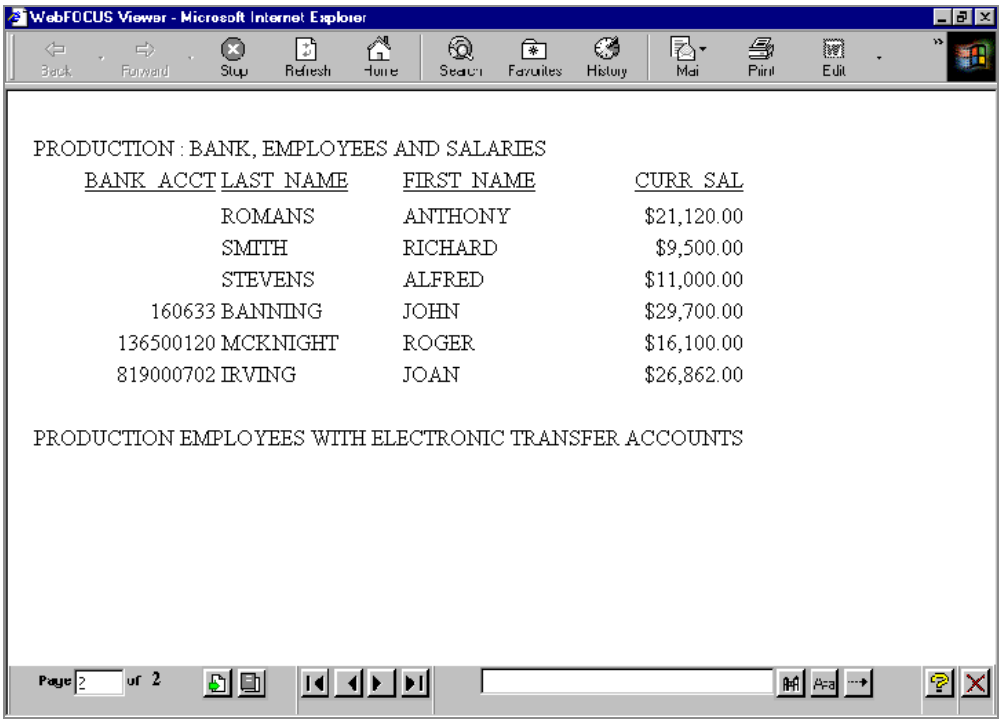
```
TABLE FILE EMPLOYEE
"<DEPARTMENT : BANK, EMPLOYEES AND SALARIES"
PRINT CURR_SAL
BY DEPARTMENT NOPRINT BY BANK_ACCT
BY LAST_NAME BY FIRST_NAME
ON DEPARTMENT PAGE-BREAK
FOOTING
"<DEPARTMENT EMPLOYEES WITH ELECTRONIC TRANSFER ACCOUNTS"
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET WEBVIEWER ON
```

```
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The output displays the output for a multi-page HTML report. On the first page of output, the value of DEPARTMENT in the page heading and footing is MIS.




On the second page of output, the value of DEPARTMENT is PRODUCTION.




**Note:** If you do not see the navigation arrows, click the maximize button.

# Displaying a Less Than Symbol in a Heading

The following request computes the difference between REVENUE_US and COGS_US and displays those rows in which the difference is less than 100,000.

```
TABLE FILE WF_RETAIL_LITE
HEADING CENTER
" Difference <<  100,000"
" "
SUM COGS_US REVENUE_US
COMPUTE Difference/D20.2 = REVENUE_US - COGS_US;
BY PRODUCT_CATEGORY
WHERE TOTAL Difference LT 100000
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The heading displays the text *Difference < 100,000*, as shown in the following image.

Difference < 100,000

| Product Category | Cost of Goods | Revenue | Difference |
|---|---|---|---|
| Computers | $109,281.00 | $179,761.46 | 70,480.46 |
| Televisions | $227,820.00 | $286,160.68 | 58,340.68 |
| Video Production | $180,540.00 | $259,179.84 | 78,639.84 |

# Retaining Trailing Blanks in an Alphanumeric Field

Trailing blanks are not retained in standard HTML output. When the output type is HTML, STYLEMODE is set to FULL by default. To retain trailing blanks in the alphanumeric field DEPARTMENT, the STYLEMODE setting has been changed to FIXED in this request and the delimiters < and > have been included around the field name in the sort footing text.

```
SET STYLEMODE = FIXED
TABLE FILE EMPLOYEE
SUM SALARY
BY DEPARTMENT SUBFOOT
"<DEPARTMENT> DEPARTMENT TOTAL SALARY IS <SALARY"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

Values for DEPARTMENT appear in the sort footing as MIS and PRODUCTION.

```
DEPARTMENT            SALARY
----------            ------
MIS                $160,177.00
MIS          DEPARTMENT TOTAL SALARY IS     $160,177.00
PRODUCTION         $172,752.00
PRODUCTION   DEPARTMENT TOTAL SALARY IS     $172,752.00
```

**Note:** SET STYLEMODE=FIXED turns off the HTML formatting of your browser for that report. The resulting report displays in a fixed font without colors and other web capabilities.

# Using the Prefix Operator TOT in a Page Heading

This request uses the prefix operator TOT to generate grand totals for three fields.

```
DEFINE FILE SALES
ACTUAL_SALES/D8.2 = UNIT_SOLD - RETURNS;
SALES/F5.1 = 100 * ACTUAL_SALES / UNIT_SOLD;
END
TABLE FILE SALES
"SUMMARY OF ACTUAL SALES"
"UNITS SOLD <TOT.UNIT_SOLD"
"RETURNS <TOT.RETURNS"
"TOTAL SOLD <TOT.ACTUAL_SALES"
" "
"BREAKDOWN BY PRODUCT"
PRINT UNIT_SOLD AND RETURNS AND ACTUAL_SALES
BY PROD_CODE
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT PDF
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The totals appear in the page heading.

```
SUMMARY OF ACTUAL SALES
UNITS SOLD   645
RETURNS  58
TOTAL SOLD    587.00

BREAKDOWN BY PRODUCT
PROD_CODE  UNIT_SOLD  RETURNS  ACTUAL_SALES
B10              60       10         50.00
                 30        2         28.00
                 13        1         12.00
B12              40        3         37.00
                 29        1         28.00
B17              29        2         27.00
                 20        2         18.00
B20              15        0         15.00
                 25        1         24.00
C13              25        3         22.00
C17              12        0         12.00
C7               45        5         40.00
                 40        0         40.00
D12              27        0         27.00
                 20        3         17.00
E1               30        4         26.00
E2               80        9         71.00
E3               70        8         62.00
                 35        4         31.00
```

# Using Multiple Prefix Operators in a Page Heading

This request uses the prefix operators MAX, MIN, AVE, and TOT. It does not require a display command because the page heading text contains data fields.

```
TABLE FILE SALES
"MOST UNITS SOLD WERE <MAX.UNIT_SOLD"
"LEAST UNITS SOLD WERE <MIN.UNIT_SOLD"
"AVERAGE UNITS SOLD WERE <AVE.UNIT_SOLD"
"TOTAL UNITS SOLD WERE <TOT.UNIT_SOLD"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The prefix operators generate summary data in the page heading.

```
MOST UNITS SOLD WERE 80
LEAST UNITS SOLD WERE 12
AVERAGE UNITS SOLD WERE 33
TOTAL UNITS SOLD WERE 645
```

# Using Multiple Prefix Operators in a Sort Footing

This request uses the prefix operators CNT and AVE in a sort footing. The output does not contain columns of data. All data is included in the sort footing itself.

```
TABLE FILE EMPLOYEE
BY DEPARTMENT NOPRINT SUBFOOT
"NUMBER OF EMPLOYEES IN DEPARTMENT <DEPARTMENT = <CNT.LAST_NAME"
"WITH AVERAGE SALARY OF <AVE.CURR_SAL"
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The sort footing is a summary report on the number of employees in a department and their average salary.

The prefix operators generate summary data in the page heading.

```
NUMBER OF EMPLOYEES IN DEPARTMENT MIS = 6
WITH AVERAGE SALARY OF $18,000.33
NUMBER OF EMPLOYEES IN DEPARTMENT PRODUCTION = 6
WITH AVERAGE SALARY OF $19,047.00
```

# Including a Text Field in a Heading or Footing

You can include one or more text fields in a heading or footing. A text field has the attribute FORMAT=TX*n* in a Master File.

# Limits for Text Fields in a Heading or Footing

- You cannot embed a text field in a Financial Modeling Language (FML) report. For details, see Creating Financial Reports With Financial Modeling Language (FML).
- You cannot apply the StyleSheet attribute WRAP to a text field, since a text field is separated into multiple lines by the character count specified in the FORMAT attribute in the Master File.

# Include a Text Field in a Heading or Footing

```
<TEXTFLD
```

# Including a Text Field in a Sort Footing

In this example, you create a Master File named TXTFLD.MAS and a corresponding FOCUS data source named TXTFLD.FOC.

1. Create and save the Master File.

   ```
   FILENAME = TXTFLD, SUFFIX = FOC,$
   SEGNAME=TXTSEG, SEGTYPE = S1,$
      FIELDNAME = CATALOG, FORMAT = A10, $
      FIELDNAME = TEXTFLD,     FORMAT = TX50,$
   ```

2. Create and save the following MODIFY procedure. This procedure creates and populates the data source in a Windows environment.

   ```
   CREATE FILE TXTFLD
   MODIFY FILE TXTFLD
   FIXFORM CATALOG/10 TEXTFLD
   DATA
   COURSE100 This course provides the junior programmer
   with the skills needed to code simple reports.%$
   COURSE200 This course provides the advanced programmer with
   techniques helpful in developing complex
   applications.%$
   ```

```
END
```

3. Run the MODIFY procedure to populate the data source.
4. Create and save the following report request.

```
TABLE FILE TXTFLD
BY CATALOG SUBFOOT
"<TEXTFLD"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF,$
ENDSTYLE
END
```

5. Run the report request.

   The output is:

```
CATALOGCOURSE 100
This course provides the junior programmer with
the skills needed to code simple reports
COURSE 200
This course provides the advanced programmer with
techniques helpful in developing complex
applications.
```

   The horizontal space occupied by the text field is determined by the number of characters specified in the FORMAT attribute in the Master File. In the sample Master File, TX50 means 50 characters wide.

**Tip:** Since the heading in this example includes a single embedded text field, the default alignment is satisfactory. However, to include text to introduce the embedded field or add another embedded field, you may align items in your output to improve readability.

# Including a Page Number in a Heading or Footing

You can include a system-generated page number in a heading or footing. For details, see Laying Out the Report Page.

# Including a Dialogue Manager Variable in a Heading or Footing

You can include a variable whose values are unknown until run time in a heading or footing. This technique allows you to customize the heading or footing by supplying a different value each time the procedure executes.

Variables fall into two categories:

- System and statistical variables are predefined and their values are automatically supplied by the system when a procedure references them. System and statistical variables have names that begin with &. For example, &DATE generates the current date in report output.
- Local (&) and global (&&) variables, whose user-defined values must be supplied at run time:
    - A local variable retains its values during the execution of one procedure. Values are lost after the procedure finishes processing. Values are *not* passed to other invoked procedures that contain the same variable name.

      A local variable is identified by a single ampersand followed by the variable name.
    - A global variable retains its value for the duration of the connection to the WebFOCUS Reporting Server and is passed from the execution of one invoked procedure to the next.

      Because a new session is created on the WebFOCUS Reporting Server each time a request is submitted, values for global variables are not retained between report requests. This means that you can use the same global variable in more than one procedure as long as these procedures are called in the same request.

      A global variable is identified by a double ampersand followed by the variable name.

  **Note:** To avoid conflicts, do not name local or global variables beginning with Date, IBI, or WF. Variable names beginning with these values are reserved for Information Builder use.

For details on Dialogue Manager variables, see the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

# Include a Dialogue Manager Variable in a Heading or Footing

```
&[&]variable
```

where:

**&**

Introduces a local Dialogue Manager variable.

**&&**

Introduces a global Dialogue Manager variable.

**variable**

Is a variable whose value is supplied by the system or by a user at run time.

# Including the Current Date in a Report Heading

This request includes today's date on the second line of the report heading, highlighted in bold.

```
TABLE FILE GGSALES
PRINT BUDDOLLARS DOLLARS
BY STCD
WHERE STCD EQ 'R1019'
ON TABLE SUBHEAD
"Sales Report for Store Code R1019"
"&DATE"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF,$
TYPE=TABHEADING, LINE=1, FONT='TIMES', SIZE=10, STYLE=BOLD, $
TYPE=TABHEADING, LINE=2, COLOR=BLUE, $
ENDSTYLE
END
```

The output is:

**Sales Report for Store Code R1019**
06/07/02

| Store ID | Budget Dollars | Dollar Sales |
|---|---|---|
| R1019 | 18560 | 25680 |
| | 21132 | 24010 |
| | 15880 | 22919 |
| | 24450 | 22605 |
| | 14556 | 18942 |
| | 13860 | 18915 |
| | 22806 | 18837 |
| | 19248 | 18535 |
| | 15120 | 18466 |
| | 15444 | 17784 |

**Note:** You can modify the format of the date. Some formats are:

| Variable | Display Format |
|---|---|
| &DATEtrMMDYY | 2002, December 11 |
| &DATEMDYY | 12/11/2002 |
| &DATEtrMDYY | December 11, 2002 |
| &DATEQYY | Q4 2002 |

# Including an Image in a Heading or Footing

A StyleSheet enables you to include an image in a heading or footing. An image, such as a logo, gives corporate identity to a report, or provides visual appeal.

For details on adding and positioning images, see Laying Out the Report Page.

# Displaying Syntax Components in Heading and Footing Objects

You can automatically display syntax components from your report or chart request in heading and footing objects by adding one or more of the following attributes:

- **<REQUEST.FILTERS.** Lists the WHERE and IF conditions in the request.
- **<REQUEST.VERB_OBJECTS.** Lists the display fields referenced in the request.
- **<REQUEST.SORT_KEYS.** Lists all sort fields in the request.
- **<REQUEST.BYKEYS.** Lists all BY sort fields in the request.
- **<REQUEST.ACROSSKEYS.** Lists all ACROSS sort fields in the request.
- **<REQUEST.VERB_OBJECTS_CONTEXT.** Lists the display command syntax used for each display field.
- **<REQUEST.SORT_KEYS_CONTEXT.** Lists all sort phrases in the request.

**Note:** The syntax component breaks onto multiple lines if the heading line length extends beyond the width of the report or chart container.

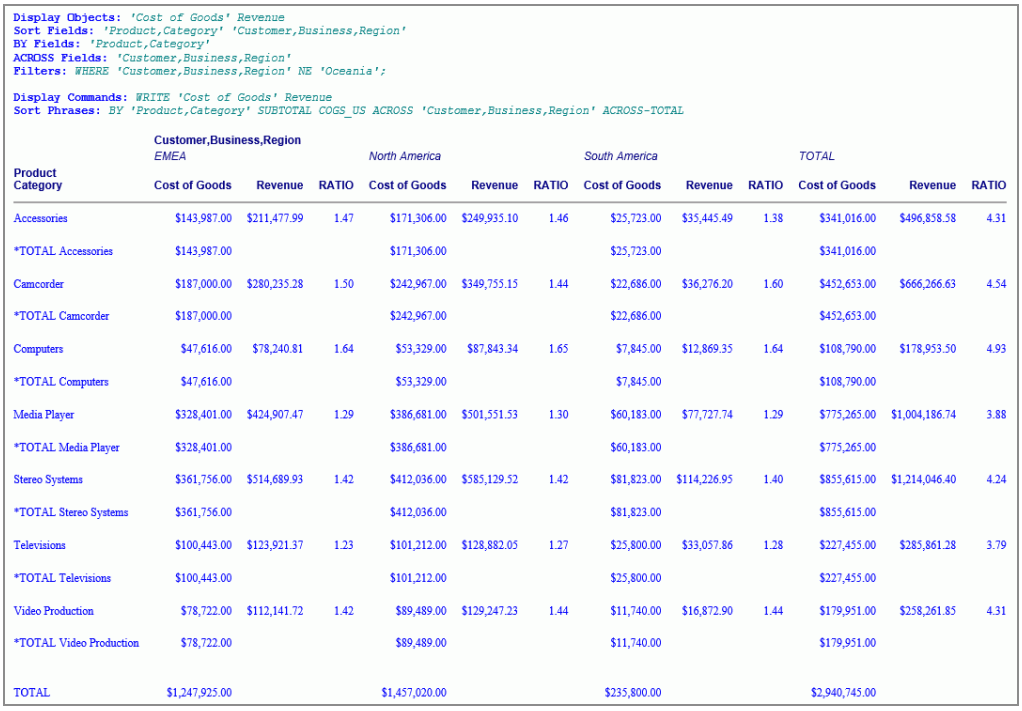
## Displaying Report Syntax Components

The following request displays all available syntax components from the report request in the heading. The spot markers (<+0>) are used to separate heading items so they can be styled separately in the StyleSheet.

```
TABLE FILE WF_RETAIL_LITE
HEADING
"Display Objects: <+0> <REQUEST.VERB_OBJECTS"
"Sort Fields: <+0> <REQUEST.SORT_KEYS"
"BY Fields: <+0> <REQUEST.BYKEYS"
"ACROSS Fields: <+0> <REQUEST.ACROSSKEYS"
"Filters: <+0> <REQUEST.FILTERS"
" "
"Display Commands: <+0> <REQUEST.VERB_OBJECTS_CONTEXT"
"Sort Phrases: <+0> <REQUEST.SORT_KEYS_CONTEXT
" "
" "
SUM COGS_US REVENUE_US
```

```
COMPUTE RATIO/D12.2=REVENUE_US/COGS_US;
BY PRODUCT_CATEGORY SUBTOTAL COGS_US
ACROSS BUSINESS_REGION ACROSS-TOTAL
WHERE BUSINESS_REGION NE 'Oceania'
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
TYPE=REPORT, COLOR = BLUE, SIZE=10, GRID=OFF,$
TYPE=HEADING, ITEM=1, OBJECT=TEXT, FONT=Courier, COLOR=BLUE,
STYLE=BOLD,$
TYPE=HEADING, ITEM=2, FONT=Courier, COLOR=TEAL, STYLE=ITALIC,$
TYPE=TITLE, FONT=ARIAL, STYLE=BOLD, COLOR=NAVY,$
TYPE=ACROSSTITLE, FONT=ARIAL, STYLE=BOLD, COLOR=NAVY,$
TYPE=ACROSSVALUE, FONT=ARIAL, STYLE=ITALIC, COLOR=NAVY, SIZE=10,$
ENDSTYLE
END
```

The output is shown in the following image.



```
Display Objects: 'Cost of Goods' Revenue
Sort Fields: 'Product,Category' 'Customer,Business,Region'
BY Fields: 'Product,Category'
ACROSS Fields: 'Customer,Business,Region'
Filters: WHERE 'Customer,Business,Region' NE 'Oceania';

Display Commands: WRITE 'Cost of Goods' Revenue
Sort Phrases: BY 'Product,Category' SUBTOTAL COGS_US ACROSS 'Customer,Business,Region' ACROSS-TOTAL
```

| | Customer,Business,Region | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *EMEA* | | | *North America* | | | *South America* | | | *TOTAL* | | |
| Product Category | Cost of Goods | Revenue | RATIO | Cost of Goods | Revenue | RATIO | Cost of Goods | Revenue | RATIO | Cost of Goods | Revenue | RATIO |
| Accessories | $143,987.00 | $211,477.99 | 1.47 | $171,306.00 | $249,935.10 | 1.46 | $25,723.00 | $35,445.49 | 1.38 | $341,016.00 | $496,858.58 | 4.31 |
| *TOTAL Accessories | $143,987.00 | | | $171,306.00 | | | $25,723.00 | | | $341,016.00 | | |
| Camcorder | $187,000.00 | $280,235.28 | 1.50 | $242,967.00 | $349,755.15 | 1.44 | $22,686.00 | $36,276.20 | 1.60 | $452,653.00 | $666,266.63 | 4.54 |
| *TOTAL Camcorder | $187,000.00 | | | $242,967.00 | | | $22,686.00 | | | $452,653.00 | | |
| Computers | $47,616.00 | $78,240.81 | 1.64 | $53,329.00 | $87,843.34 | 1.65 | $7,845.00 | $12,869.35 | 1.64 | $108,790.00 | $178,953.50 | 4.93 |
| *TOTAL Computers | $47,616.00 | | | $53,329.00 | | | $7,845.00 | | | $108,790.00 | | |
| Media Player | $328,401.00 | $424,907.47 | 1.29 | $386,681.00 | $501,551.53 | 1.30 | $60,183.00 | $77,727.74 | 1.29 | $775,265.00 | $1,004,186.74 | 3.88 |
| *TOTAL Media Player | $328,401.00 | | | $386,681.00 | | | $60,183.00 | | | $775,265.00 | | |
| Stereo Systems | $361,756.00 | $514,689.93 | 1.42 | $412,036.00 | $585,129.52 | 1.42 | $81,823.00 | $114,226.95 | 1.40 | $855,615.00 | $1,214,046.40 | 4.24 |
| *TOTAL Stereo Systems | $361,756.00 | | | $412,036.00 | | | $81,823.00 | | | $855,615.00 | | |
| Televisions | $100,443.00 | $123,921.37 | 1.23 | $101,212.00 | $128,882.05 | 1.27 | $25,800.00 | $33,057.86 | 1.28 | $227,455.00 | $285,861.28 | 3.79 |
| *TOTAL Televisions | $100,443.00 | | | $101,212.00 | | | $25,800.00 | | | $227,455.00 | | |
| Video Production | $78,722.00 | $112,141.72 | 1.42 | $89,489.00 | $129,247.23 | 1.44 | $11,740.00 | $16,872.90 | 1.44 | $179,951.00 | $258,261.85 | 4.31 |
| *TOTAL Video Production | $78,722.00 | | | $89,489.00 | | | $11,740.00 | | | $179,951.00 | | |
| TOTAL | $1,247,925.00 | | | $1,457,020.00 | | | $235,800.00 | | | $2,940,745.00 | | |

# Repeating Headings and Footings on Panels in PDF Report Output

When the columns presented on PDF reports cannot be displayed on a single page, the pages automatically panel. Paneling places subsequent columns for the same page on *overflow pages*. These overflow pages are generated until the entire width of the report is presented, after which the next vertical page is generated with a new page number and its associated horizontal panels.

In order to make panels following the initial panel more readable, you can designate that heading elements from the initial panel should be repeated on each subsequent panel using the HEADPANEL=ON StyleSheet attribute.

When paneling occurs, if default page numbering is used, the page number presented will include both the page number and the panel number (for example, 1.1, 1.2, 1.3). Turning HEADPANEL on will also cause the panel designation to be included in TABPAGENO.

HEADPANEL can be designated for the entire report, causing all headings and footings to be replicated on the paneled pages. It can also be turned on for just individual headings, footings, subheadings, or subfootings.

HEADPANEL causes borders from the initial page to be replicated on the paneled pages. Additional control of subheading and subfooting borders can be gained through the use of ALIGN-BORDERS which allows for the designation that subitem borders should align with the body of the data rather than the page or report headings. For more information about using ALIGN-BORDERS with HEADPANEL see Align Subheading and Subfooting Margins With the Report Body.

# Repeat Heading Elements on Panels

```
TYPE={REPORT|headfoot [BY=sortcolumn]}, HEADPANEL={ON|OFF}, $
```

where:

**REPORT**

Repeats all report headings, footings, page headings, page footings, subheadings, and subfootings.

**headfoot**

Identifies a heading or footing. Select from:

- **TABHEADING,** which is a report heading. This appears once at the beginning of the report and is generated by ON TABLE SUBHEAD.
- **TABFOOTING,** which is a report footing. This appears once at the end of the report and is generated by ON TABLE SUBFOOT.
- **HEADING,** which is a page heading. This appears at the top of every report page and is generated by HEADING.
- **FOOTING,** which is a page footing. This appears at the bottom of every report page and is generated by FOOTING.
- **SUBHEAD,** which is a sort heading. This appears at the beginning of a vertical (BY) sort group (generated by ON *sortfield* SUBHEAD).
- **SUBFOOT,** which is a sort footing. This appears at the end of a vertical (BY) sort group (generated by ON *sortfield* SUBFOOT).

**BY**

When there are several sort headings or sort footings, each associated with a different vertical sort (BY) column, this enables you to identify which sort heading or sort footing you wish to format.

If there are several sort headings or sort footings associated with different vertical sort (BY) columns, and you omit this attribute and value, the formatting will be applied to all of the sort headings or footings.

**sortcolumn**

Specifies the vertical sort (BY) column associated with one of the report sort headings or sort footings.

**ON**

Repeats the specified heading or footing elements on each panel.

**OFF**

Displays heading or footing elements on the first panel only. OFF is the default value.

Note that the HEADPANEL=ON attribute can only be applied to the entire heading or footing, not individual lines or items within the heading or footing.

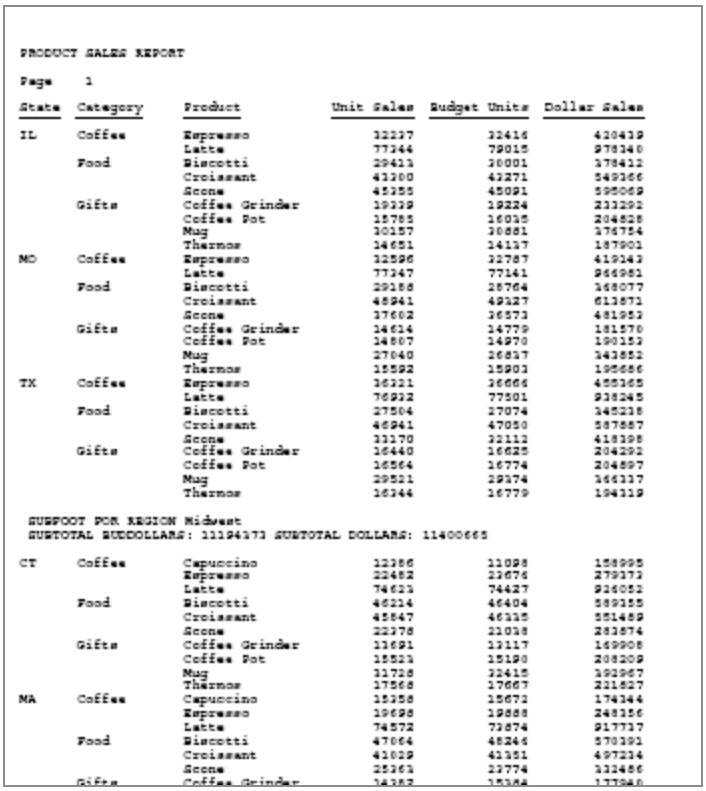
# Repeating All Headings and Footings on Report Panels

The following request against the GGSALES data source sums units sold, budgeted units sold, dollar sales, and budgeted sales by region, state, city, category, and product. The report has a page heading and, for each region, a subfooting.

```
TABLE FILE GGSALES
HEADING
"PRODUCT SALES REPORT"
""
"Page<TABPAGENO"
""
SUM UNITS BUDUNITS DOLLARS BUDDOLLARS
BY REGION NOPRINT
BY ST BY CATEGORY BY PRODUCT
ON REGION SUBFOOT
" "
" SUBFOOT FOR REGION <REGION "
" SUBTOTAL BUDDOLLARS: <ST.BUDDOLLARS SUBTOTAL DOLLARS: <ST.DOLLARS "
" "
ON TABLE SET BYPANEL ON
ON TABLE SET PAGE ON
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE = REPORT, HEADPANEL=OFF,$
ENDSTYLE
END
```

The request sets BYPANEL ON, so each panel displays the sort field values. However, since HEADPANEL=OFF for the entire report, the first panel for page 1 has the heading and the subfooting, but the second panel does not.

The output for page 1 panel 1 has the heading and subfooting, as shown in the following image. Note that with HEADPANEL=OFF, TABPAGENO does not include the panel number.



PRODUCT SALES REPORT

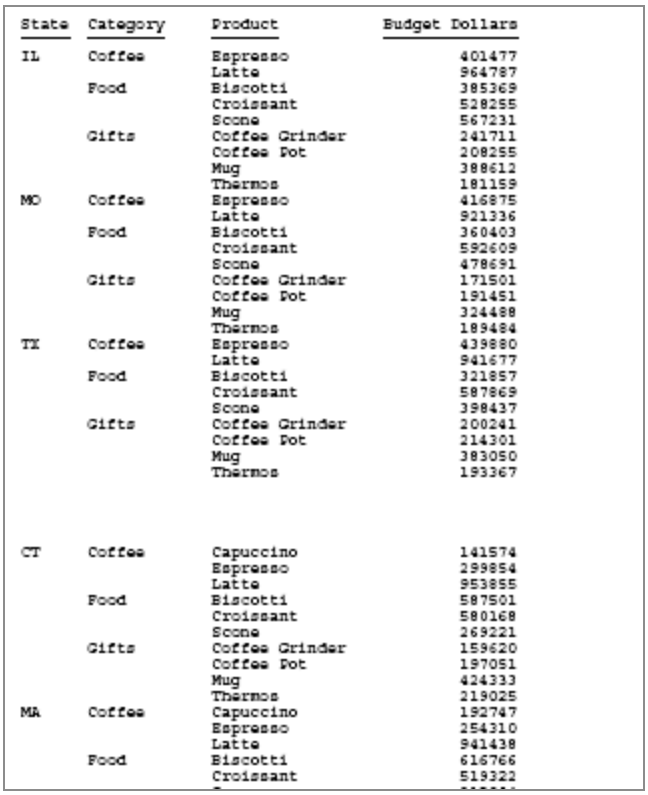
Page 1

| State | Category | Product | Unit Sales | Budget Units | Dollar Sales |
|---|---|---|---|---|---|
| IL | Coffee | Espresso | 32237 | 32416 | 420419 |
| | | Latte | 77344 | 79015 | 978340 |
| | Food | Biscotti | 29413 | 30001 | 378412 |
| | | Croissant | 41300 | 41271 | 549366 |
| | | Scone | 45355 | 45091 | 595069 |
| | Gifts | Coffee Grinder | 19339 | 19224 | 233292 |
| | | Coffee Pot | 15785 | 16035 | 204828 |
| | | Mug | 10157 | 10881 | 176754 |
| | | Thermos | 14651 | 14117 | 187901 |
| MO | Coffee | Espresso | 32596 | 32767 | 419143 |
| | | Latte | 77347 | 77141 | 966981 |
| | Food | Biscotti | 29188 | 28764 | 368077 |
| | | Croissant | 48941 | 49327 | 613871 |
| | | Scone | 37602 | 36573 | 481953 |
| | Gifts | Coffee Grinder | 14614 | 14779 | 181570 |
| | | Coffee Pot | 14807 | 14970 | 190153 |
| | | Mug | 27040 | 26817 | 343852 |
| | | Thermos | 15592 | 15903 | 195686 |
| TX | Coffee | Espresso | 36321 | 36666 | 455365 |
| | | Latte | 76932 | 77501 | 938245 |
| | Food | Biscotti | 27504 | 27074 | 345238 |
| | | Croissant | 46941 | 47050 | 587887 |
| | | Scone | 33170 | 32111 | 418398 |
| | Gifts | Coffee Grinder | 16440 | 16625 | 204292 |
| | | Coffee Pot | 16564 | 16774 | 204897 |
| | | Mug | 29521 | 29374 | 366317 |
| | | Thermos | 16344 | 16779 | 194319 |

SUBFOOT FOR REGION Midwest
SUBTOTAL BUDDOLLARS: 11194171 SUBTOTAL DOLLARS: 11400665

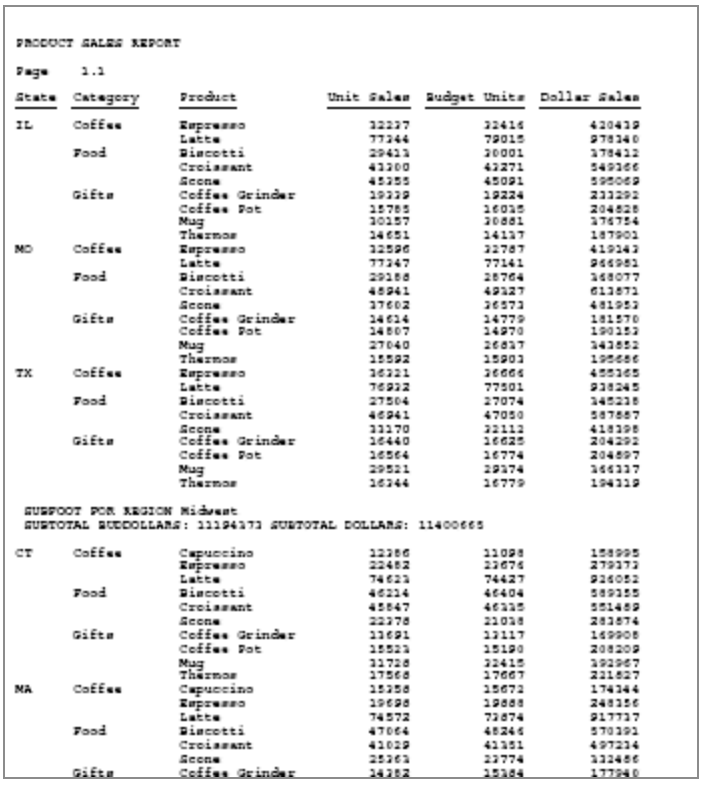
| | | | | | |
|---|---|---|---|---|---|
| CT | Coffee | Capuccino | 12386 | 11098 | 158995 |
| | | Espresso | 22462 | 21676 | 279173 |
| | | Latte | 74621 | 74427 | 926052 |
| | Food | Biscotti | 46214 | 46404 | 589155 |
| | | Croissant | 45847 | 46115 | 551489 |
| | | Scone | 22378 | 21018 | 283874 |
| | Gifts | Coffee Grinder | 11691 | 13117 | 169908 |
| | | Coffee Pot | 15521 | 15190 | 208209 |
| | | Mug | 31728 | 32415 | 392967 |
| | | Thermos | 17568 | 17667 | 221827 |
| MA | Coffee | Capuccino | 15358 | 15672 | 174344 |
| | | Espresso | 19698 | 19888 | 248156 |
| | | Latte | 74572 | 73874 | 917717 |
| | Food | Biscotti | 47064 | 48246 | 570191 |
| | | Croissant | 41029 | 41151 | 497214 |
| | | Scone | 25361 | 23774 | 332486 |
| | Gifts | Coffee Grinder | 14387 | 15364 | 177840 |

The output for page 1 panel 2 does not have the heading or subfooting, as shown in the following image.



| State | Category | Product | Budget Dollars |
|---|---|---|---|
| IL | Coffee | Espresso | 401477 |
| | | Latte | 964787 |
| | Food | Biscotti | 385369 |
| | | Croissant | 528255 |
| | | Scone | 567231 |
| | Gifts | Coffee Grinder | 241711 |
| | | Coffee Pot | 208255 |
| | | Mug | 388612 |
| | | Thermos | 181159 |
| MO | Coffee | Espresso | 416875 |
| | | Latte | 921336 |
| | Food | Biscotti | 360403 |
| | | Croissant | 592609 |
| | | Scone | 478691 |
| | Gifts | Coffee Grinder | 171501 |
| | | Coffee Pot | 191451 |
| | | Mug | 324488 |
| | | Thermos | 189484 |
| TX | Coffee | Espresso | 439880 |
| | | Latte | 941677 |
| | Food | Biscotti | 321857 |
| | | Croissant | 587869 |
| | | Scone | 398437 |
| | Gifts | Coffee Grinder | 200241 |
| | | Coffee Pot | 214301 |
| | | Mug | 383050 |
| | | Thermos | 193367 |
| CT | Coffee | Capuccino | 141574 |
| | | Espresso | 299854 |
| | | Latte | 953855 |
| | Food | Biscotti | 587501 |
| | | Croissant | 580168 |
| | | Scone | 269221 |
| | Gifts | Coffee Grinder | 159620 |
| | | Coffee Pot | 197051 |
| | | Mug | 424333 |
| | | Thermos | 219025 |
| MA | Coffee | Capuccino | 192747 |
| | | Espresso | 254310 |
| | | Latte | 941438 |
| | Food | Biscotti | 616766 |
| | | Croissant | 519322 |

The following output shows panels 1 and 2 if the StyleSheet declaration is changed to set HEADPANEL=ON for the entire report (TYPE=REPORT, HEADPANEL=ON ,$). The heading and subfooting are repeated on each panel. With HEADPANEL=ON, TABPAGENO includes the panel number.



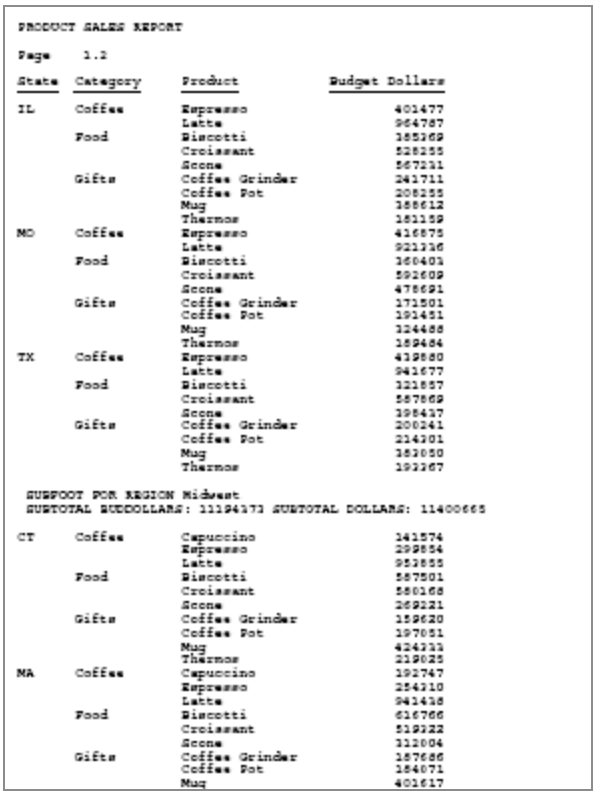
PRODUCT SALES REPORT

Page 1.1

| State | Category | Product | Unit Sales | Budget Units | Dollar Sales |
|---|---|---|---|---|---|
| IL | Coffee | Espresso | 32237 | 32416 | 420439 |
| | | Latte | 77344 | 79015 | 978140 |
| | Food | Biscotti | 29413 | 30001 | 378412 |
| | | Croissant | 43300 | 43271 | 549366 |
| | | Scone | 45355 | 45091 | 596069 |
| | Gifts | Coffee Grinder | 19339 | 19224 | 233292 |
| | | Coffee Pot | 15785 | 16035 | 204525 |
| | | Mug | 30157 | 30881 | 376754 |
| | | Thermos | 14651 | 14117 | 187901 |
| MO | Coffee | Espresso | 32596 | 32787 | 419143 |
| | | Latte | 77347 | 77141 | 966951 |
| | Food | Biscotti | 29188 | 28764 | 368077 |
| | | Croissant | 45941 | 49127 | 613871 |
| | | Scone | 37602 | 36573 | 481953 |
| | Gifts | Coffee Grinder | 14614 | 14779 | 181570 |
| | | Coffee Pot | 14807 | 14970 | 190153 |
| | | Mug | 27040 | 26817 | 343852 |
| | | Thermos | 15592 | 15903 | 195686 |
| TX | Coffee | Espresso | 16321 | 16666 | 455365 |
| | | Latte | 76922 | 77501 | 938245 |
| | Food | Biscotti | 27504 | 27074 | 345238 |
| | | Croissant | 46941 | 47050 | 587867 |
| | | Scone | 33170 | 32112 | 418398 |
| | Gifts | Coffee Grinder | 16440 | 16625 | 204292 |
| | | Coffee Pot | 16564 | 16774 | 204897 |
| | | Mug | 29521 | 29174 | 366337 |
| | | Thermos | 16344 | 16779 | 194319 |

SUBFOOT FOR REGION Midwest
SUBTOTAL BUDDOLLARS: 11194173 SUBTOTAL DOLLARS: 11400665

| | | | | | |
|---|---|---|---|---|---|
| CT | Coffee | Capuccino | 12386 | 11098 | 158995 |
| | | Espresso | 22482 | 23676 | 279373 |
| | | Latte | 74621 | 74427 | 926052 |
| | Food | Biscotti | 46214 | 46404 | 589155 |
| | | Croissant | 45847 | 46135 | 551469 |
| | | Scone | 22378 | 21038 | 283874 |
| | Gifts | Coffee Grinder | 13691 | 13117 | 169908 |
| | | Coffee Pot | 15521 | 15190 | 208209 |
| | | Mug | 31728 | 32415 | 392967 |
| | | Thermos | 17568 | 17667 | 221827 |
| MA | Coffee | Capuccino | 15356 | 15672 | 174344 |
| | | Espresso | 19698 | 19868 | 248156 |
| | | Latte | 74572 | 72874 | 917737 |
| | Food | Biscotti | 47064 | 48246 | 570191 |
| | | Croissant | 41029 | 41151 | 497214 |
| | | Scone | 25361 | 23774 | 312456 |
| | Gifts | Coffee Grinder | 14282 | 15384 | 177940 |



```
PRODUCT SALES REPORT

Page    1.2

State  Category     Product          Budget Dollars
IL     Coffee       Espresso                401477
                    Latte                   964787
       Food         Biscotti                185369
                    Croissant               528255
                    Scone                   567231
       Gifts        Coffee Grinder          241711
                    Coffee Pot              208255
                    Mug                     188612
                    Thermos                 161159
MO     Coffee       Espresso                416875
                    Latte                   921336
       Food         Biscotti                160401
                    Croissant               592609
                    Scone                   478691
       Gifts        Coffee Grinder          171501
                    Coffee Pot              191451
                    Mug                     124488
                    Thermos                 189484
TX     Coffee       Espresso                419880
                    Latte                   941677
       Food         Biscotti                121857
                    Croissant               587869
                    Scone                   195417
       Gifts        Coffee Grinder          200241
                    Coffee Pot              214201
                    Mug                     183050
                    Thermos                 192267

 SUBFOOT FOR REGION Midwest
 SUBTOTAL BUDDOLLARS: 11194173 SUBTOTAL DOLLARS: 11400665

CT     Coffee       Capuccino               141574
                    Espresso                299854
                    Latte                   953855
       Food         Biscotti                587501
                    Croissant               580168
                    Scone                   269221
       Gifts        Coffee Grinder          159620
                    Coffee Pot              197051
                    Mug                     424211
                    Thermos                 219025
MA     Coffee       Capuccino               192747
                    Espresso                254210
                    Latte                   941418
       Food         Biscotti                616766
                    Croissant               519322
                    Scone                   112004
       Gifts        Coffee Grinder          187686
                    Coffee Pot              184071
                    Mug                     401617
```

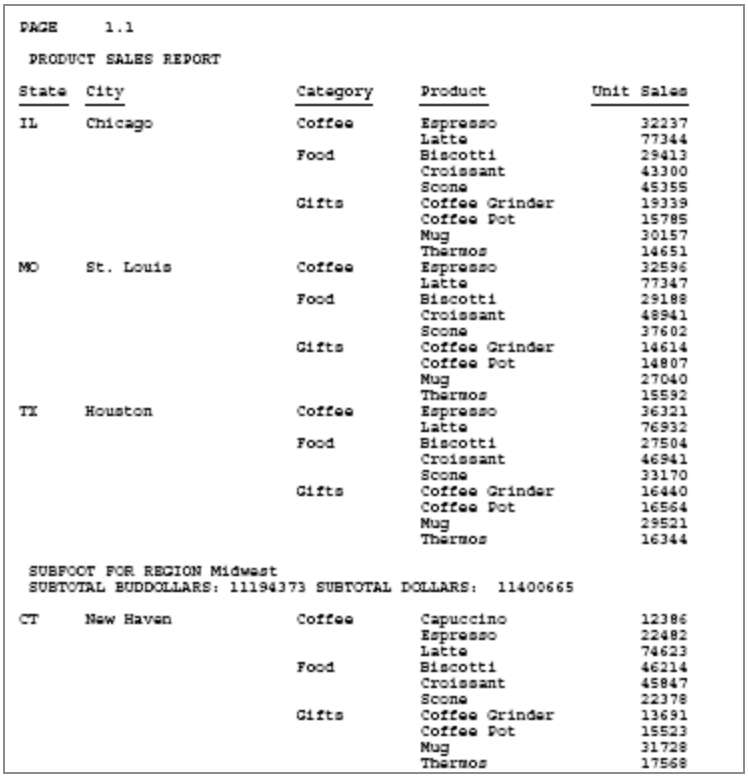
# Repeating a Subfoot on Panels in PDF Report Output

The following request against the GGSALES data source specifies the HEADPANEL=ON attribute only for the subfoot, not for the entire report. Notice that this request uses the default page numbering (ON TABLE SET PAGE ON) rather than TABPAGENO to present the page numbers on each page.

```
TABLE FILE GGSALES
HEADING
" PRODUCT SALES REPORT"
" "
SUM UNITS BUDUNITS DOLLARS BUDDOLLARS
BY REGION NOPRINT
BY ST BY CITY  BY CATEGORY BY PRODUCT
ON REGION SUBFOOT
" "
" SUBFOOT FOR REGION <REGION "
" SUBTOTAL BUDDOLLARS: <ST.BUDDOLLARS SUBTOTAL DOLLARS:  <ST.DOLLARS "
```

```
" "
ON TABLE SET BYPANEL ON
ON TABLE SET PAGE ON
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE = SUBFOOT, HEADPANEL=ON,$

ENDSTYLE
END
```

Panel 1 displays both the heading and the subfooting, as shown in the following image.



PAGE 1.1

PRODUCT SALES REPORT

| State | City | Category | Product | Unit Sales |
|---|---|---|---|---|
| IL | Chicago | Coffee | Espresso | 32237 |
| | | | Latte | 77344 |
| | | Food | Biscotti | 29413 |
| | | | Croissant | 43300 |
| | | | Scone | 45355 |
| | | Gifts | Coffee Grinder | 19339 |
| | | | Coffee Pot | 15785 |
| | | | Mug | 30157 |
| | | | Thermos | 14651 |
| MO | St. Louis | Coffee | Espresso | 32596 |
| | | | Latte | 77347 |
| | | Food | Biscotti | 29188 |
| | | | Croissant | 48941 |
| | | | Scone | 37602 |
| | | Gifts | Coffee Grinder | 14614 |
| | | | Coffee Pot | 14807 |
| | | | Mug | 27040 |
| | | | Thermos | 15592 |
| TX | Houston | Coffee | Espresso | 36321 |
| | | | Latte | 76932 |
| | | Food | Biscotti | 27504 |
| | | | Croissant | 46941 |
| | | | Scone | 33170 |
| | | Gifts | Coffee Grinder | 16440 |
| | | | Coffee Pot | 16564 |
| | | | Mug | 29521 |
| | | | Thermos | 16344 |

SUBFOOT FOR REGION Midwest
SUBTOTAL BUDDOLLARS: 11194373 SUBTOTAL DOLLARS: 11400665

| | | | | |
|---|---|---|---|---|
| CT | New Haven | Coffee | Capuccino | 12386 |
| | | | Espresso | 22482 |
| | | | Latte | 74623 |
| | | Food | Biscotti | 46214 |
| | | | Croissant | 45847 |
| | | | Scone | 22378 |
| | | Gifts | Coffee Grinder | 13691 |
| | | | Coffee Pot | 15523 |
| | | | Mug | 31728 |
| | | | Thermos | 17568 |

Panel 2 displays only the subfooting, not the heading, as shown in the following image.

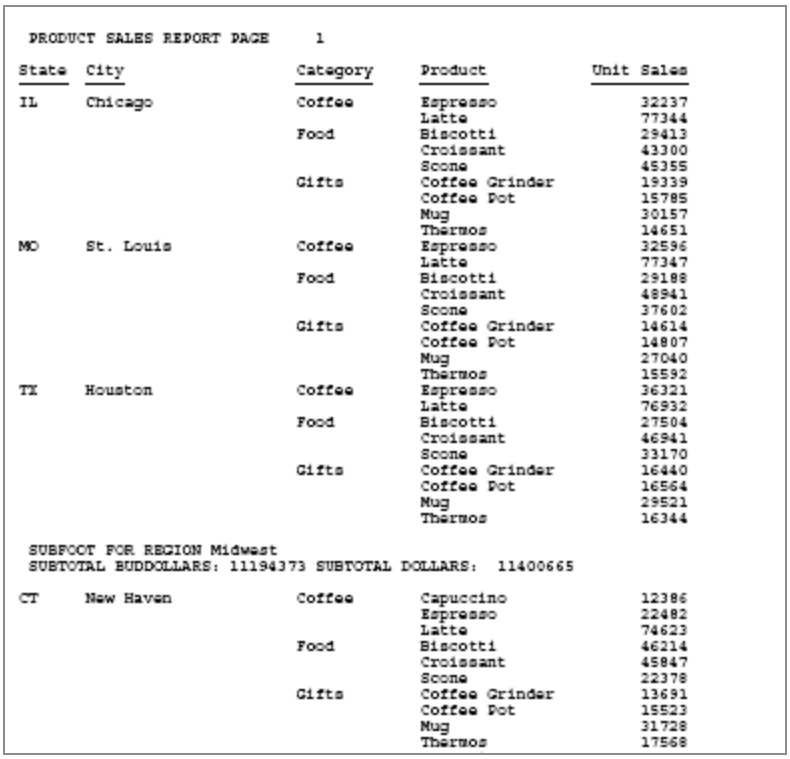
```
PAGE     1.2


State  City                 Category     Product           Budget Units
IL     Chicago              Coffee       Espresso                 32416
                                         Latte                    79015
                            Food         Biscotti                 30001
                                         Croissant                43271
                                         Scone                    45091
                            Gifts        Coffee Grinder           19224
                                         Coffee Pot               16035
                                         Mug                      30881
                                         Thermos                  14137
MO     St. Louis            Coffee       Espresso                 32787
                                         Latte                    77141
                            Food         Biscotti                 28764
                                         Croissant                49327
                                         Scone                    36573
                            Gifts        Coffee Grinder           14779
                                         Coffee Pot               14970
                                         Mug                      26837
                                         Thermos                  15903
TX     Houston              Coffee       Espresso                 36666
                                         Latte                    77501
                            Food         Biscotti                 27074
                                         Croissant                47050
                                         Scone                    32112
                            Gifts        Coffee Grinder           16625
                                         Coffee Pot               16774
                                         Mug                      29374
                                         Thermos                  16779

 SUBFOOT FOR REGION Midwest
 SUBTOTAL BUDDOLLARS: 11194373 SUBTOTAL DOLLARS:  11400665

CT     New Haven            Coffee       Capuccino                11098
                                         Espresso                 23676
                                         Latte                    74427
                            Food         Biscotti                 46404
                                         Croissant                46335
                                         Scone                    21038
                            Gifts        Coffee Grinder           13117
                                         Coffee Pot               15190
                                         Mug                      32415
                                         Thermos                  17667
```

Since the page heading is not repeated, if you use the <TABPAGENO system variable to place the page number in the heading, it will not display the panel number and will not display on the second panel.

```
TABLE FILE GGSALES
HEADING
" PRODUCT SALES REPORT PAGE <TABPAGENO"
" "
SUM UNITS BUDUNITS DOLLARS BUDDOLLARS
BY REGION NOPRINT
BY ST BY CITY  BY CATEGORY BY PRODUCT
ON REGION SUBFOOT
" "
" SUBFOOT FOR REGION <REGION "
" SUBTOTAL BUDDOLLARS: <ST.BUDDOLLARS SUBTOTAL DOLLARS:  <ST.DOLLARS "
" "
ON TABLE SET BYPANEL ON
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE = SUBFOOT, HEADPANEL=ON,$
```

```
ENDSTYLE
END
```

The first panel displays the page number in the heading, without the panel number, as shown in the following image.



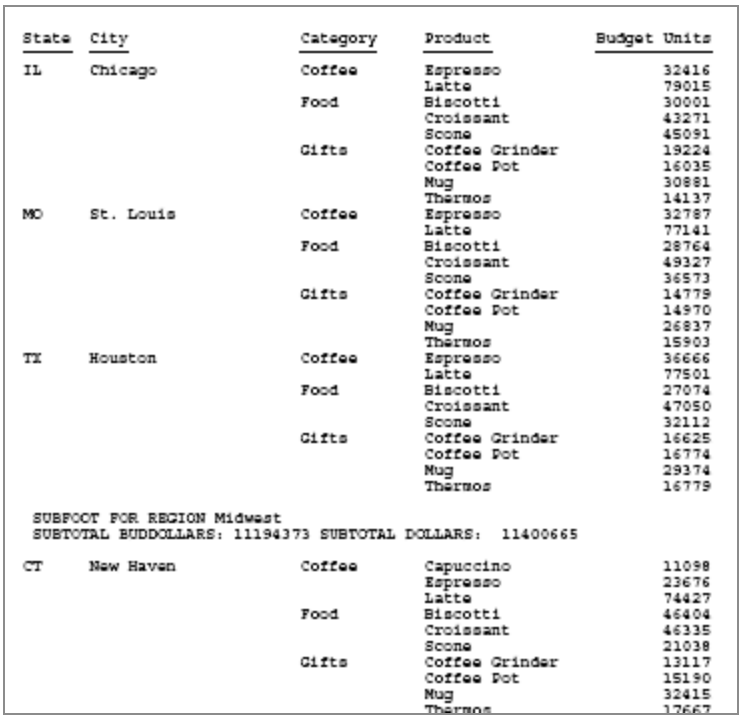
PRODUCT SALES REPORT PAGE 1

| State | City | Category | Product | Unit Sales |
|---|---|---|---|---|
| IL | Chicago | Coffee | Espresso | 32237 |
| | | | Latte | 77344 |
| | | Food | Biscotti | 29413 |
| | | | Croissant | 43300 |
| | | | Scone | 45355 |
| | | Gifts | Coffee Grinder | 19339 |
| | | | Coffee Pot | 15785 |
| | | | Mug | 30157 |
| | | | Thermos | 14651 |
| MO | St. Louis | Coffee | Espresso | 32596 |
| | | | Latte | 77347 |
| | | Food | Biscotti | 29188 |
| | | | Croissant | 48941 |
| | | | Scone | 37602 |
| | | Gifts | Coffee Grinder | 14614 |
| | | | Coffee Pot | 14807 |
| | | | Mug | 27040 |
| | | | Thermos | 15592 |
| TX | Houston | Coffee | Espresso | 36321 |
| | | | Latte | 76932 |
| | | Food | Biscotti | 27504 |
| | | | Croissant | 46941 |
| | | | Scone | 33170 |
| | | Gifts | Coffee Grinder | 16440 |
| | | | Coffee Pot | 16564 |
| | | | Mug | 29521 |
| | | | Thermos | 16344 |

SUBFOOT FOR REGION Midwest
SUBTOTAL BUDDOLLARS: 11194373 SUBTOTAL DOLLARS: 11400665

| | | | | |
|---|---|---|---|---|
| CT | New Haven | Coffee | Capuccino | 12386 |
| | | | Espresso | 22482 |
| | | | Latte | 74623 |
| | | Food | Biscotti | 46214 |
| | | | Croissant | 45847 |
| | | | Scone | 22378 |
| | | Gifts | Coffee Grinder | 13691 |
| | | | Coffee Pot | 15523 |
| | | | Mug | 31728 |
| | | | Thermos | 17568 |

The second panel does not display the heading and therefore, does not display the embedded page number, as shown in the following image.



| State | City | Category | Product | Budget Units |
|---|---|---|---|---|
| IL | Chicago | Coffee | Espresso | 32416 |
| | | | Latte | 79015 |
| | | Food | Biscotti | 30001 |
| | | | Croissant | 43271 |
| | | | Scone | 45091 |
| | | Gifts | Coffee Grinder | 19224 |
| | | | Coffee Pot | 16035 |
| | | | Mug | 30881 |
| | | | Thermos | 14137 |
| MO | St. Louis | Coffee | Espresso | 32787 |
| | | | Latte | 77141 |
| | | Food | Biscotti | 28764 |
| | | | Croissant | 49327 |
| | | | Scone | 36573 |
| | | Gifts | Coffee Grinder | 14779 |
| | | | Coffee Pot | 14970 |
| | | | Mug | 26837 |
| | | | Thermos | 15903 |
| TX | Houston | Coffee | Espresso | 36666 |
| | | | Latte | 77501 |
| | | Food | Biscotti | 27074 |
| | | | Croissant | 47050 |
| | | | Scone | 32112 |
| | | Gifts | Coffee Grinder | 16625 |
| | | | Coffee Pot | 16774 |
| | | | Mug | 29374 |
| | | | Thermos | 16779 |

SUBFOOT FOR REGION Midwest
SUBTOTAL BUDDOLLARS: 11194373 SUBTOTAL DOLLARS: 11400665

| | | | | |
|---|---|---|---|---|
| CT | New Haven | Coffee | Capuccino | 11098 |
| | | | Espresso | 23676 |
| | | | Latte | 74427 |
| | | Food | Biscotti | 46404 |
| | | | Croissant | 46335 |
| | | | Scone | 21038 |
| | | Gifts | Coffee Grinder | 13117 |
| | | | Coffee Pot | 15190 |
| | | | Mug | 32415 |
| | | | Thermos | 17667 |

# Repeating Styled Headings and Footings on Paneled Pages

The following request against the GGSALES data source has a report heading, a page heading with an image, a footing, a subheading, a subfooting, and a subtotal.

```
SET BYPANEL=ON
DEFINE FILE GGSALES
SHOWCATPROD/A30 = CATEGORY || ' / ' || PRODUCT;
END
TABLE FILE GGSALES
SUM
     DOLLARS/I8M AS ''
BY REGION
BY ST
BY CITY
ACROSS SHOWCATPROD AS 'Product Sales'

ON REGION SUBHEAD
" "
"Subheading Region <REGION"
" "
```

```
ON REGION SUBTOTAL AS '*TOTAL'
ON REGION SUBFOOT WITHIN
" "
"Subfooting Region <REGION"
" "
ON TABLE SUBHEAD
"Report Heading"
HEADING
"Page <TABPAGENO  "
" "
" "
" "
FOOTING
" "
"PAGE FOOTING "
ON TABLE SUBFOOT
" "
"Report Footing"
ON TABLE SET PAGE-NUM OFF
-*ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
     UNITS=IN,
     SQUEEZE=ON,
     ORIENTATION=PORTRAIT,
$
```

```
TYPE=REPORT,
     FONT='ARIAL',
     SIZE=9,
     HEADPANEL=ON,
     BORDER=ON,
$
TYPE=TITLE,
     STYLE=BOLD,
$
TYPE=TABHEADING,
     SIZE=20,
     STYLE=BOLD,
$
TYPE=TABFOOTING,
     SIZE=20,
     STYLE=BOLD,
$
TYPE=HEADING,
```

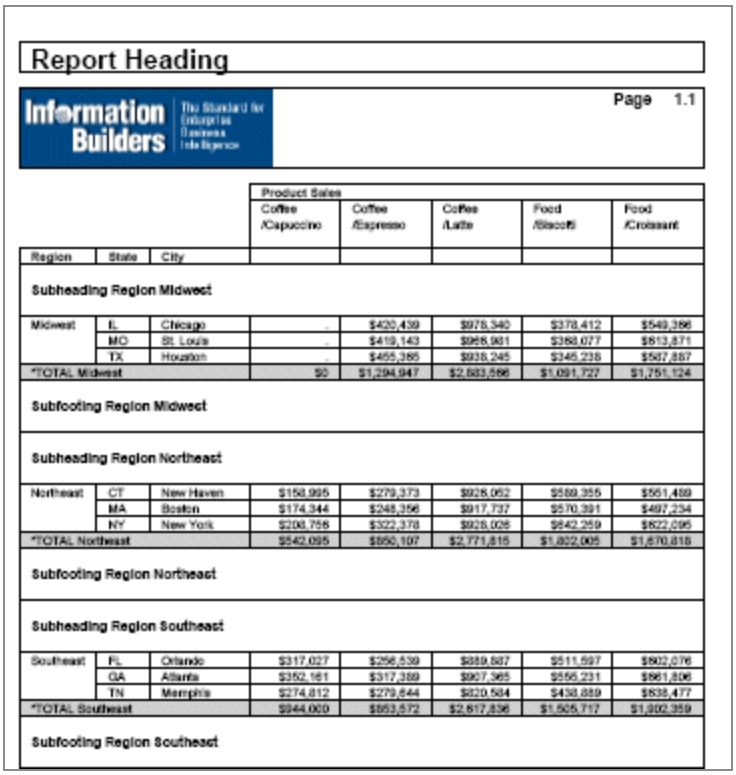
```
     SIZE=12,
     STYLE=BOLD,
$
TYPE=HEADING,
     LINE=1,
     JUSTIFY=RIGHT,
$
TYPE=HEADING,
     LINE=2,
     JUSTIFY=RIGHT,
$
TYPE=HEADING,
     LINE=3,
     JUSTIFY=RIGHT,
$
TYPE=HEADING,
     LINE=4,
     JUSTIFY=RIGHT,
$
TYPE=HEADING,
     LINE=5,
     JUSTIFY=RIGHT,
$
TYPE=HEADING,
     IMAGE=smplogo1.gif,
     POSITION=(+0.000000 +0.000000),
$
TYPE=FOOTING,
     SIZE=12,
     STYLE=BOLD,
     JUSTIFY=RIGHT,
$
TYPE=SUBHEAD,
     SIZE=10,
     STYLE=BOLD,
$
```

```
TYPE=SUBFOOT,
     SIZE=10,
     STYLE=BOLD,
$
TYPE=SUBTOTAL,
     BACKCOLOR=RGB(210 210 210),
$
TYPE=ACROSSVALUE,
     SIZE=9,
```

```
     WRAP=ON,
$
TYPE=ACROSSTITLE,
     STYLE=BOLD,
$
TYPE=GRANDTOTAL,
     BACKCOLOR=RGB(210 210 210),
     STYLE=BOLD,
$
ENDSTYLE
END
```

Since HEADPANEL=ON for the entire report, both panels display all of the heading and footing elements.

The following image shows page 1 panel 1.



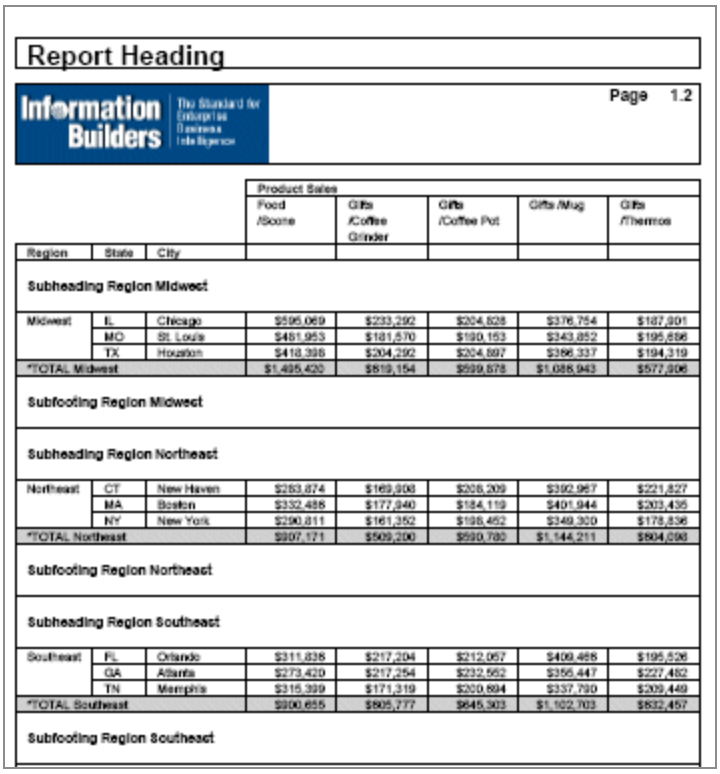
Report Heading

Information Builders — The Standard for Enterprise Business Intelligence

Page 1.1

| | | | Product Sales | | | | |
|---|---|---|---|---|---|---|---|
| | | | Coffee /Cappuccino | Coffee /Espresso | Coffee /Latte | Food /Biscotti | Food /Croissant |
| Region | State | City | | | | | |
| Subheading Region Midwest | | | | | | | |
| Midwest | IL | Chicago | . | $420,439 | $978,340 | $378,412 | $549,386 |
| | MO | St. Louis | . | $419,143 | $968,981 | $368,077 | $813,871 |
| | TX | Houston | . | $455,365 | $936,245 | $345,238 | $587,887 |
| *TOTAL Midwest | | | $0 | $1,294,947 | $2,883,566 | $1,091,727 | $1,751,124 |
| Subfooting Region Midwest | | | | | | | |
| Subheading Region Northeast | | | | | | | |
| Northeast | CT | New Haven | $158,995 | $279,373 | $926,052 | $589,355 | $551,489 |
| | MA | Boston | $174,344 | $248,356 | $917,737 | $570,391 | $497,234 |
| | NY | New York | $208,756 | $322,378 | $926,026 | $642,259 | $822,095 |
| *TOTAL Northeast | | | $542,095 | $850,107 | $2,771,815 | $1,802,005 | $1,870,818 |
| Subfooting Region Northeast | | | | | | | |
| Subheading Region Southeast | | | | | | | |
| Southeast | FL | Orlando | $317,027 | $256,539 | $889,887 | $511,597 | $802,076 |
| | GA | Atlanta | $352,161 | $317,389 | $907,365 | $556,231 | $861,806 |
| | TN | Memphis | $274,812 | $279,644 | $820,584 | $438,889 | $838,477 |
| *TOTAL Southeast | | | $944,000 | $853,572 | $2,617,836 | $1,505,717 | $1,902,359 |
| Subfooting Region Southeast | | | | | | | |

The following image shows page 1 panel 2.



Report Heading

Information Builders — The Standard for Enterprise Business Intelligence

Page 1.2

| | | | Product Sales | | | | |
|---|---|---|---|---|---|---|---|
| | | | Food /Scone | Gifts /Coffee Grinder | Gifts /Coffee Pot | Gifts /Mug | Gifts /Thermos |
| Region | State | City | | | | | |
| **Subheading Region Midwest** | | | | | | | |
| Midwest | IL | Chicago | $595,069 | $233,292 | $204,828 | $376,754 | $187,801 |
| | MO | St. Louis | $481,953 | $181,570 | $190,153 | $343,852 | $195,686 |
| | TX | Houston | $418,398 | $204,292 | $204,897 | $366,337 | $194,319 |
| *TOTAL Midwest | | | $1,495,420 | $619,154 | $599,878 | $1,086,943 | $577,806 |
| **Subfooting Region Midwest** | | | | | | | |
| **Subheading Region Northeast** | | | | | | | |
| Northeast | CT | New Haven | $283,874 | $169,908 | $208,209 | $392,967 | $221,827 |
| | MA | Boston | $332,488 | $177,840 | $184,119 | $401,944 | $203,435 |
| | NY | New York | $290,811 | $161,352 | $198,462 | $349,300 | $178,836 |
| *TOTAL Northeast | | | $907,171 | $509,200 | $590,790 | $1,144,211 | $804,098 |
| **Subfooting Region Northeast** | | | | | | | |
| **Subheading Region Southeast** | | | | | | | |
| Southeast | FL | Orlando | $311,838 | $217,204 | $212,067 | $409,466 | $195,526 |
| | GA | Atlanta | $273,420 | $217,254 | $232,562 | $356,447 | $227,482 |
| | TN | Memphis | $315,399 | $171,319 | $200,684 | $337,790 | $209,449 |
| *TOTAL Southeast | | | $900,655 | $805,777 | $645,303 | $1,102,703 | $832,457 |
| **Subfooting Region Southeast** | | | | | | | |

# Customizing a Column Title

A column title identifies the data in a report. Use the AS phrase to change the default column title for customized data identification or more desirable formatting. You can change a column title:

- In a request.
- In a Master File.

A column title defaults to the field name in the Master File. For a calculated value (one created with COMPUTE), the title defaults to the field name in the request.

# Using Default Column Titles

Consider this request:

```
TABLE FILE EMPDATA
SUM SALARY
BY DEPT
BY LASTNAME
WHERE DEPT IS 'SALES' OR 'CONSULTING' OR 'ACCOUNTING'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The report output illustrates these default column titles:

- The column title for the field named in the display command (SUM) is SALARY.
- The column titles for the fields named in the BY phrases are DEPT and LASTNAME.

The output is:

| DEPT | LASTNAME | SALARY |
|---|---|---|
| ACCOUNTING | ANDERSON | $32,400.00 |
| | LOPEZ | $26,400.00 |
| | SANCHEZ | $83,000.00 |
| | SOPENA | $79,000.00 |
| | WANG | $62,500.00 |
| CONSULTING | ELLNER | $35,900.00 |
| | WANG | $49,500.00 |
| | WHITE | $40,900.00 |
| SALES | ADDAMS | $54,100.00 |
| | CASSANOVA | $70,000.00 |
| | CHISOLM | $43,000.00 |
| | DUBOIS | $43,600.00 |
| | LASTRA | $115,000.00 |
| | MEDINA | $39,000.00 |
| | OLSON | $30,500.00 |

# Limits for Column Titles

- The width allotted for column titles has no limit other than the memory available.
- A column title for a styled output format can contain up to 16 lines of text.
- You can replace a column title for a field named in an ACROSS phrase by only one line of text.

# Customize a Column Title in a Request

```
fieldname AS 'title_line_1 [,title_line_2,...]'
```

where:

**fieldname**

Is a field named in a display command (such as PRINT or SUM), ACROSS phrase, or BY phrase.

**title_line_1,title_line_2**

Is the customized column title, enclosed in single quotation marks.

To specify a multiple-line column title, separate each line with a comma.

To customize a column title for a calculated value, use the syntax:

```
COMPUTE fieldname[/format] = expression AS 'title'
```

For related information, see Creating Temporary Fields.

**Tip:**

- To suppress the display of a column title, enter two consecutive single quotation marks without the intervening space. For example:

  ```
  PRINT LAST_NAME AS ''
  ```

- To display underscores, enclose blanks in single quotation marks.

- If you use an AS phrase for a calculated value, repeat the COMPUTE command before referencing the next computed field.
- Multi-line column titles created with the AS phrase are not supported for ACROSS fields.

# Customizing Column Titles in a Request

This request customizes the column titles for the field named in the SUM command (SALARY), and the fields named in the BY phrases (DIV and DEPT).

```
TABLE FILE EMPDATA
SUM SALARY AS 'Total,Salary'
BY DIV AS 'Division'
BY DEPT AS 'Department'
WHERE DIV EQ 'NE' OR 'SE' OR 'CORP'
HEADING
"Current Salary Report"
ON TABLE SET STYLE *
TYPE=REPORT,GRID=OFF,$
ENDSTYLE
END
```

The output is:

Current Salary Report

| Division | Department | Total Salary |
|---|---|---|
| CORP | ACCOUNTING | $283,300.00 |
| | MARKETING | $153,200.00 |
| NE | CUSTOMER SUPPORT | $81,800.00 |
| | MARKETING | $139,800.00 |
| | SALES | $82,600.00 |
| SE | CONSULTING | $85,400.00 |
| | CUSTOMER SUPPORT | $62,500.00 |
| | MARKETING | $113,000.00 |
| | PERSONNEL | $80,500.00 |
| | PROGRAMMING & DVLPMT | $49,000.00 |

# Suppressing a Column Title

This request suppresses the column title for LAST_NAME. It also illustrates a multiple-line column title (EMPLOYEE NUMBER) for the data for EMP_ID.

```
TABLE FILE EMPLOYEE
PRINT FIRST_NAME AS 'NAME' AND LAST_NAME AS ''
BY DEPARTMENT
BY EMP_ID AS 'EMPLOYEE,NUMBER'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The output is:

| DEPARTMENT | EMPLOYEE NUMBER | NAME | |
|---|---|---|---|
| MIS | 112847612 | MARY | SMITH |
| | 117593129 | DIANE | JONES |
| | 219984371 | JOHN | MCCOY |
| | 326179357 | ROSEMARIE | BLACKWOOD |
| | 543729165 | MARY | GREENSPAN |
| | 818692173 | BARBARA | CROSS |
| PRODUCTION | 071382660 | ALFRED | STEVENS |
| | 119265415 | RICHARD | SMITH |
| | 119329144 | JOHN | BANNING |
| | 123764317 | JOAN | IRVING |
| | 126724188 | ANTHONY | ROMANS |
| | 451123478 | ROGER | MCKNIGHT |

# Customizing a Column Title for a Calculated Value

This request customizes the column title for the calculated value REV.

```
TABLE FILE SALES
SUM UNIT_SOLD RETAIL_PRICE
COMPUTE REV/D12.2M = UNIT_SOLD * RETAIL_PRICE;AS 'GENERATED REVENUE'
BY PROD_CODE
WHERE CITY EQ 'NEW YORK'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The output is:

| PROD_CODE | UNIT_SOLD | RETAIL_PRICE | GENERATED REVENUE |
|---|---|---|---|
| B10 | 30 | $.85 | $25.50 |
| B17 | 20 | $1.89 | $37.80 |
| B20 | 15 | $1.99 | $29.85 |
| C17 | 12 | $2.09 | $25.08 |
| D12 | 20 | $2.09 | $41.80 |
| E1 | 30 | $.89 | $26.70 |
| E3 | 35 | $1.09 | $38.15 |

# Customizing a Column Title in a Master File

You can change the default column title using the optional TITLE attribute for a field. Any formatting you apply to the field will be applied to its customized title.

See the *ibi™ WebFOCUS® Developing Reporting Applications* manual for details on the TITLE attribute.

# Distinguishing Between Duplicate Field Names

The command SET QUALTITLES determines whether or not duplicate field names appear as qualified column titles in report output. A qualified column title distinguishes between identical field names by including the segment.

Column titles specified in an AS phrase are used when duplicate field names are referenced in a MATCH command, or when duplicate field names exist in a HOLD file.

# Distinguish Between Duplicate Field Names

```
SET QUALTITLES = {ON|OFF}
```

where:

**ON**

Enables qualified column titles when duplicate field names exist and SET FIELDNAME is set to NEW (the default). For information on SET commands, see the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

**OFF**

Disables qualified column titles. OFF is the default value.

# Controlling Column Title Underlining Using a SET Command

The SET TITLELINE command allows you to control whether column titles are underlined for report output.

# Control Column Title Underlining Using a SET Command

```
SET TITLELINE =  (ON|OFF|SKIP)
```

```
ON TABLE SET TITLELINE  (ON|OFF|SKIP)
```

where:

**ON**

Underlines column titles. ON is the default value.

**OFF**

Replaces the underline with a blank line.

**SKIP**

Omits both the underline and the line on which the underline would have displayed.

**Note:** ACROSSLINE is a synonym for TITLELINE.

# Controlling Column Title Underlining Using a SET Command

The following request has a BY and an ACROSS field.

```
SET TITLELINE=ON
TABLE FILE GGSALES
SUM UNITS BY PRODUCT
ACROSS REGION
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
INCLUDE=IBFS:/FILE/IBI_HTML_DIR/javaassist/intl/EN/ENIADefault_
combine.sty,$
ENDSTYLE
END
```

With the default value (ON) for SET TITLELINE, the column titles are underlined.

| | Region | | | |
|---|---|---|---|---|
| | Midwest | Northeast | Southeast | West |
| Product | | | | |
| Biscotti | 86105 | 145242 | 119594 | 70436 |
| Capuccino | . | 44785 | 73264 | 71168 |
| Coffee Grinder | 50393 | 40977 | 47083 | 48081 |
| Coffee Pot | 47156 | 46185 | 49922 | 47432 |
| Croissant | 139182 | 137394 | 156456 | 197022 |
| Espresso | 101154 | 68127 | 68030 | 71675 |
| Latte | 231623 | 222866 | 209654 | 213920 |
| Mug | 86718 | 91497 | 88474 | 93881 |
| Scone | 116127 | 70732 | 73779 | 72776 |
| Thermos | 46587 | 48870 | 48976 | 45648 |

With SET TITLELINE=OFF, the column titles are not underlined, but the blank line where the underlines would have been is still there.

| | Region | | | |
|---|---|---|---|---|
| | Midwest | Northeast | Southeast | West |
| Product | | | | |
| Biscotti | 86105 | 145242 | 119594 | 70436 |
| Capuccino | . | 44785 | 73264 | 71168 |
| Coffee Grinder | 50393 | 40977 | 47083 | 48081 |
| Coffee Pot | 47156 | 46185 | 49922 | 47432 |
| Croissant | 139182 | 137394 | 156456 | 197022 |
| Espresso | 101154 | 68127 | 68030 | 71675 |
| Latte | 231623 | 222866 | 209654 | 213920 |
| Mug | 86718 | 91497 | 88474 | 93881 |
| Scone | 116127 | 70732 | 73779 | 72776 |
| Thermos | 46587 | 48870 | 48976 | 45648 |

With SET TITLELINE=SKIP, both the underlines and the blank line are removed.

| | Region | | | |
|---|---|---|---|---|
| | Midwest | Northeast | Southeast | West |
| Product | | | | |
| Biscotti | 86105 | 145242 | 119594 | 70436 |
| Capuccino | . | 44785 | 73264 | 71168 |
| Coffee Grinder | 50393 | 40977 | 47083 | 48081 |
| Coffee Pot | 47156 | 46185 | 49922 | 47432 |
| Croissant | 139182 | 137394 | 156456 | 197022 |
| Espresso | 101154 | 68127 | 68030 | 71675 |
| Latte | 231623 | 222866 | 209654 | 213920 |
| Mug | 86718 | 91497 | 88474 | 93881 |
| Scone | 116127 | 70732 | 73779 | 72776 |
| Thermos | 46587 | 48870 | 48976 | 45648 |

# Controlling Column Title Underlining Using a StyleSheet Attribute

The TITLELINE attribute allows you to control whether column titles are underlined for report output.

# Control Column Title Underlining Using a StyleSheet Attribute

```
TYPE={REPORT|TITLE}, TITLELINE =  (ON|OFF|SKIP)
```

where:

**ON**

Underlines column titles. ON is the default value.

**OFF**

Replaces the underline with a blank line.

**SKIP**

Omits both the underline and the line on which the underline would have displayed.

# Controlling Column Title Underlining Using a StyleSheet Attribute

The following request has a BY and an ACROSS field.

```
TABLE FILE GGSALES
SUM UNITS BY PRODUCT
ACROSS REGION
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLE *
TYPE=REPORT, TITLELINE=ON, GRID=OFF, FONT=ARIAL,$
INCLUDE=IBFS:/FILE/IBI_HTML_DIR/javaassist/intl/EN/ENIADefault_
combine.sty,$
ENDSTYLE
END
```

With the default value (ON) for TITLELINE, the column titles are underlined.

| | Region | | | |
|---|---|---|---|---|
| | Midwest | Northeast | Southeast | West |
| Product | | | | |
| Biscotti | 86105 | 145242 | 119594 | 70436 |
| Capuccino | . | 44785 | 73264 | 71168 |
| Coffee Grinder | 50393 | 40977 | 47083 | 48081 |
| Coffee Pot | 47156 | 46185 | 49922 | 47432 |
| Croissant | 139182 | 137394 | 156456 | 197022 |
| Espresso | 101154 | 68127 | 68030 | 71675 |
| Latte | 231623 | 222866 | 209654 | 213920 |
| Mug | 86718 | 91497 | 88474 | 93881 |
| Scone | 116127 | 70732 | 73779 | 72776 |
| Thermos | 46587 | 48870 | 48976 | 45648 |

With TITLELINE=OFF, the column titles are not underlined, but the blank line where the underlines would have been is still there.

| | Region | | | |
|---|---|---|---|---|
| | Midwest | Northeast | Southeast | West |
| Product | | | | |
| Biscotti | 86105 | 145242 | 119594 | 70436 |
| Capuccino | . | 44785 | 73264 | 71168 |
| Coffee Grinder | 50393 | 40977 | 47083 | 48081 |
| Coffee Pot | 47156 | 46185 | 49922 | 47432 |
| Croissant | 139182 | 137394 | 156456 | 197022 |
| Espresso | 101154 | 68127 | 68030 | 71675 |
| Latte | 231623 | 222866 | 209654 | 213920 |
| Mug | 86718 | 91497 | 88474 | 93881 |
| Scone | 116127 | 70732 | 73779 | 72776 |
| Thermos | 46587 | 48870 | 48976 | 45648 |

With TITLELINE=SKIP, both the underlines and the blank line are removed.

| | Region | | | |
|---|---|---|---|---|
| | Midwest | Northeast | Southeast | West |
| Product | | | | |
| Biscotti | 86105 | 145242 | 119594 | 70436 |
| Capuccino | . | 44785 | 73264 | 71168 |
| Coffee Grinder | 50393 | 40977 | 47083 | 48081 |
| Coffee Pot | 47156 | 46185 | 49922 | 47432 |
| Croissant | 139182 | 137394 | 156456 | 197022 |
| Espresso | 101154 | 68127 | 68030 | 71675 |
| Latte | 231623 | 222866 | 209654 | 213920 |
| Mug | 86718 | 91497 | 88474 | 93881 |
| Scone | 116127 | 70732 | 73779 | 72776 |
| Thermos | 46587 | 48870 | 48976 | 45648 |

# Creating Labels to Identify Data

Labels enable you to provide meaningful and distinct names for the following report elements that are otherwise identified by generic labels:

- Row and column totals. See Creating a Label for a Row or Column Total.
- Subtotals for sort groups. See Creating a Label for a Subtotal and a Grand Total.

- Rows in a financial report. See Creating a Label for a Row in a Financial Report.

# Creating a Label for a Row or Column Total

A label for a row or column total identifies the sum of values for two or more fields. A label draws attention to the total. It is particularly important that you create a label for a row or column total if you have both in one report.

For related information, see Including Totals and Subtotals.

# Create a Label for a Row or Column Total

```
fieldname [AND] ROW-TOTAL[/justification][/format] [AS 'label']
fieldname [AND] COLUMN-TOTAL[/justification] [AS 'label']
```

or

```
fieldname [AND] COLUMN-TOTAL[/justification] [AS 'label']
```

where:

**fieldname**

Is a field named in a display command.

**justification**

Is the alignment of the label. Valid values are:

L which left justifies the label.

R which right justifies the label.

C which centers the label.

For related information, see Justifying a Heading, Footing, Title, or Label.

**format**

Is the format of the row or column total. When fields with the same format are summed, the format of the total is the same as the format of the fields. When fields with different formats are summed, the default D12.2 is used for either the row or column total.

**label**

Is the customized row or column total label. The default label is TOTAL.

You can also specify a row or column total with the ON TABLE phrase. With this syntax, you cannot include field names with ROW-TOTAL. Field names are optional with COLUMN-TOTAL.

```
ON TABLE ROW-TOTAL[/justification][/format] [AS 'label']
ON TABLE COLUMN-TOTAL[/justification] [AS 'label']
 [fieldname fieldname fieldname]
```

If a request queries a field created with COMPUTE, the value of that field is included in a row or column total. Keep that in mind when customizing a label that identifies the total.

# Creating a Label for a Row and Column Total

This request creates the label Total Population by State for the row total, and the label Total Population by Gender for the column total. The format D12 for ROW-TOTAL displays that data with commas.

```
TABLE FILE GGDEMOG
PRINT MALEPOP98 FEMPOP98
ROW-TOTAL/D12 AS 'Total Population by State'
BY ST
WHERE (ST EQ 'WY' OR 'MT')
ON TABLE COLUMN-TOTAL AS 'Total Population by Gender'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The output is:

| State | Male Population | Female Population | Total Population by State |
|---|---|---|---|
| MT | 426357 | 438836 | 865,193 |
| WY | 245023 | 245897 | 490,920 |
| Total Population by Gender | 671380 | 684733 | 1,356,113 |

# Creating a Row Total Label With ACROSS

This request adds the populations of two states, sorts the information using the ACROSS phrase, and labels the row totals as Total by Gender. There are two row totals within the Total by Gender column, Male Population and Female Population.

```
TABLE FILE GGDEMOG
SUM MALEPOP98/D12 FEMPOP98/D12
ROW-TOTAL AS 'Total by Gender'
ACROSS ST
WHERE ST EQ 'WY' OR 'MT';
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The output is:

| State | | | | | |
|---|---|---|---|---|---|
| MT | | WY | | Total by Gender | |
| Male Population | Female Population | Male Population | Female Population | Male Population | Female Population |
| 426,357 | 438,836 | 245,023 | 245,897 | 671,380 | 684,733 |

# Creating a Label for a Subtotal and a Grand Total

Frequently, a report contains detailed information for a sort group, and it is useful to provide a subtotal for such a group, and a grand total for all groups at the end of the report.

For related information see Including Totals and Subtotals.

# Create a Label for a Subtotal or a Grand Total

```
{BY|ON} fieldname {SUB-TOTAL|SUBTOTAL|COLUMN-TOTAL} [MULTILINES]
        [field1 [AND] field2...] [AS 'label'] [WHEN expression;]
```

where:

**fieldname**

Is a sort field named on a BY or ON phrase.

**MULTILINES**

Suppresses a subtotal when there is only one value at a sort break. After it is specified, MULTILINES suppresses the subtotal for every sort break with only one detail line. MULTI-LINES is a synonym for MULTILINES.

**field1 field2**

Are specific fields that will be subtotaled. A specified field overrides the default, which includes all numeric display fields.

**AS 'label'**

Is the customized label for the subtotal. You cannot change the default label for a higher level sort field if using SUB-TOTAL.

**WHEN expression**

Specifies a conditional subtotal as determined by a logical expression. For details, see Using Expressions.

# Creating a Label for a Subtotal and a Grand Total

This request creates a customized label for the subtotal, which is the total dollar amount deducted from employee paychecks for city taxes per department; and the grand total which is the total dollar amount for both departments.

```
TABLE FILE EMPLOYEE
SUM DED_AMT BY DED_CODE BY DEPARTMENT
BY BANK_ACCT
WHERE DED_CODE EQ 'CITY'
WHERE BANK_ACCT NE 0
ON DEPARTMENT SUBTOTAL AS 'Total City Deduction for'
ON TABLE COLUMN-TOTAL AS '**GRAND TOTAL**'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

In the output, the department values MIS and PRODUCTION are included by default in the customized subtotal label.

| DED_CODE | DEPARTMENT | BANK_ACCT | DED_AMT |
|---|---|---|---|
| CITY | MIS | 40950036 | $14.00 |
| | | 122850108 | $31.75 |
| | | 163800144 | $82.70 |
| Total City Deduction for MIS | | | $128.45 |
| | PRODUCTION | 160633 | $7.42 |
| | | 136500120 | $18.25 |
| | | 819000702 | $60.20 |
| Total City Deduction for PRODUCTION | | | $85.87 |
| **GRAND TOTAL** | | | $214.32 |

# Creating a Label for the Subtotal of a Specific Field

This request creates a customized label, Order Total, for the subtotal for LINEPRICE. It uses the default label TOTAL for the grand total.

```
TABLE FILE CENTORD
PRINT PNUM QUANTITY LINEPRICE
BY ORDER_NUM SUBTOTAL LINEPRICE AS 'Order Total'
WHERE ORDER_NUM EQ '28003' OR '28004';
```

```
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The output is:

| Order Number: | Product Number#: | Quantity: | Line Total |
|---|---|---|---|
| 28003 | 1006 | 1 | $501.60 |
| | 1008 | 1 | $239.18 |
| | 1020 | 1 | $324.06 |
| | 1032 | 1 | $103.23 |
| | 1034 | 1 | $520.40 |
| Order Total 28003 | | | $1,688.47 |
| 28004 | 1006 | 1 | $471.83 |
| | 1016 | 1 | $282.19 |
| | 1018 | 1 | $462.96 |
| | 1022 | 1 | $401.30 |
| | 1028 | 1 | $110.34 |
| | 1036 | 1 | $295.00 |
| Order Total 28004 | | | $2,023.62 |
| TOTAL | | | $3,712.09 |

# Create a Label for the Subtotal of a Calculated Value

```
{BY|ON} fieldname {SUMMARIZE|RECOMPUTE} [MULTILINES]
        [field1 [AND] field2...] [AS 'label'] [WHEN expression;]
ON TABLE {SUMMARIZE|RECOMPUTE}
```

where:

**fieldname**

Is a sort field named on a BY or ON phrase.

**MULTILINES**

Suppresses a subtotal when there is only one value at a sort break. After it is specified, MULTILINES suppresses the subtotal for every sort break with only one detail line. MULTI-LINES is a synonym for MULTILINES.

**field1 field2**

Are specific fields that will be subtotaled. Specified fields override the default, which includes all numeric display fields.

**AS 'label'**

Is the customized label for the subtotal. You cannot change the default label for a higher level sort field if using SUMMARIZE.

**WHEN expression**

Specifies a conditional subtotal as determined by a logical expression. For details, see Using Expressions.

You can also generate a subtotal with the ON TABLE phrase:

```
ON TABLE {SUMMARIZE|RECOMPUTE}
```

# Creating a Label for the Subtotal of a Calculated Value

This request creates a customized label for the subtotal, including the calculation for the field DG_RATIO, created with COMPUTE.

