Information Builders.

WebFOCUS

WebFOCUS Creating Reports With Graphical Tools
Version 5 Release 2

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Preface

This documentation describes how to use Developer Studio 5.2 graphical tools to create and style tabular and financial reports, generate a wide variety of graphs, and perform OLAP analysis. It also describes the end-user mobile environment. It is intended for administrators and developers.

How This Manual Is Organized

This manual includes the following chapters:

Chapter/Appendix		Contents
1	*Creating Reports Overview*	Describes the tools available for creating and formatting reports.
2	*Creating Reports With the Report Assistant*	Describes how to quickly create a report with the Report Assistant.
3	*Creating Reports With the Report Painter*	Describes how to create and style complex reports with the Report Painter.
4	*Creating a Graph With Graph Assistant*	Describes how to transform data into an effective graph that you can customize to suit your needs.
5	*Viewing and Printing Reports and Graphs*	Describes how to view reports with your Web browser and how to print reports.
6	*Creating Temporary Fields*	Describes how to use the DEFINE and COMPUTE commands to create temporary fields.
7	*Saving and Reusing Report Output*	Describes how to save report data to files for reuse in different formats.
8	*Joining Data Sources*	Describes how to join two or more related data sources to create a larger integrated data structure from which you can report.
9	*Visualizing Trends in Reports*	Describes how to make your HTML reports more powerful by inserting visual representations of selected data directly into the report output.
10	*Creating Reports With Financial Report Painter*	Describes how to create a report to accommodate the special needs associated with creating, calculating, and presenting financially oriented data.

Chapter/Appendix		Contents
11	*Using OLAP Analysis*	Describes how to use OLAP to view and quickly interact with data in order to make critical business decisions.
12	*Manipulating Data in an OLAP-enabled Report*	Describes how to gain more insight from your report by dynamically manipulating the report data.
13	*Creating Knowledge Map Reports*	Describes how to create and maintain Two-Way Email templates.
14	*Customizing Graphs With the Graph Editor*	Describes how to modify a graph without having to edit the underlying WebFOCUS code.
15	*Using Two-Way Email*	Describes how to request and receive WebFOCUS reports through e-mail using a handheld device, laptop, or desktop computer.
16	*Using PDA Sync*	Describes how to receive WebFOCUS reports on your PDA.
A	*Assigning Field Formats*	Describes how to assign a field a format based on the values the field will hold.
B	*Writing Expressions*	Describes how to write expressions that can be used in WebFOCUS commands.

Documentation Conventions

The following conventions apply throughout this manual:

Convention	Description
`THIS TYPEFACE` or `this typeface`	Denotes syntax that you must enter exactly as shown.
`this typeface`	Represents a placeholder (or variable) in syntax for a value that you or the system must supply.
`underscore`	Indicates a default setting.
this typeface	Represents a placeholder (or variable) in a text paragraph, a cross-reference, or an important term. It may also Indicate a button, menu item, or dialog box option you can click or select.

Convention	Description
this typeface	Highlights a file name or command in a text paragraph that must be lowercase.
Key + Key	Indicates keys that you must press simultaneously.
`{ }`	Indicates two or three choices; type one of them, not the braces.
`[ ]`	Indicates a group of optional parameters. None are required, but you may select one of them. Type only the parameter in the brackets, not the brackets.
`|`	Separates mutually exclusive choices in syntax. Type one of them, not the symbol.
`. . .`	Indicates that you can enter a parameter multiple times. Type only the parameter, not the ellipsis points (…).
`.` `.` `.`	Indicates that there are (or could be) intervening or additional commands.

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Information You Should Have

WebFOCUS:

To help our consultants answer your questions most effectively, please provide the following information when you call:

- Your six-digit site code (*xxxx.xx*).
- Your WebFOCUS configuration:
  - The front-end you are using, including vendor and release.
  - The communications protocol (for example, TCP/IP or HLLAPI), including vendor and release.
  - The software release.
  - The server you are accessing, including release (for example, 4.2.1).
- The stored procedure (preferably with line numbers) or FOCUS commands being used in server access.
- The name of the Master File and Access File.
- The exact nature of the problem:
  - Are the results or the format incorrect? Are the text or calculations missing or misplaced?
  - The error message and return code, if applicable.
  - Is this related to any other problem?
- Has the procedure or query ever worked in its present form? Has it been changed recently? How often does the problem occur?
- What release of the operating system are you using? Has it, WebFOCUS, your security system, communications protocol, or front-end software changed?

- Is this problem reproducible? If so, how?
- Have you tried to reproduce your problem in the simplest form possible? For example, if you are having problems joining two data sources, have you tried executing a query containing the code to access a single data source?
- Do you have a trace file?
- How is the problem affecting your business? Is it halting development or production? Do you just have questions about functionality or documentation?
- How is the problem affecting your business? Is it halting development or production? Do you just have questions about functionality or documentation?

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CHAPTER 1

Creating Reports Overview

Topics:

- Requirements for Creating a Report
- Report Types
- Reporting Tools
- Developing Your Report Request
- Customizing a Report

Developer Studio 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.

Developer Studio 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 graphs even if you don't know HTML or WebFOCUS reporting language commands and syntax.

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. See the *Developing Reporting Applications* manual for information on data source locations.

  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 comma-delimited format.
  - Multi-dimensional data sources, such as Fusion and Essbase.
  - XML data sources.

  For a complete list, see your *Describing Data With Graphical Tools* 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. See the *Describing Data With Graphical Tools* manual for information on Master Files and Access Files.

  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 are displayed.

Report Types

With Developer Studio you can create the following basic report types using graphical tools:

- **Tabular reports,** which display 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. For details see Chapter 2, *Creating Reports With the Report Assistant* and Chapter 3, *Creating Reports With the Report Painter*. You can display these reports in formats such as HTML, Excel, and PDF.
- **Financial reports,** which are 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 FML (Financial Modeling Language) Painter, a spreadsheet-like tool that 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.

  See Chapter 2, *Creating Reports With Financial Report Painter,* for details about the graphical Financial Report Painter.
- **Free-form reports,** which present detailed information about a single record in a form-like context. 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.

  These reports are often letters or forms.
- **Graphs,** which can present the same kinds of information as tabular reports, but in a wide variety of two- and three-dimensional graph types. You can create and customize graphs using the Graph Assistant and the Graph Editor. For details see Chapter 19, *Creating a Graph* and Chapter 14, *Customizing Graphs With the Graph Editor*.

- **OLAP reports**, which allows users drill down or roll up data hierarchies, pivot fields from columns to rows (or vice versa), and slice-and-dice information by filtering or querying data sources based on specified criteria or thresholds.

Reporting Tools

Developer Studio provides powerful reporting tools for analyzing and formatting information, including two graphical tools for building report requests:

- The Report Painter to create complex styled reports.
- The Report Assistant to create simple queries and reports.

For details see Chapter 2, *Creating Reports With the Report Assistant* and Chapter 3, *Creating Reports With the Report Painter*.

The graphical reporting tools are integrated with two language-based tools, which can be used by power reporters, analytical reporters, administrators, and developers:

- The Text editor for viewing the code generated by the graphical tools and for creating procedures and other types of application files. The Text editor can be accessed from the graphical tools and the graphical tools can be launched directly from the Text editor. For details, see *Editing Application Components as Text* under *Getting Started* in online help.
- The Command Console for issuing commands for monitoring messages, and for debugging running procedures. For details, see the *Developing Reporting Applications* manual.

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; that is, 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.

The following are the most frequently used options for structuring a report request. (Except where otherwise noted see Chapter 2, *Creating Reports With the Report Assistant* and Chapter 3, *Creating Reports With the Report Painter* for details about these and many other reporting features.)

- **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 a column's information. Developer Studio displays the sort field—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 are displayed when their values change. You can also choose not to display sort fields.

  You can sort information vertically, down a column, 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.** There are two aspects of a successful report: 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 Chapter 5, *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 from in a single request. For details, see Chapter 8, *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 Chapter 7, *Saving and Reusing 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 report request can use a Master File that is stored in the application's directory or in the WebFOCUS Reporting Server's APP PATH or baseapp directory.

Procedure How to Start a Report Request

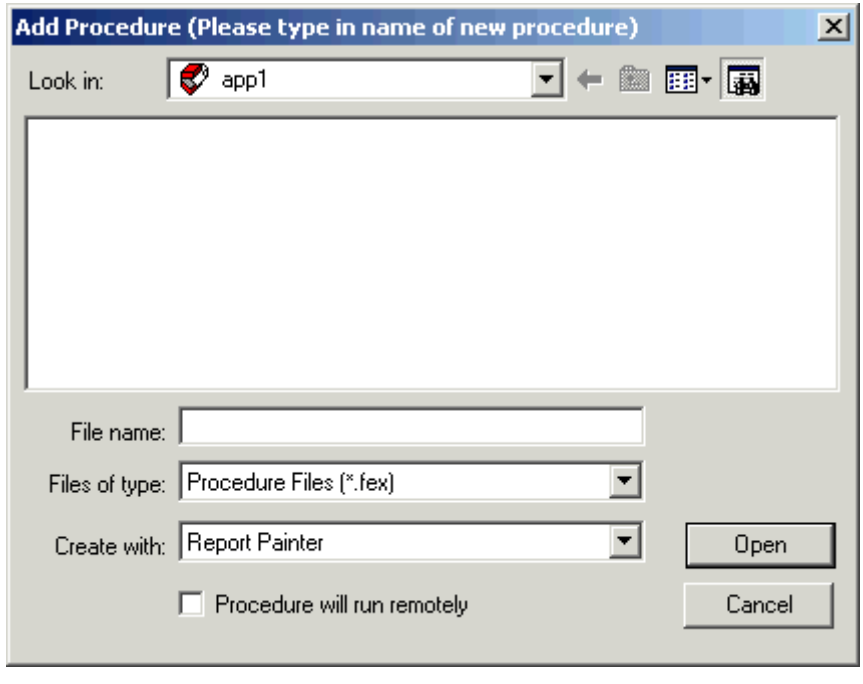
1. Create a new procedure:

- With the Procedures folder highlighted, select *New* from the File menu.

  or

- Right-click the Procedures folder and select *New* from the pop-up menu, then select *Procedure*.

The Add Procedure dialog box opens:



2. Enter a name for the new procedure in the File name field.

3. Select the tool you want to use from the Create with drop-down list. The options are:

Report Painter allows you to create complex styled reports.

Report Layout Painter allows you to create a procedure and an HTML page in a single process.

Procedure Viewer opens the Component Connector toolbox.

Text Editor allows you to create a procedure with code.

Compound Document Tool allows you to include multiple requests into a single procedure.

4. Optionally, select *Procedure will run remotely* to flag the procedure to run on a remote server.

5. Click *Open*.

- If you selected *Report Painter*, *Report Layout Painter*, *Compound Document Tool*, or *Text Editor*, the selected tool opens.
- If you select *Procedure Viewer*, the Component Connector toolbox opens. Do the following:

a. Click and hold a component connector (yellow diamond) at the point where you want to include the report in the procedure, then click the *Report* button on the component connector toolbar.

The Open dialog box opens.

b. Select the Master File you want to report against.

c. Select *Open Report Painter* or *Open Report Assistant*, and click *Open*.

The tool you selected opens.

Creating a Report Example

The example in this topic is a simple report request that illustrates some of the basic functions of Developer Studio. However, there are many more functions not shown here that you can find information on throughout this documentation.

Example Creating a Simple Report

The following annotated example illustrates some of the basic functions of Developer Studio. The numbered explanation below corresponds with the code in this request. This request can be generated using Developer Studio graphical tools, or 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 above 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.

Saving a Report

When you exit a reporting tool, you are prompted to save the report you have created. See Chapter 3, *Creating Reports With the Report Painter* for additional save options available in that tool.

When you save a procedure created in the Report Painter or the Component Connector toolbox, the entire procedure is saved; not only the report component.

Procedure How to Save a Report

Close the reporting tool and choose *Yes* in response to the question: Do you want to update the FOCEXEC?

or

Select *Save* from the File menu. Your report is saved as a component in the procedure in which it was created.

If you add other components to a procedure or edit the report component, you will be prompted to update the FOCEXEC (FOCUS procedure). Click *Yes* to save your changes.

Customizing a Report

There are two aspects of a successful report: 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 be displayed, 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, change column titles with the AS phrase, create headings and footings for different levels of the report—including each sort group, each page, and the entire report. For details, see Chapter 3, *Creating Reports With the Report Painter*.
- Change the format of a field and the justification of a column title. For details, see Chapter 3, *Creating Reports With the Report Painter*.
- Determine the width of a report column. For details, see Chapter 3, *Creating Reports With the Report Painter*.
- Dynamically control the display of subtotals, headings, and footings based on conditions you define. For details, see Chapter 3, *Creating Reports With the Report Painter*.
- Highlight a group of related information and separate it from other groups by inserting blank lines or dashes between each group. For details, see Chapter 3, *Creating Reports With the Report Painter*.
- Emphasize data using color to highlight certain values in your report based on conditions you define. For details, see Chapter 9, *Visualizing Trends in Reports*.
- Format your report using external cascading Style Sheets. For details, see Chapter 3, *Creating Reports With the Report Painter*.
- 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 Chapter 3, *Creating Reports With the Report Painter*.

CHAPTER 2

Creating Reports With the Report Assistant

Topics:

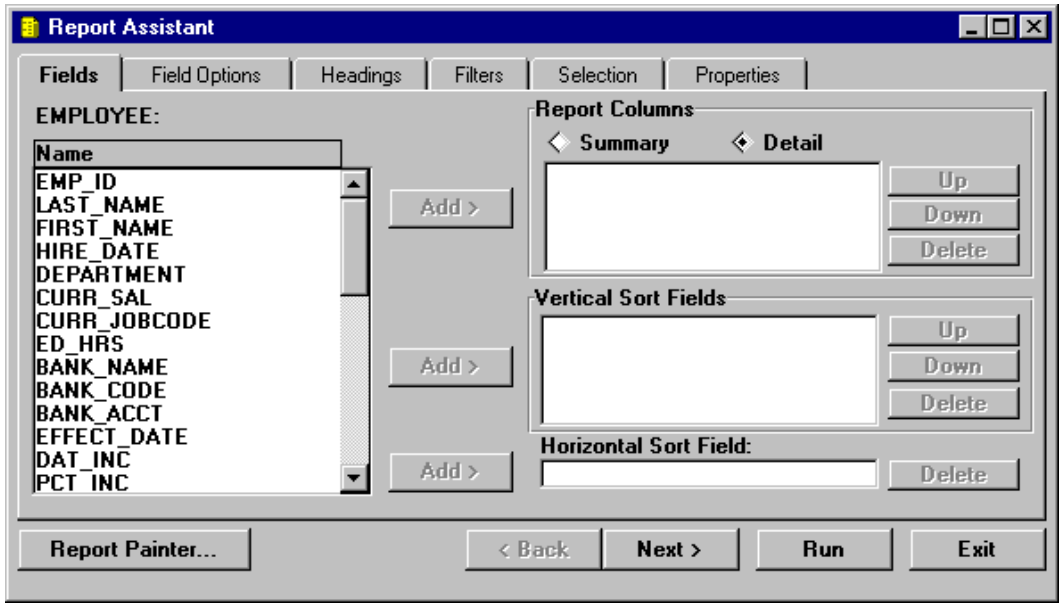
- Fields Tab (Report Assistant)
- Field Options Tab (Report Assistant)
- Headings Tab (Report Assistant)
- Filters Tab (Report Assistant)
- Selection Tab (Report Assistant)
- Properties Tab (Report Assistant)
- Running and Saving Reports From the Report Assistant
- Sample Sales Report

The Report Assistant enables you to quickly create a report in which you can sort your data, include record selection criteria, add headings, footings, subtotals, page-breaks, apply a style template and select the display format. You can also develop the report further using the Report Painter. For details, see Chapter 3, *Creating Reports With the Report Painter*.

The Report Assistant window is divided into several sections or tabs, each containing a set of options for changing the properties of the report. The tabs across the top of the window are Fields, Field Options, Headings, Filters, Selection, and Properties. Each tab calls up a window in which you can build one aspect of a report request.

Fields Tab (Report Assistant)

The Report Assistant opens at the Fields tab, where you add fields (columns) to a report, select a detailed or summarized display of data, and sort data horizontally and vertically.



The Fields tab in Report Assistant has the following fields/options:

Field window

Displays a list of field names from the selected data source.

Report Columns

Determines whether a report shows detail or summary information for the listed field(s) in the report.

Vertical Sort Fields

Lists the vertical sort field(s) in the report.

Horizontal Sort Field

Lists the Horizontal field in the report.

Procedure How to Add a Field (Report Assistant)

Using the Fields tab in Report Assistant, you can add a field from the selected data source to one of the following list boxes: Report Columns, Vertical Sort Field, or Horizontal Sort Field. The field becomes a column in your report.

To add a field name to a list box:

1. Select the field from the Fields window.
2. Click the *Add>* button to the left of the desired List box.

The field name is added to the List box.

Tip: You may also add a field by dragging and dropping the selected field to the desired List box. When adding fields using one of the methods described above, you may add multiple fields at the same time by holding down the Ctrl key and highlighting the desired fields.

Procedure How to Select a Detail or Summary Report (Report Assistant)

Using the Fields tab, select one of the following radio buttons in the Report Columns section to indicate how you want to display your data:

Detail

Creates a report showing all values of each selected field.