```
TABLE FILE EMPLOYEE
SUM GROSS DED_AMT AND COMPUTE
DG_RATIO/F4.2 = DED_AMT / GROSS;
BY DEPARTMENT BY BANK_ACCT
WHERE BANK_ACCT NE 0
ON DEPARTMENT SUMMARIZE AS 'SUBTOTAL FOR '
ON TABLE SET PAGE-NUM OFF
```

```
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

In the output, the department values MIS and PRODUCTION are included by default in the customized subtotal label. The default grand total label is TOTAL.

| DEPARTMENT | BANK ACCT | GROSS | DED AMT | DG RATIO |
|---|---|---|---|---|
| MIS | 40950036 | $6,099.50 | $2,866.18 | .47 |
| | 122850108 | $9,075.00 | $6,307.00 | .69 |
| | 163800144 | $22,013.75 | $15,377.40 | .70 |
| SUBTOTAL FOR MIS | | $37,188.25 | $24,550.58 | .66 |
| PRODUCTION | 160633 | $2,475.00 | $1,427.24 | .58 |
| | 136500120 | $9,130.00 | $3,593.92 | .39 |
| | 819000702 | $17,094.00 | $11,949.44 | .70 |
| SUBTOTAL FOR PRODUCTION | | $28,699.00 | $16,970.60 | .59 |
| TOTAL | | $65,887.25 | $41,521.18 | .63 |

# Creating a Label for a Row in a Financial Report

Financial Modeling Language (FML) meets the special needs associated with creating, calculating, and presenting financially oriented data. FML reports are structured on a row-by-row basis. This organization gives you greater control over the data incorporated into a report and over its presentation.

You identify rows by labels that you can customize for accurate data identification and format to enhance the visual appearance and clarity of the data.

For details on FML reports, see Creating Financial Reports With Financial Modeling Language (FML).

# Formatting a Heading, Footing, Title, or Label

You can use a variety of strategies for enhancing the context-building elements in a report, that is, the headings, footings, column and row titles, and labels you assign to row and column totals and to subtotals. These additions enhance the visual appeal of a report and communicate a sense of completeness, using font and color for emphasis and distinctions, and alignment to add structural clarity and facilitate comprehension.

You can:

- Apply font characteristics to column and row titles, to headings, footing, and elements in them, and to subtotals, grand totals, and subtotal calculations. For more information, see Applying Font Attributes to a Heading, Footing, Title, or Label.
- Add borders around headings and footings and grid lines around headings, footings, and column titles. For more information, see Laying Out the Report Page.

  You can also add space between heading or footing content and grid lines. For more information, see Controlling the Vertical Positioning of a Heading or Footing.
- Left-justify, right-justify, or center a heading, footing, or individual lines in a multi-line heading or footing, column titles, and subtotals. For more information, see Justifying a Heading, Footing, Title, or Label. See also Center a Page Heading or Footing Using Legacy Formatting and Justifying a Heading, Footing, Title, or Label.

  You can also justify a label for a row or column total. For more information, see Justifying a Heading, Footing, Title, or Label.
- Align a heading or footing, or elements within a heading or footing, based on:
  - Data column position in the main HTML table or on column position in an embedded HTML table created for the heading or footing in the report. These alignment techniques are supported for HTML reports. For more information, see Aligning a Heading or Footing Element in an HTML, XLSX, EXL2K, PDF, PPTX, or DHTML Report.
  - Explicit width and justification specifications for multi-line headings and footings, including unit measurements (like inches) to enforce the alignment of decimal points in stacked numeric or alphanumeric data. These alignment techniques are supported for HTML and PDF reports. For more information, see Aligning Content in a Multi-Line Heading or Footing.
  - An absolute or relative starting position, defined by either a unit measurement (like inches) or a column position. These alignment techniques are supported

for PDF reports, although some features are also supported for HTML when used with an internal cascading style sheet. For more information, see Positioning Headings, Footings, or Items Within Them.

For assistance in determining which of these approaches best suits your needs, see Choosing an Alignment Method for Heading and Footing Elements.

- Control the vertical positioning of a heading or footing. For more information, see Controlling the Vertical Positioning of a Heading or Footing.
- Position a report or sort heading or footing on a separate page. See Placing a Report Heading or Footing on Its Own Page.

# Applying Font Attributes to a Heading, Footing, Title, or Label

You can specify font family, size, color, and style for any report element you can identify in a StyleSheet:

- Row and column titles. Styling is applied to either the default title or a customized title.
- Headings and footings, and elements within them, including specific lines in a multi-line heading or footing, items in a line, text strings, and embedded fields. Note that you can also specify background color for individual elements.
- Labels for subtotals, grand totals, subtotal calculations, and row totals. Styling applies to default or customized names.
- Page numbers in a heading or footing.
- Underlines and skipped lines (not supported in HTML reports).

For detailed syntax, see Identifying a Report Component in a WebFOCUS StyleSheet. For details on font options, including size, color, and style, see Formatting Report Data.

# Applying Font Characteristics to a Report Heading and Column Titles

This request uses a StyleSheet to select 12-point Arial bold for the report heading (Sales Report), and 10-point Arial italic for the default column titles (Category, Product, Unit Sales, Dollar Sales), based on the HTML point scale, which differs from standard point sizes. See Formatting Report Data.

For an HTML report, the font name must be enclosed in single quotation marks. The StyleSheet attribute TYPE = TABHEADING identifies the report heading, and the attribute TYPE = TITLE identifies the column titles.

```
TABLE FILE GGSALES
SUM UNITS DOLLARS
BY CATEGORY BY PRODUCT
ON TABLE SUBHEAD
"Sales Report"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE = REPORT, GRID=OFF, $
TYPE = TABHEADING, FONT = 'ARIAL', SIZE = 12, STYLE = BOLD, $
TYPE = TITLE, FONT = 'ARIAL', SIZE = 10, STYLE = ITALIC, $
ENDSTYLE
END
```

The output is:

**Sales Report**

| Category | Product | Unit Sales | Dollar Sales |
|---|---|---|---|
| Coffee | Capuccino | 189217 | 2381590 |
| | Espresso | 308986 | 3906243 |
| | Latte | 878063 | 10943622 |
| Food | Biscotti | 421377 | 5263317 |
| | Croissant | 630054 | 7749902 |
| | Scone | 333414 | 4216114 |
| Gifts | Coffee Grinder | 186534 | 2337567 |
| | Coffee Pot | 190695 | 2449585 |
| | Mug | 360570 | 4522521 |
| | Thermos | 190081 | 2385829 |

# Setting Font Size for a Report Heading Using an Internal Cascading Style Sheet

An internal cascading style sheet enables you to specify an absolute size, measured in points, rather than the corresponding HTML point scale, thereby providing greater control over the appearance of fonts in a report. See Formatting Report Data and Controlling Report Formatting.

This request generates an internal cascading style sheet and specifies font characteristics for the report heading.

```
TABLE FILE GGSALES
SUM UNITS DOLLARS
BY CATEGORY BY PRODUCT
ON TABLE SUBHEAD
"Sales Report"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLESHEET *
TYPE = REPORT, GRID=OFF, $
TYPE = TABHEADING, FONT = 'ARIAL', SIZE = 12, STYLE = BOLD, $
TYPE = TITLE, FONT = 'ARIAL', SIZE = 10, STYLE = ITALIC, $
ENDSTYLE
END
```

The output is:

**Sales Report**

| Category | Product | Unit Sales | Dollar Sales |
|---|---|---|---|
| Coffee | Capuccino | 189217 | 2381590 |
| | Espresso | 308986 | 3906243 |
| | Latte | 878063 | 10943622 |
| Food | Biscotti | 421377 | 5263317 |
| | Croissant | 630054 | 7749902 |
| | Scone | 333414 | 4216114 |
| Gifts | Coffee Grinder | 186534 | 2337567 |
| | Coffee Pot | 190695 | 2449585 |
| | Mug | 360570 | 4522521 |
| | Thermos | 190081 | 2385829 |

# Applying Font Styles to a System Variable in a Report Heading

This request includes the system variable &DATE in the heading. Styling is italic to distinguish it from the rest of the heading text, which is bold. The spot marker <+0> creates two items in the heading so that each one can be formatted separately.

```
TABLE FILE GGSALES
PRINT BUDDOLLARS DOLLARS
BY STCD
WHERE STCD EQ 'R1019'
ON TABLE SUBHEAD
"Sales Report for Store Code R1019 <+0>&DATE"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF,$
TYPE=TABHEADING, FONT='TIMES', SIZE=10, STYLE=BOLD,$
TYPE=TABHEADING, ITEM=2, STYLE=ITALIC,$
ENDSTYLE
END
```

The partial output is:

**Sales Report for Store Code R1019** *06/13/02*

| Store ID | Budget Dollars | Dollar Sales |
|---|---|---|
| R1019 | 18560 | 25680 |
| | 21132 | 24010 |
| | 15880 | 22919 |
| | 24450 | 22605 |
| | 14556 | 18942 |
| | 13860 | 18915 |
| | 22806 | 18837 |
| | 19248 | 18535 |
| | 15120 | 18466 |
| | 15444 | 17784 |
| | 15190 | 17644 |
| | 12386 | 15996 |
| | 12720 | 14546 |
| | 17370 | 14328 |

# Adding Borders and Grid Lines

You can add borders and grid lines to headings, footings, titles and labels. For detailed syntax, see Laying Out the Report Page.

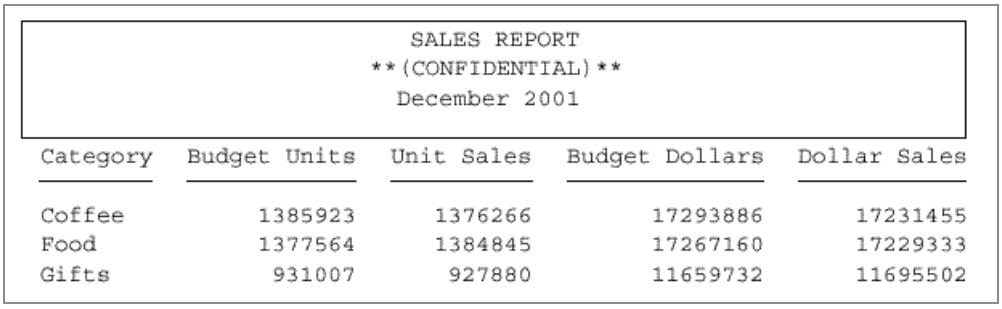
# Adding a Grid Around a Report Heading in a PDF Report

This request generates a PDF report with a grid around the heading, created with the GRID attribute, to set the heading off from the body of the report.

```
TABLE FILE GGSALES
SUM BUDUNITS UNITS BUDDOLLARS DOLLARS
BY CATEGORY
ON TABLE SUBHEAD
"SALES REPORT"
"**(CONFIDENTIAL)**"
```

```
"December 2001 </1"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT PDF
ON TABLE SET SQUEEZE ON
ON TABLE SET STYLESHEET *
TYPE = TABHEADING, JUSTIFY = CENTER, GRID=ON, $
ENDSTYLE
END
```

The output is:



SALES REPORT
**(CONFIDENTIAL)**
December 2001

| Category | Budget Units | Unit Sales | Budget Dollars | Dollar Sales |
|---|---|---|---|---|
| Coffee | 1385923 | 1376266 | 17293886 | 17231455 |
| Food | 1377564 | 1384845 | 17267160 | 17229333 |
| Gifts | 931007 | 927880 | 11659732 | 11695502 |

# Emphasizing Column Titles With Horizontal Lines in a PDF Report

This request generates a PDF report with horizontal lines, created with the HGRID attribute, above and below the column titles.

```
TABLE FILE GGSALES
SUM BUDUNITS UNITS BUDDOLLARS DOLLARS
BY CATEGORY
ON TABLE SUBHEAD
"SALES REPORT"
"**(CONFIDENTIAL)**"
"December 2001 </1"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT PDF
ON TABLE SET SQUEEZE ON
ON TABLE SET STYLESHEET *
TYPE = TABHEADING, JUSTIFY = CENTER, FONT=ARIAL, SIZE=12, $
TYPE = TITLE, HGRID=ON, $
END
```

The output is:

SALES REPORT
**(CONFIDENTIAL)**
December 2001

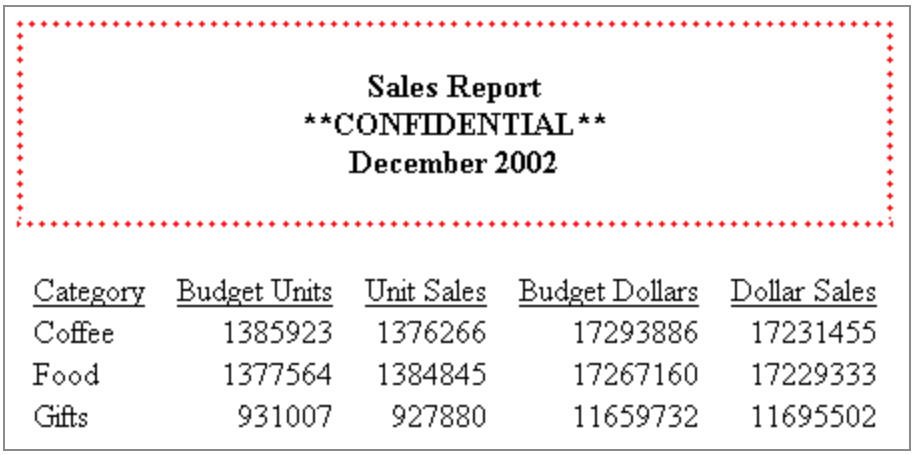
| Category | Budget Units | Unit Sales | Budget Dollars | Dollar Sales |
|---|---|---|---|---|
| Coffee | 1385923 | 1376266 | 17293886 | 17231455 |
| Food | 1377564 | 1384845 | 17267160 | 17229333 |
| Gifts | 931007 | 927880 | 11659732 | 11695502 |

# Formatting a Border Around a Report Heading

This request generates an HTML report with a heavy red dotted line around the entire report heading.

```
TABLE FILE GGSALES
SUM BUDUNITS UNITS BUDDOLLARS DOLLARS
BY CATEGORY
ON TABLE SUBHEAD
"</1 Sales Report"
"**CONFIDENTIAL**"
"December 2002 </1"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
TYPE=TABHEADING, STYLE=BOLD, JUSTIFY=CENTER, BORDER=HEAVY,
     BORDER-COLOR=RED, BORDER-STYLE=DOTTED, $
ENDSTYLE
END
```

The output is:



Sales Report
**CONFIDENTIAL**
December 2002

| Category | Budget Units | Unit Sales | Budget Dollars | Dollar Sales |
|---|---|---|---|---|
| Coffee | 1385923 | 1376266 | 17293886 | 17231455 |
| Food | 1377564 | 1384845 | 17267160 | 17229333 |
| Gifts | 931007 | 927880 | 11659732 | 11695502 |

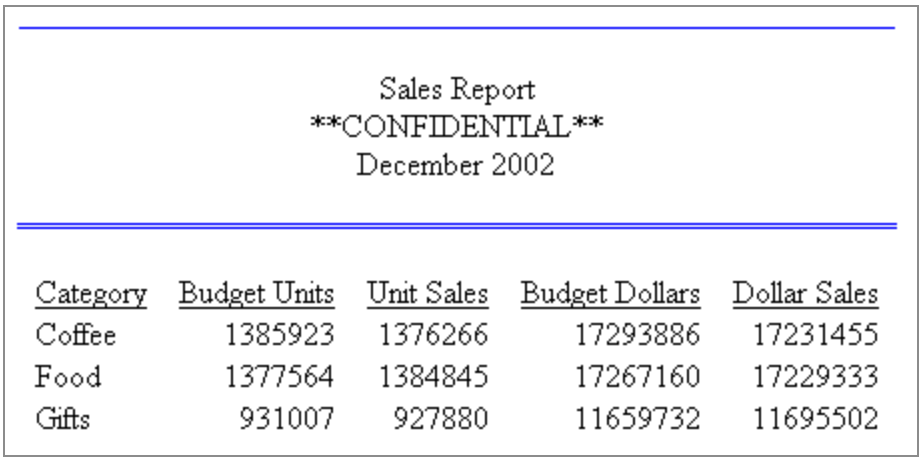
**Tip:** You can use the same BORDER syntax to generate this output in a PDF or PS report.

# Formatting a Report Heading With Top and Bottom Borders

This request generates a light blue line above the heading and a heavy double line of the same color below the heading. The request does not specify border lines for the left and right sides of the heading.

```
TABLE FILE GGSALES
SUM BUDUNITS UNITS BUDDOLLARS DOLLARS
BY CATEGORY
ON TABLE SUBHEAD
"</1 Sales Report"
"**CONFIDENTIAL**"
"December 2002 </1"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
TYPE=TABHEADING, JUSTIFY=CENTER, BORDER-TOP=LIGHT, BORDER-COLOR=BLUE,
       BORDER-BOTTOM=HEAVY, BORDER-BOTTOM-STYLE=DOUBLE,$
ENDSTYLE
END
```

The output is:



Sales Report
**CONFIDENTIAL**
December 2002

| Category | Budget Units | Unit Sales | Budget Dollars | Dollar Sales |
|---|---|---|---|---|
| Coffee | 1385923 | 1376266 | 17293886 | 17231455 |
| Food | 1377564 | 1384845 | 17267160 | 17229333 |
| Gifts | 931007 | 927880 | 11659732 | 11695502 |

**Tip:** You can use the same BORDER syntax to generate this output in a PDF or PS report.

# Justifying a Heading, Footing, Title, or Label

You can left-justify, right-justify, or center the following report elements:

- A heading or footing. See Justifying a Heading, Footing, Title, or Label.
- A column title. See Justifying a Column Title.
- A label for a row or column total. See Justifying a Label for a Row or Column Total.
- A label for a subtotal or grand total. See Justifying a Label for a Subtotal or Grand Total.

In addition, you can use justification syntax in combination with other StyleSheet syntax to align headings and footings with other report elements, based on either unit measurements or relationships to other report elements, such as columns. For a summary of these options, see Choosing an Alignment Method for Heading and Footing Elements.

# Justifying a Heading or Footing

You can left-justify, right-justify, or center a heading or footing in a StyleSheet. By default, a heading or footing is left justified. In addition, you can justify an individual line or lines in a multiple-line heading or footing.

To center a page heading or footing over the report data, you can use a legacy formatting technique that does not require a StyleSheet; simply include the CENTER command in a HEADING or FOOTING command.

**Justification behavior in HTML and PDF.** For HTML reports, justification is implemented with respect to the report width. That means a centered heading is centered over the report content. In contrast, for PDF reports the default justification area is the page width, rather than the report width, resulting in headings and footings that are not centered on the report. In most cases, you can achieve justification based on report width in a PDF report by adding the command SET SQUEEZE=ON to your request. This command improves the appearance of the report by eliminating excessive white space between columns and implements justification over the report content. However, if the heading is wider than the report, it will be centered on the page, even when SQUEEZE=ON.

**Tip:** You can also use justification syntax in combination with other StyleSheet syntax to align headings, footings, and items in them with other report elements, based on either unit measurements or relationships to other columns. For a summary of these options, see Choosing an Alignment Method for Heading and Footing Elements.

# Justify a Heading or Footing in a StyleSheet

```
TYPE = headfoot, [LINE = line_#,] JUSTIFY = option, $
```

where:

**headfoot**

Is the type of heading or footing. Valid values are TABHEADING, TABFOOTING, HEADING, FOOTING, SUBHEAD, and SUBFOOT.

**line_#**

Optionally identifies a line by its position in the heading or footing so that you can individually align it. If a heading or footing has multiple lines and you omit this option, the value supplied for JUSTIFY applies to all lines.

**option**

Is the type of justification. Valid values are:

LEFT which left justifies the heading or footing. LEFT is the default value.

RIGHT which right justifies the heading or footing.

CENTER which centers the heading or footing.

For an alternative way to center a page heading or footing without a StyleSheet, see Justifying a Heading, Footing, Title, or Label.

**Note:** JUSTIFY is not supported with WRAP.

# Justifying a Report Heading

This request centers the report heading PRODUCT REPORT, using the attribute JUSTIFY = CENTER.

```
TABLE FILE GGPRODS
SUM UNITS BY PRODUCT_DESCRIPTION BY PRODUCT_ID BY VENDOR_NAME
ON TABLE SUBHEAD
"PRODUCT REPORT"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE = REPORT, GRID=OFF, $
TYPE = REPORT, COLUMN = VENDOR_NAME, JUSTIFY = CENTER, $
TYPE = TABHEADING, JUSTIFY = CENTER, $
ENDSTYLE
END
```

The output is:

PRODUCT REPORT

| Product | Product Code | Vendor Name | Unit Price |
|---|---|---|---|
| Biscotti | F102 | Delancey Bakeries | 17.00 |
| Coffee Grinder | G110 | Appliance Craft | 125.00 |
| Coffee Pot | G121 | Appliance Craft | 140.00 |
| Croissant | F103 | West Side Bakers | 28.00 |
| French Roast | B142 | European Specialities, | 81.00 |
| Hazelnut | B141 | Coffee Connection | 58.00 |
| Kona | B144 | Evelina Imports, Ltd | 76.00 |
| Mug | G100 | NY Ceramic Supply | 26.00 |
| Scone | F101 | Ridgewood Bakeries | 13.00 |
| Thermos | G104 | ThermoTech, Inc | 96.00 |

**Tip:** If you wish to run this report in PDF format, add the code ON TABLE SET SQUEEZE ON to eliminate excessive white space between columns and to center the heading over the report.

For more information on justifying a column title, see Justifying a Heading, Footing, Title, or Label.

# Justifying Individual Lines in a Multiple-Line Report Heading

In this request, heading line 1 (SALES REPORT) is centered, heading line 2 (**CONFIDENTIAL**) is also centered, and heading line 3 (December 2001) is right justified.

```
TABLE FILE GGSALES
SUM BUDUNITS UNITS BUDDOLLARS DOLLARS
BY CATEGORY
ON TABLE SUBHEAD
"SALES REPORT"
"**(CONFIDENTIAL)**"
"December 2001"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE = REPORT, GRID=OFF, $
```

```
TYPE = TABHEADING, LINE = 1, JUSTIFY = CENTER, $
TYPE = TABHEADING, LINE = 2, JUSTIFY = CENTER, $
TYPE = TABHEADING, LINE = 3, JUSTIFY = RIGHT, $
ENDSTYLE
END
```

The output is:

SALES REPORT
**(CONFIDENTIAL)**
December 2001

| Category | Budget Units | Unit Sales | Budget Dollars | Dollar Sales |
|---|---|---|---|---|
| Coffee | 1385923 | 1376266 | 17293886 | 17231455 |
| Food | 1377564 | 1384845 | 17267160 | 17229333 |
| Gifts | 931007 | 927880 | 11659732 | 11695502 |

**Tip:** To run this report in PDF format, add the code ON TABLE SET SQUEEZE ON to eliminate excessive white space between columns and to center the heading over the report.

# Centering All Lines in a Multiple-Line Report Heading

This request centers all lines in a multiple-line report heading using the single StyleSheet attribute for the entire heading.

```
TABLE FILE GGSALES
SUM BUDUNITS UNITS BUDDOLLARS DOLLARS
BY CATEGORY
ON TABLE SUBHEAD
"SALES REPORT"
"**(CONFIDENTIAL)**"
"December 2001"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE = REPORT, GRID=OFF, $
TYPE = TABHEADING, JUSTIFY = CENTER, $
```

```
ENDSTYLE
END
```

The output is:

SALES REPORT
**(CONFIDENTIAL)**
December 2001

| Category | Budget Units | Unit Sales | Budget Dollars | Dollar Sales |
|---|---|---|---|---|
| Coffee | 1385923 | 1376266 | 17293886 | 17231455 |
| Food | 1377564 | 1384845 | 17267160 | 17229333 |
| Gifts | 931007 | 927880 | 11659732 | 11695502 |

**Tip:** To run this report in PDF format, add the code ON TABLE SET SQUEEZE ON to eliminate excessive white space between columns and to center the heading over the report.

# Justification Regions and Behavior

The region in which text is justified depends on the relationship of the sizes of certain elements in the report:

- When SQUEEZE=ON, the maximum width of all the heading types in the report is calculated. This value is called MaxHeadWidth.

  If MaxHeadWidth is less than or equal to the total width of the columns of the report, headings are justified in the space over the report columns.

  If MaxHeadWidth exceeds the total width of the columns of the report, headings are centered and right-justified in the entire width of the page.

- When SQUEEZE=OFF, the maximum width of all the headings are not pre-calculated. Headings are centered in the entire width of the page.

  With a styled, multiple-panel report (in which the width exceeds one page), headings can only appear in the first panel. Thus, the preceding calculations deal with the total width of the columns in the first panel rather than the total width of all the columns in the report.

# Center a Page Heading or Footing Using Legacy Formatting

```
{HEADING|FOOTING} CENTER
 "content ... "
["content ... "]
.
.
.
["content ... "]
```

where:

**HEADING**

Is a page heading.

**FOOTING**

Is a page footing.

**CENTER**

Centers the page heading or footing over or under the report data.

**content**

Heading or footing content can include the following elements, between double quotation marks. If the ending quotation mark is omitted, all subsequent lines of the request are treated as part of the heading or footing.

**text**

Is text for the heading or footing. You can include multiple lines of text.

The text must start on a line by itself, following the HEADING or FOOTING command.

Text can be combined with variables and spot markers.

For related information, see Limits for Headings and Footings.

**variable**

Can be any one or a combination of the following:

`Fields` (real data source fields, a virtual fields created with the DEFINE command in a Master File or report request, calculated values created with the COMPUTE command in a request, a system field such as TABPAGENO). You can qualify data source fields with certain prefix operators.

```
Dialogue Manager variables.
```

`Images`. You can include images in a heading or footing.

For details, see Including an Element in a Heading or Footing.

**spot marker**

Enables you to position items, to identify items to be formatted, and to extend code beyond the 80-character line limit of the text editor.

`<+0>` divides a heading or footing into items for formatting. For details, see Identifying a Heading, Footing, Title, or FML Free Text.

`</n` specifies skipped lines. For details, see Controlling the Vertical Positioning of a Heading or Footing.

`<-n` to position the next character on the line. For details, see Positioning Headings, Footings, or Items Within Them.

`<0X` continues a heading or footing specification on the next line of the request. For details, see Extending Heading and Footing Code to Multiple Lines in a Report Request.

**Note:** When a closing spot marker is immediately followed by an opening spot marker (><), a single space text item will be placed between the two spot markers (> <). This must be considered when applying formatting.

**Blank lines**

If you omit all text, variables, and spot markers, you have a blank heading or footing line (for example, " ") which you can use to skip a line in the heading or footing. (You can also skip a line using a vertical spot marker, such as </1.)

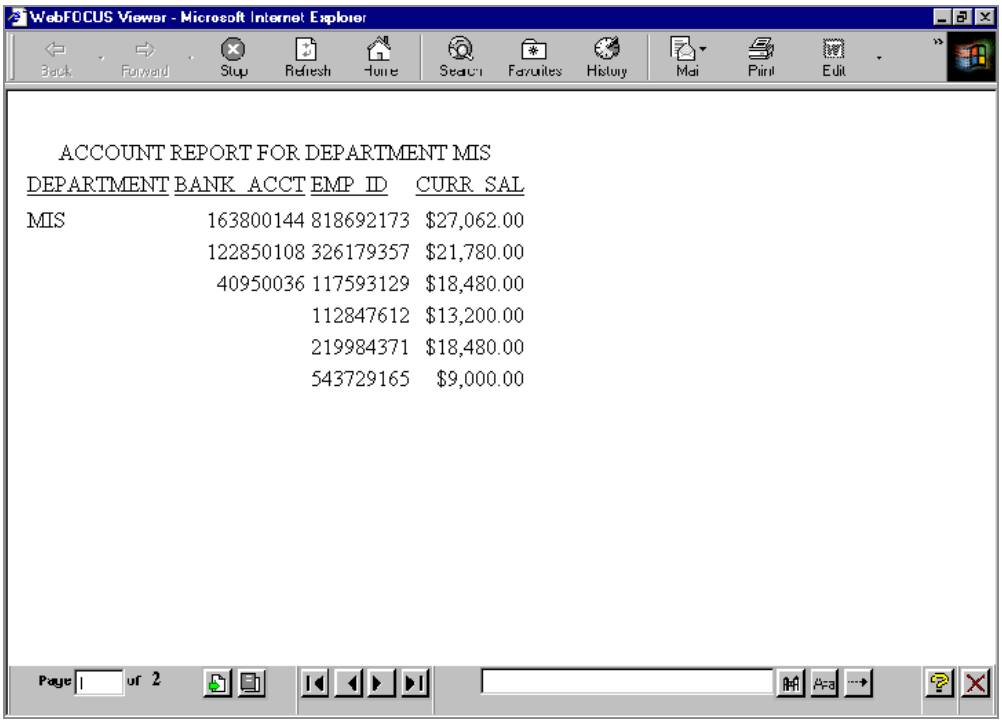
**Tip:** Do not use the command CENTER with the StyleSheet attribute JUSTIFY = CENTER. A single method will generate the desired result.

# Centering a Page Heading

This request uses the command CENTER in the page heading syntax.

```
TABLE FILE EMPLOYEE
HEADING CENTER
"ACCOUNT REPORT FOR DEPARTMENT <DEPARTMENT"
PRINT CURR_SAL BY DEPARTMENT BY HIGHEST BANK_ACCT
BY EMP_ID
ON DEPARTMENT PAGE-BREAK
ON TABLE SET PAGE-NUM OFF
ON TABLE SET WEBVIEWER ON
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE=REPORT, SIZE=10, GRID=OFF,$
ENDSTYLE
END
```

The page heading is centered over the report data, as shown in the first page of output.




**Tip:** If you do not see the navigation arrows, click the maximize button.

# Justifying a Column Title

You can left-justify, right-justify, or center a column title for a display field, BY field, ACROSS field, or calculated value using a StyleSheet.

If a title is specified with an AS phrase in a request, or with the TITLE attribute in a Master File, that title will be justified, as specified for the field in StyleSheet syntax, if such syntax exists in the request. For related information, see Customizing a Column Title.

**Justification behavior in HTML and PDF.** For HTML reports, justification is implemented with respect to the report width. That means a centered column title is centered over a report column. In contrast, for PDF reports the default justification area is the page width, rather than the report width, resulting in column titles that are not centered over the report column. You can achieve justification based on report width in a PDF report by adding the command SET SQUEEZE=ON to your request. This command improves the appearance of the report by eliminating excessive white space between columns and implements justification over the report content.

You can also justify a column title for a display or BY field using legacy formatting methods. However, when legacy formatting is applied to an ACROSS field, data values, not column titles, are justified as specified. See Justifying a Heading, Footing, Title, or Label.

# Justify a Column Title Using a StyleSheet

To justify a column title for a vertical sort column (generated by BY) or a display column (generated by PRINT, LIST, SUM, or COUNT), the StyleSheet syntax is

```
TYPE=TITLE, [COLUMN=column,] JUSTIFY=option, $
TYPE=ACROSSTITLE, [ACROSS=column,] JUSTIFY=option, $
TYPE=ACROSSVALUE, [COLUMN=column,] JUSTIFY=option, $
```

To justify a horizontal sort column title (generated by ACROSS), the StyleSheet syntax is

```
TYPE=ACROSSTITLE, [ACROSS=column,] JUSTIFY=option, $
```

To justify an ACROSS value or a ROW-TOTAL column title in an HTML report, use

```
TYPE=ACROSSVALUE, [COLUMN=column,] JUSTIFY=option, $
```

where:

**TITLE**

Specifies a vertical sort (BY) title or a display field title.

**column**

Specifies the column whose title you wish to justify. If you omit this attribute and value, the formatting will be applied to all of the report's column titles. For details on identifying columns, see Identifying a Report Component in a WebFOCUS StyleSheet.

**ACROSSTITLE**

Specifies a horizontal sort (ACROSS) title.

**ACROSSVALUE**

Specifies a horizontal sort (ACROSS) value or a ROW-TOTAL column title.

**option**

Is the type of justification. Valid values are:

`LEFT` which left justifies the column title. This value is the default for an alphanumeric field.

`RIGHT` which right justifies the column title. This value is the default for a numeric or date field.

`CENTER` which centers the column title. You cannot center an ACROSSTITLE in a PDF report.

**Note:** JUSTIFY is not supported with WRAP.

# Using a StyleSheet to Justify Column Titles for Display and BY Fields

This request centers the column titles for STORE_NAME and ADDRESS1. The default column title for STORE_NAME is Store Name, as specified in the Master File with the TITLE attribute. The default column title for ADDRESS1 is Contact, also specified in the Master File. The request right-justifies the column title for STATE, which is specified in the AS phrase as St. Each column is identified by its field name and justified separately.

```
TABLE FILE GGSTORES
PRINT STORE_NAME STATE AS 'St' BY ADDRESS1
WHERE STATE EQ 'CA'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET SQUEEZE ON
ON TABLE SET STYLESHEET *
TYPE = REPORT, GRID=OFF, $
TYPE=TITLE, COLUMN=STORE_NAME, JUSTIFY=CENTER, $
TYPE=TITLE, COLUMN=STATE, JUSTIFY=RIGHT, $
TYPE=TITLE, COLUMN=ADDRESS1, JUSTIFY=CENTER, $
ENDSTYLE
END
```

The output is:

| Contact | Store Name | St |
|---|---|---|
| JEFF DARFELL | GOTHAM GRINDS #1244 | CA |
| PAT SMILEY | GOTHAM GRINDS #1040 | CA |

# Using a StyleSheet to Justify a Column Title for ACROSS and ROW-TOTAL Fields

This request centers the column title, State, created by the ACROSS phrase over the two values (MT and WY) and the row total column title, Total by Gender, over the two row totals (Male Population and Female Population). Notice that each across value functions as a title for one or more columns in the report.

```
TABLE FILE GGDEMOG
SUM MALEPOP98 FEMPOP98
ROW-TOTAL/D12 AS 'Total by Gender'
ACROSS ST
WHERE ST EQ 'WY' OR 'MT';
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
TYPE=ACROSSTITLE, JUSTIFY=CENTER, FONT='TIMES', SIZE=11, STYLE=BOLD, $
```

```
TYPE=ACROSSVALUE, COLUMN=N5, JUSTIFY=CENTER, $
ENDSTYLE
END
```

The output is:

| | State | | | | |
|---|---|---|---|---|---|
| MT | | WY | | Total by Gender | |
| Male Population | Female Population | Male Population | Female Population | Male Population | Female Population |
| 426357 | 438836 | 245023 | 245897 | 671380 | 684733 |

# Using a StyleSheet to Justify a Column Title for a Calculated Value

This request identifies the column title of the calculated value and left justifies it over the data.

```
TABLE FILE SALES
SUM UNIT_SOLD RETAIL_PRICE
COMPUTE REV/D12.2M = UNIT_SOLD * RETAIL_PRICE;
BY PROD_CODE
WHERE CITY EQ 'NEW YORK'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
TYPE=TITLE, COLUMN=REV, STYLE=BOLD, JUSTIFY=LEFT, $
ENDSTYLE
END
```

The output is:

| PROD CODE | UNIT SOLD | RETAIL PRICE | REV |
|---|---|---|---|
| B10 | 30 | $.85 | $25.50 |
| B17 | 20 | $1.89 | $37.80 |
| B20 | 15 | $1.99 | $29.85 |
| C17 | 12 | $2.09 | $25.08 |
| D12 | 20 | $2.09 | $41.80 |
| E1 | 30 | $.89 | $26.70 |
| E3 | 35 | $1.09 | $38.15 |

**Note:** To run this report in PDF format, add the code ON TABLE SET SQUEEZE ON to eliminate excessive white space between columns and to justify column titles properly over the data.

# Justify a Column Title for a Display or BY Field Using Legacy Formatting

```
fieldname/justification [/format] [AS 'title']
```

where:

**fieldname**

Is the name of the field.

**justification**

Is the type of justification. Valid values are:

L which left justifies the column title. This value is the default for an alphanumeric field.

R which right justifies the column title. This value is the default for a numeric or date field.

C which centers the column title.

**/format**

Is an optional format specification for the field. For a display field, you can combine the justification value with the format value (in either order) to adjust the width of the column data or to specify display options.

**AS 'title'**

Is an optional customized column title.

**Tip:** For an ACROSS field, this syntax justifies data values, not column titles. For syntax that will justify the title, see Justifying a Heading, Footing, Title, or Label.

# Using Legacy Formatting to Justify Column Titles for Display and BY Fields

This request centers the column titles for STORE_NAME and ADDRESS1. The default column title for STORE_NAME is Store Name, as specified in the Master File with the TITLE attribute. The default column title for ADDRESS1 is Contact, also specified in the Master File. The request right justifies the column title for STATE, which is specified in the AS phrase as St.

```
TABLE FILE GGSTORES
PRINT STORE_NAME/C STATE/R AS 'St' BY ADDRESS1/C
WHERE STATE EQ 'CA'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE = REPORT, GRID=OFF, $
ENDSTYLE
END
```

The output is:

| Contact | Store Name | St |
|---|---|---|
| JEFF DARFELL | GOTHAM GRINDS #1244 | CA |
| PAT SMILEY | GOTHAM GRINDS #1040 | CA |

**Note:** Add the syntax, ON TABLE SET SQUEEZE ON to your request if you are using PDF format.

# Justifying a Label for a Row or Column Total

You can left-justify, right-justify, or center a label for a row or column total. For related information, see Creating Labels to Identify Data.

# Justify a Label for a Row or Column Total Using Legacy Formatting

```
ROW-TOTAL/justification [/format] [AS 'label']
COLUMN-TOTAL/justification [AS 'label']
```

or

```
COLUMN-TOTAL/justification [AS 'label']
```

where:

**justification**

Is the type of justification. Valid values are:

`L` which Left justifies the label.

`R` which right justifies the label.

`C` which centers the label.

**/format**

Is an optional format specification for a row total. You can combine the alignment value with the format value (in either order) to adjust the width of the column data or specify display options.

**AS 'label'**

Is an optional customized label.

# Centering a Label for a Row Total

This request creates the stacked label Total, Population, by State for the row total and centers it. The format D12 for ROW-TOTAL displays commas by default.

```
TABLE FILE GGDEMOG
PRINT MALEPOP98 FEMPOP98
ROW-TOTAL/C/D12 AS 'Total,Population,by State'
BY ST
WHERE (ST EQ 'WY' OR 'MT')
ON TABLE COLUMN-TOTAL AS 'Total by Gender'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE = REPORT, GRID=OFF, $
ENDSTYLE
END
```

The output is:

| State | Male Population | Female Population | Total Population by State |
|---|---|---|---|
| MT | 426357 | 438836 | 865,193 |
| WY | 245023 | 245897 | 490,920 |
| Total by Gender | 671380 | 684733 | 1,356,113 |

# Justifying a Label for a Subtotal or Grand Total

You cannot directly justify a customized label for a subtotal. However, for HTML, EXL2K, or XLSX report output, if columns are being totaled or subtotaled by the one subtotal command, and you do not specify a column in the StyleSheet, formatting is applied to the totals and subtotals of all columns and to the labeling text that introduces the total and subtotal values. For related information, see Identifying a Report Component in a WebFOCUS StyleSheet.

# Justifying Subtotal and Grand Total Labels

This request subtotals the numeric columns in the report and right-justifies the output, including the text of the label that precedes the values for the subtotals. Since numeric output is right-justified by default, in this example the justification specifications in the StyleSheet are used to reposition the labels. The default label for the automatically generated grand total is also right-justified.

```
TABLE FILE EMPLOYEE
SUM DED_AMT BY DED_CODE BY DEPARTMENT
BY BANK_ACCT
WHERE DED_CODE EQ 'CITY'
WHERE BANK_ACCT NE 0
ON DEPARTMENT SUBTOTAL AS 'Total City Deduction for'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
TYPE=SUBTOTAL, STYLE=BOLD, JUSTIFY=RIGHT,$
TYPE=GRANDTOTAL, STYLE=BOLD, JUSTIFY=RIGHT,$
ENDSTYLE
END
```

The output is:

| DED_CODE | DEPARTMENT | BANK_ACCT | DED_AMT |
|---|---|---|---|
| CITY | MIS | 40950036 | $14.00 |
| | | 122850108 | $31.75 |
| | | 163800144 | $82.70 |
| | **Total City Deduction for MIS** | | **$128.45** |
| | PRODUCTION | 160633 | $7.42 |
| | | 136500120 | $18.25 |
| | | 819000702 | $60.20 |
| **Total City Deduction for PRODUCTION** | | | **$85.87** |
| | | **TOTAL** | **$214.32** |

# Choosing an Alignment Method for Heading and Footing Elements

To align text and data in headings and footings based on factors other than left/right/center justification, consider the following descriptions before deciding which alignment method best suits your needs.

| Alignment Method | Applies to ... | When to use... | Related Methods |
|---|---|---|---|
| **1) StyleSheet Attributes:**<br>HEADALIGN<br>COLSPAN<br>JUSTIFY<br>**Details:** See Aligning a Heading or Footing Element in an HTML, XLSX, EXL2K, PDF, PPTX, or DHTML Report. | HTML<br>XLSX<br>EXL2K<br>PDF<br>PPTX<br>DHTML | **To align heading or footing items in HTML and EXL2K reports:** If you expect to display reports in HTML or EXL2K format, use HEADALIGN options to align heading and footing items with either columns in the HTML table for the body of the report or with cells in an embedded HTML table. The browser handles alignment based on your specifications, without requiring unit measurements, which are required with WIDTH and JUSTIFY.<br>**To align heading or footing items in PDF reports:** If you expect to display reports in PDF format, use the HEADALIGN=BODY option to align heading and footing items with columns in the report body.<br>**To specify a heading or footing item that spans multiple columns:** You can combine HEADALIGN syntax with the COLSPAN attribute to achieve this result. For details, see Aligning a Heading or Footing Element Across Columns in an HTML or PDF Report. | |
| **2) StyleSheet** | HTML | **For portability between HTML and** | For an HTML, |

| Alignment Method | Applies to ... | When to use... | Related Methods |
|---|---|---|---|
| **Attributes:**<br>WIDTH<br>JUSTIFY<br>**Details:** See Aligning Content in a Multi-Line Heading or Footing. | PDF<br>PS | **PDF:** To code a request that can be used without revision to produce identical output in HTML (with internal cascading style sheets) and in PDF, use WIDTH and JUSTIFY attributes in your StyleSheet. These settings can be applied to report, page, and sort headings and footings.<br>**To align heading or footing items:** Used together, WIDTH and JUSTIFY allow you to align specific items in the heading, rather than entire headings or footings or entire heading or footing lines, where the implied justification width is the total width of the report panel. To right- or center-justify an item in a heading or footing, you must know the width of the area you want to justify it in. That information is provided by the WIDTH attribute.<br>**To align decimal points in a multi-line heading or footing:** Use this technique to align decimal points in data that has varying numbers of decimal places. You define the width of the decimal item, then you measure how far in from the right side of a column you want to position the decimal point. This places the decimal point in the same position in a column, regardless of the number of decimal places displayed to its right. | PDF, or EXL2K report, you can align specific items with HEADALIGN options. |
| **3) StyleSheet** | PDF | **To set starting positions for** | For a PDF |

| Alignment Method | Applies to ... | When to use... | Related Methods |
|---|---|---|---|
| **Attribute:**<br>POSITION<br>**Details:** See Positioning Headings, Footings, or Items Within Them and Laying Out the Report Page. | PS<br>HTML (limited) | **headings or footings, or items within them:** Use POSITION syntax to specify absolute and relative starting positions.<br>In HTML, with an internal cascading style sheet, you can use POSITION to specify the starting point for a heading or footing line. You can also position an image in a heading or footing.<br>**To align heading and footing items with columns:** Use POSITION syntax to align a heading item with a column position. For example, the syntax<br>`TYPE=SUBHEAD, LINE=1, ITEM=3,POSITION=SALES, $`<br>places ITEM 3 of the sort heading at the horizontal position where the column SALES is. | report, you can accomplish most positioning with WIDTH and JUSTIFY.<br>For an HTML or PDF report, you can align a heading item with a column by setting the HEADALIGN attribute to BODY. |

# Aligning a Heading or Footing Element in an HTML, XLSX, EXL2K, PDF, PPTX, or DHTML Report

For HTML output (and for Excel 2000 output, which uses HTML alignment), you can position text and field items in headings and footings using HEADALIGN options. These options work within the limitations of HTML and browser technologies to provide a significant degree of formatting flexibility. Here is how HEADALIGN works.

For PDF output, you can use the HEADALIGN=BODY option to align heading and footing elements with the report body.

For HTML or Excel 2000 output, when HEADALIGN is set either to BODY or INTERNAL, output is laid out as an HTML table, which means that the browser determines the widths of the columns, thereby limiting the precise positioning of items. A basic rule governs the placement of heading or footing items: each item (text or embedded field) is placed in sequence into the next HTML table cell (<TD>). When HEADALIGN is set to NONE, the default, all the items in the heading or footing are strung together, inside a single cell. The browser stretches the heading table and the report table to accommodate the length of the text.

You can exercise control over the placement of items by overriding the default and choosing either BODY or INTERNAL:

- HEADALIGN=BODY puts heading item cells in the same HTML table (for HTML or EXL2K output) as the body of the report, ensuring that the items in the heading and the data in the body of the report line up naturally since they have the same column widths. For PDF output, HEADALIGN=BODY aligns heading items with data columns. This is a simple and useful way to align heading items with columns of data. For example, suppose that you have computed subtotal values that you want to include in a sort footing. Using HEADALIGN=BODY, you can align the subtotals in the same columns as the data that is being totaled.
- HEADALIGN=INTERNAL puts the heading items in an HTML table of its own. This allows the heading items to be aligned vertically with each other, independent of the data, since the widths of the heading items do not affect the width of the report columns and vice versa.
- In EXL2K formatted reports, with headings or footings containing multiple items that are separated by spot markers without spaces, the spot marker adds an additional space between the items within the text in the cell. The workaround is to use XLSX formatted reports, instead.

To compare sample output, see Comparing Output Generated With HEADALIGN Options.

To break a text string into multiple parts for manipulation across columns, you can use <+0> spot markers in the request. For details, see Identifying a Report Component in a WebFOCUS StyleSheet.

You can use HEADALIGN options in conjunction with the COLSPAN attribute. COLSPAN allows heading items to span multiple table columns, thereby providing additional flexibility in how you can design your headings. For details, see Aligning a Heading or Footing Element Across Columns in an HTML or PDF Report.

If there is more than one heading or footing type in a report, you can individually align any element within each of them using this syntax.

**Tip:** For a summary of other alignment methods, see Choosing an Alignment Method for Heading and Footing Elements.

# Align a Heading or Footing Element in an HTML or PDF Report

```
TYPE = {REPORT|headfoot}, HEADALIGN = option, $
```

where:

**REPORT**

Applies the chosen alignment to all heading and footing elements in a report.

**headfoot**

Is the type of heading or footing. Valid values are TABHEADING, TABFOOTING, HEADING, FOOTING, SUBHEAD, and SUBFOOT.

**option**

Is the type of alignment. Valid values are:

NONE which places heading items in HTML reports in an embedded HTML table inside the main (body) table, and strings together, in a single cell of the embedded table, all the heading items (text and fields) on a line. In PDF reports, this uses the default alignment heading alignment. NONE is the default value.

INTERNAL which places heading items in an HTML table of its own, with each item in a separate cell. This allows the heading items to be aligned vertically with each other, independent of the data columns. The widths of the heading items do not affect the widths of the report columns and vice versa.

**Note:** HEADALIGN=INTERNAL is not supported in PDF reports.

BODY which aligns heading items with data columns. For HTML output, this places the items in the cells of the same HTML table as the body of the report. Since they have the same column widths, the items in the heading and the data in the body of the report line up naturally. For PDF output, this aligns the heading or footing elements with the data columns.

**Note:** HEADALIGN=BODY does not support paneling.

You can combine HEADALIGN options with the COLSPAN attribute to allow heading items to span multiple HTML table columns. For details, see Align a Heading or Footing Element in an HTML or PDF Report.

# Aligning Subfooting Items With Report Columns in PDF Report Output

In the following request against the GGORDER data source, the subfooting has a text object ("Total") and a field object (ST.QUANTITY). The subfooting aligns the items with their report columns using TYPE=SUBFOOT, HEADALIGN=BODY ,$. The text object is placed in the second report column using the <+0 spot marker, and the field object is placed in the third report column using another <+0 spot marker. Then the text item is left aligned (the default) with its report column. The field object is right aligned with its report column.

```
TABLE FILE GGORDER
PRINT QUANTITY
ORDER_NUMBER ORDER_DATE STORE_CODE
BY PRODUCT_CODE BY PRODUCT_DESCRIPTION
WHERE ORDER_DATE EQ '01/01/96'
WHERE STORE_CODE EQ 'R1019'
ON PRODUCT_CODE SUBFOOT
" <+0 Total: <+0 <ST.QUANTITY"
ON TABLE SET PAGE-NUM OFF
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET STYLESHEET *
TYPE = SUBFOOT,HEADALIGN=BODY, $
TYPE = SUBFOOT,OBJECT=TEXT,STYLE = BOLD, $
TYPE = SUBFOOT,OBJECT=FIELD,JUSTIFY=RIGHT,STYLE = BOLD, $
ENDSTYLE
END
```

The output shows that the text *Total* is aligned with the product names and the subtotal field object is right aligned with the *Ordered Units* column.

| Product Code | Product | Ordered Units | Order Number | Order Date | Store Code |
|---|---|---|---|---|---|
| B141 | Hazelnut | 300 | 1 | 01/01/96 | R1019 |
| | | 117 | 2 | 01/01/96 | R1019 |
| | Total: | 417 | | | |
| B142 | French Roast | 126 | 3 | 01/01/96 | R1019 |
| | | 86 | 4 | 01/01/96 | R1019 |
| | | 49 | 5 | 01/01/96 | R1019 |
| | Total: | 261 | | | |
| F101 | Scone | 37 | 11 | 01/01/96 | R1019 |
| | | 325 | 12 | 01/01/96 | R1019 |
| | Total: | 362 | | | |
| F102 | Biscotti | 399 | 13 | 01/01/96 | R1019 |
| | Total: | 399 | | | |
| F103 | Croissant | 93 | 14 | 01/01/96 | R1019 |
| | | 433 | 15 | 01/01/96 | R1019 |
| | Total: | 526 | | | |
| G100 | Mug | 289 | 6 | 01/01/96 | R1019 |
| | | 231 | 7 | 01/01/96 | R1019 |
| | Total: | 520 | | | |
| G104 | Thermos | 347 | 8 | 01/01/96 | R1019 |
| | Total: | 347 | | | |
| G110 | Coffee Grinder | 265 | 9 | 01/01/96 | R1019 |
| | Total: | 265 | | | |
| G121 | Coffee Pot | 309 | 10 | 01/01/96 | R1019 |
| | Total: | 309 | | | |

# Using OVER With HEADALIGN=BODY in a PDF Report

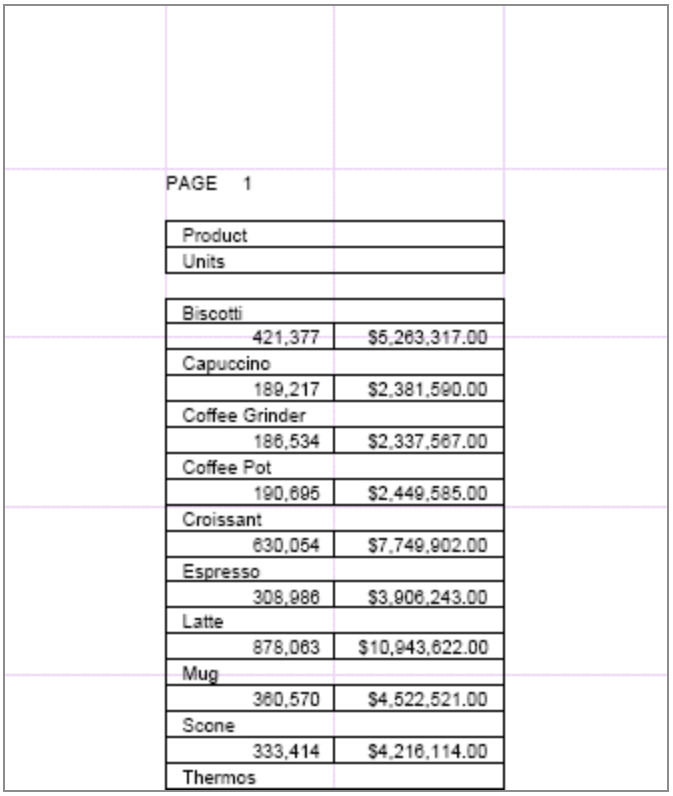
When aligning heading elements with the data line using HEADALIGN=BODY, the first row of fields serves as the anchor data row. Each heading line contains the number of columns presented in the anchor data row. Any additional columns that may appear on other data lines are not presented. If the first row of data contains fewer data value cells than other data rows, you will be unable to add alignment columns within headings for these additional columns.

In the following example, the first row (the anchor data row) contains a single value. Items placed in headings to correspond with column two that appears on subsequent rows are not displayed.

```
SET LAYOUTGRID=ON
TABLE FILE GGSALES
"Product<+0>"
"Units<+0>Dollars"
SUM
PRODUCT AS ''
OVER
UNITS/D8C AS '' DOLLARS/D12.2CM AS ''
BY PRODUCT NOPRINT
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT, SQUEEZE=ON,FONT=ARIAL, SIZE=8, LEFTGAP=.1, RIGHTGAP=.1,
```

```
GAPINTERNAL=ON, LEFTMARGIN=1,$
TYPE=REPORT, BORDER=ON, $
TYPE=HEADING, BORDERALL=ON, HEADALIGN=BODY, $
TYPE=HEADING, LINE=1, ITEM=1, COLSPAN=2, WIDTH=2, JUSTIFY=LEFT, $
TYPE=HEADING, LINE=2, ITEM=1, WIDTH=1, JUSTIFY=LEFT, $
TYPE=HEADING, LINE=2, ITEM=2, WIDTH=1, JUSTIFY=LEFT, $
TYPE=REPORT, COLUMN=PRODUCT(2),   SQUEEZE=2,  $
TYPE=REPORT, COLUMN=UNITS, SQUEEZE=1, $
TYPE=REPORT, COLUMN=DOLLARS, SQUEEZE=1, $
END
```

The output shows that the heading lines have one column each, while the data lines alternate between one column and two columns.



PAGE 1

| Product<br>Units | |
|---|---|
| Biscotti | |
| 421,377 | $5,263,317.00 |
| Capuccino | |
| 189,217 | $2,381,590.00 |
| Coffee Grinder | |
| 186,534 | $2,337,567.00 |
| Coffee Pot | |
| 190,695 | $2,449,585.00 |
| Croissant | |
| 630,054 | $7,749,902.00 |
| Espresso | |
| 308,986 | $3,906,243.00 |
| Latte | |
| 878,063 | $10,943,622.00 |
| Mug | |
| 360,570 | $4,522,521.00 |
| Scone | |
| 333,414 | $4,216,114.00 |
| Thermos | |

# Comparing Output Generated With HEADALIGN Options

The requests that follow illustrate the differences in alignment with each HEADALIGN setting. The grid lines are exposed in the output to help distinguish the HTML table created

for the body of the report from the embedded HTML tables created for the heading in some variations.

All HEADALIGN settings are compatible with COLSPAN syntax, which allows heading items to span multiple columns.

```
TABLE FILE CAR
SUM SALES BY COUNTRY BY CAR BY MODEL
ON COUNTRY SUBHEAD
"This is my subhead"
" "
"Country is:<COUNTRY Car is:<CAR"
"Model is:<MODEL"
IF COUNTRY EQ 'ENGLAND'
ON TABLE SET PAGE-NUM OFF
ON TABLE SET STYLESHEET *
TYPE=SUBHEAD, HEADALIGN=OPTION, $
TYPE=SUBHEAD, LINE=1, ITEM=1, COLSPAN=4, JUSTIFY=CENTER, $
ENDSTYLE
END
```

**HEADALIGN=NONE** without the second TYPE=SUBHEAD declaration highlighted in the request syntax creates a separate table with default left alignment. The text and fields in each heading line are strung together in a single HTML table cell.

```
TYPE=SUBHEAD, HEADALIGN=NONE, $
```

| COUNTRY | CAR | MODEL | SALES |
|---|---|---|---|
| This is my subhead<br><br>Country is:ENGLAND Car is:JAGUAR<br>Model is:V12XKE AUTO | | | |
| ENGLAND | JAGUAR | V12XKE AUTO | 0 |
| | | XJ12L AUTO | 12000 |
| | JENSEN | INTERCEPTOR III | 0 |
| | TRIUMPH | TR7 | 0 |

**HEADALIGN=NONE with COLSPAN**

```
TYPE=SUBHEAD, HEADALIGN=NONE, $
TYPE=SUBHEAD, LINE=1, ITEM=1, COLSPAN=4, JUSTIFY=CENTER, $
```

| COUNTRY | CAR | MODEL | SALES |
|---|---|---|---|
| This is my subhead<br><br>Country is:ENGLAND Car is:JAGUAR<br>Model is:V12XKE AUTO | | | |
| ENGLAND | JAGUAR | V12XKE AUTO | 0 |
| | | XJ12L AUTO | 12000 |
| | JENSEN | INTERCEPTOR III | 0 |
| | TRIUMPH | TR7 | 0 |

The first line is centered across all four columns of the internal table, based on the COLSPAN=4 setting.

**HEADALIGN=INTERNAL** creates a separate HTML table. Columns are generated based on the number of items (text and fields) in the heading. Each item is placed in a separate cell. These columns do *not* correspond to those in the HTML table for the body of the report.

```
TYPE=SUBHEAD, HEADALIGN=INTERNAL, $
```

| COUNTRY | CAR | MODEL | SALES |
|---|---|---|---|
| This is my subhead<br><br>Country is: ENGLAND Car is:JAGUAR<br>Model is: V12XKE AUTO | | | |
| ENGLAND | JAGUAR | V12XKE AUTO | 0 |
| | | XJ12L AUTO | 12000 |
| | JENSEN | INTERCEPTOR III | 0 |
| | TRIUMPH | TR7 | 0 |

Country is aligned with Model in the first column of the internal table. The value of <COUNTRY is aligned with the value of <MODEL in the second column.

**HEADALIGN=INTERNAL with COLSPAN**

```
TYPE=SUBHEAD, HEADALIGN=INTERNAL, $
TYPE=SUBHEAD, LINE=1, ITEM=1, COLSPAN=4, JUSTIFY=CENTER, $
```

| COUNTRY | CAR | MODEL | SALES |
|---|---|---|---|
| This is my subhead<br><br>Country is: ENGLAND Car is: JAGUAR<br>Model is: V12XKE AUTO | | | |
| ENGLAND | JAGUAR | V12XKE AUTO | 0 |
| | | XJ12L AUTO | 12000 |
| | JENSEN | INTERCEPTOR III | 0 |
| | TRIUMPH | TR7 | 0 |

The first line is centered across all 4 columns of the internal table, based on the COLSPAN=4 setting.

**HEADALIGN=BODY** places the heading lines within the cells of the main HTML table. As a result, the columns of the heading correspond to the columns of the main table.

```
TYPE=SUBHEAD, HEADALIGN=BODY, $
```

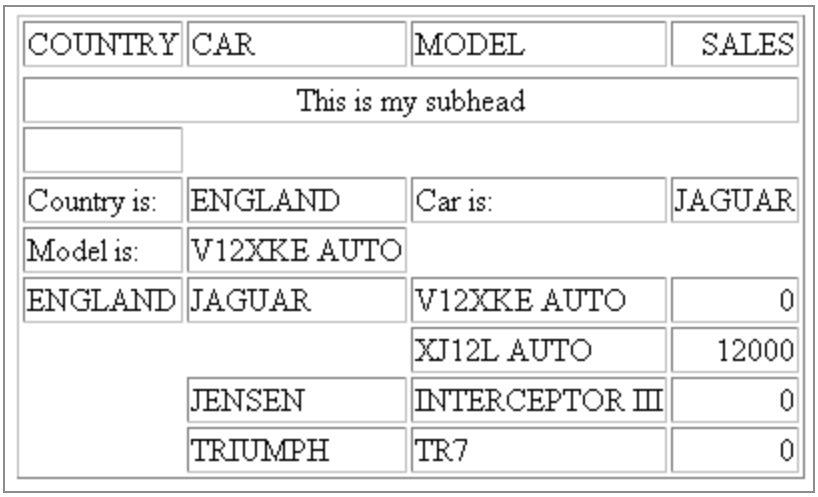
| COUNTRY | CAR | MODEL | SALES |
|---|---|---|---|
| This is my subhead | | | |
| | | | |
| Country is: | ENGLAND | Car is: | JAGUAR |
| Model is: | V12XKE AUTO | | |
| ENGLAND | JAGUAR | V12XKE AUTO | 0 |
| | | XJ12L AUTO | 12000 |
| | JENSEN | INTERCEPTOR III | 0 |
| | TRIUMPH | TR7 | 0 |

Country is aligned with Model in the first column of the main (body) HTML table. The value of <COUNTRY is aligned with the value of <MODEL in the second column.

**HEADALIGN=BODY with COLSPAN**

```
TYPE=SUBHEAD, HEADALIGN=BODY, $
TYPE=SUBHEAD, LINE=1, ITEM=1, COLSPAN=4, JUSTIFY=CENTER, $
```

COLSPAN controls the cross-column alignment of the first row of the heading.



| COUNTRY | CAR | MODEL | SALES |
|---|---|---|---|
| This is my subhead | | | |
| | | | |
| Country is: | ENGLAND | Car is: | JAGUAR |
| Model is: | V12XKE AUTO | | |
| ENGLAND | JAGUAR | V12XKE AUTO | 0 |
| | | XJ12L AUTO | 12000 |
| | JENSEN | INTERCEPTOR III | 0 |
| | TRIUMPH | TR7 | 0 |

# Aligning Elements in a Sort Footing With Data Columns

This request creates an HTML report using HEADALIGN = BODY to align the two elements of the sort footing (TOTAL IS and the value) with each of the two data columns (Product and Ordered Units). JUSTIFY = RIGHT, which applies to the entire sort footing, right justifies each sort footing element under the data column.

```
TABLE FILE GGORDER
PRINT QUANTITY
BY PRODUCT_CODE NOPRINT BY PRODUCT_DESCRIPTION
WHERE ORDER_DATE EQ '01/01/96'
WHERE STORE_CODE EQ 'R1019'
ON PRODUCT_CODE SUBFOOT
"TOTAL IS: <ST.QUANTITY"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE = REPORT, GRID = OFF, $
TYPE = SUBFOOT, HEADALIGN = BODY, JUSTIFY = RIGHT, $
TYPE = SUBFOOT, OBJECT = FIELD, STYLE = BOLD, $
```

```
ENDSTYLE
END
```

The partial output is:

| Product | Ordered Units |
|---|---|
| Hazelnut | 300 |
| | 117 |
| TOTAL IS: | **417** |
| French Roast | 126 |
| | 86 |
| | 49 |
| TOTAL IS: | **261** |
| Scone | 37 |
| | 325 |
| TOTAL IS: | **362** |

# Aligning Elements in a Page Heading Using a Separate HTML Table

This request creates an embedded HTML table for a page heading, within the HTML table that governs alignment in the body of the report. This table has three rows and three columns to accommodate all the heading elements.

In the first line of the heading, a spot marker (<+0>) creates two text elements: the first element is blank, and the second element is Gotham Grinds, Inc. In the output, the second element appears in the second cell of the first row of the embedded table. For related information, see Identifying a Report Component in a WebFOCUS StyleSheet.

The second and fourth lines of the heading are blank.

The spot markers in the third line of the heading split it into three text elements: Orders Report, blank, Run on: &DATE. In the output, each element appears in a cell in the third row of the embedded HTML table, in the order specified in the request.

```
TABLE FILE GGORDER
HEADING
" <+0>Gotham Grinds, Inc."
" "
"Orders Report <+0> <+0> Run on: &DATE"
" "
PRINT ORDER_NUMBER ORDER_DATE STORE_CODE QUANTITY
BY PRODUCT_CODE BY PRODUCT_DESCRIPTION
IF RECORDLIMIT EQ 10
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE = REPORT, GRID = ON, $
TYPE = HEADING, HEADALIGN = INTERNAL, STYLE = BOLD, $
ENDSTYLE
END
```

GRID=ON in the request enables you to see the embedded HTML table for the heading, and the main HTML table for the body of the report.

The output is:

**Gotham Grinds, Inc.**

**Orders Report** **Run on: 06/19/02**

| Product Code | Product | Order Number | Order Date | Store Code | Ordered Units |
|---|---|---|---|---|---|
| B141 | Hazelnut | 1 | 01/01/96 | R1019 | 300 |
| | | 2 | 01/01/96 | R1019 | 117 |
| B142 | French Roast | 3 | 01/01/96 | R1019 | 126 |
| | | 4 | 01/01/96 | R1019 | 86 |
| | | 5 | 01/01/96 | R1019 | 49 |
| G100 | Mug | 6 | 01/01/96 | R1019 | 289 |
| | | 7 | 01/01/96 | R1019 | 231 |
| G104 | Thermos | 8 | 01/01/96 | R1019 | 347 |
| G110 | Coffee Grinder | 9 | 01/01/96 | R1019 | 265 |
| G121 | Coffee Pot | 10 | 01/01/96 | R1019 | 309 |

Notice that the positioning is maintained when the grid is hidden (off).

**Gotham Grinds, Inc.**

**Orders Report** **Run on: 04/20/01**

| Product Code | Product | Order Number | Order Date | Store Code | Ordered Units |
|---|---|---|---|---|---|
| B141 | Hazelnut | 1 | 01/01/96 | R1019 | 300 |
| | | 2 | 01/01/96 | R1019 | 117 |
| B142 | French Roast | 3 | 01/01/96 | R1019 | 126 |
| | | 4 | 01/01/96 | R1019 | 86 |
| | | 5 | 01/01/96 | R1019 | 49 |
| G100 | Mug | 6 | 01/01/96 | R1019 | 289 |
| | | 7 | 01/01/96 | R1019 | 231 |
| G104 | Thermos | 8 | 01/01/96 | R1019 | 347 |
| G110 | Coffee Grinder | 9 | 01/01/96 | R1019 | 265 |
| G121 | Coffee Pot | 10 | 01/01/96 | R1019 | 309 |

# Aligning a Text Field With a Column in a Sort Footing

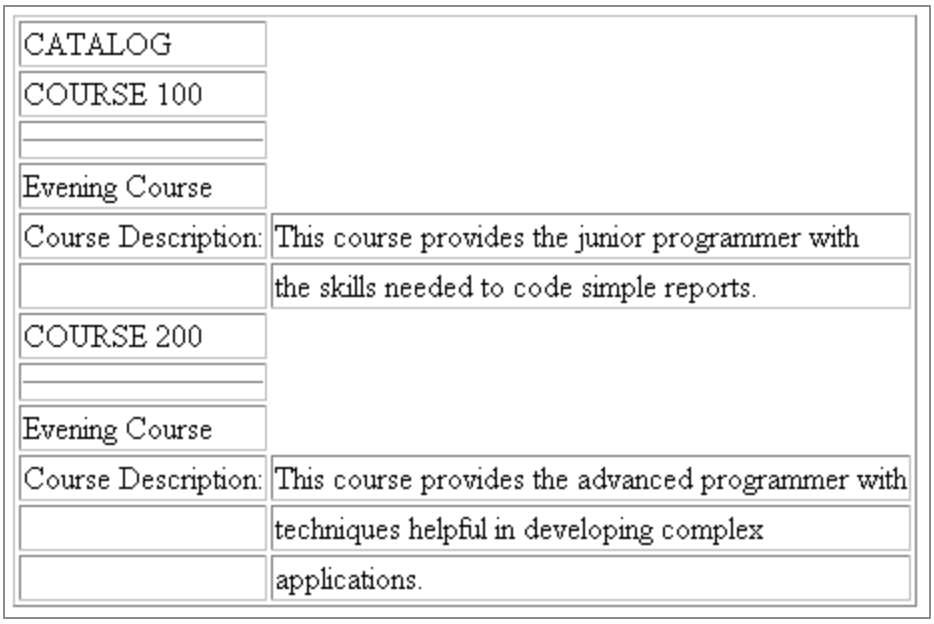
This example uses a Master File and the MODIFY procedure created in the example named Including a Text Field in a Sort Footing. Rerun that example and return here to align the text field.

The request uses HEADALIGN=BODY to align the text field lines in a sort footing. With this setting, each element in the footing is aligned with a column in the main HTML table generated for the report: the first element (the text Course Description:) is aligned with the first data column, CATALOG. The embedded field is aligned in a second column. The grid is turned on in this example to make the alignment easier to see.

```
TABLE FILE TXTFLD
BY CATALOG SUBFOOT
"Course Description: <TEXTFLD"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE = REPORT, GRID = ON, $
TYPE = SUBFOOT, HEADALIGN = BODY, $
```

```
ENDSTYLE
END
```

The output displays a new value for the text field each time the value of CATALOG changes.



| CATALOG | |
|---|---|
| COURSE 100 | |
| | |
| Evening Course | |
| Course Description: | This course provides the junior programmer with |
| | the skills needed to code simple reports. |
| COURSE 200 | |
| | |
| Evening Course | |
| Course Description: | This course provides the advanced programmer with |
| | techniques helpful in developing complex |
| | applications. |

# Aligning and Styling a Text Field in a Sort Footing

This example uses a Master File and the MODIFY procedure created in the example named Including a Text Field in a Sort Footing. Rerun that example and return here to align the text field. This request applies boldface type to the second line of a multiple-line sort footing, which includes the text Course Description as well as the text of the field TEXTFLD. Line 1 of the sort footing is the text Evening Course.

```
TABLE FILE TXTFLD
BY DESCRIPTION AS 'CATALOG' SUBFOOT
"Evening Course"
"Course Description: <TEXTFLD"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE = REPORT, GRID = OFF, $
TYPE = SUBFOOT, HEADALIGN = BODY, $
TYPE = SUBFOOT, LINE = 2, STYLE = BOLD, $
```

```
ENDSTYLE
END
```

The output is:

CATALOG

COURSE 100

Evening Course

**Course Description: This course provides the junior programmer with the skills needed to code simple reports.**

COURSE 200

Evening Course

**Course Description: This course provides the advanced programmer with techniques helpful in developing complex applications.**

If the StyleSheet instead identifies the text field as an object for styling

```
TYPE = SUBFOOT, HEADALIGN = BODY, $
TYPE = SUBFOOT, LINE = 2, OBJECT = FIELD, STYLE = BOLD, $
```

then only the text in TEXTFLD is bold.

CATALOG

COURSE 100

Evening Course

Course Description: **This course provides the junior programmer with the skills needed to code simple reports.**

COURSE 200

Evening Course

Course Description: **This course provides the advanced programmer with techniques helpful in developing complex applications.**

# Aligning a Heading or Footing Element Across Columns in an HTML or PDF Report

With HEADALIGN=BODY, each heading or footing element is aligned with a data column in an HTML or PDF report. With HEADALIGN=INTERNAL, each element is continued in a column of an HTML table created and aligned specifically for the report heading or footing. By default, every heading or footing element (ITEM) is placed in the first available column. However, you can position an item to span multiple columns using the COLSPAN attribute. For details about HEADALIGN options, see Aligning a Heading or Footing Element in an HTML, XLSX, EXL2K, PDF, PPTX, or DHTML Report.

You must specify the HEADALIGN and COLSPAN attributes in two separate StyleSheet declarations, since HEADALIGN applies to an entire heading or footing, while COLSPAN applies to a specific item in a heading or footing.

# Align a Heading or Footing Element Across Columns in an HTML or PDF Report

```
TYPE = headfoot, [subtype,] COLSPAN = n, $
```

where:

**headfoot**

Is the type of heading or footing. Valid values are TABHEADING, TABFOOTING, HEADING, FOOTING, SUBHEAD, and SUBFOOT.

**subtype**

Are additional attributes that identify the report component. These options can be used separately or in combination, depending upon the degree of specificity required to identify an element. Valid values are:

- **LINE,** which identifies a line by its position in a heading or footing. Identifying individual lines enables you to format each line differently.

  If a heading or footing has multiple lines and you apply a StyleSheet declaration

that does not specify LINE, the declaration is applied to *all* lines. Blank lines are counted when interpreting the value of LINE.

- **OBJECT,** which identifies an element in a heading or footing as a text string or field value. Valid values are TEXT or FIELD. TEXT may represent free text or a Dialogue Manager amper (&) variable.

  It is not necessary to specify OBJECT=TEXT unless you are styling both text strings and embedded fields in the same heading or footing.

- **ITEM,** which identifies an item by its position in a line. To divide a heading or footing line into items, you can use the <+0> spot marker. For more information, see Identifying a Report Component in a WebFOCUS StyleSheet.

To determine the ITEM for an OBJECT, follow these guidelines:

- When used with OBJECT=TEXT, count only the text strings from left to right.
- When used with OBJECT=FIELD, count only values from left to right.
- When used without OBJECT, count text strings and field values from left to right.

If you apply a StyleSheet declaration that specifies ITEM, the number is counted from the beginning of each line in the heading or footing, not just from the beginning of the first line.

**COLSPAN**

Is an attribute that aligns an item in the width spanned by multiple columns.

**n**

Is the column with which the specified item is aligned.

# Centering a Page Heading Across Three Columns

In this request, HEADALIGN=INTERNAL creates a three-column embedded HTML table for the heading. The COLSPAN attribute then centers the first line of the heading, Gotham Grinds, Inc., over the report, spanning the three columns in the embedded HTML table.

```
TABLE FILE GGORDER
HEADING
"Gotham Grinds, Inc."
" "
"Orders Report <+0> <+0> Run on: &DATE"
```

```
" "
PRINT ORDER_NUMBER ORDER_DATE STORE_CODE QUANTITY
BY PRODUCT_CODE BY PRODUCT_DESCRIPTION
IF RECORDLIMIT EQ 10
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE = REPORT, GRID = OFF, $
TYPE = HEADING, HEADALIGN = INTERNAL, $
TYPE = HEADING, LINE=1, COLSPAN=3, STYLE = BOLD, JUSTIFY=CENTER, $
TYPE = HEADING, LINE=3, ITEM=3, JUSTIFY=RIGHT, $
ENDSTYLE
END
```

The output is:

**Gotham Grinds, Inc.**

**Orders Report** **Run on: 06/19/02**

| Product Code | Product | Order Number | Order Date | Store Code | Ordered Units |
|---|---|---|---|---|---|
| B141 | Hazelnut | 1 | 01/01/96 | R1019 | 300 |
| | | 2 | 01/01/96 | R1019 | 117 |
| B142 | French Roast | 3 | 01/01/96 | R1019 | 126 |
| | | 4 | 01/01/96 | R1019 | 86 |
| | | 5 | 01/01/96 | R1019 | 49 |
| G100 | Mug | 6 | 01/01/96 | R1019 | 289 |
| | | 7 | 01/01/96 | R1019 | 231 |
| G104 | Thermos | 8 | 01/01/96 | R1019 | 347 |
| G110 | Coffee Grinder | 9 | 01/01/96 | R1019 | 265 |
| G121 | Coffee Pot | 10 | 01/01/96 | R1019 | 309 |

# Aligning a Field Value Across Multiple Columns

In this request, HEADALIGN=BODY aligns the sort footing in the same HTML table as the body of the report. COLSPAN = 5 positions the first item in the sort footing (the text Total) in the fifth column of the HTML table. The second item in the sort footing (the field <ST.QUANTITY) is positioned in the next available column.

The HEADALIGN attribute is on a separate line from the COLSPAN attribute because it applies to the entire sort footing (and consequently to both items), whereas COLSPAN applies to the single item Total.

```
TABLE FILE GGORDER
PRINT ORDER_NUMBER ORDER_DATE STORE_CODE QUANTITY
BY PRODUCT_CODE BY PRODUCT_DESCRIPTION
WHERE ORDER_DATE EQ '01/01/96'
WHERE STORE_CODE EQ 'R1019'
ON PRODUCT_CODE SUBFOOT
"Total: <ST.QUANTITY"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET STYLESHEET *
TYPE = REPORT, GRID = OFF, $
TYPE = SUBFOOT, HEADALIGN = BODY, JUSTIFY = RIGHT, STYLE = BOLD, $
TYPE = SUBFOOT, OBJECT = TEXT, COLSPAN = 5, $
ENDSTYLE
END
```

The partial output is:

| Product Code | Product | Order Number | Order Date | Store Code | Ordered Units |
|---|---|---|---|---|---|
| B141 | Hazelnut | 1 | 01/01/96 | R1019 | 300 |
| | | 2 | 01/01/96 | R1019 | 117 |
| | | | | **Total:** | **417** |
| B142 | French Roast | 3 | 01/01/96 | R1019 | 126 |
| | | 4 | 01/01/96 | R1019 | 86 |
| | | 5 | 01/01/96 | R1019 | 49 |
| | | | | **Total:** | **261** |
| F101 | Scone | 11 | 01/01/96 | R1019 | 37 |
| | | 12 | 01/01/96 | R1019 | 325 |
| | | | | **Total:** | **362** |

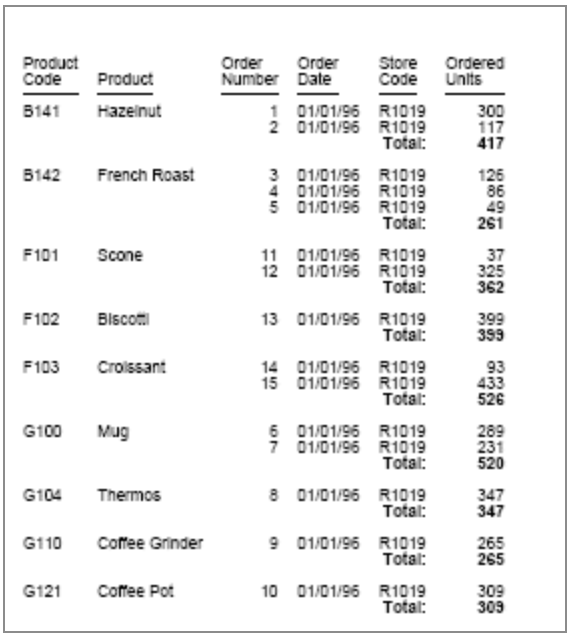
# Aligning a Field Value Across Multiple Columns in a PDF Report

In this request, HEADALIGN=BODY aligns the sort footing in the same grid as the body of the report. COLSPAN=5 positions the first item in the sort footing (the text *Total*) in the fifth column of the report output. The second item in the sort footing (the field <ST.QUANTITY) is positioned in the next available column. The subfooting items are right justified.

The HEADALIGN attribute is on a separate line from the COLSPAN attribute because it applies to the entire sort footing (and consequently to both items), whereas COLSPAN applies only to the text item *Total*.

```
TABLE FILE GGORDER
PRINT ORDER_NUMBER ORDER_DATE STORE_CODE QUANTITY
BY PRODUCT_CODE BY PRODUCT_DESCRIPTION
WHERE ORDER_DATE EQ '01/01/96'
WHERE STORE_CODE EQ 'R1019'
ON PRODUCT_CODE SUBFOOT
"Total:<ST.QUANTITY"
""
ON TABLE SET PAGE-NUM OFF
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET STYLESHEET *
TYPE=REPORT, FONT=ARIAL, SQUEEZE=ON,$
TYPE = SUBFOOT, HEADALIGN = BODY, JUSTIFY = RIGHT, STYLE = BOLD, $
TYPE = SUBFOOT, ITEM=1, COLSPAN = 5, $
ENDSTYLE
END
```

The output shows that the first item in the sort footing (the text *Total*) is in the fifth column of the report output. The second item in the sort footing (the field <ST.QUANTITY) is positioned in the next available column.



| Product Code | Product | Order Number | Order Date | Store Code | Ordered Units |
|---|---|---|---|---|---|
| B141 | Hazelnut | 1 | 01/01/96 | R1019 | 300 |
| | | 2 | 01/01/96 | R1019 | 117 |
| | | | | **Total:** | **417** |
| B142 | French Roast | 3 | 01/01/96 | R1019 | 126 |
| | | 4 | 01/01/96 | R1019 | 86 |
| | | 5 | 01/01/96 | R1019 | 49 |
| | | | | **Total:** | **261** |
| F101 | Scone | 11 | 01/01/96 | R1019 | 37 |
| | | 12 | 01/01/96 | R1019 | 325 |
| | | | | **Total:** | **362** |
| F102 | Biscotti | 13 | 01/01/96 | R1019 | 399 |
| | | | | **Total:** | **399** |
| F103 | Croissant | 14 | 01/01/96 | R1019 | 93 |
| | | 15 | 01/01/96 | R1019 | 433 |
| | | | | **Total:** | **526** |
| G100 | Mug | 6 | 01/01/96 | R1019 | 289 |
| | | 7 | 01/01/96 | R1019 | 231 |
| | | | | **Total:** | **520** |
| G104 | Thermos | 8 | 01/01/96 | R1019 | 347 |
| | | | | **Total:** | **347** |
| G110 | Coffee Grinder | 9 | 01/01/96 | R1019 | 265 |
| | | | | **Total:** | **265** |
| G121 | Coffee Pot | 10 | 01/01/96 | R1019 | 309 |
| | | | | **Total:** | **309** |

# Aligning Content in a Multi-Line Heading or Footing

The HEADALIGN and COLSPAN syntax described in Aligning a Heading or Footing Element in an HTML, XLSX, EXL2K, PDF, PPTX, or DHTML Report is specific to HTML reports. This topic describes how you can design reports that are printable across HTML and PDF formats. Using the WIDTH and JUSTIFY syntax in a StyleSheet, you can:

- Align vertical sets of text or data as columnar units.
- Combine columnar formatting with line-by-line formatting.
- Align decimal points when the data displayed has varying numbers of decimal places. See Aligning Decimals in a Multi-Line Heading or Footing.

You can apply WIDTH and JUSTIFY attributes to report headings and footings, page headings and footings, and sort headings and footings, using either mono-space or proportional fonts.

These techniques rely on internal cascading style sheets, which support WebFOCUS StyleSheet attributes that were not previously available for HTML reports. The syntax associated with these techniques resolves the problem of having to format headings differently for HTML reports (using HEADALIGN and COLSPAN) and PDF and PS reports (using POSITION and spot markers).

While the WIDTH and JUSTIFY attributes are particularly useful when you need to format a multi-line heading or footing, or align stacked decimals, you can also use this syntax to position items in an individual heading or footing line.

**Tip:** For a summary of other alignment methods, see Choosing an Alignment Method for Heading and Footing Elements.

# Align Heading Text and Data in Columns

For a multi-line report or page heading or footing, use the syntax:

```
TYPE=headfoot, WRAP=OFF, $
TYPE=headfoot, [LINE=line_#,] ITEM=item_#, [OBJECT={TEXT|FIELD}],
 WIDTH=width,   [JUSTIFY=option,] $
```

For a multi-line sort heading or footing, use the syntax:

```
TYPE=headfoot, WRAP=OFF, $
TYPE={SUBHEAD|SUBFOOT}, [BY=sortfield] [LINE=line_#,] ITEM=item_#,
 [OBJECT={TEXT|FIELD}], WIDTH=width, [JUSTIFY=option,] $
```

where:

**headfoot**

Is the type of heading or footing. Valid values are TABHEADING, TABFOOTING, HEADING, FOOTING, SUBHEAD, and SUBFOOT.

**sortfield**

When TYPE=SUBHEAD or SUBFOOT, you can specify alignment for the sort heading or sort footing associated with a particular sort field. If no sort field is specified, formatting is applied to the sort headings or footings associated with all sort fields.

**LINE**

Is an optional entry that identifies a line by its position in a heading or footing. Identifying individual lines enables you to format each one differently.

If a heading or footing has multiple lines and you apply a StyleSheet declaration that does not specify LINE, the declaration is applied to *all* lines. Blank lines are counted when interpreting the value of LINE.

You can use LINE in combination with ITEM.

**ITEM**

Is a required entry when you are using WIDTH to control alignment. An item can identify either:

- A vertical set of text or data that you wish to align as a columnar unit. You must identify each vertical unit as an item.
- An item's position in a line. You must identify each line element as an item. See Line and Item Formatting in a Multi-Line Heading or Footing for information about acceptable variations.

You can use either or both approaches for a single heading or footing.

To divide a heading or footing line into items, you can use the <+0> spot marker. See, Identifying a Report Component in a WebFOCUS StyleSheet. The number of items you can identify is limited by the cumulative widths of the items in the heading or footing, within the physical boundaries of the report page.

You can use ITEM in conjunction with OBJECT to refine the identification of an element whose width you want to define. To determine the ITEM for an OBJECT, follow these guidelines:

- When used with OBJECT=TEXT, count only the text strings from left to right.
- When used with OBJECT=FIELD, count only values from left to right.
- When used without OBJECT, count text strings and field values from left to right.

If you apply a StyleSheet declaration that specifies ITEM, the number is counted from the beginning of each line in the heading or footing, not just from the beginning of the first line.

**OBJECT**

Is an optional entry that identifies an element in a heading or footing as a text string or field value. Valid values are TEXT or FIELD. TEXT may represent free text or a Dialogue Manager amper (&) variable.

It is not necessary to specify OBJECT=TEXT unless you are styling both text strings and embedded fields in the same heading or footing.

**width**

Is the measurement expressed in units (inches by default), which is required to accommodate the longest text string or field value associated with a numbered item. For details, see Aligning Content in a Multi-Line Heading or Footing.

**option**

Is the type of justification. Valid values are:

LEFT which left justifies the heading or footing. LEFT is the default value.

RIGHT which right justifies the heading or footing.

CENTER which centers the heading or footing.

**DECIMAL (n)**

Is the measurement expressed in units (inches by default), which specifies how far in from the right side of a column to place the decimal point. With this specification, you can locate the decimal point in the same position within a column, regardless of the number of decimal places displayed to its right.

The measurement will be a portion of the width specified for this item. For details, see Measure for Column Width.

**Note:** JUSTIFY is not supported with WRAP.

# Line and Item Formatting in a Multi-Line Heading or Footing

Line formatting maximizes your control over the items you identify on each line:

- You can align and stack the same number of items with uniform widths. For example,

| | | | |
|---|---|---|---|
| Line 1 | Item 1 | Item 2 | Item 3 |
| Line 2 | Item 1 | Item 2 | Item 3 |

- You can also align different numbers of items as long as the items on each line have the same starting point and the same cumulative width.

| | | | |
|---|---|---|---|
| Line 1 | | | |
| Line 2 | | | |

Do not use HEADALIGN or COLSPAN syntax, which are specific to HTML reports and may conflict with WIDTH and JUSTIFY settings.