Summary

Creates a report that adds all the values of a numeric field and displays the sum.

Procedure How to Move Fields in a Report (Report Assistant)

From the Fields tab:

1. Select a field name from the Report Columns, Vertical Sort Field, or Horizontal Sort Fields box.
2. Click the *Up* or *Down* button.

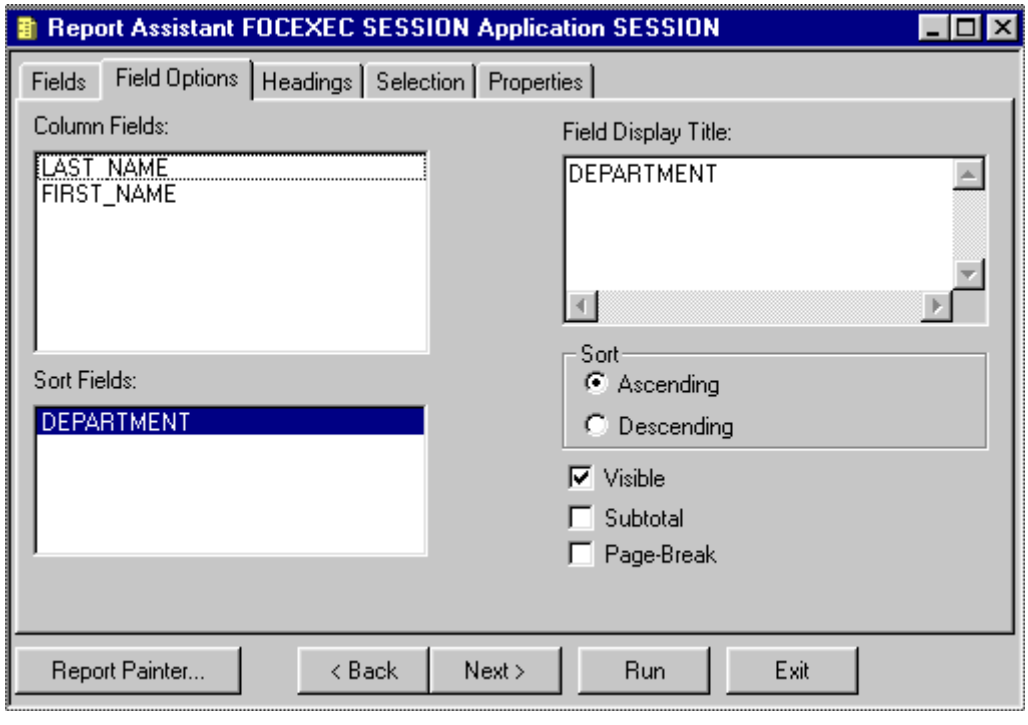
Procedure How to Delete Fields From a Report (Report Assistant)

In the Fields tab, select a field name from the Report Columns, Vertical Sort Field, or Horizontal Sort Fields box, then click *Delete*.

Field Options Tab (Report Assistant)

Select the Field Options tab to change column titles, suppress the display of a column, arrange sorting in ascending or descending order, display subtotals for numeric data, break report pages based on sort fields, and apply arithmetic operations to summary fields.

Note: The options in the Field Options tab depend on the type of field you have selected.



The Field Options tab in Report Assistant has the following fields/options:

Column Fields

Lists the detail field(s) in the report.

When a field is selected in this list box, the Column Options drop-down box becomes available.

Sort Fields

Lists the sort field(s) in the report.

When a field is selected in this list box, the following options become available:

Sort

Choose *Ascending* to sort data from top to bottom. Choose *Descending* to sort data from bottom to top.

Subtotal

Select to display a subtotal for the selected numeric sort field. (For vertical sort fields only.)

Page-Break

Select to start a new report page when the value of a selected sort field changes. (For vertical sort fields only.)

Field Display Title

Enables you to change the title of the selected report column.

Select the field from the Column Fields or Sort Fields list box, and type the new title in the Field Display Title entry box.

Column Options

Performs various calculations or other operations on the selected field.

Select a field from the Column Fields list box and choose a prefix operator from the drop-down box.

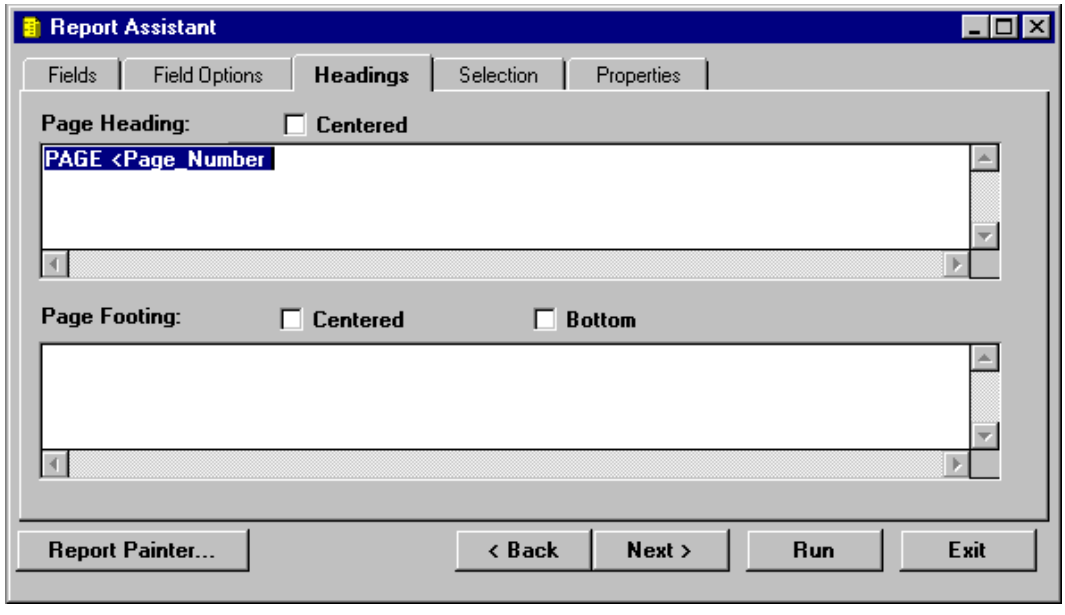
Note that most of the operators in this list are designed for use with Summary fields. For more information, see *Performing a Calculation on a Numeric Column* in Chapter 3, *Creating Reports With the Report Painter*.

Visible

Deselect to suppress the display of the selected column. *Visible* is the default.

Headings Tab (Report Assistant)

Select the Headings tab to add and position page headings and page footings on a report.



The Headings tab in Report Assistant has the following fields/options:

Page Heading

Adds a heading to the report that will appear on every page. The default page heading is the page number.

Page Footing

Adds a footing to the report that will appear on every page.

Centered

Centers the page heading or footing.

Bottom

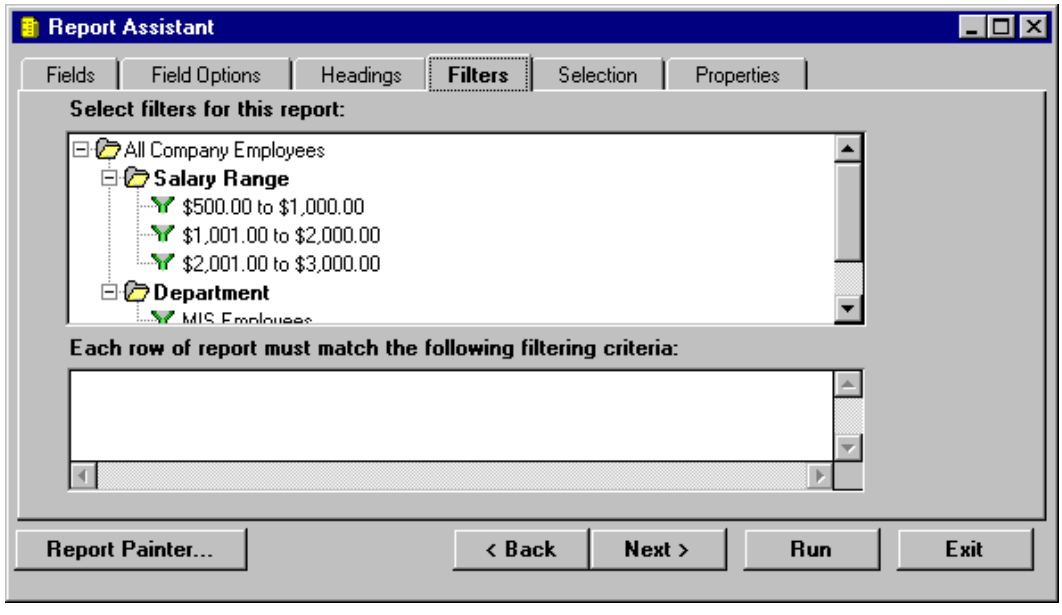
Places the page footing at the bottom of each report page.