For HTML reports, turn WRAP OFF (ON is the default) to ensure proper processing of WIDTH and JUSTIFY.

# Aligning Data and Text in a Multi-Line Heading or Footing

In the following free-form report, content is defined entirely in the sort heading, where text and data are stacked to support comparison among countries. Each set of data is aligned vertically, to appear as a column. To achieve this affect, each vertical unit is identified as an item: the first column of text is *item 1*, the next column of data is *item 2*, and so on.

Note especially the last column, in which decimal data with different numbers of decimal places is lined up on the decimal point to facilitate reading and comparison.

| | | | |
|---|---|---|---|
| Country: | ARGENTINA | Exchange Rate: | 35.00 |
| Type: | ST. NOTES | Projected Return: | 4.200 |
| Holder: | COMM | Balance: | 42,167,880.00 |
| | | | |
| Country: | BRAZIL | Exchange Rate: | 39.55 |
| Type: | ST. NOTES | Projected Return: | 4.200 |
| Holder: | COMM | Balance: | 45,493,501.00 |
| | | | |
| Country: | CANADA | Exchange Rate: | 49.00 |
| Type: | ST. NOTES | Projected Return: | 3.990 |
| Holder: | COMM | Balance: | 56,212,634.00 |
| | | | |
| Country: | CZECH. REP | Exchange Rate: | 1,192.45 |
| Type: | ST. NOTES | Projected Return: | 12.110 |
| Holder: | COMM | Balance: | 51,121,201.00 |

The chart below breaks out the structure of the previous report:

| Item1: Text | Item 2: Data values | Item 3: Text | Item 4: Values with decimal places |
|---|---|---|---|
| Country | ARGENTINA BRAZIL, and so on | Exchange Rate | *nn.dd* |
| Type | ST.NOTES | Projected Return | *n.ddd* |
| Holder | COMM | Balance | *nn,nnn,nnn.dd* |

For each item, you specify the width of the column and the justification of its content, as illustrated in the following code.

```
DEFINE FILE SHORT
BALANCE/D14.2=BALANCE;
END
TABLE FILE SHORT
BY COUNTRY NOPRINT SUBHEAD
"Country:<COUNTRY Exchange Rate:<EXCHANGE_RATE"
"Type:<TYPE Projected Return:<PROJECTED_RETURN"
"Holder:<HOLDER Balance:<BALANCE"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLESHEET *
TYPE=REPORT, FONT='TIMES', $
TYPE=REPORT, GRID=OFF, $
TYPE=SUBHEAD, ITEM=1, WIDTH=1.00, JUSTIFY=RIGHT, $
TYPE=SUBHEAD, ITEM=2, WIDTH=1.25, JUSTIFY=RIGHT, $
TYPE=SUBHEAD, ITEM=3, WIDTH=1.25, JUSTIFY=RIGHT,$
TYPE=SUBHEAD, ITEM=4, WIDTH=1.5,  JUSTIFY=DECIMAL(.6),$
ENDSTYLE
END
```

This procedure produces a three-line sort heading, broken out as four items, each with a measured width and defined justification. The decimal item (4) uses a variation on standard justification to line up the decimal points. For details, see Aligning Content in a Multi-Line Heading or Footing and Aligning Decimals in a Multi-Line Heading or Footing.

**Note:** To take advantage of this feature for an HTML report, you must turn on internal cascading style sheets (SET HTMLCSS=ON). This command enables WebFOCUS StyleSheet

attributes that were not previously available for HTML reports. This line of code is ignored for a PDF report.

# Aligning Decimals in a Multi-Line Heading or Footing

The ability to align heading content in a multi-line heading based on width and justification values has special benefit in reports that contain data with different numbers of decimal places. For example, if a figure is in dollars, it is formatted with a decimal point and two places for zeroes. If in Swiss francs, it is formatted with a decimal place and four zeroes. If in yen, the decimal is at the end with no zeroes. In addition, sometimes the currency or units do not vary, but the number of digits of decimal precision varies.

By aligning the decimal points in a vertical stack, you can more easily read and compare these numbers, as illustrated in the following output:

| Floating decimal points | | Aligned decimal points | |
|---|---|---|---|
| Bond ----------- | Face Value --- | Bond ----------- | Face Value |
| Galosh Ltd. | 22375.5784596 | Galosh Ltd. | 22375.5784596 |
| Mukluk Inc. | 1212345.457 | Mukluk Inc. | 1212345.457 |
| Overshoe Inc. | 232.45484 | Overshoe Inc. | 232.45484 |

The technique uses a width specification for the item that contains decimals, combined with a variation on standard left/right/center justification to achieve the proper decimal alignment. For the syntax that generates this output, see Align Heading Text and Data in Columns.

# Measure for Column Width

Determining the width of a heading or footing item is a three-step process:

**Procedure**

1. Identify the maximum number of characters in a text string or field.
2. For a text string, simply count the characters. For a field, refer to the format specification in the Master File or in a command such as a DEFINE.
3. Measure the physical space in units (for example, in inches) that is required to display the number of characters identified in step 1, based on the size of the font you are using. For example, the following value of the COUNTRY field would measure as follows:

| Font | Font size | Comparison | Inches |
|---|---|---|---|
| Helvetica | 10 | England | .5 |
| Times New Roman | 10 | England | .44 |
| Courier | 10 | England | .56 |

**Tip:** Consider using a consistent set of fonts in your reports to make your measurements reusable.

# Measure for Decimal Alignment

After you have determined the width of an item, you can do a related measurement to determine the physical space required to display decimal data with a varying number of digits to the right of the decimal point.

**Procedure**

1. Determine the maximum number of decimal places you need to accommodate to the right of the decimal place, plus the decimal point itself.
2. Measure the physical space in units (for example, in inches) that is required to

display the number of characters identified in step 1, based on the size of the font you are using.

# Combining Column and Line Formatting in Headings and Footings

By combining column and line formatting, you can create complex reports in which different ranges of lines in the same heading or footing have different numbers of aligned columns in different locations.

# Combining Column and Line Formatting to Align Items in a Sort Heading

This request produces a free-form report in which content is defined in a seven-line sort heading. Text and data is stacked in two groupings:

- The first grouping identifies the country and region (continent).
- The second grouping provides financial information for each country/region pair.

Although this is a single sort heading, our goal is to format the information in each grouping a bit differently to provide emphasis and facilitate comparison. The request also demonstrates a coding technique that makes formatting changes easier for the report designer. See the annotations following the code for details.

As you review the sample request, keep in mind that a heading can contain two kinds of items: text and embedded fields. A text item consists of any characters, even a single blank, between embedded fields and/or spot markers. In particular, if you have a single run of text that you want to treat as two items, you can separate the two items using a <+0> spot marker. For example, in the heading line:

```
" <+0>Country:<COUNTRY"
```

item #1 is a single blank space.

item #2, separated by the <+0> spot marker, is the text Country:

item #3 is the embedded field <COUNTRY.

For details about the <+0> spot marker, see Identifying a Report Component in a WebFOCUS StyleSheet.

**Request and annotations:**

```
    DEFINE FILE SHORT
    BALANCE/D14.2=BALANCE;
    END
    TABLE FILE SHORT
    BY COUNTRY NOPRINT SUBHEAD
1.  " <+0>Country:<COUNTRY"
2.  " <+0>Region:<REGION"
    " "
3.  "Type:<TYPE <+0>Exchange Rate:<EXCHANGE_RATE"
4.  "Holder:<HOLDER <+0>Projected Return:<PROJECTED_RETURN"
5.  "Risk class:<RISK_CLASS <+0>Balance:<BALANCE"
    " "
    ON TABLE SET PAGE-NUM OFF
6.  ON TABLE SET HTMLCSS ON
    ON TABLE SET STYLESHEET *
    TYPE=REPORT, FONT='TIMES', $
    TYPE=REPORT, GRID=OFF, $
    -* Bottom section of subhead:
7.  TYPE=SUBHEAD, ITEM=1, WIDTH=1.00, JUSTIFY=RIGHT, $
8.  TYPE=SUBHEAD, ITEM=2, WIDTH=1.25, JUSTIFY=RIGHT, $
9.  TYPE=SUBHEAD, ITEM=3, WIDTH=.5, $
10. TYPE=SUBHEAD, ITEM=4, WIDTH=1.25, JUSTIFY=RIGHT,$
11. TYPE=SUBHEAD, ITEM=5, WIDTH=1.5, JUSTIFY=DECIMAL(.6),$
    -* Top section of subhead (overrides above ITEM defaults
    -*   for lines 1 and 2):
12. -SET &INDENT=1.5;
13. TYPE=SUBHEAD, LINE=1, ITEM=1, WIDTH=&INDENT, $
14. TYPE=SUBHEAD, LINE=1, ITEM=2, WIDTH=1, JUSTIFY=LEFT, $
15. TYPE=SUBHEAD, LINE=1, ITEM=3, SIZE=14, WIDTH=2, JUSTIFY=LEFT, $
16. TYPE=SUBHEAD, LINE=2, ITEM=1, WIDTH=&INDENT, $
17. TYPE=SUBHEAD, LINE=2, ITEM=2, WIDTH=1, JUSTIFY=LEFT, $
18. TYPE=SUBHEAD, LINE=2, ITEM=3, WIDTH=2, JUSTIFY=LEFT, $
    ENDSTYLE
    END
```

The output highlights the key information and its relationship by aligning text and data, including decimal data in which decimal points are aligned for easy comparison.

| | | | |
|---|---|---|---|
| | Country: | ARGENTINA | |
| | Region: | SOUTH AMERICA | |
| Type: | ST. NOTES | Exchange Rate: | 35.00 |
| Holder: | COMM | Projected Return: | 4.200 |
| Risk class: | Medium | Balance: | 42,167,880.00 |
| | Country: | BRAZIL | |
| | Region: | SOUTH AMERICA | |
| Type: | ST. NOTES | Exchange Rate: | 39.55 |
| Holder: | COMM | Projected Return: | 4.200 |
| Risk class: | Medium | Balance: | 45,493,501.00 |
| | Country: | CZECH. REP | |
| | Region: | EASTERN EUROPE | |
| Type: | ST. NOTES | Exchange Rate: | 1,192.45 |
| Holder: | COMM | Projected Return: | 12.110 |
| Risk class: | High | Balance: | 51,121,201.00 |
| | Country: | ENGLAND | |
| | Region: | WESTERN EUROPE | |
| Type: | ST. NOTES | Exchange Rate: | 21.35 |
| Holder: | COMM | Projected Return: | 4.060 |
| Risk class: | Medium | Balance: | 125,757,198.00 |

| Line # | Description |
|---|---|
| **1-2** | Defines the content for the *top*, two-line section of the sort heading. Each line contains three items: the first is a blank area (denoted by a space, separated from the next item by a <+0> spot marker), the second contains text, the third contains data values related to the text. |
| **3-5** | Defines the content for the *bottom*, three-line section of the sort heading. Each line contains five items: text, data values related to the text, a blank column (denoted by a space, separated from the next item by a null spot marker), text, data values related to the text. |

| Line # | Description |
|---|---|
| **6** | Turns on internal cascading style sheets, a requirement for these formatting options. This command enables WebFOCUS StyleSheet attributes that were not previously available for HTML reports. This line of code is ignored for a PDF report. |
| **7-11** | Specifies the basic formatting characteristics for the sort heading by breaking the content into five columns, each identified as an item with a defined width, and justification information for all but the empty column.<br><br>**Important:** Had additional formatting code (annotated as 12-17) not been included in the request, the specifications annotated as 7-11 would have applied to the entire sort heading (that is, the formatting of the three columns in the top section of the heading would have been based on the specifications for the first three columns described below). However, that is not the effect we want to achieve, so a second section of StyleSheet code is defined to override this formatting for lines 1 and 2 of the sort heading. See annotations 12-18.<br><br>The formatting of the *bottom*, three-line section of the heading is controlled by the following specifications:<br><br>Item 1 identifies a columnar unit that contains text (that is, Type, Holder, Risk Class). It has a defined width of 1 inch and the text is right justified.<br><br>Item 2 identifies a columnar unit that contains data values related to the text in item 1. It has a defined width of 1.25 inches and the data is right justified.<br><br>Item 3 identifies a columnar unit that contains blank space and serves as a separator between columns. It has a width of .5 inches. Justification is not relevant.<br><br>Item 4 identifies a columnar unit that contains text (e.g., Exchange Rate, Projected Return, Balance). It has a defined width of 1.25 inches and the text is right justified.<br><br>Item 5 identifies a columnar unit that contains a decimal value. The width of the column that contains the value is 1.5 inches, with the |

| Line # | Description |
|---|---|
| | decimal point anchored .6 inches in from the right edge of that column.<br><br>The common width and justification definitions enforce the proper alignment of each item. |
| **12** | Defines a variable called &INDENT, with a width setting of 1.5 inches. This variable defines the width of the blank area (item 1) at the beginning of lines 1 and 2 of the sort heading.<br><br>Defining the width as a variable enables you to experiment with different widths simply by changing the value in one location. For a complex report, this technique can potentially save a lot of development time. For details, see the documentation on Dialogue Manager in the *ibi™ WebFOCUS® Developing Reporting Applications* manual. |
| **13-18** | Specifies line-by-line formatting for the *top*, two-line section of the sort heading. This code overrides the previous formatting for lines 1 and 2 of the sort heading because it specifies a line number.<br><br>Item 1 on each line refers to the blank area. The width is defined as a variable and implemented based on the current value of &INDENT.<br><br>Item 2 on each line refers to the text area. It has a defined width of 1 inch and the text is left justified.<br><br>Item 3 on each line refers to the data values. It has a defined width of 2 inches and the data is left justified.<br><br>The common width and justification definitions enforce the proper alignment of each item.<br><br>Notice that item 1 in line 15 defines a font size for the data values associated with the COUNTRY field. All other items on both lines use a default font. Line-by-line formatting enables you to define a unique characteristic for a single item. |

# Positioning Headings, Footings, or Items Within Them

For a PDF, PS, or HTML report, you can use the POSITION attribute in a StyleSheet to specify a starting position for a heading or footing, expressed as a unit measurement. For HTML, this capability requires an internal cascading style sheet. For details on selecting an alignment method, see Choosing an Alignment Method for Heading and Footing Elements.

In addition, for a PDF or PS report, you can use the POSITION attribute to specify an absolute or relative starting position for an element within a heading or footing or to align an item in a heading or footing with a report column. An absolute starting position is the distance from the left margin of the report. A relative starting position is the distance from the preceding object. For the first item on a heading line this is the left margin of the report.

In an HTML report, you can use related syntax and an internal cascading style sheet to position an image in a heading or footing. For details on images, see Laying Out the Report Page.

# Set a Starting Position for a Heading or Footing

Use the following syntax to specify a starting position for an entire heading or footing in relation to the left margin of a report.

```
TYPE = headfoot, POSITION = position, $
```

where:

**headfoot**

Is the type of heading or footing. Valid values are TABHEADING, TABFOOTING, HEADING, FOOTING, SUBHEAD, and SUBFOOT.

**position**

Is the desired distance from the left, expressed by the UNITS attribute (the default is INCHES).

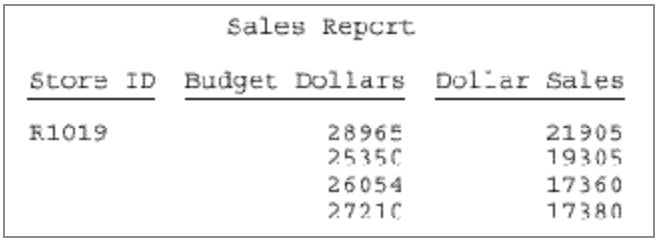
**Note:** In an HTML report, this syntax must be used in conjunction with an internal cascading style sheet.

# Setting a Starting Position for a Report Heading in PDF

This request positions the report heading 1.25 inches from the left margin.

```
SET ONLINE-FMT=PDF
TABLE FILE GGSALES
PRINT BUDDOLLARS DOLLARS
BY STCD
WHERE BUDDOLLARS GE 25000
WHERE STCD EQ 'R1019'
ON TABLE SUBHEAD
"Sales Report"
" "
ON TABLE SET PAGE-NUM OFF
ON TABLE SET SQUEEZE ON
ON TABLE SET STYLESHEET *
TYPE = TABHEADING, POSITION = 1.25, $
ENDSTYLE
END
```

The output is:



Sales Report

| Store ID | Budget Dollars | Dollar Sales |
|---|---|---|
| R1019 | 28965 | 21905 |
| | 25350 | 19305 |
| | 26054 | 17360 |
| | 27210 | 17380 |

# Setting a Starting Position for a Report Heading in HTML

The request generates an internal cascading style sheet as part of its HTML code, enabling the use of the POSITION attribute to specify a starting position for the heading, Sales Report, 1.5 inches from the left margin.

```
SET ONLINE-FMT = HTML
TABLE FILE GGSALES
PRINT BUDDOLLARS DOLLARS
BY STCD
WHERE BUDDOLLARS GE 25000
WHERE STCD EQ 'R1019'
ON TABLE SUBHEAD
"Sales Report"
" "
ON TABLE SET PAGE-NUM OFF
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
TYPE = TABHEADING, POSITION = 1.5, $
ENDSTYLE
END
```

The output is:

Century Corporation Orders Report

| Order Number: | Product Number#: | Quantity: | Line Total |
|---|---|---|---|
| Century Corporation orders for store Audio Expert (Store # 1003CA) in CA. | | | |
| 74610 | 1012 | 268 | $222,234.35 |
| | 1028 | 323 | $29,215.62 |
| | 1032 | 339 | $27,208.12 |
| | 1034 | 339 | $154,943.38 |
| | 1036 | 339 | $93,266.39 |
| Century Corporation orders for store Audio Expert (Store # 1003CO) in CO. | | | |
| 39274 | 1006 | 179 | $54,201.50 |
| | 1008 | 179 | $29,034.16 |
| | 1020 | 179 | $45,457.59 |
| | 1032 | 400 | $30,861.24 |
| | 1034 | 400 | $143,744.49 |

# Set a Starting Position for a Heading or Footing Element

For a PDF or PS report, use the following syntax to specify a starting position for a heading or footing element in relation to the preceding item

```
TYPE = headfoot, [subtype,] POSITION = {+|-}option, $
```

where:

**headfoot**

Is the type of heading or footing. Valid values are TABHEADING, TABFOOTING, HEADING, FOOTING, SUBHEAD, and SUBFOOT.

**subtype**

Are additional attributes that identify the report component. These options can be used separately or in combination, depending upon the degree of specificity you need to fully identify an element. Valid values are:

- **LINE,** which identifies a line by its position in a heading or footing. Identifying individual lines enables you to format each line differently.

  If a heading or footing has multiple lines and you apply a StyleSheet declaration that does not specify LINE, the declaration is applied to *all* lines. Blank lines are counted when interpreting the value of LINE.

- **ITEM,** which identifies an item by its position in a line. To divide a heading or footing line into items, you can use the <+0> spot marker. For details, see Identifying a Report Component in a WebFOCUS StyleSheet.

  To determine an ITEM number for an OBJECT, follow these guidelines:

  - When used with OBJECT=TEXT, count only the text strings from left to right.
  - When used with OBJECT=FIELD, count only values from left to right.
  - When used without OBJECT, count text strings and field values from left to right.

  If you apply a StyleSheet declaration that specifies ITEM, the number is counted from the beginning of each line in the heading or footing, not just from the

beginning of the first line.

- **OBJECT,** which identifies an element in a heading or footing as a text string or field value. Valid values are TEXT or FIELD. TEXT may represent free text or a Dialogue Manager amper (&) variable.

  It is not necessary to specify OBJECT=TEXT unless you are styling both text strings and embedded fields in the same heading or footing.

**option**

Is the alignment method. Valid values are:

- ***position*,** which is the desired distance, expressed by the UNITS attribute (the default is inches) for absolute positioning.
- **+,** which starts the heading or footing element at the specified distance to the *right* of the preceding item. For the first item in a heading or footing, the preceding item is the left margin of the report.
- **-,** which starts the heading or footing element at the specified distance to the *left* of the preceding item. This is useful if you want to overlap images in a heading.
- ***column_title*,** which aligns the heading or footing element with the first character of the designated column.

# Setting an Absolute Starting Position for a Heading Item

This request uses the spot marker <+0> to divide the report heading into three text strings. It starts the third text string, 1st Qtr 2001, 3 inches from the left report margin. This technique can be used in PDF as well as PS reports.

```
SET ONLINE-FMT = PDF
TABLE FILE GGSALES
SUM UNITS DOLLARS BY CATEGORY BY PRODUCT
ON TABLE SUBHEAD
"Sales Report - <+0>All Products<+0> 1st Qtr 2001"
" "
ON TABLE SET PAGE-NUM OFF
ON TABLE SET SQUEEZE ON
ON TABLE SET STYLESHEET *
```

```
TYPE = TABHEADING, OBJECT = TEXT, ITEM=1, SIZE = 12, STYLE = BOLD, $
TYPE = TABHEADING, OBJECT = TEXT, ITEM=2, STYLE = BOLD, $
TYPE = TABHEADING, OBJECT = TEXT, ITEM=3, POSITION = 3, $
ENDSTYLE
END
```

The output is:

**Sales Report - All Products** 1st Qtr 2001

| Category | Product | Unit Sales | Dollar Sales |
|---|---|---|---|
| Coffee | Capuccino | 189217 | 2381590 |
| | Espresso | 308986 | 3906243 |
| | Latte | 878063 | 10943622 |
| Food | Biscotti | 421377 | 5263317 |
| | Croissant | 630054 | 7749902 |
| | Scone | 333414 | 4216114 |
| Gifts | Coffee Grinder | 186534 | 2337567 |
| | Coffee Pot | 190695 | 2449585 |
| | Mug | 360570 | 4522521 |
| | Thermos | 190081 | 2385829 |

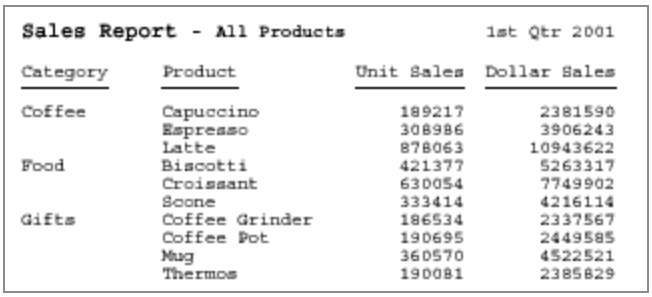
# Setting a Relative Starting Position for a Heading Item

This request uses the spot marker <+0> to divide the report heading into three text strings. It starts the third text string, 1st Qtr 2001, one inch to the right of the previous item on the heading line. Inches is the default unit of measure. This technique can be used in PDF as well as PS reports.

```
SET ONLINE-FMT = PDF
TABLE FILE GGSALES
SUM UNITS DOLLARS BY CATEGORY BY PRODUCT
ON TABLE SUBHEAD
"Sales Report - <+0>All Products<+0> 1st Qtr 2001"
" "
ON TABLE SET PAGE-NUM OFF
ON TABLE SET SQUEEZE ON
ON TABLE SET STYLESHEET *
TYPE = TABHEADING, OBJECT = TEXT, ITEM=1, SIZE = 12, STYLE = BOLD, $
TYPE = TABHEADING, OBJECT = TEXT, ITEM=2, STYLE = BOLD, $
TYPE = TABHEADING, OBJECT = TEXT, ITEM=3, POSITION = +1, $
```

```
ENDSTYLE
END
```

The output is:



**Sales Report - All Products** 1st Qtr 2001

| Category | Product | Unit Sales | Dollar Sales |
|---|---|---|---|
| Coffee | Capuccino | 189217 | 2381590 |
| | Espresso | 308986 | 3906243 |
| | Latte | 878063 | 10943622 |
| Food | Biscotti | 421377 | 5263317 |
| | Croissant | 630054 | 7749902 |
| | Scone | 333414 | 4216114 |
| Gifts | Coffee Grinder | 186534 | 2337567 |
| | Coffee Pot | 190695 | 2449585 |
| | Mug | 360570 | 4522521 |
| | Thermos | 190081 | 2385829 |

# Aligning a Heading Item With a Column

This request uses the spot marker <+0> to divide the report heading into three text strings. It starts the second text string at the horizontal position where the column UNITS (Unit Sales) is. This technique can be used in PDF as well as PS reports.

```
SET ONLINE-FMT = PDF
TABLE FILE GGSALES
SUM UNITS DOLLARS BY CATEGORY BY PRODUCT
ON TABLE SUBHEAD
"Sales Report - <+0>All Products<+0> 1st Qtr 2001"
" "
ON TABLE SET PAGE-NUM OFF
ON TABLE SET SQUEEZE ON
ON TABLE SET STYLESHEET *
TYPE = TABHEADING, LINE=1, ITEM=2, POSITION=UNITS, $
ENDSTYLE
END
```

The output is:

```
Sales Report -                    All Products 1st Qtr 2001

Category      Product             Unit Sales  Dollar Sales

Coffee        Capuccino               189217       2381590
              Espresso                308986       3906243
              Latte                   878063      10943622
Food          Biscotti                421377       5263317
              Croissant               630054       7749902
              Scone                   333414       4216114
Gifts         Coffee Grinder          186534       2337567
              Coffee Pot              190695       2449585
              Mug                     360570       4522521
              Thermos                 190081       2385829
```

**Tip:** In this request the column (UNITS) is identified by name. However, there are other ways to identify a column that you wish to format. See Identifying a Report Component in a WebFOCUS StyleSheet.

# Using PRINTPLUS

PRINTPLUS includes enhancements to display alternatives offered by WebFOCUS. For example, you can place a FOOTING after a SUBFOOT in your report. PRINTPLUS provides the flexibility to produce the exact report you desire.

The PRINTPLUS parameter must be set to ON to use the following TABLE capabilities:

- PAGE-BREAK is handled internally to provide the correct spacing of pages. For example, if a new report page is started and an instruction to skip a line at the top of the new page is encountered, WebFOCUS knows to suppress the blank line and start at the top of the page.
- NOSPLIT is handled internally. (Use NOSPLIT to force a break at a specific spot.)
- You can perform RECAPs in cases where pre-specified conditions are met.
- A Report SUBFOOT now prints above the footing instead of below it.
- Data displays correctly in subfoots when IF/WHERE TOTAL or BY HIGHEST is used.
- BY field actions are linked with BY field options so they appear on the same page. The footing no longer splits on two pages.
- Footings and Subfoots always appear on a page with at least one data item, and will never split between two pages.
- Printing beyond the length of the page no longer occurs.

- Splitting of fields linked by OVER onto separate pages no longer occurs.
- There is no reserved space for conditional output. The output page is fully used.
- The order of sort fields is no longer relevant.

**Note:** PRINTPLUS is not supported for StyleSheets. A warning message is generated in this case.

# Use PRINTPLUS

Issue the command

```
SET PRINTPLUS = {ON|OFF}
```

# Using PRINTPLUS With SUBFOOT and FOOTING

With PRINTPLUS on, the SUBFOOT prints first, followed by the FOOTING.

```
SET PRINTPLUS = ON
 TABLE FILE CAR
  PRINT CAR MODEL
  BY SEATS BY COUNTRY
  IF COUNTRY EQ ENGLAND OR FRANCE OR ITALY
  ON TABLE SUBFOOT
  " "
  " SUMMARY OF CARS IN COUNTRY BY SEATING CAPACITY"
  FOOTING
  " RELPMEK CAR SURVEY "
ON TABLE SET STYLE *
TYPE=REPORT,GRID=OFF,$
ENDSTYLE
END
```

The output is:

| SEATS | COUNTRY | CAR | MODEL |
|---|---|---|---|
| ----- | ------- | - | ----- |
| 2 | ENGLAND | TRIUMPH | TR7 |
| | ITALY | ALFA ROMEO | 2000 GT VELOCE |
| | | ALFA ROMEO | 2000 SPIDER VELOCE |
| | | MASERATI | DORA 2 DOOR |
| 4 | ENGLAND | JAGUAR | V12XKE AUTO |
| | | JENSEN | INTERCEPTOR III |
| | ITALY | ALFA ROMEO | 2000 4 DOOR BERLINA |
| 5 | ENGLAND | JAGUAR | XJ12L AUTO |
| | FRANCE | PEUGEOT | 504 4 DOOR |

| | | | |
|---|---|---|---|
| | | | |

SUMMARY OF CARS IN COUNTRY BY SEATING CAPACITY

RELPMEK CAR SURVEY

# Using Spot Markers to Refine Positioning

You can employ several types of spot markers to refine the positioning of headings and footings, and elements within them, in HTML and PDF reports that use proportional fonts. For maximum control, you can combine spot markers with other alignment techniques. See Choosing an Alignment Method for Heading and Footing Elements.

The following spot markers enable you to position items and to identify items to be formatted:

- **<+0>** divides a heading or footing into items for formatting.

  To divide a heading or footing into items that can be formatted separately, place the <+0> spot marker after the text string or field you wish to specify. It will not add any additional spaces to your heading or footing. For details, see Identifying a Report Component in a WebFOCUS StyleSheet.

- **</n** specifies skipped lines.

  To specify skipped lines in a heading or footing, place the </*n*> spot marker on the same line as the text in the request. If you place it on a line by itself, WebFOCUS counts the line the spot marker is on plus the number of skip-lines you designate. For details, see Controlling the Vertical Positioning of a Heading or Footing.

- **<-n** controls the positioning of a character immediately following a field.

**Note:** When a closing spot marker is immediately followed by an opening spot marker (><), a single space text item will be placed between the two spot markers (> <). This must be considered when applying formatting.

You can also use spot markers to position heading and footing elements at fixed and relative column locations. Several spot markers control positioning based on the pre-defined width of a character in a monospace font. This is a legacy formatting technique that is not supported for proportional fonts.

# Positioning a Character Immediately After a Field in an HTML Report

This request generates an HTML report in which the closing parenthesis and the period in the sort heading follow immediately after the STORE_CODE and STATE fields, respectively. This behavior is controlled by the <-1 spot markers, which indicate a relative starting position from the preceding object. Without these spot markers to indicate that the punctuation characters should follow the preceding objects, an extra space would appear in each of these positions in the display.

```
SET ONLINE-FMT = HTML
SET PAGE-NUM = OFF
JOIN STORE_CODE IN CENTCOMP TO STORE_CODE IN CENTORD
```

```
TABLE FILE CENTCOMP
HEADING
"Century Corporation Orders Report </1"
PRINT PROD_NUM QUANTITY LINEPRICE
BY STORE_CODE NOPRINT
BY ORDER_NUM
ON STORE_CODE SUBHEAD
"Century Corporation orders for store <STORENAME <0X
(store # <STORE_CODE<-1 ) in <STATE|.</1"
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The partial output is:

Century Corporation Orders Report

| Order Number: | Product Number#: | Quantity: | Line Total |
|---|---|---|---|
| Century Corporation orders for store Audio Expert (Store # 1003CA) in CA. | | | |
| 74610 | 1012 | 268 | $222,234.35 |
| | 1028 | 323 | $29,215.62 |
| | 1032 | 339 | $27,208.12 |
| | 1034 | 339 | $154,943.38 |
| | 1036 | 339 | $93,266.39 |
| Century Corporation orders for store Audio Expert (Store # 1003CO) in CO. | | | |
| 39274 | 1006 | 179 | $54,201.50 |
| | 1008 | 179 | $29,034.16 |
| | 1020 | 179 | $45,457.59 |
| | 1032 | 400 | $30,861.24 |
| | 1034 | 400 | $143,744.49 |

# Positioning a Character Immediately After a Field in a PDF or PS Report

In a PDF report, an embedded field in a heading or footing must be followed by a space in the request to be recognized for processing. However, in the output the space may not be desirable. This example demonstrates two techniques for positioning punctuation characters immediately after a field in a PDF report.

The first technique uses the POSITION attribute in a StyleSheet to position the closing parenthesis immediately after the STORE_CODE value. The second technique uses the <-1 spot marker to position the period immediately after the STATE value. The POSITION measurement is based on the UNITS designation POINTS. Experimentation demonstrated that -7 points moves the closing parenthesis to the proper location after the field, using the default proportional font and size.

```
SET ONLINE-FMT = PDF
SET PAGE-NUM = OFF
JOIN STORE_CODE IN CENTCOMP TO STORE_CODE IN CENTORD

TABLE FILE CENTCOMP
HEADING
"Century Corporation Orders Report"
PRINT PROD_NUM QUANTITY LINEPRICE
```

```
BY STORE_CODE NOPRINT
BY ORDER_NUM
ON STORE_CODE SUBHEAD
"Century Corporation orders for store <STORENAME (store # <STORE_CODE )
in <0X <STATE <-1 . </1"
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, UNITS=POINTS, $
TYPE=SUBHEAD, OBJECT=TEXT, ITEM=3, POSITION= -7, $
ENDSTYLE
END
```

The output is:

```
Century Corporation Orders Report
Order Number:  Product Number#:   Quantity:       Line Total

Century Corporation orders for store Audio Expert (store # 1003CA) in    CA.

74610          1012                    268      $222,234.35
               1028                    323       $29,215.62
               1032                    339       $27,208.12
               1034                    339      $154,943.38
               1036                    339       $93,266.39
Century Corporation orders for store Audio Expert (store # 1003CO) in    CO.

39274          1006                    179       $54,201.50
               1008                    179       $29,034.16
               1020                    179       $45,457.59
               1032                    400       $30,861.24
               1034                    400      $143,744.49
Century Corporation orders for store Audio Expert (store # 1003CT) in    CT.
```

Without the spot marker and position measurement, the output would have looked like this:

```
Century Corporation Orders Report
Order Number:  Product Number#:   Quantity:       Line Total

Century Corporation orders for store Audio Expert (store # 1003CA) in    CA .

74610          1012                    268      $222,234.35
               1028                    323       $29,215.62
               1032                    339       $27,208.12
               1034                    339      $154,943.38
               1036                    339       $93,266.39
Century Corporation orders for store Audio Expert (store # 1003CO) in    CO .

39274          1006                    179       $54,201.50
               1008                    179       $29,034.16
               1020                    179       $45,457.59
               1032                    400       $30,861.24
               1034                    400      $143,744.49
Century Corporation orders for store Audio Expert (store # 1003CT) in    CT .
```

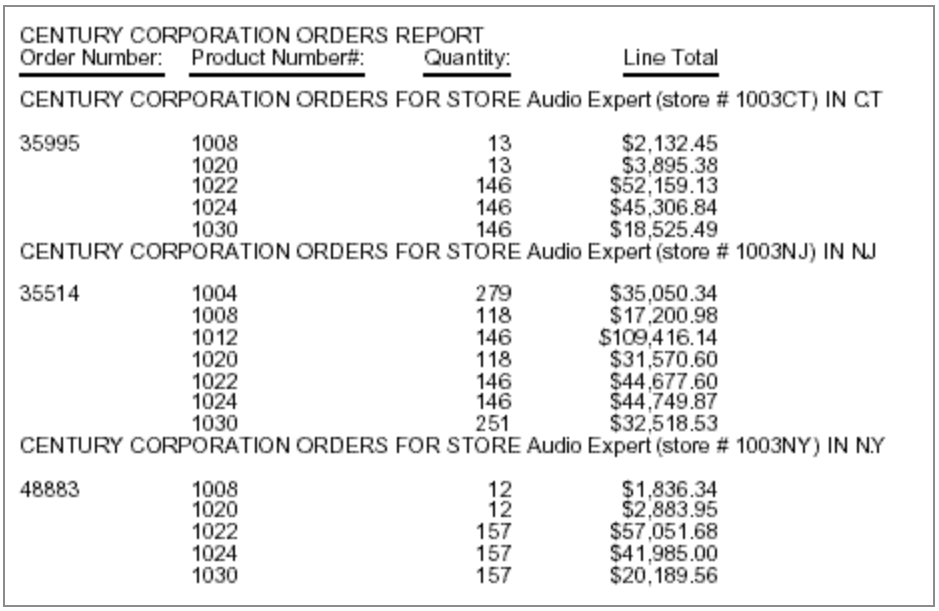
# Customizing Position Measurements for Font Attributes

This request uses a 12-point Helvetica font. Experimentation demonstrated that the POSITION value of -2 moves the text in this font and size to the required position.

```
SET ONLINE-FMT = PDF
SET PAGE-NUM = OFF
JOIN STORE_CODE IN CENTCOMP TO STORE_CODE IN CENTORD

TABLE FILE CENTCOMP
HEADING
"CENTURY CORPORATION ORDERS REPORT"
PRINT PROD_NUM QUANTITY LINEPRICE
BY STORE_CODE NOPRINT WHERE STORE_CODE EQ '1003NY' OR '1003CT' OR
    '1003NJ'
BY ORDER_NUM
ON STORE_CODE SUBHEAD
"CENTURY CORPORATION ORDERS FOR STORE <STORENAME (store # <STORE_
CODE)<0X
 IN <STATE <-1 . </1"
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, UNITS=POINTS, FONT='Helvetica', SIZE=12, $
TYPE=SUBHEAD, OBJECT=TEXT, ITEM=3, POSITION= -2, $
ENDSTYLE
END
```

**Tip:** You cannot use the POSITION attribute to position a heading element in an in HTML report. However, you can achieve the same result by placing the horizontal spot markers <-1 immediately after the fields STORE_CODE and STATE. Do not add a space between the field and the character that will follow it.

The output is:



CENTURY CORPORATION ORDERS REPORT

| Order Number: | Product Number#: | Quantity: | Line Total |
|---|---|---|---|
| CENTURY CORPORATION ORDERS FOR STORE Audio Expert (store # 1003CT) IN CT | | | |
| 35995 | 1008 | 13 | $2,132.45 |
| | 1020 | 13 | $3,895.38 |
| | 1022 | 146 | $52,159.13 |
| | 1024 | 146 | $45,306.84 |
| | 1030 | 146 | $18,525.49 |
| CENTURY CORPORATION ORDERS FOR STORE Audio Expert (store # 1003NJ) IN NJ | | | |
| 35514 | 1004 | 279 | $35,050.34 |
| | 1008 | 118 | $17,200.98 |
| | 1012 | 146 | $109,416.14 |
| | 1020 | 118 | $31,570.60 |
| | 1022 | 146 | $44,677.60 |
| | 1024 | 146 | $44,749.87 |
| | 1030 | 251 | $32,518.53 |
| CENTURY CORPORATION ORDERS FOR STORE Audio Expert (store # 1003NY) IN NY | | | |
| 48883 | 1008 | 12 | $1,836.34 |
| | 1020 | 12 | $2,883.95 |
| | 1022 | 157 | $57,051.68 |
| | 1024 | 157 | $41,985.00 |
| | 1030 | 157 | $20,189.56 |

# Controlling the Vertical Positioning of a Heading or Footing

You can use several vertical positioning techniques to enhance the appearance and readability of a report:

- In a report generated in HTML, PDF, or other report formats, you can add one or more lines above or below heading or footing text using spot markers and free text lines. See Add Blank Lines to a Heading or Footing.
- In a PDF report you can control the space above or below a heading or footing line or the distance between text and the surrounding grid lines in a heading or footing line using the TOPGAP and BOTTOMGAP attributes in a StyleSheet. See Controlling the Vertical Positioning of a Heading or Footing. For full information on TOPGAP and BOTTOMGAP, see Laying Out the Report Page.
- In a PDF report, you can position a page footing at the bottom of a page, rather than directly after the report data. See Controlling the Vertical Positioning of a Heading or Footing.

# Add Blank Lines to a Heading or Footing

Use the following syntax options to add blank lines above or below, or within a heading or footing, where:

**</n**

Is a spot marker that specifies the number of lines to skip. It is best to put the spot marker on the same line as the text in the request. If you place the spot marker </*n* on a line by itself, it will add that line in addition to the designated number of skipped lines.

**" "**

Indicates a separate line in the heading or footing, with blank content.

You can use these techniques separately or in combination.

# Adding Blank Lines Above and Below a Report Heading

This request creates an HTML report with one blank line between each line of the page heading and two blank lines between the page heading and the actual report. The first blank line is added as an empty text line, The next blank lines are added with the skip-line spot marker.

```
TABLE FILE GGSALES
SUM BUDUNITS UNITS BUDDOLLARS DOLLARS
BY CATEGORY
ON TABLE SUBHEAD
"SALES REPORT"
" "
"**(CONFIDENTIAL)**</1"
"December 2002 </2"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, TOPMARGIN=0, $
TYPE = TABHEADING, JUSTIFY = CENTER, $
ENDSTYLE
END
```

The output is:

SALES REPORT

**(CONFIDENTIAL)**

DECEMBER 2002

| Category | Budget Units | Unit Sales | Budget Dollars | Dollar Sales |
|---|---|---|---|---|
| Coffee | 1385923 | 1376266 | 17293907 | 17231465 |
| Food | 1377564 | 1384845 | 17267160 | 17229344 |
| Gifts | 931007 | 927880 | 11659732 | 11695502 |

# Control Vertical Spacing in a Heading or Footing

In a PDF report, you can use the TOPGAP and BOTTOMGAP attributes to control spacing above or below a heading or footing line or the distance between heading or footing text and the grid lines above and below them.

**Note:** You can use TOPGAP and BOTTOMGAP with multi-line headings. Keep in mind that between heading lines the top *and* bottom gap will be inserted, making the spacing between lines greater than the spacing at the top and bottom of the heading.

```
TYPE=headfoot, {TOPGAP|BOTTOMGAP}=gap, $
```

where:

**headfoot**

Is the type of heading or footing. Valid values are TABHEADING, TABFOOTING, HEADING, FOOTING, SUBHEAD, and SUBFOOT.

**TOPGAP**

Indicates how much space to add above a report component.

**BOTTOMGAP**

Indicates how much space to add below a report component.

**gap**

Is the amount of blank space, in the unit of measurement specified by the UNITS parameter (inches, by default).

In the absence of grids, the default value is 0.

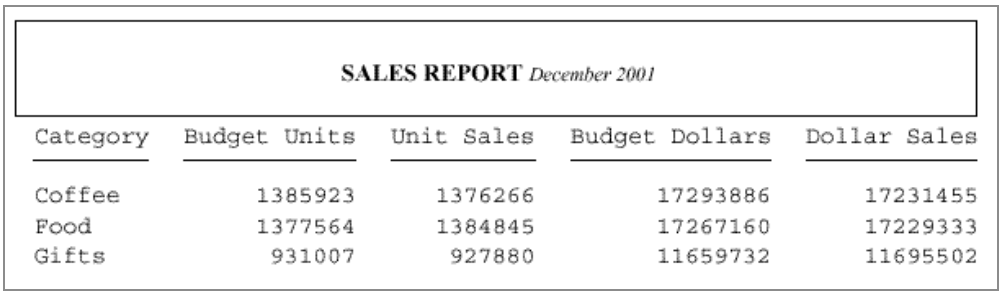
In the presence of grids, the default value increases to provide space between the grid and the text.

# Adding Blank Space to Separate Heading Text From Grid Lines in a PDF Report

This request generates a PDF report with blank space added above and below the report heading to separate the text from the upper and lower grid lines. The space above is added by the TOPGAP attribute. The space below is added by the BOTTOMGAP attribute.

```
TABLE FILE GGSALES
SUM BUDUNITS UNITS BUDDOLLARS DOLLARS
BY CATEGORY
ON TABLE SUBHEAD
"SALES REPORT <+0>December 2001"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT PDF
ON TABLE SET SQUEEZE ON
ON TABLE SET STYLESHEET *
TYPE = TABHEADING, GRID=ON, JUSTIFY=CENTER, TOPGAP=.25, BOTTOMGAP=.25, $
TYPE = TABHEADING,  FONT='TIMES', SIZE=12, STYLE=BOLD, $
TYPE = TABHEADING, ITEM=2, SIZE=10, STYLE=ITALIC, $
ENDSTYLE
END
```

The output is:



**SALES REPORT** *December 2001*

| Category | Budget Units | Unit Sales | Budget Dollars | Dollar Sales |
|---|---|---|---|---|
| Coffee | 1385923 | 1376266 | 17293886 | 17231455 |
| Food | 1377564 | 1384845 | 17267160 | 17229333 |
| Gifts | 931007 | 927880 | 11659732 | 11695502 |

# Adjusting Vertical Spacing Below a Sort Footing

The request generates a PDF report in which the sort footings are bolded for emphasis and space is added below each footing to visually tie the footing text to the preceding data.

```
TABLE FILE GGPRODS
PRINT PACKAGE_TYPE AND UNIT_PRICE
WHERE UNIT_PRICE GT 50
BY PRODUCT_DESCRIPTION NOPRINT BY PRODUCT_ID
ON PRODUCT_DESCRIPTION SUBFOOT
"Summary for <PRODUCT_DESCRIPTION"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT PDF
ON TABLE SET SQUEEZE ON
ON TABLE SET STYLESHEET *
TYPE=SUBFOOT, STYLE=BOLD, BOTTOMGAP=.25, $
ENDSTYLE
END
```

The output is:

```
Product              Unit
Code      Package    Price

G110      Case      125.00
Summary for Coffee Grinder

G121      Case      140.00
Summary for Coffee Pot

B142      Pounds     81.00
Summary for French Roast

B141      Pounds     58.00
Summary for Hazelnut

B144      Pounds     76.00
Summary for Kona
```

# Position a Page Footing at the Bottom of a Page

You can position a page footing at the bottom of a page. By default, a page footing appears two lines below the report data.

```
FOOTING [BOTTOM]
  "content ... "
["content ... "]
.
.
.
["content ... "]
```

where:

**FOOTING**

Is the required command that identifies the content as a page footing.

**BOTTOM**

Is an optional command that places the footing at the bottom of the page. If you omit BOTTOM, the page footing appears two lines below the report data. **Note:** FOOTING BOTTOM is not supported in an HTML report or by the WebFOCUS Viewer.

**content**

Footing content can include the following elements, between double quotation marks. (If the ending quotation mark is omitted, all subsequent lines of the request are treated as part of the footing.)

**text**

Is the footing text. You can include multiple lines of text.

The text must start on a line by itself, following the FOOTING command.

Text can be combined with variables and spot markers.

For related information, see Limits for Headings and Footings.

**variable**

Can be any one or a combination of the following:

`Fields` (real data source fields, virtual fields created with the DEFINE command in a Master File or report request, calculated values created with the COMPUTE command in a request, system fields such as TABPAGENO). You can qualify data source fields with certain prefix operators.

```
Dialogue Manager variables.
```

`Images.` You can include images in a heading or footing.

For details, see Including an Element in a Heading or Footing.

**spot marker**

Enables you to position items, to identify items to be formatted, and to extend code beyond the 80-character line limit of the text editor.

`<+0>` divides a heading or footing into items for formatting. For details, see Identifying a Report Component in a WebFOCUS StyleSheet.

`</n` specifies skipped lines. For details, see Controlling the Vertical Positioning of a Heading or Footing.

`<-n` to position the next character on the line. For details, see Positioning Headings, Footings, or Items Within Them.

`<0X` continues a heading or footing specification on the next line of the request. For details, see Extending Heading and Footing Code to Multiple Lines in a Report Request.

**Note:** When a closing spot marker is immediately followed by an opening spot marker (><), a single space text item will be placed between the two spot markers (> <). This must be considered when applying formatting.

**Blank lines**

If you omit all text, variables, and spot markers, you have a blank heading or footing line (for example, " ") which you can use to skip a line in the heading or footing. (You can also skip a line using a vertical spot marker, such as </1.)

**Note:** The maximum number of sort headings and sort footings in one request is 33.

# Positioning a Page Footing at the Bottom of a Page

This request produces a PDF report in which the page footing appears at the bottom of the page, rather than in its default position, two lines below the report data.

```
TABLE FILE GGSALES
PRINT UNITS DOLLARS
BY CATEGORY BY STCD
WHERE TOTAL DOLLARS GE 25000
FOOTING BOTTOM
"PRELIMINARY SALES FIGURES"
ON TABLE SET ONLINE-FMT PDF
ON TABLE SET PAGE-NUM OFF
END
```

The following output shows the end of the report, with the footing.

```
               R1088           1676          25140
                               1789          26835
               R1100           1781          26715
                               3015          45225
               R1109           1694          25410
               R1200           1765          26475
                               1675          25125
                               1773          26595
               R1244           1800          25200
               R1248           1798          26970
                               1695          25425
                               1699          25485
Gifts          R1020           3609          47468
               R1200           3473          51180


 PRELIMINARY SALES FIGURES
```

# Placing a Report Heading or Footing on Its Own Page

In a PDF report or an HTML report displayed in the WebFOCUS Viewer, you can request that a report heading or footing appear on its own page to set off important information. For example, you might want to create a cover page that flags salary information as *Confidential* and is separate from the actual data.

# Position a Report Heading or Footing on Its Own Page

Each heading or footing line must begin and end with a double quotation mark.

```
ON TABLE PAGE-BREAK AND {SUBHEAD|SUBFOOT}
"content ... "
["content ... "]
.
.
.
["content ... "]
```

where:

**PAGE-BREAK**

Determines when a new page starts. Use with the SET LINES command to control the length of a printed page.

**SUBHEAD**

Generates a report heading.

**SUBFOOT**

Generates a report footing.

**content**

Heading or footing content can include the following elements, between double quotation marks. If the ending quotation mark is omitted, all subsequent lines of the request are treated as part of the report heading.

**text**

Is the heading or footing text. You can include multiple lines of text.

The text must start on a line by itself, following the SUBHEAD or SUBFOOT command.

Text can be combined with variables and spot markers.

For related information, see Limits for Headings and Footings.

**variable**

Can be any one or a combination of the following:

`Fields` (real data source fields, virtual fields created with the DEFINE command in a Master File or report request, calculated values created with the COMPUTE command in a request, system fields such as TABPAGENO). You can qualify data source fields with certain prefix operators.

```
Dialogue Manager variables.
```

`Images`. You can include images in a heading or footing.

For details, see Including an Element in a Heading or Footing.

**spot marker**

Enables you to position items, to identify items to be formatted, and to extend code beyond the 80-character line limit of the text editor.

`<+0>` divides a heading or footing into items for formatting. For details, see Identifying a Report Component in a WebFOCUS StyleSheet.

`</n` specifies skipped lines. For details, see Controlling the Vertical Positioning of a Heading or Footing.

`<-n` positions the next character on the line. For details, see Positioning Headings, Footings, or Items Within Them.

`<0X` continues a heading or footing specification on the next line of the request. For details, see Extending Heading and Footing Code to Multiple Lines in a Report Request.

**Note:** When a closing spot marker is immediately followed by an opening spot marker (><), a single space text item will be placed between the two spot markers (> <). This must be considered when applying formatting.

**Blank lines**

If you omit all text, variables, and spot markers, you have a blank heading or footing line (for example, " ") which you can use to skip a line in the heading or footing. (You can also skip a line using a vertical spot marker, such as </1.)

# Positioning a Report Heading on a Separate Page

Using PAGE-BREAK, this request generates a two-page report, with important information by itself on the first page.

```
TABLE FILE CENTORD
SUM ORDER_DATE LINEPRICE AS 'Order,Total:'
BY HIGHEST 5 ORDER_NUM
ON TABLE PAGE-BREAK AND SUBHEAD
"CONFIDENTIAL COMPANY INFORMATION"
"March 2003"
HEADING
"Order Revenue"
" "
ON TABLE SET PAGE-NUM OFF
```

```
ON TABLE SET ONLINE-FMT PDF
END
```

The first page of output identifies the confidential nature of the report and the date.

```
CONFIDENTIAL COMPANY INFORMATION
March 2003
```

The second page of output contains the column titles and data.

```
Order Revenue

Order Number:  Date Of Order:          Order Total:
94710          2001/01/02          $406,964.24
94680          2001/01/02          $421,916.60
94670          2001/01/02          $513,868.76
94550          2001/01/02          $496,323.64
94530          2001/01/02            $3,472.41
```

**Tip:** To produce comparable results in HTML, include the following code in the request to turn on the WebFOCUS Viewer.

```
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET WEBVIEWER ON
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The first page will display the report heading. You can navigate to the second page for the report data.

# Positioning a Report Footing on a Separate Page

Using PAGE-BREAK, this request generates a two-page report with the report footing, which signals the end of the report, on a page by itself.

```
TABLE FILE CENTORD
HEADING
"Order Revenue"
```

```
" "
SUM ORDER_DATE LINEPRICE AS 'Order,Total:'
BY HIGHEST 5 ORDER_NUM
ON TABLE PAGE-BREAK AND SUBFOOT
"END OF REPORT"
ON TABLE SET PAGE-NUM OFF
ON TABLE SET ONLINE-FMT PDF
END
```

The first page of output contains the column titles and data.

```
Order Revenue

                                          Order
Order Number:  Date Of Order:             Total:
-------------  -------------             ------
94710          2001/01/02           $406,964.24
94680          2001/01/02           $421,916.60
94670          2001/01/02           $513,868.76
94550          2001/01/02           $496,323.64
94530          2001/01/02             $3,472.41
```

The last page of output signals the end of the report.

```
END OF REPORT
```

**Note:** To produce comparable results in HTML, include the following code in the request to turn on the WebFOCUS Viewer.

```
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET WEBVIEWER ON
ON TABLE SET STYLESHEET *
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The first page of output will contain the column titles and data. You can navigate to the last page to see END OF REPORT.

# Formatting Report Data

This chapter covers information about formatting and positioning text in a report. You can select the size, color, font, and style for the text of your report, in addition to being able to adjust the position of text within a report.

# Specifying Font Format in a Report

Using StyleSheet attributes, you can enhance the appearance of a report by specifying the font, size, and color of the font. Font format can be designated for a report as a whole, or for headings, footings, and columns individually.

# Specify Font Size in a Report

To specify a font size, use the following syntax within a StyleSheet.

```
TYPE = type, [subtype,] SIZE=pts, $
```

where:

**type**

Is the report component you wish to affect, such as REPORT, HEADING, or TITLE.

**subtype**

Is any additional attribute, such as COLUMN, ACROSS, ITEM etc. that is needed to identify the report component that you are formatting. See Identifying a Report Component in a WebFOCUS StyleSheet for more information about how to specify different report components.

**pts**

Is the size of the font in points. The default value is 10, which corresponds to the HTML default font size 3. For more information on the correlation between point size and html font size, see Specifying Font Format in a Report.

# Specifying Font Size in a Report

In the following report request, the point size of column titles is set to 12:

```
TABLE FILE GGSALES
ON TABLE SET PAGE-NUM OFF
SUM UNITS DOLLARS BY CATEGORY
ON TABLE SET STYLE *
TYPE=TITLE, SIZE=12, $
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The output is:

| Category | Unit Sales | Dollar Sales |
|---|---|---|
| Coffee | 1376266 | 17231465 |
| Food | 1384845 | 17229344 |
| Gifts | 927880 | 11695502 |

# Usage Notes for Changing Font Size

Point size is fixed, except in an HTML report. Relative point size uses a different scale than HTML font size. The following table lists the point size and the corresponding HTML font size:

| Size in Points | Corresponding HTML Font Size |
|---|---|
| 8 or smaller | 1 |
| 9 | 2 |
| 10 | 3 |
| 11 | 4 |

| Size in Points | Corresponding HTML Font Size |
|---|---|
| 12 | 5 |
| 13 | 6 |
| 14 or larger | 7 |

# Specify Bold or Italic Font Style in a Report

To specify a font style, use the following syntax within a StyleSheet.

```
TYPE=type, [subtype,] STYLE=[+|-]txtsty[{+|-}txtsty], $
```

where:

**type**

Is the report component you wish to affect, such as REPORT, HEADING, or TITLE.

**subtype**

Is any additional attribute, such as COLUMN, ACROSS, ITEM etc. that is needed to identify the report component that you are formatting. See Identifying a Report Component in a WebFOCUS StyleSheet for more information about how to specify different report components.

**txtsty**

Is one of the following values: NORMAL, BOLD, ITALIC. The default value is NORMAL.

Note that if you specify a style that is not supported for the font you are using, the specified font will display without the style.

**+**

Enables you to specify a combination of font styles. You can add additional font styles to an attribute that already has one or more font styles applied to it.

**-**

Enables you to remove a font style from an attribute.

# Specifying Font Style in a Report

In the following report, the column titles are specified to have bold and italic font styles:

```
TABLE FILE GGSALES
SUM UNITS DOLLARS BY CATEGORY
ON TABLE SET STYLE *
TYPE=TITLE, STYLE=BOLD+ITALIC, $
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The output is:

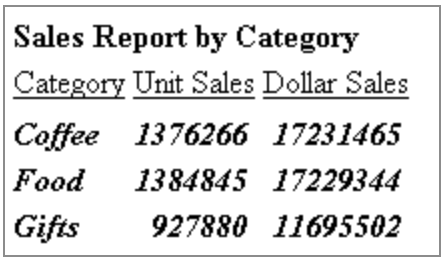
| *Category* | *Unit Sales* | *Dollar Sales* |
|---|---|---|
| Coffee | 1376266 | 17231465 |
| Food | 1384845 | 17229344 |
| Gifts | 927880 | 11695502 |

# Adding and Removing Inherited Font Style in a Report

In the following report request, the font styles bold and italics are specified for the entire report. The inherited italics are removed from the heading, and both styles are removed from the column titles:

```
TABLE FILE GGSALES
HEADING
"Sales Report by Category"
SUM UNITS DOLLARS BY CATEGORY
ON TABLE SET STYLE *
TYPE=REPORT, STYLE=BOLD+ITALIC, $
TYPE=HEADING, STYLE=-ITALIC, $
TYPE=TITLE, STYLE=-BOLD-ITALIC, $
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The output is:



**Sales Report by Category**

| Category | Unit Sales | Dollar Sales |
|---|---|---|
| *Coffee* | *1376266* | *17231465* |
| *Food* | *1384845* | *17229344* |
| *Gifts* | *927880* | *11695502* |

# Specify Font Color in a Report

To specify a color for the font of a report or a report component, use the following syntax within a StyleSheet.

```
TYPE=type, [subtype,] COLOR={color|RGB({r g b|#hexcolor})},$
```

where:

**type**

Is the report component you wish to affect, such as REPORT, HEADING, or TITLE.

**subtype**

Is any additional attribute, such as COLUMN, ACROSS, ITEM etc. that is needed to identify the report component that you are formatting. See Identifying a Report Component in a WebFOCUS StyleSheet for more information about how to specify different report components.

**color**

Is one of the preset color values such as GREY or GOLD. If the display or output device does not support colors, it substitutes shades of gray. The default value is BLACK. For a complete list of available color values, see Specifying Font Format in a Report.

**RGB(r g b)**

Specifies the font color using a mixture of red, green, and blue.

(*r g b*) Is the desired intensity of red, green, and blue, respectively. The values are on a scale of 0 to 255, where 0 is the least intense and 255 is the most intense. Note that using the three color components in equal intensities results in shades of gray.

**RGB(#hexcolor)**

Is the hexadecimal value for the color. For example, FF0000 is the hexadecimal value for red. The hexadecimal digits can be in upper or lower case and must be preceded by a pound sign (#).

# Color Values in a Report

The following chart lists all available color values that can be utilized with the syntax

```
COLOR=color, or BACKCOLOR=color,
```

where *color* is one of the following values:

| | |
|---|---|
| AQUA (CYAN) | MEDIUM FOREST GREEN (OLIVE) |
| AQUAMARINE | MEDIUM GOLDENROD |
| BLACK | MEDIUM ORCHID |
| BLUE VIOLET | MEDIUM SLATE BLUE |
| CADET BLUE | MEDIUM SPRING GREEN |
| CORAL | MEDIUM TURQUOISE |
| CORNFLOWER BLUE | MEDIUM VIOLET RED |

| | |
|---|---|
| CYAN (AQUA) | MIDNIGHT BLUE |
| DARK GREEN | NAVY (NAVY BLUE) |
| DARK OLIVE GREEN | OLIVE (MEDIUM FOREST GREEN) |
| DARK ORCHID | ORANGE |
| DARK SLATE BLUE (PURPLE) | ORANGE RED |
| DARK SLATE GREY | ORCHID |
| DARK TURQUOISE | PALE GREEN |
| DIM GREY (GRAY, GREY) | PINK |
| FIREBRICK | PLUM |
| FOREST GREEN (GREEN) | PURPLE (DARK SLATE BLUE) |
| FUCHSIA (MAGENTA) | RED |

| | |
|---|---|
| GOLD | SALMON |
| GOLDENROD | SEA GREEN |
| GRAY (DIM GREY, GREY) | SIENNA |
| GREEN (FOREST GREEN) | SILVER |
| GREEN YELLOW | SKY BLUE |
| GREY (DIM GREY, GRAY) | SLATE BLUE |
| INDIAN RED | STEEL BLUE (TEAL) |
| KHAKI | TAN |
| LIGHT BLUE | TEAL (STEEL BLUE) |
| LIGHT GREY | THISTLE |
| LIGHT STEEL BLUE | TURQUOISE |

| | |
|---|---|
| LIME | VIOLET |
| LIME GREEN | VIOLET RED |
| MAGENTA (FUCHSIA) | WHEAT |
| MAROON | WHITE |
| MEDIUM AQUAMARINE | YELLOW |
| MEDIUM BLUE | YELLOW GREEN |

# Specifying Fonts for Reports

You can specify your own fonts in a report by using the FONT attribute in a StyleSheet. If you are specifying a font for an HTML report, the web browser must support the font. If the web browser does not support the font, it reverts to its default behavior of using the default proportional font.

# Specify Fonts in a Report

To specify a font for your report, use the following syntax within a StyleSheet.

```
TYPE=type, [subtype,] FONT='font[,font]',$
```

where:

**type**

Is the report component you wish to affect, such as REPORT, HEADING, or TITLE.

**subtype**

Is any additional attribute, such as COLUMN, ACROSS, ITEM etc. that is needed to identify the report component that you are formatting. See Identifying a Report Component in a WebFOCUS StyleSheet for more information about how to specify different report components.

**font**

Is the name of the font. You must enclose the value in single quotes. If you are creating an HTML report, you can specify more than one font within the single quotes to accommodate more than one browser.

**Note:** In an HTML report, specifying different fonts for several different report components significantly increases the size of the source code.

# Specifying Multiple Fonts in an HTML Report

To control how a report looks on more than one platform, you can specify both a common Windows font and a common UNIX font in a request. The web browser searches for the first font in the list. If the browser does not find the first font, it searches for the next font in the list. If none of the fonts are identified, the browser uses the default proportional font.

In this example, the web browser first searches for the Arial font. If the browser does not find Arial, it searches for the Helvetica font. If neither font is identified, the browser uses the default proportional font.

```
TYPE=REPORT, FONT='ARIAL,HELVETICA',$
```

# Specify the Default Browser Fonts for HTML Reports

A browser assigns specific fonts as the default proportional and default monospaced fonts. To specify a default browser font for an HTML report, you use the reserved names,

DEFAULT-PROPORTIONAL and DEFAULT-FIXED in the StyleSheet of your report. The browser displays the report accordingly.

To select the default fixed or proportional font of the browser, use the following syntax. Note that you must specify TYPE to indicate which report components you wish to affect.

```
FONT={DEFAULT-PROPORTIONAL|DEFAULT-FIXED},$
```

where:

**DEFAULT-PROPORTIONAL**

Specifies the default proportional font of the web browser.

**DEFAULT-FIXED**

Specifies the default monospaced font of the web browser.

# Specifying Default Browser Fonts

In this example, the web browser uses the default monospace font for the entire report except the report heading and the column headings. For these headings, the web browser uses the default proportional font.

```
TABLE FILE GGSALES
HEADING
"Sales Report"
SUM UNITS DOLLARS BY CATEGORY BY PRODUCT
ON TABLE SET STYLE *
TYPE=REPORT,FONT=DEFAULT-FIXED,$
TYPE=TITLE,FONT=DEFAULT-PROPORTIONAL,$
TYPE=HEADING,FONT=DEFAULT-PROPORTIONAL,$
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The output is:

Sales Report

| Category | Product | Unit Sales | Dollar Sales |
|---|---|---|---|
| Coffee | Capuccino | 189217 | 2381600 |
| | Espresso | 308986 | 3906243 |
| | Latte | 878063 | 10943622 |
| Food | Biscotti | 421377 | 5263328 |
| | Croissant | 630054 | 7749902 |
| | Scone | 333414 | 4216114 |
| Gifts | Coffee Grinder | 186534 | 2337567 |
| | Coffee Pot | 190695 | 2449585 |
| | Mug | 360570 | 4522521 |
| | Thermos | 190081 | 2385829 |

# Specifying Background Color in a Report

Using StyleSheet attributes, you can enhance the appearance of a report by specifying a background color. You can designate background colors for a report as a whole, or for headings, footings, and columns individually.

Additionally, alternating backcolors (banded) can be specified for the background of the data lines in a report. These alternating colors are not supported for stacked columns (OVER, FOLD-LINE).

# Specify Background Color in a Report

To specify a color for the background of a report, use the following syntax within a StyleSheet.

Note that when using BACKCOLOR in a PDF report, extra space is added to the top, bottom, right, and left of each cell of data in the report. This is for readability and to prevent truncation.

```
TYPE=type, [subtype,] BACKCOLOR={color|RGB({r g b|#hexcolor})}, $
```

where:

**type**

Is the report component you wish to affect, such as REPORT, HEADING, or TITLE. In a HEADING, FOOTING, SUBHEADING, or SUBFOOTING, you can specify a background color for individual elements.

**subtype**

Is any additional attribute, such as COLUMN, ACROSS, ITEM, that is needed to identify the report component that you are formatting. In a HEADING, FOOTING, SUBHEADING, or SUBFOOTING, you can specify a background color for individual elements. For more information about how to specify different report components, see Identifying a Report Component in a WebFOCUS StyleSheet.

**color**

Is the background color, which fills the space of the specified report component. The default value is NONE. If you are creating a report in HTML format, background colors will only appear in web browsers that support them.

**RGB (r g b)**

Specifies the font color using a mixture of red, green, and blue.

(*r g b*) Is the desired intensity of red, green, and blue, respectively. The values are on a scale of 0 to 255, where 0 is the least intense and 255 is the most intense. Note that using the three color components in equal intensities results in shades of gray.

**RGB (#hexcolor)**

Is the hexadecimal value for the color. For example, FF0000 is the hexadecimal value for red. The hexadecimal digits can be in upper or lower case and must be preceded by a pound sign (#).

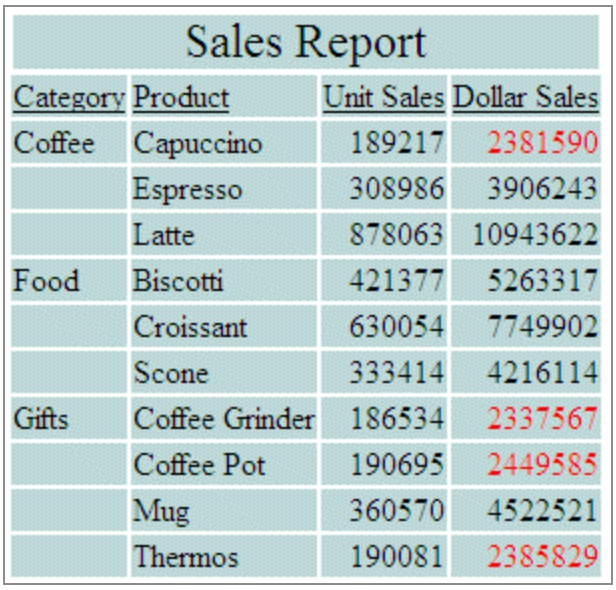
# Specifying Background and Font Color in a Report

You can use color in a report to emphasize important information in a report. In the following report request, the data in the Dollar Sales column has been specified as RED on the condition that the Dollars value is less than 2,500,000. The background color is set to LIGHT BLUE:

```
TABLE FILE GGSALES
ON TABLE SET PAGE-NUM OFF
```

```
HEADING
"Sales Report"
SUM UNITS DOLLARS BY CATEGORY BY PRODUCT
ON TABLE SET STYLE *
TYPE=REPORT, BACKCOLOR=LIGHT BLUE, $
TYPE=DATA, COLUMN=DOLLARS, COLOR=RED, WHEN=DOLLARS LT 2500000, $
TYPE=REPORT, GRID=OFF, $
TYPE=HEADING, JUSTIFY=CENTER, SIZE=12,$
ENDSTYLE
END
```

The output is:



Sales Report

| Category | Product | Unit Sales | Dollar Sales |
|---|---|---|---|
| Coffee | Capuccino | 189217 | 2381590 |
| | Espresso | 308986 | 3906243 |
| | Latte | 878063 | 10943622 |
| Food | Biscotti | 421377 | 5263317 |
| | Croissant | 630054 | 7749902 |
| | Scone | 333414 | 4216114 |
| Gifts | Coffee Grinder | 186534 | 2337567 |
| | Coffee Pot | 190695 | 2449585 |
| | Mug | 360570 | 4522521 |
| | Thermos | 190081 | 2385829 |

# Specify Alternating Data Background Color in a Report

To specify alternating colors for the background of the data in a report, use the following syntax within a StyleSheet.

Note that when using BACKCOLOR in a PDF report, extra space is added to the top, bottom, right, and left of each cell of data in the report. This is for readability and to prevent truncation.

```
TYPE=DATA,BACKCOLOR=({c1|RGB({r1 g1 b1|#hc1})} {c2|RGB({r2 g2
b2|#hc2})}),$
```

where:

**c1, c2**

Are the background colors for the data in the report. The default value is NONE. If you are creating a report in HTML format, background colors will only appear in web browsers that support them. Color names that contain a space must be enclosed in single quotation marks, as a space is the delimiter between the alternating color values.

**RGB(r1 g1 b1), RGB(r2 g2 b2)**

Specifies the font colors using a mixture of red, green, and blue.

(*r g b*) Is the desired intensity of red, green, and blue, respectively. The values are on a scale of 0 to 255, where 0 is the least intense and 255 is the most intense. Note that using the three color components in equal intensities results in shades of gray.

**RGB(#hc1), RGB(#hc2)**

Are the hexadecimal values for the colors. For example, FF0000 is the hexadecimal value for red. The hexadecimal digits can be in upper or lower case and must be preceded by a pound sign (#).

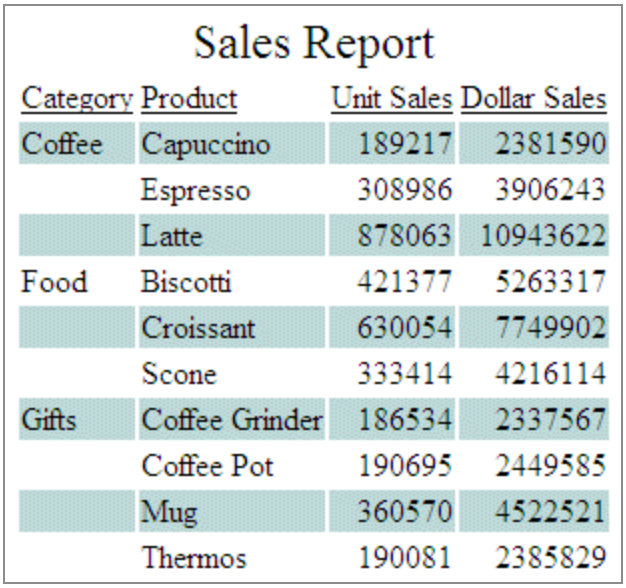
# Specifying Alternating Background Colors for the Data Lines in a Report

The following request against the GGSALES data source produces alternating light blue and white data rows on the report output:

```
TABLE FILE GGSALES
ON TABLE SET PAGE-NUM OFF
HEADING
"Sales Report"
SUM UNITS DOLLARS
BY CATEGORY
BY PRODUCT
ON TABLE PCHOLD FORMAT HTML
ON TABLE SET STYLE *
```

```
TYPE=REPORT, GRID=OFF, $
TYPE=DATA, BACKCOLOR=('LIGHT BLUE' WHITE),$
TYPE=HEADING, JUSTIFY=CENTER, SIZE=12,$
ENDSTYLE
END
```

The output is:



Sales Report

| Category | Product | Unit Sales | Dollar Sales |
|---|---|---|---|
| Coffee | Capuccino | 189217 | 2381590 |
| | Espresso | 308986 | 3906243 |
| | Latte | 878063 | 10943622 |
| Food | Biscotti | 421377 | 5263317 |
| | Croissant | 630054 | 7749902 |
| | Scone | 333414 | 4216114 |
| Gifts | Coffee Grinder | 186534 | 2337567 |
| | Coffee Pot | 190695 | 2449585 |
| | Mug | 360570 | 4522521 |
| | Thermos | 190081 | 2385829 |

# Alternating Background Color By Wrapped Line

The ALTBACKPERLINE attribute alternates the background color by line for reports that use positioned drivers, for example PDF, DHTML, PPT, and PPTX. This enables you to wrap a long field value, and alternate the background color of each line for that value, independent of borders. In order to apply alternating background color per line, you need to explicitly add the SET ALTBACKPERLINE=ON command to procedures that use WRAP.

# Alternate Background Color By Wrapped Line

```
SET ALTBACKPERLINE = {ON|OFF}
```

where:

**ON**

Alternates background color by line.

**OFF**

Alternates background color by row. This is the default value.

# Alternating Background Color By Wrapped Line

The following report request prints a COMPUTE field with a long line of text, using WRAP and without using the SET ALTBACKPERLINE command. The default alternating background color is applied by row.

```
TABLE FILE WF_RETAIL PRINT
COMPUTE LONG_LINE/A1000 = 'This is a very long line of data, set up so
that'
                          |'it wraps onto the next line within a
report'
                          |'and to test the alternate color syntax'
                          |'in style sheets.';
BY PRODUCT_CATEGORY BY PRODUCT_SUBCATEG BY MODEL
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET PAGE OFF
ON TABLE SET STYLE *
UNITS=IN, PAGESIZE='A4', LEFTMARGIN=0.19, TOPMARGIN=0.00,
BOTTOMMARGIN=0.00, SQUEEZE=ON, ORIENTATION=LANDSCAPE, $
TYPE=REPORT, FONT='ARIAL', SIZE=8, COLOR=BLACK, BACKCOLOR='NONE',
STYLE=NORMAL, $
TYPE=REPORT, COLUMN=N4, WRAP=1, $
TYPE=DATA, COLUMN=N4, BACKCOLOR=(RGB(235 240 178) RGB(255 255 255)), $
ENDSTYLE
END
```

The output is:

| Product Category | Product Subcategory | Model | LONG_LINE |
|---|---|---|---|
| Accessories | Charger | B00D7MOHDO | This is a very long line of data, set up so thatit wraps onto the next line within a reportand to test the alternate color syntaxin style sheets. |
| | | BCG34HRE4KN | This is a very long line of data, set up so thatit wraps onto the next line within a reportand to test the alternate color syntaxin style sheets. |
| | Headphones | Audio Technica ATHW5000 | This is a very long line of data, set up so thatit wraps onto the next line within a reportand to test the alternate color syntaxin style sheets. |
| | | Denon AHD5000 | This is a very long line of data, set up so thatit wraps onto the next line within a reportand to test the alternate color syntaxin style sheets. |

With the SET ALTBACKPERLINE=ON command added to the request, the alternating background color is applied by line, as shown in the following output.

| Product Category | Product Subcategory | Model | LONG_LINE |
|---|---|---|---|
| Accessories | Charger | B00D7MOHDO | This is a very long line of data, set up so thatit wraps onto the next line within a reportand to test the alternate color syntaxin style sheets. |
| | | BCG34HRE4KN | This is a very long line of data, set up so thatit wraps onto the next line within a reportand to test the alternate color syntaxin style sheets. |
| | Headphones | Audio Technica ATHW5000 | This is a very long line of data, set up so thatit wraps onto the next line within a reportand to test the alternate color syntaxin style sheets. |
| | | Denon AHD5000 | This is a very long line of data, set up so thatit wraps onto the next line within a reportand to test the alternate color syntaxin style sheets. |

# Specifying Data Format in a Report

You can affect how data is represented in a report in several ways:

- You can change the format of the numeric values that appear in a column.
- You can determine whether or not you wish to use Continental Decimal Notation (CDN).
- You can set a specific character or set of characters to represent fields that do not contain data.

# Changing the Format of Values in a Report Column

A field format is defined in the Master File. You can, however, change the format of a report column. Field formats are described in full detail in the *Describing Data With ibi™ WebFOCUS®® Language* manual.

# Change Format of Values in a Column

```
fieldname [alignment] [/format]
```

where:

**fieldname**

Is a display field—that is, a field displayed by the PRINT, LIST, SUM, or COUNT command, a row-total, or a column-total.

**alignment**

Specifies the position of the column title.

`/R` specifies a right justified column title.

`/L` specifies a left justified column title.

`/C` specifies a centered column title.

**format**

Is any valid field format, preceded by a slash (/). Field formats are described in the *Describing Data With ibi™ WebFOCUS® Language* manual. Field formats cannot be used with a column total.

# Changing the Format of Values in a Column

The UNIT_PRICE field has a format of D7.2 as defined in the GGPRODS Master File. To add a floating dollar sign to the display, the field format can be redefined as follows:

```
TABLE FILE GGPRODS
PRINT UNIT_PRICE/D7.2M
END
```

The output is:

```
    Unit
   Price  $58.00
  $81.00
  $76.00
  $13.00
  $17.00
  $28.00
  $26.00
  $96.00
 $125.00
 $140.00
```

# Using Multiple Format Specifications in a Column

The following request illustrates column title justification with a format specification, a BY field specification, and an AS phrase specification:

```
TABLE FILE CAR
PRINT MODEL/A10 STANDARD/A15/R AS 'RJUST,STANDARD'
BY CAR/C
WHERE CAR EQ 'JAGUAR' OR 'TOYOTA'
END
```

The output is:

```
                                    RJUST
       CAR        MODEL             STANDARD
---------------  -----       ---------------
JAGUAR           V12XKE AUT  POWER STEERING
                 XJ12L AUTO  RECLINING BUCKE
                             WHITEWALL RADIA
                             WRAP AROUND BUM
                             4 WHEEL DISC BR
TOYOTA           COROLLA 4   BODY SIDE MOLDI
                             MACPHERSON STRU
```

# Usage Notes for Changing Column Format

- Each time you reformat a column, the field is counted twice against the limit for display fields in a single report. For details, see Controlling Report Formatting.
- If you create an extract file from the report—that is, a HOLD, PCHOLD, SAVE, or SAVB file—the extract file will contain fields for both the original format and the redefined format, unless HOLDLIST=PRINTONLY. Extract files are described in Saving and Reusing Your Report Output.
- When the size of a word in a text field instance is greater than the format of the text field in the Master File, the word wraps to a second line, and the next word begins on the same line.
- You may specify justification for display fields, BY fields, and ACROSS fields. For ACROSS fields, data values, not column titles, are justified as specified.
- For display commands only, the justification parameter may be combined with a format specification. The format specification may precede or follow the justification parameter.
- If a title is specified with an AS phrase or in the Master File, that title will be justified as specified in FORMAT.
- When multiple ACROSS fields are requested, justification is performed on the lowest ACROSS level only. All other justification parameters for ACROSS fields are ignored.

# Controlling Missing Values for a Reformatted Field

When a field is reformatted in a request (for example, SUM *field*/*format*), an internal COMPUTE field is created to contain the reformatted field value and display on the report output. If the original field has a missing value, that missing value can be propagated to the internal field by setting the COMPMISS parameter ON. If the missing value is not propagated to the internal field, it displays a zero (if it is numeric) or a blank (if it is alphanumeric). If the missing value is propagated to the internal field, it displays the missing data symbol on the report output.

# Control Missing Values in Reformatted Fields

```
SET COMPMISS = {ON|OFF}
```

where:

**ON**

Propagates a missing value to a reformatted field. ON is the default value.

**OFF**

Displays a blank or zero for a reformatted field.

# Controlling Missing Values in Reformatted Fields

The following procedure prints the RETURNS field from the SALES data source for store 14Z. With COMPMISS OFF, the missing values display as zeros in the column for the reformatted field value.

**Note:** Before trying this example, you must make sure that the SALEMISS procedure, which adds missing values to the SALES data source, has been run.

```
SET COMPMISS = OFF
TABLE FILE SALES
PRINT RETURNS RETURNS/D12.2 AS 'REFORMATTED,RETURNS'
BY STORE_CODE
WHERE STORE_CODE EQ '14Z'
END
```

The output is:

```
                        REFORMATTED
STORE_CODE  RETURNS     RETURNS
----------  -------     -----------
14Z               2            2.00
                  2            2.00
                  0             .00
                  .             .00
                  4            4.00
                  0             .00
                  3            3.00
```

```
                  4            4.00
                  .             .00
                  4            4.00
```

With COMPMISS ON, the column for the reformatted version of RETURNS displays the missing data symbol when a value is missing:

```
SET COMPMISS = ON
TABLE FILE SALES
PRINT RETURNS RETURNS/D12.2 AS 'REFORMATTED,RETURNS'
BY STORE_CODE
WHERE STORE_CODE EQ '14Z'
END
```

The output is:

```
                       REFORMATTED
STORE_CODE  RETURNS    RETURNS
----------  -------    -----------
14Z               2           2.00
                  2           2.00
                  0            .00
                  .              .
                  4           4.00
                  0            .00
                  3           3.00
                  4           4.00
                  .              .
                  4           4.00
```

# Usage Notes for SET COMPMISS

- If you create a HOLD file with COMPMISS ON, the HOLD Master File for the reformatted field indicates MISSING = ON (as does the original field). With COMPMISS = OFF, the reformatted field does NOT have MISSING = ON in the generated Master File.
- The COMPMISS parameter cannot be set in an ON TABLE command.

# Using Commas vs. Decimals (Continental Decimal Notation)

The CDN parameter determines the characters used for punctuation in numbers. For information about the CDN parameter values, see the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

# Setting Characters to Represent Null and Missing Values

You can alter the appearance of your report output by specifying your own string of characters that will appear when no data is available for a field.

# Set Characters to Represent a Null or Missing Value

To specify a string for NODATA fields, use the following syntax

```
ON TABLE SET NODATA character string
```

where:

**NODATA**

Indicates that a NODATA character will be set.

**character string**

Is the string of characters that you want to appear when no data is available for a field. The default value is a period (.).

# Set the NODATA Character as a SET Command

To specify a character for NODATA fields, use the following syntax

```
SET NODATA=character
```

where:

**character**

Is the character or characters that you want to appear when no data is available for a field. The maximum number of characters is 11. The default value is a period (.).

# Setting the NODATA Character in a Request

This request changes the NODATA character for missing data from a period (default) to the word NONE.

```
TABLE FILE EMPLOYEE
PRINT CURR_SAL
BY LAST_NAME BY FIRST_NAME
ACROSS DEPARTMENT
ON TABLE SET NODATA NONE
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, SQUEEZE=OFF,$
ENDSTYLE
END
```

This request produces the following report.

| | | DEPARTMENT | |
|---|---|---|---|
| LAST_NAME | FIRST_NAME | MIS | PRODUCTION |
| BANNING | JOHN | NONE | $29,700.00 |

| | | | |
|---|---|---|---|
| BLACKWOOD | ROSEMARIE | $21,780.00 | NONE |
| CROSS | BARBARA | $27,062.00 | NONE |
| GREENSPAN | MARY | $9,000.00 | NONE |
| IRVING | JOAN | NONE | $26,862.00 |
| JONES | DIANE | $18,480.00 | NONE |
| MCCOY | JOHN | $18,480.00 | NONE |
| MCKNIGHT | ROGER | NONE | $16,100.00 |
| ROMANS | ANTHONY | NONE | $21,120.00 |
| SMITH | MARY | $13,200.00 | NONE |
| | RICHARD | NONE | $9,500.00 |
| STEVENS | ALFRED | NONE | $11,000.00 |

# Using Conditional Grid Formatting in a Field

You can use conditional grid formatting in order to emphasize a particular cell or field in a report.

# Creating a Report Using Conditional Grid Formatting

```
TABLE FILE CAR
SUM SALES BY CAR
ON TABLE SET STYLE *
ON TABLE PCHOLD FORMAT PDF
TYPE=DATA, COLUMN=SALES, GRID=HEAVY, WHEN=CAR EQ 'DATSUN', $
ENDSTYLE
END
```

The output is:

| CAR | SALES |
|---|---|
| ALFA ROMEO | 30200 |
| AUDI | 7800 |
| BMW | 80390 |
| DATSUN | 43000 |
| JAGUAR | 12000 |
| JENSEN | 0 |
| MASERATI | 0 |
| PEUGEOT | 0 |
| TOYOTA | 35030 |
| TRIUMPH | 0 |

# Positioning Data in a Report

You can position data within a report by selecting a justification (right, left or center) of a column or by specifying whether or not you wish to have data wrap within a cell. For information on positioning a column on the page, see Laying Out the Report Page.

# Controlling Wrapping of Report Data

You can control the wrapping of report data in a report, thus preventing line breaks within report cells. When using HTML output, most web browsers will, by default, wrap alphanumeric report data that does not fit on a single line in a cell.

This bumps the contents of the cell onto a second line. A web browser wraps data based on its algorithmic settings. Use the WRAP attribute if you wish to suppress a web browser data wrapping.

By default, WRAP is set to ON for HTML output, allowing each individual browser to define the width of each column in the report. For PDF, PS, DHTML, PPT, and PPTX output, WRAP is set OFF by default. For these positioned output formats in which the location of each item in the report is explicitly defined, WRAP = ON is not a valid value, except when specified for ACROSSVALUE. For other elements of the report, such as headers, footers, titles, or data, define the width of wrapped lines by using a numerical value, as in WRAP = *n*.

In PDF and PostScript report output, you can control the line spacing in wrapped lines by using the WRAPGAP attribute.

**Wrapping Data in PDF Reports That Use the OVER Phrase**

OVER allows the presentation of a single data record across multiple lines within a report. By default, when OVER is defined within a request, the report shifts from a columnar presentation to a row level presentation. The field titles are displayed to the left of each value, rather than at the top of each column. This layout was not designed to be aligned in any specific fashion but to allow for the presentation of multiple elements of data within a small area. In many cases, reports that place columns over each other use blank AS names in order to align the columns properly. You can use the WRAP attribute to wrap data in PDF reports that use OVER and this technique works well with blank AS names.

**Wrapping Data in PDF Reports That Use the ACROSS Phrase**

In a request that uses ACROSS, the output displays each value of the ACROSS field above the set of data columns applicable to that ACROSS value.

If the ACROSS value is longer than the width of its columns, you can wrap the ACROSS value within the width of its underlying columns.

By default, the width of each ACROSS value group (the ACROSS value and the data columns within) is defined as the largest of either the sum of the width of the data columns or the largest ACROSS value for that group. With wrapping, the size of each

ACROSS wrap will be defined by the width defined based on this rule including all data columns and any non-wrapped across fields.

The width of each ACROSS column for a given ACROSS group is defined as the length of the largest value for that ACROSS group. A single width is used for each group so in groups where the values are shorter than the longest value, you will see a larger right gap within the cell.

For reports containing multiple ACROSS fields, you can wrap individual ACROSS fields or all of them. Each designated value will wrap within the defined ACROSS group.

# Control Wrapping of Report Data

To control wrapping of text inside a report, use the following syntax within a StyleSheet.

```
TYPE=type, [subtype,] WRAP=value, $
```

where:

**type**

Is the report component you wish to affect, such as REPORT, HEADING, or TITLE.

**subtype**

Is any additional attribute, such as COLUMN, ACROSS, ITEM etc. that is needed to identify the report component that you are formatting. See Identifying a Report Component in a WebFOCUS StyleSheet for more information about how to specify different report components.

**value**

Is one of the following:

- **ON,** which turns on data wrapping. ON is the default value for HTML report output. For PDF, PS, DHTML, PPT, and PPTX report output, WRAP is set OFF by default. For these positioned output formats in which the location of each item in the report is explicitly defined, WRAP = ON is not a valid value, except when specified for ACROSSVALUE. For other elements of the report, such as headers, footers, titles, or data, define the width of wrapped lines by using a numerical value, as in WRAP = *n*. For HTML reports, WRAP is supported with all fields. For

PDF reports, WRAP is supported only with embedded fields, not text.

**Note:** This setting is not supported when using WRAP with OVER in PDF report output.

- **OFF,** which turns off data wrapping. This is the default value for PDF, PS, DHTML, PPT, and PPTX report output.
- ***n*,** which represents a specific numeric value that the column width can be set to. The value represents the measure specified with the UNITS parameter. This setting is supported for wrapping data in PDF reports that use the OVER phrase.

**Note:** WRAP=ON and WRAP=*n* are not supported with JUSTIFY.

# Allowing the Web Browser to Wrap Report Data

The following example, with WRAP=ON, wraps report data based on the web browser functionality. Note that because this value is the default, there is no need to specify WRAP=ON in the report request syntax.