Note: By default, page footings appear just below the last line of text on each page.

Filters Tab (Report Assistant)

Select the Filters tab to apply the filters your administrator has defined for you.

Note: The Filters feature is only available in Managed Reporting view. If your administrator has not defined any filters, then the Filters tab will not appear.



The Filters tab has the following options:

Select Filters for this report

Lists the filters you can select, organized in folders under a reporting object.

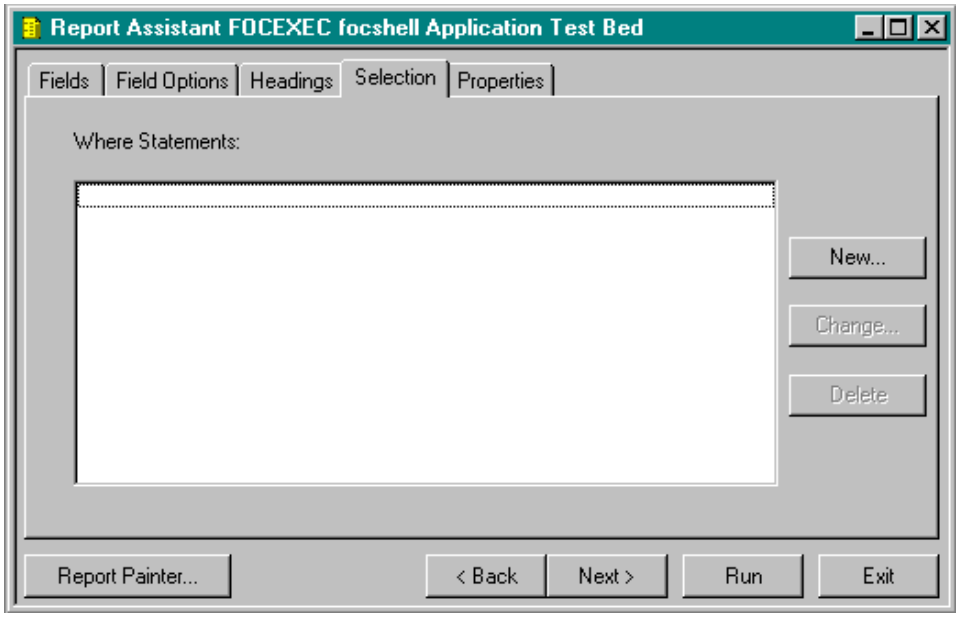
Click a filter to add it to the filtering criteria (lower box). Continue to add filters to build the criteria you need.

Each row of report must match the following filtering criteria

Displays your selections with the required AND/OR logic.

Selection Tab (Report Assistant)

The Selection tab enables you to create a Where statement that defines record selection criteria for your report. An Expression Builder tool is available to guide you through this task. For details, see *Using the Expression Builder* in Appendix B, *Writing Expressions*.



The Selection tab in Report Assistant has the following fields/options:

Where Statements

Displays selection criteria constructed for the report with the Expression Builder.

New

Enables you to create new selection criteria expressions using the Expression Builder dialog box.

Change

Revises existing selection criteria.

Select the expression you wish to change from the Where Statements window, and click the *Change* button.

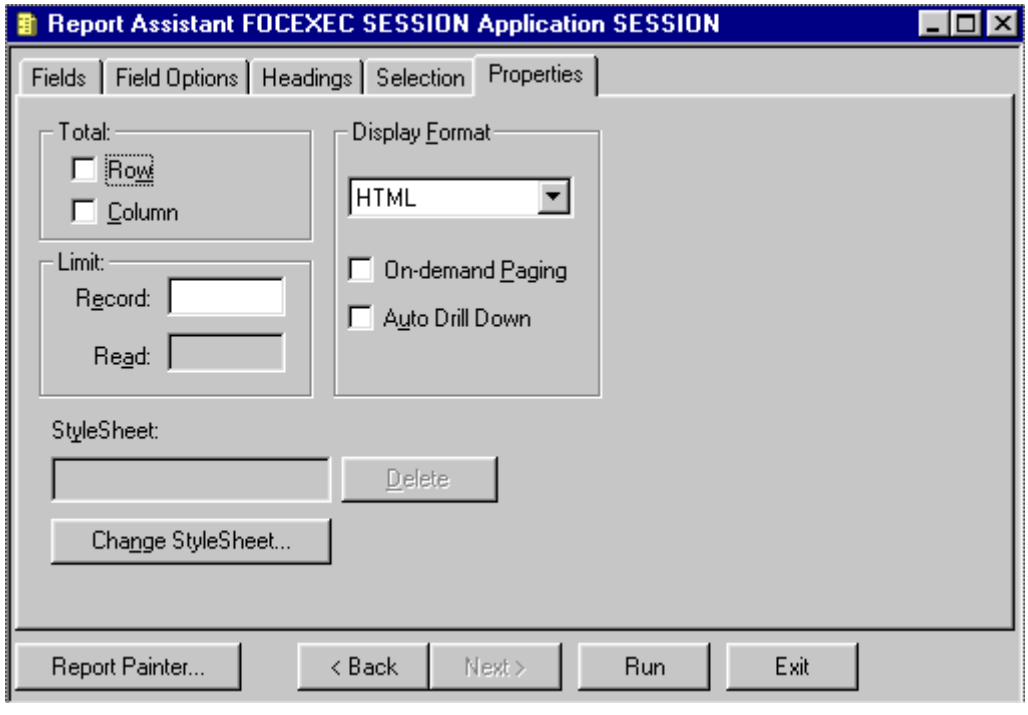
Delete

Removes selection criteria from the report.

Select the expression you wish to delete from the Where Statements window, and click the *Delete* button.

Properties Tab (Report Assistant)

Select the Properties tab to indicate how you wish to display the report, and to specify other options.



The Properties tab in Report Assistant has the following fields/options:

Total

Calculates and displays a total for selected numeric fields:

- Select *Row* to display a total for a row of numeric data.
- Select *Column* to display a total for a column of numeric data.

Record Limit

Specifies the number of records to retrieve. For some reports, retrieving a limited number of records is satisfactory. For example, you may wish to test a report with a limited answer set.

To set the number, enter it in the Retrieval Limit field, located on the Properties tab in Report Assistant. (Unless you erase or change it, this number will be used by default for subsequent reports.)

Read Limit

Specifies the maximum number of physical records to be read. Retrieval stops at the number you specify.

StyleSheet

You can style your report in the Report Assistant by choosing from a variety of professionally designed Style templates that are provided for you.

Display Format

Applies one of the following display formats to the report: Styled, HTML, PDF, Excel 2000 (EXL2K) or FOCUS default. Click the down arrow and select a display format from the drop-down list:

- Styled (FOCUS proprietary report format).
- Web (HTML).
- Adobe Acrobat (PDF).
- Excel 2000 (EXL2K)
- FOCUS default. (This option applies whichever of the previous four formats was set as an environment parameter. For details on setting preferences, refer to *Setting Preferences* in *Application Development Getting Started* and *Customizing Your Environment* in *Developing Reporting Applications*.)

On-demand Paging

For HTML-formatted reports, this option causes the server to send the report to the browser one page at a time. You can use controls on the browser to display the next or previous page, all pages, or to navigate to a specific page. This option can only be used with the HTML display format. For details about on-demand paging see Chapter 5, *Viewing and Printing Reports and Graphs*.

Auto Drill Down

By enabling AutoDrill, you can drill-down to the next lower level in a defined Dimension hierarchy by clicking a related data value within the body of an OLAP-enabled report while the OLAP Control Panel is closed. For details see Chapter 12, *Manipulating Data in an OLAP-enabled Report*.

Enable OLAP

If you are running a report remotely, you can OLAP-enable a report. This provides you with the ability to easily slice, dice, and pivot information to develop iterative scenarios for comparison and evaluation. For details see Chapter 11, *Using OLAP Analysis*, Chapter 12, *Manipulating Data in an OLAP-enabled Report*, and Chapter 9, *Visualizing Trends in Reports*.

Note: The Enable OLAP check box will not be active for reports that are being run against a local repository.

Procedure How to Select a Style Template

1. Select *Change StyleSheet…* in the Properties tab. The StyleSheet dialog box opens.
2. Select a StyleSheet and click *OK*.
3. When you run your report the style will automatically be applied.

Running and Saving Reports From the Report Assistant

You can run and save a report from any tab in the Report Assistant. You also have access to the Report Painter from any tab in the Report Assistant.

Procedure How to Run a Report (Report Assistant)

Click *Run*. The report displays in a browser. You return to the Report Assistant when you exit the browser.

Procedure How to Save a Report (Report Assistant)

Click *Exit* from any tab. You are prompted to save your changes.

Procedure How to Exit Report Assistant

Click *Exit*. You are prompted to save your changes.

Procedure How to Access Report Painter From Report Assistant

Click *Report Painter*. The Report Painter opens with your report.

Note: Report Painter allows you to enhance your report using features not supported by the Report Assistant. Therefore, once you have edited your report with Report Painter you cannot use the Report Assistant to edit the report again.

Sample Sales Report

You can give the Report Assistant a quick trial run by creating and saving a report that shows detailed sorted sales information.

Example **Creating a Sales Report (Report Assistant)**

The following example demonstrates how to use the Report Assistant to create a simple sales report.

1. Open the GGSALES data source in the Report Assistant.
2. In the Fields tab, hold down Ctrl, and click the following fields:
   - UNITS
   - DOLLARS
   - BUDUNITS
   - BUDDOLLARS
3. Click the *Add>* button to add the selected fields as Report Columns. Deselect the four highlighted fields.
4. Highlight the CITY field.
5. Click the *Add>* button to add the selected field as a Vertical Sort Fields.
6. Select the *Headings* tab.
7. Place your cursor after the default text PAGE<Page_Number in the Page Heading entry box, and press *Enter*.
8. Type the following heading text:

   Sales Report
9. Click *Run*.

The report displays as shown:

PAGE 1
Sales Report

City	Unit Sales	Dollar Sales	Budget Units	Budget Dollars
Atlanta	1797	25158	1971	27594
	1677	23478	1492	22380
	1756	22828	1837	27555
	1604	22456	1583	23745
	1506	21084	1438	20132
	1616	21008	1813	21756
	1360	20400	1594	15940

10. After viewing the report, choose *Exit* from the File menu. Then click the *Exit* button on the Report Assistant dialog box.

Another dialog box asks if you want to save the changes. Click *Yes* to save the report request, *No* to exit without saving, or *Cancel* to remove the dialog box and continue working in the Report Assistant.

CHAPTER 3

Creating Reports With the Report Painter

Topics:

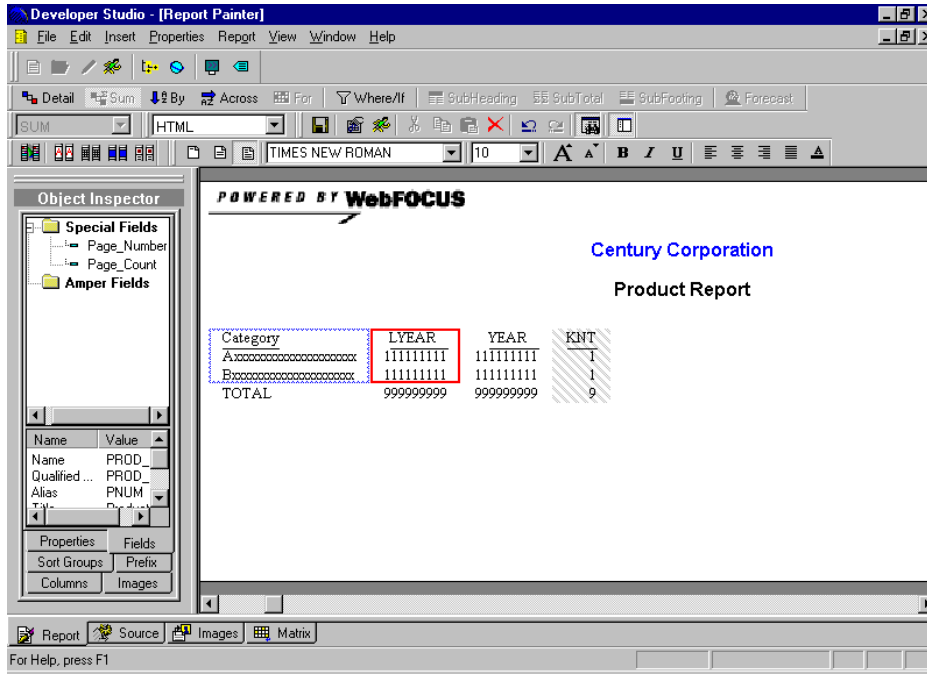
- Report Painter Layout and Toolbars
- Using the Object Inspector
- Viewing Options
- Adding a Field as a Report Column
- Displaying Data
- Sorting Data
- Navigating Sort Groups From a Table of Contents
- Including a Total or Subtotal
- Selecting Data
- Adding a Page Heading or Footing
- Formatting a Column
- Choosing an Output Format
- Styling With Fonts, Colors, and Grids
- Styling or Positioning an Individual Item in a Text String
- Defining a Conditional Report Style
- Adding an Image
- Applying an External Style Sheet
- Controlling Output Destinations
- Creating a Drill Down Procedure
- Setting Up the Report Page
- Creating Mailing Labels
- Business Intelligence Features
- Running and Saving a Report
- Report Painter Limitations
- Field Properties and Report Options Dialog Boxes

The Report Painter provides you with many powerful reporting features that enable you to create and style complex reports. You can graphically paint the report on the Report Painter window, a graphical representation of the report page.

Following are a few of Report Painter's many reporting features: customized styling elements, such as fonts, colors, grids; styling triggered by conditions you define; embedded graphic images; inclusion of calculated values in reports; options for creating section subtotals, subheadings, and subfootings; control of text and field positioning in heading and footings; page setup and layout controls; control of column formatting; support for hyperlinking (or drill-down) functionality; support for mailing labels and multi-pane reports; integration with the Financial Report Painter for financial reporting.

Report Painter Layout and Toolbars

When the Report Painter opens for a new report, it appears as shown:



The main elements of the Report Painter are described below:

Menu Bar	Displays pull-down menus for the Report Painter.
Desktop Toolbar	Displays tool buttons and operational buttons such as Open and Run.
General Toolbar	Displays buttons that provide quick access to commonly performed functions. See *The General Toolbar* on page 3-4.
Columns Toolbar	Displays buttons that are primarily used to perform functions on a selected column. See *The Columns Toolbar* on page 3-7.
Font Toolbar	Displays buttons that are primarily used to applying styling to a selected item. See *The Font Toolbar* on page 3-5.

Quick Style Toolbar	Displays buttons that allow you to copy style characteristics from one column to another, including: font, grid, background color, conditional styling, or all of the above. See *The Quick Style Toolbar* on page 3-6.
Output Format Toolbar	Allows a user to change the output format to HTML, PDF, PS or Excel 2000.
Prefix Toolbar	Displays prefix operators. See *The Prefix Toolbar* on page 3-8.
Object Inspector	Allows a user to add fields to a report, create sort groups, and view column, report, and image properties. See *Using the Object Inspector* on page 3-9.
Page Heading	Page heading band.
Insert Mode Symbol	The Insert symbol is a large letter I, which indicates that you can add a field in the report window.
Report Painter Window	Displays the fields that are included in the report. This window is a representation of the printed report page.
View tabs	Displays four different view modes: report, source (editor), image, and Financial Report Painter.

Report Painter Toolbars

The Report Painter contains built-in docked toolbars that you can show, hide, or move as needed. By default, the *General*, *Columns,* and *Font* toolbars are docked below the Explorer toolbar. These docked toolbars can be moved from their original position, where they become floating toolbars and can and placed anywhere on your Report Painter window. The docked toolbar locks in place when you drag it to the top or bottom edge of the Report Painter window.

Procedure How to Show/Hide a Toolbar

1. From the View menu, select *Toolbars*.
2. Click the toolbar you wish to show or hide.

A check mark next to the toolbar indicates it is displayed in the Report Painter window.

Tip: To quickly hide a floating toolbar, click the *Close* button in the upper-right hand corner of the toolbar.

Procedure How to Move a Toolbar

Drag the move handle on a docked toolbar, or drag the title bar on a floating toolbar to another location. If you drag the toolbar to the bottom edge of the Report Painter window it will snap in place and become a docked toolbar.

Reference The General Toolbar

The General toolbar contains buttons that provide quick access to commonly performed functions. The behavior of the button is determined either by the selected object or the previously performed command or action. Therefore, depending upon your location in the Report Painter or previously performed actions, certain toolbar buttons may be inactive.

Button	Definition
	Saves the entire report procedure to disk.
	Opens the Report Options dialog box. The following are a few of the options in this dialog box: change the properties of your report, apply formatting, add images, calculate values, apply selection criteria, and much more.
	Executes the report.
	Removes the selected item and places it on the clipboard.
	Copies the selected item to the clipboard.
	Inserts the content of the clipboard at the insertion point, or replaces a selected item.
	Removes the selected item from the report.
	Reverses the last command or action.
	Reverses the action of the Undo command.
	Toggles between displaying or hiding invisible fields in the body of the report.
	Toggles between displaying or hiding the Object Inspector.