```
TABLE FILE GGPRODS
PRINT SIZE UNIT_PRICE PACKAGE_TYPE
VENDOR_CODE VENDOR_NAME
BY PRODUCT_ID BY PRODUCT_DESCRIPTION
ON TABLE SET STYLE *
TYPE=REPORT, GRID=ON, $
ENDSTYLE
END
```

**Note:** Wrap is determined by the size of your browser window, so you may need to shrink your window to see the example wrap the data as in the following image.

| PAGE 1 | | | | | | |
|---|---|---|---|---|---|---|
| Product Code | Product | Size | Unit Price | Package | Vendor ID | Vendor Name |
| B141 | Hazelnut | 16 | 58.00 | Pounds | V082 | Coffee Connection |
| B142 | French Roast | 12 | 81.00 | Pounds | V083 | European Specialities, |
| B144 | Kona | 12 | 76.00 | Pounds | V081 | Evelina Imports, Ltd |

Notice that records in the Vendor Name column break to a second line.

# Suppressing the Wrapping of Report Data

The following report request, with WRAP=OFF, suppresses the web browser data wrapping:

```
TABLE FILE GGPRODS
PRINT SIZE UNIT_PRICE PACKAGE_TYPE
VENDOR_CODE VENDOR_NAME
BY PRODUCT_ID BY PRODUCT_DESCRIPTION
ON TABLE SET STYLE *
TYPE=REPORT, WRAP=OFF, $
TYPE=REPORT, GRID=ON, $
ENDSTYLE
END
```

The output is:

PAGE 1

| Product Code | Product | Size | Unit Price | Package | Vendor ID | Vendor Name |
|---|---|---|---|---|---|---|
| B141 | Hazelnut | 16 | 58.00 | Pounds | V082 | Coffee Connection |
| B142 | French Roast | 12 | 81.00 | Pounds | V083 | European Specialities, |
| B144 | Kona | 12 | 76.00 | Pounds | V081 | Evelina Imports, Ltd |

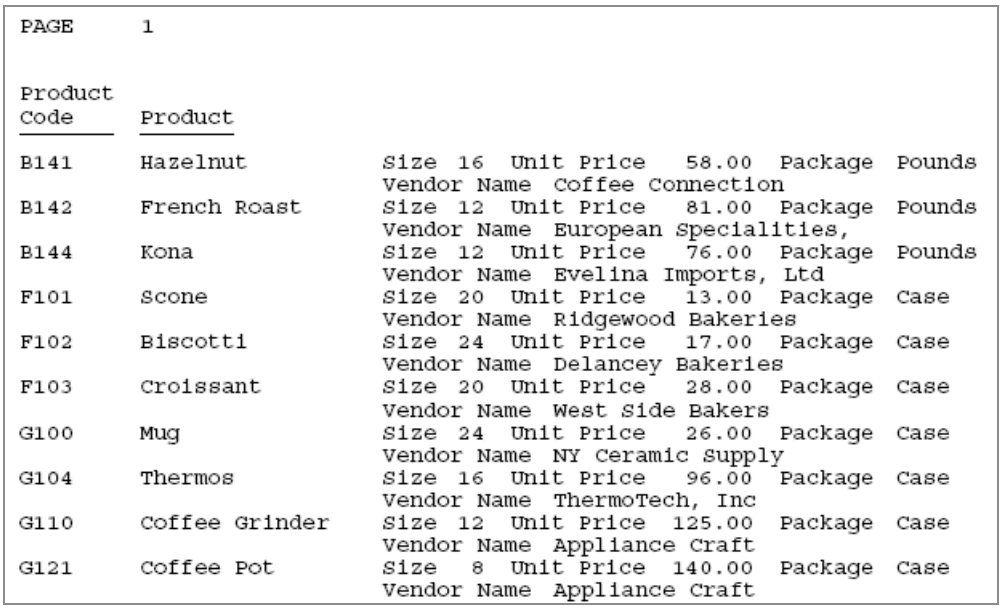
# Wrapping Columns With OVER

The following request against the GGPRODS data source places the column VENDOR_NAME on a new line with the OVER phrase. By default, wrap is turned off and must be defined explicitly within the StyleSheet:

```
TABLE FILE GGPRODS
PRINT SIZE UNIT_PRICE PACKAGE_TYPE OVER
VENDOR_NAME
BY PRODUCT_ID BY PRODUCT_DESCRIPTION
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET STYLE *
```

```
TYPE=REPORT, SQUEEZE=ON, $
ENDSTYLE
END
```

The partial output is shown in the following image.



```
PAGE     1


Product
Code     Product

B141     Hazelnut          Size 16  Unit Price   58.00  Package  Pounds
                           Vendor Name  Coffee Connection
B142     French Roast      Size 12  Unit Price   81.00  Package  Pounds
                           Vendor Name  European Specialities,
B144     Kona              Size 12  Unit Price   76.00  Package  Pounds
                           Vendor Name  Evelina Imports, Ltd
F101     Scone             Size 20  Unit Price   13.00  Package  Case
                           Vendor Name  Ridgewood Bakeries
F102     Biscotti          Size 24  Unit Price   17.00  Package  Case
                           Vendor Name  Delancey Bakeries
F103     Croissant         Size 20  Unit Price   28.00  Package  Case
                           Vendor Name  West Side Bakers
G100     Mug               Size 24  Unit Price   26.00  Package  Case
                           Vendor Name  NY Ceramic Supply
G104     Thermos           Size 16  Unit Price   96.00  Package  Case
                           Vendor Name  ThermoTech, Inc
G110     Coffee Grinder    Size 12  Unit Price  125.00  Package  Case
                           Vendor Name  Appliance Craft
G121     Coffee Pot        Size  8  Unit Price  140.00  Package  Case
                           Vendor Name  Appliance Craft
```

The following version of the request turns wrapping on and sets a column width of 1.5 for the VENDOR_NAME column, which has been placed on a new line because of the OVER phrase:

```
TABLE FILE GGPRODS
PRINT SIZE UNIT_PRICE PACKAGE_TYPE OVER
VENDOR_NAME
BY PRODUCT_ID BY PRODUCT_DESCRIPTION
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT, COLUMN=VENDOR_NAME, WRAP=1.5,$
ENDSTYLE
END
```

The partial output shows that the VENDOR_NAME column now wraps. Notice that turning WRAP ON causes the OVER value, not the OVER TITLE, to wrap:

```
PAGE     1

Product
Code     Product
B141     Hazelnut          Size 16  Unit Price   58.00  Package  Pounds
                           Vendor Name  Coffee
                                        Connection
B142     French Roast      Size 12  Unit Price   81.00  Package  Pounds
                           Vendor Name  European
                                        Specialities,
B144     Kona              Size 12  Unit Price   76.00  Package  Pounds
                           Vendor Name  Evelina
                                        Imports, Ltd
F101     Scone             Size 20  Unit Price   13.00  Package  Case
                           Vendor Name  Ridgewood
                                        Bakeries
F102     Biscotti          Size 24  Unit Price   17.00  Package  Case
                           Vendor Name  Delancey
                                        Bakeries
F103     Croissant         Size 20  Unit Price   28.00  Package  Case
                           Vendor Name  West Side
                                        Bakers
G100     Mug               Size 24  Unit Price   26.00  Package  Case
                           Vendor Name  NY Ceramic
                                        Supply
```

# Wrap ACROSS Values

Wrapping ACROSS Values is supported for HTML and PDF output formats.

```
TYPE=ACROSSVALUE, [ACROSS={fieldname|Nn|An}] WRAP={OFF|ON} ,$
```

where:

**ACROSS**

If you have a request with multiple ACROSS fields, you can identify each field using the ACROSS identifier. You only need to include the ACROSS identifier if you have multiple ACROSS fields in your request.

**fieldname**

Specifies a horizontal sort row by its field name.

**Nn**

Identifies a column by its position in the report. To determine this value, count vertical sort (BY) fields, display fields, and ROW-TOTAL fields, from left to right, including NOPRINT fields.

**An**

Specifies a horizontal sort row by its position in the sequence of horizontal sort rows. To determine this value, count horizontal sort (ACROSS) fields. Cannot be combined with a field name specification in the same StyleSheet.

**OFF**

Turns off wrapping of the ACROSS values. OFF is the default value.

**ON**

Turns on wrapping of the ACROSS values.

**Note:** WRAP=ON is not supported with JUSTIFY.

# Wrapping ACROSS Values in PDF Report Output

In the following request against the GGPRODS data source, VENDOR_NAME is an ACROSS field:

```
TABLE FILE GGPRODS
HEADING
" PRODUCT REPORT"
" "
PRINT PRODUCT_ID UNIT_PRICE/D5
ACROSS VENDOR_NAME
BY SIZE
WHERE VENDOR_NAME GT 'B' AND VENDOR_NAME LT 'F'
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=REPORT, COLUMN=PRODUCT_ID, WIDTH=.25, $
TYPE=REPORT, COLUMN=UNIT_PRICE, WIDTH=.25, $
ENDSTYLE
END
```

As shown in the following image, the output is too wide for one panel because some of the ACROSS field values (vendor names) are longer than the sum of the product code and unit price columns under them.

```
PAGE     1.1

 PRODUCT REPORT

      Vendor Name
      Coffee Connection         Delancey Bakeries         European Specialities,
      Product   Unit            Product   Unit            Product   Unit
Size  Code      Price           Code      Price           Code      Price
----  --------  -----           --------  -----           --------  -----
  12  .             .           .             .           B142         81
      .             .           .             .           .             .
  16  B141         58           .             .           .             .
  24  .             .           F102         17           .             .
```

The following version of the request wraps the ACROSS values (TYPE=ACROSSVALUE, WRAP=ON ,$):

```
TABLE FILE GGPRODS
HEADING
" PRODUCT REPORT"
" "
PRINT PRODUCT_ID UNIT_PRICE/D5
ACROSS VENDOR_NAME
BY SIZE
WHERE VENDOR_NAME GT 'B' AND VENDOR_NAME LT 'F'
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF, $
TYPE=REPORT, COLUMN=PRODUCT_ID, WIDTH=.25, $
TYPE=REPORT, COLUMN=UNIT_PRICE, WIDTH=.25, $
TYPE = ACROSSVALUE, WRAP=ON,$
ENDSTYLE
END
```

The report now fits on one panel, as shown in the following image.

```
PAGE     1

 PRODUCT REPORT

      Vendor Name
      Coffee            Delancey          European          Evelina
      Connection        Bakeries          Specialities,     Imports, Ltd
      Product   Unit    Product   Unit    Product   Unit    Product   Unit
Size  Code      Price   Code      Price   Code      Price   Code      Price
----  --------  -----   --------  -----   --------  -----   --------  -----
  12  .             .   .             .   B142         81   .             .
      .             .   .             .   .             .   B144         76
  16  B141         58   .             .   .             .   .             .
  24  .             .   F102         17   .             .   .             .
```

# OVER With Blank Column Titles

When OVER fields are defined with blank AS names (the value of the title of the column is set to empty ' '), they can be used to build a report with multiple data lines that present in an aligned grid fashion.

In this type of report, the column titles are usually indicated by adding multiple corresponding lines to the page headings rather than using the default titles that display to the left of the column field values. To present OVER fields with unique titles that take advantage of these new alignment features, you can place the column titles in independent fields and include them as fields within the given request.

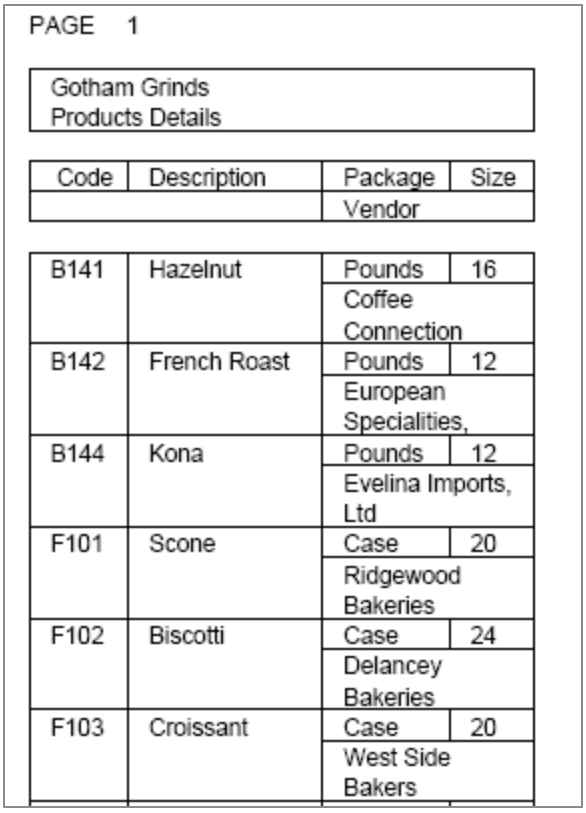
# Using OVER and WRAP With Blank AS Names

The following example demonstrates using OVER with blank AS names and WRAP to build a multi-data line report:

```
TABLE FILE GGPRODS
PRINT PACKAGE_TYPE AS '' SIZE  AS '' OVER
VENDOR_NAME AS ''
BY PRODUCT_ID  AS ''
BY PRODUCT_DESCRIPTION  AS ''
ON TABLE SUBHEAD
"Gotham Grinds"
"Products Details"
HEADING
" Code <+0>Description<+0>Size  <+0>Package"
-*" <+0> <+0>Vendor"
" <+0>Vendor"
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT, FONT=ARIAL, SIZE=10, SQUEEZE=ON,$
TYPE=REPORT, COLUMN=PACKAGE_TYPE, SQUEEZE=.5 ,$
TYPE=REPORT, COLUMN=VENDOR_NAME, WRAP=1 ,$
TYPE=REPORT, BORDER=ON, $
TYPE=HEADING, LINE=1, ITEM=1, BORDER=ON, $
TYPE=HEADING, LINE=1, ITEM=2, BORDER=ON, POSITION=PRODUCT_DESCRIPTION,$
TYPE=HEADING, LINE=1, ITEM=3, BORDER=ON, POSITION=SIZE ,$
TYPE=HEADING, LINE=1, ITEM=4, BORDER=ON, POSITION=PACKAGE_TYPE, $
TYPE=HEADING, LINE=2, ITEM=1, BORDER=ON, $
TYPE=HEADING, LINE=2, ITEM=2, BORDER=ON, POSITION=PACKAGE_TYPE,$
```

```
ENDSTYLE
END
```

On the report output, the Package Type and Size have been placed over the vendor name. The page heading has the corresponding titles. In the heading, the titles Package and Size have also been placed over the title Vendor Name. Note that the vendor name data wraps to maintain the alignment.



PAGE 1

Gotham Grinds
Products Details

| Code | Description | Package | Size |
|---|---|---|---|
| | | Vendor | |
| B141 | Hazelnut | Pounds | 16 |
| | | Coffee Connection | |
| B142 | French Roast | Pounds | 12 |
| | | European Specialities, | |
| B144 | Kona | Pounds | 12 |
| | | Evelina Imports, Ltd | |
| F101 | Scone | Case | 20 |
| | | Ridgewood Bakeries | |
| F102 | Biscotti | Case | 24 |
| | | Delancey Bakeries | |
| F103 | Croissant | Case | 20 |
| | | West Side Bakers | |

# OVER and WRAP With Non-Blank Column Titles

The width of both the column title and the column data for each OVER value is determined by the single SQUEEZE or WRAP value. The title will automatically size to the same width as the wrapped data column. If the column title is wider than the width defined for the column wrap, you can either define a smaller title or add your titles as OVER fields that can be sized independently.

The following examples demonstrate how to build a report with OVER and WRAP that has column titles longer than the designated WRAP size.

# Using OVER and WRAP With Column Titles

The following request defines two virtual fields to contain the column titles for the Product Name and Vendor Name fields. It then prints each virtual field next to its related data field and gives each a blank AS name. The first virtual field and data field are placed over the second virtual field and data field:

```
DEFINE FILE GGPRODS
TITLE_PROD/A20 = 'Product Description';
TITLE_VEND/A20 = 'Vendor Name';
END
TABLE FILE GGPRODS
PRINT TITLE_PROD AS '' PRODUCT_DESCRIPTION  AS '' OVER
TITLE_VEND AS '' VENDOR_NAME  AS ''
BY PRODUCT_ID  AS ''
ON TABLE SUBHEAD
"Gotham Grinds"
"Products Details"
ON TABLE PCHOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT, FONT=ARIAL, SIZE=10, SQUEEZE=ON,$
TYPE=REPORT, COLUMN=TITLE_PROD , SQUEEZE=1.25 ,$
TYPE=REPORT, COLUMN=TITLE_VEND , SQUEEZE=1.25 ,$
TYPE=REPORT, COLUMN=PRODUCT_DESCRIPTION, WRAP=.75 ,$
TYPE=REPORT, COLUMN=VENDOR_NAME, WRAP=.75 ,$
TYPE=REPORT, BORDER=ON, $
ENDSTYLE
END
```

The output shows that the titles and data align properly.

PAGE 1

Gotham Grinds
Products Details

| | | |
|---|---|---|
| B141 | Product Description | Hazelnut |
| | Vendor Name | Coffee Connection |
| B142 | Product Description | French Roast |
| | Vendor Name | European Specialities, |
| B144 | Product Description | Kona |
| | Vendor Name | Evelina Imports, Ltd |
| F101 | Product Description | Scone |
| | Vendor Name | Ridgewood Bakeries |
| F102 | Product Description | Biscotti |
| | Vendor Name | Delancey Bakeries |
| F103 | Product Description | Croissant |
| | Vendor Name | West Side Bakers |
| G100 | Product Description | Mug |
| | Vendor Name | NY Ceramic Supply |
| G104 | Product Description | Thermos |

# Control Spacing Between Wrapped Lines

You can use the WRAPGAP attribute in a StyleSheet to control spacing between wrapped lines in the data elements in PDF and PostScript report output.

```
TYPE=DATA, WRAPGAP={ON|OFF|n}
```

where:

**ON**

Does not leave any space between wrapped lines. ON is equivalent to specifying 0.0 for *n*.

**OFF**

Places wrapped data on the next line. OFF is the default value.

**n**

Is a number greater than or equal to zero that specifies how much space to leave between wrapped lines (using the unit of measurement specified by the UNITS attribute). Setting *n* to zero does not leave any space between wrapped lines, and is equivalent to specifying WRAPGAP=ON.

# Specifying Spacing for Wrapped Lines

In the following request, wrapping is turned on for the ADDRESS_LN3 column of the report:

```
TABLE FILE EMPLOYEE
PRINT ADDRESS_LN3
BY LAST_NAME BY FIRST_NAME
WHERE LAST_NAME LE 'CROSS'
  ON TABLE PCHOLD FORMAT PDF
ON TABLE SET PAGE NOPAGE
ON TABLE SET STYLE *
type=report, grid=on, $
type=data, topgap=0.2, bottomgap=0.2,  $
type=data, wrapgap=off, $
type=REPORT, column=ADDRESS_LN3, wrap=1.0 ,$
ENDSTYLE
END
```

With WRAPGAP=OFF, each wrapped line is placed on the next report line:

| LAST NAME | FIRST NAME | ADDRESS L! |
|---|---|---|
| BANNING | JOHN | FREEPORT<br>NY 11520 |
| BLACKWOOD | ROSEMARIE | NEW YORK<br>NY 10001 |
| | | EDISON NJ<br>08817 |
| | | BROOKLYN<br>NY 11210 |
| CROSS | BARBARA | NEW YORK<br>NY 10001 |
| | | FLUSHING<br>NY 11354 |

With WRAPGAP=ON, the wrapped lines are placed directly under each other:

| LAST_NAME | FIRST_NAME | ADDRESS_L! |
|---|---|---|
| BANNING | JOHN | FREEPORT<br>NY 11520 |
| BLACKWOOD | ROSEMARIE | NEW YORK<br>NY 10001 |
| | | EDISON NJ<br>08817 |
| | | BROOKLYN<br>NY 11210 |
| CROSS | BARBARA | NEW YORK<br>NY 10001 |
| | | FLUSHING<br>NY 11354 |

# Usage Notes for WRAPGAP

You can only specify WRAPGAP for columns that have wrapping enabled (WRAP attribute or parameter set to ON or a number). The TOPGAP and BOTTOMGAP attributes specify how much vertical space to leave above and below a report component. Increasing the values or these attributes makes a decrease in spacing between wrapped lines more noticeable.

# Justifying Report Columns

You can adjust text within a column by specifying whether report columns are left justified, right justified, or centered. By default, alphanumeric columns are left justified, numeric columns are right justified, and heading and footing elements are left justified. However, you can change the default using the JUSTIFY attribute. For information on justifying column titles using /R /L and /C, see Using Headings, Footings, Titles, and Labels.

# Justify a Report Column

To left justify, right justify, or center a column, use the following syntax within a StyleSheet.

```
TYPE=type, [subtype,] [COLUMN=column,] JUSTIFY=option, $
```

where:

**type**

Is the report component you wish to affect, such as REPORT, HEADING, or TITLE.

**subtype**

Is any additional attribute, such as COLUMN, ACROSS, ITEM etc. that is needed to identify the report component that you are formatting. For more information about how to specify different report components, see Identifying a Report Component in a WebFOCUS StyleSheet.

**column**

Is the column or group of columns you wish to justify. This attribute is only necessary if you wish to justify a specific column or set of columns. Omitting this attribute justifies the entire report.

**option**

Is the justification you wish to select:

- **LEFT,** which specifies that the column will be left justified.
- **RIGHT,** which specifies that the column will be right justified.
- **CENTER,** which specifies that the column will be centered.

**Note:** JUSTIFY is not supported with WRAP=ON or WRAP=*n*.

# Justifying Data in a Report Column

The following example displays the StyleSheet syntax used to center the data in the Vendor Name column. The header is also center justified.

```
TABLE FILE GGPRODS
HEADING
"PRODUCT REPORT"
SUM UNITS BY PRODUCT_DESCRIPTION BY PRODUCT_ID BY VENDOR_NAME
ON TABLE SET STYLE *
TYPE=REPORT, COLUMN=VENDOR_NAME, JUSTIFY=CENTER,  $
TYPE=HEADING, JUSTIFY=CENTER, $
TYPE=REPORT, GRID=OFF, $
ENDSTYLE
END
```

The output is:

PRODUCT REPORT

| Product | Product Code | Vendor Name | Unit Price |
|---|---|---|---|
| Biscotti | F102 | Delancey Bakeries | 17.00 |
| Coffee Grinder | G110 | Appliance Craft | 125.00 |
| Coffee Pot | G121 | Appliance Craft | 140.00 |
| Croissant | F103 | West Side Bakers | 28.00 |
| French Roast | B142 | European Specialities, | 81.00 |
| Hazelnut | B141 | Coffee Connection | 58.00 |
| Kona | B144 | Evelina Imports, Ltd | 76.00 |
| Mug | G100 | NY Ceramic Supply | 26.00 |
| Scone | F101 | Ridgewood Bakeries | 13.00 |
| Thermos | G104 | ThermoTech, Inc | 96.00 |

# Field-Based Reformatting

Field-based reformatting allows you to apply different formats to each row in a single report column by using a field to identify the format that applies to each row. For example, you can use this technique to apply the appropriate decimal currency formats when each row represents a different country.

The field that contains the format specifications can be:

- A real field in the data source.
- A temporary field created with a DEFINE command.

- A DEFINE in the Master File.
- A COMPUTE command. If the field is created with a COMPUTE command, the command must appear in the request prior to using the calculated field for reformatting.

The field that contains the formats must be alphanumeric and be at least eight characters in length. Only the first eight characters are used for formatting.

The field-based format may specify a length longer than the length of the original field. However, if the new length is more than one-third larger than the original length, the report column width may not be large enough to hold the value (indicated by asterisks in the field).

You can apply a field-based format to any type of field. However, the new format must be compatible with the original format:

- A numeric field can be reformatted to any other numeric format with any edit format options.
- An alphanumeric field can be reformatted to a different length.
- Any date field can be reformatted to any other date format type.
- Any date-time field can be reformatted to any other date-time format.

If the field-based format is invalid or specifies an impermissible type conversion, the field displays with plus signs (++++) on the report output. If the format field is blank or missing, the value is displayed without reformatting.

# Define and Apply a Format Field

- With a DEFINE command:

```
DEFINE FILE filename
format_field/A8 = expression;
END
```

- In a Master File:

```
DEFINE format_field/A8 = expression; $
```

- In a request:

  ```
  COMPUTE format_field/A8 = expression;
  ```

  where:

  **format_field**

  Is the name of the field that contains the format for each row.

  **expression**

  Is the expression that assigns the format values to the format field.

After the format field is defined, you can apply it in a report request:

```
TABLE FILE filename
displayfieldname/format_field[/just]
END
```

where:

**display**

Is any valid display command.

**fieldname**

Is a field in the request to be reformatted.

**format_field**

Is the name of the field that contains the formats. If the name of the format field is the same as an explicit format, the explicit format will be used. For example, a field named I8 cannot be used for field-based reformatting because it will be interpreted as the explicit format I8.

**just**

Is a justification option, L, R, or C. The justification option can be placed before or after the format field, separated from the format by a slash.

# Displaying Different Decimal Places for Currency Values

```
DEFINE FILE CAR
CFORMAT/A8 = DECODE COUNTRY('ENGLAND' 'D10.1' 'JAPAN' 'D10' ELSE
'D10.2');
END

TABLE FILE CAR
SUM SALES/CFORMAT/C DEALER_COST/CFORMAT
BY COUNTRY
END
```

The output is:

```
COUNTRY       SALES    DEALER_COST
-------     ---------  -----------
ENGLAND      12,000.0     37,853.0
FRANCE            .00     4,631.00
ITALY       30,200.00    41,235.00
JAPAN          78,030        5,512
W GERMANY   88,190.00    54,563.00
```

# Displaying Multi-Line An and AnV Fields

Using StyleSheet attributes, you can display An (character) and AnV (varchar) fields that contain line breaks on multiple lines in a PDF or PostScript report. Line breaks can be based on line-feeds, carriage-returns, or a combination of both. If you do not add these StyleSheet attributes, all line-feed and carriage-return formatting within these fields will be ignored, and all characters will be displayed on one line that wraps to fit the width of the report.

# Display An and AnV Fields Containing Line Breaks on Multiple Lines

```
TYPE=REPORT,LINEBREAK='type',$
```

where:

**REPORT**

Is the type of report component. TYPE must be REPORT. Otherwise an error will result.

**'type'**

Specifies that line breaks will be inserted in a report based on the following:

LF inserts a line break after each line-feed character found in all An and AnV fields.

CR inserts a line break after each carriage-return character found in all An and AnV fields.

LFCR inserts a line break after each combination of a line-feed character followed by a carriage-return character found in all An and AnV fields.

CRLF inserts a line break after each combination of a carriage-return character followed by a line-feed character found in all An and AnV fields.

**Note:** This feature is supported in PDF, PPTX, or PS formats.

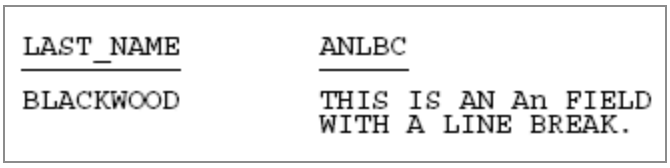
# Displaying an Alphanumeric Field With Line Breaks in a PDF Report

The following request defines an alphanumeric named ANLB field with a semicolon (in an EDCDIC environment) or a circumflex (in an ASCII environment) in the middle. The CTRAN function then replaces the semicolon or circumflex with a carriage return character and stores this string in a field named ANLBC. On the report output, this field displays on two lines:

```
DEFINE FILE EMPLOYEE
ANLB/A40 ='THIS IS AN An FIELD;WITH A LINE BREAK.';
```

```
ANLBC/A40 = CTRAN(40, ANLB, 094, 013  , ANLBC);
END
TABLE FILE EMPLOYEE
PRINT LAST_NAME ANLBC
WHERE LAST_NAME EQ 'BLACKWOOD'
ON TABLE HOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT,LINEBREAK='CR',$
ENDSTYLE
END
```

The output is:



| LAST_NAME | ANLBC |
| --- | --- |
| BLACKWOOD | THIS IS AN An FIELD<br>WITH A LINE BREAK. |

# Using an Alphanumeric Field With a Line Break in a Subfoot

The following request defines an alphanumeric named ANLB field with a semicolon in the middle. The CTRAN function then replaces the semicolon (hex 094 in an EBCDIC environment, hex 059 in an ASCII environment) with a carriage return character and stores this string in a field named ANLBC. In the subfoot, this field displays on two lines.

The following report request is for an EBCDIC environment:

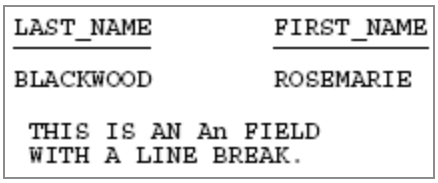
```
DEFINE FILE EMPLOYEE
ANLB/A40 ='THIS IS AN An FIELD;WITH A LINE BREAK.';
ANLBC/A40 = CTRAN(40, ANLB, 094, 013  , ANLBC);
END
TABLE FILE EMPLOYEE
PRINT FIRST_NAME
BY LAST_NAME
WHERE LAST_NAME EQ 'BLACKWOOD'
ON LAST_NAME SUBFOOT
  " "
  " <ANLBC "
ON TABLE HOLD FORMAT PDF
ON TABLE SET STYLE *
```

```
TYPE=REPORT,LINEBREAK='CR',$
ENDSTYLE
END
```

The following report request is for an ASCII environment:

```
DEFINE FILE EMPLOYEE
ANLB/A40 ='THIS IS AN An FIELD;WITH A LINE BREAK.';
ANLBC/A40 = CTRAN(40, ANLB, 059, 013  , ANLBC);
END
TABLE FILE EMPLOYEE
PRINT FIRST_NAME
BY LAST_NAME
WHERE LAST_NAME EQ 'BLACKWOOD'
ON LAST_NAME SUBFOOT
  " "
  " <ANLBC "
ON TABLE HOLD FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT,LINEBREAK='CR',$
ENDSTYLE
END
```

The output is:



# Creating a Graph

Graphs often convey meaning more clearly than data listed in tabular format. Using the GRAPH command, you can easily transform almost any type of data into an effective graph that you can customize to suit your needs.

You can link your graph to other resources, or feature conditional styling to highlight specific data in your graph. You may also select from a multitude of graph styles, which include the standard graph formats bar, line, pie, and scatter as well as many variations on these types.

You can also represent data graphically using data visualization. For details, see Displaying Report Data.

# Content Analysis: Determining Graphing Objectives

WebFOCUS offers a range of reporting tools that allow you to create reports that deliver critical information to your users. By selecting a tool that is well suited to your particular needs, you can design the information you deliver to users. One effective option with almost any type of data is a graphic presentation.

Graphs allow you to display multivariate or complex data efficiently, precisely, and in a way that a viewer can intuitively grasp. A graph is an effective presentation tool because it presents a visual idea, communicating meaningful changes in data to a user in a memorable way. By viewing your graph, a user can identify and track a change that you want them to notice.

Creating a meaningful graph is not simply a matter of applying aesthetics to your data. Instead, graphs allow you to design your presentation to capture the essential information in your data.

The first step in creating excellent graphics is determining your graphing objectives. You can break this process into several stages.

1. Assess your data:

Look for meaningful patterns or changes in the data. Does your data change most dramatically over time or in relationship to some other value? Are there two sets of data that you would like to compare to each other?

Determine what movement or changes you would like to highlight. Which of the patterns in the data would you most want the viewer to picture?

2. Select the graph type that best suits your argument and the overall shape of your data. Determine what will lead viewers to the cognitive task or connection that you want them to make.
3. Begin developing your graph.
4. Refine your graph:

   Are the labels meaningful or useful?

   How can the data be organized in a meaningful way? Consider customizing the scales you use with your graph.

# The GRAPH Command

GRAPH request syntax is similar to TABLE request syntax. To produce a graph instead of a tabular report, you need only substitute the command GRAPH for TABLE in the request. Thus, you can produce graphs by simply converting TABLE requests to GRAPH requests.

However, not every TABLE facility has a GRAPH counterpart, and there are some practical limitations on the amount of information that you can effectively display in a graph. When a TABLE request is converted in this manner, the various phrases that make up the body of the request take on special meanings that determine the format and layout of the graph. The type of graph produced by a GRAPH request depends on the display command used (SUM or PRINT), and the sort phrase(s) used (ACROSS or BY).

# Similarities Between GRAPH and TABLE

The GRAPH request elements generally follow the same rules as their TABLE counterparts:

- The word FILE and the file name must immediately follow the GRAPH command, unless they were previously specified in a SET command:

```
SET FILE=filename
```

You can specify any file available to WebFOCUS, including joined or cross-referenced structures.

- You can concatenate unlike data source files in a GRAPH request with the MORE command. For details, see Universal Concatenation.
- The order of the phrases in the request does not affect the format of the graph. For example, the selection phrase may follow or precede the display command and sort phrase(s). The order of sort phrases does affect the format of a graph, just as the order of sort phrases in TABLE requests affects the appearance of reports.
- The word END must be on a line by itself to complete a request.
- All dates are displayed in MDY format unless they are changed to alphanumeric fields.

# Differences Between GRAPH and TABLE

There are a few notable syntactical differences between TABLE and GRAPH. Specifically, the following restrictions apply:

- A GRAPH request must contain a display command with at least one display field and at least one sort phrase (BY or ACROSS) in order to generate a meaningful graph.
- In GRAPH requests the object of the display command must always be a numeric field.
- No more than five display fields are permitted in a GRAPH request. Standard graph formats generally do not permit more variables to be displayed without rendering the graph unreadable.
- Several BY phrases can be used in a request, in which case multiple graphs are created. A single ACROSS phrase is allowed in a GRAPH request, and requests for certain graph forms can contain both ACROSS and BY phrases.
- The number of ACROSS values cannot exceed 64.
- The RUN option is not available as an alternative to END.

# Converting a TABLE Request to a GRAPH Request

The following illustrates how a TABLE request can easily be converted into a GRAPH request by changing the TABLE command to a GRAPH command.

```
TABLE FILE GGORDER
HEADING CENTER
"SAMPLE TABLE"
SUM QUANTITY
BY PRODUCT_DESC AS 'Coffee Types'
WHERE PRODUCT_DESC EQ 'French Roast' OR 'Hazelnut' OR 'Kona'
END
```

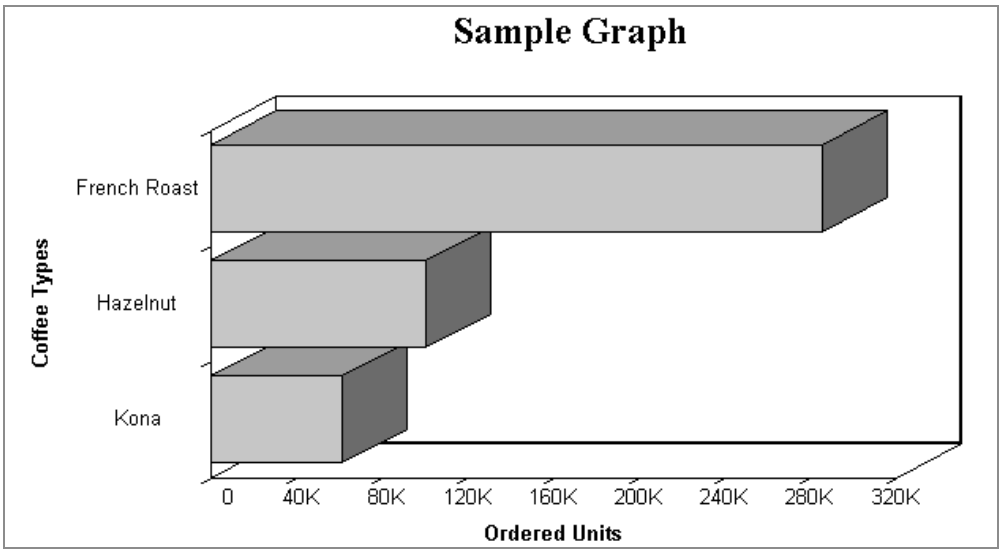
The output is:

```
        SAMPLE TABLE
Coffee Types      Ordered Units
------------      -------------
French Roast             285689
Hazelnut                 100427
Kona                      61498
```

The same request with a GRAPH command in place of the TABLE command is:

```
GRAPH FILE GGORDER
HEADING CENTER
"Sample Graph"
SUM QUANTITY
BY PRODUCT_DESC AS 'Coffee Types'
WHERE PRODUCT_DESC EQ 'French Roast' OR 'Hazelnut' OR 'Kona'
END
```

The output is:




# Creating an HTML5 Graph

WebFOCUS supports a graph output format that takes advantage of the HTML5 standard. The charts are rendered in the browser as high quality interactive vector graphics using a built-in JavaScript engine. Note that older browsers do not support all of the features of the HTML5 standard.

You can use the SET AUTOFIT command to make the HTML5 graph output resize to fit into the container in which it is placed.

# Create HTML5 Graph Output

In your graph request, include the following commands

```
ON GRAPH PCHOLD FORMAT JSCHART
```

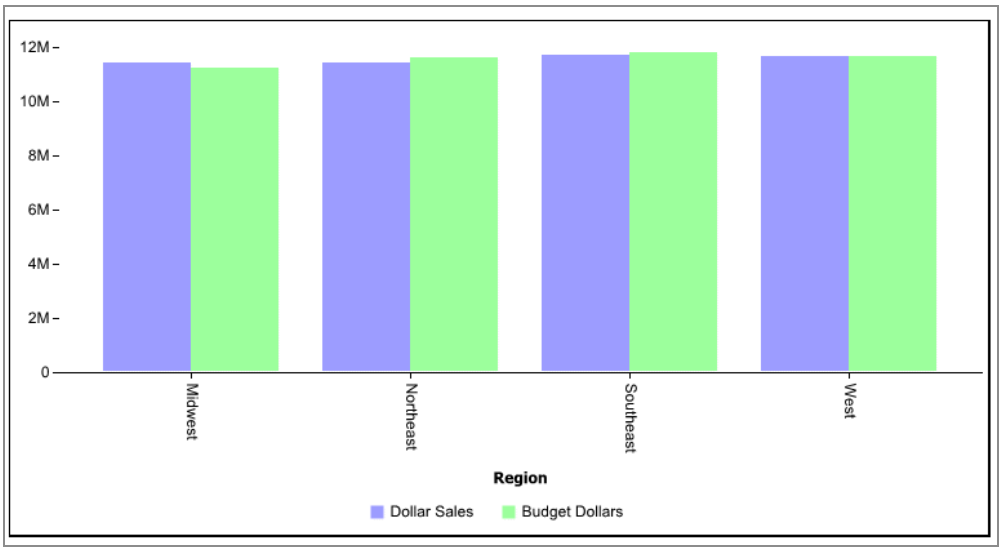
If the ON GRAPH PCHOLD FORMAT JSCHART command is not issued, server-side graphics are generated.

# Creating an HTML5 Vertical Bar Graph

The following request against the GGSALES data source creates an HTML5 vertical bar graph:

```
GRAPH FILE GGSALES
SUM DOLLARS BUDDOLLARS
BY REGION
ON GRAPH PCHOLD FORMAT JSCHART
ON GRAPH SET LOOKGRAPH VBAR
END
```

The output is:




# Resize HTML5 Graph Output to Fit Its Container

```
ON GRAPH SET AUTOFIT {OFF|ON|RESIZE}
```

where:

**OFF**

Respects the dimensions specified by the HAXIS and VAXIS parameters.

**ON**

Always resizes the HTML5 graph output to fit its container.

**RESIZE**

Respects the dimensions specified by the HAXIS and VAXIS parameters initially, but resizes the graph output if the container is resized.

# Selecting a Graph Type

When creating a graph, it is important to select the appropriate graph type with which to display your data. You may select from a number of basic graph types, as well as refinements on these types. Basic graph types include line graphs (connected point plots), bar graphs, pie graphs, and scatter graphs. Use the brief descriptions (see Graph Types) to select a graph type that suits the data set you are displaying and the change you want to highlight. Keep in mind that the data are the sets of numbers that you are displaying, and the scales are the numbers or variable measures displayed along the axes of the graph.

**Note:** When using a stacked chart of any type at least 2 series are required.

# Graph Types

Following are descriptions of the types of graphs you can create:

- **Line graphs.** Line graphs are useful for emphasizing the movement or trend of numerical data over time, since they allow a viewer to trace the evolution of a particular point by working backwards or interpolating. Highs and lows, rapid or slow movement, or a tendency towards stability are all types of trends that are well suited to a line graph.

  Line graphs can also be plotted with two or more scales to suggest a comparison of the same value, or set of values, in different time periods. The number of scales your graph has depends on the type of graph you select. For details, see Determining Graph Styles Using LOOKGRAPH.

- **Bar graphs.** A bar graph plots numerical data by displaying rectangular blocks against a scale. The length of a bar corresponds to a value or amount. Viewers can develop a clear mental image of comparisons among data series by distinguishing the relative heights of the bars. Use a bar graph to display numerical data when you

want to present distributions of data. You can create horizontal as well as vertical bar graphs.

- **Pie graphs.** A pie graph emphasizes where your data fits in relation to a larger whole. Keep in mind that pie graphs work best when your data consists of several large sets. Too many variables divide the pie into small segments that are difficult to see. Use color or texture on individual segments to create visual contrast.
- **Scatter graphs.** Scatter graphs share many of the characteristics of basic line graphs. Data can be plotted using variable scales on both axes. When you use a scatter graph, your data is plotted using a basic line pattern. Use a scatter graph to visualize the density of individual data values around particular points or to demonstrate patterns in your data. A numeric X-axis, or sort field, will always yield a scatter graph by default.

  It is important to note that scatter graphs and line graphs are distinguishable from one another only by virtue of their X-axis format. Line graphs can appear without connecting lines (making them look like scatter graphs) and scatter graphs can appear with connecting lines (making them look like line graphs).
- **Area graphs.** Area graphs are similar to line graphs except that the area between the data line and the zero line (or axis) is usually colored or textured. Area graphs allow you to stack data on top of each other. Stacking allows you to highlight the relationship between data series, showing how some data series approach or shadow a second series.
- **3D graphs.** 3D graphs add dimension to your graphing presentation. Dimensionality allows your viewers to recognize trends based on two or more data sets easily. 3D graphs also add impact to your presentation.
- **Bipolar graphs.** A bipolar graph is split along a horizontal line. This type of graph is useful for comparative trend analysis of widely disparate data values over time or other sort values.
- **Radar graphs.** This is a type of circular graph used when categories are cyclical. Radar graphs are essentially analogous to a line chart, except that the scale wraps around. Radar graphs work well with any data that are cyclical, such as the months of a year.

# Selecting Scales

After you have chosen a graph type, you should select an appropriate scale. A scale is a classification scheme or series of measures that you select for application to the axes of your graph. The scale provides the framework against which your data are plotted. When you choose an appropriate scale for your data, meaningful patterns can emerge, and when you modify a scale, the overall shape of your graph changes.

Steps or measures in the scale are represented along the axes of your graph by marks. The type of scale you choose determines the number of divisions along the scale. There are two general types of scales you can apply to the y-axis of your graph:

- Linear scales
- Logarithmic scales

A linear scale is a scale in which the values increase arithmetically. Each measure along the scale is one unit higher than the one that precedes it. Linear scales are useful when the data you are plotting are relatively small in range.

A logarithmic scale is a scale in which the values increase logarithmically. Each measure along the scale represents an exponential increase in the data value. Logarithmic scales are useful when you need to accommodate a large range of numbers.

# Select Scales

To use logarithmic scales in your graph, add the following to your GRAPH request:

```
ON GRAPH SET STYLE *
*GRAPH_SCRIPT
setY1LogScale(value);
*END
ENDSTYLE
END
```

where:

**value**

Is one of the following:

`true` turns on logarithmic scaling.

`false` turns off logarithmic scaling. Linear scaling is used instead.

# Determining Graph Styles With Display Commands and Sort Phrases

Each GRAPH request must include a sort phrase and at least one display field (up to five are allowed).

The fields, which are the subjects of the graph, may be real or virtual fields, with or without direct operation prefixes (AVE., MIN., MAX., etc.). They may also be calculated values.

**Note:** Display fields used only for calculations need not appear in the graph. You can use the NOPRINT or SUP-PRINT phrases to suppress the display of such fields. For details, see Sorting Tabular Reports.

By default, a particular combination of display commands and sort phrases determines the graph format. The combinations are:

| Graph Type | Display Command and Sort Phrase |
|---|---|
| Line graph | `PRINT A {ACROSS\|BY} B`<br>(where B is alphanumeric) |
| Vertical bar graph | `SUM A ACROSS B`<br>(where B is alphanumeric) |
| Horizontal bar graph | `SUM A BY B` |
| Pie graph | `SET LOOKGRAPH=PIE`<br>`SUM A {ACROSS\|BY} B`<br>or |

| Graph Type | Display Command and Sort Phrase |
|---|---|
| | `SET PIE=ON`<br>`SUM A {ACROSS\|BY} B` |
| Scatter graph (without connecting lines) | `PRINT A ACROSS B`<br>(where B is numeric) |
| Scatter graph (with connecting lines) | `SUM A ACROSS B`<br>(where B is numeric) |

You can override the default graph format using the LOOKGRAPH parameter. For details, see Determining Graph Styles Using LOOKGRAPH.

# Create a Line Graph

To create a line graph, issue a GRAPH request with the following display command and sort field combination

```
PRINT fieldname1 [AND] fieldname2...
{ACROSS|BY} sortfield
```

where:

**fieldname1...**

Is the name of the field to be displayed on the Y-axis of the graph. There can be a maximum of 5 display fields in a GRAPH request.

**AND**

Is an optional phrase used to enhance readability. It can be used between any two field names and does not affect the graph.

**sortfield**

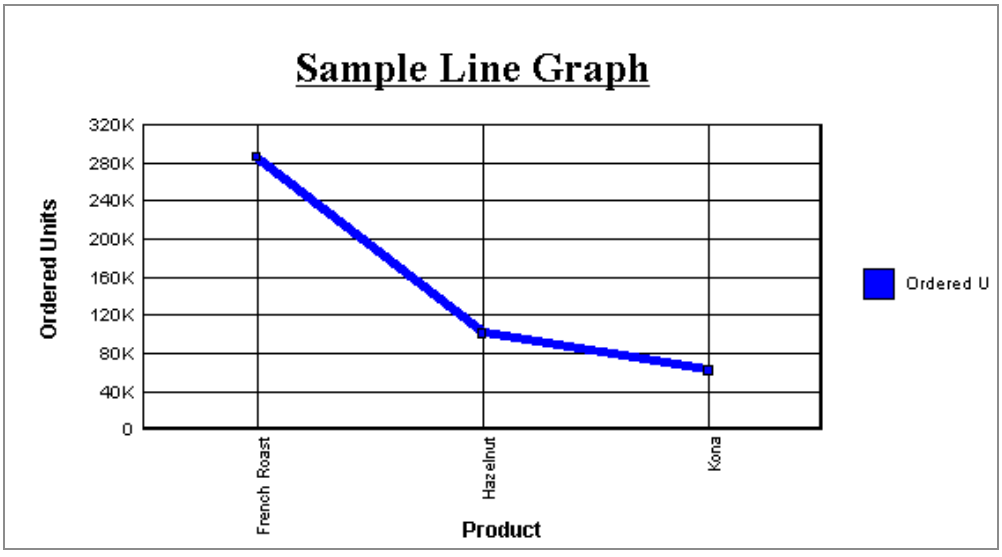
Is the name of the field to be displayed on the X-axis of the graph. This must be an alphanumeric field in order to generate a line graph. If the field specified is numeric, you can still create a line graph by using the LOOKGRAPH=LINE parameter. For details, see Determining Graph Styles Using LOOKGRAPH.

# Creating a Line Graph

The following illustrates how to create a line graph using the LOOKGRAPH command:

```
SET LOOKGRAPH = LINE, GRID=ON
SET HAXIS=600, VAXIS=315
GRAPH FILE GGORDER
HEADING CENTER
"Sample Line Graph"
SUM QUANTITY
ACROSS PRODUCT_DESC
WHERE PRODUCT_DESC EQ 'French Roast' OR 'Hazelnut' OR 'Kona'
END
```

The output is:



# Create a Horizontal Bar Graph

To create a horizontal bar graph, issue a GRAPH request with the following display command and sort field combination

```
SUM fieldname1 [AND] fieldname2...
BY sortfield
```

where:

**fieldname1...**

Is the name of a field to be displayed on the Y-axis of the graph. There can be a maximum of 5 display fields in a GRAPH request.

**AND**

Is an optional phrase used to enhance readability. It can be used between any two field names and does not affect the graph.

**sortfield**

Is the name of a field to be displayed on the X-axis of the graph. A separate group of bars is created for each value of the BY field, and each group contains one bar for each display command (SUM) object.

# Create a Vertical Bar Graph

To create a vertical bar graph, issue a GRAPH request with the following display command and sort field combination

```
SUM fieldname1 [AND] fieldname2...
ACROSS sortfield
```

where:

**fieldname1...**

Is the name of the field to be displayed on the Y-axis of the graph. There can be a maximum of 5 display fields in a GRAPH request.

**AND**

Is an optional phrase used to enhance readability. It can be used between any two field names and does not affect the graph.

**sortfield**

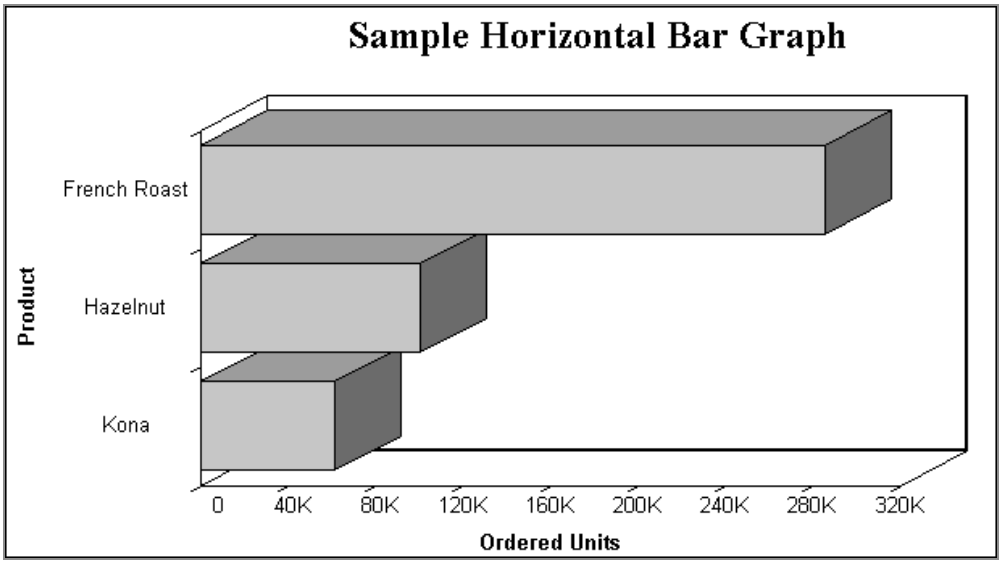
Is the name of an alphanumeric field to be displayed on the X-axis of the graph.

# Creating a Horizontal Bar Graph

The following illustrates how to create a horizontal bar graph:

```
GRAPH FILE GGORDER
HEADING CENTER
"Sample Horizontal Bar Graph"
SUM QUANTITY
BY PRODUCT_DESC
WHERE PRODUCT_DESC EQ 'French Roast' OR 'Hazelnut' OR 'Kona'
END
```

The output is:

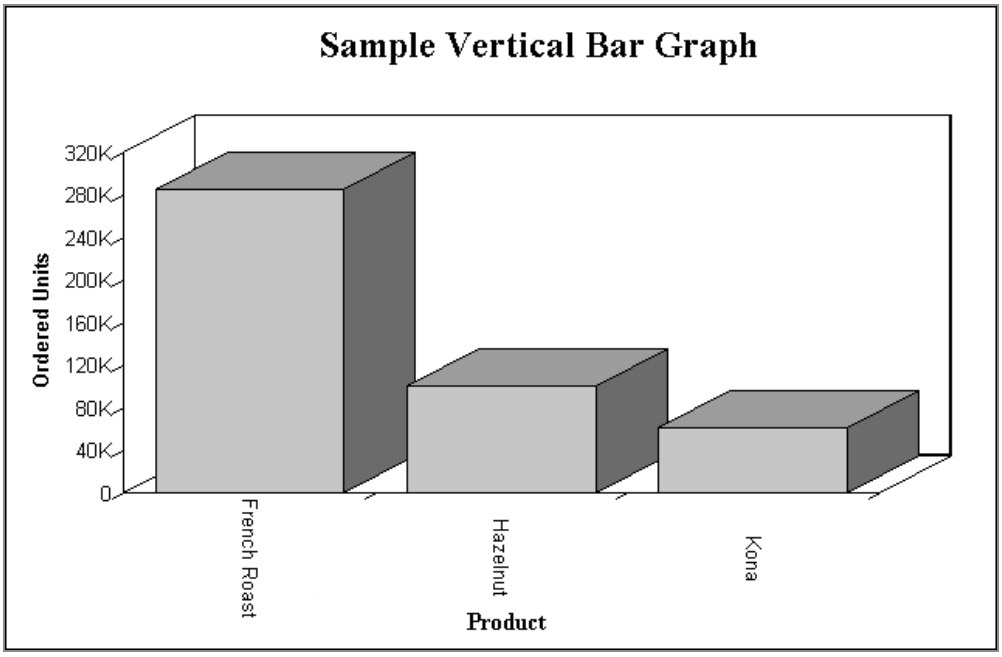



# Creating a Vertical Bar Graph

The following illustrates how to create a vertical bar graph:

```
GRAPH FILE GGORDER
HEADING CENTER
"SAMPLE VERTICAL BAR GRAPH"
SUM QUANTITY
ACROSS PRODUCT_DESC
WHERE PRODUCT_DESC EQ 'French Roast' OR 'Hazelnut' OR 'Kona'
END
```

The output is:




# Create a Pie Graph

To create a pie graph, issue a GRAPH request with the following SET command and display and sort field combination

```
SET LOOKGRAPH=PIE
SUM fieldname1 [AND] fieldname2...
{ACROSS|BY} sortfield
```

where:

**fieldname1...**

Is the name of the field to be displayed in the graph. There can be a maximum of 5 display fields in a GRAPH request.

**AND**

Is an optional phrase used to enhance readability. It can be used between any two field names and does not affect the graph.

**sortfield**

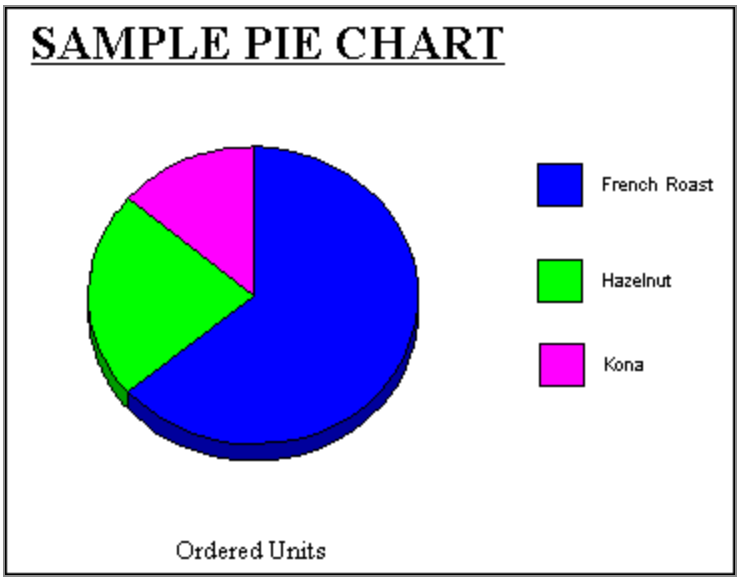
Is the name of the field to be displayed in the graph. Each value in the sort field will be represented by a section in the pie graph.

# Creating a Pie Graph

The following illustrates how to create a pie graph using a BY sort phrase and the LOOKGRAPH command:

```
SET LOOKGRAPH=PIE
GRAPH FILE GGORDER
HEADING CENTER
"SAMPLE PIE CHART"
SUM QUANTITY
BY PRODUCT_DESC AS COFFEES
WHERE PRODUCT_DESC EQ 'French Roast' OR 'Hazelnut' OR 'Kona'
END
```

The output is:




# Create a Scatter Graph

To create a scatter graph, issue a GRAPH request with the following display command and sort field combination

```
{PRINT|SUM} fieldname1 [AND] fieldname2...
ACROSS sortfield
```

where:

**fieldname**

Is the name of the field to be displayed in the graph. There can be a maximum of 5 display fields in a GRAPH request. When you specify more than one display field, they are represented by different symbols.

**AND**

Is an optional phrase used to enhance readability. It can be used between any two field names and does not affect the graph.

**sortfield**

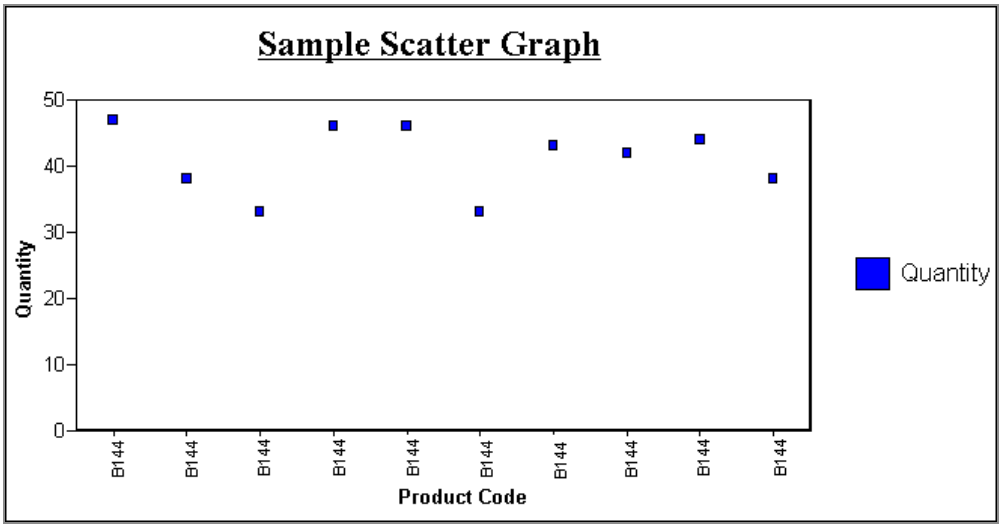
Is the name of the numeric field to be displayed on the X-axis of the graph.

# Creating a Scatter Graph

The following illustrates how to create a scatter graph:

```
GRAPH FILE GGORDER
HEADING CENTER
"Sample Scatter Graph"
PRINT QUANTITY AS 'Quantity'
ACROSS PRODUCT_CODE
WHERE PRODUCT_CODE EQ 'B144'
WHERE QUANTITY LT 51
END
```

The output is:




# Determining Graph Styles Using LOOKGRAPH

By default, a particular combination of display commands and sort phrases determines the graph format. You can override the default graph format by using the LOOKGRAPH parameter.

The LOOKGRAPH parameter enables you to change the format of the graph without having to set individual control parameters or restructure the graph request. However, even if you use LOOKGRAPH, you can choose to set individual control parameters (for example, SET GRID=ON).

# Specify a Graph Style Using LOOKGRAPH

```
SET LOOKGRAPH= option
```

where:

**option**

Specifies the graph style. For details on graph styles, see:

- Style Options for Line Graphs.
- Style Options for Bar Graphs.
- Style Options for Pie Graphs.
- Style Options for Scatter Graphs.
- Style Options for Three-Dimensional Graphs.
- Style Options for Area Graphs.
- Style Options for Stock Charts.
- Style Options for Polar Charts.
- Style Options for Radar Charts.
- Style Options for Bubble Charts.
- Style Options for Spectral Charts.
- Other Graph Types.
- Options for HTML5-Only Chart Types.

# Style Options for Line Graphs

Choose one of the following LOOKGRAPH values to change the style of connected point plots:

| SET LOOKGRAPH= | Description |
|---|---|
| LINE | A vertical connected point plot graph. |
| HLINE | A horizontal connected point plot graph. |
| HLINE2 | A horizontal connected point plot graph with two axes. |
| HLINE2S | A horizontal connected point plot graph with two separate axes. |
| HLINSTK | A stacked horizontal connected point plot graph. |
| HLINSTK2 | A stacked horizontal connected point plot graph with two axes. |
| HLNSTK2S | A stacked horizontal connected point plot graph with two separate axes. |
| HLNSTKPC | A stacked horizontal connected point plot graph showing percentages. |
| VLINE | A vertical connected point plot graph. |
| VLINE2 | A vertical connected point plot graph with two axes. |
| VLINE2S | A vertical connected point plot graph with two separate axes. |

| SET LOOKGRAPH= | Description |
|---|---|
| VLINSTK | A stacked vertical connected point plot graph. |
| VLINSTK2 | A stacked vertical connected point plot graph with two axes. |
| VLNSTK2S | A stacked vertical connected point plot graph with two separate axes. |
| VLNSTKPC | A stacked vertical connected point plot graph showing percentages. |

# Style Options for Bar Graphs

Choose one of the following LOOKGRAPH values to change the style of bar graphs:

| SET LOOKGRAPH= | Description |
|---|---|
| BAR | A bar graph with the bars displayed beside each other. |
| STACK | A bar graph with stacked bars. |
| VBAR | A vertical bar graph. |
| VBAR2AX | A vertical bar graph with two axes. |
| VBAR2AXS | A vertical bar graph with two separate axes. |

| SET LOOKGRAPH= | Description |
|---|---|
| VBRSTK1 | A stacked vertical bar graph. |
| VBRSTK2 | A stacked vertical bar graph with two axes. |
| VBRSTK2S | A stacked vertical bar graph with two separate axes. |
| VBRSTKPC | A stacked vertical bar graph that shows percentages. |
| HBAR | A horizontal bar graph. |
| HBAR2AX | A horizontal bar graph with two axes. |
| HBAR2AXS | A horizontal bar graph with two separate axes. |
| HBRSTK1 | A stacked horizontal bar graph. |
| HBRSTK2 | A stacked horizontal bar graph with two axes. |
| HBRSTK2S | A stacked horizontal bar graph with two separate axes. |
| HBRSTKPC | A stacked horizontal bar graph that shows percentages. |

# Style Options for Pie Graphs

Choose one of the following LOOKGRAPH values to change the style of pie graphs:

| SET LOOKGRAPH= | Description |
|---|---|
| `PIE` | A pie graph. |
| `PIESINGL` | A single pie graph. |
| `PIEMULTI` | Multiple pie graphs. |
| `PIERING` | A ring-shaped pie graph. |
| `PIEMULPR` | Multiple, ring-shaped pie graphs of proportional size. |
| `PIEMULTP` | Multiple pie graphs of proportional size. |
| `PIEMULTR` | Multiple, ring-shaped pie graphs. |

# Style Options for Scatter Graphs

Choose one of the following LOOKGRAPH values to change the style of scatter graphs:

| SET LOOKGRAPH= | Description |
|---|---|
| SCATTER | Produces a scatter graph. |
| SCATTERD | A dual scatter graph. Values from an additional data set are displayed on a second value (Y) axis. |
| SCATTRLS | A scatter graph that labels each data point with its exact numeric value. |
| SCATTRLD | A dual scatter graph that labels each data point with its exact numeric value. |

# Style Options for Three-Dimensional Graphs

Choose one of the following LOOKGRAPH values to change the style of three-dimensional graphs:

| SET LOOKGRAPH= | Description |
|---|---|
| 3DAREAG | A three-dimensional connected group area chart. |
| 3DAREAS | A three-dimensional connected series area chart. |
| 3DBAR | A two-dimensional bar graph with three-dimensional bars. |
| 3D_BAR | A three-dimensional chart with bars. |

| SET LOOKGRAPH= | Description |
|---|---|
| 3DCUBE | A three-dimensional bar graph in which all data points are blocks of identical size, hovering at the position that shows their data value. |
| 3DGROUP | A three-dimensional chart with bars. |
| 3DOCTAGN | A three-dimensional bar graph with octagon-shaped bars that have no roots. |
| 3DPYRAMD | A three-dimensional pyramid chart. |
| 3DRIBBNG | A three-dimensional connected group ribbon chart. |
| 3DRIBBNS | A three-dimensional connected series ribbon chart. |
| 3DSPHERE | A three-dimensional bar graph in which all data points are spheres of identical size, hovering at the position that shows their data value. |
| 3DSTACK | A two-dimensional stack chart with three-dimensional type bars. |
| 3DSURFCE | A three-dimensional surface chart that graphs all data points as a three-dimensional surface, like a rolling wave. |
| 3DSURFHC | A three-dimensional honeycomb surface chart that graphs all data points as a three-dimensional surface using a honeycomb effect. |
| 3DSURFSD | A three-dimensional surface chart with sides that graphs all data points as a three-dimensional surface with solid sides. |

# Style Options for Area Graphs

Choose one of the following LOOKGRAPH values to change the style of area graphs:

| SET LOOKGRAPH= | Description |
|---|---|
| VAREA | A vertical area graph. |
| VAREASTK | A stacked vertical area graph. |
| VAREAR2 | A vertical area graph with two axes. |
| VARESTK2 | A stacked vertical area graph with two axes. |
| VARESTKP | A stacked vertical area graph that shows percentages. |
| HAREA | A horizontal area graph. |
| HAREAR2 | A horizontal area graph with two axes. |
| HAREASTK | A stacked horizontal area graph. |
| HARESTK2 | A stacked horizontal area graph with two axes. |
| HARESTKP | A stacked horizontal area graph that shows percentages. |

# Style Options for Stock Charts

Choose one of the following LOOKGRAPH values to change the style of stock charts:

| SET LOOKGRAPH= | Description |
|---|---|
| STOCK | A stock chart. |
| STOCKH | A high-low stock chart. Bars representing higher numeric values are placed behind bars representing lower numeric values. Only the top of the higher bar is visible, clearly illustrating the difference in value.<br>The most popular application of this type of graph is to represent stock prices. Each bar represents the highest and lowest prices for a given stock on a given day. |
| STOCKHB | A bipolar high-low stock chart. Values from different data sets are displayed on separate poles. |
| STOCKHD | A dual high-low stock chart. Values from an additional data set are displayed on a second value (Y) axis. |
| STOCKHCL | A high-low-close stock chart. The most popular application of this type of graph is to represent stock prices. Each bar represents the highest, lowest, and closing prices for a given stock on a given day. |
| STOCKHCB | A bipolar high-low-close stock chart. Values from different data sets are displayed on separate poles.<br>The most popular application of this type of graph is to represent stock prices. Each bar represents the highest, lowest, and closing prices for a given stock on a given day. |
| STOCKHCD | A dual high-low-close stock chart. Values from an additional data set are displayed on a second value (Y) |

| SET LOOKGRAPH= | Description |
|---|---|
| | axis. |
| STOCKHOC | A high-low-open-close stock chart.<br>The most popular application of this type of graph is to represent stock prices. Each bar represents the highest, lowest, opening, and closing prices for a given stock on a given day. |
| STOCKHOB | A bipolar high-low-open-close stock chart. Values from different data sets are displayed on separate poles. |
| STOCKHOD | A dual high-low-open-close stock chart. Values from an additional data set are displayed on a second value (Y) axis. |
| STOCKHV | A high-low-volume stock chart. |
| STOCKHOV | A high-low-open-close-volume stock chart. |
| STOCKC | A candle stock chart. |
| STOCKHC | A high-low candle stock chart. |
| STOCKCV | A volume candle stock chart. |
| STOCKHCV | A high-low-volume candle stock chart. |

# Style Options for Polar Charts

Choose one of the following LOOKGRAPH values to change the style of polar charts:

| SET LOOKGRAPH= | Description |
|---|---|
| POLAR | A polar chart that displays data points on a circle. |
| POLAR2 | A dual polar chart. Values from an additional data set are displayed on a second value (Y) axis. |

# Style Options for Radar Charts

Choose one of the following LOOKGRAPH values to change the style of radar charts:

| SET LOOKGRAPH= | Description |
|---|---|
| RADARA | A radar area chart. |
| RADARL | A radar line chart. |
| RADARL2 | A dual radar line chart. Values from an additional data set are displayed on a second value (Y) axis. |

# Style Options for Bubble Charts

Choose one of the following LOOKGRAPH values to change the style of bubble charts:

| SET LOOKGRAPH= | Description |
|---|---|
| `BUBBLE` | A bubble chart. |
| `BUBBLED` | A bubble chart with a dual axis. |
| `BUBBLEDL` | A bubble chart with a dual axis and labels. |
| `BUBBLEL` | A bubble chart with labels. |

# Style Options for Spectral Charts

Choose one of the following LOOKGRAPH values to change the style of spectral charts:

| SET LOOKGRAPH= | Description |
|---|---|
| `SPECTRAL` | A spectral map chart. This is a chart with a row or column matrix of markers that is colored according to the data values. |

# Other Graph Types

| SET LOOKGRAPH= | Description |
|---|---|
| `GANTT` | Provides a visual representation of project oriented time critical events. Gantt charts require six display fields and one sort field, in that order. Conditional styling and drill-down are not supported for GANTT charts. |

| SET LOOKGRAPH= | Description |
|---|---|
| POSITION | Product position charts provide a visual representation of market share and growth versus revenue and measurement (past, present, future). Product position charts require a set of three display fields. |
| VWATERFL | Vertical waterfall graph. |
| HWATERFL | Horizontal waterfall graph. |
| PARETO | Displays data following Pareto 80:20 rule. Pareto charts require only one display field. |
| MULTI3Y<br>MULTI4Y<br>MULTI5Y | Stacks charts in order to make it easier to read, analyze and manage them. |

# Options for HTML5-Only Chart Types

The following LOOKGRAPH values are valid only when generating an HTML5 chart:

| SET LOOKGRAPH | Description |
|---|---|
| BUBBLEMAP | A bubblemap is a chart in which proportionally sized bubbles are displayed on relevant areas of the map. |
| CHOROPLETH | a chloropleth is a chart in which areas on a map are shaded or patterned in proportion to the value of the measure being represented, |

| SET LOOKGRAPH | Description |
|---|---|
| MEKKO | A Mekko chart is a variant of a stacked bar chart, in which the width of the bars is adjusted relative to its value in the data set. |
| PARABOX | A Parabox (or parallel coordinates chart) is similar to a regular line chart, except that each group in the line chart has a unique and interactive numeric axis. Each line represents one series of data. Each vertical bar represents a numeric axis. You can click and drag along each of the axes to select (filter) the lines that pass through that part of the axis |
| STREAM | A streamgraph is a simplified version of a stacked area chart. In a streamgraph, there are no axes or gridlines. The baseline is free, which makes it easier to perceive the thickness of any given layer across the data. |
| TAGCLOUD | A tagcloud is a visual representation of frequency. It displays only group labels. The size of each label is proportional to its data value. |
| TREEMAP | A treemap chart displays hierarchical data as a set of nested rectangles. |

# Selecting Values for the X and Y Axes

The values you select for the X- and Y-axes determine what data is included in the graph you are creating, and how it appears.

The X-axis value is determined by the sort phrase (BY or ACROSS) used in your GRAPH request. At least one sort phrase is required in every GRAPH request. When there are multiple BY phrases or when an ACROSS and BY phrase are included in the same request, multiple graphs are generated, one for each combination of values for the fields referenced in the request. For details, see Creating Multiple Graphs.

The Y-axis value is determined from the display field associated with the display command (SUM or PRINT) issued in your GRAPH request.

You can also:

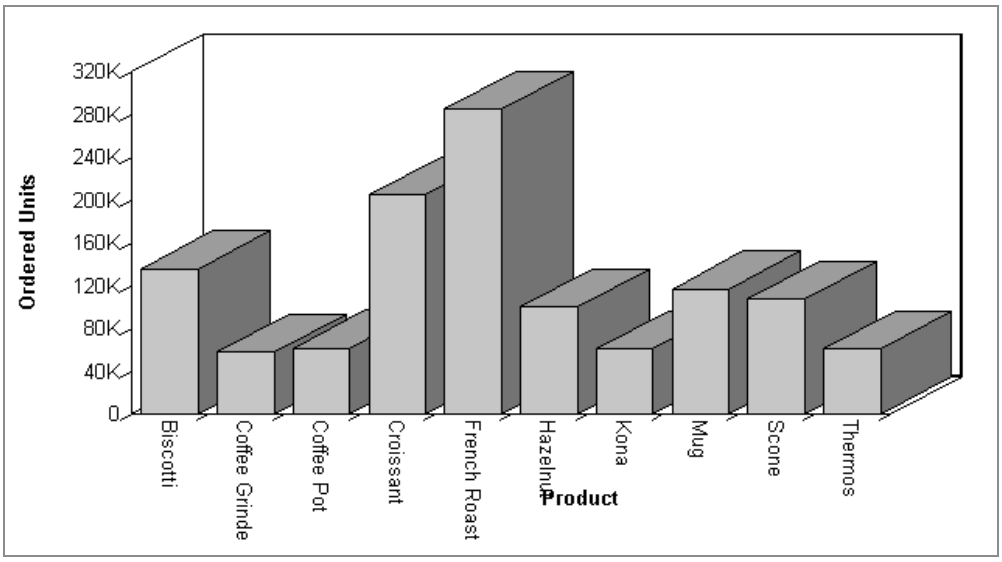
- Select a second horizontal category (X axis), which will produce multiple graphs. For details, see Creating Multiple Graphs.
- Temporarily hide the display of a Y-axis field. For details, see Hiding the Display of a Y-Axis Field.
- Interpolate X and Y axis values using linear regression. For details, see Interpolating X and Y Axis Values Using Linear Regression.

# Selecting Values for the X and Y Axes

The following illustrates how to set the X-axis (PRODUCT_DESC) using an ACROSS phrase and the Y-axis (QUANTITY) with the display command SUM:

```
GRAPH FILE GGORDER
SUM QUANTITY AS 'Ordered Units'
ACROSS PRODUCT_DESC
END
```

The output is:



# Hiding the Display of a Y-Axis Field

You can hide the display of a Y-axis field in a graph. This option is useful when you want to temporarily remove a particular Y-axis field while retaining all of the original graph properties.

To temporarily hide the display of a Y-axis field, add the NOPRINT command to the field. Although the NOPRINT command applies to both verb objects and sort fields in a TABLE request, it only applies to verb objects in a GRAPH request.

# Interpolating X and Y Axis Values Using Linear Regression

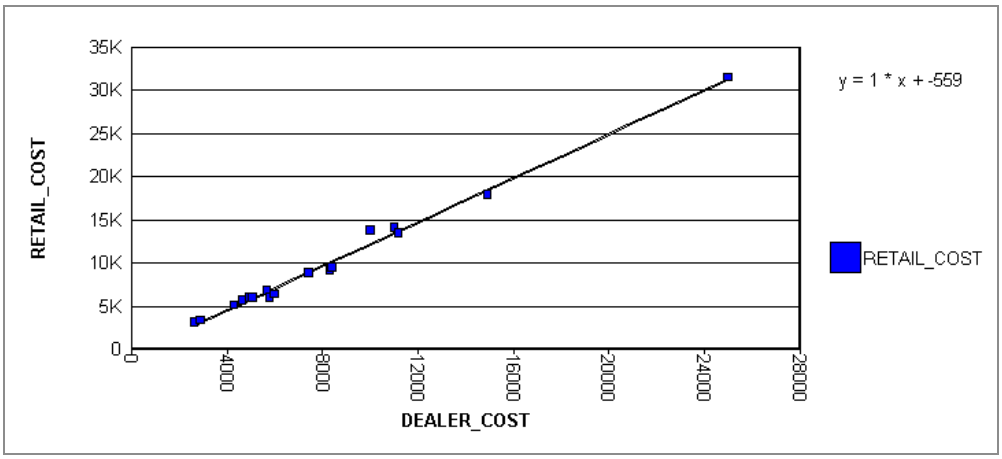
You can interpolate X and Y axis values using basic linear regression. Basic linear regression involves the average of the summation of X and Y axis values to determine a linear equation that expresses the trend of the scatter diagram. Use the SET parameter GTREND to turn on basic linear regression in your graph.

GTREND is only available for use with scatter charts.

The following illustrates how to turn on linear regression in a scatter chart.

```
SET 3D=OFF
GRAPH FILE CAR
PRINT RC
ACROSS DC
ON GRAPH SET LOOKGRAPH SCATTER
ON GRAPH SET GTREND ON
END
```

The output is:




# Creating Multiple Graphs

You can create multiple graphs by including secondary sort dimensions (fields).

By default, the number of graphs created depends on the number of values in the fields you designate in the sort (BY, ACROSS) phrases. You can change this default using the GRMERGE parameter:

- With GRMERGE OFF (the default), if a request contains two BY fields, there will be as many graphs as there are values in the first BY field. The second BY field will determine the X-axis. For example, if you have selected a BY field with two values, two graphs will be generated. If you have selected a field with ten values, ten graphs will be generated. If there is one BY phrase and one ACROSS phrase, as many graphs will display as there are values in the BY field. The ACROSS field will determine the X-axis. You can select the second horizontal category by including multiple BY phrases or an ACROSS and BY phrase in the same request.
- With GRMERGE ON, WebFOCUS creates one merged graph.
- With GRMERGE ADVANCED, WebFOCUS uses three parameters to determine:
  - How many graphs to generate (GRMULTIGRAPH).
  - How many sort fields should be placed on the graph legend (GRLEGEND).
  - How many sort fields should be placed on the X-axis (GRXAXIS).

Multiple graphs can be displayed in either merged format or in columns. For details, see Merging Multiple Graphs and Displaying Multiple Graphs in Columns.

# Merging Multiple Graphs

By default, when you create a graph that has multiple BY fields, or a BY and ACROSS field, multiple graphs are generated. You can merge these graphs into a single graph or into multiple merged graphs.

To do this, use the SET command GRMERGE.

# Merge Multiple Graphs

```
SET GRMERGE={ON|OFF|ADVANCED}
```

where:

**ON**

Turns on the merge graph option.

**OFF**

Turns off the merge graph option. This is the default.

**ADVANCED**

Turns on the advanced merge option. This option uses three parameters to determine how to merge the graphs:

- GRMULTIGRAPH, which specifies how many sort fields to use to create multiple graphs.
- GRLEGEND, which specifies how many sort fields to place on the graph legend.
- GRXAXIS, which specifies how many sort fields to display on the X-axis. GRXAXIS must be at least 1 in order to plot the graph. A value greater than one creates nested X-axes.

**Note:** The sum of the sort fields used by GRMULTIGRAPH, GRLEGEND, and GRXAXIS must equal the number of sort fields in the graph request.

The syntax for the GRMULTIGRAPH, GRLEGEND, and GRXAXIS parameters is:

**ON GRAPH SET GRMULTIGRAPH n**

Specifies how many sort fields (0 through 2) to use to break the output into multiple graphs. The outermost sort fields are used to separate the graphs. When **n** is greater than zero, this is similar to GRMERGE=OFF, but allows an additional sort field.

**ON GRAPH SET GRLEGEND n**

Specifies how many of the remaining outermost sort fields (0 through 2), after the ones used for GRMULTIGRAPH, to add to the graph legend. When **n** is greater than zero, this is similar to GRMERGE=ON, but allows an additional sort field.

**ON GRAPH SET GRXAXIS n**

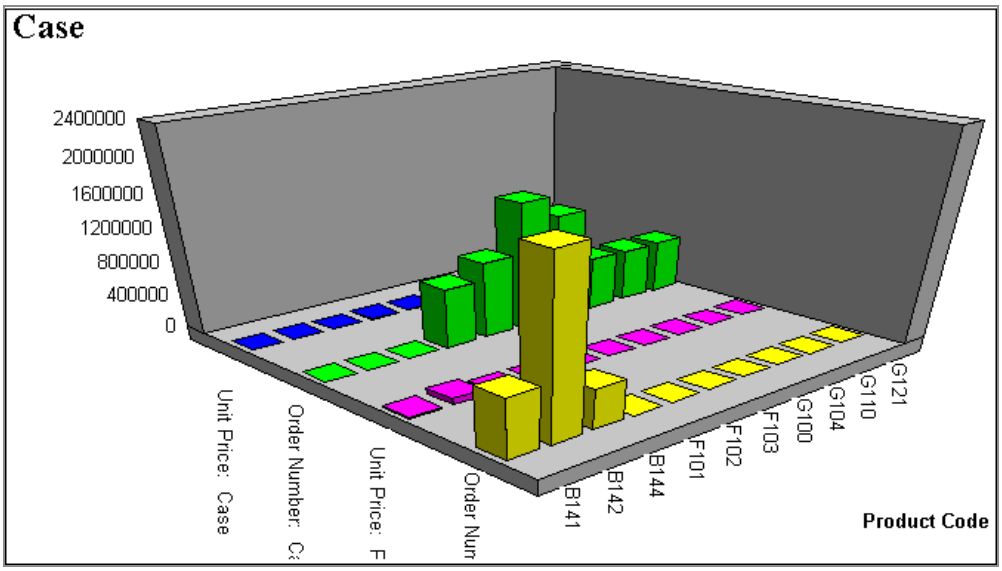
Specifies how many of the remaining sort fields (1 through 3) to display on the X-axis. When n is greater than 1, this creates nested X-axes.

# Merging Multiple Graphs With GRMERGE ON

The following illustrates a graph with two horizontal, or X-axes, categories (PRODUCT_ID and PACKAGE_TYPE) that have been merged.

```
SET GRMERGE=ON
GRAPH FILE GGORDER
SUM UNIT_PRICE ORDER_NUMBER
ACROSS PRODUCT_ID
BY PACKAGE_TYPE
END
```

The output is:

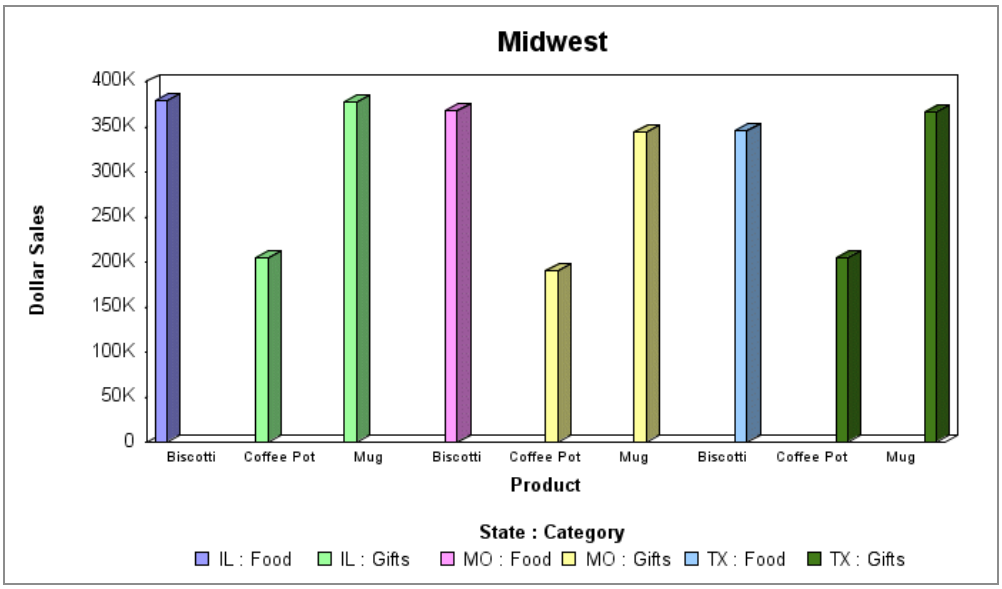



# Merging Multiple Graphs With GRMERGE ADVANCED

The following example generates a vertical bar graph that separates the outermost sort field (REGION) onto separate graphs, distinguishes the next two sort fields (ST and CATEGORY) by combining them on the graph legend, and places the CATEGORY sort field on the X-axis:

```
GRAPH FILE GGSALES
SUM DOLLARS
BY REGION BY ST BY CATEGORY BY PRODUCT
WHERE CATEGORY EQ 'Food' OR 'Gifts'
WHERE PRODUCT EQ 'Coffee Pot' OR 'Biscotti' OR 'Mug'
ON GRAPH SET GRMERGE ADVANCED
ON GRAPH SET GRMULTIGRAPH 1
ON GRAPH SET GRLEGEND 2
ON GRAPH SET GRXAXIS 1
ON GRAPH SET LOOKGRAPH VBAR
END
```

The first graph is for region Midwest. The legend distinguishes State-Category combinations by color, and the PRODUCT sort field is repeated on the X-axis for each State-Category combination:




# Merging Multiple OLAP Graphs

When you create an OLAP graph that has multiple BY fields, or a BY and ACROSS field, multiple graphs are generated. You can merge these graphs into a single graph.

To do this, use the SET command OLAPGRMERGE.

# Merge Multiple OLAP Graphs

```
SET OLAPGRMERGE={ON|OFF}
```

where:

**ON**

Turns on the merge graph option. With this setting AUTODRILL is disabled for the graph.

**OFF**

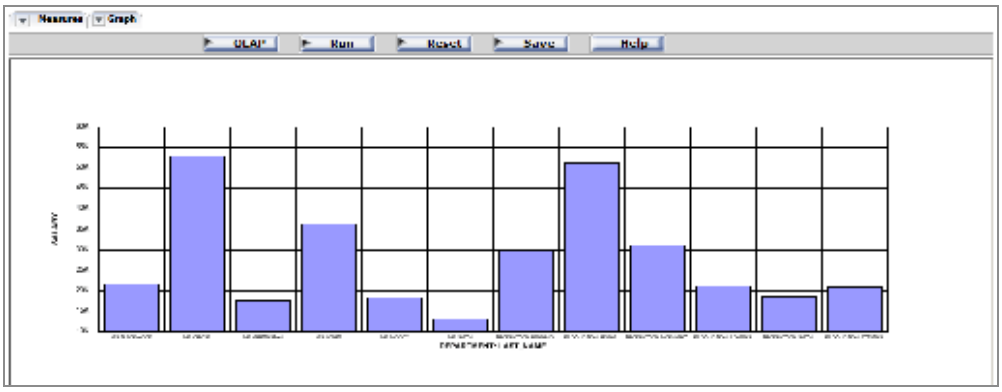
Turns off the merge graph option and creates a separate graph for every value of the outer sort field. OFF is the default value.

# Merging OLAP-Enabled Graphs

The following OLAP request against the EMPLOYEE data source has two BY fields. To merge the graphs, the SET OLAPGRMERGE=ON command is issued:

```
-OLAP ON
SET GRAPHEDIT=SERVER
SET OLAPGRMERGE=ON
TABLE FILE EMPLOYEE
SUM SALARY
BY DEP
BY LAST_NAME
ON TABLE SET PAGE-NUM OFF
ON TABLE NOTOTAL
ON TABLE PCHOLD FORMAT HTML
ON TABLE SET HTMLCSS ON
ON GRAPH SET HAXIS 300
ON GRAPH SET VAXIS 100
ON TABLE SET AUTODRILL ALL
ON TABLE SET OLAPPANE TABBED
ON TABLE SET STYLE *
     INCLUDE = endeflt,
$
     LEFTMARGIN=0.500000,
     RIGHTMARGIN=0.500000,
     TOPMARGIN=0.500000,
     BOTTOMMARGIN=0.500000,
$
TYPE=REPORT,
     TOPGAP=0.000000,
     BOTTOMGAP=0.013889,
$
ENDSTYLE
END
```

The output is:



# Displaying Multiple Graphs in Columns

When you create a graph that has multiple BY fields, or a BY and ACROSS field, multiple graphs are generated. You can display these graphs in columns.

To do this, use the SET command GRWIDTH. GRWIDTH may be set to any value between 0-512. The default is 0.

# Display Multiple Graphs in Columns

```
SET GRWIDTH=nn
```

where:

**nn**

Is the number of columns in which to display multiple graphs. This may be any value from 0-512. The default is 0.

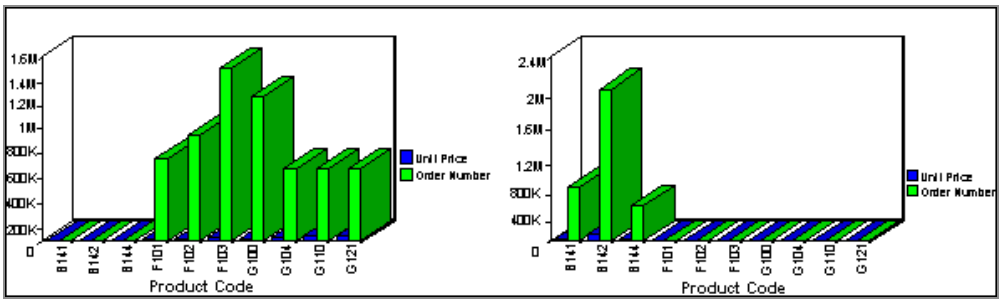
All values from 1-512 will display graphs in an HTML table with the corresponding number of columns. The default value of 0 will display the graphs one under the other in a Java applet.

# Displaying Multiple Graphs in Columns

The following illustrates how to set the number of columns in which you wish to display multiple graphs. In this example, the graphs are set to display in two columns.

```
SET GRWIDTH=2
GRAPH FILE GGORDER
SUM UNIT_PRICE ORDER_NUMBER
ACROSS PRODUCT_ID
BY PACKAGE_TYPE
END
```

The output is:




# Plotting Dates in Graphs

Numeric fields containing dates are recognized by the field formats specified in the Master File. Such fields can be used in ACROSS or BY phrases in GRAPH requests. To review the various format types, refer to the *Describing Data With ibi™ WebFOCUS® Language* manual.

Plotted dates are handled in the following manner:

- If the date field named has a month-first format, it is plotted in ascending time order (even if the file is not sorted in ascending date order). Hence, month/year values of 01/76, 03/76, 09/75 will be plotted by month within year: 09/75, 01/76, 03/76.
- Axis scaling is performed on the basis of days in the month and months in the year. When the date format includes the day, the scale usually starts at the first day of the month, at the "zero" axis point.

You can selectively combine groups of date point plots to reduce the number of separate points on the horizontal axis. You do this with the IN-GROUPS-OF option. For example, if

the date field format is I6YMD, you can display the data by month rather than by day by grouping it in 30-day increments:

```
ACROSS DATE IN-GROUPS-OF 30
```

This eliminates plot points for individual days. If your date format is YMD, you can redefine the format and divide the field contents by 100 to eliminate the days:

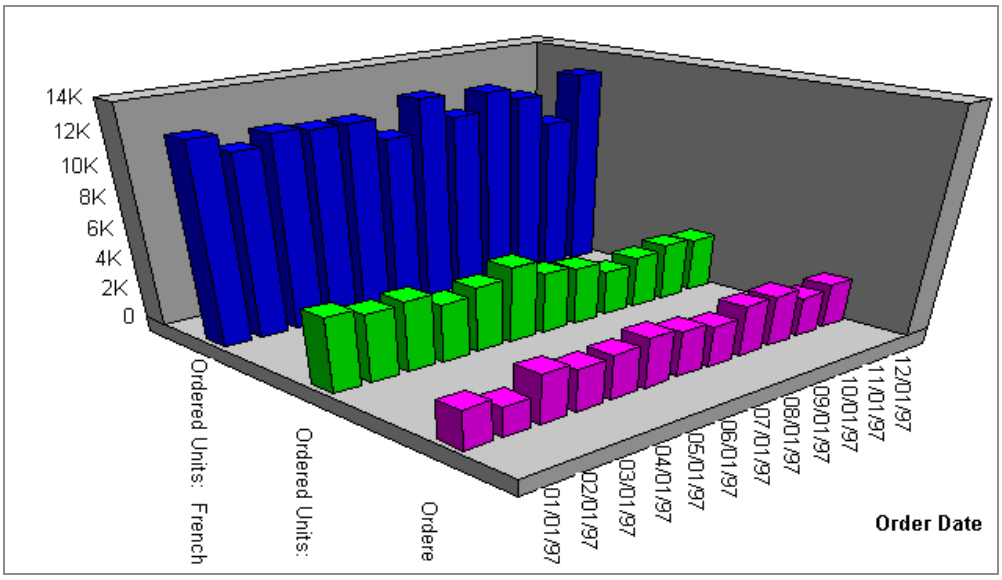
```
DATE/I4YM=DATE/100
```

# Including Date Fields in a Graph

The following example illustrates how month-first formatted date fields are displayed in a graph.

```
SET GRMERGE = ON
GRAPH FILE GGORDER
SUM QUANTITY
ACROSS ORDER_DATE
BY PRODUCT_DESC
WHERE PRODUCT_DESC EQ 'French Roast' OR 'Hazelnut' OR 'Kona' AND
ORDER_DATE GE '010197'
END
```

The output is:




# Basic Date Support for X and Y Axes

OLDDATES can be manipulated accordingly with the usage of YRTHRESH and DEFCENT SET parameters. If you do not specify the YRTHRESH and DEFCENT commands for dates with the Y format (for example, YMD, MDY, DMY, YM, etc.), the code will assume the format 19*XX*.

# Date Support Limitations

- The following date formats are supported:
  - SHORT (18) is completely numeric, such as 12/13/52 or 3:30pm.
  - MEDIUM (19) is longer, such as Jan 12, 1952.
  - LONG (20) is longer, such as January 12, 1952 or 3:30:32pm.
  - FULL (21) is almost completely specified, such as Tuesday, April 12, 1952 AD or 3:30:42pm PST.

  The default date format for the X and Y axes is MEDIUM. You can overwrite the default by using one of the following API calls (where *xx* is one of the numbers listed above):

```
setTextFormatPreset(getX1Label(),xx); // for X Axis
```

```
setTextFormatPreset(getY1Label(),xx); // for Y Axis
```

The default date format for Data Text is LONG. This only applies to graphs with dates on the Y axis. Currently this format is not supported on the X axis. You can overwrite the default by using the following API call:

```
setDataTextFormat(xx);
```

For more information, see Applying Custom Styling to a Graph.

- In a graph with dates on the X axis and numeric fields on the Y axis, the tool tip displays the data format of the graph by default. This means that a date value will display its raw GMT value in milliseconds. This does not occur for dates on the Y axis and strings on the X axis, because the data format is already in date format.
- DATETIME is not fully supported.
- The ability to set the start and end dates for the appropriate axis is not supported.
- The ability to set the step for dates is not supported.

# Formatting Dates for Y-Axis Values

You can display date-formatted numbers for Y-axis fields and on tool tips. The following date formats are supported:

| Display Format | Corresponding WebFOCUS Format |
|---|---|
| yy/mm/dd | YMD |
| yy/mm | YM |
| mm/dd/yyyy | MDYY |
| mm/dd/yy | MDY |
| mm/dd | MD |

For complete details on date formats, see the *Describing Data With ibi™ WebFOCUS® Language* manual.

# Refining the Data Set For Your Graph

After selecting field values for the X and Y axes, you may wish to limit the data that displays in your graph. You can do this by creating WHERE statements. A WHERE statement limits data by creating parameters the data must satisfy before it is included in the data set.

For details on WHERE, WHERE TOTAL, and IF phrases, see Selecting Records for Your Report.

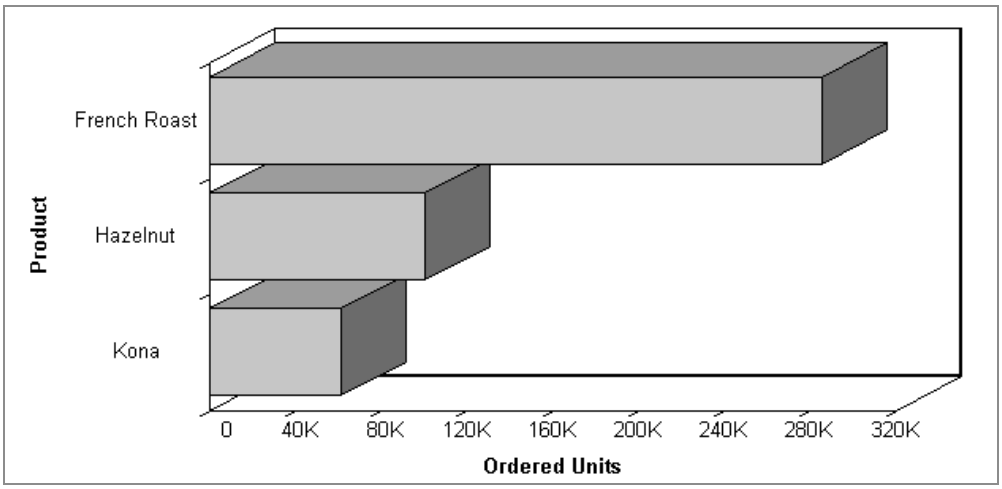
# Specifying WHERE Criteria in a Graph Request

The syntax for WHERE, WHERE TOTAL, and IF phrases in a GRAPH request is identical to that used in a TABLE request.

The following graph request shows data for specific product descriptions, namely French Roast, Hazelnut, or Kona.

```
GRAPH FILE GGORDER
SUM QUANTITY
BY PRODUCT_DESC
WHERE PRODUCT_DESC EQ 'French Roast' OR 'Hazelnut' OR 'Kona'
END
```

The output is:




# Displaying Missing Data Values in a Graph

You can display missing data values (in a bar graph, line graph, area graph, or any variation of these graph types) in one of the following formats:

- **Graph as zero.** In bar graphs, a bar appears on the zero line. In line graphs, a solid line connects the missing value with the succeeding value. In area graphs, the area appears on the zero line.
- **Graph as gap.** In all graph types (bar, line, or area), missing values appear as a gap in the graph.
- **Dotted line to zero.** In line graphs, a dotted line connects the missing value with the succeeding value. In 3D bar graphs, solid lines outline the flat bar corresponding to the missing value. In 2D bar graphs, a gap appears in the graph. In area graphs, a transparent area extends down to the zero line and then up to the succeeding value.
- **Interpolated dotted line.** In a line graph, missing values appear as an interpolated dotted line that connects the plot points immediately preceding and succeeding the missing value. In bar and area graphs, missing values display as an interpolated (transparent) bar or area.

  **Note:** You can specify a default value (other than the default value of zero) to represent missing data. To do this use a DEFINE command. For details, see Handling Records With Missing Field Values.

# Display Missing Values in a Graph

```
GRAPH FILE filename
.
.
.
SET VZERO={ON|OFF}
ON GRAPH SET STYLE *
*GRAPH_SCRIPT
API call
*END
ENDSTYLE
END
```

where:

**ON**

Displays missing values as zero. An API call is not necessary when VZERO is set to ON. Alternatively, you can add ON GRAPH SET VZERO ON.

**OFF**

Displays missing values as a gap, a dotted line to zero, or, an interpolated dotted line, depending on the API call that is added. Alternatively, you can add ON GRAPH SET VZERO OFF.

**API call**

Determines how missing values display in the graph when VZERO is set to OFF. Possible values are:

`setFillMissingData(0);` displays missing values as a gap.

`setFillMissingData(1);` displays missing values as a dotted line to zero.

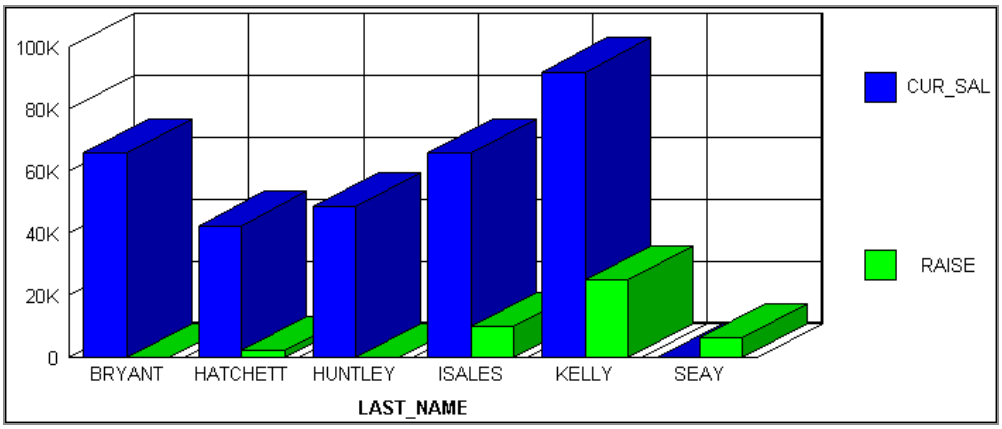
`setFillMissingData(2);` displays missing values as an interpolated dotted line.

# Displaying Missing Values as Zero In a Graph

The following illustrates how missing values are represented in a bar graph when designated to appear as zero. The CURR_SAL value for Seay is missing, as well as the RAISE value for Bryant and Huntley.

```
SET LOOKGRAPH=BAR
SET GRAPHEDIT=SERVER
SET GRID=ON
SET VZERO=ON
GRAPH FILE MSFATIA
SUM CUR_SAL
RAISE
ACROSS LAST_NAME
ON GRAPH SET STYLE *
*GRAPH_SCRIPT
setTextRotation(getO1Label(),0);
*END
ENDSTYLE
END
```

The output is:



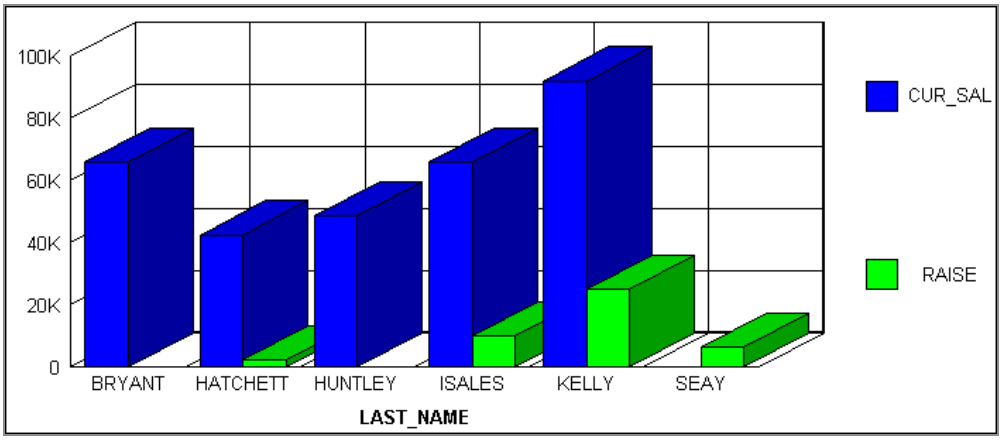

# Displaying Missing Values as a Gap

The following illustrates how missing values are represented in a bar graph when designated to appear as a gap. The CURR_SAL value for Seay is missing, as well as the RAISE value for Bryant and Huntley.

```
SET LOOKGRAPH=BAR
SET GRAPHEDIT=SERVER
SET GRID=ON
SET VZERO=OFF
GRAPH FILE MSFATIA
SUM CUR_SAL
RAISE
```

```
ACROSS LAST_NAME
ON GRAPH SET STYLE *
*GRAPH_SCRIPT
setFillMissingData(0);
setTextRotation(getO1Label(),0);
*END
ENDSTYLE
END
```

The output is:



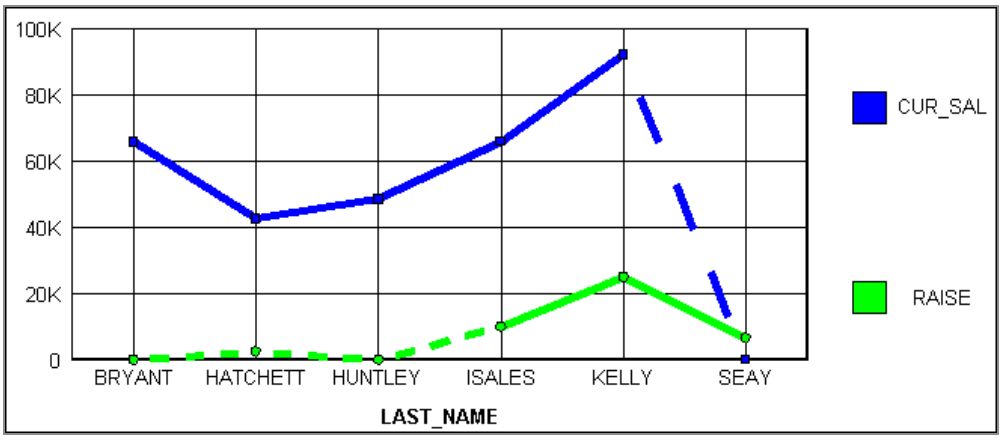

# Displaying Missing Values as a Dotted Line to Zero

The following illustrates how missing values are represented in a line graph when designated to appear as a dotted line to zero. The CURR_SAL value for Seay is missing, as well as the RAISE value for Bryant and Huntley.

```
SET LOOKGRAPH=LINE
SET GRAPHEDIT=SERVER
SET GRID=ON
SET VZERO=OFF
GRAPH FILE MSFATIA
SUM CUR_SAL
RAISE
ACROSS LAST_NAME
ON GRAPH SET STYLE *
*GRAPH_SCRIPT
setFillMissingData(1);
setTextRotation(getO1Label(),0);
*END
```

```
ENDSTYLE
END
```

The output is:

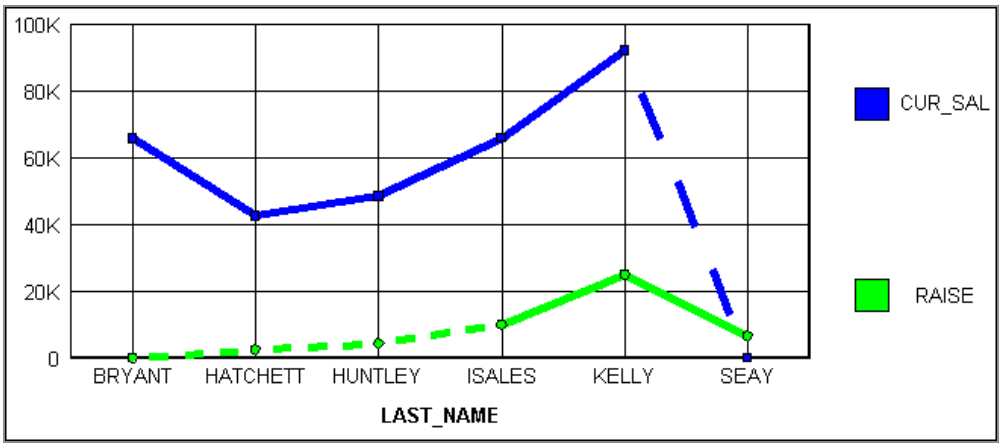



# Displaying Missing Values as an Interpolated Dotted Line

The following illustrates how missing values are represented in a line graph when designated to appear as an interpolated dotted line. The CURR_SAL value for Seay is missing, as well as the RAISE value for Bryant and Huntley.

```
SET LOOKGRAPH=LINE
SET GRAPHEDIT=SERVER
SET GRID=ON
SET VZERO=OFF
GRAPH FILE MSFATIA
SUM CUR_SAL
RAISE
ACROSS LAST_NAME
ON GRAPH SET STYLE *
*GRAPH_SCRIPT
setFillMissingData(2);
setTextRotation(getO1Label(),0);
*END
ENDSTYLE
END
```

The output is:




# Applying Conditional Styling to a Graph

You can add further value to your graph by using conditional styling to highlight certain defined data with specific styles and colors.

For example, you can apply the color red to all departments that did not reach their sales quotas and apply the color black to all departments that did reach their sales quotas. In this example, the user can view quickly which departments did or did not reach their quotas. To examine how the results of one department may impact the results of a second department, you may want to provide a drill-down to a report that examines this possibility.

You can apply color to the following graph types:

- Bar graphs.
- Three-dimensional graphs with noncontinuous plot points.
- Pie graphs.
- Stack charts.

You can apply conditional styling using StyleSheets.

**Note:** Conditional styling is only supported for Y-axis values.

# Apply Conditional Styling to a Graph

```
TYPE=DATA,[COLUMN|ACROSSCOLUMN=Nn,]COLOR=color, [WHEN=expression,]$
```

where:

**DATA**

Identifies data as the graph component to which color is being applied. This value must appear at the beginning of the declaration.

**COLUMN|ACROSSCOLUMN**

Is the graph subcomponent to which you want to apply color. Valid graph subcomponents are COLUMN and ACROSSCOLUMN.

**Nn**

Identifies a column by its position in the report. To determine this value, count BY fields, display fields, and ROW-TOTAL fields, from left to right, including NOPRINT fields. For details, see Identifying a Report Component in a WebFOCUS StyleSheet.

**color**

Identifies the color that you want to apply to the graph component or subcomponent. For a list of valid colors, see Formatting Report Data.

**expression**

Is any Boolean expression that specifies conditions for applying the specified color to the graph component. The expression must be valid on the right side of a COMPUTE command. For details, see Using Expressions.

**Note:** IF... THEN ... ELSE logic is not necessary in a WHEN clause and is not supported.

All non-numeric literals in a WHEN expression must be specified within single quotation marks.

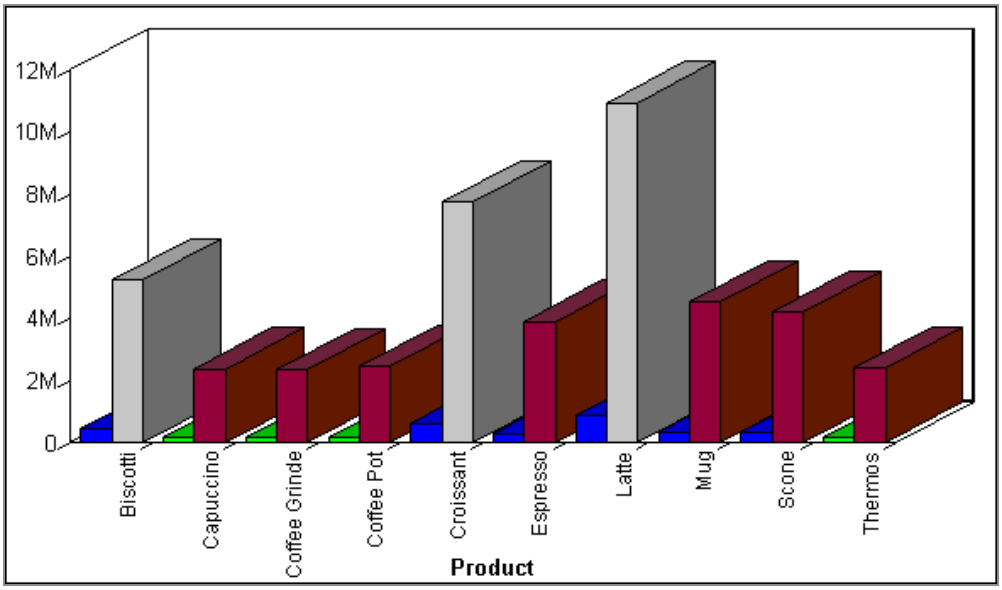
# Applying Conditional Styling to a Graph

The following illustrates how you can apply conditional styling to a graph.

```
   GRAPH FILE GGSALES
   SUM UNITS DOLLARS ACROSS PRODUCT
   ON GRAPH SET STYLE *
1. TYPE=DATA,COLOR=BLUE,$
2. TYPE=DATA,ACROSSCOLUMN=N2,COLOR=FIREBRICK,$
3. TYPE=DATA,ACROSSCOLUMN=N2,COLOR=SILVER,WHEN=N2 GT 5000000,$
4. TYPE=DATA,ACROSSCOLUMN=N1,COLOR=LIME,WHEN=N1 LT 200000,$
   ENDSTYLE
   END
```

1. This line specifies blue as the default data color.
2. This line specifies firebrick as the default color for the DOLLARS column.
3. This line specifies silver as the color for the DOLLARS column when the value for DOLLARS is greater than five million.
4. This line specifies lime as the UNITS column color when the number of UNITS is less than two hundred thousand.

The output is:




# Linking Graphs to Other Resources

To drill down to a more detailed level of information in a graph, you can link a procedure (FOCEXEC) or a URL to one or more values in your graph. When you run your graph, the

selected values become "hot spots" that invoke the underlying procedure, JavaScript function, or URL.

The JSURLS parameter includes JavaScript or VBScript files in an HTML graph. This allows you to customize the display of WebFOCUS HTML graphs with any JavaScript or VBScript functions. The JavaScript and VBScript files are the last files loaded, and are loaded in the order they are listed, allowing complete customization of the HTML page.

This feature works with any graph format that outputs an HTML document, for example JSCHART and PCHOLD FORMAT PNG.

In addition, when a WebFOCUS graph is run, a set of pre-defined JavaScript functions is invoked. Using JSURLS, you can disable or modify these default functions. To view the full set of pre-defined JavaScript functions, see /ibi/WebFOCUSxx/ibi_apps/ibi_html/javaassist/ibi/html/js/ibigl.js.

The syntax is:

```
SET JSURLS='/file1 [/file2] [/file3]...'
```

where:

**/file1 [/file2] [/file3]...**

Are the files that contain JavaScript or VBScript. If there is more than one js file, the delimiter is a blank and the values must be enclosed in single quotes. Files must be in a location that is accessible by the web server. The total length of the value is limited to 256 bytes.

You can reference files with a URL.

# Link a Graph to Another Request

```
TYPE=DATA,[COLUMN|ACROSSCOLUMN=Nn,]COLOR=color,[WHEN=expression,]
FOCEXEC=fex[(parameters ...),]$
```

where:

**DATA**

Identifies Data as the graph component to which the user is applying the color. The TYPE attribute and its value must appear at the beginning of the declaration.

**COLUMN|ACROSSCOLUMN**

Is the graph subcomponent to which you want to apply color. Valid graph subcomponents are COLUMN and ACROSSCOLUMN.

**color**

Identifies the color that you want to apply to the graph component or subcomponent. For a list of valid colors, see Formatting Report Data.

**Nn**

Identifies a column by its position in the report. To determine this value, count BY fields, display fields, and ROW-TOTAL fields, from left to right, including NOPRINT fields. For more information, see Identifying a Report Component in a WebFOCUS StyleSheet.

**FOCEXEC=fex**

Identifies the file name of the linked procedure to run when a user selects the report object.

**parameters**

Are values to be passed to the procedure. You can pass one or more values, using any combination of the following methods:

- You can specify a constant value, enclosed in single quotation marks.
- You can specify the name or the position of a graph column.
- You can specify the name of a Dialogue Manager amper variable to pass its value.
- You can use amper variables only in inline StyleSheets.

**Note:** The usual use of an amper variable is to pass a constant value, in which case, it would have to be embedded in single quotation marks. For example:

```
'&ABC'.
```

The method you can use to pass values can vary, depending on the method you use to execute the hyperlink. You can pass one or more values. The entire string of values must be enclosed in parentheses, and separated from each other by a blank space.

**expression**

Is any Boolean expression that specifies conditions for applying the specified color to the graph component. The expression must be valid on the right side of a COMPUTE command. For details, see Using Expressions.

**Note:** IF ... THEN ... ELSE logic is not necessary in a WHEN clause and is not supported.

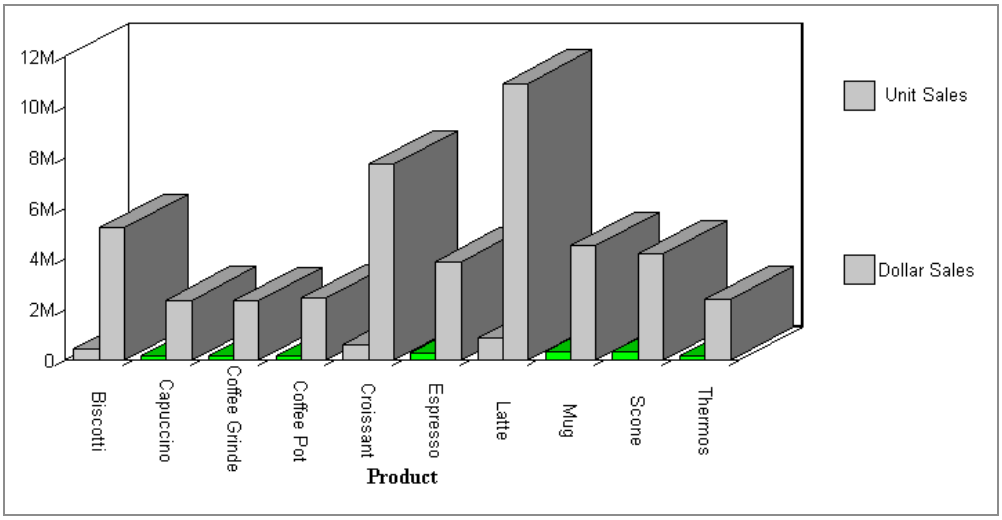
All non-numeric literals in a WHEN expression must be specified within single quotation marks.

# Linking to Additional Reports or Graphs

In this example, when the value for UNITS is less than four hundred thousand, the color is lime and you can drill-down to a detail report.

```
GRAPH FILE GGSALES
SUM UNITS DOLLARS ACROSS PRODUCT
ON GRAPH SET STYLE *
TYPE=DATA,COLOR=SILVER,$
TYPE=DATA,ACROSSCOLUMN=N1,COLOR=LIME,WHEN=N1 LT 400000,FOCEXEC=GRAPH2,$
ENDSTYLE
END
```

The output is:



# Link to a URL

You can define a link from any component to any URL including webpages, websites, Servlet programs, or non-World Wide Web resources, such as an email application. After you have defined a link, you can select the component to access the URL.

The links you create can be dynamic. With a dynamic link, your selection passes the value of the selected component to the URL. The resource uses the passed value to dynamically determine the results that are returned. You can pass one or more parameters. For details, see Creating Parameters.

```
TYPE=type, [subtype], URL=url[(parameters ...)], [TARGET=frame,] [ALT =
'description',] $
```

where:

**type**

Identifies the report or graph component that you select in the web browser to execute the link. The TYPE attribute and its value must appear at the beginning of the declaration.

**subtype**

Are any additional attributes, such as COLUMN, LINE, or ITEM, that are needed to identify the report component that you are formatting. For information on identifying components, see Identifying a Report Component in a WebFOCUS StyleSheet.

**url**

Identifies any valid URL, including a URL that specifies a WebFOCUS Servlet program, or the name of a report column enclosed in parentheses whose value is a valid URL to which the link will jump.

**Note:**

- The maximum length of a URL=*url* argument, including any associated variable=object parameters, is limited by the maximum number of characters allowed by the browser. For information about this limit for your browser, search on your browser vendor's support site. The URL argument can span more than one line, as described in Creating and Managing a WebFOCUS StyleSheet.

  Note that the length of the URL is limited by the maximum number of characters

allowed by the browser. For information about this limit for your browser, search on your browser vendor's support site.

- If the URL refers to a WebFOCUS Servlet program that takes parameters, the URL must end with a question mark (?).

**parameters**

Values that are passed to the URL. For details, see Creating Parameters.

**frame**

Identifies the target frame in the webpage in which the output from the drill-down link is displayed. For details, see Specifying a Target Frame.

**description**

Is a textual description of the link supported in an HTML report for compliance with Section 508 accessibility. Enclose the description in single quotation marks.

The description also displays as a pop-up description when your mouse or cursor hovers over the link in the report output.

# Link to a JavaScript Function

You can use a StyleSheet to define a link to a JavaScript function from any report or graph component. After you have defined the link, you can select the component to execute the JavaScript function.

Just as with drill-down links to procedures and URLs, you can specify optional parameters that allow values of a component to be passed to the JavaScript function. The function will use the passed value to dynamically determine the results that are returned to the browser. For details, see Creating Parameters.

**Note:**

- JavaScript functions can, in turn, call other JavaScript functions.
- You cannot specify a target frame if you are executing a JavaScript function. However, the JavaScript function itself can specify a target frame for its results.

```
TYPE=type, [subtype], JAVASCRIPT=function[(parameters ...)], $
```

where:

**type**

Identifies the report component that you select in the web browser to execute the link. The TYPE attribute and its value must appear at the beginning of the declaration.

**subtype**

Are any additional attributes, such as COLUMN, LINE, or ITEM, that are needed to identify the report component that you are formatting. See Identifying a Report Component in a WebFOCUS StyleSheet for details.

**function**

Identifies the JavaScript function to run when you select the report component.

The maximum length of a JAVASCRIPT=*function* argument, including any associated parameters, is 2400 characters and can span more than one line. If you split a single argument across a line, you need to use the \ character at the end of the first line, as continuation syntax. If you split an argument at a point where a space is required as a delimiter, the space must be before the \ character or be the first character on the next line. The \ character does not act as the delimiter.

In this example,

```
JAVASCRIPT=myfunc(COUNTRY \
CAR MODEL 'ABC'),$
```

the argument correctly spans two lines.

**Note:**

- You can use the SET JSURLS command or the Dialogue Manager -HTMLFORM command to embed the chart into an HTML document in which the function is defined.
- When you have an HTML document called by -HTMLFORM, ensure that the file extension is .HTM (not .HTML).

For more information about the -HTMLFORM command, see the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

**parameters**

Values that are passed to the JavaScript function. For details, see Creating Parameters.

# Create Multiple Drill-Down Links

```
TYPE=type, [subtype], DRILLMENUITEM='description'|'DrillDown n',
     type_of_link
```

where:

**type**

Identifies the component that you select in the web browser to execute the link. The TYPE attribute and its value must appear at the beginning of the declaration.

**subtype**

Are any additional attributes, such as COLUMN, LINE, or ITEM, that are needed to identify the component that you are formatting. See Identifying a Report Component in a WebFOCUS StyleSheet for information on identifying report components.

**description**

Is the text that appears on the pop-up menu of drill-down options on the output. The default value is DrillDown *n*, where *n* is a consecutive integer, such as DrillDown 1, DrillDown 2, and so on.

**type_of_link**

Is the type of link, for example, a link to a detail report or URL. For a summary of valid values, see Summary of Drill-Down Links.

# Syntax Guidelines

You can create multiple drill-down links from a component on a summary request, chosen from any combination of supported actions. For example, you can create links to a detail report, chart, or Maintain procedure, a JavaScript function, and a URL. When you click a component in the summary request, a pop-up menu appears listing the drill-down options.

This feature does not apply to headings or footings,

When you create multiple drill-down links, you cannot specify a single drill-down action (for example, FOCEXEC or URL) before the first DRILLMENUITEM.

The menu created by the DRILLMENUITEM keyword is styled using a Cascading Stylesheet file. The file is /ibi/WebFOCUS*xx*/ibi_apps/ibi_html/javaassist/ibi/html/js/multidrill.css, where *xx* is the version and major release number of WebFOCUS.

**Tip:** You can make changes to the /ibi/WebFOCUS82/ibi_apps/ibi_html/javaassist/ibi/html/js/multidrill.css file to affect the font, size, and color of the DRILLMENUITEM menu.

- Make a backup of the /ibi/WebFOCUS82/ibi_apps/ibi_html/javaassist/ibi/html/js/multidrill.css file.
- Modify the multidrill.css file, with the desired changes.
- Rename the multidrill.css.gz file. This file resides in the same location as the multidrill.css file.
- Clear cache.
- Restart the WebFOCUS Reporting Server.

# Summary of Drill-Down Links

You can link to:

- Another request. The StyleSheet attribute is FOCEXEC.
- A URL. The StyleSheet attribute is URL. You pass a valid URL.

  Note that the length of the URL is limited by the maximum number of characters allowed by the browser. For information about this limit for your browser, search on the support site for your browser vendor.
- A URL from a field. The StyleSheet attribute is URL. You pass the name of a report column whose value is a valid URL to which the link will jump.
- A JavaScript function. The StyleSheet attribute is JAVASCRIPT.
- A WebFOCUS Maintain procedure. The StyleSheet attribute is URL with the keyword MNTCON EX. For details on the syntax, see Linking to a Maintain Data Procedure.
- A WebFOCUS compiled Maintain procedure. The StyleSheet attribute is URL with the keyword MNTCON RUN. For details on the syntax, see Linking to a Maintain Data Procedure.

# Creating Parameters

Parameters allow you to specify criteria and conditions for the linked (drill down) report. By defining parameters, you can control the amount and type of information to retrieve when you click on a hot spot.

For complete details, see Linking a Report to Other Resources.

# Adding Labels to a Graph

Adding labels to your graph helps provide important information about what the data in your graph represents. You may choose to add headings and/or footings to your graph, as well as horizontal (X) and vertical (Y) axis labels.

You can add a heading or footing to your graph using the HEADING or FOOTING phrase. The syntax is the same as that used for headings and footings in TABLE requests. You can also embed field values in graph headings and footings. This capability is particularly useful for annotating graphs that contain multiple sort fields.

For details on headings, footings, and embedded fields, see Using Headings, Footings, Titles, and Labels.

**Note:** If your graph labels or legends are not appearing correctly when you run your graph, see Change Color Settings for details on correcting this.

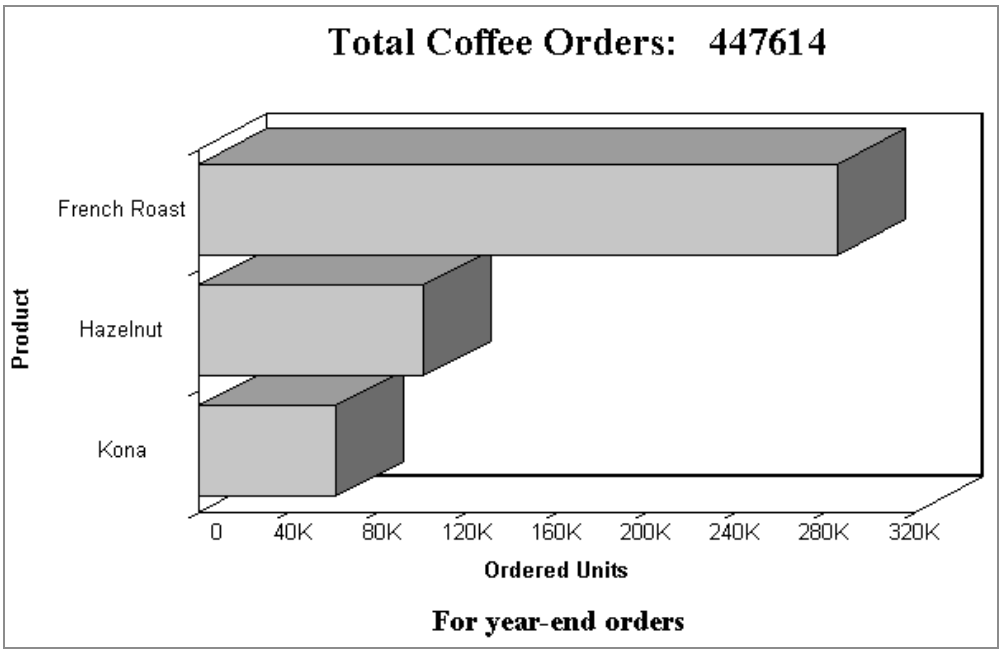
# Adding a Heading and Footing to a Graph

The following illustrates how to add a heading with an embedded field value to your graph. In this example, the heading is "Total Coffee Orders" with the embedded field TOT.QUANTITY.

```
GRAPH FILE GGORDER
HEADING CENTER
"Total Coffee Orders: <TOT.QUANTITY "
SUM QUANTITY
BY PRODUCT_DESC
WHERE PRODUCT_DESC EQ 'French Roast' OR 'Hazelnut' OR 'Kona'
FOOTING CENTER
```

```
"For year-end orders"
END
```

The output is:




# Adding Vertical (Y-axis) and Horizontal (X-axis) Labels to a Graph

Vertical (Y-axis) and horizontal (X-axis) graph labels are placed on the graph according to the display fields and sort fields specified in the request. The titles that appear on the graph are the titles that appear in the Master File for that particular field.

The vertical (Y-axis) title of the graph is determined by the display field. Note that when the number of Y-axis labels is greater than one, the labels do not appear along the Y-axis. Instead, the labels appear in a legend that provides the names of the fields being graphed.

The horizontal (X-axis) title of the graph is determined by the sort field.

You can replace a title by using an AS phrase in the GRAPH request.

# Applying Custom Styling to a Graph

You can customize your graph using StyleSheets and SET commands. You can set the graph width and height, set fixed scales for the X and Y axes, enable the Graph Editor, and use Graph API calls to further customize your graph.

For details on customizing graph headings and footings, see Using Headings, Footings, Titles, and Labels.

# Setting the Graph Height and Width

The width (or horizontal axis) of each graph, which includes any surrounding text, is automatically set to 760 pixels. When setting the graph width, you should allow for the inclusion of any text required for the vertical axis and its labels along the left margin.

To maximize display space, you can limit the size of your labels through the use of either AS phrases or DECODE expressions.

The height (or vertical axis) of your graph is automatically set to 405 pixels.

The vertical axis is automatically set (VAUTO=ON) to cover the total range of plotted values. The height of the axis is set as high as possible (taking into consideration the presence of any headings or footings and the need to provide suitably rounded vertical class markers). The range is divided into intervals called "classes." The scale is normalized to provide class values rounded to the appropriate multiples and powers of 10 for the intervals plotted on the axis.

# Set the Graph Width

```
SET HAXIS={nn|760}
```

where:

**{nn|760}**

Is a positive numeric value. The default is 760 pixels.

**Note:** The maximum HAXIS size for SVG graphs is 40 inches.

# Set the Graph Height

```
SET VAXIS={nn|400}
```

where:

**{nn|400}**

Is a positive numeric value. The default is 400 pixels.

**Note:** The maximum VAXIS size for SVG graphs is 40 inches.

# Customizing Graphs Using SET Parameters

The GRAPH environment includes a set of parameters that control the appearance of the graph and offer some additional control when you run the request.

For example, the BSTACK parameter enables you to specify that the bars on a bar graph are to be stacked rather than placed side by side.

# Use SET Parameters With GRAPH Requests

To set the parameters that control the GRAPH environment, use the appropriate variation of the SET parameter.

```
SET parameter=value,parameter=value...
```

For a list of supported GRAPH parameters, see Values and Functions of SET Parameters for Graphs.

**Note:**

- Repeat the command SET on each new line.
- When entering more than one parameter on a line, separate them with commas.
- You can use unique truncations of parameter names. You must make sure that they are unique.

# Using SET Parameters With GRAPH Requests

The following shows how to set the height (Y-axis) and width (X-axis) for a graph.

```
SET HAXIS=75,VAXIS=40
GRAPH FILE filename
.
.
.
END
```

# Values and Functions of SET Parameters for Graphs

| Graph SET Parameter | Values | Parameter Function |
|---|---|---|
| 3D | ON\|OFF | When ON, a three-dimensional chart is produced. When OFF, a two-dimensional chart is produced. ON is the default. |
| AUTOTICK | ON\|OFF | When ON, tick mark intervals are automatically set. ON is the default. (See also HTICK and VTICK.) |
| BARNUMB | ON\|OFF | When ON, places the summary values at the ends of the bars on bar graphs or slices on pie graphs. OFF is the default. |

| Graph SET Parameter | Values | Parameter Function |
|---|---|---|
| BSTACK | ON\|OFF | When ON, specifies that the bars on a bar graph are to be stacked rather than placed side by side. OFF is the default. |
| GRAPHEDIT | graphedit | As of WebFOCUS 8.0, this parameter has been deprecated. |
| GRID | ON\|OFF | When ON, specifies that a grid is to be drawn on the graph at the horizontal and vertical class marks (see also VGRID). OFF is the default. |
| HAUTO | ON\|OFF | When ON, specifies automatic scaling of the horizontal axis unless overridden by the user. If OFF, user must supply values for HMAX and HMIN. ON is the default. |
| HAXIS | | Specifies the width in characters of the horizontal axis. This parameter can be adjusted for graphs generated offline. HAXIS is ignored for online displays since the width of the graph is automatically adjusted to the width of the display area. |

| Graph SET Parameter | Values | Parameter Function |
|---|---|---|
| HCLASS | nnn | Specifies the horizontal interval mark when AUTOTICK=OFF (see also HTICK). |
| HISTOGRAM | ON\|OFF | When ON, a histogram is drawn instead of a curve when values on the horizontal axis are not numeric. ON is the default. |
| HMAX | nnn | Specifies the maximum value on the horizontal axis when the automatic scaling is not used (HAUTO=OFF). |
| HMIN | nnn | Specifies the minimum value on the horizontal axis when the automatic scaling is not used (HAUTO=OFF). |
| HSTACK | ON\|OFF | When ON, specifies that the bars on a histogram are to be stacked rather than placed side by side. OFF is the default. |
| HTICK | nnn | Specifies the horizontal axis tick mark interval when AUTOTICK is OFF (see also HCLASS). |
| LOOKGRAPH | option | Specifies the graph type. For more information, see Determining Graph Styles Using LOOKGRAPH. |

| Graph SET Parameter | Values | Parameter Function |
|---|---|---|
| PIE | ON\|OFF | When ON, specifies that a pie graph is desired. OFF is the default. |
| VAUTO | ON\|OFF | When ON, specifies automatic scaling of the vertical axis unless overridden by the user. If OFF, the user must supply values for VMAX and VMIN. ON is the default. |
| VAXIS | | Specifies page length in lines. This parameter can be adjusted for graphs generated offline. VAXIS is ignored for online displays since the height of the graph is automatically adjusted to the display area. |
| VCLASS | nnn | Specifies the vertical interval mark when AUTOTICK=OFF (see also VTICK). |
| VGRID | ON\|OFF | When ON, specifies that a grid is to be drawn on the graph at the horizontal and vertical class marks (see also GRID). OFF is the default. |
| VMAX | nnn | Specifies the maximum value on the vertical axis |

| Graph SET Parameter | Values | Parameter Function |
|---|---|---|
| | | when the automatic scaling is not used (VAUTO=OFF). |
| VMIN | nnn | Specifies the minimum value on the vertical axis when the automatic scaling is not used (VAUTO=OFF). |
| VTICK | nnn | Specifies the vertical axis tick mark interval when AUTOTICK is OFF (see also VCLASS). |
| VZERO | ON\|OFF | Determines whether values along the Y-axis are stored or ignored. If ON, missing data along the Y-axis is treated as zero. If OFF, missing data along the Y-axis is ignored and values are not stored in the plot matrix. OFF is the default. |

# Setting Fixed Scales for the X-Axis

The horizontal scale is automatically set to cover the total range of values to be plotted (HAUTO=ON). The range is divided into intervals called "classes." The scale is normalized to provide class values rounded to the appropriate multiples of 10 for the intervals plotted on the axis.

To assign fixed upper and lower limits (useful when producing a series of graphs where consistent scales are needed), you can turn off the automatic scaling mechanism and set new limit values by setting HAUTO=OFF.

# Set Fixed Scales for the X-Axis

```
SET HAUTO=OFF, HMAX=nn, HMIN=nn
```

where:

**HAUTO**

Is the automatic scaling facility. If HAUTO is ON, any values for HMAX and HMIN are overridden.

**HMAX=nn**

Sets the upper limit on the horizontal axis. The default is 0.

**HMIN=nn**

Controls the lower limit on the horizontal axis when HAUTO is OFF. The default is 0.

**Note:**

- When entering several SET parameters on one line, separate them with commas.
- If you define limits that do not incorporate all of the data values, OVER or UNDER will be displayed to indicate that some of the data extracted is not reflected on the graph.

# Setting Fixed Scales for the Y-Axis

To give the vertical scale fixed upper and lower limits (useful when producing a series of graphs where consistent scales are needed), you can turn off the automatic scaling mechanism and set fixed limits using the SET VAUTO=OFF command.

# Set Fixed Scales for the Y-Axis

```
SET VAUTO=OFF, VMAX=nn, VMIN=nn
```

where:

**VAUTO**

Is the automatic scaling facility. If VAUTO is ON, any values for VMAX and VMIN are overridden.

**VMAX=nn**

Sets the upper limit on the vertical axis when VAUTO is OFF. The default is 0.

**VMIN=nn**

Controls the lower limit on the vertical axis when VAUTO is OFF. The default is 0.

**Note:**

- When entering several SET parameters on one line, separate them with commas.
- If you define limits that do not incorporate all of the data values, OVER or UNDER will be displayed to indicate that some of the data extracted is not reflected on the graph.

# Customizing Graphs Using the Graph API and HTML5 JSON Properties

You can further enhance your graph output by manually adding API calls inside the ON GRAPH SET STYLE * and ENDSTYLE commands in the GRAPH request. If you are creating an HTML5 graph, you can also include JavaScript Object Notation (JSON) methods and properties. When you save changes the corresponding API calls and properties will be written to the graph StyleSheet.

For reference information about the Graph API, see the *ibi™ WebFOCUS® Graphics* manual.

When you include both JSON and API calls in the StyleSheet section of the request, the API calls are parsed first, then the JSON. Therefore, if the JSON sets the same property as an API call, the JSON will take precedence. In general, the later declarations overwrite the properties set in earlier declarations.

# Customize a Graph Using the Graph API

```
GRAPH FILE filename
graph commands
ON GRAPH SET STYLE *
*GRAPH_SCRIPT
API calls
*END
```

```
*GRAPH_JS
JSON
*END
```

```
WEBFOCUS StyleSheet commands
ENDSTYLE
END
```

where:

**filename**

Specifies a data source for the graph.

**API calls**

Are API calls. They must be included in a GRAPH_SCRIPT block within *GRAPH_SCRIPT and *END declarations. A request can contain multiple GRAPH_SCRIPT blocks anywhere within the style section. For reference information about the Graph API, see the *ibi™ WebFOCUS® Graphics* manual.

**JSON**

Are JSON methods and properties that apply to HTML5 graph output. They must be included in a GRAPH_JS block within *GRAPH_JS *END declarations. A request can contain multiple GRAPH_JS blocks anywhere within the style section. For reference information about the JSON methods and properties, see the *Creating HTML5 Charts With ibi™ WebFOCUS® Language* manual.

**WEBFOCUS StyleSheet commands**

For details on StyleSheet commands, see Creating and Managing a WebFOCUS StyleSheet.

# Customizing Graphs Using the Graph API

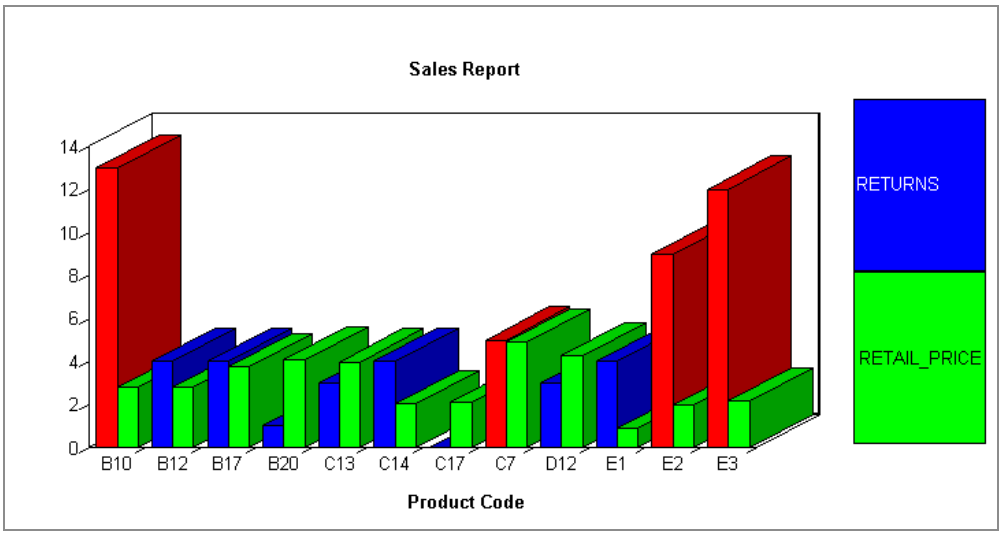
The following annotated example illustrates how to customize a graph using ON GRAPH SET STYLE *. The Graph API code is highlighted in the request.

```
   GRAPH FILE SALES
   SUM RETURNS
   RETAIL_PRICE
   ACROSS PROD_CODE AS 'Product Code'
   ON GRAPH SET STYLE *
   *GRAPH_SCRIPT
1. setLegendMarkerPosition(4);
2. setO1LabelRotate(0);
3. setTitleString("Sales Report");
4. setTextJustHoriz(getTitle(),1);
   *END
   DEFMACRO=COND0001, MACTYPE=RULE, WHEN=RETURNS GT 4,$
   TYPE=DATA,MACRO=COND0001,ACROSSCOLUMN=RETURNS,COLOR=RED,$
   ENDSTYLE
   END
```

where:

1. Displays legend text inside the legend marker.
2. Displays the X-axis labels horizontally.
3. Displays the title (Sales Report) without quotes.
4. Centers the title.

The output is:




# Saving a Graph as an Image File

You can save graph output to an image file using the GRAPHSERVURL parameter or the JSCOM3 configuration on the WebFOCUSWebFOCUS Reporting Server. Saving graph output as an image file is useful when you want to create a single PDF or HTML report that contains multiple outputs, such as output from a TABLE request and a GRAPH request. You can distribute this type of report using ReportCaster.

For details, see Saving a Graph as an Image File Using GRAPHSERVURL.

# Saving a Graph as an Image File Using GRAPHSERVURL

The GRAPHSERVURL parameter enables users who are running against a server environment where the WebFOCUS Reporting Server is installed on a z/OS, Windows, or UNIX machine to save graph output as a GIF file. GIF images can be embedded in a PDF or HTML report.

The GRAPHSERVURL parameter sends an http request to the machine that has the WebFOCUS Graph Servlet. The graph image is created by the WebFOCUS Graph Servlet, and the image is sent back to a temporary location on the WebFOCUS Reporting Server (if an Allocation has not been specified), or to the location specified in a FILEDEF command. You may use the Allocation Wizard to create a FILEDEF command.

# Save a Graph as an Image File Using GRAPHSERVURL

**Procedure**

1. Install JDK as per the requirements in the *ibi™ WebFOCUS®® Installation and Configuration* manual for your platform.
2. Create a procedure that produces the image, and set GRAPHSERVURL in the procedure to the URL that invokes the WebFOCUS Graph Servlet. For example,

   ```
   SET GRAPHSERVURL=http://hostname/ibi_apps/IBIGraphServlet
   ```

   where:

   **hostname**

   Is the name of the machine where WebFOCUS is installed.

   For more details, see Save a Graph as an Image File.
3. Run the procedure directly on the WebFOCUS Reporting Server, using a browser.

# Save a Graph as an Image File

```
[FILEDEF filename DISK drive:\...\filename.fmt]
SET GRAPHSERVURL= graph_servlet_URL
GRAPH FILE file
graph commands
ON GRAPH HOLD AS filename FORMAT fmt
END
```

where:

**FILEDEF**

Saves the image file to the location you specify.

**filename**

Is the name you give the image file, which must match the FILEDEF command filename. If you want to prompt for a filename, include an amper variable such as &FILENAME in the procedure.

**fmt**

Is the type of image file in which to store the graph. Acceptable values are: PNG, SVG, GIF, or JPG.

**graph_servlet_URL**

Is the URL to invoke the WebFOCUS Graph Servlet. The maximum number of characters is 256.

**file**

Is the name of the data source you wish to report against.

**Note:** To insert an image that resides in a permanent location, you must provide the fully qualified path to the image file. For example, to insert a GIF file,

```
TYPE=REPORT, IMAGE=drive:\...\ filename.gif
```

where:

**drive:\...\filename.gif**

Is the path where the GIF file is located. The WebFOCUS Reporting server must be installed on that drive.

# Inserting a GIF Image Into a PDF Report

The following illustrates how you can create a GIF file from a graph request, and then embed the GIF image into a PDF report.

1. Create the remote procedure in a location accessible to the EDA path or application path. For example, if you are running against your local server it may look like this:

   ```
   SET GRAPHSERVURL= http://localhost/ibi_apps/IBIGraphServlet
   GRAPH FILE CENTORD
   ```

```
SUM LINEPRICE
ACROSS PLANTLNG AS 'Plant'
ON GRAPH HOLD AS PLANT FORMAT GIF
END
```

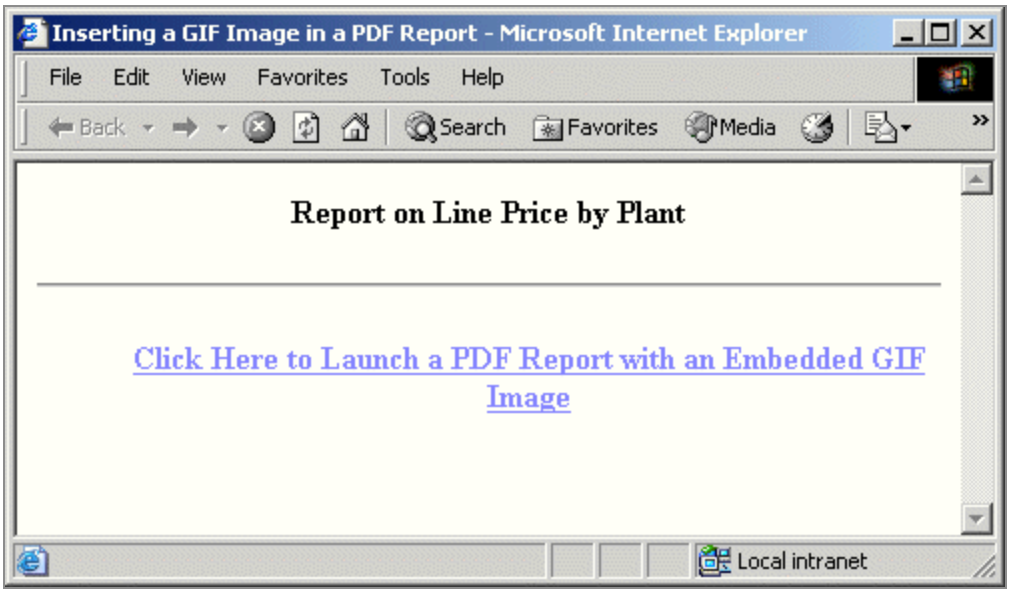
```
TABLE FILE CENTORD
SUM LINEPRICE
BY PLANTLNG AS 'Plant'
ON TABLE SET STYLE *
TYPE=REPORT, IMAGE=plant.gif, POSITION=(4 0), SIZE=(5 3), $
ENDSTYLE
ON TABLE PCHOLD FORMAT PDF
END
```

**Note:** If you are using JSCOM3, you can eliminate the SET GRAPHSERVURL parameter from the procedure.

2. Save the procedure as HOLDGIF.
3. Create an HTML file that calls the HOLDGIF WebFOCUS procedure from a hyperlink. For example,

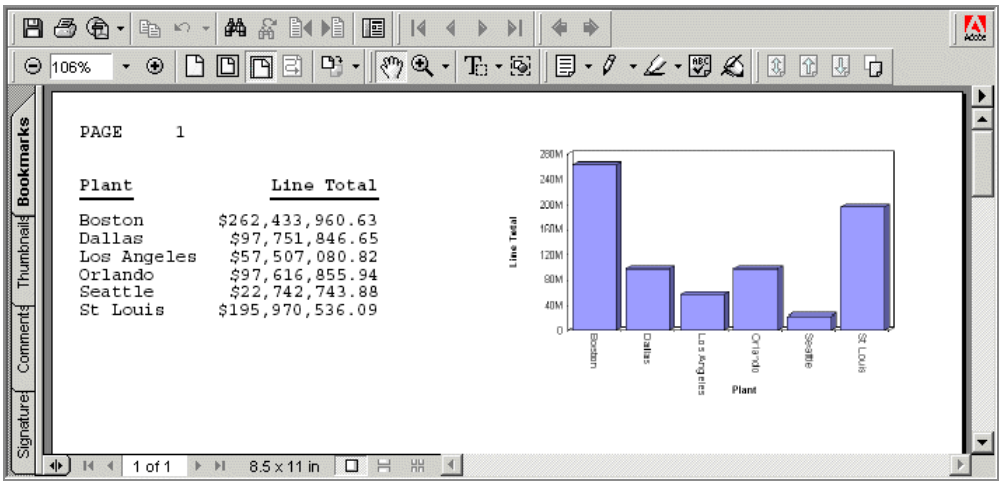
```
<HTML>
<HEAD>
<TITLE> Inserting a GIF Image in a PDF Report </TITLE>
</HEAD>
<BODY>
<H4 ALIGN=CENTER>Report on Line Price by Plant</H4>
<HR>
<P><FONT SIZE=+2></FONT></P>
<UL TYPE=SQUARE
<LI><A HREF="http://localhost/ibi_apps/WFServlet?IBIF_ex=holdgif">
<H4 ALIGN=CENTER>Click Here to Launch a PDF Report with an Embedded
    GIF Image</H4></A>
</UL>
</BODY>
</HTML>
```

The resulting launch page looks like this:




You can now run the report from a browser. To distribute the report using ReportCaster, you would schedule the actual procedure, in this case HOLDGIF, to distribute the report.

4. Click the link to run the report. The report looks like this:




**Note:** To run this procedure as a Managed Reporting Standard Report, add the -MRNOEDIT command to the beginning of the StyleSheet declaration containing the IMAGE attribute. This prevents Managed Reporting from looking for the GIF file in the Managed Reporting Repository. The image that is specified must reside on the WebFOCUS Reporting Server.

The -MRNOEDIT syntax is not case-sensitive and it can be used on a single line or a block of lines. For example:

**Single line**

```
-MRNOEDIT TYPE=REPORT, IMAGE=PLANT.gif, POSITION=(4 0), SIZE=(5 3), $
```

or

```
-MRNOEDIT TYPE=REPORT, IMAGE=PLANT.gif,
-MRNOEDIT POSITION=(4 0), SIZE=(5 3), $
```

**Multiple lines**

```
-MRNOEDIT BEGIN
TYPE=REPORT, IMAGE=PLANT.gif, POSITION=(4 0), SIZE=(5 3), $
-MRNOEDIT END
```

# Usage Notes for Saving a Graph

If you selected the **Save Report** check box in the configuration pane of the WebFOCUS Administration Console (under Redirection Settings), you will be prompted whether to save or open the output file. If the procedure contained a PCHOLD command that specified an AS name for the output file, the name is retained if you choose to save the file. If no AS name was specified, a random filename is generated.

**Important:** You must do the following in the WebFOCUS Administration Console to utilize Save Report functionality for WebFOCUS GRAPH requests (specified with a PNG, SVG, GIF, or JPG format in the procedure):

- Set **Save Report** to **yes** for the .htm Extension.

  Running a server-side GRAPH request creates an HTM file that contains a link to the actual graph output, which is stored as a temporary image file with a .jpg, .gif, .svg, or .png extension.

  When you execute a GRAPH request, if you select the **Save** option when prompted to Open or Save the output, the output is saved to an HTM file using only a reference to the graph image, which will eventually expire and be deleted from the server (according to the temporary file expiration settings in the WebFOCUS Client Configuration).

  To preserve the output of the GRAPH request, open the saved HTM file, right-click the

graph image, and select **Save Picture As** to save it to disk permanently. You can then substitute an absolute reference to the saved image file in the returned HTM output file.

- Click **Save** to save your changes in the Redirection Settings panel.

# Printing a Graph

When you run your graph, you may print the output directly from the browser.

**Note:** If your graph labels or legends are not appearing correctly when you run your graph, see Change Color Settings for details on correcting this.

# Print Your Graph

**Procedure**

1. Run your graph.
2. From the browser, select **Print** from the File menu.

# Send Graph Output Directly to a Printer

Add the following syntax to your GRAPH request:

```
ON GRAPH SET PRINT OFFLINE
```

# Change Color Settings

**Procedure**

1. From the Windows Control Panel, select **Display**.
2. Click the **Settings** tab.

3. In the Color palette box, click the drop-down arrow and select True Color or High Color.

   **Note:** If your version of Windows does not have these options, select 65536 or a higher color count.

4. Click **OK**.

### Result

If you use different color settings from this recommended value, your graphs may appear in grayscale format.

# Creating Financial Reports With Financial Modeling Language (FML)

The Financial Modeling Language (FML) is designed for the special needs associated with creating, calculating, and presenting financially oriented data, such as balance sheets, consolidations, or budgets. These reports are distinguished from other reports because calculations are inter-row, as well as inter-column, and each row or line represents a unique entry or series of entries that can be aggregated directly from the input data or calculated as a function of the data.

## Reporting With FML

FML is an integrated extension of the TABLE command. By adding the FOR phrase and the RECAP command, you can handle an expanded range of applications.

**Note:** MORE is not supported in FML requests.

In conjunction with Dialogue Manager, FML can evaluate "what if" scenarios and develop complete decision support systems. These systems can take advantage of business intelligence features, such as statistical analysis and graphics, in addition to standard financial statements.

Procedures using FML are not hard-wired to the data. As in any other report request, they can easily be changed. FML includes the following facilities:

- **Row and column formatting.** You can specify results in a row-by-row, column-by-column fashion. For more information, see Performing Inter-Row Calculations.
- **Intermediate results.** You can post FML results to an external file and pick them up at a later time for analysis. This is useful when intermediate results are developed and a final procedure consolidates the results later. For more information, see Saving and Retrieving Intermediate Report Results.
- **Inline data entry.** FML enables you to specify constants from within the procedure, in addition to the data values retrieved from your data source. For more information, see Supplying Data Directly in a Request.

- **Recursive reporting.** You can produce reports where the results from the end of one time period or column become the starting balance in the next. For example, you can use recursive reports to produce a cash flow projection. For more information, see Creating a Recursive Model.
- **Dynamic reporting from a chart of accounts or a similar hierarchy of information.** You can create a report that changes as the organization of information changes, ensuring that you automatically retrieve information that reflects the latest structure and its values. There is no need to alter either the Master File or the report request. For more information, see Reporting Dynamically From a Hierarchy.

# Sample FML Request

This example produces a simple asset sheet, contrasting the results of two years. It illustrates many key features of the Financial Modeling Language (FML). Numbers to the left of the procedure lines correspond to explanations that follow the request.

```
   TABLE FILE FINANCE
   HEADING CENTER
   "COMPARATIVE ASSET SHEET </2"
   SUM AMOUNT ACROSS HIGHEST YEAR
   WHERE YEAR EQ '1983' OR '1982'
1. FOR ACCOUNT
2. 1000           AS 'UTILITY PLANT'                 LABEL   UTP
OVER
2. 1010 TO 1050   AS 'LESS ACCUMULATED DEPRECIATION' LABEL   UTPAD
OVER
3. BAR
OVER
4. RECAP UTPNET = UTP-UTPAD; AS 'TOTAL PLANT-NET'
OVER
   BAR
OVER
    2000 TO 3999  AS 'INVESTMENTS'                   LABEL   INV
OVER
5. "CURRENT ASSETS"
OVER
    4000          AS 'CASH'                          LABEL   CASH
OVER
    5000 TO 5999  AS 'ACCOUNTS RECEIVABLE-NET'       LABEL   ACR
OVER
    6000          AS 'INTEREST RECEIVABLE'           LABEL   ACI
OVER
```

```
    6500          AS 'FUEL INVENTORY'                LABEL   FUEL
OVER
    6600          AS 'MATERIALS AND SUPPLIES'        LABEL   MAT
OVER
    6900          AS 'OTHER'                         LABEL   MISC
OVER
    BAR
OVER
   RECAP TOTCAS=CASH+ACR+ACI+FUEL+MAT+MISC;AS 'TOTAL CURRENT ASSETS'
OVER
    BAR
OVER
    7000          AS 'DEFERRED DEBITS'               LABEL   DEFDB
OVER
```

```
    BAR
OVER
6. RECAP TOTAL = UTPNET+INV+TOTCAS+DEFDB; AS 'TOTAL ASSETS'
OVER
    BAR AS '='
    FOOTING
    "</2 *** PRELIMINARY ASSET SHEET BASED ON UNAUDITED FIGURES ***"
   END
```

1. FOR and OVER are FML phrases that enable you to structure the report on a row-by-row basis.
2. LABEL assigns a variable name to a row item for use in a RECAP calculation.

   1000 and 1010 TO 1050 are tags that identify the data values of the FOR field, ACCOUNT in the FINANCE data source. A report row can be associated with a tag that represents a single data value (like 1000), multiple data values, or a range of values (like 1010 TO 1050).
3. BAR enables you to underline a column of numbers before performing a RECAP calculation.
4. The RECAP command creates a new value based on values already identified in the report with LABEL. In this case, the value UTPNET is derived from UTP and UTPAD and is renamed TOTAL PLANT-NET with an AS phrase to provide it with greater meaning in the report.
5. Free text can be incorporated at any point in an FML report, similar to underlines.
6. Notice that this RECAP command derives a total (TOTAL ASSETS) from values

retrieved directly from the data source, and from values derived from previous RECAP computations (UTPNET and TOTCAS).

The output is shown as follows.

COMPARATIVE ASSET SHEET

| | YEAR 1983 | 1982 |
|---|---|---|
| UTILITY PLANT | 1,430,903 | 1,294,611 |
| LESS ACCUMULATED DEPRECIATION | 249,504 | 213,225 |
| TOTAL PLANT-NET | 1,181,399 | 1,081,386 |
| INVESTMENTS | 818 | 5,639 |
| CURRENT ASSETS | | |
| CASH | 4,938 | 4,200 |
| ACCOUNTS RECEIVABLE-NET | 28,052 | 23,758 |
| INTEREST RECEIVABLE | 15,945 | 10,206 |
| FUEL INVENTORY | 35,158 | 45,643 |
| MATERIALS AND SUPPLIES | 16,099 | 12,909 |
| OTHER | 1,264 | 1,743 |
| TOTAL CURRENT ASSETS | 101,456 | 98,459 |
| DEFERRED DEBITS | 30,294 | 17,459 |
| TOTAL ASSETS | 1,313,967 | 1,202,943 |

*** PRELIMINARY ASSET SHEET BASED ON UNAUDITED FIGURES ***

# Creating Rows From Data

A normal TABLE request sorts rows of a report according to the BY phrase you use. The data retrieved is sorted from either low-to-high or high-to-low, as requested. The rows may be limited by a screening phrase to a specific subset, but:

- They appear in a sort order.
- Rows appear only for values that are retrieved from the file.

- You can only insert free text between rows when a sort field changes value, such as:

```
ON DIVISION SUBFOOT
```

- You can only insert calculations between rows when a sort field changes value, such as:

```
ON DIVISION RECAP
```

In contrast, the FML FOR phrase creates a matrix in which you can structure your report row-by-row. This organization gives you greater control over the data that is incorporated into a report, and its presentation. You can:

- Report on specific data values for a field in a data source and combine particular data values under a common label, for use in calculations.
- Type data directly into the request to supplement data retrieved from the data source.
- Include text, underlines, and calculations at points in the report that are not related to sort breaks.
- Perform recursive processing, in which the result of an interim calculation is saved and then used as the starting point for a subsequent calculation.
- Suppress the display of rows for which no data is retrieved.
- Identify rows by labels and columns by numbers, addresses, and values so that you can point to the individual cells formed at each intersection (as on a spreadsheet).

# Retrieve FOR Field Values From a Data Source

The syntax for specifying rows is:

```
FOR fieldname [AS 'coltitle'] value [OR value OR...] [AS 'text']
[LABEL label] OVER
.
.
.
[value [OR value ...]] [AS 'text'] [LABEL label]
END
```

where:

**fieldname**

Is the FOR field for the FML report.

**coltitle**

Is the column title for the FOR field on the report output.

**value**

Is the value (also known as a tag value) describing the data that is retrieved for this row of the report.

**AS 'text'**

Enables you to assign a name to a tag value, which replaces the tag value in the output. Enclose the text in single quotation marks.

**label**

Assigns a label to the row for reference in a RECAP expression. The label can be up to 66 characters and cannot have blanks or special characters. Each explicit label you assign must be unique.

Even if you assign an explicit label, the positional label (R1, R2, and so on) is retained internally.

By default, a tag value for a FOR field (like 1010) may be added only once to the FML matrix. However, if you wish to add the same value of a FOR field to the matrix more than once, you can turn on the FORMULTIPLE parameter (the default setting is OFF). For more information, see Use the Same FOR Field Value in Multiple Rows.

For more information about the FMLFOR, FMLLIST, and FMLINFO functions that return the tag values used in an FML request, see the *ibi™ WebFOCUS® Using Functions* manual.

# Creating Rows From Values in a Data Source

Assume you have a simple data source with financial data for each corporate account, as follows:

```
CHART OF ACCOUNTS
```

```
ACCOUNT          DESCRIPTION

1010             CASH ON HAND
1020             DEMAND DEPOSITS
1030             TIME DEPOSITS
1100             ACCOUNTS RECEIVABLE
1200             INVENTORY
.                     .
.                     .
.                     .
```

Using the FOR phrase in FML, you can issue the following TABLE request in which each value of ACCOUNT is represented by a tag (1010, 1020, and so on), and displays as a separate row:

```
TABLE FILE LEDGER
SUM AMOUNT
FOR ACCOUNT
1010 OVER
1020 OVER
1030 OVER
1100 OVER
1200
END
```

The output is shown as follows.

```
      AMOUNT
      ------
1010   8,784
1020   4,494
1030   7,961
1100  18,829
1200  27,307
```

# Creating Rows From Multiple Records

There are different ways to combine multiple values from your data sources into an FML report row. You can use:

- The OR phrase to sum the values of two or more tags in a single expression. For

more information, see Sum Values in Rows With the OR Phrase.

- The TO phrase to identify a range of tag values on which to report. For more information, see Identify a Range of Values With the TO Phrase.
- A mask to specify a group of tag values without having to name each one. For more information, see Use Masking Characters to Retrieve Tag Values.

By default, a FOR field value can only be included in a single row of an FML matrix. However, by turning on the FORMULTIPLE parameter, you can include the same data value in multiple rows in the FML matrix. For example, the same value can exist as a solitary value in one row, be part of a range in another row, and be used in a calculation in a third row. For more information, see Use the Same FOR Field Value in Multiple Rows.

In addition to these methods, you can extract multiple tags for a row from an external file.

# Sum Values in Rows With the OR Phrase

To sum the values of two or more tags in a single report row, use the OR phrase in the FOR phrase. The syntax is:

```
FOR fieldname
value1 OR value2 [OR valuen...] [AS 'text'] [LABEL label] [OVER]
.
.
.
```

where:

**fieldname**

Is a field name in the data source.

**value1, value2, valuen**

Are the tag values to be retrieved and summed.

**AS 'text'**

Assigns a title to the combined tag values. Enclose the text in single quotation marks (').

**label**

Assigns a label to the row for reference in a RECAP expression. The label can be up to 66 characters and cannot have blanks or special characters. Each explicit label you assign must be unique.

Even if you assign an explicit label, the positional label (R1, R2, and so on) is retained internally.

# Summing Values in Rows

The following model sums the values of three tags (1010, 1020, 1030) as CASH.

```
TABLE FILE LEDGER
SUM AMOUNT FOR ACCOUNT
1010 OR 1020 OR 1030  AS 'CASH'                    OVER
1100                  AS 'ACCOUNTS RECEIVABLE'     OVER
1200                  AS 'INVENTORY'
END
```

The output is shown as follows.

```
                     AMOUNT
                     ------
CASH                 21,239
ACCOUNTS RECEIVABLE  18,829
INVENTORY            27,307
```

# Identify a Range of Values With the TO Phrase

To sum the values of a range of tags in a single report row, use the TO phrase in the FOR phrase. The syntax is:

```
FOR fieldname
value1 TO value2 [AS 'text'] [LABEL label] [OVER]
```

where:

**fieldname**

Is a field name in the data source.

**value1**

Is the tag value at the lower limit of the range.

**TO**

Is the required phrase.

**value2**

Is the tag value at the upper limit of the range.

**AS 'text'**

Assigns a title to the combined tag values. Enclose the text in single quotation marks (').

**label**

Assigns a label to the row for reference in a RECAP expression. The label can be up to 66 characters and cannot have blanks or special characters. Each explicit label you assign must be unique.

Even if you assign an explicit label, the positional label (R1, R2, and so on) is retained internally.

# Identifying a Range of Values

Since CASH accounts in the LEDGER system are identified by the tags 1010, 1020, and 1030, you can specify the range 1010 to 1030:

```
TABLE FILE LEDGER
SUM AMOUNT FOR ACCOUNT
1010 TO 1030 AS 'CASH'
END
```

# Use Masking Characters to Retrieve Tag Values

If the tag field has a character (alphanumeric) format, you can perform a masked match. Use the dollar sign character ($) as the mask. For instance,

```
A$$D
```

matches any four-character value beginning with A and ending with D. The two middle places can be any character. This is useful for specifying a whole group of tag values without having to name each one.

# Using Masking Characters to Match a Group of Tags

In this example, the amounts associated with all four-character accounts that begin with 10, expressed with a mask as 10$$, are used to produce the CASH row of the report.

```
TABLE FILE LEDGER
SUM AMOUNT FOR ACCOUNT
10$$ AS 'CASH'                  OVER
1100 AS 'ACCOUNTS RECEIVABLE'  OVER
1200 AS 'INVENTORY'
END
```

The output is shown as follows.

```
                    AMOUNT
                    ------
CASH                21,239
ACCOUNTS RECEIVABLE  18,829
INVENTORY           27,307
```

# Use the Same FOR Field Value in Multiple Rows

You can use the same value of a FOR field in many separate rows (whether alone, as part of a range, or in a calculation) by including the following syntax before or within an FML request.

```
SET FORMULTIPLE={ON|OFF}
```

or

```
ON TABLE SET FORMULTIPLE {ON|OFF}
```

where:

**ON**

Enables you to reference the same value of a FOR field in more than one row in an FML request.

With FORMULTIPLE set to ON, a value retrieved from the data source is included on every line in the report output for which it matches the tag references.

**OFF**

Does not enable you to include the same value in multiple rows. OFF is the default value.

With FORMULTIPLE set to OFF, multiple tags referenced in any of these ways (OR, TO, *) are evaluated first for an exact reference or for the end points of a range, then for a mask, and finally within a range. For example, if a value is specified as an exact reference and then as part of a range, the exact reference is displayed. Note that the result is unpredictable if a value fits into more than one row whose tags have the same priority (for example, an exact reference and the end point of a range).

For more information, see Reporting Dynamically From a Hierarchy.

# Referencing the Same Value in More Than One Row

This request retrieves the tag values for accounts 1010, 1020, and 1030, and lists corresponding values individually. It then aggregates the same values and displays the sum as TOTAL CASH. Similarly, the tag values for accounts 1100 and 1200 displays as detail items, and then summarized as TOTAL NON-CASH ASSETS.

```
SET FORMULTIPLE=ON
TABLE FILE LEDGER
SUM AMOUNT
FOR ACCOUNT
```

```
1010 AS 'CASH ON HAND'                OVER
1020 AS 'DEMAND DEPOSITS'             OVER
1030 AS 'TIME DEPOSITS'               OVER
BAR                                   OVER
1010 OR 1020 OR 1030 AS 'TOTAL CASH'  OVER
" "                                   OVER
1100 AS 'ACCOUNTS RECEIVABLE'         OVER
1200 AS 'INVENTORY'                   OVER
BAR                                   OVER
1100 TO 1200 AS 'TOTAL NON-CASH ASSETS'
END
```

The output is shown as follows.

```
                      AMOUNT
                      ------
CASH ON HAND           8,784
DEMAND DEPOSITS        4,494
TIME DEPOSITS          7,961
                      ------
TOTAL CASH            21,239

ACCOUNTS RECEIVABLE   18,829
INVENTORY             27,307
                      ------
TOTAL NON-CASH ASSETS 46,136
```

# Using Tags From External Files

In this example, the values for a row of the FML report come from an external file called CASHSTUF, which contains the following tags.

```
1010
1020
1030
```

The following TABLE request uses the tag values from the external file, summing the amounts in accounts 1010, 1020, and 1030 into the CASH row of the FML report.

```
TABLE FILE LEDGER
SUM AMOUNT FOR ACCOUNT
```

```
(CASHSTUF)  AS 'CASH'                 OVER
1100        AS 'ACCOUNTS RECEIVABLE'
END
```

Notice that the file name must be enclosed in parentheses.

# Using the BY Phrase in FML Requests

Only one FOR phrase is permitted in a TABLE request. It substitutes in part for a BY phrase, which controls the sort sequence. However, the request can also include up to 32 BY phrases. In general, BY phrases specify the major (outer) sort fields in FML reports, and the FOR phrase specifies the minor (inner) sort field. Note that the BY ROWS OVER phrase is not supported in a request that uses the FOR phrase.

# Combining BY and FOR Phrases in an FML Request

In this example, the report results for ACCOUNT (the inner sort field) are sorted by REGION (the outer sort field).

```
DEFINE FILE REGION
CUR_YR=E_ACTUAL;
LAST_YR=.831*CUR_YR;
REGION/A4=IF E_ACTUAL NE 0 OR E_BUDGET NE 0 THEN 'EAST' ELSE 'WEST';
END

TABLE FILE REGION
HEADING CENTER
"CURRENT ASSETS FOR REGION <REGION"
" "
SUM CUR_YR LAST_YR
BY REGION NOPRINT
FOR ACCOUNT
10$$ AS 'CASH'                      OVER
1100 AS 'ACCOUNTS RECEIVABLE'       OVER
1200 AS 'INVENTORY'                 OVER
BAR                                 OVER
```

```
RECAP CUR_ASSET/I5C = R1 + R2 + R3;
END
```

The output is shown as follows.

```
           CURRENT ASSETS FOR REGION EAST

                              CUR_YR         LAST_YR
                              ------         -------
 CASH                       9,511.00        7,903.64
 ACCOUNTS RECEIVABLE               .               .
 INVENTORY                         .               .
                      --------------  --------------
 CUR_ASSET                  9,511           7,903
```

A sort field value can be used in a RECAP command to allow the model to take different actions within each major sort break. For instance, the following calculation computes a non-zero value only for the EAST region.

```
RECAP X=IF REGION EQ 'EAST' THEN .25*CASH ELSE 0;
AS 'AVAILABLE FOR DIVIDENDS'
```

For more information, see Performing Inter-Row Calculations.

# Supplying Data Directly in a Request

In certain cases, you may need to include additional constants (such as exchange rates or inflation rates) in your model. Not all data values for the model have to be retrieved from the data source. Using FML, you can supply data directly in the request.

# Supply Data Directly in a Request

```
DATA value,[..., value],$ [AS 'text'] [LABEL label] OVER
```

where:

**value**

Specifies the values that you are supplying. Values in a list must be separated by commas. The list must end with a comma and a dollar sign (,$).

**AS 'text'**

Enables you to assign a title to the data row. Enclose the text in single quotation marks.

Without this entry, the row title is blank on the report.

**label**

Assigns a name to the data row for use in RECAP calculations. The label can be up to 66 characters and cannot have blanks or special characters. Each explicit label you assign must be unique.

# Supplying Data Directly in a Request

In this example, two values (.87 and 1.67) are provided for the exchange rates of euros and pounds, respectively.

```
DEFINE FILE LEDGER
EUROS/I5C=AMOUNT;
POUNDS/I5C=3.2*AMOUNT;
END

TABLE FILE LEDGER
SUM EUROS AS 'EUROPE,DIVISION'
POUNDS AS 'ENGLISH,DIVISION'
FOR ACCOUNT
1010 AS 'CASH--LOCAL CURRENCY' LABEL CASH          OVER
DATA .87, 1.67 ,$ AS 'EXCHANGE RATE' LABEL EXCH    OVER
RECAP US_DOLLARS/I5C = CASH * EXCH;
END
```

The values supplied are taken one column at a time for as many columns as the report originally specified.

The output is shown in the following image.

| | EUROPE DIVISION | ENGLISH DIVISION |
|---|---|---|
| CASH--LOCAL CURRENCY | 8,784 | 28,108 |
| EXCHANGE RATE | .87 | 1.67 |
| US_DOLLARS | 7,642 | 46,940 |

# Performing Inter-Row Calculations

The RECAP command enables you to perform calculations on data in the rows of the report to produce new rows. You must supply the name and format of the value that results from the calculation, and an expression that defines the calculation you wish to perform. Since RECAP calculations are performed among rows, each row in the calculation must be uniquely identified. FML supplies default row labels for this purpose (R1, R2, and so on). However, you may assign more meaningful labels. For more information, see Referring to Rows in Calculations.

# Define Inter-Row Calculations

```
RECAP calcname[/format]=expression; [AS 'text']
```

where:

**RECAP**

Is the required command name. It should begin on a line by itself.

**calcname**

Is the name you assign to the calculated value. The name can be up to 66 characters long, and must start with an alphabetic character. This name also serves as an explicit label. For more information, see Referring to Rows in Calculations.

**format**

Is the USAGE format of the calculated value. It cannot exceed the column width. The default is the format of the column in which the calculated value is displayed.

**expression**

Can be any calculation available with the DEFINE command (including IF ... THEN ... ELSE syntax, functions, excluding DECODE and EDIT, and fields in date format). The expression may extend to as many lines as it requires. A semicolon is required at the end of the expression. For more information, see Using Functions in RECAP Calculations and the *ibi™ WebFOCUS®® Using Functions* manual.

The expression can include references to specific rows using the default FML positional labels (R1, R2, and so on), or it can refer to rows, columns, and cells using a variety of

flexible notation techniques. Note that R**n** references can only be used for rows previously evaluated within the model. For more information, see Referring to Rows in Calculations, Referring to Columns in Calculations, and Referring to Cells in Calculations.

**AS 'text'**

Changes the default title of the row. By default, the name of the RECAP value is displayed as the row title in output. The AS phrase replaces the default. Enclose the text in single quotation marks.

# Usage Notes for RECAP

- RECAP expressions refer to other rows in the model by their labels (either explicit or default). Labels referred to in a RECAP expression must also be specified in the report request.
- The format specified for the RECAP result overrides the format of the column. In the following example,

  ```
  RECAP TOTVAL/D6.2S=IF R1 GT R4 THEN R4 ELSE R1;
  AS 'REDUCED VALUE'
  ```

  TOTVAL/D6.2S displays the result as six positions with two decimal places (and displays blanks if the value was zero) in each column of the report, regardless of the format of the data in the column. This feature can be used to display percentages in a column of whole numbers.
- Subtotals are not supported in FML.
- In environments that support the RETYPE command, note that RETYPE does not recognize labels in FML with field format redefinition.
- R**n** references (default positional row labels) can only be used for rows previously evaluated within the model.

# Referring to Rows in Calculations

FML assigns a default positional label to each TAG, DATA, RECAP, and PICKUP row. These positional labels are automatically prefixed with the letter R, so that the first such row in

the model is R1, the second is R2, and so on. You can use these labels to refer to rows in RECAP expressions.

**Note:** Default labels are not assigned to rows that contain underlines, blank lines, or free text, since these row types need not be referenced in expressions.

When you refer to rows in a RECAP expression, you can:

- Use the positional row label assigned by FML.
- Create an explicit row label of your own.

  **Note:** You should not create an explicit label with a name of the form R**n**, as that type of name is used for default positional row labels assigned by FML and may cause problems with subsequent RECAPs.
- Mix positional and explicit row labels.

If you assign an explicit label, the positional label (R1, R2, and so on) is retained internally.

Note that an explicit label is not needed for a RECAP row, because the name of the calculated value on the left of the equal sign can be used as a label.

In addition to their role in RECAP calculations, you can use labels to format rows in an FML report. For more information, see Formatting an FML Report.

# Assign an Explicit Row Label

```
rowtype [AS 'text'] LABEL label [OVER]
```

where:

**rowtype**

Can be a TAG, DATA, or PICKUP row.

**AS 'text'**

Assigns a different name to the row for the report. Enclose the text in single quotation marks (').

**label**

Assigns a label to a row for reference in a RECAP expression or a StyleSheet declaration. The label can be up to 66 characters and cannot have blanks or special characters. Each explicit label you assign must be unique.

**Note:** You should not create an explicit label with a name of the form R**n**, as that type of name is used for default positional row labels assigned by FML and may cause problems with subsequent RECAPs.

Even if you assign an explicit label, the positional label (R1, R2, and so on) is retained internally.

# Referring to Default Row Labels in RECAP Expressions

In this example, FML assigns account 1010 the implicit label R1, account 1020, the implicit label R2, and account 1030, the implicit label R3. Since no label is assigned to a BAR row, the RECAP row is assigned the implicit label R4.