Reference The Font Toolbar

The Font toolbar contains buttons that are primarily used to apply styling to a selected item.

Button	Definition
	Applies styling only to the title component of the column.
	Applies styling only to the data component of the column.
	Applies styling to the entire column.
TIMES NEW ROMAN	Changes the font of the selected item.
10	Changes the font size of the selected item.
	Increases the font size of the column object by one point.
	Decreases the font size of the column object by one point.
	Applies the bold style to the selected object.
	Applies the italic style to the selected object.
	Applies the underline style to the selected object.
	Applies left justification to the selected object.
	Applies center justification to the selected object.
	Applies right justification to the selected object.

Button	Definition
	Returns the default justification to the selected object.
	Allows you to change font color.

Reference The Quick Style Toolbar

The Quick Style toolbar contains buttons that are primarily used to copy format characteristics from one column and applies the characteristics to another column. To activate the toolbar, you must multi-select two or more columns. When you click one of the Quick Style buttons, the Report Painter copies the style from the first column selected and applies the style to all other selected columns. Depending upon your selection, certain toolbar buttons may be inactive or unavailable.

Button	Definition
	Copies all style characteristics of selected item including: font, grid, background color and conditional styling. It then applies the style to all other selected columns.
	Copies the font characteristics of the selected item. It then applies the font to all other selected columns.
	Copies the grid characteristics of the selected item. It then applies the grid to all other selected columns.
	Copies the background color characteristics of the selected item. It then applies the color to all other selected columns.
	Copies the conditional styling characteristics of the selected item. It then applies the condition to all other selected columns.

Reference The Columns Toolbar

The Columns toolbar contains buttons that are primarily used to perform functions on a selected column. Depending upon your selection, certain toolbar buttons may be inactive or unavailable.

Button	Definition
Detail	Displays the individual values of the selected fields in the report when run. This button is selected by default when you open the Report Painter.
Sum	Adds (sums) all the values of the selected numeric field in the report when run.
By	Sorts and groups the records in a report by the values in the selected field; the data is sorted vertically. You can sort a report by more than one field.
Across	Sorts and groups the records in a report by the values in the selected field; the data is sorted horizontally. You can sort a report by more than one field.
For	Enables you to structure financial reports row by row in the Financial Report Painter, based on the selected For field. For details, see Chapter 10, *Creating Reports With Financial Report Painter*.
Where/If	Enables you to select records based on WHERE, IF, and WHERE TOTAL criteria. You can also specify retrieval limits.
SubHeader	Enables you to enter a sub-heading in the report; the sub-heading is displayed each time the selected sort (By) field changes; it is placed before the new value.
SubTotal	Displays a subtotal for numeric data whenever the value of the selected sort (By) field changes.
SubFooter	Enables you to enter a sub-footing in the report; the sub-footing is displayed each time the selected sort (By) field changes; it is placed after the new value.

Button	Definition
Forecast	Opens the Forecast dialog box in which you can add a Forecast column to the report. This feature calculates trends in numeric data and predicts values beyond the range of values stored in the data source. For more information about the Forecast feature, see Chapter 5, *Creating Temporary Fields*.

Reference

The Prefix Toolbar

The Prefix toolbar is an optional toolbar that you can add from the View menu by choosing *Toolbars*, then *Prefix*.

This Prefix toolbar is added to the General toolbar. It provides a drop-down menu of prefix operators that you can apply to a field. Clicking the down arrow enables you to switch prefix operators for the selected field. For details, see *Operations You Can Perform on Fields* on page 3-27.

Tip: The list of available operators adjusts to show those that are appropriate for the type of field you select.

Using the Object Inspector

The Object Inspector allows a user to add fields to a report, create sort groups, and view column, report, image properties, and the hierarchical structure of the Master File.

The Report Painter opens by default with the Object Inspector positioned in the left window pane of the Report Painter window. The Object Inspector can be closed or floated on top of the Report Painter window. Any changes made in the Object Inspector are reflected in the Report Painter window and vice versa.

The Object Inspector has five tabs that you can toggle between: Fields, Columns, Properties, Sort Groups, and Images. Among other things, the Object Inspector enables you to:

- View and modify the properties of a column.
- View the thumbnail and properties of an image.
- View properties of a selected reporting object (column, heading, footing, or entire report).
- Add fields to your report.
- View the hierarchical structure of the Master File. The hierarchical structure includes the root segment, followed by either fields, or other segments with fields.
- Create variable fields.
- View the available fields and adjust the amount, type, and order of information displayed.
- View and modify the sort status of a field.

Note: The Object Inspector is available only in the Report Painter view.

Procedure **How to Float the Object Inspector**

From the File menu, select *Float Object Inspector.*

or

Double-click the Object Inspector title bar.

The Object Inspector becomes a movable window that you can float on top of the Report Painter window.

Tip: To dock the Object Inspector, deselect *Float Object Inspector* from the File Menu or double-click the Object Inspector title bar

Procedure How to Show/Hide the Object Inspector

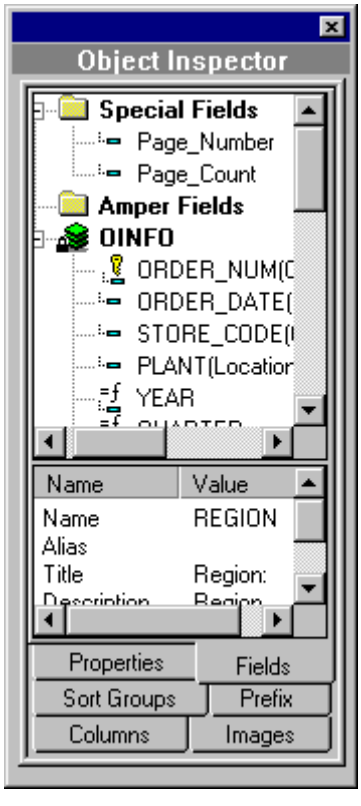
Once you have populated a report with information, you may wish to close the Object Inspector so that the report is more fully visible on the screen.

Click the *Show/Hide Object Inspector* button on the General Toolbar.

Tip: You can reopen the Object Inspector at any time by re-selecting this option from the General toolbar.

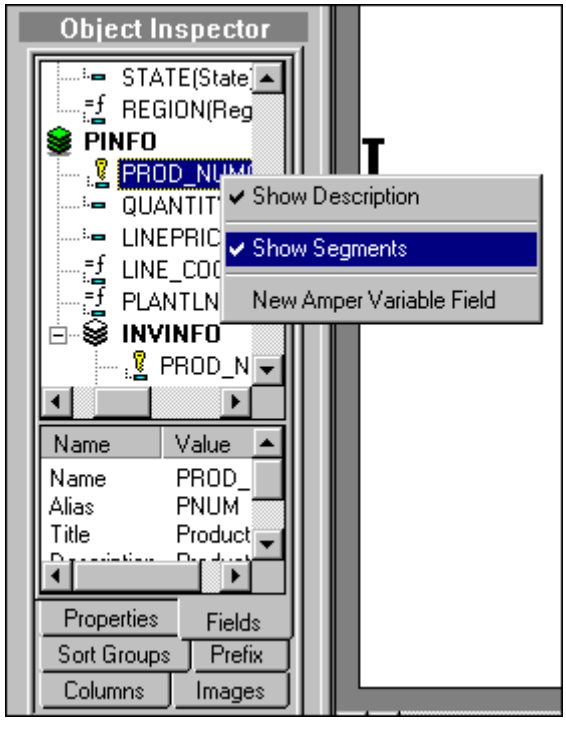
Adding a Column to Your Report (Object Inspector)

The Fields tab in the Object Inspector lists all field names available for use in your report. This includes fields in the open file, and any joined files, as well as temporary fields. You can select a field to view its field name, qualified field name, alias, title, description, and format in the lower pane. You can double-click or drag fields from this pane to the Report Painter window, where they become report columns. For details, see *How to Add a Column to Your Report* on page 3-21.



Viewing Master File Segments (Object Inspector)

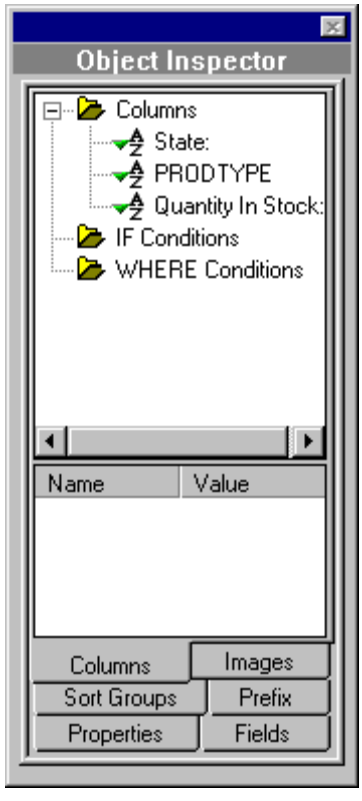
You can view the hierarchical structure of the Master File from the Fields tab in the Object Inspector. The hierarchical structure includes the root segment, followed by either fields, or other segments with fields. Selecting a segment or field in the Fields tab displays the field properties in the bottom windowpane of the Object Inspector.