```
TABLE FILE LEDGER
SUM AMOUNT FOR ACCOUNT
1010 AS 'CASH ON HAND'      OVER
1020 AS 'DEMAND DEPOSITS'   OVER
1030 AS 'TIME DEPOSITS'     OVER
BAR                         OVER
RECAP TOTCASH = R1 + R2 + R3; AS 'TOTAL CASH'
END
```

The output is shown as follows.

```
                AMOUNT
                ------
CASH ON HAND     8,784
DEMAND DEPOSITS  4,494
TIME DEPOSITS    7,961
                ------
TOTAL CASH      21,239
```

**Referring to Explicit Row Labels in RECAP Expressions**

The following request assigns the labels CA, AR, and INV to three tag rows, which are referenced in the RECAP expression.

```
TABLE FILE LEDGER
SUM AMOUNT FOR ACCOUNT
10$$ AS 'CASH'                    LABEL CA    OVER
1100 AS 'ACCOUNTS RECEIVABLE'     LABEL AR    OVER
1200 AS 'INVENTORY'               LABEL INV   OVER
BAR                                           OVER
RECAP CURASST/I5C = CA + AR + INV;
END
```

The output is shown as follows.

```
                    AMOUNT
                    ------
CASH                21,239
ACCOUNTS RECEIVABLE 18,829
INVENTORY           27,307
                    ------
CURASST             67,375
```

Note that the RECAP value could subsequently be referred to by the name CURASST, which functions as an explicit label.

**Using Labels to Repeat Rows**

In certain cases, you may wish to repeat an entire row later in your report. For example, the CASH account can appear in the Asset statement and Cash Flow statement of a financial analysis, as shown below.

```
TABLE FILE LEDGER
SUM AMOUNT FOR ACCOUNT
"ASSETS"                          OVER
10$$ AS 'CASH' LABEL TOTCASH      OVER
.
.
"CASH FLOW"                       OVER
RECAP SAMECASH/I5C = TOTCASH; AS 'CASH'
END
```

When you refer to the CASH row the second time, you can use a RECAP calculation (with a new name) and refer to the label, either explicitly (TOTCASH) or implicitly (R1), in the row where CASH was first used.

**Tip:** If you set the FORMULTIPLE parameter ON, you can repeat the row without giving it another name. For more information, see Creating Rows From Multiple Records.

# Referring to Columns in Calculations

An FML report can refer to explicit columns, as well as explicit rows. You can refer to columns using:

- Column numbers.
- Contiguous column notation in RECAP expressions. For example, (2,5) represents columns 2 through 5.
- Column addressing.
- A factor to represent every other column, or every third column, and so on.
- Column notation to control the creation of column reference numbers.
- Column values.

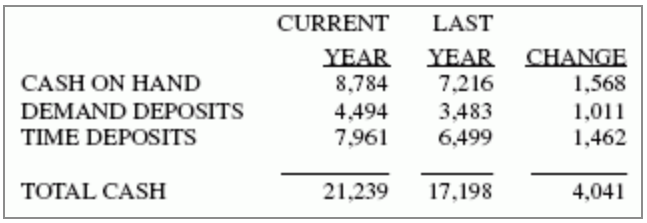
# Applying Column Declarations in RECAP Expressions

The following request generates an FML matrix with four rows and three columns of data.

```
DEFINE FILE LEDGER
CUR_YR/I5C=AMOUNT;
LAST_YR/I5C=.87*CUR_YR - 142;
END

TABLE FILE LEDGER
SUM CUR_YR AS 'CURRENT,YEAR'
   LAST_YR AS 'LAST,YEAR'
COMPUTE CHANGE/I5C = CUR_YR - LAST_YR;
FOR ACCOUNT
1010 AS 'CASH ON HAND'                  OVER
1020 AS 'DEMAND DEPOSITS'               OVER
1030 AS 'TIME DEPOSITS'                 OVER
BAR                                     OVER
RECAP TOTCASH/I5C = R1 + R2 + R3; AS 'TOTAL CASH'
END
```

Both the columns of the report, as well as the cells of the matrix, can be referenced in another FML report.

The output is shown in the following image.



| | CURRENT YEAR | LAST YEAR | CHANGE |
|---|---|---|---|
| CASH ON HAND | 8,784 | 7,216 | 1,568 |
| DEMAND DEPOSITS | 4,494 | 3,483 | 1,011 |
| TIME DEPOSITS | 7,961 | 6,499 | 1,462 |
| TOTAL CASH | 21,239 | 17,198 | 4,041 |

For example, you could use the value 6,499 in another FML report by referring to column 2, row 3. For more information, see Referring to Cells in Calculations.

# Referring to Column Numbers in Calculations

You can perform a calculation for one column or for a specific set of columns. To identify the columns, place the column number in parentheses after the label name.

# Referring to Column Numbers in a RECAP Expression

```
DEFINE FILE LEDGER
CUR_YR/I5C=AMOUNT;
LAST_YR/I5C=.87*CUR_YR - 142;
END

TABLE FILE LEDGER
SUM CUR_YR AS 'CURRENT,YEAR'
LAST_YR AS 'LAST,YEAR'
FOR ACCOUNT
1010 AS 'CASH ON HAND'                                OVER
1020 AS 'DEMAND DEPOSITS'                             OVER
1030 AS 'TIME DEPOSITS'                               OVER
BAR                                                   OVER
RECAP TOTCASH/I5C = R1 + R2 + R3; AS 'TOTAL CASH'     OVER
" "                                                   OVER
RECAP GROCASH(2)/F5.2 = 100*TOTCASH(1)/TOTCASH(2) - 100;
```

```
AS 'CASH GROWTH(%)'
END
```

In the second RECAP expression, note that:

- TOTCASH(1) refers to total cash in column 1.
- TOTCASH(2) refers to total cash in column 2.
- The resulting calculation is displayed in column 2 of the row labeled CASH GROWTH (%).

The RECAP value is only calculated for the column specified.

The output is shown in the following image.

| | CURRENT YEAR | LAST YEAR |
|---|---|---|
| CASH ON HAND | 8,784 | 7,216 |
| DEMAND DEPOSITS | 4,494 | 3,483 |
| TIME DEPOSITS | 7,961 | 6,499 |
| TOTAL CASH | 21,239 | 17,198 |
| CASH GROWTH(%) | | 23.50 |

After data retrieval is completed, a single column is calculated all at once, and multiple columns one by one.

# Referring to Contiguous Columns in Calculations

When a set of contiguous columns is needed within a RECAP, you can separate the first and last column numbers with commas. For example, DIFFERENCE (2,5) indicates that you want to compute the results for columns 2 through 5.

## Recapping Over Contiguous Columns

In this example, the RECAP calculation for ATOT occurs only for columns 2 and 3, as specified in the request. No calculation is performed for column 1.

```
DEFINE FILE LEDGER
CUR_YR/I5C=AMOUNT;
LAST_YR/I5C=.87*CUR_YR - 142;
NEXT_YR/I5C=1.13*CUR_YR + 222;
END

TABLE FILE LEDGER
SUM NEXT_YR CUR_YR LAST_YR
FOR ACCOUNT
10$$ AS 'CASH'                        OVER
1100 AS 'ACCOUNTS RECEIVABLE'         OVER
1200 AS 'INVENTORY'                   OVER
BAR                                   OVER
RECAP ATOT(2,3)/I5C = R1 + R2 + R3;
AS 'ASSETS--ACTUAL'
END
```

The output is shown in the following image.

| | NEXT_YR | CUR_YR | LAST_YR |
|---|---|---|---|
| CASH | 25,992 | 21,239 | 17,198 |
| ACCOUNTS RECEIVABLE | 21,941 | 18,829 | 15,954 |
| INVENTORY | 31,522 | 27,307 | 23,329 |
| ASSETS--ACTUAL | | 67,375 | 56,481 |

# Referring to Column Addresses in Calculations

When you need a calculation for every other or every third column instead of every column, you can supply a factor, or column address, to do this. Column addressing is useful when several data fields are displayed within each value of a column sort.

# Use Column Addressing in a RECAP Expression

The left-hand side of the expression has the form:

```
value(s,e,i)[/format]=
```

where:

**value**

Is the name you assign to the result of the RECAP calculation.

**s**

Is the starting column.

**e**

Is the ending column (it may be * to denote all columns).

**i**

Is the increment factor.

**format**

Is the USAGE format of the calculated value. The default value is the format of the original column.

# Applying Column Addressing in a RECAP Expression

In the following statement, there are two columns for each month:

```
SUM ACTUAL AND FORECAST ACROSS MONTH
```

If you want to perform a calculation only for the ACTUAL data, control the placement of the results with a RECAP in the form:

```
RECAP calcname(1,*,2)=expression;
```

The asterisk means to continue the RECAP for all odd-numbered columns (beginning in column 1, with an increment of 2, for all columns).

# Referring to Relative Column Addresses in Calculations

A calculation can use a specific column as a base, and refer to all other columns by their displacement from that column. The column to the left of the base column has a

displacement of -1 relative to the base column. The column to the right has a displacement of +1. For example,

```
COMP=FIX(*)-FIX(*-1);
```

can refer to the change in fixed assets from one period to the next. The reference to COMP=FIX(*) is equivalent to COMP=FIX.

When referring to a prior column, the column must already have been retrieved, or its value is zero.

# Applying Relative Column Addressing in a RECAP Expression

This example computes the change in cash (CHGCASH) for columns 1 and 2.

```
DEFINE FILE LEDGER
CUR_YR/I5C=AMOUNT;
LAST_YR/I5C=.87*CUR_YR - 142;
NEXT_YR/I5C=1.13*CUR_YR + 222;
END

TABLE FILE LEDGER
SUM NEXT_YR CUR_YR LAST_YR
FOR ACCOUNT
10$$ AS 'TOTAL CASH' LABEL TOTCASH           OVER
" "                                          OVER
RECAP CHGCASH(1,2)/I5SC = TOTCASH(*) - TOTCASH(*+1); AS 'CHANGE IN CASH'
END
```

The output is shown in the following image.

| | NEXT_YR | CUR_YR | LAST_YR |
|---|---|---|---|
| TOTAL CASH | 25,992 | 21,239 | 17,198 |
| CHANGE IN CASH | 4,753 | 4,041 | |

# Controlling the Creation of Column Reference Numbers

Column notation assigns a sequential column number to each column in the internal matrix created for a report request. If you want to control the creation of column reference numbers for the columns that are used in your report, use the CNOTATION column notation command.

Because column numbers refer to columns in the internal matrix, they are assigned after retrieval and aggregation of data are completed. Columns created and displayed in a report are stored in the internal matrix, and columns that are not displayed in a report may also be generated and stored in the internal matrix. Columns stored in the internal matrix include calculated values, reformatted field values, BY fields, fields with the NOPRINT option, and certain RECAP calculations such as FORECAST and REGRESS. Every other column in the internal matrix is assigned a column number by default, which means you have to account for all internally generated columns, if you want to refer to the appropriate column value in your request.

You can change the default assignment of column reference numbers by using the SET CNOTATION=PRINTONLY command which assigns column numbers only to columns that display in the report output. You can use column notation in COMPUTE and RECAP commands to refer to these columns in your request.

# Control the Creation of Column Reference Numbers

```
SET CNOTATION={ALL|PRINTONLY|EXPLICIT}
```

where:

**ALL**

Assigns column reference numbers to every column in the internal matrix. ALL is the default value.

**PRINTONLY**

Assigns column reference numbers only to columns that display in the report output.

**EXPLICIT**

Assigns column reference numbers to all fields referenced in the request, whether displayed or not.

**Note:** CNOTATION is not supported in an ON TABLE phrase.

# Referring to Column Values in Calculations

When a report is sorted using the ACROSS phrase, all of the retrieved values are aligned under their appropriate columns. Each column has a title consisting of one value of the ACROSS field. The entire column of data can be addressed by this value in a RECAP calculation.

# Referring to a Column by Its Value in a RECAP Expression

The following request uses a factor that depends on the value of the ACROSS field (YEAR) to calculate the inventory cost for each year. It then calculates the profit by summing the assets and subtracting the inventory cost for each year.

```
TABLE FILE LEDGER
SUM AMOUNT ACROSS YEAR
FOR ACCOUNT
10$$ AS 'CASH' LABEL CASH                          OVER
1100 AS 'ACCOUNTS RECEIVABLE' LABEL RECEIVE        OVER
BAR                                                OVER
1200 AS 'INVENTORY VALUE' LABEL INVENT             OVER
RECAP INVENTORY_FACTOR/F5.2 = IF YEAR LT '1986'
   THEN 1.1 ELSE 1.25; AS 'INVENTORY COST FACTOR' OVER
RECAP INVENTORY_COST = INVENTORY_FACTOR * INVENT;
   AS 'INVENTORY COST'                             OVER
BAR                                                OVER
RECAP PROFIT = CASH + RECEIVE - INVENTORY_COST;
END
```

The output is shown in the following image.

| | YEAR | | |
|---|---|---|---|
| | 1985 | 1986 | 1987 |
| CASH | 5,663 | 7,001 | 8,575 |
| ACCOUNTS RECEIVABLE | 5,295 | 6,250 | 7,284 |
| INVENTORY VALUE | 7,754 | 9,076 | 10,477 |
| INVENTORY COST FACTOR | 1.10 | 1.25 | 1.25 |
| INVENTORY COST | 8,529 | 11,345 | 13,096 |
| PROFIT | 2,429 | 1,906 | 2,763 |

# Referring to Rows and Columns in Calculations

You can style multiple RECAP commands in a matrix when the RECAP statements are placed after the last ACROSS value.

## Styling Multiple RECAP Statements in a Matrix

```
TABLE FILE GGSALES
SUM UNITS
BY PRODUCT
ACROSS REGION
RECAP
TTL1/I8 = C1+C2+C3+C4;
TTL2/D12.2 = TTL1*1.25;

ON TABLE SET STYLE *
TYPE=DATA, COLUMN=TTL1 (*), COLOR=BLUE, BACKCOLOR=SILVER, STYLE=BOLD, $
TYPE=DATA, COLUMN=TTL2 (*), COLOR=RED, BACKCOLOR=AQUA, STYLE=BOLD, $
ENDSTYLE
END
```

The output is shown in the following image.

| Product | Region Midwest | Northeast | Southeast | West | TTL1 | TTL2 |
|---|---|---|---|---|---|---|
| Biscotti | 86105 | 145242 | 119594 | 70436 | 421377 | 526,721.25 |
| Capuccino | . | 44785 | 73264 | 71168 | 189217 | 236,521.25 |
| Coffee Grinder | 50393 | 40977 | 47083 | 48081 | 186534 | 233,167.50 |
| Coffee Pot | 47156 | 46185 | 49922 | 47432 | 190695 | 238,368.75 |
| Croissant | 139182 | 137394 | 156456 | 197022 | 630054 | 787,567.50 |
| Espresso | 101154 | 68127 | 68030 | 71675 | 308986 | 386,232.50 |
| Latte | 231623 | 222866 | 209654 | 213920 | 878063 | 1,097,578.75 |
| Mug | 86718 | 91497 | 88474 | 93881 | 360570 | 450,712.50 |
| Scone | 116127 | 70732 | 73779 | 72776 | 333414 | 416,767.50 |
| Thermos | 46587 | 48870 | 48976 | 45648 | 190081 | 237,601.25 |

# Referring to Cells in Calculations

You can refer to columns and rows using a form of cell notation that identifies the intersection of a row and a column as (r, c).

# Use Cell Notation for Rows and Columns in a RECAP Expression

A row and column can be addressed in an expression by the notation:

```
E(r,c)
```

where:

**E**

Is a required constant.

**r**

Is the row number.

**c**

Is the column number. Use an asterisk (*) to indicate the current column.

# Referring to Columns Using Cell Notation in a RECAP Expression

In this request, two RECAP expressions derive VARIANCEs (EVAR and WVAR) by subtracting values in four columns (1, 2, 3, 4) in row three (PROFIT). These values are identified using cell notation (r,c).

```
TABLE FILE REGION
SUM E_ACTUAL E_BUDGET W_ACTUAL W_BUDGET
FOR ACCOUNT
3000 AS 'SALES'                          OVER
3100 AS 'COST'                           OVER
BAR                                      OVER
RECAP PROFIT/I5C = R1 - R2;              OVER
" "                                      OVER
RECAP EVAR(1)/I5C = E(3,1) - E(3,2);
AS 'EAST--VARIANCE'                      OVER
RECAP WVAR(3)/I5C = E(3,3) - E(3,4);
AS 'WEST--VARIANCE'
END
```

The output is shown as follows.

```
                E_ACTUAL  E_BUDGET  W_ACTUAL  W_BUDGET
                --------  --------  --------  --------
SALES              6,000     4,934     7,222     7,056
COST               4,650     3,760     5,697     5,410
                  ------    ------    ------    ------
PROFIT             1,350     1,174     1,525     1,646

EAST--VARIANCE       176
WEST--VARIANCE                          -121
```

**Note:** In addition to illustrating cell notation, this example demonstrates the use of column numbering. Notice that the display of the EAST and WEST VARIANCEs in columns 1 and 3,

respectively, are controlled by the numbers in parentheses in the request: EVAR (1) and WVAR (3).

# Using Functions in RECAP Calculations

You may provide your own calculation routines in RECAP rows to perform special-purpose calculations, a useful feature when these calculations are mathematically complex or require extensive look-up tables.

User-written functions are coded as subroutines in any language that supports a call process, such as FORTRAN, COBOL, PL/1, and BAL. For information about creating your own functions, see the *ibi™ WebFOCUS® Using Functions* manual.

# Call a Function in a RECAP Command

```
RECAP calcname[(s,e,i)][/format]=function
(input1,...,inputn,'format2');
```

where:

**calcname**

Is the name you assign to the calculated value.

**(s,e,i)**

Specify a start (s), end (e), and increment (i) value for the column where you want the value displayed. If omitted, the value appears in all columns.

**format**

The format for the calculation is optional. The default is the format of the column. If the calculation consists of only the subroutine, make sure that the format of the subroutine output value (*format2*) agrees with the calculation format. If the calculation format is larger than the column width, the value displays in that column as asterisks (*).

**function**

Is the name of the function, up to eight characters long. It must be different from any row label and cannot contain any of the following special characters:

```
= -, / ()
```

**input1, inputn**

Are the input arguments for the call to the function. They may include numeric constants, alphanumeric literals, row and column references notation, E notation, or labels, or names of other RECAP calculations.

Make sure that the values being passed to the function agree in number and type with the arguments as coded in the function.

**format2**

Is the format of the return value, which must be enclosed in single quotation marks.

# Calling a Function in a RECAP Command

Suppose you have a function named INVEST in your private collection of functions (INVEST is not available in the supplied library), and it calculates an amount on the basis of cash on hand, total assets, and the current date. In order to create a report that prints an account of company assets and calculates how much money the company has available to invest, you must create a report request that invokes the INVEST function.

The current date is obtained from the &YMD system variable. The NOPRINT option beside it prevents the date from appearing in the report. The date is solely used as input for the next RECAP statement.

The request is:

```
TABLE FILE LEDGER
HEADING CENTER
"ASSETS AND MONEY AVAILABLE FOR INVESTMENT </2"
SUM AMOUNT ACROSS HIGHEST YEAR
IF YEAR EQ 1985 OR 1986
FOR ACCOUNT
1010 AS 'CASH'                                LABEL CASH      OVER
1020 AS 'ACCOUNTS RECEIVABLE'                 LABEL ACR       OVER
1030 AS 'INTEREST RECEIVABLE'                 LABEL ACI       OVER
```

```
1100 AS 'FUEL INVENTORY'                          LABEL FUEL      OVER
1200 AS 'MATERIALS AND SUPPLIES'                  LABEL MAT       OVER
BAR                                                               OVER
RECAP TOTCAS = CASH+ACR+ACI+FUEL+MAT; AS 'TOTAL ASSETS'           OVER
BAR                                                               OVER
RECAP THISDATE/A8 = &YMD; NOPRINT                                 OVER
RECAP INVAIL = INVEST(CASH,TOTCAS,THISDATE,'D12.2'); AS
          'AVAIL. FOR INVESTMENT'                                 OVER
BAR AS '='
END
```

The output is shown in the following image.

ASSETS AND MONEY AVAILABLE FOR INVESTMENT

| | YEAR | |
|---|---|---|
| | 1986 | 1985 |
| CASH | 2,100 | 1,684 |
| ACCOUNTS RECEIVABLE | 875 | 619 |
| INTEREST RECEIVABLE | 4,026 | 3,360 |
| FUEL INVENTORY | 6,250 | 5,295 |
| MATERIALS AND SUPPLIES | 9,076 | 7,754 |
| TOTAL ASSETS | 22,327 | 18,712 |
| AVAIL. FOR INVESTMENT | 3,481 | 2,994 |

# Inserting Rows of Free Text

Insert text anywhere in your FML report by typing it on a line by itself and enclosing it within double quotation marks. You can also add blank lines, designated as text, to improve the appearance of the report.

In addition, you can include data developed in your FML report in a row of free text by including the label for the data variable in the text row.

# Inserting Free Text

In this example, three rows of free text are inserted, one blank and two text rows.

```
TABLE FILE LEDGER
SUM AMOUNT FOR ACCOUNT
" --- CASH ACCOUNTS ---"            OVER
```

```
1010 AS 'CASH ON HAND'                OVER
1020 AS 'DEMAND DEPOSITS'             OVER
1030 AS 'TIME DEPOSITS'               OVER
" "                                   OVER
" --- OTHER CURRENT ASSETS ---"       OVER
1100 AS 'ACCOUNTS RECEIVABLE'         OVER
1200 AS 'INVENTORY'
END
```

The output is shown as follows.

```
                     AMOUNT
                     ------
 --- CASH ACCOUNTS ---
CASH ON HAND          8,784
DEMAND DEPOSITS       4,494
TIME DEPOSITS         7,961

 --- OTHER CURRENT ASSETS ---
ACCOUNTS RECEIVABLE  18,829
INVENTORY            27,307
```

Notice that the blank row was created by enclosing a blank within double quotation marks on a separate line of the report request.

# Insert Data Variables in Text Rows

```
"text <label[(c)][>]"
```

where:

**<**

Is a required left caret to bracket the label.

**label**

Is the explicit or implicit row label. (In a RECAP, the calculated value functions as the label.)

**c**

Is an optional cell identifier that indicates the column number of the cell. However, this identifier is required whenever there is more than one column in the report. If you use it, enclose it in parentheses.

**>**

Is an optional right caret that can be used to make the positioning clearer.

# Inserting a Data Variable in a Text Row

In this example, the RECAP value CURASST is suppressed by the NOPRINT command, and inserted instead as a data variable in the text row.

```
SET PAGE-NUM=OFF
TABLE FILE LEDGER
SUM AMOUNT FOR ACCOUNT
10$$ AS 'Cash'                    LABEL CA    OVER
1100 AS 'Accounts Receivable'     LABEL AR    OVER
1200 AS 'Inventory'               LABEL INV   OVER
RECAP CURASST/I5C = CA + AR + INV; NOPRINT   OVER
"Current Assets: <CURASST"
END
```

The output is shown in the following.

```
                    AMOUNT
                    ------
Cash                21,239
Accounts Receivable  18,829
Inventory           27,307
Current Assets: 67,375
```

# Adding a Column to an FML Report

The request controls the number of columns in any report. For instance, if a request contains the display command SUM AMOUNT AND FORECAST, the report contains two columns: AMOUNT and FORECAST.

Add columns in an FML request, just as in a TABLE request, using the COMPUTE command to calculate a value or simply to allocate the space, column title, and format for a column.

# Adding a Column to an FML Report

This example uses a COMPUTE command to generate the calculated value CHANGE and display it as a new column in the FML report. The following request generates an FML matrix with four rows and three columns of data.

```
DEFINE FILE LEDGER
CUR_YR/I5C=AMOUNT;
LAST_YR/I5C=.87*CUR_YR - 142;
END

TABLE FILE LEDGER
SUM CUR_YR AS 'CURRENT,YEAR'
   LAST_YR AS 'LAST,YEAR'
COMPUTE CHANGE/I5C = CUR_YR - LAST_YR;
FOR ACCOUNT
1010 AS 'CASH ON HAND'                  OVER
1020 AS 'DEMAND DEPOSITS'               OVER
1030 AS 'TIME DEPOSITS'                 OVER
BAR                                     OVER
RECAP TOTCASH/I5C = R1 + R2 + R3; AS 'TOTAL CASH'
END
```

The output is shown in the following image.

| | CURRENT YEAR | LAST YEAR | CHANGE |
|---|---|---|---|
| CASH ON HAND | 8,784 | 7,216 | 1,568 |
| DEMAND DEPOSITS | 4,494 | 3,483 | 1,011 |
| TIME DEPOSITS | 7,961 | 6,499 | 1,462 |
| TOTAL CASH | 21,239 | 17,198 | 4,041 |

**Note:** The designated calculation is performed on each tag or RECAP row of the report. The RECAP rows, however, may change the calculation.

### Adding a New Time Period as a Column

The following request adds a future time period to a report.

```
DEFINE FILE LEDGER
CUR_YR/P5C=AMOUNT;
LAST_YR/P5C=.87*AMOUNT - 142;
END

TABLE FILE LEDGER
SUM AMOUNT
ACROSS YEAR AND COMPUTE 1999/P5C = 2.5*AMOUNT;
FOR ACCOUNT
1010 AS 'CASH ON HAND'                    OVER
1020 AS 'DEMAND DEPOSITS'                 OVER
1030 AS 'TIME DEPOSITS'                   OVER
BAR                                       OVER
RECAP TOTCASH/P5C = R1 + R2 + R3; AS 'TOTAL CASH' OVER
RECAP CHANGE(2,*) = TOTCASH(*) - TOTCASH(*-1);
END
```

The output is shown as follows.

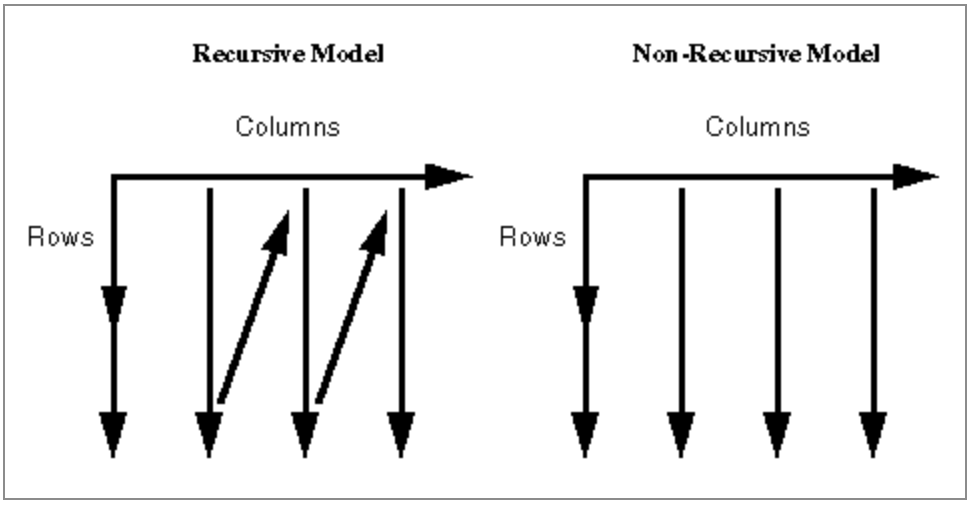
| | YEAR | | | |
|---|---|---|---|---|
| | 1985 | 1986 | 1987 | 1999 |
| CASH ON HAND | 1,684 | 2,100 | 5,000 | 4,210 |
| DEMAND DEPOSITS | 619 | 875 | 3,000 | 1,548 |
| TIME DEPOSITS | 3,360 | 4,026 | 575 | 8,400 |
| TOTAL CASH | 5,663 | 7,001 | 8,575 | 14,158 |
| CHANGE | | 1,338 | 1,574 | 5,583 |

# Creating a Recursive Model

Models involving different time periods often require using the ending value of one time period as the starting value for the next. The calculations describing these situations have two characteristics:

- The labels on one or more RECAP rows are duplicates of other rows. They are used repeatedly to recompute certain values.
- A calculation may refer to a label not yet described, but provided later in the model. If, at the end of the model, a label that is needed is missing, a message is displayed.

Recursive models require that the columns are produced in sequential order, one by one. In nonrecursive models, all of the columns can be produced simultaneously. Schematically, these patterns are shown as follows.




FML automatically switches to sequential order as soon as either of the two modeling conditions requiring the switch is recognized (either reuse of labels by different rows, or forward reference to a label in a calculation).

# Creating a Recursive Model

The following example illustrates recursive models. Note that one year of ENDCASH becomes the next year of STARTING CASH.

```
DEFINE FILE REGION
CUR_YR=E_ACTUAL;
LAST_YR=.831*CUR_YR;
NEXT_YR=1.2297*CUR_YR;
END

TABLE FILE REGION
SUM LAST_YR CUR_YR NEXT_YR
FOR ACCOUNT
10$$ AS 'STARTING CASH' LABEL STCASH        OVER
RECAP STCASH(2,*) = ENDCASH(*-1);           OVER
" "                                         OVER
3000 AS 'SALES' LABEL SLS                   OVER
3100 AS 'COST' LABEL COST                   OVER
BAR                                         OVER
RECAP PROFIT/I5C = SLS - COST;              OVER
```

```
" "                                                    OVER
RECAP ENDCASH/I5C = STCASH + PROFIT;
END
```

The output is shown as follows.

| | LAST_YR | CUR_YR | NEXT_YR |
|---|---|---|---|
| STARTING CASH | 7,903.64 | 9,024.00 | 10,374.00 |
| SALES | 4,986.00 | 6,000.00 | 7,378.20 |
| COST | 3,864.15 | 4,650.00 | 5,718.11 |
| PROFIT | 1,121 | 1,350 | 1,660 |
| ENDCASH | 9,024 | 10,374 | 12,034 |

# Reporting Dynamically From a Hierarchy

Hierarchical relationships between fields can be defined in a Master File, and automatically displayed using the Financial Modeling Language (FML). The parent and child fields must share data values, and their relationship should be hierarchical. The formats of the parent and child fields must both be either numeric or alphanumeric.

For example, suppose that:

- Employee and manager IDs are contained within an employee data source.

  or

- A general ledger data source contains both an account number field and an account parent field.

By examining these fields, it is possible to construct the entire organization chart or chart of accounts structure. However, to print the chart in a traditional FML report, you need to list the employee IDs or account numbers in the request syntax in the order in which they should appear on the report. If an employee or account is added, removed, or transferred, you have to change the report request to reflect this change in organizational structure. For example:

```
TABLE FILE EMPLOYEE
PRINT DEPARTMENT CURR_JOBCODE
FOR EMP_ID
999999999   OVER
```

```
222222222   OVER
  .
  .
  .
```

In contrast, with FML hierarchies you can define the hierarchical relationship between two fields in the Master File and load this information into memory. The FML request can then dynamically construct the rows that represent this relationship and display them in the report, starting at any point in the hierarchy. In the example shown, EMP_ID is called the hierarchy field.

# Requirements for FML Hierarchies

1. In the Master File, use the PROPERTY=PARENT_OF and REFERENCE=*hierarchyfld* attributes to define the hierarchical relationship between two fields. For more information, see the *Describing Data With ibi™ WebFOCUS® Language* manual.

   The hierarchy must be loaded into memory. This loaded hierarchy is called a chart. If the hierarchy is defined in the Master File and referenced by the FML request, it is loaded automatically. If you want to use a hierarchy defined in a Master File that is not either referenced in the FML request or joined to the Master File referenced in the FML request, issue the LOAD CHART command before issuing the FML request.

   The number of charts that can be loaded is 16. Charts are automatically unloaded when the session ends.

2. In the FOR phrase of the FML request. Use the GET/WITH CHILDREN or ADD phrase to retrieve the hierarchical data starting at a specific point in the hierarchy.

To use FML hierarchies, the FOR field must either be:

- The hierarchy field.

  or

- Used as the join field to a unique segment that has the hierarchy field. In this case, the hierarchy field must be the join field. Note that the condition that the join be unique only applies if the hierarchy is defined in the cross-referenced segment.

In other words, the FOR field must be in a parent-child hierarchy, or linked to one. The latter case allows transaction data that contains the hierarchy field to be joined to a separate data source that contains the hierarchy definition.

As with any FML request, a tagged row is displayed even if no data is found in the file for the tag values, with a period (.) representing the missing data. You can override this convention by adding the phrase WHEN EXISTS to the definition of a tagged row. This makes displaying a row dependent upon the existence of data for the tag.

**Note:** In order for the hierarchical indentations to be retained in HTML output, the setting SHOWBLANKS=ON must be in effect.

# Defining a Hierarchy in a Master File

The CENTGL Master File contains a charts of accounts hierarchy. The field GL_ACCOUNT_PARENT is the parent field in the hierarchy. The field GL_ACCOUNT is the hierarchy field. The field GL_ACCOUNT_CAPTION can be used as the descriptive caption for the hierarchy field.

```
FILE=CENTGL     ,SUFFIX=FOC
SEGNAME=ACCOUNTS,SEGTYPE=S01
FIELDNAME=GL_ACCOUNT,           ALIAS=GLACCT,  FORMAT=A7,
          TITLE='Ledger,Account', FIELDTYPE=I, $
FIELDNAME=GL_ACCOUNT_PARENT,    ALIAS=GLPAR,   FORMAT=A7,
          TITLE=Parent,
          PROPERTY=PARENT_OF, REFERENCE=GL_ACCOUNT, $
FIELDNAME=GL_ACCOUNT_TYPE,      ALIAS=GLTYPE,  FORMAT=A1,
          TITLE=Type,$
FIELDNAME=GL_ROLLUP_OP,         ALIAS=GLROLL,  FORMAT=A1,
          TITLE=Op, $
FIELDNAME=GL_ACCOUNT_LEVEL,     ALIAS=GLLEVEL, FORMAT=I3,
          TITLE=Lev, $
FIELDNAME=GL_ACCOUNT_CAPTION,   ALIAS=GLCAP,   FORMAT=A30,
          TITLE=Caption,
          PROPERTY=CAPTION, REFERENCE=GL_ACCOUNT, $
FIELDNAME=SYS_ACCOUNT,          ALIAS=ALINE,   FORMAT=A6,
          TITLE='System,Account,Line', MISSING=ON, $
```

The CENTSYSF data source contains detail-level financial data. This is unconsolidated financial data for a fictional corporation, CenturyCorp. It is designed to be separate from the CENTGL database as if it came from an external accounting system. It uses a different account line system (SYS_ACCOUNT) which can be joined to the SYS_ACCOUNT field in CENTGL. Data uses *natural* signs (expenses are positive, revenue negative).

```
FILE=CENTSYSF     ,SUFFIX=FOC
SEGNAME=RAWDATA   ,SEGTYPE=S2
```

```
FIELDNAME=SYS_ACCOUNT   ,  ,A6       , FIELDTYPE=I,
          TITLE='System,Account,Line', $
FIELDNAME=PERIOD        ,  ,YYM      , FIELDTYPE=I, $
FIELDNAME=NAT_AMOUNT    ,  ,D10.0    , TITLE='Month,Actual', $
FIELDNAME=NAT_BUDGET    ,  ,D10.0    , TITLE='Month,Budget', $
FIELDNAME=NAT_YTDAMT    ,  ,D12.0    , TITLE='YTD,Actual', $
```

# Displaying an FML Hierarchy

The GET CHILDREN and WITH CHILDREN commands dynamically retrieve and display hierarchical data on the FML report. GET CHILDREN displays only the children, not the parent value referenced in the command. WITH CHILDREN displays the parent and then the children.

# Display an FML Hierarchy

```
TABLE FILE filename{PRINT|SUM} ...
FOR hierarchyfld
parentvalue {GET|WITH} CHILD[REN] [n|ALL]
 [AS CAPTION|'text'] [LABEL label]
.
.
.
END
```

where:

**filename**

Is the name of the file to be used in the FML request. If the hierarchy for this request cannot be loaded automatically, it must have been loaded previously by issuing the LOAD CHART command.

**hierarchyfld**

Is the hierarchy field name. If the request references a joined structure, the name must be the field name from the host file. The alias name is not supported.

**parentvalue**

Is the parent value for which the children are to be retrieved.

**GET CHILDREN**

Displays the hierarchy starting from the first child of the specified *parentvalue*. It does not include the parent in the display. (This corresponds to the FML syntax CHILD1 OVER CHILD2 OVER ...)

**WITH CHILDREN**

Displays the hierarchy starting from the specified *parentvalue*. It includes the parent in the display. (This corresponds to the FML syntax *parentvalue* OVER CHILD1 OVER CHILD2 OVER ...).

**n|ALL**

Is a positive integer from 1 to 99, specifying the number of levels of the hierarchy to display. If a number greater than 99 is specified, a warning message is displayed and *n* is set to 99. The default value is 1. Therefore, if *n* is omitted, only direct children are displayed. GET or WITH CHILDREN 2 displays direct children and grandchildren. GET or WITH CHILDREN 99 displays children to 99 levels. ALL is a synonym for 99. Each child instance is printed over the one that follows. Successive levels of the hierarchy field are indented two spaces from the previous level.

**CAPTION**

Indicates that the caption values to display should be taken from the field defined as the CAPTION in the Master File.

Note that the AS CAPTION phrase is supported for tagged rows, including those that do not use the GET/WITH CHILDREN or ADD syntax. However, the hierarchy must be defined (by specifying the PARENT_OF attribute) in order to load and display the caption values. If the hierarchy is not defined, the AS CAPTION phrase is ignored.

**'text'**

Is a text string to use as the row title for the hierarchy field values. The CAPTION field defined in the Master File is not used as the caption on the report output.

**label**

Is an explicit row label. Each generated row is labeled with the specified label text.

**Note:** The hierarchy is displayed sorted by the parent field and, within parent, sorted by the hierarchy field.

For information about the FMLFOR, FMLLIST, FMLCAP, and FMLINFO functions that return the tag values and captions used in an FML request, see the *Describing Data with ibi™ WebFOCUS®* manual.

# Displaying an FML Hierarchy

The following request displays two levels of account numbers, starting from account 3000:

```
SET SHOWBLANKS=ON
TABLE FILE CENTGL
PRINT GL_ACCOUNT_PARENT
FOR GL_ACCOUNT
3000 WITH CHILDREN 2
END
```

The output is shown as follows.

```
             Parent
             ------
3000         1000
  3100       3000
    3110     3100
    3120     3100
    3130     3100
    3140     3100
    3200     3000
    3300     3200
    3400     3200
    3500     3200
    3600     3200
    3700     3200
    3800     3200
    3900     3200
```

**Note:**

- If the request specifies GET CHILDREN instead of WITH CHILDREN, the line for the parent value (3000) does not display on the report output.
- In order to retain the indentations in HTML output, the SET SHOWBLANKS=ON

command must be in effect.

**Displaying an FML Hierarchy With Captions**

The following request displays two levels of a chart of accounts hierarchy, starting with account 1000 (the top of the hierarchy), and displays the caption field values instead of the account numbers.

```
SET SHOWBLANKS=ON
TABLE FILE CENTGL
PRINT GL_ACCOUNT_PARENT
FOR GL_ACCOUNT
1000 WITH CHILDREN 2 AS CAPTION
END
```

The output is shown as follows.

```
                                Parent
                                ------
Profit Before Tax
  Gross Margin                  1000
    Sales Revenue               2000
    Cost Of Goods Sold          2000
  Total Operating Expenses      1000
    Selling Expenses            3000
    General + Admin Expenses    3000
  Total R+D Costs               1000
    Salaries                    5000
    Misc. Equipment             5000
```

**Note:** If the request specifies GET CHILDREN instead of WITH CHILDREN, the line for the parent value (1000, Profit Before Tax) does not display on the report output.

# Consolidating an FML Hierarchy

The ADD command consolidates multiple levels of the hierarchy on one line of the FML report output. You can use ADD alone or in conjunction with GET CHILDREN or WITH CHILDREN. Note that ADD is designed to work with requests that use the SUM command. It is also designed to be used with detail-level data, not data that is consolidated.

When used alone, ADD aggregates the parent and children on one line of the report output, summing the numeric data values included on the line. This corresponds to the FML syntax *parentvalue* or CHILD1 OR CHILD2 OR ...

When used in conjunction with GET CHILDREN, ADD displays one line for each child of the specified parent value. Each line is a summation of that child and all of its children. You can specify the number of levels of children to display (which determines the number of lines generated on the report output) and the depth of summation under each child. By default, only direct children have a line in the report output, and the summary for each child includes all of its children.

When used in conjunction with WITH CHILDREN, ADD first displays a line in the report output that consists of the summation of the parent value and all of its children. Then it displays additional lines identical to those displayed by GET CHILDREN ADD.

In order to use a data record in more than one line of an FML report (for example, to display both detail and summary lines or to consolidate detail data at multiple levels), the following setting is required:

```
SET FORMULTIPLE=ON
```

# Create One Summary Row for an FML Hierarchy

```
TABLE FILE filenameSUM ...
FOR hierarchyfld
parentvalue ADD [n|ALL]
 [AS CAPTION|'text'] [LABEL label]
.
.
.
END
```

where:

**filename**

Is the name of the file to be used in the FML request. If the hierarchy for this request cannot be loaded automatically, it must have been loaded previously by issuing the LOAD CHART command.

**hierarchyfld**

Is the hierarchy field name. If the request references a joined structure, the name must be the field name from the host file. The alias name is not supported.

**parentvalue**

Is the parent value that determines the starting point in the hierarchy for the aggregation.

**ADD**

Displays the parent and *n* levels of its children on one row, summing the numeric data values displayed on the row. This corresponds to the FML syntax *parentvalue* or CHILD1 OR CHILD2 OR CHILD3 and more, if applicable.

To display the sum of just the children, you must display the parent row, display the summary row, and use a RECAP to subtract the parent row from the sum. For example:

```
FOR ...
parentvalue                 OVER
parentvalue ADD 1           OVER
RECAP CHILDSUM = R2-R1;
```

**n|ALL**

Is a positive integer from 1 to 99, specifying the number of levels of the hierarchy to aggregate. ALL is the default value. Therefore, if *n* is omitted, all children are included in the sum. If *n* is 1, only direct children are included. If *n* is 2, direct children and grandchildren are included. ADD 99 includes up to 99 levels of children. ALL is a synonym for 99.

**CAPTION**

Indicates that the caption of the parent value displays for the total row.

Note that the AS CAPTION phrase is supported for tagged rows, including those that do not use the GET CHILDREN or ADD syntax. However, the hierarchy must be defined (by specifying the PARENT_OF attribute) in order to load and display the caption values. If the hierarchy is not defined, the AS CAPTION phrase is ignored.

**'text'**

Is a text string to use as the row title for the aggregate row. The CAPTION field defined in the Master File is not used as the caption on the report output.

**label**

Is an explicit row label. Each generated row is labeled with the specified label text.

# Displaying One Summary Line for an FML Hierarchy

The CENTSYSF data source contains detail-level financial data. To use the account hierarchy in the CENTGL data source with this financial data, the two data sources are joined. The data in CENTSYSF is stored with natural signs, which means, in financial terms, that revenues and liabilities are stored as negative numbers. The portion of the hierarchy used in this request contains only positive data.

Note that the join is not required to be unique, because the hierarchy is defined in the host segment.

First the WITH CHILDREN command displays the lines of the hierarchy starting with account Selling Expenses (3100). Note that only accounts with no children are populated in this detail-level data source. The ADD command then creates one line that is the sum of account 3100 and all of its children.

```
SET SHOWBLANKS=ON
SET FORMULTIPLE=ON
JOIN SYS_ACCOUNT IN CENTGL TO ALL SYS_ACCOUNT IN CENTSYSF
TABLE FILE CENTGL
SUM NAT_AMOUNT/D10.0 NAT_YTDAMT/D10.0
FOR GL_ACCOUNT
3100 WITH CHILDREN ALL AS CAPTION OVER
BAR                               OVER
3100 ADD AS CAPTION
IF PERIOD EQ '2002/03'
END
```

The output is shown as follows.

| | Month Actual | YTD Actual |
|---|---|---|
| Selling Expenses | . | . |
| Advertising | . | . |
| TV/Radio | 1,049,146. | 2,954,342. |
| Print Media | 244,589. | 721,448. |
| Internet Advertising | 9,542. | 29,578. |
| Promotional Expenses | 53,719. | 151,732. |
| Joint Marketing | 97,135. | 289,799. |
| Bonuses/Commisions | 100,188. | 304,199. |
| Selling Expenses | 1,554,319. | 4,451,098. |

# Consolidate FML Hierarchy Data to Any Level and Depth

```
TABLE FILE filename
SUM ...
FOR hierarchyfld
parentvalue {GET|WITH} CHILD[REN] [n|ALL] ADD [m|ALL]
 [AS CAPTION|'text'] [LABEL label]
.
.
.
END
```

where:

**filename**

Is the name of the file used in the FML request. If the hierarchy for this request cannot load automatically, it previously loaded by issuing the LOAD CHART command.

**hierarchyfld**

Is the hierarchy field name. If the request references a joined structure, the name must be the field name from the host file. The alias name is not supported.

**parentvalue**

Is the parent value that determines the starting point in the hierarchy for the aggregation.

**GET|WITH**

GET specifies that the first line generated on the report is the consolidated line for the first child of the parent value. WITH specifies that the first line generated on the report is the consolidated line for the parent value, followed by the consolidated lines for each of its children, to the level specified by *n*.

**n|ALL**

Is a positive integer from 1 to 99, specifying the number of levels of children to display. The line of output for each child has the sum of that child and its children to the depth specified for the ADD option. The default value is 1. Therefore, if *n* is omitted, each direct child has a line on the report. If *n* is 2, direct children and grandchildren each have a line on the report output. ALL is a synonym for 99.

**ADD**

Sums the hierarchy to the depth specified by *m* for each line generated by the GET or WITH CHILDREN command.

**m|ALL**

Is a positive integer from 1 to 99, specifying the number of levels of children to consolidate on each line of the report output. If a number greater than 99 is specified, a warning message is displayed and *m* is set to 99. The default value is ALL. Therefore, if *m* is omitted, the consolidated line sums all children. If *m* is 2, only direct children and grandchildren are consolidated for each line on the report output. ADD 99 aggregates children to 99 levels. ALL is a synonym for 99.

**CAPTION**

Indicates that the caption of the parent value displays for the total row.

Note that the AS CAPTION phrase is supported for tagged rows, including those that do not use the GET CHILDREN or ADD syntax. However, the hierarchy must be defined (by specifying the PARENT_OF attribute) in order to load and display the caption values. If the hierarchy is not defined, the AS CAPTION phrase is ignored.

**'text'**

Is a text string to use as the row title for the aggregate row. The CAPTION field defined in the Master File is not used as the caption on the report output.

**label**

Is an explicit row label. Each generated row is labeled with the specified label text.

# Consolidating FML Hierarchy Data

In the following request, the first WITH CHILD command displays the detail data for the hierarchy starting with account 3100. The next WITH CHILD command creates a consolidated line for the parent account (3100) and each direct child.

```
SET SHOWBLANKS=ON
SET FORMULTIPLE=ON
JOIN SYS_ACCOUNT IN CENTGL TO ALL SYS_ACCOUNT IN CENTSYSF
TABLE FILE CENTGL
SUM NAT_AMOUNT/D10.0 NAT_YTDAMT/D10.0
FOR GL_ACCOUNT
3100 WITH CHILDREN ALL AS CAPTION      OVER
" "                                    OVER
BAR AS =                               OVER
" "                                    OVER
3100 WITH CHILDREN ADD AS CAPTION
IF PERIOD EQ '2002/03'
END
```

Note that the join is not required to be unique, because the hierarchy is defined in the host segment.

In the following output, the top portion shows the detail-level data. The bottom portion shows the consolidated data. In the consolidated portion of the report:

- There is one line for the parent that is the sum of itself plus all of its children to all levels.
- There is one line for each direct child of account Selling Expenses (3100): Advertising, Promotional Expenses, Joint Marketing, and Bonuses/Commisions.
- The line for Advertising is the sum of itself plus all of its children. If it has multiple levels of children, they are all added into the sum. The other direct children of 3100 do not themselves have children, so the sum on each of those lines consists of only

the parent value.

| | Month Actual | YTD Actual |
|---|---|---|
| Selling Expenses | . | . |
| Advertising | . | . |
| TV/Radio | 1,049,146. | 2,954,342. |
| Print Media | 244,589. | 721,448. |
| Internet Advertising | 9,542. | 29,578. |
| Promotional Expenses | 53,719. | 151,732. |
| Joint Marketing | 97,135. | 289,799. |
| Bonuses/Commisions | 100,188. | 304,199. |
| Selling Expenses | 1,554,319. | 4,451,098. |
| Advertising | 1,303,277. | 3,705,368. |
| Promotional Expenses | 53,719. | 151,732. |
| Joint Marketing | 97,135. | 289,799. |
| Bonuses/Commisions | 100,188. | 304,199. |

Using GET CHILDREN instead of WITH CHILDREN eliminates the top line from each portion of the output. The remaining lines are the same.

| | Month Actual | YTD Actual |
|---|---|---|
| Advertising | . | . |
| TV/Radio | 1,049,146. | 2,954,342. |
| Print Media | 244,589. | 721,448. |
| Internet Advertising | 9,542. | 29,578. |
| Promotional Expenses | 53,719. | 151,732. |
| Joint Marketing | 97,135. | 289,799. |
| Bonuses/Commisions | 100,188. | 304,199. |
| Advertising | 1,303,277. | 3,705,368. |
| Promotional Expenses | 53,719. | 151,732. |
| Joint Marketing | 97,135. | 289,799. |
| Bonuses/Commisions | 100,188. | 304,199. |

The following request displays a consolidated line for account 2000 and each of its direct children and grandchildren.

```
SET SHOWBLANKS=ON
SET FORMULTIPLE=ON
JOIN SYS_ACCOUNT IN CENTGL TO ALL SYS_ACCOUNT IN CENTSYSF
TABLE FILE CENTGL
SUM NAT_AMOUNT/D10.0 NAT_YTDAMT/D10.0
FOR GL_ACCOUNT
2000 WITH CHILDREN 2 ADD AS CAPTION
IF PERIOD EQ '2002/03'
END
```

The output is shown as follows.

| | Month Actual | YTD Actual |
|---|---|---|
| Gross Margin | -4,513,659. | -13,080,549. |
| Sales Revenue | -10,398,305. | -30,877,546. |
| Retail Sales | -8,237,253. | -24,539,197. |
| Mail Order Sales | -1,138,414. | -3,403,387. |
| Internet Sales | -1,022,638. | -2,934,962. |
| Cost Of Goods Sold | 5,884,646. | 17,796,997. |
| Variable Material Costs | 4,415,560. | 13,410,629. |
| Direct Labor | 961,143. | 2,920,449. |
| Fixed Costs | 507,943. | 1,465,919. |

# Loading a Hierarchy Manually

In most cases, a hierarchy loads automatically as a result of the request syntax. However, if you need to use a hierarchy defined in one Master File against a data source that is not joined to the hierarchy file (but that contains the same hierarchy field), you can manually load the hierarchy data using the LOAD CHART command.

The number of charts that can load is limited by available memory. Charts automatically unload when the session ends.

The chart loads by running a TABLE request that produces a list of parent values and their associated children.

```
TABLE FILE chartfile
BY parentfield BY hierarchyfield
[SUM captionfield]
END
```

The resulting chart contains the following information. It may also contain the associated captions, depending on whether the AS CAPTION phrase was used in the request.

```
parentfield     hierarchyfield
-----------     --------------
parentvalue1    child1
parentvalue1    child2
parentvalue2    child3
   .
   .
   .
```

# Load a Hierarchy From One Master File for Use With a Separate Master File

You can manually load the hierarchy data, if you need to use a hierarchy defined in one Master File, against a data source that is not joined to the hierarchy file but that contains the same hierarchy field.

Available memory dictates the number of charts that can load. Charts automatically unload when WebFOCUS terminates.

```
LOAD CHART chartfile[.sega].hierarchyfld
   [FOR requestfile[[.segb].fieldb]]
```

where:

**chartfile**

Is the name of the Master File that contains the hierarchy information.

**sega**

Is the name of the segment that contains the hierarchy field. The segment name is only required if a field in another segment in the structure has the same field name as the hierarchy field.

**hierarchyfld**

Is the hierarchy field. It is required because a Master File can define multiple hierarchies.

**FOR**

Loads a hierarchy defined in a Master File that is not used in the FML report request. For example, if Master File B contains the hierarchy information but Master File A is used in the request (without a join between Master Files A and B), issue the following LOAD CHART command prior to the FML request:

```
LOAD CHART B.FLDB FOR A.FLDA
TABLE FILE A ...
```

**requestfile**

Is the name of the Master File used in the FML request.

**segb**

Is the name of the segment that contains the hierarchy field values in the Master File used in the FML request. It is not required if it has the same name as *sega*.

**fieldb**

Is the field in the Master File specified in the FML request that contains the values of the hierarchy field. It is not required if it has the same name as the hierarchy field.

**Note:**

- If you issue the LOAD CHART command multiple times for the same hierarchy, the new hierarchy overlays the previous version in memory.
- If you issue the LOAD CHART command for a data source that is dynamically joined to the hierarchy file, you must issue the JOIN command prior to issuing the LOAD CHART command.

# Usage Notes for FML Hierarchies

- PROPERTY and REFERENCE are propagated to HOLD Master Files when HOLDATTR is set to ON.
- The following setting is required in order to use a data record in more than one row of an FML request (for example, both a detail and summary row):

```
SET FORMULTIPLE=ON
```

- When reporting against a rolled-up data source such as ESSBASE, the data values stored for the parent instance are an aggregate of all of its children. Do not use the ADD feature on consolidated data.
- When reporting against a data source with shared members (such as ESSBASE), in which the same data can be defined multiple times with different hierarchy field values, data shared by two different parents is counted twice in an aggregation operation. To avoid this double aggregation, use the FST operator in the SUM command for the shared fields.
- When the report output is in HTML format, the setting SHOWBLANKS=ON must be in effect in order to retain the hierarchical indentations.

# Customizing a Row Title

You can customize a row title in an FML report for accurate data identification. Using the AS phrase, you can provide new titles for TAG, DATA, RECAP, and PICKUP rows.

# Customize a Row Title in FML

For a TAG row, use the syntax:

```
value AS {'title'|CAPTION}
```

For a DATA or PICKUP row, use the syntax:

```
value AS 'title'
```

For a RECAP row, use the syntax:

```
RECAP calcname[/format]=expression; AS 'title'
```

where:

**value**

Is the value on which you are reporting, whether retrieved from a data source or external file (represented by a tag), supplied directly by a user in the request, or picked up from a work file.

**title**

Is the customized row title, enclosed in single quotation marks if it contains embedded blanks.

In a TAG, DATA, or PICKUP row, the default row title is *value*.

In a RECAP row, the default title is *calcname*.

**CAPTION**

In the Master File of a hierarchical data source, CAPTION identifies a TAG row using a caption field. Note that the hierarchy in the Master File defines the PARENT-OF the FOR field.

**calcname**

Is the value that is derived by the RECAP calculation.

# Changing the Titles of Tag Rows

In the following example, the row titles CASH ON HAND and DEMAND DEPOSITS provide meaningful identifications for the corresponding tags.

```
TABLE FILE LEDGER
SUM AMOUNT FOR ACCOUNT
1010 AS 'CASH ON HAND' OVER
1020 AS 'DEMAND DEPOSITS'
END
```

Note that single quotation marks are necessary since the row title being assigned has embedded blanks.

The output is shown as follows.

```
                    AMOUNT
                    ------
```

```
CASH ON HAND      8,784
DEMAND DEPOSITS   4,494
```

If no AS phrase is included, the tag values are displayed in the report.

**Customizing a Row Title for a RECAP Value**

This request creates the title TOTAL CASH for the RECAP value TOTCASH.

```
TABLE FILE LEDGER
SUM AMOUNT FOR ACCOUNT
1010 AS 'CASH ON HAND'      OVER
1020 AS 'DEMAND DEPOSITS'   OVER
1030 AS 'TIME DEPOSITS'     OVER
RECAP TOTCASH = R1 + R2 + R3; AS 'TOTAL CASH'
END
```

The output is shown as follows.

```
                  AMOUNT
                  ------
CASH ON HAND       8,784
DEMAND DEPOSITS    4,494
TIME DEPOSITS      7,961
TOTAL CASH        21,239
```

If no AS phrases are included, the name of the RECAP value (TOTCASH) displays in the report.

# Formatting an FML Report

Improve the readability and presentation of your FML report by:

- **Underlining numeric columns.** Reports with columns of numbers frequently need to display underlines before some RECAP calculations. You can specify an underline character, introduced by the word BAR, in place of the tag value.
- **Adding page breaks.** You can request a new page at any point in a report by placing the word PAGE-BREAK in place of the tag value.
- **Formatting rows, columns, and cells.** You can apply StyleSheet attributes, such as FONT, SIZE, STYLE, and COLOR, to individual rows and columns, or to cells within

those rows.

- **Adding borders around rows, columns, and cells.** You can use BORDER attributes in a StyleSheet to specify the weight, style, and color of border lines around a row or cell. You can specify formatting variations for the top, bottom, left, and right borders.
- **Indenting text or numbers.** You can indent a tag value, label text, or caption text a specified number of spaces for an FML tag row, hierarchy, or RECAP row. If you apply the indent to rows in an FML hierarchy, the parent line of the hierarchy is indented the number of spaces specified as the indent.

  **Note:** For an HTML, PDF, or PostScript report, you can use the BLANKINDENT setting to specify an indentation between levels of an FML hierarchy. See Indenting Row Titles in an FML Hierarchy.

# Add an Underline Character for Columns

```
BAR [AS 'character'] OVER
```

where:

**character**

Is either the hyphen character (-) or the equal character (=). Enclose the character in single quotation marks. The default character is the hyphen (-).

# Underlining Columns

This example uses the default underscore character (_).

```
TABLE FILE LEDGER
SUM AMOUNT FOR ACCOUNT
1010 AS 'CASH ON HAND'       OVER
1020 AS 'DEMAND DEPOSITS'    OVER
1030 AS 'TIME DEPOSITS'      OVER
BAR                          OVER
RECAP TOTCASH = R1 + R2 + R3;
END
```

The output is shown as follows.

```
                 AMOUNT
                 ------
CASH ON HAND      8,784
DEMAND DEPOSITS   4,494
TIME DEPOSITS     7,961
                 ------
TOTCASH          21,239
```

Notice that the BAR ... OVER phrase underlines only the column containing the display field.

# Specify a Page Break in an FML Report

Include the following syntax in the FML request in place of a tag value.

```
PAGE-BREAK OVER
```

# Specifying a Page Break in an FML Report

In this example, a page break is inserted after the first two RECAP commands to highlight each calculation.

```
TABLE FILE LEDGER
SUM AMOUNT FOR ACCOUNT
1010 AS 'CASH ON HAND'                                      OVER
1020 AS 'DEMAND DEPOSITS'                                   OVER
1030 AS 'TIME DEPOSITS'                                     OVER
BAR                                                         OVER
RECAP TOTCASH = R1 + R2 + R3; AS 'TOTAL CASH'               OVER
PAGE-BREAK                                                  OVER
1100 AS 'ACCOUNTS RECEIVABLE' LABEL RECEIVE                 OVER
1200 AS 'INVENTORY'  LABEL INVENT                           OVER
BAR                                                         OVER
RECAP TOTASSET = RECEIVE + INVENT; AS 'TOTAL ASSETS'        OVER
PAGE-BREAK                                                  OVER
RECAP TOTAL = TOTCASH + TOTASSET;
END
```

The output is shown as follows.

PAGE 1

| | AMOUNT |
|---|---|
| CASH ON HAND | 8,784 |
| DEMAND DEPOSITS | 4,494 |
| TIME DEPOSITS | 7,961 |
| TOTAL CASH | 21,239 |

PAGE 2

| | AMOUNT |
|---|---|
| ACCOUNTS RECEIVABLE | 18,829 |
| INVENTORY | 27,307 |
| TOTAL ASSETS | 46,136 |

PAGE 3

| | AMOUNT |
|---|---|
| TOTAL | 67,375 |

# Format a Row, Column, or Cell in an FML Report

```
TYPE=type, [COLUMN=column] [LABEL={Rn|label}], format_def, $
```

where:  StyleSheets" />

**type**

Identifies the component you wish to format. Valid values are:

REPORT denotes a row with the specified label.

DATA denotes a row with the specified label, which contains user-supplied data values.

FREETEXT denotes a free text or a blank row with the specified label.

UNDERLINE denotes underlines generated by BAR. Formatting of an underline is supported for PDF and PS, but not for HTML reports.

**column**

Identifies a specific column. You can identify the column by its name or position in a row.

**LABEL**

Is the controlling factor in identifying and formatting an FML row.

Note that the label is used to identify a row for calculation or formatting. The label for a TAG or DATA row never appears in the report output. It is used only to identify rows within the FML code. For a RECAP row, the name of the calculated value serves as a label. It appears in the report unless an alternate title is specified.

label is an explicit row label that you can assign to identify a row more clearly.

**format_def**

Is the formatting definition, such as FONT, SIZE, STYLE, and COLOR. See Formatting an FML Report.

**Note:** To format a cell, identify the cell as the intersection of a column and a row using COLUMN= ... plus LABEL= ... in the same StyleSheet declaration.

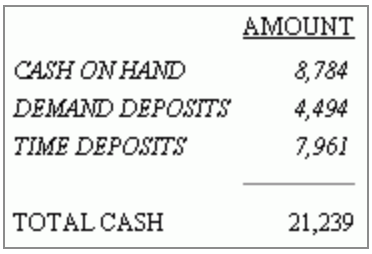
# Formatting Rows in an FML Report

The following illustrates how to identify and format an entire FML row, consisting of the row label and the row data. The LABEL attribute in the StyleSheet identifies the three TAG rows, which are styled here as italic.

```
SET PAGE-NUM=OFF
TABLE FILE LEDGER
SUM AMOUNT FOR ACCOUNT
1010 AS 'CASH ON HAND' LABEL COH OVER
1020 AS 'DEMAND DEPOSITS' LABEL DD OVER
1030 AS 'TIME DEPOSITS' LABEL TD OVER
BAR OVER
RECAP TOTCASH = R1 + R2 + R3; AS 'TOTAL CASH'
ON TABLE SET STYLESHEET *
TYPE = REPORT, GRID = OFF, $
TYPE = REPORT, LABEL = COH, STYLE = ITALIC, $
```

```
TYPE = REPORT, LABEL = DD,  STYLE = ITALIC, $
TYPE = REPORT, LABEL = TD,  STYLE = ITALIC, $
ENDSTYLE
END
```

The output is shown in the following image.



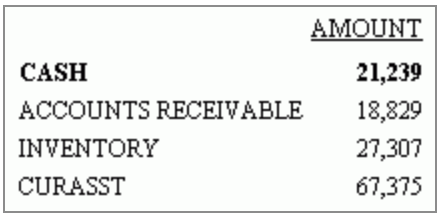
| | AMOUNT |
|---|---|
| *CASH ON HAND* | *8,784* |
| *DEMAND DEPOSITS* | *4,494* |
| *TIME DEPOSITS* | *7,961* |
| TOTAL CASH | 21,239 |

**Applying Boldface to a TAG Row in an FML Report**

This request applies boldface to the customized row title, CASH, and to the related data in the AMOUNT column. The StyleSheet uses the explicit label CA to identify the component to format. StyleSheets" />

```
SET PAGE-NUM=OFF
TABLE FILE LEDGER
SUM AMOUNT FOR ACCOUNT
10$$ AS 'CASH'                 LABEL CA   OVER
1100 AS 'ACCOUNTS RECEIVABLE' LABEL AR   OVER
1200 AS 'INVENTORY'            LABEL INV  OVER
RECAP CURASST/I5C = CA + AR + INV;
ON TABLE SET STYLESHEET *
TYPE = REPORT, GRID = OFF, $
TYPE = REPORT, LABEL = CA, STYLE = BOLD, $
ENDSTYLE
END
```

The output is shown in the following image.



| | AMOUNT |
|---|---|
| **CASH** | **21,239** |
| ACCOUNTS RECEIVABLE | 18,829 |
| INVENTORY | 27,307 |
| CURASST | *67,375* |

**Applying Boldface to a Cell in an FML Matrix**

This request generates a report in which the data value for AMOUNT is bold in the row titled CASH. However, the row title CASH is not bold. This is accomplished by pinpointing the cell in the StyleSheet declaration. In this case, the column (N2) within the row (CA).

```
SET PAGE-NUM=OFF
TABLE FILE LEDGER
SUM AMOUNT FOR ACCOUNT
10$$ AS 'CASH'                 LABEL CA   OVER
1100 AS 'ACCOUNTS RECEIVABLE' LABEL AR   OVER
1200 AS 'INVENTORY'            LABEL INV  OVER
RECAP CURASST/I5C = CA + AR + INV;
ON TABLE SET STYLESHEET *
TYPE = REPORT, GRID = OFF, $
TYPE = REPORT, COLUMN = N2, LABEL = CA, STYLE = BOLD, $
ENDSTYLE
END
```

The output is shown in the following image.

| | AMOUNT |
|---|---|
| **CASH** | **21,239** |
| ACCOUNTS RECEIVABLE | 18,829 |
| INVENTORY | 27,307 |
| CURASST | 67,375 |

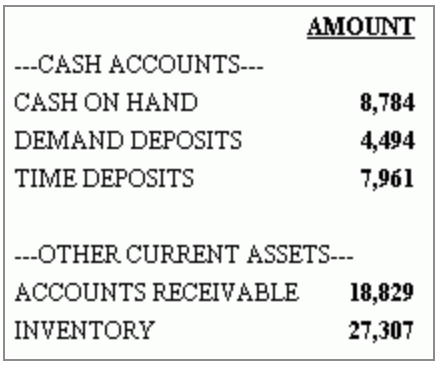
**Applying Boldface to a Column in an FML Report**

This request identifies the AMOUNT column by name and formats its title and data in bold. The same result is achieved if the column is identified as N2.

```
SET PAGE-NUM=OFF
TABLE FILE LEDGER
SUM AMOUNT FOR ACCOUNT
"---CASH ACCOUNTS---"                  OVER
1010 AS 'CASH ON HAND'                 OVER
1020 AS 'DEMAND DEPOSITS'              OVER
1030 AS 'TIME DEPOSITS'                OVER
" "                                    OVER
"---OTHER CURRENT ASSETS---"           OVER
1100 AS 'ACCOUNTS RECEIVABLE'          OVER
1200 AS 'INVENTORY'
ON TABLE SET STYLESHEET *
TYPE = REPORT, GRID = OFF, $
TYPE = REPORT, COLUMN = AMOUNT, STYLE = BOLD, $
```

```
ENDSTYLE
END
```

The output is shown in the following image.



| | AMOUNT |
|---|---|
| ---CASH ACCOUNTS--- | |
| CASH ON HAND | 8,784 |
| DEMAND DEPOSITS | 4,494 |
| TIME DEPOSITS | 7,961 |
| | |
| ---OTHER CURRENT ASSETS--- | |
| ACCOUNTS RECEIVABLE | 18,829 |
| INVENTORY | 27,307 |

### Applying Boldface to a Free Text Row

This request styles the free text as bold. Since in this example the same styling applies to both free text rows, labels are not required to distinguish between them.

```
SET PAGE-NUM=OFF
TABLE FILE LEDGER
SUM AMOUNT FOR ACCOUNT
"---CASH ACCOUNTS---"  LABEL CA         OVER
1010 AS 'CASH ON HAND'                  OVER
1020 AS 'DEMAND DEPOSITS'               OVER
1030 AS 'TIME DEPOSITS'                 OVER
" "                                     OVER
"---OTHER CURRENT ASSETS---"  LABEL OCA OVER
1100 AS 'ACCOUNTS RECEIVABLE'           OVER
1200 AS 'INVENTORY'
ON TABLE SET STYLESHEET *
TYPE = REPORT, GRID = OFF, $
TYPE = FREETEXT, STYLE = BOLD, $
ENDSTYLE
END
```

The output is shown in the following image.

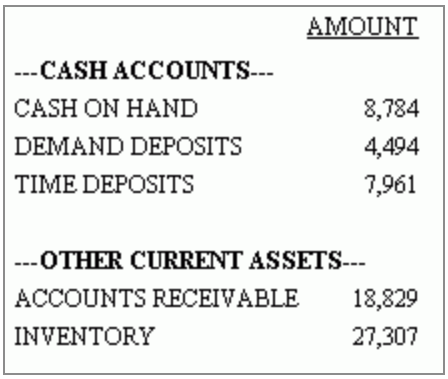
| | AMOUNT |
|---|---|
| ---CASH ACCOUNTS--- | |
| CASH ON HAND | 8,784 |
| DEMAND DEPOSITS | 4,494 |
| TIME DEPOSITS | 7,961 |
| | |
| ---OTHER CURRENT ASSETS--- | |
| ACCOUNTS RECEIVABLE | 18,829 |
| INVENTORY | 27,307 |

**Formatting Free Text Rows Separately in an FML Report**

This request uses the SIZE attribute to distinguish two lines of free text: CASH ACCOUNTS and OTHER CURRENT ASSETS. The labels CA and OCA are used to identify and format each row separately.

```
SET PAGE-NUM=OFF
TABLE FILE LEDGER
SUM AMOUNT FOR ACCOUNT
" --- CASH ACCOUNTS ---" LABEL CA            OVER
1010 AS 'CASH ON HAND'                        OVER
1020 AS 'DEMAND DEPOSITS'                     OVER
1030 AS 'TIME DEPOSITS'                       OVER
" "                                           OVER
" --- OTHER CURRENT ASSETS ---" LABEL OCA    OVER
1100 AS 'ACCOUNTS RECEIVABLE'                 OVER
1200 AS 'INVENTORY'
ON TABLE SET STYLESHEET *
TYPE = REPORT, GRID = OFF, $
TYPE = FREETEXT, LABEL = CA, STYLE = BOLD, SIZE = 12, $
TYPE = FREETEXT, LABEL = OCA, STYLE = BOLD, SIZE = 10, $
ENDSTYLE
END
```

The output is shown in the following image.



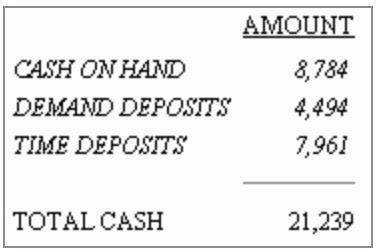
| | AMOUNT |
|---|---|
| **---CASH ACCOUNTS---** | |
| CASH ON HAND | 8,784 |
| DEMAND DEPOSITS | 4,494 |
| TIME DEPOSITS | 7,961 |
| | |
| **---OTHER CURRENT ASSETS---** | |
| ACCOUNTS RECEIVABLE | 18,829 |
| INVENTORY | 27,307 |

### Styling Text and a Variable in a Free Text Row

In this example, the text and variable components of the free text row are styled separately. The text, Current Assets, is italic and the value derived from the RECAP calculation is bold.

```
SET PAGE-NUM=OFF
TABLE FILE LEDGER
SUM AMOUNT AS 'Amount' FOR ACCOUNT
10$$ AS 'Cash'                    LABEL CA    OVER
1100 AS 'Accounts Receivable'     LABEL AR    OVER
1200 AS 'Inventory'               LABEL INV   OVER
RECAP CURASST/I5C = CA + AR + INV; NOPRINT  OVER
"Current Assets: <CURASST"
ON TABLE SET STYLESHEET *
TYPE = REPORT, GRID=OFF, $
TYPE = FREETEXT, OBJECT = TEXT, ITEM = 1, SIZE = 12, STYLE = ITALIC, $
TYPE = FREETEXT, OBJECT = FIELD, ITEM = 1, STYLE = BOLD, $
ENDSTYLE
END
```

The output is shown in the following image.



| | AMOUNT |
|---|---|
| *CASH ON HAND* | *8,784* |
| *DEMAND DEPOSITS* | *4,494* |
| *TIME DEPOSITS* | *7,961* |
| | |
| TOTAL CASH | 21,239 |

### Applying Boldface to an FML RECAP Row

This request applies boldface to the row title and calculated value in a RECAP row. Notice that the RECAP label in the StyleSheet is TOTCASH. In a RECAP, the name assigned to the calculated value serves as the explicit label.

```
SET PAGE-NUM=OFF
TABLE FILE LEDGER
SUM AMOUNT FOR ACCOUNT
1010 AS 'CASH ON HAND'    LABEL CASH    OVER
1020 AS 'DEMAND DEPOSITS' LABEL DD      OVER
1030 AS 'TIME DEPOSITS'   LABEL TD      OVER
RECAP TOTCASH = R1 + R2 + R3; AS 'TOTAL CASH'
ON TABLE SET STYLESHEET *
TYPE = REPORT, GRID = OFF, $
TYPE = REPORT, LABEL = TOTCASH, STYLE = BOLD, $
TYPE = REPORT, LABEL = CASH, COLUMN = N1, STYLE = ITALIC, $
TYPE = REPORT, LABEL = DD, COLUMN = N1, STYLE = ITALIC, $
TYPE = REPORT, LABEL = TD, COLUMN = N1, STYLE = ITALIC, $
ENDSTYLE
END
```

The output is shown in the following image.

| | AMOUNT |
|---|---|
| *CASH ON HAND* | 8,784 |
| *DEMAND DEPOSITS* | 4,494 |
| *TIME DEPOSITS* | 7,961 |
| **TOTAL CASH** | **21,239** |

# Add and Format Row and Cell Borders

To request a uniform border around a row or cell, use this syntax:

```
TYPE=REPORT, LABEL=row_label, [COLUMN=column,] BORDER=option,
[BORDER-STYLE=line_style,] [BORDER-COLOR={color|RGB® g b)},] $
```

To specify different characteristics for the top, bottom, left, and/or right borders, use this syntax:

```
TYPE=REPORT, LABEL=row_label, [COLUMN=column,] BORDER-position=option,
[BORDER-[position-]STYLE=line_style,]
[BORDER-[position-]COLOR={color|RGB(r g b)},] $
```

To specify different characteristics for the top, bottom, left, and/or right borders, use this syntax:

```
TYPE=REPORT, LABEL=row_label, [COLUMN=column,] BORDER-position=option,
[BORDER-[position-]STYLE=line_style,]
[BORDER-[position-]COLOR={color|RGB(r g b)},] $
```

where:

**row_label**

Is the row to which the specified border characteristics are applied.

**column**

Used in conjunction with row label. Designates a cell (at the point of intersection of the row and the column) to which the specified border characteristics are applied.

**option**

Can be one of the following values:

ON turns borders on for the entire heading or footing. ON generates the same line as MEDIUM.

OFF turns borders off for the entire heading or footing. OFF is the default.

LIGHT specifies a thin line. You can specify a light line for the entire heading or footing, or for one or more border positions.

MEDIUM identifies a medium line (ON sets the line as MEDIUM). You can specify a light line for the entire heading or footing, or for one or more border positions. Note that the medium line setting ensures consistency with lines created with GRID attributes.

HEAVY identifies a thick line. You can specify a heavy line for the entire heading or footing, or for one or more border positions.

width specifies the line width in points (where 72 pts=1 inch). You can specify a line width in points for the entire heading or footing or for one or more border positions. Line width specified in points is displayed differently in HTML and PDF output. For uniform appearance, regardless of display format, use LIGHT, MEDIUM, or HEAVY.

**position**

Specifies which border line to format. Valid values are TOP, BOTTOM, LEFT, RIGHT.

You can specify a position qualifier for any of the BORDER keywords. This enables you to format line width, line style, and line color individually, for any side of the border.

**line_style**

Sets the style of the border line. WebFOCUS StyleSheets support all of the standard Cascading Style Sheets line styles. Several 3-dimensional styles are only available in HTML, as noted by asterisks. Valid values are:

```
NONE
SOLID
DOTTED
DASHED
DOUBLE*
GROOVE*
RIDGE*
INSET*
OUTSET*
```

**color**

Is one of the preset color values. The default value is BLACK.

If the display or output device does not support colors, it substitutes shades of gray.

**RGB**

Specifies the font color using a mixture of red, green, and blue.

**(r g b)**

Is the desired intensity of red, green, and blue, respectively. The values are on a scale of 0 to 255, where 0 is the least intense and 255 is the most intense. Note that using the three color components in equal intensities results in shades of gray.

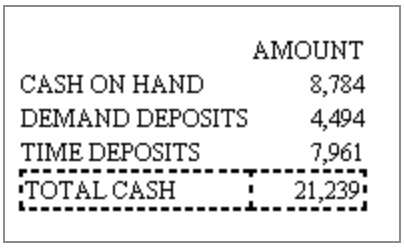
**Note:** For HTML reports, the BORDERS feature requires that cascading style sheets be turned ON. This code is not required for PDF and PS reports.

# Emphasizing a Row Using Uniform Border Lines

This example places a dashed border of medium thickness around the RECAP row identified by the label TOTCASH. For HTML reports, the BORDERS feature requires that cascading style sheets be turned ON.

```
SET PAGE-NUM=OFF
TABLE FILE LEDGER
SUM AMOUNT FOR ACCOUNT
1010 AS 'CASH ON HAND'    LABEL CASH    OVER
1020 AS 'DEMAND DEPOSITS' LABEL DD      OVER
1030 AS 'TIME DEPOSITS'   LABEL TD      OVER
RECAP TOTCASH = R1 + R2 + R3; AS 'TOTAL CASH'
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLESHEET *
TYPE = REPORT, GRID = OFF, $
TYPE = REPORT, LABEL = TOTCASH, BORDER = MEDIUM,
  BORDER-STYLE = DASHED, $
ENDSTYLE
END
```

The output is shown in the following image.



| | AMOUNT |
|---|---|
| CASH ON HAND | 8,784 |
| DEMAND DEPOSITS | 4,494 |
| TIME DEPOSITS | 7,961 |
| TOTAL CASH | 21,239 |

# Emphasizing a Row Using Different Top/Bottom and Left/Right Borders

This example places a heavy black border line above and below the RECAP row identified by the label TOTCASH, and a thin silver dotted line to the left and right of each column in the row.

For HTML reports, the BORDERS feature requires that cascading style sheets be turned ON.

```
SET PAGE-NUM=OFF
TABLE FILE LEDGER
SUM AMOUNT FOR ACCOUNT
1010 AS 'CASH ON HAND'    LABEL CASH    OVER
1020 AS 'DEMAND DEPOSITS' LABEL DD      OVER
1030 AS 'TIME DEPOSITS'   LABEL TD      OVER
RECAP TOTCASH = R1 + R2 + R3; AS 'TOTAL CASH'
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLESHEET *
TYPE = REPORT, GRID = OFF,$
TYPE = REPORT, LABEL = TOTCASH,
     BORDER-TOP = HEAVY,
     BORDER-BOTTOM = HEAVY,
     BORDER-LEFT = LIGHT,
     BORDER-RIGHT = LIGHT,
     BORDER-TOP-STYLE = SOLID,
     BORDER-BOTTOM-STYLE = SOLID,
     BORDER-LEFT-STYLE = DOTTED,
     BORDER-RIGHT-STYLE = DOTTED,
     BORDER-LEFT-COLOR = 'SILVER',
     BORDER-RIGHT-COLOR = 'SILVER', $
ENDSTYLE
END
```

The output is shown in the following image.

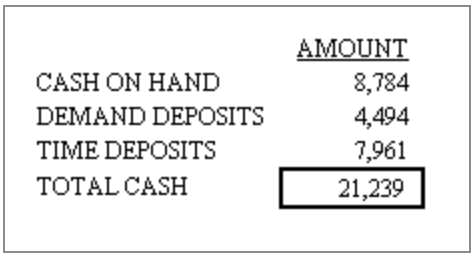
| | AMOUNT |
|---|---|
| CASH ON HAND | 8,784 |
| DEMAND DEPOSITS | 4,494 |
| TIME DEPOSITS | 7,961 |
| TOTAL CASH | 21,239 |

# Adding Uniform Border Lines Around a Cell

This example places a border of medium thickness around the cell in the second column of the row identified by the label TOTCASH. The combined LABEL and COLUMN specifications are identified in the cell. The BORDERS feature requires that cascading style sheets be turned ON.

```
SET PAGE-NUM=OFF
TABLE FILE LEDGER
SUM AMOUNT FOR ACCOUNT
1010 AS 'CASH ON HAND'    LABEL CASH    OVER
1020 AS 'DEMAND DEPOSITS' LABEL DD      OVER
1030 AS 'TIME DEPOSITS'   LABEL TD      OVER
RECAP TOTCASH = R1 + R2 + R3; AS 'TOTAL CASH'
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLESHEET *
TYPE = REPORT, GRID = OFF,$
TYPE = REPORT, LABEL = TOTCASH, COLUMN = N2, BORDER = MEDIUM, $
ENDSTYLE
END
```

The output is shown in the following image.



| | AMOUNT |
|---|---|
| CASH ON HAND | 8,784 |
| DEMAND DEPOSITS | 4,494 |
| TIME DEPOSITS | 7,961 |
| TOTAL CASH | 21,239 |

# Specify an Indent for an FML Label, Tag, or Caption

```
FOR forfield [IN k]
tag [[GET CHILDREN|WITH CHILDREN] n] INDENT m [AS ['text'|CAPTION]]
[OVER]
```

or

```
RECAP fieldname[/format]=expression; INDENT m [AS 'text']
```

where:

**forfield**

Is a field in the data source whose values are included in the report.

**k**

Is the starting column for the FOR value in an FML report.

**tag**

Is a value of *forfield* to be displayed on a row of the FML report.

**n**

Is the number of levels of an FML hierarchy to display on the FML report.

**m**

Is a positive integer (zero is not supported) specifying the number of spaces to indent the tag value, label, or caption of an FML row or hierarchy. The indentation starts from column one if there is no IN phrase specified in the FOR command. If there is an IN phrase, indentation starts from the column specified in the IN phrase. The maximum indentation is the same as the maximum length of an AS name.

If you indent an FML hierarchy, the parent line of the hierarchy is indented the number of spaces specified as the indent. The hierarchy levels are indented two spaces from each other. If the GET CHILDREN phrase is used, the first line of the hierarchy is indented an additional two spaces because the hierarchy output begins with the first child rather than the parent. For more information about the use of GET CHILDREN, see Displaying an FML Hierarchy.

**'text'**

Is a label to be displayed on a row of the FML report.

**CAPTION**

Indicates that a caption field has been defined in the Master File.

**OVER**

Indicates that this row is not the last row to be displayed.

**fieldname**

Is a name you assign to the value calculated by the RECAP command.

**format**

Is the USAGE format for RECAP field. It cannot exceed the column width. The default is the format of the column in which the calculated value is displayed.

**expression**

Is the expression that describes how to calculate the field value for RECAP.

# Indenting a Tag Row in an FML Hierarchy

In the following request, the label of the second row for tag value 3000 is indented five spaces. Because the GET CHILDREN phrase is used, the first line of the FML hierarchy, in the third row for tag value 3000, is indented seven spaces (five + two).

```
SET FORMULTIPLE=ON
TABLE FILE CENTGL
PRINT GL_ACCOUNT_PARENT
FOR GL_ACCOUNT
3000                           AS 'Not Indented'        OVER
3000                 INDENT 5  AS 'Indented 5'          OVER
3000 GET  CHILDREN 2 INDENT 5  AS 'Hierarchy Indented 5'
END
```

The output is shown as follows.

```
                               Parent
                               ------
Not Indented                   3000
     Indented 5                3000
       Hierarchy Indented 5    3000
         Hierarchy Indented 5  3100
         Hierarchy Indented 5  3100
         Hierarchy Indented 5  3100
         Hierarchy Indented 5  3100
         Hierarchy Indented 5  3000
         Hierarchy Indented 5  3200
         Hierarchy Indented 5  3200
         Hierarchy Indented 5  3200
         Hierarchy Indented 5  3200
         Hierarchy Indented 5  3200
         Hierarchy Indented 5  3200
         Hierarchy Indented 5  3200
```

### Indenting FML RECAP Rows

The following request sums price, cost, and quantity in stock for digital and analog product types. The first RECAP command calculates the total for each column, and indents the label five spaces. The second RECAP command calculates the profit, and indents the label 10 spaces.

```
SET FORMULTIPLE=ON
TABLE FILE CENTINV
SUM PRICE COST QTY_IN_STOCK
FOR PRODTYPE
Digital                                              OVER
Analog                                               OVER
BAR                                                  OVER
RECAP TOTAL = R1 + R2; INDENT 5  AS 'Total:'         OVER
BAR                                                  OVER
RECAP PROFIT(2) = TOTAL(1) - TOTAL(2); AS 'Profit:' INDENT 10
END
```

The output is shown as follows.

```
                                    Our    Quantity
                        Price:      Cost:  In Stock:
                        ------      -----  ---------
Digital                4,080.00      3,052.00     119143
Analog                 1,883.00      1,371.00     139345
                   ------------  ------------    -------
     Total:            5,963.00      4,423.00     258488
                   ------------  ------------    -------
          Profit:                     1,540.00
```

# Indenting Row Titles in an FML Hierarchy

To clarify relationships within an FML hierarchy, the captions (titles) of values are indented at each level. Use the BLANKINDENT parameter in an HTML, PDF, or PostScript report to specify the indentation between each level in the hierarchy. You can use the default indentation for each hierarchy level or choose your own indentation value. To print indented captions in an HTML report, you must set the BLANKINDENT parameter to ON or to a number.

SET BLANKINDENT does not redefine the width of the indented column, if it is not wide enough to accommodate the indented fields. Columns in table-based formats will automatically size themselves as needed, while columns in position-based formats, such as PDF, PostScript, or PPTX, shift out of alignment. You can use StyleSheet syntax to make the column wide enough for the indented values, and move the columns that follow it. Change the width of a column using the StyleSheet SQUEEZE = *n* attribute to supply the required space.

A related feature enables you to change the number of blank spaces before the parent line of a hierarchy or before any FML tag or RECAP row in any FML request. For more information, see Formatting an FML Report.

# Indent FML Hierarchy Captions in an HTML Report

```
SET BLANKINDENT={ON|OFF|n}
ON TABLE SET BLANKINDENT {ON|OFF|n}
```

where:

**ON**

Indents FML hierarchy captions 0.125 units for each space that normally displays before the caption. For child levels in an FML hierarchy, it indents 0.125 units for each space that normally displays between this line and the line above it.

**OFF**

Turns off indentations for FML hierarchy captions in an HTML report. OFF is the default value. For other formats, uses the default indentation of two spaces.

**n**

Is an explicit measurement in the unit of measurement defined by the UNITS parameter. This measurement is multiplied by the number of spaces that normally displays before the caption. For child levels in an FML hierarchy, it indents *n* units for each space that normally displays between this line and the line above it. The default number of spaces is two. Zero (0) produces the same report output as OFF. Negative values for *n* are not supported.

# Using the Default Indentation for FML Hierarchy Captions

The following request creates an HTML report with the default indentation:

```
SET PAGE-NUM=NOPAGE
SET BLANKINDENT=ON
SET FORMULTIPLE=ON
TABLE FILE CENTGL
PRINT GL_ACCOUNT_PARENT
FOR GL_ACCOUNT
3000                  AS CAPTION      OVER
3000 GET  CHILDREN 2  AS CAPTION
ON TABLE SET ONLINE-FMT HTML
ON TABLE SET HTMLCSS ON
ON TABLE SET STYLE *
TYPE = REPORT, GRID = OFF, $
ENDSTYLE
END
```

The output is shown in the following image.

| | Parent |
|---|---|
| Total Operating Expenses | 1000 |
| Selling Expenses | 3000 |
| Advertising | 3100 |
| Promotional Expenses | 3100 |
| Joint Marketing | 3100 |
| Bonuses/Commisions | 3100 |
| General + Admin Expenses | 3000 |
| Salaries-Corporate | 3200 |
| Company Benefits | 3200 |
| Depreciation Expenses | 3200 |
| Gain/(Loss) Sale of Equipment | 3200 |
| Leasehold Expenses | 3200 |
| Interest Expenses | 3200 |
| Utilities | 3200 |

# Specifying an Indentation Value for FML Hierarchy Captions

The following request specifies an indentation of .25 for each level of an FML hierarchy. This number is expressed in the default unit of measurement, which is inches:

```
SET PAGE-NUM=NOPAGE
SET BLANKINDENT=.25
SET FORMULTIPLE=ON
TABLE FILE CENTGL
PRINT GL_ACCOUNT_PARENT
FOR GL_ACCOUNT
3000                AS CAPTION          OVER
3000 GET  CHILDREN 2 AS CAPTION

ON TABLE SET STYLE *
TYPE = REPORT, GRID = OFF, $
ENDSTYLE
END
```

The output is shown in the following image.

| | Parent |
|---|---|
| Total Operating Expenses | 1000 |
| Selling Expenses | 3000 |
| Advertising | 3100 |
| Promotional Expenses | 3100 |
| Joint Marketing | 3100 |
| Bonuses/Commisions | 3100 |
| General + Admin Expenses | 3000 |
| Salaries-Corporate | 3200 |
| Company Benefits | 3200 |
| Depreciation Expenses | 3200 |
| Gain/(Loss) Sale of Equipment | 3200 |
| Leasehold Expenses | 3200 |
| Interest Expenses | 3200 |
| Utilities | 3200 |

# Suppressing the Display of Rows

You may sometimes wish to retrieve data in a TAG row solely for use in a calculation, without displaying the row in a report. To suppress the display of a tag row, add the word NOPRINT to the row declaration, as in a TABLE request.

You may also wish to suppress the display of a TAG row if no data is found for the values. For more information, see Suppressing Rows With No Data.

In addition, you can suppress the display of RECAP rows by adding the word NOPRINT to the RECAP command, following the semicolon. This technique is useful to suppress the display of an intermediate RECAP value, which is intended for use as input to other calculations.

# Suppressing the Display of a TAG Row

This example uses the value of COST in its computation, but does not display COST as a row in the report.

```
DEFINE FILE REGION
AMOUNT/I5C=E_ACTUAL;
END

TABLE FILE REGION
SUM AMOUNT FOR ACCOUNT
3000 AS 'SALES' LABEL SLS           OVER
3100 AS 'COST' LABEL COST NOPRINT   OVER
RECAP PROFIT/I5C = SLS - COST;      OVER
" "                                 OVER
RECAP ROS/F6.2 = 100*PROFIT/SLS;
AS 'RETURN ON SALES'
END
```

The output is shown as follows.

| | AMOUNT |
|---|---|
| SALES | 6,000 |
| PROFIT | 1,350 |
| | |
| RETURN ON SALES | 22.50 |

# Suppressing Rows With No Data

The text for a tag row is displayed even if no data is found in the file for the tag values, with a period (.) representing the missing data. You can override this convention by adding the phrase WHEN EXISTS to the definition of a TAG row. This makes displaying a row dependent upon the existence of data for the tag. This feature is useful, for example, when the same model is applied to different divisions in a company.

# Suppressing Rows With No Data

In this example, assume that the variable DIVISION contains Division 1, a real estate syndicate, and Division 2, a bank. The following request describes their balance sheets in one FML report. Rows that are irrelevant for each division are not displayed.

```
TABLE FILE LEDGER
HEADING CENTER
"BALANCE SHEET FOR DIVISION <DIVISION"
" "
SUM AMOUNT
BY DIVISION NOPRINT
ON DIVISION PAGE-BREAK
FOR ACCOUNT
2000 AS 'LAND' WHEN EXISTS LABEL LD          OVER
2100 AS 'CAR LOANS' WHEN EXISTS LABEL LOAN   OVER
   .
   .
   .
```

# Saving and Retrieving Intermediate Report Results

Many reports require results developed in prior reports. This can be accomplished only if a place is provided for storing intermediate values. An example is the need to compute net profit in an Income Statement prior to calculating equity in a Balance Sheet. FML can save selected rows from one or more models by posting them to a work file. The posted rows can then be picked up from the work file and reused.

The default work file is FOCPOST. This is a comma-delimited file from which you can report directly if a FOCPOST Master File is available. In order to use the work file in a request, you must assign a physical name to the FOCPOST ddname before running the report that posts the data, and again before running the report that picks up the data.

You can assign the physical name to the file by issuing a FILEDEF command on Windows and UNIX, or a TSO ALLOCATE or DYNAM ALLOCATE command on z/OS, before the request is run. You may create a FILEDEF command by using the Allocation Wizard.

While you cannot prepare an FML report entirely from data that you supply directly in your request, you can prepare a report entirely from data that is stored in a comma-delimited work file.

# Posting Data

You can save any TAG, RECAP, or DATA row by posting the output to a file. You can use these rows as though they were provided in a DATA row.

The row is processed in the usual manner in the report, depending on its other options, and then posted. The label of the row is written first, followed by the numeric values of the columns, each comma-separated, and ending with the terminator character ($). For more information, see Posting Rows to a Work File.

**Note:** Only fields that are actually displayed on the report output are posted. Fields that are not printed (for example, fields specified with the NOPRINT option, extra fields that are created when you reformat fields in the request, or fields implied by use in a calculation) are not posted.

# Post Data to a File

The syntax for saving any TAG, RECAP, or DATA row is:

```
POST [TO ddname]
```

where:

**ddname**

Is the logical name you assign to the work file in which you are posting data.

Add this syntax to any row you wish to post to the work file.

# Posting Rows to a Work File

The following request creates an FML report, and posts two tag rows to the LEDGEOUT work file.

```
FILEDEF LEDGEOUT DISK [APP]\LEDGEOUT.DAT
```

```
DEFINE FILE LEDGER
CUR_YR/I5C=AMOUNT;
LAST_YR/I5C=.87*CUR_YR - 142;
END
```

```
TABLE FILE LEDGER
SUM CUR_YR LAST_YR
FOR ACCOUNT
1100 LABEL AR POST TO LEDGEOUT OVER
1200 LABEL INV POST TO LEDGEOUT
END
```

The output is shown in the following image.

| | CUR_YR | LAST_YR |
|---|---|---|
| 1100 | 18,829 | 15,954 |
| 1200 | 27,307 | 23,329 |

# Pick Up Data From a Work File

You can retrieve posted rows from any work file and use them as if they were provided in a DATA row by adding the following phrase to an FML request.

```
DATA PICKUP [FROM ddname] id1 [OR id2 ...] [LABEL label] [AS 'text']
```

where:

**ddname**

Is the logical name of the work file from which you are retrieving data.

**id**

Is the label that was assigned in the work file to the posted row of data that is now being picked up.

**label**

Is the label you wish to assign to the data you are picking up.

The label you assign to the picked data can, but is not required to, match the label (id) of the posted data.

You can include LABEL and AS phrases, but WHEN EXISTS is not supported.

**Note:** The retrieved fields are mapped to all fields (printed or not) in the memory repository (internal matrix) of the report. If the matrix contains columns that do not correspond to the fields in the posted file, the retrieved values may be misaligned. For example, if you reformat a field in the PICKUP request, that field will be represented by two columns in the internal matrix. However, the posted file will have only one value representing that field, and the retrieved values will not be mapped properly to the associated columns in the matrix.

# Picking Up Data From a Work File

In the following example, the data in the LEDGER data source and in the LEDGEOUT work file are used in the RECAP calculation. To see how this file was created, refer to Posting Rows to a Work File.

**Tip:** You must assign a logical name to the file by issuing a FILEDEF command on Windows and UNIX, or a DYNAM ALLOCATE command on z/OS, before the request is run. You may create a FILEDEF command by using the Allocation Wizard.

```
DEFINE FILE LEDGER
CUR_YR/I5C=AMOUNT;
LAST_YR/I5C=.87*CUR_YR - 142;
END
```

```
TABLE FILE LEDGER
SUM CUR_YR LAST_YR
FOR ACCOUNT
1010 TO 1030 AS 'CASH' LABEL CASH   OVER
DATA PICKUP FROM LEDGEOUT AR  AS 'ACCOUNTS RECEIVABLE' LABEL AR   OVER
DATA PICKUP FROM LEDGEOUT INV AS 'INVENTORY' LABEL INV            OVER
BAR                                 OVER
RECAP CUR_ASSET/I5C = CASH + AR + INV;
END
```

The output is shown as follows.

| | CUR_YR | LAST_YR |
|---|---|---|
| CASH | 21,239 | 17,198 |
| ACCOUNTS RECEIVABLE | 18,829 | 15,954 |
| INVENTORY | 27,307 | 23,329 |
| CUR_ASSET | 67,375 | 56,481 |

The following line can be used to pick up the sum of the two accounts from LEDGEOUT.

```
DATA PICKUP FROM LEDGEOUT AR OR INV
AS 'ACCTS REC AND INVENTORY'
```

**Note:** Since the rows in a PICKUP file are stored in standard comma-delimited format, they can be provided either from a prior posting, or directly by a user.

# Creating HOLD Files From FML Reports

A report created with FML can be extracted to a HOLD file in the same way as all other reports created with the TABLE language.

In this case, you identify the set of tag values specified for each row by the description field (the AS text supplied in the model). When no text is given for a row, the first tag value is used automatically. Therefore, in simple models with only one tag per row and no text, the lines in the HOLD file contain the single tag value. The rows derived from the RECAP calculation form part of the HOLD file. Pure text rows (including BAR rows) are omitted.

For HOLD to be supported with RECAP, the format of the RECAP field must be the same as the format of the original column.

This feature enables you to create new rows in the HOLD file that are the result of calculations. The augmented HOLD file may then be used in a variety of TABLE requests.

**Note:** You cannot reformat RECAP rows when creating HOLD files.

# Creating a Hold File From an FML Report

The following request creates a HOLD file that contains records for CASH, ACCOUNTS RECEIVABLE, INVENTORY, and the RECAP row CURRENT ASSETS.

```
TABLE FILE LEDGER
SUM AMOUNT FOR ACCOUNT
1010 TO 1030 AS 'CASH'                              OVER
1100 AS 'ACCOUNTS RECEIVABLE'                       OVER
1200 AS 'INVENTORY'                                 OVER
RECAP CA = R1 + R2 + R3; AS 'CURRENT ASSETS'
ON TABLE HOLD
END
```

Query the HOLD file:

```
>
? HOLD

DEFINITION OF HOLD FILE: HOLD

FIELDNAME          ALIAS          FORMAT

                   E01            A 19
AMOUNT             E02            I5C
```

Then report from the HOLD file as:

```
TABLE FILE HOLD
PRINT E01 E02
END
```

The output is shown as follows.

```
                     AMOUNT
                     ------
CASH                 21,239
ACCOUNTS RECEIVABLE  18,829
INVENTORY            27,307
CURRENT ASSETS       67,375
```

# Creating a Free-Form Report

You can present data in an unrestricted or free-form format using a layout of your own design.

Whereas tabular and matrix reports present data in columns and rows for the purpose of comparison across records, and graphic reports present data visually using charts and graphs, free-form reports reflect your chosen positioning of data on a page. Free-form reporting meets your needs when your goal is to present a customized picture of a data source record on each page of a report.

**Note:** You can create free-form reports with PDF, HTML, and Styled formats. HTML output has all report pages on one HTML page. Page breaks are retained in PDF output.

# Creating a Free-Form Report

You can create a free-form report from a TABLE request that omits the display commands that control columnar and matrix formatting (PRINT, LIST, SUM, and COUNT). Instead, the request includes the following report features:

| | |
|---|---|
| **Heading** | Contains the body of the report. It displays the text characters, graphic characters, and data fields that make up the report. |
| **Footing** | Contains the footing of the report. This is the text that appears at the bottom of each page of the report. The footing may display the same characters and data fields as the heading. |
| **Prefix operators** | Indicates field calculations and manipulation. |

| | |
|---|---|
| **Temporary fields** | Derives new values from existing fields in a data source. |
| **BY phrases** | Specifies the report sort order, and determines how many records are included on each page. |
| **WHERE criteria** | Selects records for the report. |

When creating a free-form report, you can:

- Design your report to include text, data fields, and graphic characters. See Designing a Free-Form Report.
- Customize the layout of your report. See Laying Out a Free-Form Report.
- Select the sort order and the records that are included in your report. See Sorting and Selecting Records in a Free-Form Report.

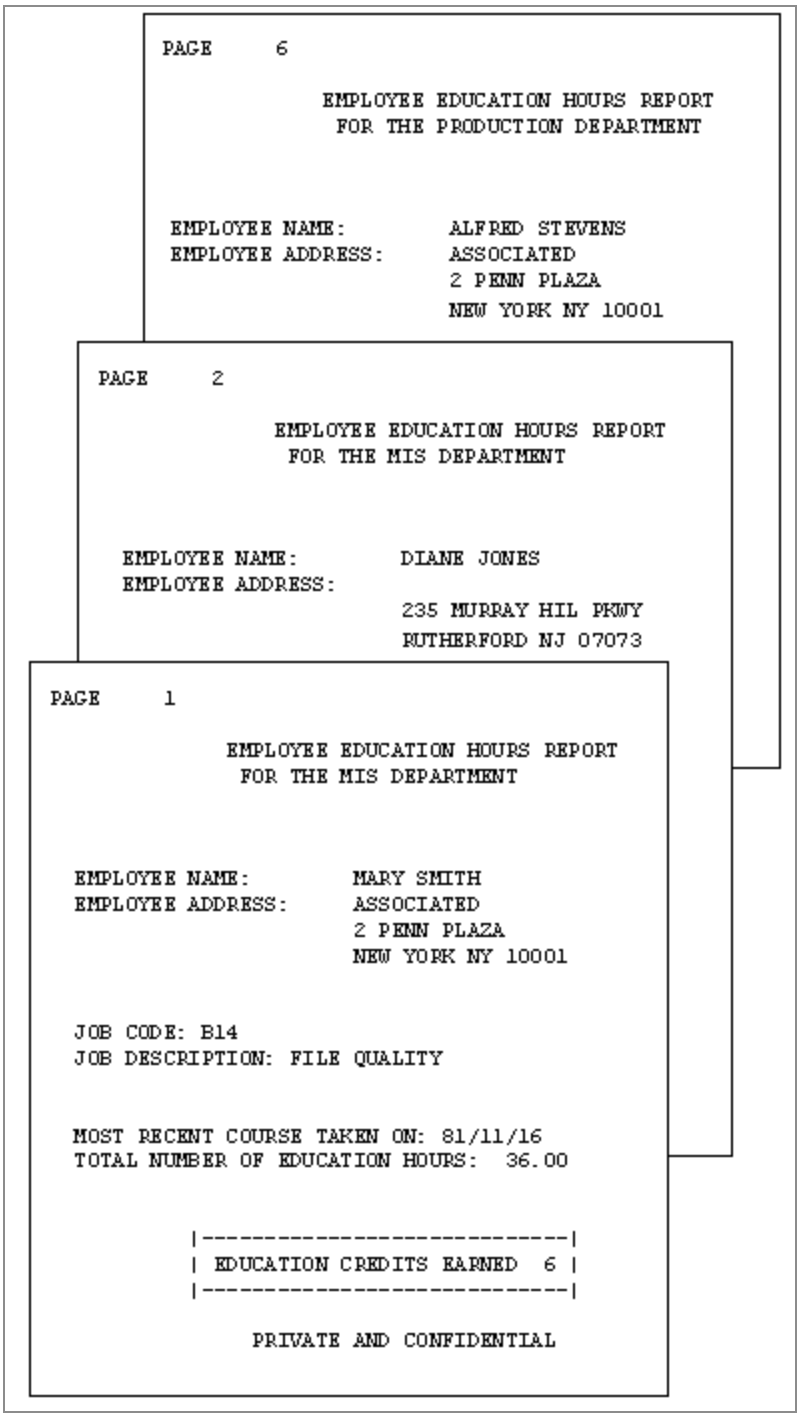
# Creating a Free-Form Report

Suppose that you are a Personnel Manager and it is your responsibility to administer your company education policies. This education policy states that the number of hours of outside education that an employee may take at the company expense is determined by the number of hours of in-house education completed by the employee.

To do your job efficiently, you want a report that shows the in-house education history of each employee. Each employee information should display on a separate page so that it can be placed in the employee personnel file and referenced when an employee requests approval to take outside courses.

To meet this requirement, you create the EMPLOYEE EDUCATION HOURS REPORT, which displays a separate page for each employee. Notice that pages 1 and 2 of the report provide information about employees in the MIS department, while page 6 provides information for an employee in the Production department.

The following diagram simulates the output you would see if you ran the procedure in the example named Request for EMPLOYEE EDUCATION HOURS REPORT.


PAGE 6
EMPLOYEE EDUCATION HOURS REPORT
FOR THE PRODUCTION DEPARTMENT
EMPLOYEE NAME: ALFRED STEVENS
EMPLOYEE ADDRESS: ASSOCIATED
2 PENN PLAZA
NEW YORK NY 10001
PAGE 2
EMPLOYEE EDUCATION HOURS REPORT
FOR THE MIS DEPARTMENT
EMPLOYEE NAME: DIANE JONES
EMPLOYEE ADDRESS:
235 MURRAY HIL PKWY
RUTHERFORD NJ 07073
PAGE 1
EMPLOYEE EDUCATION HOURS REPORT
FOR THE MIS DEPARTMENT
EMPLOYEE NAME: MARY SMITH
EMPLOYEE ADDRESS: ASSOCIATED
2 PENN PLAZA
NEW YORK NY 10001
JOB CODE: B14
JOB DESCRIPTION: FILE QUALITY
MOST RECENT COURSE TAKEN ON: 81/11/16
TOTAL NUMBER OF EDUCATION HOURS: 36.00
EDUCATION CREDITS EARNED 6
PRIVATE AND CONFIDENTIAL

# Request for EMPLOYEE EDUCATION HOURS REPORT

The following request produces the EMPLOYEE EDUCATION HOURS REPORT. Numbers to the left of the request correspond to numbers in the following annotations:

```
1. SET STYLE = OFF
   SET STYLEMODE=FIXED
   SET ONLINE-FMT = PDF
2. DEFINE FILE EMPLOYEE
      CR_EARNED/I2 = IF ED_HRS GE 50 THEN 9
         ELSE IF ED_HRS GE 30 THEN 6
         ELSE 3;
      END
3. TABLE FILE EMPLOYEE
   BY DEPARTMENT
4. HEADING
   " "
   "<13>EMPLOYEE EDUCATION HOURS REPORT"
5. "<14>FOR THE <DEPARTMENT DEPARTMENT"
6. "</2"
   "EMPLOYEE NAME:    <23><FIRST_NAME <LAST_NAME>"
   "EMPLOYEE ADDRESS: <23><ADDRESS_LN1>"
   "<23><ADDRESS_LN2>"
   "<23><ADDRESS_LN3>"
   "</1"
   "JOB CODE: <JOBCODE>"
   "JOB DESCRIPTION: <JOB_DESC>"
   "</1"
7. "MOST RECENT COURSE TAKEN ON: <MAX.DATE_ATTEND>"
   "TOTAL NUMBER OF EDUCATION HOURS: <ED_HRS>"
   "</1"
8. "<10>|-------------------------------------|"
9. "<10>| EDUCATION CREDITS EARNED <CR_EARNED>|"
   "<10>|-------------------------------------|"
10.BY EMP_ID NOPRINT PAGE-BREAK
11.WHERE ED_HRS GT 0
12.FOOTING
   "<15>PRIVATE AND CONFIDENTIAL"
   END
```

The following explains the role of each line of the request in producing the sample report:

1. Two SET commands are required to view the desired display in a browser. The SET STYLE = OFF command enables a free-form design by ignoring default StyleSheet parameters. SET STYLEMODE = FIXED turns off HTML formatting and allows the report designer to determine where items in the report are placed, using spot markers and skip-line commands.
2. The DEFINE command creates a virtual field for the report. The calculation reflects the company policy for earning outside education credits. The result is stored in CR_EARNED and appears later in the report.
3. A free-form report begins with a standard TABLE FILE command. The sample report uses the EMPLOYEE data source.
4. The heading section, initiated by the HEADING command, defines the body of the report. Most of the text and data fields that display in the report are specified in the heading section. In this request, the heading section continues until the second BY phrase BY EMP_ID NOPRINT PAGE-BREAK.
5. This line illustrates the following:
    - The second line of the text in the page heading.
    - A data field embedded in the text: <DEPARTMENT.
    - The start position of the line, column 14: <14>.
6. You can enhance the readability of a report using skip-line commands. The command </2, when coded on a line by itself, generates two blank lines, as seen between the page heading and employee name.
7. This line illustrates how to perform a field calculation in a free-form report using a prefix operator. In this case, we requested the date on which the most recent course was taken—that is, the maximum value for the DATE_ATTEND field.
8. The next three lines illustrate the use of special characters to create a graphic in the report. The box around EDUCATION CREDITS EARNED may need adjustment for output displayed in a proportional font.
9. The value of the field created by the DEFINE command displays in the box, highlighting the number of education credits an employee has earned. This line demonstrates that you can display a virtual field in the body of your report.
10. This line illustrates the use of sorting in a free-form report. The report specifications require that information for only one employee displays per page. This is achieved by using the BY and PAGE-BREAK commands. Note that in order to produce a report

with page breaks, the report output must be PDF.

11. You can specify record selection in a free-form report. As a result of the WHERE criterion, the report includes only employees who have accumulated in-house education credits.
12. Since we have designed a personnel report, it is important to have the words PRIVATE AND CONFIDENTIAL at the end of each report page. The FOOTING command accomplishes this.

# Designing a Free-Form Report

To design the body of a free-form report, use the HEADING and FOOTING commands. They enable you to:

- Incorporate text, data fields, and graphic characters in your report.
- Lay out your report by positioning text and data in exact column locations and skipping lines for readability.

Use the HEADING command to define the body of a free-form report, and the FOOTING command to define what appears at the bottom of each page of a report. A footing is optional. You can define an entire report using just a heading.

# Incorporating Text in a Free-Form Report

You can specify text anywhere in a free-form report, for a variety of purposes. In the sample request (see the example named Request for EMPLOYEE EDUCATION HOURS REPORT) text is used:

- As a report title:

```
"<13>EMPLOYEE EDUCATION HOURS REPORT"
```

- As a label for data fields:

```
"EMPLOYEE NAME:   <FIRST_NAME <LAST_NAME>"
```

- With a data field and graphic characters:

```
"<10>| EDUCATION CREDITS EARNED <CR_EARNED>|"
```

- As a page footing:

```
"<15>PRIVATE AND CONFIDENTIAL"
```

# Incorporating Data Fields in a Free-Form Report

The crucial element in any report, free-form or otherwise, is the data. The data fields available in a request include data fields in the Master File, cross-referenced fields, and virtual fields created with the DEFINE command.

The sample request (see Request for EMPLOYEE EDUCATION HOURS REPORT) references all three types of data fields:

- ED_HRS is found in the EMPLOYEE Master File:

```
"TOTAL NUMBER OF EDUCATION HOURS: <ED_HRS>"
```

- DATE_ATTEND is found in the EDUCFILE Master File, which is cross-referenced in the EMPLOYEE Master File:

```
"MOST RECENT COURSE TAKEN ON: <MAX.DATE_ATTEND>"
```

- CR_EARNED is created with the DEFINE command before the TABLE FILE command, and is referenced as follows:

```
"<10>| EDUCATION CREDITS EARNED <CR_EARNED>|"
```

You can also apply a prefix operator to a data field to select a particular value (for example, the maximum value within a sort group) or to perform a calculation (for example, to compute the average value of a field). You can use any available prefix operator in a free-form report.

In the sample request, the MAX prefix operator selects the most recent completion date of an in-house course:

```
"MOST RECENT COURSE TAKEN ON: <MAX.DATE_ATTEND>"
```

As is true with all types of reports, you must understand the structure of the data source to use the prefix operators correctly.

# Incorporating Graphic Characters in a Free-Form Report

Graphics in a report can be as creative as your imagination. The sample report (see Creating a Free-Form Report) uses special characters to enclose text and a virtual field in a box. Some other ideas include:

- Highlighting key data fields using asterisks or other special characters available directly from your keyboard, or using the HEXBYT function. See the *ibi™ WebFOCUS® Using Functions* manual for details on HEXBYT.
- Enclosing the entire report in a box to give it a form-like appearance.
- Using double lines to separate the body of the report from its page heading and page footing.

The use of special characters to create graphics is limited by what can be entered and viewed from your workstation and what can be printed on your printer. If you have difficulty producing the graphics that you want, be sure to check with someone in your organization who knows what is available.

# Laying Out a Free-Form Report

To provide spacing in a report and position text and data fields, use the spot marker feature of the HEADING and FOOTING commands.

**Note:** To take advantage of this feature in an HTML report, include the SET STYLEMODE=FIXED command in your request.

The sample request (see the example named Request for EMPLOYEE EDUCATION HOURS REPORT) illustrates this feature. The first two examples show how to position text and data fields on your report, while the third example shows how to skip lines:

- The spot marker <13> positions the specified text in column 13 of the report:

```
"<13>EMPLOYEE EDUCATION HOURS REPORT"
```

- The spot marker <23> positions the specified data field in column 23 of the report:

```
"<23><ADDRESS_LN2>"
```

- The spot marker </1 on a line by itself skips two lines after displaying the job description:

```
"JOB DESCRIPTION: <JOB_DESC>""</1""MOST RECENT COURSE TAKEN ON:
<MAX.DATE_ATTEND>"
```

When designing a free-form report, take advantage of sort field options, such as NOPRINT, PAGE-BREAK (PDF output only), and UNDER-LINE. The sample request uses PAGE-BREAK to place each employee information on a separate page:

```
BY EMP_ID NOPRINT PAGE-BREAK
```

# Sorting and Selecting Records in a Free-Form Report

As with tabular and matrix reports, you can both sort a report and conditionally select records for it. Use the same commands as for tabular and matrix reports. For example, use the BY phrase to sort a report and define WHERE criteria to select records from the data source.

# Using SQL to Create Reports

SQL users can issue report requests that combine SQL statements with TABLE formatting phrases to take advantage of a wide range of report preparation options.

These combined requests are supported through the SQL Translator, which converts ANSI Level 2 SQL statements into executable FOCUS requests.

You can use the SQL Translator to retrieve and analyze FOCUS and DBMS data.

# Supported and Unsupported SQL Statements

SQL Translation Services is compliant with ANSI Level 2. This facility supports many, but not all, SQL statements. The WebFOCUS Reporting Server and specific RDBMS engines may also support the *alpha1* CONCAT *alpha2* syntax. See Supported SQL Statements and Unsupported SQL Statements.

Many of the supported SQL statements are candidates for Dialect Translation. This feature enables a server to route inbound SQL requests to SQL-capable subservers and data adapters where possible. Dialect Translation avoids translation to the Reporting Server Data Manipulation Language (DML), while maintaining data location transparency. It transforms a standard SQL statement into one that can be processed by the destination SQL engine, while preserving the semantic meaning of the statement.

**Note:** Because the SQL Translator is ANSI Level 2 compliant, some requests that worked in prior releases may no longer work.

# Supported SQL Statements

SQL Translation Services supports the following:

- SELECT, including SELECT ALL and SELECT DISTINCT.
- CREATE TABLE. The following data types are supported for CREATE TABLE: REAL, DOUBLE PRECISION, FLOAT, INTEGER, DECIMAL, CHARACTER, SMALLINT, DATE, TIME,

and TIMESTAMP.

- INSERT, UPDATE, and DELETE for relational, IMS, and FOCUS data sources.
- Equijoins and non-equijoins.
- Outer joins, subject to certain restrictions. See SQL Joins.
- CREATE VIEW and DROP VIEW.
- PREPARE and EXECUTE.
- Delimited identifiers of table names and column names. Table and column names containing embedded blanks or other special characters in the SELECT list should be enclosed in double quotation marks.
- Column names qualified by table names or by table tags.
- The UNION [ALL], INTERSECT [ALL], and EXCEPT [ALL] operators.
- Non-correlated subqueries for all requests in the WHERE predicate and in the FROM list.
- Correlated subqueries for requests that are candidates for Dialect Translation to an RDBMS that supports this feature. Note that correlated subqueries are not supported for FOCUS and other non-relational data sources.
- Numeric constants, literals, and expressions in the SELECT list.
- Scalar functions for queries that are candidates for Dialect Translation if the RDBMS engine supports the scalar function type. These include: ABS, CHAR, CHAR_LENGTH, CONCAT, COUNTBY, DATE, DAY, DAYS, DECIMAL, EDIT, EXTRACT, FLOAT, HOUR, IF, INT, INTEGER, LCASE, LENGTH, LOG, LTRIM, MICROSECOND, MILLISECOND, MINUTE, MONTH, POSITION, RTRIM, SECOND, SQRT, SUBSTR (or SUBSTRING), TIME, TIMESTAMP, TRIM, VALUE, UCASE, and YEAR.
- The concatenation operator, '||', used with literals or alphanumeric columns.
- The following aggregate functions: COUNT, MIN, MAX, SUM, and AVG.
- The following expressions can appear in conditions: CASE, NULLIF, and COALESCE.
- Date, time, and timestamp literals of several different formats. See SQL Translator Support for Date, Time, and Timestamp Fields.
- All requests that contain ANY, SOME, and ALL that do not contain =ALL, <>ANY, and <>SOME.

- =ALL, <>ANY, and <>SOME for requests that are candidates for Dialect Translation if the RDBMS engine supports quantified subqueries.
- The special registers USER, CURRENT_DATE, CURRENT_TIME, CURRENT_TIMESTAMP, CURRENT_EDASQLVERSION, and CURRENT_TIMEZONE.
- NULL and NOT NULL predicates.
- LIKE and NOT LIKE predicates.
- IN and NOT IN predicates.
- Date and time arithmetic.
- EXISTS and NOT EXISTS predicates.
- GROUP BY clauses expressed using explicit column names, AS names, or column positions.
- ORDER BY clauses expressed using explicit column names or column numbers.
- FOR FETCH ONLY feature to circumvent record locking.
- Continental Decimal Notation (CDN) when the CDN variable is set.
- National Language Support (NLS).

# Unsupported SQL Statements

SQL Translation Services does not support the following:

- More than 15 joins per SELECT. This limit is set by SQL. FOCUS supports up to 16 joins.
- ALIAS names in Master Files and the use of formatting options to format output.
- Unique truncations of column names.
- Temporary defined columns. Permanent defined columns, defined in the WebFOCUS Reporting Server Dynamic Catalog or in the Master File, are supported.
- Correlated subqueries for DML Generation.

# SQL Translator Reserved Words

The following words may not be used as field names in a Master File that is used with the SQL Translator:

- ALL
- COUNT
- SUM
- MAX
- MIN
- AVG
- CURRENT
- DISTINCT
- USER

# Using SQL Translator Commands

The SQL command may be used to report from any supported data source or set of data sources. Standard TABLE phrases for formatting reports can be appended to the SQL statements to take advantage of a wide range of report preparation options.

**Note:** If you need to join data sources for your request, you have two options: use the JOIN command before you issue any SQL statements, or use the WHERE predicate in the SQL SELECT statement to join the required files dynamically. See SQL Joins.

# Use SQL Translator Commands

```
SQL
sql statement;
[ECHO|FILE]
[TABLE phrases]
END
```

where:

**SQL**

Is the SQL command identifier, which invokes the SQL Translator.

**Note:** The SQL command components must appear in the order represented above.

**sql statement**

Is a supported SQL statement. The statement must be terminated by a semicolon (;). It can continue for more than one line. See Supported SQL Statements.

Within the SQL statement, field names are limited to 48 characters (an ANSI standard Level 2 limitation). View names generated through the SQL CREATE VIEW statement are limited to 18 characters and subqueries can be nested up to 15 levels deep. Correlated subqueries are not supported by FOCUS and other non-relational data sources.

**ECHO**

Are optional debugging phrases that capture the generated TABLE request. These options are placed after the SQL statement.

**FILE [name]**

Writes the translated TABLE phrases to the named procedure. If you do not supply a file name, a default name is assigned when the request runs. The file is then deleted.

**TABLE phrases**

Are optional TABLE formatting phrases. See TABLE Formatting Phrases in SQL Requests.

**END or QUIT**

Is required to terminate the procedure.

# Using SQL Translator Commands

The following request contains an SQL statement and TABLE formatting commands:

```
SQL
SELECT BODYTYPE, AVG(MPG), SUM(SALES)
FROM CAR
WHERE RETAIL_COST > 5000
GROUP BY BODYTYPE;
```

```
TABLE HEADING CENTER
"AVERAGE MPG AND TOTAL SALES PER BODYTYPE"
END
```

# TABLE Formatting Phrases in SQL Requests

You can include TABLE formatting phrases in an SQL request, subject to the following rules:

- Use TABLE formatting phrases with SELECT and UNION only.
- Introduce the formatting phrases with the word TABLE.
- You may specify headings and footings, describe actions with an ON phrase, or use the ON TABLE SET command. Additionally, you can use ON TABLE HOLD or ON TABLE PCHOLD to create an extract file. You can also specify READLIMIT and RECORDLIMIT tests.

  For details on headings and footings, see Using Headings, Footings, Titles, and Labels.

  For details on ON TABLE HOLD or ON TABLE PCHOLD, see Saving and Reusing Your Report Output.
- You cannot specify additional display fields, ACROSS fields, WHERE or IF criteria (other than READLIMIT or RECORDLIMIT tests), or calculated values. BY phrases are ignored.

# The SQL SELECT Statement

The SQL SELECT statement translates into one or more TABLE PRINT or TABLE SUM commands, depending on whether individual field display or aggregation is applied in the request. See Displaying Report Data.

The SQL statement SELECT * translates to a PRINT of every field in the Master File, and uses all of the fields of the Cartesian product. This is a quick way to display a file, provided it fits in a reasonable number of screens for display, or provided you use ON TABLE HOLD or ON TABLE PCHOLD to retain retrieved data in a file for reuse. See Saving and Reusing Your Report Output.

SQL functions (such as COUNT, SUM, MAX, MIN, AVG) are supported in SELECT lists and HAVING conditions. Expressions may be used as function arguments.

The function COUNT (*) translates to a count of the number of records produced by printing all fields in the Master File. This is the same as counting all rows in the Cartesian product that results from a SELECT on all fields.

Whenever possible, expressions in the SQL WHERE predicate are translated into corresponding WHERE criteria in the TABLE request. Expressions in SELECT lists generate virtual fields. The SQL HAVING clauses also translate into corresponding WHERE TOTAL criteria in the TABLE request. The SQL LIKE operator is translated directly into the corresponding LIKE operator in the WHERE criteria of the TABLE request. For details on record selection in TABLE requests, see Selecting Records for Your Report.

Only subqueries based on equality, when the WHERE expression is compared to a subquery by using an equal (=) sign, are supported. For example: WHERE field = (SELECT ...).

The SQL UNION operator translates to a TABLE request that creates a HOLD file for each data source specified, followed by a MATCH command with option HOLD OLD-OR-NEW, which combines records from both the first (old) data source and the second (new) data source. See Merging Data Sources.

For related information, see Supported SQL Statements and Use SQL Translator Commands.

# Using the SQL SELECT Statement Without a FROM Clause

SELECT without a FROM clause is supported for returning a one-row answer set consisting of one or more constant values. No Master File is needed for issuing this type of SELECT. One use for this syntax is to test functions. For example, the following SQL SELECT returns a literal value and the results of two function calls:

```
SQL
SELECT 'MOD' AS FUNCTION, MOD(6,3) AS MOD1, MOD(5,3) AS MOD2;
TABLE
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
```

```
ENDSTYLE
END
```

The output is shown in the following image.

| FUNCTION | MOD1 | MOD2 |
|---|---|---|
| MOD | 0 | 2 |

# SQL Joins

When performing SQL joins, the formats of the joined fields must be the same. Join fields need not be indexed, and non-equijoins are supported.

Recursive, outer, and inner joins are supported. Inner join is the default.

# Create an Inner Join

Two syntax variations are supported for inner joins.

**Variation 1**

```
SQL
SELECT fieldlist FROM file1 [alias1], file2 [alias2]
[WHERE where_condition];
END
```

**Variation 2**

```
SQL
SELECT fieldlist FROM file1 [alias1] INNER JOIN file2 [alias2]
ON join_condition [INNER JOIN ...]
[WHERE where_condition];
END
```

where:

**fieldlist**

Identifies which fields are retrieved from which data sources.

Joined fields in the SQL WHERE predicate must be qualified if the names are not unique. Specify them with their corresponding file names or file aliases. For example:

```
{file1|alias1}.field1, {file2|alias2}.field2
```

**FROM**

Introduces the data sources to be joined.

**file1, file2**

Are the data sources to be joined.

**alias1, alias2**

Are optional alternate names for the data sources to be joined.

**where_condition**

Is an optional selection condition for the joined answer set. Joined rows that do not satisfy this condition are eliminated from the returned answer set. If omitted in Variation 1, the answer set is the Cartesian product of the two data sources.

**join_condition**

Is the join condition.

# Create an Outer Join

```
SQL
SELECT fieldlist FROM file1 {LEFT|RIGHT|FULL} JOIN file2
ON join_condition [{LEFT|RIGHT|FULL} JOIN ...]
WHERE where_condition
END
```

where:

**fieldlist**

Identifies which fields are to be retrieved from which data sources.

Joined fields in the SQL WHERE predicate must be qualified if the names are not unique. Specify them with their corresponding file names or file aliases. For example:

```
{file1|alias1}.field1, {file2|alias2}.field2
```

**FROM**

Introduces the data sources to be joined.

**file1, file2**

Are the data sources to be joined.

**alias1, alias2**

Are optional alternate names for the data sources to be joined.

**join_condition**

Is the join condition. The condition must specify equality. For example, T1.A=T2.B.

**where_condition**

Is an optional selection condition for the joined answer set. Joined rows that do not satisfy this condition are eliminated from the returned answer set.

# Join Name Assignments From the SQL Translator

Joins issued by the SQL Translator are assigned names in the format:

```
SQLJNMnn
```

where:

**SQLJNM**

Is the SQL Translator join prefix.

**nn**

Is a number between 01 and 16 assigned in the order in which the joins are created (FOCUS supports a maximum of 16 joins). The first join has the AS name SQLJNM01, the second join is named SQLJNM02, and so on, up to SQLJNM16.

All joins are automatically created and cleared by the SQL Translator. No user-specified joins are affected.

# Using Qualified Field Names in SQL Joins

In the following statement, T.A and U.B are qualified field names:

```
SQL
 SELECT T.A, T.B
 FROM T, U
 WHERE T.A = U.B;
END
```

# Using Recursive SQL Joins

In the following statement, A and B are aliases for the same data source, CAR. The output from CAR is pairs of B values that have the same A values:

```
SQL
   SELECT A.SEATS, B.SEATS
   FROM CAR A, CAR B
   WHERE A.MODEL = B.MODEL;
END
```

Note that all field names in the SELECT clause must be unique or qualified.

# Using SQL Full Outer Joins

In the following statement, B, C, and D are aliases for different data sources:

```
SQL
SELECT
       B.FIELD1 AS B_FIELD1, B.FIELD2 AS B_FIELD2,
       D.FIELD1 AS D_FIELD1, D.FIELD2 AS D_FIELD2
FROM
((FILE1 B FULL OUTER JOIN FILE2 C ON B.FIELD2 = C.FIELD2 )
           FULL OUTER JOIN FILE3 D ON C.FIELD2 = D.FIELD2 )
WHERE B.FIELD1 < 2
END
```

Multiple FULL OUTER JOINS are supported. However, they generate from a few to many temporary HOLD files.

# SQL Join Considerations

- In standard SQL, WHERE field='a' selects records where the field has the value 'a' or 'A'. The SQL Translator is case-sensitive and returns the exact value requested (in this case, 'a' only).
- The SQL comparison operators ANY, SOME, and ALL are supported, with the exception of =ALL, <>ANY, and <>SOME.
- Sub-selects are not supported in HAVING conditions.
- In a multi-segment structure, parent segments are omitted from reports if no instances of their descendant segments exist. This is an inner join.
- The SQL Translator applies optimization techniques when constructing joins. See Index Optimized Retrieval.

For related information about index optimization and optimized join statements, see your Server documentation.

# SQL CREATE TABLE and INSERT INTO Commands

SQL Translator supports the commands CREATE TABLE and INSERT INTO table:

- CREATE TABLE creates a new data source table. It only generates single-segment

Master Files.

- INSERT INTO inserts a row or block of rows into a table or view. Single-record insert with actual data values is supported.

These commands enable you to create tables to enhance reporting efficiency.

**Note:** When applications are enabled, the Master File and data source are written to the APPHOLD directory. When applications are disabled, the Master File and data source are written to the TEMP directory.

# Usage Notes for CREATE TABLE and INSERT INTO Commands

- According to normal SQL data definition syntax, each CREATE TABLE or INSERT INTO statement must terminate with a semicolon.
- The CREATE TABLE command supports the INTEGER, SMALLINT, FLOAT, CHARACTER, DATE, TIME, TIMESTAMP, DECIMAL, DOUBLE PRECISION and REAL data types. Decimals are rounded in the DOUBLE PRECISION and REAL data types.
- When using the CREATE TABLE and INSERT INTO commands, the data type FLOAT should be declared with a precision and used in an INSERT INTO command without the 'E' designation. This requires the entire value to be specified without an exponent.
- The CHECK and DEFAULT options are not supported with the CREATE TABLE command.

# Creating a Table With Single-Record Insert

The following shows a single-record insert, creating the table U with one record:

```
-* Single-record insert example.
-*
SQL
CREATE TABLE U (A INT, B CHAR(6), C CHAR(6), X INT, Y INT);
END
```

```
SQL
INSERT INTO U (A,B,C,X,Y) VALUES (10, '123456','654321', 10, 15);
END
```

# SQL CREATE VIEW and DROP VIEW Commands

A view is a transient object that inherits most of the characteristics of a table. Like a table, it is composed of rows and columns:

- CREATE VIEW creates views. Note that it does not put the view in the system catalog.
- DROP VIEW explicitly removes transient tables and views from the environment.

**Tip:** To use a view, issue a SELECT from it. You cannot issue a TABLE request against the view because the view is not extracted as a physical FOCUS data source. To create a HOLD file for extracted data, specify ON TABLE HOLD after the SQL statements. For details on creating HOLD files, see Saving and Reusing Your Report Output.

# Create a View

The SQL Translator supports the following SQL statement:

```
CREATE VIEW viewname AS subquery ;
```

where:

**viewname**

Is the name of the view.

**subquery**

Is a SELECT statement that nests inside:

- A WHERE, HAVING, or SELECT clause of another SELECT.
- An UPDATE, DELETE, or INSERT statement.
- Another subquery.

## Creating and Reporting From an SQL View

The following example creates a view named XYZ:

```
SQL
CREATE VIEW XYZ
 AS SELECT CAR, MODEL
 FROM CAR;
END
```

To report from the view, issue:

```
SQL
 SELECT CAR, MODEL
 FROM XYZ;
END
```

According to normal SQL data definition syntax, each CREATE VIEW statement must terminate with a semicolon.

## Dropping an SQL View

The following request removes the XYZ view:

```
SQL
 DROP VIEW XYZ;
END
```

# SQL PREPARE, EXECUTE, and COMMIT Commands

The SQL PREPARE statement creates a machine language form of an SQL statement and associates it with an identifier; you can then execute the SQL statement by referring to this identifier.

The COMMIT statement makes updates or inserts permanent, and clears all PREPARE statements.

# Executing an SQL SELECT Statement Using an Identifier

The following example executes an SQL SELECT statement by referencing the identifier PREP_QUERY:

```
SQL
 PREPARE PREP_QUERY FROM
 SELECT COUNTRY
 FROM CAR
 WHERE LENGTH > ? AND COUNTRY = ?;
END
SQL
 EXECUTE PREP_QUERY USING 165, 'ITALY';
END
SQL
 EXECUTE PREP_QUERY USING 190, 'ENGLAND';
END
SQL
 EXECUTE PREP_QUERY USING 182, 'FRANCE';
END
SQL
 COMMIT;
END
```

In the statement, each question mark (?) indicates where to substitute a value. Provide the necessary values in the USING clause of the EXECUTE statement in the order of the question marks in the original statement.

# Cartesian Product Style Answer Sets

The SQL Translator automatically generates Cartesian product style answer sets unless you explicitly turn this feature off. However, it is advisable to leave the CARTESIAN setting on, since turning it off does not comply with ANSI standards. For details on the SET CARTESIAN command, see Merging Data Sources.

# Continental Decimal Notation (CDN)

Continental Decimal Notation displays numbers using a comma to mark the decimal position and periods for separating significant digits into groups of three. This notation is available for SQL Translator requests.

## Using CDN to Separate Digits

The following example creates a column defined as 1.2 + SEATS:

```
SET CDN=ON
SQL
   SELECT SEATS + 1,2
   FROM CAR;
END
```

# Specifying Field Names in SQL Requests

Specify fields in an SQL request using:

- **Delimited identifiers.** A field name may contain (but not begin with) the symbols ., #, @, _, and $. You must enclose such field names in double quotation marks when referring to them.
- **Qualified field names.** Qualify a field name with file and file alias names. File alias names are described in the discussion of joins in SQL Joins. See the *Describing Data With ibi™ WebFOCUS® Language* manual for more information.
- **Field names with embedded blanks and special characters.** A SELECT list can specify field names with embedded blanks or other special characters. You must enclose such field names in double quotation marks. Special characters are any characters not listed as delimited identifiers, and not contained in the national character set of the installed FOCUS environment.

# Specifying a Field Name With a Delimited Identifier

The following field identifier can be included in a request:

```
"COUNTRY.NAME"
```

# Qualifying a Delimited Field Name

To qualify the delimited field name COUNTRY.NAME with its file name, use:

```
CAR."COUNTRY.NAME"
```

# SQL UNION, INTERSECT, and EXCEPT Operators

The SQL UNION, INTERSECT, and EXCEPT operators generate MATCH logic. The number of files that can participate is determined by the MATCH limit. UNION with parentheses is supported.

- SELECT A UNION SELECT B retrieves rows in A or B or both. (This is equivalent to the MATCH phrase OLD-OR-NEW.)
- INTERSECT retrieves rows in both A and B. (This is equivalent to the MATCH phrase OLD-AND-NEW.)
- EXCEPT retrieves rows in A, but not B. (This is equivalent to the MATCH phrase OLD-NOT-NEW.)

Match logic merges the contents of your data sources. See Merging Data Sources.

# Numeric Constants, Literals, Expressions, and Functions

The SQL SELECT list, WHERE predicate, and HAVING clause can include numeric constants, literals enclosed in single quotation marks, expressions, and any scalar functions.

Internally, a virtual field is created for each of these in the SELECT list. The value of the virtual field is provided in the answer set.

# SQL Translator Support for Date, Time, and Timestamp Fields

Several new data types have been defined for the SQL Translator to support date-time fields in the WHERE predicate or field list of a SELECT statement.

In addition, time or timestamp columns can be defined in relational or FOCUS data sources, and are accessible to the translator. Values can be entered using INSERT and UPDATE statements, and displayed in SELECT statements.

Time or timestamp data items (columns or literals) can be compared in conditions. Time values or timestamp values can be added to or subtracted from each other, with the result being the difference in number of seconds. Expressions of the form T + 2 HOURS or TS + 5 YEARS are allowed. These expressions are translated to calls to the date-time functions described in the *ibi™ WebFOCUS® Using Functions* manual.

All date formats for actual and virtual fields in the Master File are converted to the form YYYYMMDD. If you specify a format that lacks any component, the SQL Translator supplies a default value for the missing component. To specify a portion of a date, such as the month, use a virtual field with an alphanumeric format.

# SQL Translator Support for Date, Time, and Timestamp Fields

In the following chart, fff represents the second to three decimal places (milliseconds) and ffffff represents the second to six decimal places (microseconds).

The following formats are allowed as input to the Translator:

| Format | USAGE Attribute in Master File | Date Components |
|---|---|---|
| Date | `YYMD` | `YYYY-MM-DD` |
| Hour | `HH` | `HH` |
| Hour through minute | `HHI` | `HH.MM` |
| Hour through second | `HHIS` | `HH.MM.SS` |
| Hour through millisecond | `HHISs` | `HH.MM.SS.fff` |
| Hour through microsecond | `HHISsm` | `HH.MM.SS.ffffff` |
| Year through hour | `HYYMDH` | `YYYY-MM-DD HH` |
| Year through minute | `HYYMDI` | `YYYY-MM-DD HH.MM` |
| Year through second | `HYYMDS` | `YYYY-MM-DD HH.MM.SS` |
| Year through millisecond | `HYYMDs` | `YYYY-MM-DD HH.MM.SS.fff` |
| Year through microsecond | `HYYMDm` | `YYYY-MM-DD HH.MM.SS.ffffff` |

**Note:**

- Time information may be given to the hour, minute, second, or fraction of a second.
- The separator within date information may be either a hyphen or a slash.
- The separator within time information must be a colon.
- The separator between date and time information must be a space.

# Extracting Date-Time Components Using the SQL Translator

The SQL Translator supports several functions that return components from date-time values. Use the EXTRACT statement to extract components.

Use the TRIM function to remove leading and/or trailing patterns from date, time, and timestamp values. See the *ibi™ WebFOCUS® Using Functions* manual.

# Use Date, Time, and Timestamp Functions Accepted by the SQL Translator

The following functions return date-time components as integer values. Assume *x* is a date-time value:

| Function | Return Value |
|---|---|
| `YEAR(x)` | year |
| `MONTH(x)` | month number |
| `DAY(x)` | day number |

| Function | Return Value |
| --- | --- |
| `HOUR(x)` | hour |
| `MINUTE(x)` | minute |
| `SECOND(x)` | second |
| `MILLISECOND(x)` | millisecond |
| `MICROSECOND(x)` | microsecond |

# Using SQL Translator Date, Time, and Timestamp Functions

Using the timestamp column TS whose value is '1999-11-23 07:32:16.123456':

```
YEAR(TS) = 1999
MONTH(TS) = 11
DAY(TS) = 23
HOUR(TS) = 7
MINUTE(TS) = 32
SECOND(TS) = 16
MILLISECOND(TS) = 123
MICROSECOND(TS) = 123456
```

# Using SQL Translator Date, Time, and Timestamp Functions in a SELECT Statement

Assume that a FOCUS data source called VIDEOTR2 includes a date-time field named TRANSDATE.

```
SQL
SELECT TRANSDATE,
YEAR(TRANSDATE), MONTH(TRANSDATE),
MINUTE(TRANSDATE)
FROM VIDEOTR2;
FILE VIDSQL
END
```

The SQL Translator produces the following virtual fields for functions, followed by a TABLE request to display the output:

```
SET COUNTWIDTH=ON
-SET SQLERRNUM = 0;
DEFINE FILE
VIDEOTR2 TEMP
SQLDEF01/I4 MISSING ON NEEDS ALL = HPART(TRANSDATE,'YEAR','I4');
SQLDEF02/I2 MISSING ON NEEDS ALL = HPART(TRANSDATE,'MONTH','I2');
SQLDEF03/I2 MISSING ON NEEDS ALL = HPART(TRANSDATE,'MINUTE','I2');
END
TABLEF FILE VIDEOTR2
PRINT TRANSDATE SQLDEF01 AS 'SQLDEF01' SQLDEF02 AS 'SQLDEF02' SQLDEF03
AS
  'SQLDEF03'
ON TABLE SET CARTESIAN ON
ON TABLE SET ASNAMES ON
ON TABLE SET HOLDLIST PRINTONLY
END
```

The output is:

```
TRANSDATE         SQLDEF02  SQLDEF04  SQLDEF05
1999/06/20 04:14      1999         6        14
1991/06/27 02:45      1991         6        45
1996/06/21 01:16      1996         6        16
1991/06/21 07:11      1991         6        11
```

```
1991/06/20 05:15      1991         6        15
1999/06/26 12:34      1999         6        34
1919/06/26 05:45      1919         6        45
1991/06/21 01:10      1991         6        10
1991/06/19 07:18      1991         6        18
1991/06/19 04:11      1991         6        11
1998/10/03 02:41      1998        10        41
1991/06/25 01:19      1991         6        19
1986/02/05 03:30      1986         2        30
1991/06/24 04:43      1991         6        43
1991/06/24 02:08      1991         6         8
1999/10/06 02:51      1999        10        51
1991/06/25 01:17      1991         6        17
```

# Use the SQL Translator EXTRACT Function to Extract Date-Time Components

Use the following ANSI standard function to extract date-time components as integer values:

```
EXTRACT(component FROM value)
```

where:

**component**

Is one of the following: YEAR, MONTH, QUARTER, DAY, WEEKDAY, HOUR, MINUTE, SECOND, MILLISECOND, or MICROSECOND.

**value**

Is a date-time, DATE, TIME, or TIMESTAMP field, constant or expression.

For example, the following are equivalent:

```
EXTRACT(YEAR FROM TS)
YEAR(TS)
```

## Using the EXTRACT Function

```
SELECT D. EXTRACT(YEAR FROM D), EXTRACT(MONTH FROM D),
EXTRACT(DAY FROM D) FROM T
```

This request produces rows similar to the following:

```
1999-01-01     1999      1       1
2000-03-03     2000      3       3
```

# Index Optimized Retrieval

The SQL Translator improves query performance by generating optimized code that enables the underlying retrieval engine to access the selected records directly, without scanning all segment instances.

For more information about index optimization and optimized join statements, see your Server documentation for your platform.

# Optimized Joins

The SQL Translator accepts joins in SQL syntax. SQL language joins have no implied direction. The concepts of host and cross-referenced files do not exist in SQL.

The SQL Translator analyzes each join to identify efficient implementation. First, it assigns costs to the candidate joins in the query:

- Cost = 1 for an equijoin to a field that can participate as a cross-referenced field according to FOCUS join rules. This is common in queries against relational tables with equijoin predicates in the WHERE clause.
- Cost = 16 for an equijoin to a field that cannot participate as a cross-referenced field according to FOCUS join rules.
- Cost = 256 for a non-equijoin or an unrestricted Cartesian product.

The Translator then uses these costs to build a join structure for the query. The order of the tables in the FROM clause of the query influences the first two phases of the join analysis:

1. If there are cost=1 joins from the first table referenced in the FROM clause to the second, from the second table to the third, and so on, the Translator joins the tables in the order specified in the query. If not, it goes on to Phase 2.
2. If Phase 1 fails to generate an acceptable join structure, the Translator attempts to generate a join structure without joining any table to a table that precedes it in the FROM clause. Therefore, this phase always makes the first table referenced in the query the host table. If there is no cost=1 join between two tables, or if using one requires changing the table order, the Translator abandons Phase 2 and implements Phase 3.
3. The Translator generates the join structure from the lowest-cost joins first, and then from the more expensive joins as necessary. This sorting process may change the order in which tables are joined. The efficiency of the join that this procedure generates depends on the relative sizes of the tables being joined.

If the analysis results in joining to a table that cannot participate as a cross-referenced file according to FOCUS rules (because it lacks an index, for example), the Translator generates code to build an indexed HOLD file, and implements the join with this file. However, the HOLD file does not participate in the analysis of join order.

# TABLEF Optimization

To improve performance, the SQL Translator can be set to generate FOCUS TABLEF commands instead of TABLE commands. Take advantage of this optimization using the SET SQLTOPTTF command (SQL Translator OPTimization TableF). See Improving Report Processing.

# Improve Performance Using SQLTOPTTF

```
SET SQLTOPTTF = {ON|OFF}
```

where:

**ON**

Causes TABLEF commands to be generated when possible (for example, if there is no join or GROUP BY phrase). ON is the default value.

**OFF**

Causes TABLE commands to be generated.

# SQL INSERT, UPDATE, and DELETE Commands

The SQL INSERT, UPDATE, and DELETE commands enable SQL users to manipulate and modify data:

- The INSERT statement introduces new rows into an existing table.
- The DELETE statement removes a row or combination of rows from a table.
- The UPDATE statement enables users to update a row or group of rows in a table.

You can issue an SQL INSERT, UPDATE, or DELETE command against one segment instance (row) at a time. When you issue one of these commands against a multi-segment Master File:

- All fields referenced in the command must be on a single path through the file structure.
- The command must explicitly specify (in the WHERE predicate) every key value from the root to the target segment instance, and this combination of key values must uniquely identify one segment instance (row) to be affected by the command.

  If you are modifying every field in the row, you can omit the list of field names from the command.
- The SQL Translator supports subqueries, such as:

  ```
  INSERT...INTO...SELECT...FROM...
  ```

Although each INSERT, UPDATE, or DELETE command can specify only one row, referential integrity constraints may produce the following modifications to the data source:

- If you delete a segment instance that has descendant segment instances (children), the children are automatically deleted.

- If you insert a segment for which parent segments are missing, the parent segments are automatically created.

# Improving Report Processing

The following high-performance methods optimize data retrieval and report processing:

- Temporary rotation of network and hierarchical data sources to create an alternate view of the data.
- Automatic alternate file views with the AUTOPATH feature.
- Automatic indexed retrieval (AUTOINDEX).
- Retrieval of pre-sorted data using the TABLEF command.
- Preserving the internal matrix of a report using the SAVEMATRIX parameter.
- Compiling expressions into machine code to provide faster processing.

**Note:** These techniques may not be available for all data sources. See your data adapter documentation to determine if a technique is valid for your data source.

# Rotating a Data Structure for Enhanced Retrieval

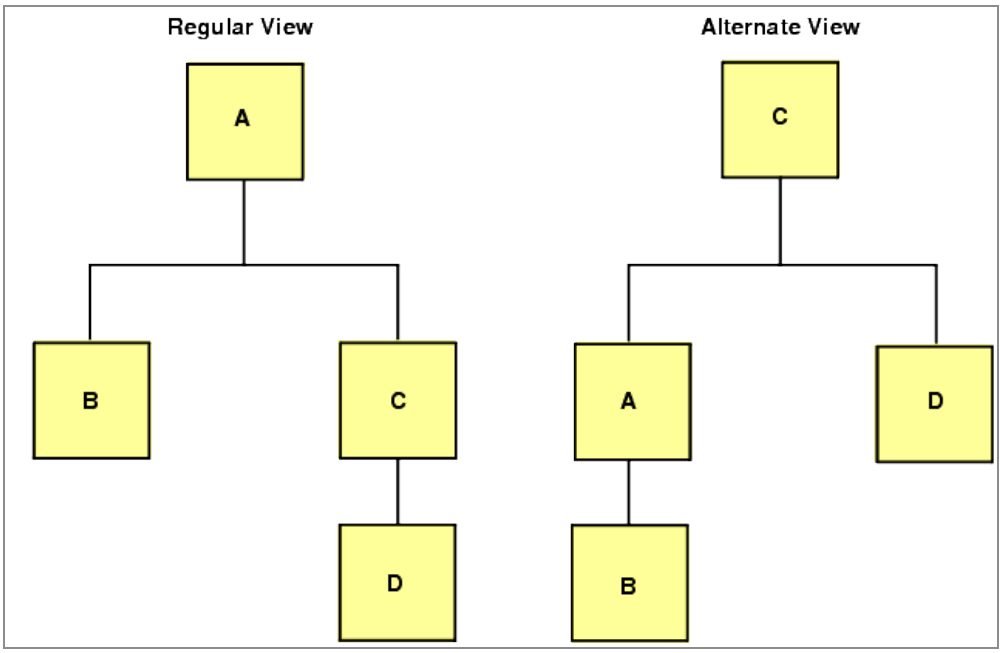
If you are using certain network or hierarchical data sources such as IMS, CA-IDMS/DB, or FOCUS, you can rotate the data source, creating an alternate view which changes some of the segment relationships and enables you to access the segments in a different order. By reporting from an alternate view, you can do the following:

- Change the access path. For example, you can access data in a lower segment more quickly by promoting that segment to a higher level.
- Change the path structure of a data source. This option is especially helpful if you wish to create a report using several sort fields that are on different paths in the file. By changing the view of the file hierarchy, all the desired sort fields can be on the same path.

It should be noted that retrieval is controlled by the minimum referenced subtree. For more information, see *Understanding the Efficiency of the Minimum Referenced Subtree* in

the *Describing a Group of Fields* chapter in the *Describing Data With ibi™ WebFOCUS® Language* manual.

For example, consider the regular and alternate views below:




Since C is the root segment in the alternate view, particular instances of C can be selected faster.

# Request an Alternate View

To request an alternate view, add the name of a field found in the alternate root segment to the file name in the TABLE command, separated by a period (.):

```
TABLE FILE filename.fieldname
```

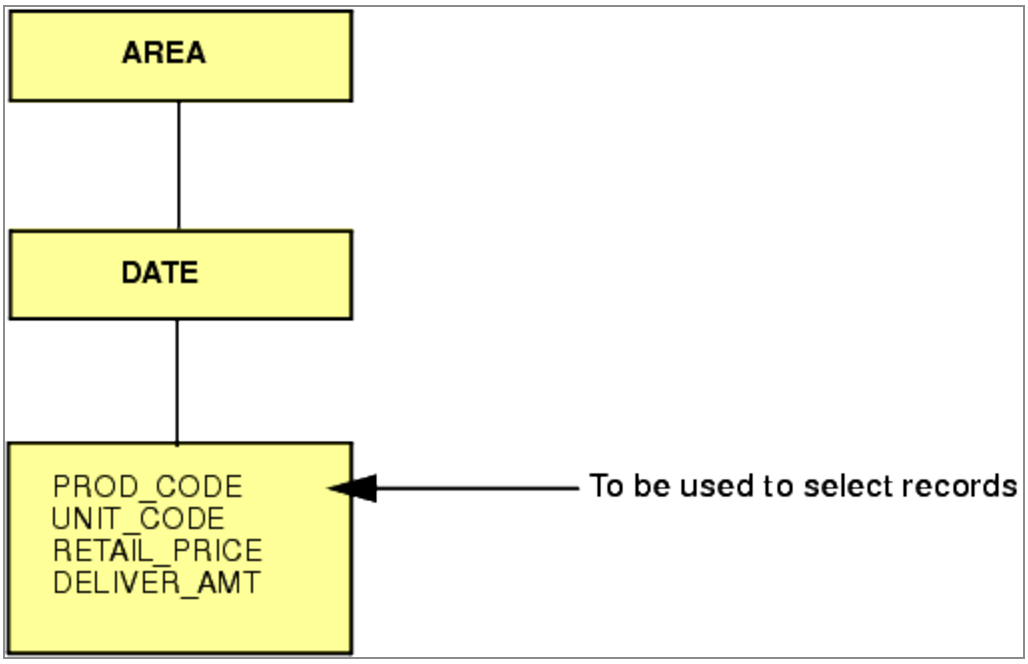
# Usage Notes for Restructuring Data

- If you use a non-indexed field, each segment instance is retrieved until the specified record is found. Therefore, this process is less efficient than using an indexed field.

- When you use the alternate view feature on a particular child segment, the data retrieved from that segment is retrieved in physical order, not logical order. This is because the child becomes a root segment for the report request, and there are no logical pointers between the child segments of different parents.
- Alternate view on an indexed field is a special case that uses the index for retrieval. When you perform an alternate view on an indexed field, you enhance the speed of retrieval. However, you must include an equality test on the indexed field, for example WHERE (MONTH EQ 1) OR (MONTH EQ 2), in order to benefit from the performance improvement.
- A field name specified in an alternate file view may not be qualified or exceed 12 characters.
- Automatic Indexed Retrieval (AUTOINDEX) is never invoked in a TABLE request against an alternate file view.

# Restructuring Data

Consider the following data structure, in which PROD_CODE is an indexed field:




You could issue the following request to promote the segment containing PROD_CODE to the top of the hierarchy, thereby enabling quicker access to the data in that segment.

```
TABLE FILE SALES.PROD_CODE
"SALES OF B10 DISTRIBUTED BY AREA"
SUM UNIT_SOLD AND RETAIL_PRICE
BY AREA
WHERE PROD_CODE EQ 'B10'
ON TABLE COLUMN-TOTAL
END
```

# Optimizing Retrieval Speed for ibi FOCUS Data Sources

When the AUTOPATH parameter in set ON, an optimized retrieval path—that is, one in which the lowest retrieved segment is the entry point—is selected dynamically. It is equivalent to the alternate view syntax:

```
TABLE FILE filename.fieldname
```

where:

**fieldname**

Is not indexed. Retrieval starts at the segment in which *fieldname* resides.

The system determines whether optimized retrieval is appropriate by analyzing the fields referenced in a request and the data source structure. For more information on the AUTOPATH parameter, see the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

# Automatic Indexed Retrieval

Automatic indexed retrieval (AUTOINDEX) optimizes the speed of data retrieval in FOCUS data sources. To take advantage of automatic indexed retrieval, a TABLE request must contain an equality or range test on an indexed field in the highest segment referenced in the request.

This method is not supported if a:

- Range test applies to a packed data value.

- Request specifies an alternate view (that is, TABLE FILE *filename.fieldname*).
- Request contains the code BY HIGHEST or BY LOWEST.

For related information on AUTOINDEX, see the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

# Use Indexed Retrieval

```
SET AUTOINDEX = {ON|OFF}
```

where:

**ON**

Uses indexed data retrieval for optimized speed when possible. The request must contain an equality or range test on an indexed field in the highest segment referenced in the request. ON is the default value.

**OFF**

Uses sequential data retrieval unless a request specifies an indexed view (TABLE FILE *filename.indexed_fieldname*) and contains an equality test on *indexed_fieldname*. In that case, indexed data retrieval is automatically performed.

# Usage Notes for Indexed Retrieval

- AUTOINDEX is never invoked when the TABLE request contains an alternate file view (that is, TABLE FILE *filename.fieldname*).
- Even if AUTOINDEX is ON, indexed retrieval is not performed when the TABLE request contains BY HIGHEST or BY LOWEST phrases.
- When a request specifies an indexed view (as in TABLE FILE *filename.indexed_fieldname*), indexed retrieval is implemented under the following circumstances:
    - AUTOINDEX is OFF and the request contains an equality test on the indexed field.

- AUTOINDEX is ON and the request contains either an equality or a range (FROM ... TO) test against the indexed field.

# Using Indexed Retrieval

The following Master File is referenced in the examples that follow:

```
FILENAME=SALES,SUFFIX=FOC,
  SEGNAME=STOR_SEG,SEGTYPE=S1,
    FIELDNAME=AREA,ALIAS=LOC,FORMAT=A1,$
  SEGNAME=DATE_SEG,PARENT=STOR_SEG,SEGTYPE=SH1,
    FIELDNAME=DATE,ALIAS=DTE,FORMAT=A4MD, $
  SEGNAME=DEPT,PARENT=DATE_SEG,SEGTYPE=S1,
    FIELDNAME=DEPARTMENT,ALIAS=DEPT,FORMAT=A5,FIELDTYPE=I,$
    FIELDNAME=DEPT_CODE,ALIAS=DCODE,FORMAT=A3,FIELDTYPE=I,$
    FIELDNAME=PROD_TYPE,ALIAS=PTYPE,FORMAT=A10,FIELDTYPE=I,$
  SEGNAME=INVENTORY,PARENT=DEPT,SEGTYPE=S1,$
    FIELDNAME=PROD_CODE,ALIAS=PCODE,FORMAT=A3,FIELDTYPE=I,$
    FIELDNAME=UNIT_SOLD,ALIAS=SOLD,FORMAT=I5,$
    FIELDNAME=RETAIL_PRICE,ALIAS=RP,FORMAT=D5.2M,$
    FIELDNAME=DELIVER_AMT,ALIAS=SHIP,FORMAT=I5,$
```

The following procedure contains an equality test on DEPT_CODE and PROD_CODE. DEPT_CODE is used for indexed retrieval since it is in the higher of the referenced segments.

```
SET AUTOINDEX=ON
TABLE FILE SALES
SUM UNIT_SOLD RETAIL_PRICE
IF DEPT_CODE EQ 'H01'
IF PROD_CODE EQ 'B10'
END
```

If your TABLE request contains an equality or range test against more than one indexed field in the same segment, AUTOINDEX uses the first index referenced in that segment for retrieval. The following stored procedure contains an equality test against two indexed fields. Since DEPT_CODE appears before PROD_TYPE in the Master File, AUTOINDEX uses DEPT_CODE for retrieval.

```
SET AUTOINDEX=ON
TABLE FILE SALES
SUM UNIT_SOLD AND RETAIL_PRICE
```

```
IF PROD_TYPE EQ 'STEREO'
IF DEPT_CODE EQ 'H01'
END
```

Indexed retrieval is not invoked if the equality or range test is run against an indexed field that does not reside in the highest referenced segment. In the following example, indexed retrieval is not performed, because the request contains a reference to AREA, a field in the STOR_SEG segment:

```
SET AUTOINDEX=ON
TABLE FILE SALES
SUM UNIT_SOLD AND RETAIL_PRICE
BY AREA
IF PROD_CODE EQ 'B10'
IF PROD_TYPE EQ 'STEREO'
END
```

# Data Retrieval Using TABLEF

TABLEF is a variation of the TABLE command that provides a fast method of retrieving data that is already stored in the order required for printing and requires no additional sorting.

Using TABLEF, records are retrieved in the logical sequence from the data source. The standard report request syntax applies, subject to the following rules:

- Any BY phrases must be compatible with the logical sequence of the data source. BY phrases are used only to establish control breaks, not to change the order of the records.
- ACROSS phrases are not permitted.
- Multiple display commands are not permitted. Only one display command may be used.
- After the report is executed, RETYPE, HOLD, and SAVE are not available. However, you can produce an extract file if you include ON TABLE HOLD or ON TABLE SAVE as part of the request.
- NOSPLIT is not compatible with the TABLEF command, and produces a FOC037 error message.
- TABLEF can be used with HOLD files and other non-FOCUS data sources when the

natural sort sequence of both the request and the data are the same.

- The DST. prefix operator is not permitted.
- BORDER styling is not supported with TABLEF.
- TABLEF is not supported with SQUEEZE.

# Printing Using Fast Table Retrieval

If you previously created a HOLD file from the EMPLOYEE data source, sorted by the CURR_SAL, LAST_NAME, and FIRST_NAME fields, you can issue the following TABLEF request:

```
TABLEF FILE HOLD
PRINT CURR_SAL AND LAST_NAME AND FIRST_NAME
END
```

# Compiling Expressions

Compiling expressions into machine code provides faster processing.

# Compiling Expressions Using the DEFINES Parameter

The SET DEFINES, SET COMPUTE, and SET MODCOMPUTE commands have been deprecated. Expressions are compiled unless environmental conditions prevent compilation.

Among the benefits of the compiling expressions are:

- Compilation of only those expressions that are actually used in the TABLE request.
- Much faster execution of expressions containing complex calculations on long packed fields.
- Compilation of date expressions.

# Usage Notes for Compiled Expressions

- Any expression that cannot be compiled runs without compilation. This does not affect compilation of other expressions. The following elements in an expression disable compilation:
    - Functions. However, expressions that use the following functions can be compiled: YMD, DMY, INT, and DECODE.
    - CONTAINS, OMITS, LAST.

If compilation is not possible because of environmental conditions, the processing is handled without compilation. No message is generated indicating that compilation did not take place. To determine whether it did take place, issue the ? COMPILE command.

# Master Files and Diagrams

This appendix contains descriptions and structure diagrams for the sample data sources used throughout the documentation.

# EMPLOYEE Data Source

EMPLOYEE contains sample data about company employees. Its segments are:

**EMPINFO**

Contains employee IDs, names, and positions.

**FUNDTRAN**

Specifies employee direct deposit accounts. This segment is unique.

**PAYINFO**

Contains the employee salary history.

**ADDRESS**

Contains employee home and bank addresses.

**SALINFO**

Contains data on employee monthly pay.

**DEDUCT**

Contains data on monthly pay deductions.

EMPLOYEE also contains cross-referenced segments belonging to the JOBFILE and EDUCFILE files, also described in this appendix. The segments are:

**JOBSEG (from JOBFILE)**

Describes the job positions held by each employee.

**SKILLSEG (from JOBFILE)**

Lists the skills required by each position.

**SECSEG (from JOBFILE)**

Specifies the security clearance needed for each job position.

**ATTNDSEG (from EDUCFILE)**

Lists the dates that employees attended in-house courses.

**COURSEG (from EDUCFILE)**

Lists the courses that the employees attended.

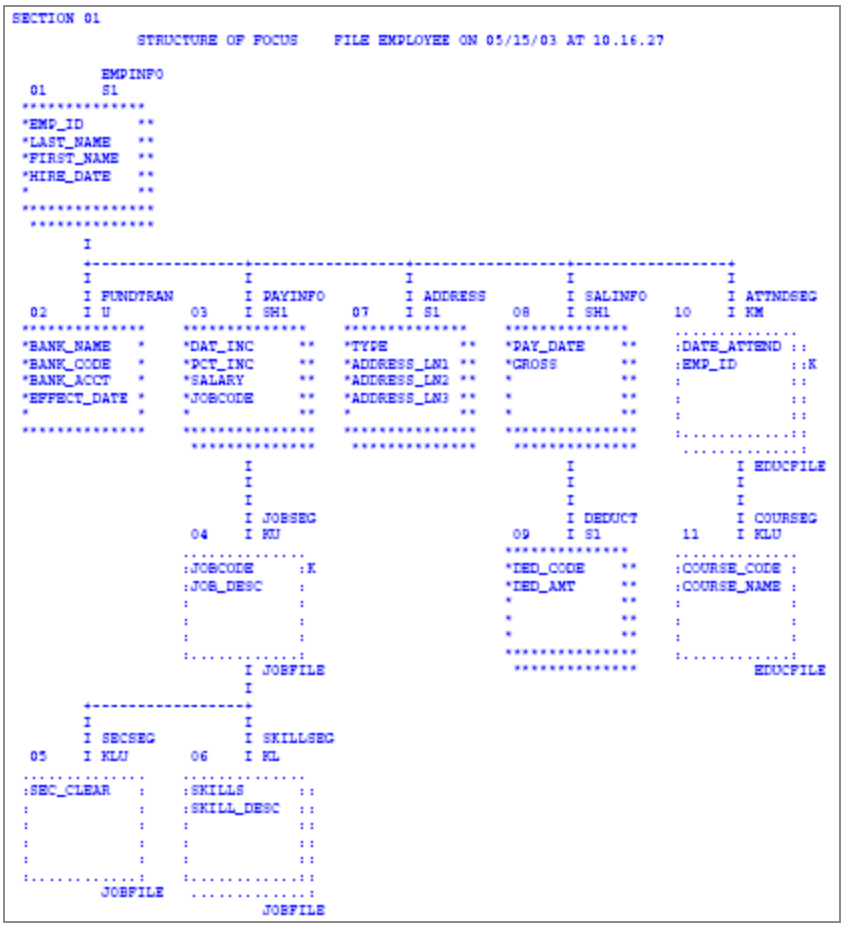
# EMPLOYEE Master File

```
FILENAME=EMPLOYEE, SUFFIX=FOC
 SEGNAME=EMPINFO,  SEGTYPE=S1
  FIELDNAME=EMP_ID,        ALIAS=EID,    FORMAT=A9,          $
  FIELDNAME=LAST_NAME,     ALIAS=LN,     FORMAT=A15,         $
  FIELDNAME=FIRST_NAME,    ALIAS=FN,     FORMAT=A10,         $
  FIELDNAME=HIRE_DATE,     ALIAS=HDT,    FORMAT=I6YMD,       $
  FIELDNAME=DEPARTMENT,    ALIAS=DPT,    FORMAT=A10,         $
  FIELDNAME=CURR_SAL,      ALIAS=CSAL,   FORMAT=D12.2M,      $
  FIELDNAME=CURR_JOBCODE,  ALIAS=CJC,    FORMAT=A3,          $
  FIELDNAME=ED_HRS,        ALIAS=OJT,    FORMAT=F6.2,        $
 SEGNAME=FUNDTRAN,  SEGTYPE=U,   PARENT=EMPINFO
  FIELDNAME=BANK_NAME,     ALIAS=BN,     FORMAT=A20,         $
  FIELDNAME=BANK_CODE,     ALIAS=BC,     FORMAT=I6S,         $
  FIELDNAME=BANK_ACCT,     ALIAS=BA,     FORMAT=I9S,         $
  FIELDNAME=EFFECT_DATE,   ALIAS=EDATE,  FORMAT=I6YMD,       $
 SEGNAME=PAYINFO,   SEGTYPE=SH1, PARENT=EMPINFO
  FIELDNAME=DAT_INC,       ALIAS=DI,     FORMAT=I6YMD,       $
  FIELDNAME=PCT_INC,       ALIAS=PI,     FORMAT=F6.2,        $
  FIELDNAME=SALARY,        ALIAS=SAL,    FORMAT=D12.2M,      $
  FIELDNAME=JOBCODE,       ALIAS=JBC,    FORMAT=A3,          $
```

```
SEGNAME=ADDRESS,   SEGTYPE=S1,  PARENT=EMPINFO
 FIELDNAME=TYPE,          ALIAS=AT,     FORMAT=A4,          $
 FIELDNAME=ADDRESS_LN1,   ALIAS=LN1,    FORMAT=A20,         $
 FIELDNAME=ADDRESS_LN2,   ALIAS=LN2,    FORMAT=A20,         $
 FIELDNAME=ADDRESS_LN3,   ALIAS=LN3,    FORMAT=A20,         $
 FIELDNAME=ACCTNUMBER,    ALIAS=ANO,    FORMAT=I9L,         $
SEGNAME=SALINFO,   SEGTYPE=SH1, PARENT=EMPINFO
 FIELDNAME=PAY_DATE,      ALIAS=PD,     FORMAT=I6YMD,       $
 FIELDNAME=GROSS,         ALIAS=MO_PAY, FORMAT=D12.2M,      $
SEGNAME=DEDUCT,    SEGTYPE=S1,  PARENT=SALINFO
 FIELDNAME=DED_CODE,      ALIAS=DC,     FORMAT=A4,          $
 FIELDNAME=DED_AMT,       ALIAS=DA,     FORMAT=D12.2M,      $
SEGNAME=JOBSEG,    SEGTYPE=KU,  PARENT=PAYINFO, CRFILE=JOBFILE,
 CRKEY=JOBCODE,$
SEGNAME=SECSEG,    SEGTYPE=KLU, PARENT=JOBSEG,   CRFILE=JOBFILE, $
SEGNAME=SKILLSEG,  SEGTYPE=KL,  PARENT=JOBSEG,   CRFILE=JOBFILE, $
SEGNAME=ATTNDSEG,  SEGTYPE=KM,  PARENT=EMPINFO,  CRFILE=EDUCFILE,
 CRKEY=EMP_ID,$
SEGNAME=COURSEG,   SEGTYPE=KLU, PARENT=ATTNDSEG, CRFILE=EDUCFILE,$
```

# EMPLOYEE Structure Diagram

The EMPLOYEE structure follows:




# JOBFILE Data Source

JOBFILE contains sample data about company job positions. Its segments are:

**JOBSEG**

Describes what each position is. The field JOBCODE in this segment is indexed.

**SKILLSEG**

Lists the skills required by each position.

**SECSEG**

Specifies the security clearance needed, if any. This segment is unique.

# JOBFILE Master File

```
FILENAME=JOBFILE,  SUFFIX=FOC
 SEGNAME=JOBSEG,   SEGTYPE=S1
  FIELDNAME=JOBCODE,    ALIAS=JC, FORMAT=A3,    INDEX=I,$
  FIELDNAME=JOB_DESC,   ALIAS=JD, FORMAT=A25           ,$
 SEGNAME=SKILLSEG, SEGTYPE=S1,  PARENT=JOBSEG
  FIELDNAME=SKILLS,     ALIAS=,   FORMAT=A4            ,$
  FIELDNAME=SKILL_DESC, ALIAS=SD, FORMAT=A30           ,$
 SEGNAME=SECSEG,   SEGTYPE=U,   PARENT=JOBSEG
  FIELDNAME=SEC_CLEAR,  ALIAS=SC, FORMAT=A6            ,$
```

# JOBFILE Structure Diagram

```
SECTION 01
              STRUCTURE OF FOCUS    FILE JOBFILE ON 05/15/03 AT 14.40.06

          JOBSEG
  01      S1
 **************
 *JOBCODE     **I
 *JOB_DESC    **
 *            **
 *            **
 *            **
 ***************
  **************
        I
        +-----------------+
        I                 I
        I SECSEG          I SKILLSEG
  02    I U         03    I S1
 **************    *************
 *SEC_CLEAR   *    *SKILLS     **
 *            *    *SKILL_DESC **
 *            *    *           **
 *            *    *           **
 *            *    *           **
 **************    **************
                    *************
```

# EDUCFILE Data Source

EDUCFILE contains sample data about company in-house courses. Its segments are:

**COURSEG**

Contains data on each course.

**ATTNDSEG**

Specifies which employees attended the courses. Both fields in the segment are key fields. The field EMP_ID in this segment is indexed.

# EDUCFILE Master File

```
FILENAME=EDUCFILE, SUFFIX=FOC
 SEGNAME=COURSEG,  SEGTYPE=S1
  FIELDNAME=COURSE_CODE,  ALIAS=CC,   FORMAT=A6,          $
  FIELDNAME=COURSE_NAME,  ALIAS=CD,   FORMAT=A30,         $
 SEGNAME=ATTNDSEG,  SEGTYPE=SH2,  PARENT=COURSEG
  FIELDNAME=DATE_ATTEND,  ALIAS=DA,   FORMAT=I6YMD,       $
  FIELDNAME=EMP_ID,       ALIAS=EID,  FORMAT=A9, INDEX=I,  $
```

# EDUCFILE Structure Diagram

```
SECTION 01
             STRUCTURE OF FOCUS    FILE EDUCFILE ON 05/15/03 AT
14.45.44

          COURSEG
  01      S1
 **************
 *COURSE_CODE **
 *COURSE_NAME **
 *            **
 *            **
 *            **
 ***************
  **************
```

```
        I
        I
        I
        I ATTNDSEG
  02    I SH2
 **************
 *DATE_ATTEND **
 *EMP_ID      **I
 *            **
 *            **
 *            **
 ***************
  **************
```

# SALES Data Source

SALES contains sample data about a dairy company with an affiliated store chain. Its segments are:

**STOR_SEG**

Lists the stores buying the products.

**DAT_SEG**

Contains the dates of inventory.

**PRODUCT**

Contains sales data for each product on each date. The PROD_CODE field is indexed. The RETURNS and DAMAGED fields have the MISSING=ON attribute.

# SALES Master File

```
FILENAME=KSALES,   SUFFIX=FOC
 SEGNAME=STOR_SEG, SEGTYPE=S1
  FIELDNAME=STORE_CODE,  ALIAS=SNO,   FORMAT=A3,   $
  FIELDNAME=CITY,        ALIAS=CTY,   FORMAT=A15,  $
  FIELDNAME=AREA,        ALIAS=LOC,   FORMAT=A1,   $
 SEGNAME=DATE_SEG, PARENT=STOR_SEG, SEGTYPE=SH1,
```

```
  FIELDNAME=DATE,         ALIAS=DTE,   FORMAT=A4MD, $
 SEGNAME=PRODUCT,  PARENT=DATE_SEG, SEGTYPE=S1,
  FIELDNAME=PROD_CODE,   ALIAS=PCODE, FORMAT=A3,   FIELDTYPE=I,$
  FIELDNAME=UNIT_SOLD,   ALIAS=SOLD,  FORMAT=I5,   $
  FIELDNAME=RETAIL_PRICE,ALIAS=RP,    FORMAT=D5.2M,$
  FIELDNAME=DELIVER_AMT, ALIAS=SHIP,  FORMAT=I5,   $
  FIELDNAME=OPENING_AMT, ALIAS=INV,   FORMAT=I5,   $
  FIELDNAME=RETURNS,     ALIAS=RTN,   FORMAT=I3,   MISSING=ON,$
  FIELDNAME=DAMAGED,     ALIAS=BAD,   FORMAT=I3,   MISSING=ON,$
```

# SALES Structure Diagram

```
SECTION 01
             STRUCTURE OF FOCUS    FILE SALES ON 05/15/03 AT 14.50.28

          STOR_SEG
  01      S1
 **************
 *STORE_CODE  **
 *CITY        **
 *AREA        **
 *            **
 *            **
 ***************
  **************
        I
        I
        I
        I DATE_SEG
  02    I SH1
 **************
 *DATE        **
 *            **
 *            **
 *            **
 *            **
 ***************
  **************
        I
        I
        I
        I PRODUCT
  03    I S1
```

```
**************
*PROD_CODE   **I
*UNIT_SOLD   **
*RETAIL_PRICE**
*DELIVER_AMT **
*            **
***************
 **************
```

# CAR Data Source

CAR contains sample data about specifications and sales information for rare cars. Its segments are:

**ORIGIN**

Lists the country that manufactures the car. The field COUNTRY is indexed.

**COMP**

Contains the car name.

**CARREC**

Contains the car model.

**BODY**

Lists the body type, seats, dealer and retail costs, and units sold.

**SPECS**

Lists car specifications. This segment is unique.

**WARANT**

Lists the type of warranty.

**EQUIP**

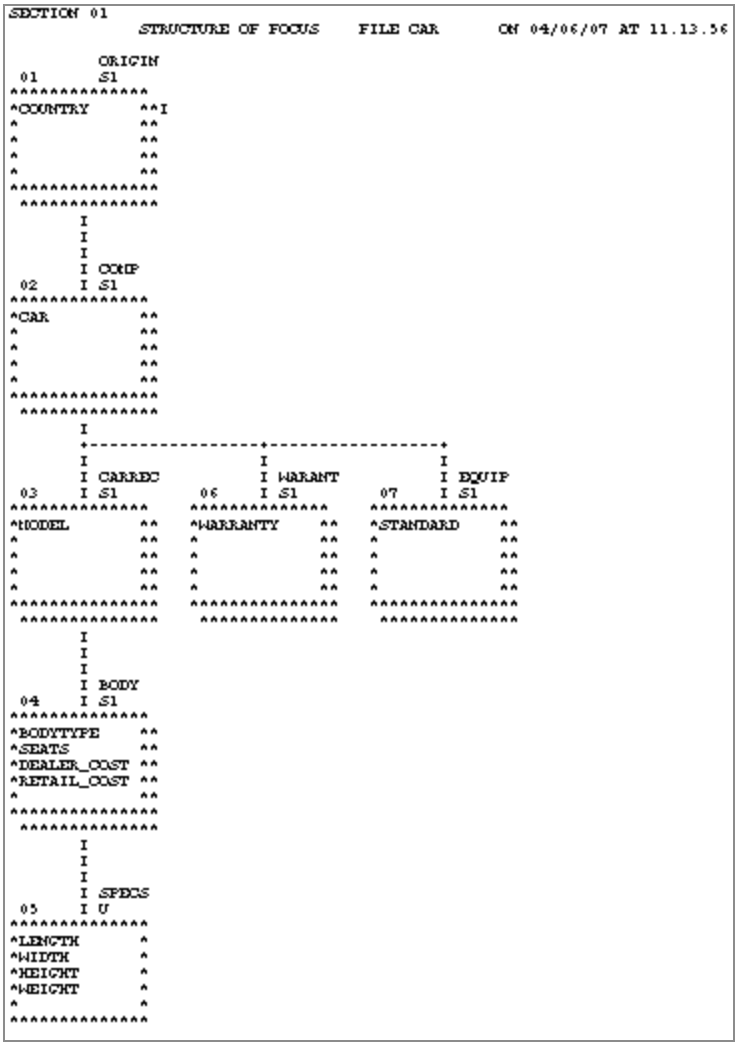
Lists standard equipment.

The aliases in the CAR Master File are specified without the ALIAS keyword.

# CAR Master File