Right-clicking a field and selecting *Show Segments* from the shortcut menu displays the hierarchical structure of the Master File.You can double-click or drag segments or fields from this pane to the Report Painter window, where they become report columns.

Viewing Column Properties (Object Inspector)

You can view and modify the column properties in the Report Painter window from the Columns tab in the Object Inspector.

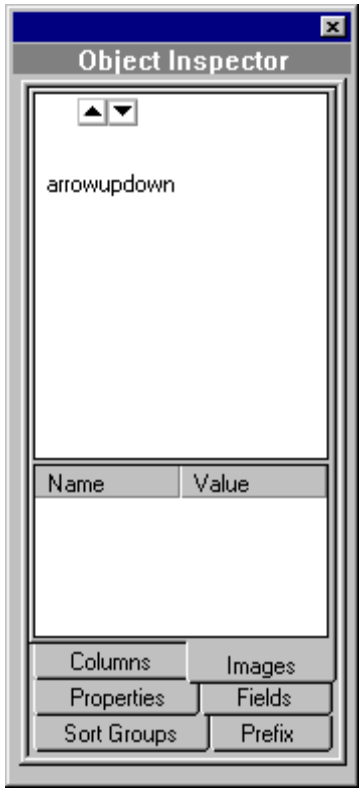


Selecting a column in the Columns tab displays the column properties in the bottom windowpane of the Object Inspector. These properties include: column name, sort type, format, prefix operator status, drill down status, and visualize status. There is a descriptive icon to the left of each column indicating the sort status of the column. For details, see *Viewing and Manipulating Sort Groups (Object Inspector)* on page 3-15.

Right-clicking a column and selecting *Options* from the shortcut menu opens the Field Properties dialog box where you can format and style your column as well as apply drill down capabilities. Any changes made to the column properties are reflected in the Report Painter window.

Viewing Image Properties (Object Inspector)

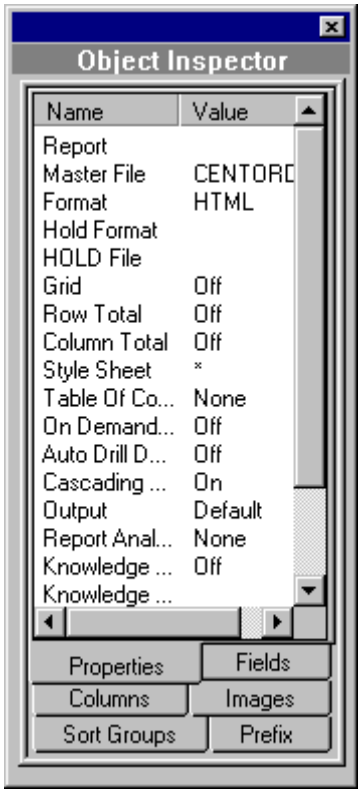
You can view properties of an image in the Report Painter window from the Images tab in the Object Inspector.



Selecting the thumbnail of the image in the Images tab displays the image properties in the bottom pane of the Object Inspector. These properties include: the location of the image, image name, positioning on page, and size.

Viewing Reporting Object Properties (Object Inspector)

When you select a reporting object (column, heading, footing, or entire report) in the Report Painter window, its properties are reflected in the Properties tab in the Object Inspector.



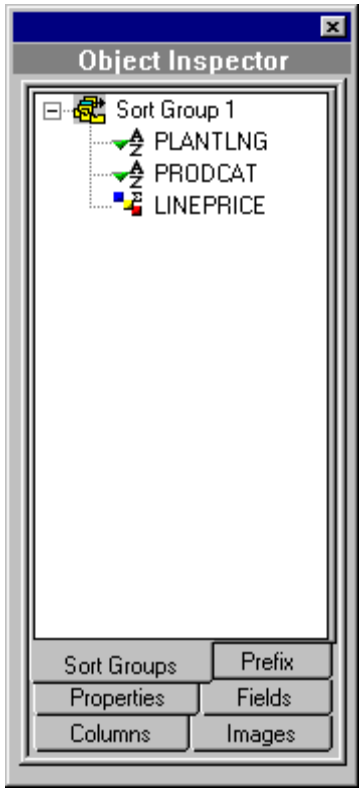
Procedure How to View the Properties of the Entire Report

Place your cursor in a blank space in the Report Painter window.

The report properties are displayed in the Properties tab in the Object Inspector.

Viewing and Manipulating Sort Groups (Object Inspector)

You can view and modify the sorting properties of fields in the Report Painter window from the Sort Groups tab in the Object Inspector.



The Sort Groups tab displays the sorting method being applied to each column in the Report Painter window. You can change the sorting method (for example, from By to Across or from Detail to Sum) from the Sort Groups pane. The changes are reflected in the Object Inspector Columns and Sort Groups panes and in the Report Painter window.

You can also create reports that include both detail and summary information from the Sort Groups pane. For details, see *Sorting in Groups to Create a Combined Detail/Summary Report* on page 3-39.

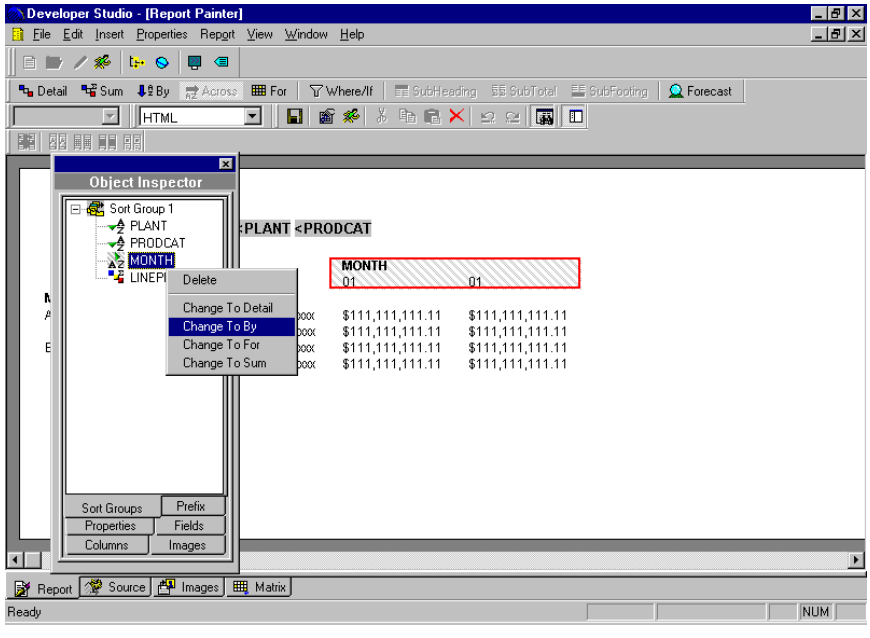
Reference Sort Type Icons

The icons in the first column to the left of the field name display the type of sort field. The icons and their meanings are defined in the following table:

Icon	Definition
	Across field.
	By field.
	Sum field.
	Detail field.
	For field.

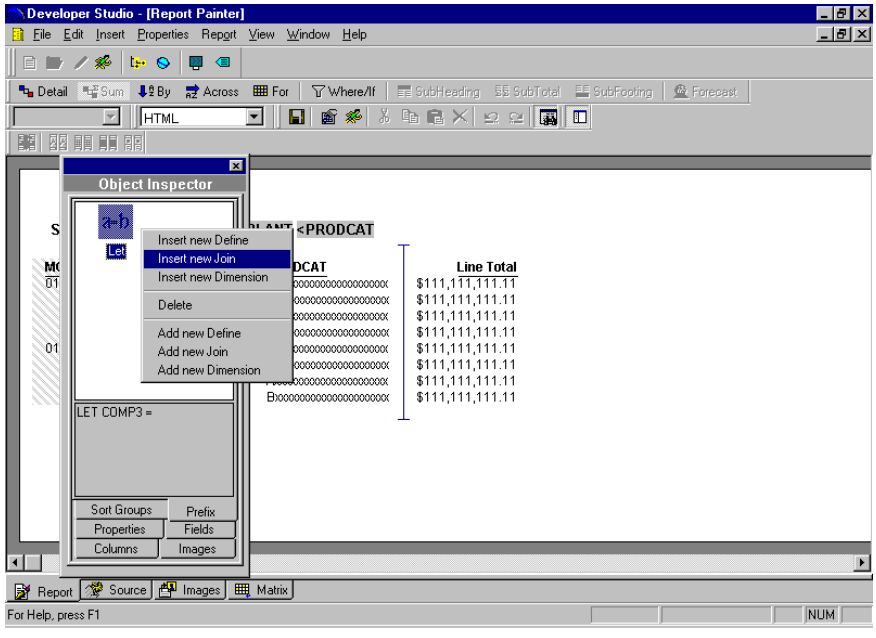
Opening Report Components (Object Inspector)

Right-clicking a field in the Object Inspector and selecting *Show Segments* from the shortcut menu displays the hierarchical structure of the Master File. You can double-click or drag segments or fields from this pane to the Report Painter window, where they become report columns. The Sort Groups tab displays the sorting method being applied to each column in the Report Painter window. You can change the sorting method (for example, from By to Across or from Detail to Sum) from the Sort Groups pane. The changes are reflected in the Object Inspector Columns and Sort Groups panes and in the Report Painter window.