```
FILENAME=CAR,SUFFIX=FOC
 SEGNAME=ORIGIN,SEGTYPE=S1
  FIELDNAME=COUNTRY,COUNTRY,A10,FIELDTYPE=I,$
 SEGNAME=COMP,SEGTYPE=S1,PARENT=ORIGIN
  FIELDNAME=CAR,CARS,A16,$
 SEGNAME=CARREC,SEGTYPE=S1,PARENT=COMP
  FIELDNAME=MODEL,MODEL,A24,$
 SEGNAME=BODY,SEGTYPE=S1,PARENT=CARREC
  FIELDNAME=BODYTYPE,TYPE,A12,$
  FIELDNAME=SEATS,SEAT,I3,$
  FIELDNAME=DEALER_COST,DCOST,D7,$
  FIELDNAME=RETAIL_COST,RCOST,D7,$
  FIELDNAME=SALES,UNITS,I6,$
 SEGNAME=SPECS,SEGTYPE=U,PARENT=BODY
  FIELDNAME=LENGTH,LEN,D5,$
  FIELDNAME=WIDTH,WIDTH,D5,$
  FIELDNAME=HEIGHT,HEIGHT,D5,$
  FIELDNAME=WEIGHT,WEIGHT,D6,$
  FIELDNAME=WHEELBASE,BASE,D6.1,$
  FIELDNAME=FUEL_CAP,FUEL,D6.1,$
  FIELDNAME=BHP,POWER,D6,$
  FIELDNAME=RPM,RPM,I5,$
  FIELDNAME=MPG,MILES,D6,$
  FIELDNAME=ACCEL,SECONDS,D6,$
 SEGNAME=WARANT,SEGTYPE=S1,PARENT=COMP
  FIELDNAME=WARRANTY,WARR,A40,$
 SEGNAME=EQUIP,SEGTYPE=S1,PARENT=COMP
  FIELDNAME=STANDARD,EQUIP,A40,$
```

# CAR Structure Diagram




# LEDGER Data Source

LEDGER contains sample accounting data. It consists of one segment, TOP. This data source is specified primarily for FML examples. Aliases do not exist for the fields in this Master File, and the commas act as placeholders.

# LEDGER Master File

```
FILENAME=LEDGER, SUFFIX=FOC,$
 SEGNAME=TOP,    SEGTYPE=S2,$
  FIELDNAME=YEAR   ,  , FORMAT=A4, $
  FIELDNAME=ACCOUNT,  , FORMAT=A4, $
  FIELDNAME=AMOUNT ,  , FORMAT=I5C,$
```

# LEDGER Structure Diagram

```
SECTION 01
            STRUCTURE OF FOCUS    FILE LEDGER   ON 05/15/03 AT 15.17.08

          TOP
  01      S2
 **************
 *YEAR         **
 *ACCOUNT      **
 *AMOUNT       **
 *             **
 *             **
 ***************
  **************
```

# FINANCE Data Source

FINANCE contains sample financial data for balance sheets. It consists of one segment, TOP. This data source is specified primarily for FML examples. Aliases do not exist for the fields in this Master File, and the commas act as placeholders.

# FINANCE Master File

```
FILENAME=FINANCE, SUFFIX=FOC,$
 SEGNAME=TOP,     SEGTYPE=S2,$
```

```
  FIELDNAME=YEAR   ,  , FORMAT=A4,  $
  FIELDNAME=ACCOUNT,  , FORMAT=A4,  $
  FIELDNAME=AMOUNT ,  , FORMAT=D12C,$
```

# FINANCE Structure Diagram

```
SECTION 01
            STRUCTURE OF FOCUS    FILE FINANCE  ON 05/15/03 AT 15.17.08

          TOP
  01      S2
 **************
 *YEAR         **
 *ACCOUNT      **
 *AMOUNT       **
 *             **
 *             **
 ***************
  **************
```

# REGION Data Source

REGION contains sample account data for the eastern and western regions of the country. It consists of one segment, TOP. This data source is specified primarily for FML examples. Aliases do not exist for the fields in this Master File, and the commas act as placeholders.

# REGION Master File

```
FILENAME=REGION, SUFFIX=FOC,$
 SEGNAME=TOP,    SEGTYPE=S1,$
  FIELDNAME=ACCOUNT,  , FORMAT=A4, $
  FIELDNAME=E_ACTUAL, , FORMAT=I5C,$
  FIELDNAME=E_BUDGET, , FORMAT=I5C,$
  FIELDNAME=W_ACTUAL, , FORMAT=I5C,$
  FIELDNAME=W_BUDGET, , FORMAT=I5C,$
```

# REGION Structure Diagram

```
SECTION 01
            STRUCTURE OF FOCUS    FILE REGION   ON 05/15/03 AT 15.18.48

          TOP
  01      S1
 **************
 *ACCOUNT     **
 *E_ACTUAL    **
 *E_BUDGET    **
 *W_ACTUAL    **
 *            **
 ***************
  **************
```

# EMPDATA Data Source

EMPDATA contains sample data about company employees. It consists of one segment, EMPDATA. The PIN field is indexed. The AREA field is a temporary field.

# EMPDATA Master File

```
FILENAME=EMPDATA, SUFFIX=FOC
 SEGNAME=EMPDATA, SEGTYPE=S1
  FIELDNAME=PIN,          ALIAS=ID,       FORMAT=A9,  INDEX=I,    $
  FIELDNAME=LASTNAME,     ALIAS=LN,       FORMAT=A15,             $
  FIELDNAME=FIRSTNAME,    ALIAS=FN,       FORMAT=A10,             $
  FIELDNAME=MIDINITIAL,   ALIAS=MI,       FORMAT=A1,              $
  FIELDNAME=DIV,          ALIAS=CDIV,     FORMAT=A4,              $
  FIELDNAME=DEPT,         ALIAS=CDEPT,    FORMAT=A20,             $
  FIELDNAME=JOBCLASS,     ALIAS=CJCLAS,   FORMAT=A8,              $
  FIELDNAME=TITLE,        ALIAS=CFUNC,    FORMAT=A20,             $
  FIELDNAME=SALARY,       ALIAS=CSAL,     FORMAT=D12.2M,          $
  FIELDNAME=HIREDATE,     ALIAS=HDAT,     FORMAT=YMD,             $
$
DEFINE AREA/A13=DECODE DIV (NE 'NORTH EASTERN' SE 'SOUTH EASTERN'
CE 'CENTRAL' WE 'WESTERN' CORP 'CORPORATE' ELSE 'INVALID AREA');$
```

# EMPDATA Structure Diagram

```
SECTION 01
            STRUCTURE OF FOCUS    FILE EMPDATA  ON 05/15/03 AT 14.49.09

          EMPDATA
  01      S1
 **************
 *PIN         **I
 *LASTNAME    **
 *FIRSTNAME   **
 *MIDINITIAL  **
 *            **
 ***************
  **************
```

# TRAINING Data Source

TRAINING contains sample data about training courses for employees. It consists of one segment, TRAINING. The PIN field is indexed. The EXPENSES, GRADE, and LOCATION fields have the MISSING=ON attribute.

# TRAINING Master File

```
FILENAME=TRAINING, SUFFIX=FOC
 SEGNAME=TRAINING, SEGTYPE=SH3
  FIELDNAME=PIN,          ALIAS=ID,     FORMAT=A9,   INDEX=I,    $
  FIELDNAME=COURSESTART,  ALIAS=CSTART, FORMAT=YMD,              $
  FIELDNAME=COURSECODE,   ALIAS=CCOD,   FORMAT=A7,               $
  FIELDNAME=EXPENSES,     ALIAS=COST,   FORMAT=D8.2, MISSING=ON  $
  FIELDNAME=GRADE,        ALIAS=GRA,    FORMAT=A2,   MISSING=ON, $
  FIELDNAME=LOCATION,     ALIAS=LOC,    FORMAT=A6,   MISSING=ON, $
```

# TRAINING Structure Diagram

```
SECTION 01
            STRUCTURE OF FOCUS    FILE TRAINING ON 05/15/03 AT 14.51.28

          TRAINING
  01      SH3
 **************
 *PIN          **I
 *COURSESTART **
 *COURSECODE  **
 *EXPENSES    **
 *            **
 ***************
  **************
```

# COURSE Data Source

COURSE contains sample data about education courses. It consists of one segment, CRSELIST.

# COURSE Master File

```
FILENAME=COURSE,   SUFFIX=FOC
 SEGNAME=CRSELIST,  SEGTYPE=S1
  FIELDNAME=COURSECODE,  ALIAS=CCOD,   FORMAT=A7,   INDEX=I,    $
  FIELDNAME=CTITLE,      ALIAS=COURSE, FORMAT=A35,              $
  FIELDNAME=SOURCE,      ALIAS=ORG,    FORMAT=A35,              $
  FIELDNAME=CLASSIF,     ALIAS=CLASS,  FORMAT=A10,              $
  FIELDNAME=TUITION,     ALIAS=FEE,    FORMAT=D8.2, MISSING=ON, $
  FIELDNAME=DURATION,    ALIAS=DAYS,   FORMAT=A3,   MISSING=ON, $
  FIELDNAME=DESCRIPTN1,  ALIAS=DESC1,  FORMAT=A40,              $
  FIELDNAME=DESCRIPTN2,  ALIAS=DESC2,  FORMAT=A40,              $
  FIELDNAME=DESCRIPTN2,  ALIAS=DESC3,  FORMAT=A40,              $
```

# COURSE Structure Diagram

```
SECTION 01
             STRUCTURE OF FOCUS    FILE COURSE   ON 05/15/03 AT 12.26.05

         CRSELIST
 01      S1
**************
*COURSECODE  **I
*CTITLE      **
*SOURCE      **
*CLASSIF     **
*            **
***************
 **************
```

# JOBHIST Data Source

JOBHIST contains information about employee jobs. Both the PIN and JOBSTART fields are keys. The PIN field is indexed.

# JOBHIST Master File

```
FILENAME=JOBHIST, SUFFIX=FOC
SEGNAME=JOBHIST, SEGTYPE=SH2
 FIELDNAME=PIN,          ALIAS=ID,       FORMAT=A9,      INDEX=I ,$
 FIELDNAME=JOBSTART,     ALIAS=SDAT,     FORMAT=YMD,              $
 FIELDNAME=JOBCLASS,     ALIAS=JCLASS,   FORMAT=A8,               $
 FIELDNAME=FUNCTITLE,    ALIAS=FUNC,     FORMAT=A20,              $
```

# JOBHIST Structure Diagram

```
SECTION 01
     STRUCTURE OF FOCUS    FILE JOBHIST  ON 01/22/08 AT 16.23.46
```

```
    JOBHIST
  01      SH2
 **************
 *PIN          **I
 *JOBSTART     **
 *JOBCLASS     **
 *FUNCTITLE    **
 *             **
 ***************
  **************
```

# JOBLIST Data Source

JOBLIST contains information about jobs. The JOBCLASS field is indexed.

# JOBLIST Master File

```
FILENAME=JOBLIST, SUFFIX=FOC
SEGNAME=JOBSEG,   SEGTYPE=S1
 FIELDNAME=JOBCLASS,     ALIAS=JCLASS,   FORMAT=A8,    INDEX=I ,$
 FIELDNAME=CATEGORY,     ALIAS=JGROUP,   FORMAT=A25,            $
 FIELDNAME=JOBDESC,      ALIAS=JDESC,    FORMAT=A40,            $
 FIELDNAME=LOWSAL,       ALIAS=LSAL,     FORMAT=D12.2M,         $
 FIELDNAME=HIGHSAL,      ALIAS=HSAL,     FORMAT=D12.2M,         $
DEFINE GRADE/A2=EDIT  (JCLASS,'$$$99');$
DEFINE LEVEL/A25=DECODE GRADE (08 'GRADE 8' 09 'GRADE 9' 10
'GRADE 10' 11 'GRADE 11' 12 'GRADE 12' 13 'GRADE 13' 14 'GRADE 14');$
```

# JOBLIST Structure Diagram

```
SECTION 01
             STRUCTURE OF FOCUS    FILE JOBLIST  ON 01/22/08 AT
16.24.52
          JOBSEG
  01      S1
 **************
```

```
 *JOBCLASS    **I
 *CATEGORY    **
 *JOBDESC     **
 *LOWSAL      **
 *            **
 ***************
  **************
```

# LOCATOR Data Source

JOBHIST contains information about employee location and phone number. The PIN field is indexed.

# LOCATOR Master File

```
FILENAME=LOCATOR, SUFFIX=FOC
SEGNAME=LOCATOR,   SEGTYPE=S1,
 FIELDNAME=PIN,           ALIAS=ID_NO,    FORMAT=A9,   INDEX=I, $
 FIELDNAME=SITE,          ALIAS=SITE,     FORMAT=A25,           $
 FIELDNAME=FLOOR,         ALIAS=FL,       FORMAT=A3,            $
 FIELDNAME=ZONE,          ALIAS=ZONE,     FORMAT=A2,            $
 FIELDNAME=BUS_PHONE,     ALIAS=BTEL,     FORMAT=A5,            $
```

# LOCATOR Structure Diagram

```
SECTION 01
              STRUCTURE OF FOCUS    FILE LOCATOR  ON 01/22/08 AT
16.26.55
          LOCATOR
  01      S1
 **************
 *PIN          **I
 *SITE         **
 *FLOOR        **
 *ZONE         **
```

```
*            **
***************
 **************
```

# PERSINFO Data Source

PERSINFO contains employee personal information. The PIN field is indexed.

# PERSINFO Master File

```
FILENAME=PERSINFO, SUFFIX=FOC
SEGNAME=PERSONAL, SEGTYPE=S1
 FIELDNAME=PIN,          ALIAS=ID,       FORMAT=A9,   INDEX=I,    $
 FIELDNAME=INCAREOF,     ALIAS=ICO,      FORMAT=A35,              $
 FIELDNAME=STREETNO,     ALIAS=STR,      FORMAT=A20,              $
 FIELDNAME=APT,          ALIAS=APT,      FORMAT=A4,               $
 FIELDNAME=CITY,         ALIAS=CITY,     FORMAT=A20,              $
 FIELDNAME=STATE,        ALIAS=PROV,     FORMAT=A4,               $
 FIELDNAME=POSTALCODE,   ALIAS=ZIP,      FORMAT=A10,              $
 FIELDNAME=COUNTRY,      ALIAS=CTRY,     FORMAT=A15,              $
 FIELDNAME=HOMEPHONE,    ALIAS=TEL,      FORMAT=A10,              $
 FIELDNAME=EMERGENCYNO,  ALIAS=ENO,      FORMAT=A10,              $
 FIELDNAME=EMERGCONTACT, ALIAS=ENAME,    FORMAT=A35,              $
 FIELDNAME=RELATIONSHIP, ALIAS=REL,      FORMAT=A8,               $
 FIELDNAME=BIRTHDATE,    ALIAS=BDAT,     FORMAT=YMD,              $
```

# PERSINFO Structure Diagram

```
SECTION 01
     STRUCTURE OF FOCUS    FILE PERSINFO ON 01/22/08 AT 16.27.24
   PERSONAL
  01      S1
 **************
 *PIN         **I
 *INCAREOF    **
 *STREETNO    **
```

```
 *APT         **
 *            **
 ***************
  **************
```

# SALHIST Data Source

SALHIST contains information about employee salary history. The PIN field is indexed. Both the PIN and EFFECTDATE fields are keys.

# SALHIST Master File

```
FILENAME=SALHIST,  SUFFIX=FOC
SEGNAME=SLHISTRY,  SEGTYPE=SH2
 FIELDNAME=PIN,        ALIAS=ID,     FORMAT=A9,     INDEX=I,  $
 FIELDNAME=EFFECTDATE, ALIAS=EDAT,   FORMAT=YMD,              $
 FIELDNAME=OLDSALARY,  ALIAS=OSAL,   FORMAT=D12.2,            $
```

# SALHIST Structure Diagram

```
SECTION 01
     STRUCTURE OF FOCUS    FILE SALHIST  ON 01/22/08 AT 16.28.02
    SLHISTRY
  01      SH2
 **************
 *PIN         **I
 *EFFECTDATE  **
 *OLDSALARY   **
 *            **
 *            **
 ***************
  **************
```

# VIDEOTRK, MOVIES, and ITEMS Data Sources

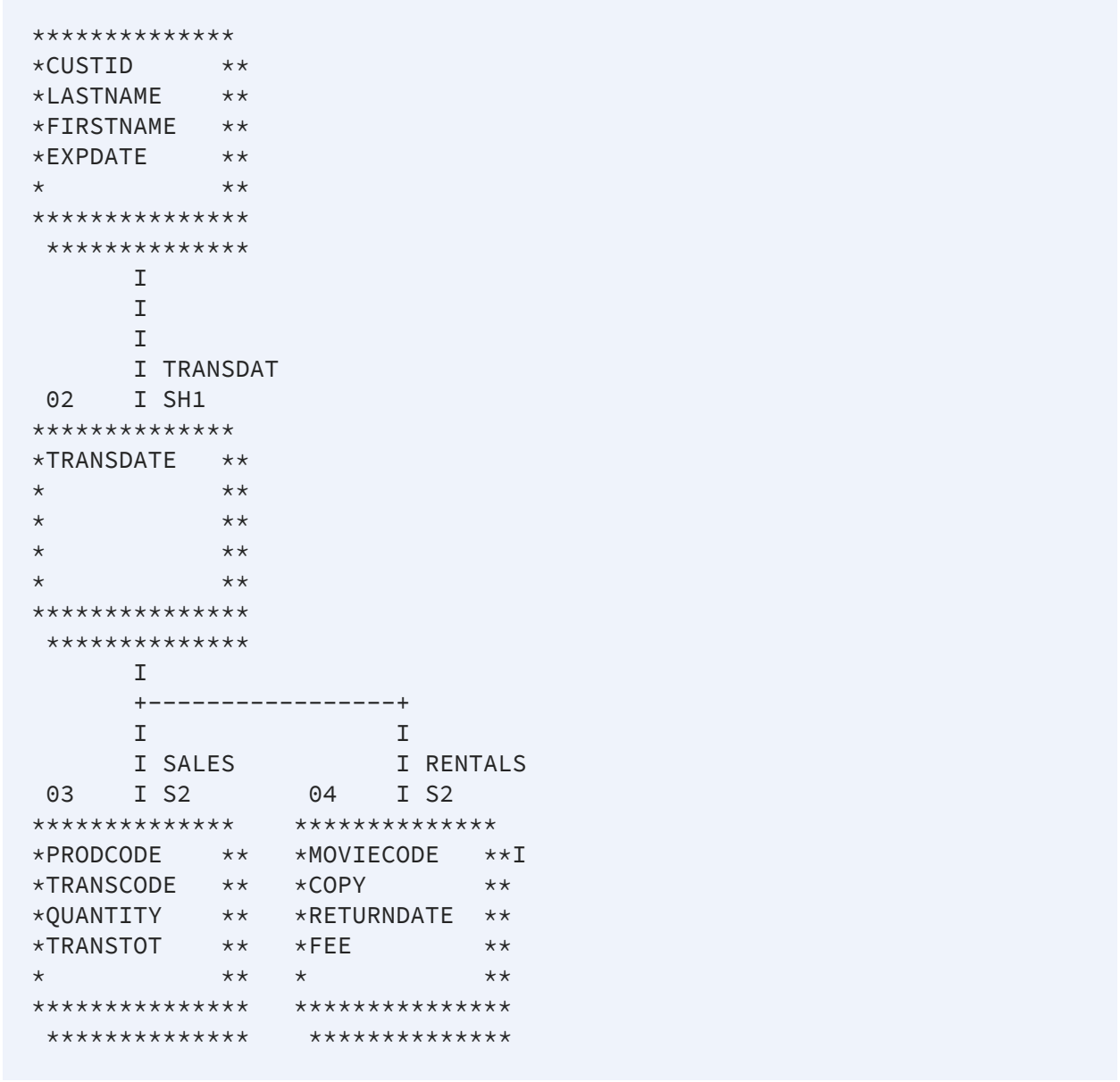
VIDEOTRK contains sample data about customer, rental, and purchase information for a video rental business. It can be joined to the MOVIES or ITEMS data source. VIDEOTRK and MOVIES are used in examples that illustrate the use of the Maintain Data facility.

# VIDEOTRK Master File

```
FILENAME=VIDEOTRK, SUFFIX=FOC
 SEGNAME=CUST,     SEGTYPE=S1
  FIELDNAME=CUSTID,     ALIAS=CIN,          FORMAT=A4,    $
  FIELDNAME=LASTNAME,   ALIAS=LN,           FORMAT=A15,   $
  FIELDNAME=FIRSTNAME,  ALIAS=FN,           FORMAT=A10,   $
  FIELDNAME=EXPDATE,    ALIAS=EXDAT,        FORMAT=YMD,   $
  FIELDNAME=PHONE,      ALIAS=TEL,          FORMAT=A10,   $
  FIELDNAME=STREET,     ALIAS=STR,          FORMAT=A20,   $
  FIELDNAME=CITY,       ALIAS=CITY,         FORMAT=A20,   $
  FIELDNAME=STATE,      ALIAS=PROV,         FORMAT=A4,    $
  FIELDNAME=ZIP,        ALIAS=POSTAL_CODE,  FORMAT=A9,    $
SEGNAME=TRANSDAT,  SEGTYPE=SH1,  PARENT=CUST
  FIELDNAME=TRANSDATE,  ALIAS=OUTDATE,      FORMAT=YMD,   $
SEGNAME=SALES,     SEGTYPE=S2,   PARENT=TRANSDAT
  FIELDNAME=PRODCODE,   ALIAS=PCOD,         FORMAT=A6,    $
  FIELDNAME=TRANSCODE,  ALIAS=TCOD,         FORMAT=I3,    $
  FIELDNAME=QUANTITY,   ALIAS=NO,           FORMAT=I3S,   $
  FIELDNAME=TRANSTOT,   ALIAS=TTOT,         FORMAT=F7.2S, $
SEGNAME=RENTALS,   SEGTYPE=S2,   PARENT=TRANSDAT
  FIELDNAME=MOVIECODE,  ALIAS=MCOD,         FORMAT=A6, INDEX=I, $
  FIELDNAME=COPY,       ALIAS=COPY,         FORMAT=I2,    $
  FIELDNAME=RETURNDATE, ALIAS=INDATE,       FORMAT=YMD,   $
  FIELDNAME=FEE,        ALIAS=FEE,          FORMAT=F5.2S, $
```

# VIDEOTRK Structure Diagram

```
SECTION 01
             STRUCTURE OF FOCUS    FILE VIDEOTRK ON 05/15/03 AT 12.25.19

         CUST
 01      S1
```




# MOVIES Master File

```
FILENAME=MOVIES,    SUFFIX=FOC
 SEGNAME=MOVINFO,   SEGTYPE=S1
  FIELDNAME=MOVIECODE,   ALIAS=MCOD,  FORMAT=A6, INDEX=I, $
  FIELDNAME=TITLE,       ALIAS=MTL,   FORMAT=A39,  $
  FIELDNAME=CATEGORY,    ALIAS=CLASS, FORMAT=A8,   $
  FIELDNAME=DIRECTOR,    ALIAS=DIR,   FORMAT=A17,  $
```

```
  FIELDNAME=RATING,      ALIAS=RTG,   FORMAT=A4,   $
  FIELDNAME=RELDATE,     ALIAS=RDAT,  FORMAT=YMD,  $
  FIELDNAME=WHOLESALEPR, ALIAS=WPRC,  FORMAT=F6.2, $
  FIELDNAME=LISTPR,      ALIAS=LPRC,  FORMAT=F6.2, $
  FIELDNAME=COPIES,      ALIAS=NOC,   FORMAT=I3,   $
```

# MOVIES Structure Diagram

```
SECTION 01
             STRUCTURE OF FOCUS    FILE MOVIES   ON 05/15/03 AT 12.26.05

         MOVINFO
 01      S1
**************
*MOVIECODE   **I
*TITLE       **
*CATEGORY    **
*DIRECTOR    **
*            **
***************
 **************
```

# ITEMS Master File

```
FILENAME=ITEMS,   SUFFIX=FOC
 SEGNAME=ITMINFO, SEGTYPE=S1
  FIELDNAME=PRODCODE,  ALIAS=PCOD,  FORMAT=A6,  INDEX=I, $
  FIELDNAME=PRODNAME,  ALIAS=PROD,  FORMAT=A20,          $
  FIELDNAME=OURCOST,   ALIAS=WCOST, FORMAT=F6.2,         $
  FIELDNAME=RETAILPR,  ALIAS=PRICE, FORMAT=F6.2,         $
  FIELDNAME=ON_HAND,   ALIAS=NUM,   FORMAT=I5,           $
```

# ITEMS Structure Diagram

```
SECTION 01
             STRUCTURE OF FOCUS    FILE ITEMS    ON 05/15/03 AT 12.26.05

          ITMINFO
 01       S1
**************
*PRODCODE    **I
*PRODNAME    **
*OURCOST     **
*RETAILPR    **
*            **
***************
 **************
```

# VIDEOTR2 Data Source

VIDEOTR2 contains sample data about customer, rental, and purchase information for a video rental business. It consists of four segments.

# VIDEOTR2 Master File

```
FILENAME=VIDEOTR2, SUFFIX=FOC
 SEGNAME=CUST,     SEGTYPE=S1
  FIELDNAME=CUSTID,       ALIAS=CIN,          FORMAT=A4,          $
  FIELDNAME=LASTNAME,     ALIAS=LN,           FORMAT=A15,         $
  FIELDNAME=FIRSTNAME,    ALIAS=FN,           FORMAT=A10,         $
  FIELDNAME=EXPDATE,      ALIAS=EXDAT,        FORMAT=YMD,         $
  FIELDNAME=PHONE,        ALIAS=TEL,          FORMAT=A10,         $
  FIELDNAME=STREET,       ALIAS=STR,          FORMAT=A20,         $
  FIELDNAME=CITY,         ALIAS=CITY,         FORMAT=A20,         $
  FIELDNAME=STATE,        ALIAS=PROV,         FORMAT=A4,          $
  FIELDNAME=ZIP,          ALIAS=POSTAL_CODE,  FORMAT=A9,          $
  FIELDNAME=EMAIL,        ALIAS=EMAIL,        FORMAT=A18,         $
 SEGNAME=TRANSDAT, SEGTYPE=SH1,  PARENT=CUST
  FIELDNAME=TRANSDATE,    ALIAS=OUTDATE,      FORMAT=HYYMDI,      $
 SEGNAME=SALES,    SEGTYPE=S2,   PARENT=TRANSDAT
  FIELDNAME=TRANSCODE,    ALIAS=TCOD,         FORMAT=I3,          $
```

```
  FIELDNAME=QUANTITY,     ALIAS=NO,           FORMAT=I3S,         $
  FIELDNAME=TRANSTOT,     ALIAS=TTOT,         FORMAT=F7.2S,       $
SEGNAME=RENTALS,  SEGTYPE=S2,   PARENT=TRANSDAT
  FIELDNAME=MOVIECODE,    ALIAS=MCOD,         FORMAT=A6, INDEX=I, $
  FIELDNAME=COPY,         ALIAS=COPY,         FORMAT=I2,          $
  FIELDNAME=RETURNDATE,   ALIAS=INDATE,       FORMAT=YMD,         $
  FIELDNAME=FEE,          ALIAS=FEE,          FORMAT=F5.2S,       $
```

# VIDEOTR2 Structure Diagram

```
SECTION 01
     STRUCTURE OF FOCUS    FILE VIDEOTR2 ON 05/15/03 AT 16.45.48

          CUST
  01      S1
 **************
 *CUSTID      **
 *LASTNAME    **
 *FIRSTNAME   **
 *EXPDATE     **
 *            **
 ***************
  **************
        I
        I
        I
        I TRANSDAT
  02    I SH1
 **************
 *TRANSDATE   **
 *            **
 *            **
 *            **
 *            **
 ***************
  **************
        I
        +-----------------+
        I                 I
        I SALES           I RENTALS
  03    I S2        04    I S2
 **************    **************
 *TRANSCODE   **   *MOVIECODE   **I
```

```
 *QUANTITY    **   *COPY        **
 *TRANSTOT    **   *RETURNDATE  **
 *            **   *FEE         **
 *            **   *            **
 ***************   ***************
  **************    **************
```

# Gotham Grinds Data Sources

Gotham Grinds is a group of data sources that contain sample data about a specialty items company.

- GGDEMOG contains demographic information about the customers of Gotham Grinds, a company that sells specialty items like coffee, gourmet snacks, and gifts. It consists of one segment, DEMOG01.
- GGORDER contains order information for Gotham Grinds. It consists of two segments, ORDER01 and ORDER02.
- GGPRODS contains product information for Gotham Grinds. It consists of one segment, PRODS01.
- GGSALES contains sales information for Gotham Grinds. It consists of one segment, SALES01.
- GGSTORES contains information for each of Gotham Grinds 12 stores in the United States. It consists of one segment, STORES01.

# GGDEMOG Master File

```
FILENAME=GGDEMOG, SUFFIX=FOC
 SEGNAME=DEMOG01, SEGTYPE=S1
  FIELD=ST,       ALIAS=E02, FORMAT=A02, INDEX=I,TITLE='State',
   DESC='State',$
  FIELD=HH,       ALIAS=E03, FORMAT=I09, TITLE='Number of Households',
   DESC='Number of Households',$
  FIELD=AVGHHSZ98,ALIAS=E04, FORMAT=I09, TITLE='Average Household Size',
   DESC='Average Household Size',$
  FIELD=MEDHHI98, ALIAS=E05, FORMAT=I09, TITLE='Median Household
```

```
Income',
   DESC='Median Household Income',$
  FIELD=AVGHHI98, ALIAS=E06, FORMAT=I09, TITLE='Average Household
Income',
   DESC='Average Household Income',$
  FIELD=MALEPOP98,ALIAS=E07, FORMAT=I09, TITLE='Male Population',
   DESC='Male Population',$
  FIELD=FEMPOP98, ALIAS=E08, FORMAT=I09, TITLE='Female Population',
   DESC='Female Population',$
  FIELD=P15TO1998,ALIAS=E09, FORMAT=I09, TITLE='15 to 19',
   DESC='Population 15 to 19 years old',$
  FIELD=P20TO2998,ALIAS=E10, FORMAT=I09, TITLE='20 to 29',
   DESC='Population 20 to 29 years old',$
  FIELD=P30TO4998,ALIAS=E11, FORMAT=I09, TITLE='30 to 49',
   DESC='Population 30 to 49 years old',$
  FIELD=P50TO6498,ALIAS=E12, FORMAT=I09, TITLE='50 to 64',
   DESC='Population 50 to 64 years old',$
  FIELD=P65OVR98, ALIAS=E13, FORMAT=I09, TITLE='65 and over',
   DESC='Population 65 and over',$
```

# GGDEMOG Structure Diagram

```
SECTION 01
     STRUCTURE OF FOCUS    FILE GGDEMOG  ON 05/15/03 AT 12.26.05

         GGDEMOG
 01      S1
**************
*ST          **I
*HH          **
*AVGHHSZ98   **
*MEDHHI98    **
*            **
***************
 **************
```

# GGORDER Master File

```
FILENAME=GGORDER, SUFFIX=FOC,$
 SEGNAME=ORDER01, SEGTYPE=S1,$
  FIELD=ORDER_NUMBER, ALIAS=ORDNO1,   FORMAT=I6,  TITLE='Order,Number',
   DESC='Order Identification Number',$
  FIELD=ORDER_DATE,   ALIAS=DATE,     FORMAT=MDY, TITLE='Order,Date',
   DESC='Date order was placed',$
  FIELD=STORE_CODE,   ALIAS=STCD,     FORMAT=A5,  TITLE='Store,Code',
   DESC='Store Identification Code (for order)',$
  FIELD=PRODUCT_CODE, ALIAS=PCD,      FORMAT=A4,  TITLE='Product,Code',
   DESC='Product Identification Code (for order)',$
  FIELD=QUANTITY,     ALIAS=ORDUNITS, FORMAT=I8,  TITLE='Ordered,Units',
   DESC='Quantity Ordered',$
SEGNAME=ORDER02, SEGTYPE=KU, PARENT=ORDER01, CRFILE=GGPRODS, CRKEY=PCD,
CRSEG=PRODS01  ,$
```

# GGORDER Structure Diagram

```
SECTION 01
     STRUCTURE OF FOCUS    FILE GGORDER  ON 05/15/03 AT 16.45.48

          GGORDER
  01      S1
 **************
 *ORDER_NUMBER**
 *ORDER_DATE  **
 *STORE_CODE  **
 *PRODUCT_CODE**
 *            **
 ***************
  **************
        I
        I
        I
        I ORDER02
  02    I KU
 ..............
 :PRODUCT_ID  :K
 :PRODUCT_DESC:
 :VENDOR_CODE :
 :VENDOR_NAME :
```

```
 :           :
 :...........:
```

# GGPRODS Master File

```
FILENAME=GGPRODS, SUFFIX=FOC
 SEGNAME=PRODS01, SEGTYPE=S1
  FIELD=PRODUCT_ID, ALIAS=PCD, FORMAT=A4, INDEX=I, TITLE='Product,Code',
   DESC='Product Identification Code',$
  FIELD=PRODUCT_DESCRIPTION, ALIAS=PRODUCT, FORMAT=A16, TITLE='Product',
   DESC='Product Name',$
  FIELD=VENDOR_CODE, ALIAS=VCD, FORMAT=A4, INDEX=I, TITLE='Vendor ID',
   DESC='Vendor Identification Code',$
  FIELD=VENDOR_NAME, ALIAS=VENDOR, FORMAT=A23, TITLE='Vendor Name',
   DESC='Vendor Name',$
  FIELD=PACKAGE_TYPE, ALIAS=PACK, FORMAT=A7, TITLE='Package',
   DESC='Packaging Style',$
  FIELD=SIZE, ALIAS=SZ, FORMAT=I2, TITLE='Size',
   DESC='Package Size',$
  FIELD=UNIT_PRICE, ALIAS=UNITPR, FORMAT=D7.2, TITLE='Unit,Price',
   DESC='Price for one unit',$
```

# GGPRODS Structure Diagram

```
SECTION 01
     STRUCTURE OF FOCUS    FILE GGPRODS  ON 05/15/03 AT 12.26.05

         GGPRODS
 01      S1
**************
*PRODUCT_ID  **I
*PRODUCT_DESC**I
*VENDOR_CODE **
*VENDOR_NAME **
*            **
***************
 **************
```

# GGSALES Master File

```
FILENAME=GGSALES, SUFFIX=FOC
 SEGNAME=SALES01, SEGTYPE=S1
  FIELD=SEQ_NO, ALIAS=SEQ, FORMAT=I5, TITLE='Sequence#',
   DESC='Sequence number in database',$
  FIELD=CATEGORY, ALIAS=E02, FORMAT=A11, INDEX=I, TITLE='Category',
   DESC='Product category',$
  FIELD=PCD, ALIAS=E03, FORMAT=A04, INDEX=I, TITLE='Product ID',
   DESC='Product Identification code (for sale)',$
  FIELD=PRODUCT, ALIAS=E04, FORMAT=A16, TITLE='Product',
   DESC='Product name',$
  FIELD=REGION, ALIAS=E05, FORMAT=A11, INDEX=I, TITLE='Region',
   DESC='Region code',$
  FIELD=ST, ALIAS=E06, FORMAT=A02, INDEX=I, TITLE='State',
   DESC='State',$
  FIELD=CITY, ALIAS=E07, FORMAT=A20, TITLE='City',
   DESC='City',$
  FIELD=STCD, ALIAS=E08, FORMAT=A05, INDEX=I, TITLE='Store ID',
   DESC='Store identification code (for sale)',$
  FIELD=DATE, ALIAS=E09, FORMAT=I8YYMD, TITLE='Date',
   DESC='Date of sales report',$
  FIELD=UNITS, ALIAS=E10, FORMAT=I08, TITLE='Unit Sales',
   DESC='Number of units sold',$
  FIELD=DOLLARS, ALIAS=E11, FORMAT=I08, TITLE='Dollar Sales',
   DESC='Total dollar amount of reported sales',$
  FIELD=BUDUNITS, ALIAS=E12, FORMAT=I08, TITLE='Budget Units',
   DESC='Number of units budgeted',$
  FIELD=BUDDOLLARS, ALIAS=E13, FORMAT=I08, TITLE='Budget Dollars',
   DESC='Total sales quota in dollars',$
```

# GGSALES Structure Diagram

```
SECTION 01
     STRUCTURE OF FOCUS    FILE GGSALES  ON 05/15/03 AT 12.26.05

         GGSALES
 01      S1
**************
*SEQ_NO      **
*CATEGORY    **I
*PCD         **I
```

```
*PRODUCT     **I
*            **
***************
 **************
```

# GGSTORES Master File

```
FILENAME=GGSTORES, SUFFIX=FOC
 SEGNAME=STORES01, SEGTYPE=S1
  FIELD=STORE_CODE, ALIAS=E02, FORMAT=A05, INDEX=I, TITLE='Store ID',
   DESC='Franchisee ID Code',$
  FIELD=STORE_NAME, ALIAS=E03, FORMAT=A23, TITLE='Store Name',
   DESC='Store Name',$
  FIELD=ADDRESS1, ALIAS=E04, FORMAT=A19, TITLE='Contact',
   DESC='Franchisee Owner',$
  FIELD=ADDRESS2, ALIAS=E05, FORMAT=A31, TITLE='Address',
   DESC='Street Address',$
  FIELD=CITY, ALIAS=E06, FORMAT=A22, TITLE='City',
   DESC='City',$
  FIELD=STATE, ALIAS=E07, FORMAT=A02, INDEX=I, TITLE='State',
   DESC='State',$
  FIELD=ZIP, ALIAS=E08, FORMAT=A06, TITLE='Zip Code',
   DESC='Postal Code',$
```

# GGSTORES Structure Diagram

```
SECTION 01
     STRUCTURE OF FOCUS    FILE GGSTORES ON 05/15/03 AT 12.26.05

         GGSTORES
 01      S1
**************
*STORE_CODE  **I
*STORE_NAME  **
*ADDRESS1    **
*ADDRESS2    **
*            **
***************
 **************
```

# Century Corp Data Sources

Century Corp is a consumer electronics manufacturer that distributes products through retailers around the world. Century Corp has thousands of employees in plants, warehouses, and offices worldwide. Their mission is to provide quality products and services to their customers.

Century Corp is a group of data sources that contain financial, human resources, inventory, and order information. The last three data sources are designed to be used with chart of accounts data.

- CENTCOMP Master File contains location information for stores. It consists of one segment, COMPINFO.
- CENTFIN Master File contains financial information. It consists of one segment, ROOT_SEG.
- CENTHR Master File contains human resources information. It consists of one segment, EMPSEG.
- CENTINV Master File contains inventory information. It consists of one segment, INVINFO.
- CENTORD Master File contains order information. It consists of four segments, OINFO, STOSEG, PINFO, and INVSEG.
- CENTQA Master File contains problem information. It consists of three segments, PROD_SEG, INVSEG, and PROB_SEG.
- CENTGL Master File contains a chart of accounts hierarchy. The field GL_ACCOUNT_PARENT is the parent field in the hierarchy. The field GL_ACCOUNT is the hierarchy field. The field GL_ACCOUNT_CAPTION can be used as the descriptive caption for the hierarchy field.
- CENTSYSF Master File contains detail-level financial data. CENTSYSF uses a different account line system (SYS_ACCOUNT), which can be joined to the SYS_ACCOUNT field in CENTGL. Data uses "natural" signs (expenses are positive, revenue negative).
- CENTSTMT Master File contains detail-level financial data and a cross-reference to the CENTGL data source.
- CENTGLL Master File contains a chart of accounts hierarchy. The field GL_ACCOUNT_PARENT is the parent field in the hierarchy. The field GL_ACCOUNT is the hierarchy field. The field GL_ACCOUNT_CAPTION can be used as the descriptive caption for the hierarchy field.

# CENTCOMP Master File

```
FILE=CENTCOMP, SUFFIX=FOC, FDFC=19, FYRT=00
  SEGNAME=COMPINFO, SEGTYPE=S1, $
  FIELD=STORE_CODE, ALIAS=SNUM, FORMAT=A6, INDEX=I,
   TITLE='Store Id#:',
   DESCRIPTION='Store Id#', $
  FIELD=STORENAME, ALIAS=SNAME, FORMAT=A20,
   WITHIN=STATE,
   TITLE='Store,Name:',
   DESCRIPTION='Store Name', $
  FIELD=STATE, ALIAS=STATE, FORMAT=A2,
   WITHIN=PLANT,
   TITLE='State:',
   DESCRIPTION=State, $
  DEFINE REGION/A5=DECODE STATE ('AL' 'SOUTH' 'AK' 'WEST' 'AR' 'SOUTH'
  'AZ' 'WEST' 'CA' 'WEST' 'CO' 'WEST' 'CT' 'EAST'
  'DE' 'EAST' 'DC' 'EAST' 'FL' 'SOUTH' 'GA' 'SOUTH' 'HI' 'WEST'
  'ID' 'WEST' 'IL' 'NORTH' 'IN' 'NORTH' 'IA' 'NORTH'
  'KS' 'NORTH' 'KY' 'SOUTH' 'LA' 'SOUTH' 'ME' 'EAST' 'MD' 'EAST'
  'MA' 'EAST' 'MI' 'NORTH' 'MN' 'NORTH' 'MS' 'SOUTH' 'MT' 'WEST'
  'MO' 'SOUTH' 'NE' 'WEST'  'NV' 'WEST' 'NH' 'EAST' 'NJ' 'EAST'
  'NM' 'WEST' 'NY' 'EAST' 'NC' 'SOUTH' 'ND' 'NORTH' 'OH' 'NORTH'
  'OK' 'SOUTH' 'OR' 'WEST' 'PA' 'EAST' 'RI' 'EAST' 'SC' 'SOUTH'
  'SD' 'NORTH' 'TN' 'SOUTH' 'TX' 'SOUTH' 'UT' 'WEST' 'VT' 'EAST'
  'VA' 'SOUTH' 'WA' 'WEST' 'WV' 'SOUTH' 'WI' 'NORTH' 'WY' 'WEST'
  'NA' 'NORTH' 'ON' 'NORTH' ELSE ' ');,
   TITLE='Region:',
   DESCRIPTION=Region, $
```

# CENTCOMP Structure Diagram

```
SECTION 01
       STRUCTURE OF FOCUS    FILE CENTCOMP ON 05/15/03 AT 10.20.49

          COMPINFO
  01      S1
 **************
 *STORE_CODE  **I
 *STORENAME   **
 *STATE       **
 *            **
```

```
 *            **
 ***************
  **************
```

# CENTFIN Master File

```
FILE=CENTFIN, SUFFIX=FOC, FDFC=19, FYRT=00
  SEGNAME=ROOT_SEG, SEGTYPE=S4, $
  FIELD=YEAR, ALIAS=YEAR, FORMAT=YY,
   WITHIN='*Time Period', $
  FIELD=QUARTER, ALIAS=QTR, FORMAT=Q,
   WITHIN=YEAR,
   TITLE=Quarter,
   DESCRIPTION=Quarter, $
  FIELD=MONTH, ALIAS=MONTH, FORMAT=M,
   TITLE=Month,
   DESCRIPTION=Month, $
  FIELD=ITEM, ALIAS=ITEM, FORMAT=A20,
   TITLE=Item,
   DESCRIPTION=Item, $
  FIELD=VALUE, ALIAS=VALUE, FORMAT=D12.2,
   TITLE=Value,
   DESCRIPTION=Value, $
  DEFINE ITYPE/A12=IF EDIT(ITEM,'9$$$$$$$$$$$$$$$$$$') EQ 'E'
   THEN 'Expense' ELSE IF EDIT(ITEM,'9$$$$$$$$$$$$$$$$$$') EQ 'R'
   THEN 'Revenue' ELSE 'Asset';,
   TITLE=Type,
   DESCRIPTION='Type of Financial Line Item',$
  DEFINE MOTEXT/MT=MONTH;,$
```

# CENTFIN Structure Diagram

```
SECTION 01
       STRUCTURE OF FOCUS    FILE CENTFIN  ON 05/15/03 AT 10.25.52

          ROOT_SEG
  01      S4
 **************
 *YEAR        **
```

```
 *QUARTER     **
 *MONTH       **
 *ITEM        **
 *            **
 ***************
  **************
```

# CENTHR Master File

```
FILE=CENTHR, SUFFIX=FOC
  SEGNAME=EMPSEG, SEGTYPE=S1, $
  FIELD=ID_NUM, ALIAS=ID#, FORMAT=I9,
   TITLE='Employee,ID#',
   DESCRIPTION='Employee Identification Number', $
  FIELD=LNAME, ALIAS=LN, FORMAT=A14,
   TITLE='Last,Name',
   DESCRIPTION='Employee Last Name', $
  FIELD=FNAME, ALIAS=FN, FORMAT=A12,
   TITLE='First,Name',
   DESCRIPTION='Employee First Name', $
  FIELD=PLANT, ALIAS=PLT, FORMAT=A3,
   TITLE='Plant,Location',
   DESCRIPTION='Location of the manufacturing plant',
   WITHIN='*Location', $
  FIELD=START_DATE, ALIAS=SDATE, FORMAT=YYMD,
   TITLE='Starting,Date',
   DESCRIPTION='Date of employment',$
  FIELD=TERM_DATE, ALIAS=TERM_DATE, FORMAT=YYMD,
   TITLE='Termination,Date',
   DESCRIPTION='Termination Date', $
  FIELD=STATUS, ALIAS=STATUS, FORMAT=A10,
   TITLE='Current,Status',
   DESCRIPTION='Job Status', $
  FIELD=POSITION, ALIAS=JOB, FORMAT=A2,
   TITLE=Position,
   DESCRIPTION='Job Position',  $
  FIELD=PAYSCALE, ALIAS=PAYLEVEL, FORMAT=I2,
   TITLE='Pay,Level',
   DESCRIPTION='Pay Level',
   WITHIN='*Wages',$
  DEFINE POSITION_DESC/A17=IF POSITION EQ 'BM' THEN
   'Plant Manager' ELSE
   IF POSITION EQ 'MR' THEN 'Line Worker' ELSE
```

```
 IF POSITION EQ 'TM' THEN 'Line Manager' ELSE
 'Technician';
 TITLE='Position,Description',
 DESCRIPTION='Position Description',
 WITHIN='PLANT',$
DEFINE BYEAR/YY=START_DATE;
 TITLE='Beginning,Year',
 DESCRIPTION='Beginning Year',
 WITHIN='*Starting Time Period',$
```

```
DEFINE BQUARTER/Q=START_DATE;
 TITLE='Beginning,Quarter',
 DESCRIPTION='Beginning Quarter',
 WITHIN='BYEAR',
DEFINE BMONTH/M=START_DATE;
 TITLE='Beginning,Month',
 DESCRIPTION='Beginning Month',
 WITHIN='BQUARTER',$
DEFINE EYEAR/YY=TERM_DATE;
 TITLE='Ending,Year',
 DESCRIPTION='Ending Year',
 WITHIN='*Termination Time Period',$
DEFINE EQUARTER/Q=TERM_DATE;
 TITLE='Ending,Quarter',
 DESCRIPTION='Ending Quarter',
 WITHIN='EYEAR',$
DEFINE EMONTH/M=TERM_DATE;
 TITLE='Ending,Month',
 DESCRIPTION='Ending Month',
 WITHIN='EQUARTER',$
DEFINE RESIGN_COUNT/I3=IF STATUS EQ 'RESIGNED' THEN 1
 ELSE 0;
 TITLE='Resigned,Count',
 DESCRIPTION='Resigned Count',$
DEFINE FIRE_COUNT/I3=IF STATUS EQ 'TERMINAT' THEN 1
 ELSE 0;
 TITLE='Terminated,Count',
 DESCRIPTION='Terminated Count',$
DEFINE DECLINE_COUNT/I3=IF STATUS EQ 'DECLINED' THEN 1
 ELSE 0;
 TITLE='Declined,Count',
 DESCRIPTION='Declined Count',$
DEFINE EMP_COUNT/I3=IF STATUS EQ 'EMPLOYED' THEN 1
 ELSE 0;
 TITLE='Employed,Count',
 DESCRIPTION='Employed Count',$
```

```
  DEFINE PEND_COUNT/I3=IF STATUS EQ 'PENDING' THEN 1
   ELSE 0;
   TITLE='Pending,Count',
   DESCRIPTION='Pending Count',$
  DEFINE REJECT_COUNT/I3=IF STATUS EQ 'REJECTED' THEN 1
   ELSE 0;
   TITLE='Rejected,Count',
   DESCRIPTION='Rejected Count',$
  DEFINE FULLNAME/A28=LNAME||', '|FNAME;
   TITLE='Full Name',
   DESCRIPTION='Full Name: Last, First', WITHIN='POSITION_DESC',$
```

```
  DEFINE SALARY/D12.2=IF BMONTH LT 4 THEN PAYLEVEL * 12321
   ELSE IF BMONTH GE 4 AND BMONTH LT 8 THEN PAYLEVEL * 13827
   ELSE PAYLEVEL * 14400;,
   TITLE='Salary',
   DESCRIPTION='Salary',$
  DEFINE PLANTLNG/A11=DECODE PLANT (BOS 'Boston' DAL 'Dallas'
   LA 'Los Angeles' ORL 'Orlando' SEA 'Seattle' STL 'St Louis'
   ELSE 'n/a');$
```

# CENTHR Structure Diagram

```
SECTION 01
     STRUCTURE OF FOCUS    FILE CENTHR   ON 05/15/03 AT 10.40.34

          EMPSEG
  01      S1
 **************
 *ID_NUM      **
 *LNAME       **
 *FNAME       **
 *PLANT       **
 *            **
 ***************
  **************
```

# CENTINV Master File

```
FILE=CENTINV, SUFFIX=FOC, FDFC=19, FYRT=00
 SEGNAME=INVINFO, SEGTYPE=S1, $
  FIELD=PROD_NUM, ALIAS=PNUM, FORMAT=A4, INDEX=I,
   TITLE='Product,Number:',
   DESCRIPTION='Product Number', $
  FIELD=PRODNAME, ALIAS=PNAME, FORMAT=A30,
   WITHIN=PRODCAT,
   TITLE='Product,Name:',
   DESCRIPTION='Product Name', $
  FIELD=QTY_IN_STOCK, ALIAS=QIS, FORMAT=I7,
   TITLE='Quantity,In Stock:',
   DESCRIPTION='Quantity In Stock', $
  FIELD=PRICE, ALIAS=RETAIL, FORMAT=D10.2,
   TITLE='Price:',
   DESCRIPTION=Price, $
  FIELD=COST, ALIAS=OUR_COST, FORMAT=D10.2,
   TITLE='Our,Cost:',
   DESCRIPTION='Our Cost:', $
  DEFINE PRODCAT/A22 = IF PRODNAME CONTAINS 'LCD'
   THEN 'VCRs' ELSE IF PRODNAME
   CONTAINS 'DVD' THEN 'DVD' ELSE IF PRODNAME CONTAINS 'Camcor'
   THEN 'Camcorders'
   ELSE IF PRODNAME CONTAINS 'Camera' THEN 'Cameras' ELSE IF PRODNAME
   CONTAINS 'CD' THEN 'CD Players'
   ELSE IF PRODNAME CONTAINS 'Tape' THEN 'Digital Tape Recorders'
   ELSE IF PRODNAME CONTAINS 'Combo' THEN 'Combo Players'
   ELSE 'PDA Devices'; WITHIN=PRODTYPE, TITLE='Product Category:' ,$
  DEFINE PRODTYPE/A19 = IF PRODNAME CONTAINS 'Digital' OR 'DVD' OR 'QX'
   THEN 'Digital' ELSE 'Analog';,WITHIN='*Product Dimension',
   TITLE='Product Type:',$
```

# CENTINV Structure Diagram

```
SECTION 01
       STRUCTURE OF FOCUS    FILE CENTINV  ON 05/15/03 AT 10.43.35

          INVINFO
  01      S1
 **************
 *PROD_NUM    **I
```

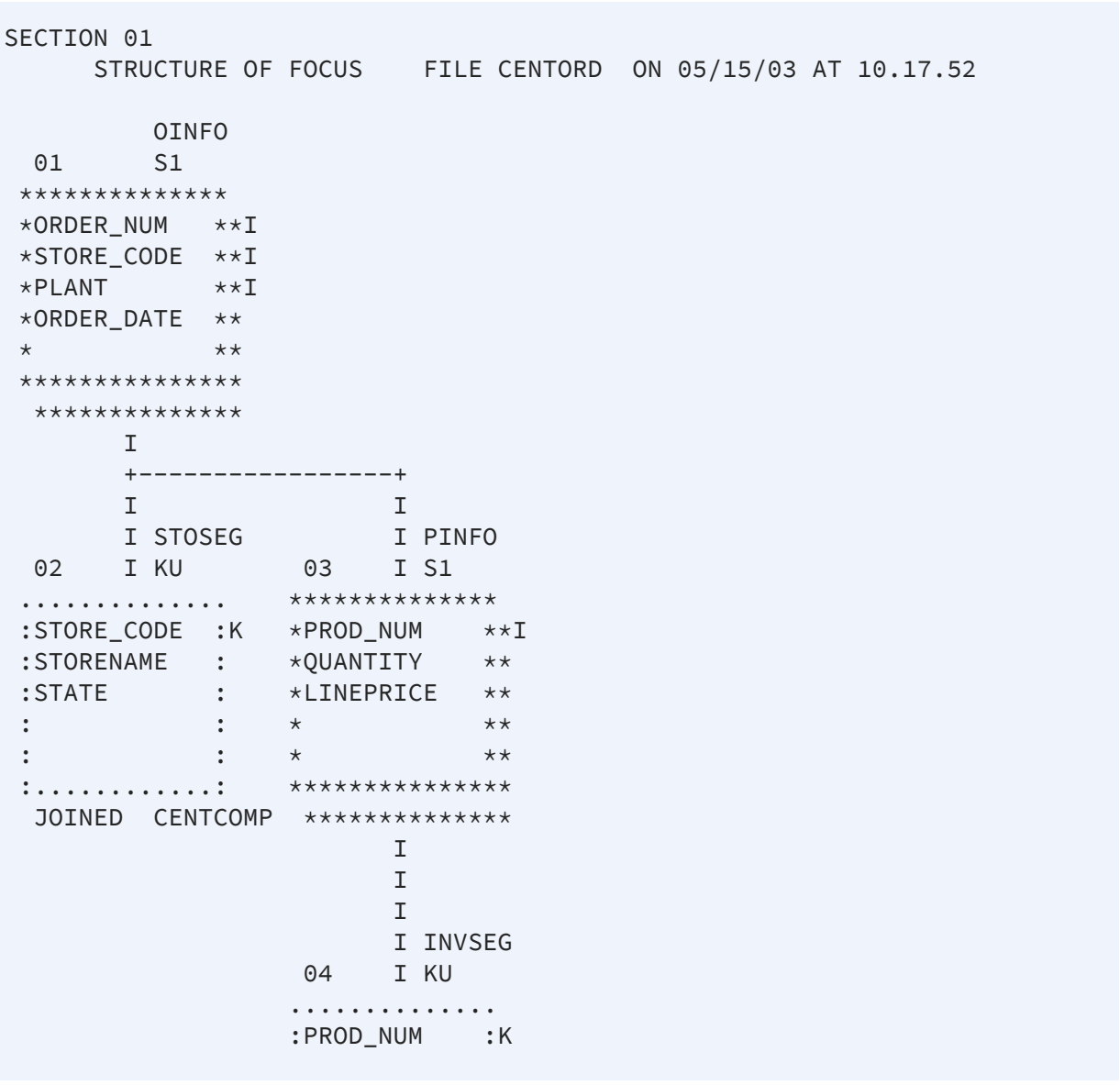
```
 *PRODNAME    **
 *QTY_IN_STOCK**
 *PRICE       **
 *            **
 ***************
  **************
```

# CENTORD Master File

```
FILE=CENTORD, SUFFIX=FOC
 SEGNAME=OINFO, SEGTYPE=S1, $
  FIELD=ORDER_NUM, ALIAS=ONUM, FORMAT=A5, INDEX=I,
   TITLE='Order,Number:',
   DESCRIPTION='Order Number', $
  FIELD=ORDER_DATE, ALIAS=ODATE, FORMAT=YYMD,
   TITLE='Date,Of Order:',
   DESCRIPTION='Date Of Order', $
  FIELD=STORE_CODE, ALIAS=SNUM, FORMAT=A6, INDEX=I,
   TITLE='Company ID#:',
   DESCRIPTION='Company ID#', $
  FIELD=PLANT, ALIAS=PLNT, FORMAT=A3, INDEX=I,
   TITLE='Manufacturing,Plant',
   DESCRIPTION='Location Of Manufacturing Plant',
   WITHIN='*Location',$
  DEFINE YEAR/YY=ORDER_DATE;,
   WITHIN='*Time Period',$
  DEFINE QUARTER/Q=ORDER_DATE;,
   WITHIN='YEAR',$
  DEFINE MONTH/M=ORDER_DATE;,
   WITHIN='QUARTER',$
 SEGNAME=PINFO, SEGTYPE=S1, PARENT=OINFO, $
  FIELD=PROD_NUM, ALIAS=PNUM, FORMAT=A4,INDEX=I,
   TITLE='Product,Number#:',
   DESCRIPTION='Product Number#', $
  FIELD=QUANTITY, ALIAS=QTY, FORMAT=I8C,
   TITLE='Quantity:',
   DESCRIPTION=Quantity, $
  FIELD=LINEPRICE, ALIAS=LINETOTAL, FORMAT=D12.2MC,
   TITLE='Line,Total',
   DESCRIPTION='Line Total', $
  DEFINE LINE_COGS/D12.2=QUANTITY*COST;,
   TITLE='Line,Cost Of,Goods Sold',
   DESCRIPTION='Line cost of goods sold', $
```

```
 DEFINE PLANTLNG/A11=DECODE PLANT (BOS 'Boston' DAL 'Dallas'
  LA 'Los Angeles' ORL 'Orlando' SEA 'Seattle' STL 'St Louis'
  ELSE 'n/a');
SEGNAME=INVSEG, SEGTYPE=DKU, PARENT=PINFO, CRFILE=CENTINV,
 CRKEY=PROD_NUM,   CRSEG=INVINFO,$
SEGNAME=STOSEG, SEGTYPE=DKU, PARENT=OINFO, CRFILE=CENTCOMP,
 CRKEY=STORE_CODE, CRSEG=COMPINFO,$
```

# CENTORD Structure Diagram



```
                    :PRODNAME    :
                    :QTY_IN_STOCK:
                    :PRICE       :
                    :            :
                    :............:
                     JOINED  CENTINV
```

# CENTQA Master File

```
FILE=CENTQA, SUFFIX=FOC, FDFC=19, FYRT=00
 SEGNAME=PROD_SEG, SEGTYPE=S1, $
  FIELD=PROD_NUM, ALIAS=PNUM, FORMAT=A4, INDEX=I,
   TITLE='Product,Number',
   DESCRIPTION='Product Number', $
 SEGNAME=PROB_SEG, PARENT=PROD_SEG, SEGTYPE=S1, $
  FIELD=PROBNUM, ALIAS=PROBNO, FORMAT=I5,
   TITLE='Problem,Number',
   DESCRIPTION='Problem Number',
   WITHIN=PLANT,$
  FIELD=PLANT, ALIAS=PLT, FORMAT=A3, INDEX=I,
   TITLE=Plant,
   DESCRIPTION=Plant,
   WITHIN=PROBLEM_LOCATION,$
  FIELD=PROBLEM_DATE, ALIAS=PDATE, FORMAT=YYMD,
   TITLE='Date,Problem,Reported',
   DESCRIPTION='Date Problem Was Reported', $
  FIELD=PROBLEM_CATEGORY, ALIAS=PROBCAT, FORMAT=A20, $
   TITLE='Problem,Category',
   DESCRIPTION='Problem Category',
   WITHIN=*Problem,$
  FIELD=PROBLEM_LOCATION, ALIAS=PROBLOC, FORMAT=A10,
   TITLE='Location,Problem,Occurred',
   DESCRIPTION='Location Where Problem Occurred',
   WITHIN=PROBLEM_CATEGORY,$
  DEFINE PROB_YEAR/YY=PROBLEM_DATE;,
   TITLE='Year,Problem,Occurred',
   DESCRIPTION='Year Problem Occurred',
   WITHIN=*Time Period,$
  DEFINE PROB_QUARTER/Q=PROBLEM_DATE;
   TITLE='Quarter,Problem,Occurred',
   DESCRIPTION='Quarter Problem Occurred',
   WITHIN=PROB_YEAR,$
  DEFINE PROB_MONTH/M=PROBLEM_DATE;
```

```
   TITLE='Month,Problem,Occurred',
   DESCRIPTION='Month Problem Occurred',
   WITHIN=PROB_QUARTER,$
  DEFINE PROBLEM_OCCUR/I5 WITH PROBNUM=1;,
   TITLE='Problem,Occurrence'
   DESCRIPTION='# of times a problem occurs',$
  DEFINE PLANTLNG/A11=DECODE PLANT (BOS 'Boston' DAL 'Dallas'
   LA 'Los Angeles' ORL 'Orlando' SEA 'Seattle' STL 'St Louis'
   ELSE 'n/a');$
 SEGNAME=INVSEG, SEGTYPE=DKU, PARENT=PROD_SEG, CRFILE=CENTINV,
  CRKEY=PROD_NUM, CRSEG=INVINFO,$
```

# CENTQA Structure Diagram

```
SECTION 01
       STRUCTURE OF FOCUS    FILE CENTQA   ON 05/15/03 AT 10.46.43

          PROD_SEG
  01      S1
 **************
 *PROD_NUM    **I
 *            **
 *            **
 *            **
 *            **
 ***************
  **************
        I
        +-----------------+
        I                 I
        I INVSEG          I PROB_SEG
  02    I KU        03    I S1
 ..............    **************
 :PROD_NUM    :K   *PROBNUM     **
 :PRODNAME    :    *PLANT       **I
 :QTY_IN_STOCK:    *PROBLEM_DATE**
 :PRICE       :    *PROBLEM_CAT>**
 :            :    *            **
 :............:    ***************
  JOINED  CENTINV   **************
```

# CENTGL Master File

```
FILE=CENTGL ,SUFFIX=FOC
 SEGNAME=ACCOUNTS, SEGTYPE=S1
  FIELDNAME=GL_ACCOUNT, ALIAS=GLACCT, FORMAT=A7,
   TITLE='Ledger,Account', FIELDTYPE=I, $
  FIELDNAME=GL_ACCOUNT_PARENT, ALIAS=GLPAR, FORMAT=A7,
   TITLE=Parent,
   PROPERTY=PARENT_OF, REFERENCE=GL_ACCOUNT, $
  FIELDNAME=GL_ACCOUNT_TYPE, ALIAS=GLTYPE, FORMAT=A1,
   TITLE=Type,$
  FIELDNAME=GL_ROLLUP_OP, ALIAS=GLROLL, FORMAT=A1,
   TITLE=Op, $
  FIELDNAME=GL_ACCOUNT_LEVEL, ALIAS=GLLEVEL, FORMAT=I3,
   TITLE=Lev, $
  FIELDNAME=GL_ACCOUNT_CAPTION, ALIAS=GLCAP, FORMAT=A30,
   TITLE=Caption,
   PROPERTY=CAPTION, REFERENCE=GL_ACCOUNT, $
  FIELDNAME=SYS_ACCOUNT, ALIAS=ALINE, FORMAT=A6,
   TITLE='System,Account,Line', MISSING=ON, $
```

# CENTGL Structure Diagram

```
SECTION 01
       STRUCTURE OF FOCUS    FILE CENTGL   ON 05/15/03 AT 15.18.48

          ACCOUNTS
  01      S1
 **************
 *GL_ACCOUNT  **I
 *GL_ACCOUNT_>**
 *GL_ACCOUNT_>**
 *GL_ROLLUP_OP**
 *            **
 ***************
  **************
```

# CENTSYSF Master File

```
FILE=CENTSYSF ,SUFFIX=FOC
 SEGNAME=RAWDATA ,SEGTYPE=S2
  FIELDNAME = SYS_ACCOUNT ,  ,A6    , FIELDTYPE=I,
   TITLE='System,Account,Line', $
  FIELDNAME = PERIOD      ,  ,YYM   , FIELDTYPE=I,$
  FIELDNAME = NAT_AMOUNT  ,  ,D10.0 , TITLE='Month,Actual', $
  FIELDNAME = NAT_BUDGET  ,  ,D10.0 , TITLE='Month,Budget', $
  FIELDNAME = NAT_YTDAMT  ,  ,D12.0 , TITLE='YTD,Actual',   $
  FIELDNAME = NAT_YTDBUD  ,  ,D12.0 , TITLE='YTD,Budget',   $
```

# CENTSYSF Structure Diagram

```
SECTION 01
       STRUCTURE OF FOCUS    FILE CENTSYSF   ON 05/15/03 AT 15.19.27

          RAWDATA
  01      S2
 **************
 *SYS_ACCOUNT **I
 *PERIOD      **I
 *NAT_AMOUNT  **
 *NAT_BUDGET  **
 *            **
 ***************
  **************
```

# CENTSTMT Master File

```
FILE=CENTSTMT, SUFFIX=FOC
 SEGNAME=ACCOUNTS, SEGTYPE=S1
  FIELD=GL_ACCOUNT, ALIAS=GLACCT,  FORMAT=A7,
   TITLE='Ledger,Account', FIELDTYPE=I, $
  FIELD=GL_ACCOUNT_PARENT, ALIAS=GLPAR, FORMAT=A7,
   TITLE=Parent,
   PROPERTY=PARENT_OF, REFERENCE=GL_ACCOUNT, $
  FIELD=GL_ACCOUNT_TYPE, ALIAS=GLTYPE, FORMAT=A1,
```

```
   TITLE=Type,$
  FIELD=GL_ROLLUP_OP, ALIAS=GLROLL, FORMAT=A1,
   TITLE=Op, $
  FIELD=GL_ACCOUNT_LEVEL, ALIAS=GLLEVEL, FORMAT=I3,
   TITLE=Lev, $
  FIELD=GL_ACCOUNT_CAPTION, ALIAS=GLCAP, FORMAT=A30,
   TITLE=Caption,
   PROPERTY=CAPTION, REFERENCE=GL_ACCOUNT, $
 SEGNAME=CONSOL, SEGTYPE=S1, PARENT=ACCOUNTS, $
  FIELD=PERIOD, ALIAS=MONTH, FORMAT=YYM, $
  FIELD=ACTUAL_AMT, ALIAS=AA, FORMAT=D10.0, MISSING=ON,
   TITLE='Actual', $
  FIELD=BUDGET_AMT, ALIAS=BA, FORMAT=D10.0, MISSING=ON,
   TITLE='Budget', $
  FIELD=ACTUAL_YTD, ALIAS=AYTD, FORMAT=D12.0, MISSING=ON,
   TITLE='YTD,Actual', $
  FIELD=BUDGET_YTD, ALIAS=BYTD, FORMAT=D12.0, MISSING=ON,
   TITLE='YTD,Budget', $
```

# CENTSTMT Structure Diagram

```
SECTION 01
     STRUCTURE OF FOCUS    FILE CENTSTMT ON 05/15/03 AT 14.45.44

          ACCOUNTS
  01      S1
 **************
 *GL_ACCOUNT  **I
 *GL_ACCOUNT_>**
 *GL_ACCOUNT_>**
 *GL_ROLLUP_OP**
 *            **
 ***************
  **************
        I
        I
        I
        I CONSOL
  02    I S1
 **************
 *PERIOD      **
 *ACTUAL_AMT  **
 *BUDGET_AMT  **
```

```
 *ACTUAL_YTD  **
 *            **
 ***************
  **************
```

# CENTGLL Master File

```
FILE=CENTGLL       ,SUFFIX=FOC
SEGNAME=ACCOUNTS   ,SEGTYPE=S01
FIELDNAME=GL_ACCOUNT,           ALIAS=GLACCT,  FORMAT=A7,
            TITLE='Ledger,Account', FIELDTYPE=I, $
FIELDNAME=GL_ACCOUNT_PARENT,    ALIAS=GLPAR,   FORMAT=A7,
            TITLE=Parent,
            PROPERTY=PARENT_OF, REFERENCE=GL_ACCOUNT, $
FIELDNAME=GL_ACCOUNT_TYPE,      ALIAS=GLTYPE,  FORMAT=A1,
            TITLE=Type,$
FIELDNAME=GL_ROLLUP_OP,         ALIAS=GLROLL,  FORMAT=A1,
            TITLE=Op, $
FIELDNAME=GL_ACCOUNT_LEVEL,     ALIAS=GLLEVEL, FORMAT=I3,
            TITLE=Lev, $
FIELDNAME=GL_ACCOUNT_CAPTION,   ALIAS=GLCAP,   FORMAT=A30,
            TITLE=Caption,
            PROPERTY=CAPTION, REFERENCE=GL_ACCOUNT, $
FIELDNAME=SYS_ACCOUNT,          ALIAS=ALINE,   FORMAT=A6,
            TITLE='System,Account,Line', MISSING=ON, $
```

# CENTGLL Structure Diagram

```
SECTION 01
       STRUCTURE OF FOCUS    FILE CENTGLL ON 05/15/03 AT 14.45.44

          ACCOUNTS
  01      S1
 **************
 *GL_ACCOUNT  **I
 *GL_ACCOUNT_>**
 *GL_ACCOUNT_>**
 *GL_ROLLUP_OP**
 *            **
```

```
***************
 ***************
```

# Error Messages

To see the text or explanation for any error message, you can display it or find it in an errors file. All of the FOCUS error messages are stored in eight system ERRORS files.

- For UNIX, Windows, and Open/VMS, the extension is .err.
- For z/OS, the ddname is ERRORS.

# Displaying Messages

To display the text and explanation for any message, issue the following query command in a stored procedure :

```
? n
```

where:

**n**

Is the message number.

The message number and text appear, along with a detailed explanation of the message (if one exists). For example, issuing the following command:

```
? 210
```

displays the following:

```
(FOC210)        THE DATA VALUE HAS A FORMAT ERROR:
An alphabetic character has been found where all numerical digits are
required.
```

# Table Syntax Summary and Limits

This appendix summarizes WebFOCUS reporting commands and options.

## TABLE Syntax Summary

The syntax of a TABLE request is:

```
DEFINE FILE filename    CLEAR|ADD
tempfield  [/format] [{DEFCENT|DFC} {cc|19} {YRTHRESH|YRT} {[-]yy|0}]
    [MISSING {ON|OFF} [NEEDS] {SOME|ALL} [DATA]]
    [(GEOGRAPHIC_ROLE = georole)] [WITH realfield]
    [TITLE 'line1[,line2 ...']]
  [DESCRIPTION 'description'] = expression;
tempfield  [/format]    REDEFINES qualifier.fieldname = expression;
.
.
.
END
TABLE  FILE  filename
HEADING  [CENTER]
"text"
{display_command}   [SEG.] field   [/R|/L|/C]   [/format]
{display_command}   [prefixop.] [field]  [/R|/L|/C]  [/format]
  [NOPRINT|AS 'title1,...,title5']   [AND|OVER]   [obj2...obj1024]
      [WITHIN field]   [IN [+]n]
COMPUTE field  [/format] [(GEOGRAPHIC_ROLE = georole)] =
        expression; [AS 'title,...,title5']  [IN [+]n]
[AND]  ROW-TOTAL      [/R|/L|/C]    [/format][AS 'name']
[AND]  COLUMN-TOTAL   [/R|/L|/C]    [AS 'name']
ACROSS  [HIGHEST]  sortfieldn       [IN-GROUPS-OF qty]
    [NOPRINT|  AS 'title1,...,title5']
BY  [HIGHEST]  sortfieldn           [IN-GROUPS-OF qty]
    [NOPRINT|  AS 'title1,...,title5']
BY  [HIGHEST|LOWEST{n}]  TOTAL  [prefix_operator]  {field|code_value}
RANKED [AS 'name'] BY {TOP|HIGHEST|LOWEST} [n] field
       [PLUS OTHERS AS 'othertext']
      [IN-GROUPS-OF qty [TILES [TOP m]] [AS 'heading']]
      [NOPRINT|AS 'title1,...,title5']
```

```
{BY|ACROSS} sortfield IN-RANGES-OF value [TOP limit]
ON   sfld  option1  [AND]  option2   [WHEN expression;...]
ON   sfld  RECAP   fld1  [/fmt] = FORECAST (fld2, intvl, npredct,
  '{MOVAVE|EXPAVE}',npnt);
```

```
ON sfld RECAP fld1[/fmt] = FORECAST(fld2, interval, npredict,
'DOUBLEXP',
   npoint1, npoint2);
```

```
ON sfld RECAP fld1[/fmt] = FORECAST(fld2, interval, npredict,
'SEASONAL',
   nperiod, npoint1, npoint2, npoint3);
```

```
ON   sfld  RECAP   fld1  [/fmt] = FORECAST (fld2, intvl, npredct,
'REGRESS');
```

```
ON {sortfield|TABLE} RECAP y[/fmt] = REGRESS(n, x1, [x2, [x3,]] z);
ON   sfld  RECAP   fld1  [/fmt] = FORECAST (infield, interval, npredict,
  'DOUBLEXP',npoint, npoint2);
ON  sfld   RECAP   fld1  [/fmt] = FORECAST (infield, interval, npredict,
  'SEASONAL', nperiod, npoint, npoint2, npoint3);{BY|ON} fieldname
SUBHEAD
  [NEWPAGE]
"text"
```

```
{BY|ON} fieldname SUBFOOT [WITHIN] [MULTILINES][NEWPAGE]
"text" [<prefop.fieldname ... ]"        [WHEN expression;]
```

```
WHERE   [TOTAL]  expression
WHERE   {RECORDLIMIT|READLIMIT}  EQ  n
IF      [TOTAL]  field relation  value  [OR value...]
WHERE_GROUPED expression
ON TABLE  SET parameter value
ON TABLE  HOLD [VIA program][AS name] [FORMAT format] [DATASET dataset]
              [MISSING {ON|OFF}] [PERSISTENCE {STAGE|PERMANENT}]
ON TABLE  {PCHOLD|SAVE|SAVB} [AS name] [FORMAT format]  [MISSING
{ON|OFF}]
ON TABLE  NOTOTAL
ON TABLE  COLUMN-TOTAL [/R|/L|/C]  [AS 'name']  fieldname
ON TABLE  {ROW-TOTAL|ACROSS-TOTAL}[/R|/L|/C][format] [AS 'name'] fldname
{BY|ON}  sfld [AS 'text1']   {SUBTOTAL|SUB-TOTAL|SUMMARIZE|RECOMPUTE}
```

```
  [MULTILINES] [pref. ] [field1 [pref. ] field2 ...] [AS 'text2']
  [WHEN expression;]
{ACROSS|ON}  sfld [AS 'text1'] {SUBTOTAL|SUB-TOTAL|SUMMARIZE|RECOMPUTE}
   [AS 'text2']  [COLUMNS c1 [AND c2 ...]]
ON  TABLE {SUBTOTAL|SUB-TOTAL|SUMMARIZE|RECOMPUTE}
  [pref. ] [field1 [pref. ] field2 ...] [AS 'text2']
FOOTING  [CENTER]  [BOTTOM]
"text"
MORE
FILE  file2
   [IF field relation value [OR value...]|WHERE expression]
{END|RUN|QUIT}
```

# Hierarchical Reporting Syntax Summary

```
SUM [FROLL.]measure_field ...
BY hierarchy_field [HIERARCHY [WHEN expression_using_hierarchy_fields;]
  [SHOW [TOP|UP n] [TO {BOTTOM|DOWN m}] [byoption [WHEN condition] ...]
]
[WHERE expression_using_dimension_data]
[ON hierarchy_field HIERARCHY [WHEN expression_using_hierarchy_fields;]
  [SHOW [TOP|UP n] [TO BOTTOM|DOWN m] [byoption [WHEN condition] ...]]
```

# TABLEF Syntax Summary

The syntax of a TABLEF request is:

```
TABLEF FILE filename
HEADING [CENTER]
"text"
```

```
{display_command}  [SEG.]field  [/R|/L|/C]  [/format]
{display_command}  [prefixop.][field] [/R|/L|/C] [/format]
    [NOPRINT|AS 'title1,...,title5']    [AND|OVER]    [obj2...obj495]
    [IN n]
```

```
COMPUTE field [/format]=expression; [AS 'title1,...title5']
[AND] ROW-TOTAL [AND] COLUMN-TOTAL
```

```
BY [HIGHEST] keyfieldn [NOPRINT]
```

```
ON keyfield option1 [AND] option2...
```

```
WHERE [TOTAL] expression
```

```
IF [TOTAL] field relation value [OR value...]
```

```
ON TABLE SET parameter value
```

```
ON TABLE HOLD [VIA program] [AS name] [FORMAT format]  [MISSING
{ON|OFF}]
ON TABLE PCHOLD             [AS name] [FORMAT format]  [MISSING
{ON|OFF}]
ON TABLE SAVE               [AS name] [FORMAT format]  [MISSING
{ON|OFF}]
ON TABLE SAVB               [AS name] [FORMAT format]  [MISSING
{ON|OFF}]
```

```
ON TABLE  NOTOTAL
ON TABLE  COLUMN-TOTAL fieldname
ON TABLE  ROW-TOTAL fieldname
```

```
 FOOTING [CENTER] [BOTTOM]
 "text"

{END|RUN|QUIT}
```

**Note:**

- Prefix operators for TABLEF can be: AVE., ASQ., MAX., MIN., FST., LST., CNT., or SUM.
- TABLEF requests cannot use:
    - Prefix operators DST., PCT., PCT.CNT., RPCT., and TOT.

- Variables TABPAGENO, TABLASTPAGE, and BYLASTPAGE.
- SET SQUEEZE
- Border styling.
- ACROSS phrases.
- WITHIN phrases.
- RANKED BY phrases.
- NOSPLIT.
- Requests with multiple display commands (multi-verb requests).

# MATCH Syntax Summary

The syntax of a MATCH request is:

```
MATCH FILE filename    (the OLD file) report request
BY field1 [AS sortfield]
MORE
FILE file3
subrequest
RUN
.
.
.
FILE filename2         (the NEW file) report request
BY field1 [AS sortfield1]
.
.
.
[AFTER MATCH HOLD [AS filename]  matchtype]
MORE
FILE file4
subrequest
END
```

where:

**matchtype**

Can be any of the following:

```
OLD
```

```
NEW
```

```
OLD-NOT-NEW
```

```
NEW-NOT-OLD
```

```
OLD-AND-NEW
```

```
OLD-OR-NEW
```

```
OLD-NOR-NEW
```

# FOR Syntax Summary

The formal syntax of the FOR statement is:

```
FOR fieldname [NOPRINT]row [OVER row]
.
.
.
.
END
```

where:

**row**

Can be any of the following:

```
tag [OR tag...][options]
[fieldname]
```

```
DATA n,[n,....] $
DATA PICKUP [FROM filename] tag [LABEL label] [AS 'text']
RECAP name[/format]=expression;
BAR [AS 'character'] [OVER]
"text"
parentvalue {GET|WITH} CHILD[REN] [{n|ALL}] [ADD [m|ALL]]
   [AS {CAPTION|'text'}] [LABEL label]parentvalue ADD [{m|ALL}] [AS
{CAPTION|'text'}] [LABEL label]
PAGE-BREAK [OVER]
```

**tag**

Can be any of the following:

```
value [OR value...] value TO value
```

**options**

Can be any of the following:

```
AS 'text'
[INDENT m]
NOPRINT
[LABEL label]
WHEN EXISTS
[POST [TO filename]]
```

# TABLE Limits

The following limits apply to TABLE requests:

- There is no limit to the number of verb objects in a TABLE request. However, an error can occur if the report output format has a limit to the number of columns supported, the operating system has a maximum record length that cannot fit all of the columns, or the amount of memory needed to store the output is not available.
- Number of verb objects referenced in a MATCH request: 495

- Number of columns of report output: 1024
- Total length of all fields in the request or in a single Master File: 256K
- Total number of sort fields (combined BY and ACROSS): 128

  An internal sort will be generated automatically under some circumstances, and these have to be counted in the total. HOLD FORMAT FOCUS/XFOCUS will add FOCLIST as a BY field in order to ensure uniqueness.
- Maximum size of the output record: 256K (FORMAT/USAGE)
- Maximum size of the output file: FOCUS partition 2GB, XFOCUS 32GB
- Maximum size of internal expression representation of a single DEFINE, COMPUTE, -SET, or WHERE phrase: 64K

  The internal representation is generated in polish postfix notation, which is significantly smaller than the entered expression. In addition, the constants in expressions (as in DECODE or IF…THEN..ELSE conditions) are stored outside of the expression representations, reducing the space requirement for the expression representation itself.
- Maximum number of segments in a structure or file: 512.

  This means that a total of 511 JOINs can be in effect at any one given time.

  **Note:** FOCUS data sources are limited to 64 segments.

  The maximum number of field pairs in a join is 128.
- Maximum size of Alphanumeric fields: 4K characters ( in UTF, this means 12K bytes)
- Maximum number of display commands in a TABLE request: 64.

# Referring to Fields in a Report Request

When creating a report, you refer to fields in several parts of the request. For example, in display commands (PRINT, SUM), in sort phrases (BY, ACROSS), and in selection criteria (WHERE, WHERE TOTAL, IF).

Several methods are available for referring to a field. You can:

- Refer to individual fields by using the alias specified in the Master File, referring to the name defined in the Master File, or using the shortest unique truncation of the field name or alias. For details, see Referring to an Individual Field.
- Refer to fields using qualified field names. For details, see Referring to Fields Using Qualified Field Names.
- Refer to all fields in a segment using only one field name. For details, see Referring to All of the Fields in a Segment.

You can also view a list of all the fields that are included in the currently active data source, or a specified Master File. For details, see the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

# Referring to an Individual Field

You can refer to an individual field in any one of the following ways:

- Using the field name defined in the Master File.
- Using the alias (the field name synonym) defined in the Master File.
- Using the shortest unique truncation of the field name or the alias. When a truncation is used, it must be unique. If it is not unique, an error message is displayed.
- Adding the letter S to the end of a field name defined in the Master File.

# Referring to an Individual Field

In the following requests, DEPARTMENT is the complete field name, DPT is the alias, and DEP is a unique truncation of DEPARTMENT. All these examples produce the same output.

```
1. TABLE FILE EMPLOYEE
   PRINT DEPARTMENT
   END
```

```
2. TABLE FILE EMPLOYEE
   PRINT DPT
   END
```

```
3. TABLE FILE EMPLOYEE
   PRINT DEP
   END
```

**Note:** If you use a truncation that is not unique, the following message will appear:

```
(FOC016) THE TRUNCATED FIELDNAME IS NOT UNIQUE : D
```

# Referring to Fields Using Qualified Field Names

Field names and aliases have a maximum length of 512 characters. They can also be qualified by prepending up to two qualifiers and qualification characters. However, text fields and indexed field names in Master Files for FOCUS data sources are limited to 12 characters, although the aliases for text and indexed fields can have the same length as general field names. Field names are always displayed as column titles in reports, unless a TITLE attribute or an AS phrase is used to provide an alternative name. For related information, see Using Headings, Footings, Titles, and Labels.

You may use the file name, segment name, or both as a qualifier for a specified field.

# Activate Long and Qualified Field Names

The SET FIELDNAME command enables you to activate long (up to 512 characters) and qualified field names.

```
SET FIELDNAME = fieldname
```

where:

**fieldname**

Specifies the activation status of long and qualified field names. Valid identifiers include:

NEW specifies that 512-character and qualified field names are supported. NEW is the default value.

NOTRUNC supports the 512-character maximum. It does not permit unique truncations of field names.

OLD is no longer operational and will function as NEW.

# Using a Qualified Field Name to Refer to a Field

```
EMPLOYEE.EMPINFO.EMP_ID
```

Is the fully-qualified name of the field EMP_ID in the EMPINFO segment of the EMPLOYEE file.

# Usage Notes for Long and Qualified Field Names

? SET displays the current value of FIELDNAME. In addition, a Dialogue Manager variable called &FOCFIELDNAME is available. &FOCFIELDNAME may have a value of NEW or NOTRUNC.

For additional information about using qualified field names in report requests, see the *Describing Data With ibi™ WebFOCUS® Language* manual.

# Referring to All of the Fields in a Segment

If you want to generate a report that displays all of a segment fields, you can refer to the complete segment without specifying every field. You only need to specify one field in the segment (any field will do) prefixed with the SEG. operator.

# Referring to All Fields in a Segment

The segment PRODS01in the GGPRODS Master File contains the PRODUCT_ID, PRODUCT_DESCRIPTION, VENDOR_CODE, VENDOR_NAME, PACKAGE_TYPE, SIZE, and UNIT_PRICE fields.

```
SEGMENT=PRODS01
FIELDNAME = PRODUCT_ID
FIELDNAME = PRODUCT_DESCRIPTION
FIELDNAME = VENDOR_CODE
FIELDNAME = VENDOR_NAME
FIELDNAME = PACKAGE_TYPE
FIELDNAME = SIZE
FIELDNAME = UNIT_PRICE
```

To write a report that includes data from every field in the segment, you can issue either of the following requests:

```
1. TABLE FILE GGPRODS
   PRINT PRODUCT_ID AND PRODUCT_DESCRIPTION AND VENDOR_CODE AND
    VENDOR_NAME AND PACKAGE_TYPE AND SIZE AND UNIT_PRICE
   END
```

```
2. TABLE FILE GGPRODS
   PRINT SEG.PRODUCT_ID
   END
```

# Displaying a List of Field Names

If you want to see a list of all the fields that are included in the currently active data source, you can issue the ?F field name query.

This is useful if you need to refer to a list of field names, or need to check the spelling of a field name, without exiting from the request process. It will also show you the entire 66-character field name.

You can issue the ?F query from the Editor in WebFOCUS.

More information on all of the query (?) commands appears in the *ibi™ WebFOCUS® Developing Reporting Applications* manual.

# Listing Field Names, Aliases, and Format Information

The ?FF query displays field name, alias, and format information for a specified Master File, grouped by segment.

You can issue the ?FF query from the Editor in WebFOCUS.

If your software supports MODIFY or FSCAN, you can also issue ?FF from these facilities.

**Note:**

- If duplicate field names match a specified string, the display includes the field name qualified by the segment name with both ?F and ?FF.
- Field names longer than 31 characters are truncated in the display, and a caret (>) is appended in the 32nd position to indicate that the field name is longer than the display.

# ibi Documentation and Support Services

For information about this product, you can read the documentation, contact Support, and join Community.

## How to Access ibi Documentation

Documentation for ibi products is available on the Product Documentation website, mainly in HTML and PDF formats.

The Product Documentation website is updated frequently and is more current than any other documentation included with the product.

## Product-Specific Documentation

The documentation for this product is available on the ibi™ WebFOCUS® Documentation page.

## How to Contact Support for ibi Products

You can contact the Support team in the following ways:

- To access the Support Knowledge Base and getting personalized content about products you are interested in, visit our product Support website.
- To create a Support case, you must have a valid maintenance or support contract with a Cloud Software Group entity. You also need a username and password to log in to the product Support website. If you do not have a username, you can request one by clicking **Register** on the website.

## How to Join ibi Community

ibi Community is the official channel for ibi customers, partners, and employee subject matter experts to share and access their collective experience. ibi Community offers access to Q&A forums, product wikis, and best practices. It also offers access to extensions, adapters, solution accelerators, and tools that extend and enable customers to gain full value from ibi products. For a free registration, go to ibi Community.

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