You can also create reports that include both detail and summary information from the Sort Groups pane. For details, see *Sorting in Groups to Create a Combined Detail/Summary Report* on page 3-39.

You can open report components that precede the report component from the Prefix Tab on the Object Inspector. Selecting a component in the Prefix tab displays the syntax for that component in the bottom windowpane of the Object Inspector. Double-clicking a component opens the tool that created the component.



Viewing Options

Although you will generally work in the Report Painter view as you build your report, you may want to toggle between other views where you can view and edit the code generated by the graphical tools, view the positioning of images, or model complex reports.

The Report Painter opens by default in the Report Painter view, but clicking on any view tab in the lower left-hand corner of the Report Painter window adjusts the display of data.

Procedure **How to Switch Views in the Report Painter**

Choose one of the following tabs in the lower right-hand corner of the Report Painter to adjust the display of data:

Report

Displays the Report Painter window, where you build and style your report.

Source

Displays the code generated by the Report Painter. You can create and edit code in this view and it will be reflected in the Report Painter.

Images

Displays image(s) and enables you to position them anywhere in the report.

Matrix

Displays the Financial Report Painter Design grid where you can model complex reports that allow cell-based computations, data labels, and free text placement. For details, see Chapter 10, *Creating Reports With Financial Report Painter*.

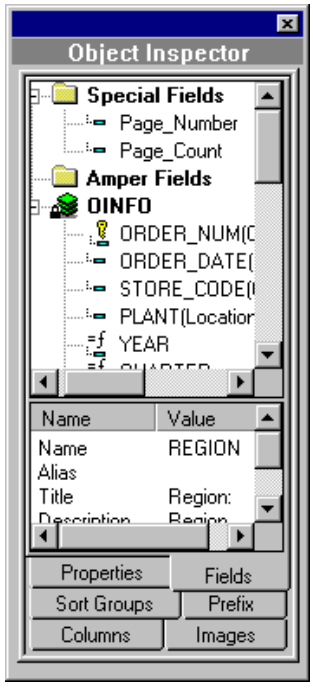
Tip: You can also switch Report Painter views by selecting one of the following options from the View menu: *Show Report Painter*, *Show Matrix View*, *Show Source View*, or *Show Image View*.

Adding a Field as a Report Column

To create a report, you must add fields to it. A field is the smallest meaningful element of data.

Ordinarily, when you add a field to a report, the field name appears as the column title and the field values appear within that column. If you choose to organize data horizontally rather than vertically, the field name appears as a row label rather than as a column title. But, from the point of view of adding fields to a report, the principle is the same. See *Sorting Data* on page 3-29 for details.

The Fields tab in the Object Inspector lists all field names available for use in your report. This includes fields in the open file, and any joined files, as well as temporary fields and variable fields.



Selecting a field in the Fields tab displays the field properties in the bottom windowpane of the Object Inspector. You can right-click a field and adjust the amount, type, and order of information that is displayed in the Fields tab. For example, you can automatically sort the fields and display the format and/or description for each field.

You can also create a variable field as a column to control output. For example, in a cost report, the variable might be &COST, which would allow a user to specify RETAIL_COST or DEALER_COST at run time. For details, see *How to Create a Variable Field in Your Report* on page 3-21.

Procedure How to Add a Column to Your Report

To add columns to your Report Painter window from the Fields tab in the Object Inspector:

- Double-click a field name in the Fields tab.

  or

- Drag a field from the Fields tab to the Report Painter window.

Procedure How to Create a Variable Field in Your Report

1. Click inside the Fields tab on the Object Inspector.
2. Right-click a field and select *New Amper Variable Field*.

   The Variable Editor opens.
3. In the Name input box, type a name for the variable. This name will appear as the Column title if the field is added to the report.
4. Optionally, provide text for the message that prompts a user to supply a value for the variable.
5. Click *Add*. The Add Accept Value dialog box opens.
6. Click the *Fields* radio button and select one or more fields from the activated list.
7. Click *OK*.

Procedure How to Create a Temporary Field in Your Report

You can create a temporary field based on existing information in the data source, and then add that field to your report request.

Select the *Report Options* button from the General Toolbar and choose the *Computes* tab, where you can create the temporary field.

This field will be listed in the Fields tab in the Object Inspector, along with the fields in the data source, so that you add it to the report as you would any other field.

As you create your temporary field, the fields in the data source you are reporting against are listed in a secondary Fields window that shows field names and descriptions by default. To adjust the information that you see in the Fields list window (for example, to display field formats and aliases, along with the field name), right-click in the window and select display options from the pop-up menu.

For details, see Chapter 5, *Creating Temporary Fields*.

Moving or Deleting a Column

You can copy, cut, paste, drag and drop, and delete columns in reports.

Procedure How to Copy and Paste a Column

You can use Copy and Paste to copy a selected column on a report from one location to another. To make a copy of a column:

1. Select the column you want to copy.
2. Choose *Copy* from the Edit menu.

   or

   Select the *Copy* button on the General toolbar.
3. Position the mouse pointer between columns in the column title area.

   You will see a hand with a finger pointing down at the target location.
4. Click the left mouse button.

   This step displays the Insert Mode symbol at the target location.
5. Choose *Paste* from the Edit menu.

Procedure How to Cut and Paste a Column

You can use cut and paste to move a selected column on a report from one location to another. To cut a field:

1. Select the column you want to cut.
2. Choose *Cut* from the Edit menu.

   or

   Select the *Cut* button from the General toolbar.
3. Position the mouse pointer between columns in the column title area.

   You will see a hand with a finger pointing down at the target location.
4. Click the left mouse button. This step displays the Insert Mode symbol at the target location.
5. Choose *Paste* from the Edit menu.

Procedure How to Drag and Drop a Field

To drag a field from the Fields tab in the Object Inspector to the Report Painter window, select the field and drag it to the desired location.

To move a column from one location to another in the Report Painter window, select and drag the column to the new location.

Procedure How to Delete a Column

To delete a column from a report:

Right-click the column and select *Delete* from shortcut menu or press the *Delete* key.

Displaying Data

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

- List each field value (a Detailed presentation of data).
- Add all the values and display the sum (a Summary presentation of data).

These display options are very flexible; you can report from several fields using a single command and include several different display commands in a single report request.

Tip: The WebFOCUS language provides a few detail and summary variations that the graphical reporting tools do not support. See *Creating Reports With WebFOCUS Language*.

Displaying Individual Values

The Detail option lists individual values of the field(s) you specify.

For all Detail requests, the number of records retrieved and the number of lines displayed are the same. Unless you choose to sort the data, the Detail option simply displays all the values of the selected fields in the order in which they are accessed from the data source. For details, on sorting see *Sorting Data* on page 3-29.

Procedure How to Display Detailed Data in Report Painter

Select the *Detail* button on the Columns toolbar. Detail is selected by default.

Your selection is applied to any fields you select while that button is highlighted. This enables you to choose different display options within the same report.

Tip: Once a field is in the Report Painter window, you can change its display mode by selecting the field and clicking either the Detail or Sum button.

Example Creating a Detail Report

Suppose that you want to compare your product line to that of your competition. The following example shows how to create a detail report that lists the products that Gotham Grinds carries along with the wholesalers from which these products are purchased.

1. Open the GGPRODS data source in the Report Painter.

   Note that the *Detail* button on the Report Painter toolbar is selected. This is the default.

2. Double-click or drag *VENDOR_NAME* from the Fields tab of the Object Inspector.

3. Double-click or drag *PRODUCT_DESCRIPTION* from the Fields tab of the Object Inspector.

4. Run the report by clicking the *Run* button on the toolbar. The report displays in the browser.

Vendor Name	Product
Coffee Connection	Hazelnut
European Specialities,	French Roast
Evelina Imports, Ltd	Kona
Ridgewood Bakeries	Scone
Delancey Bakeries	Biscotti
West Side Bakers	Croissant
NY Ceramic Supply	Mug
ThermoTech, Inc	Thermos
Appliance Craft	Coffee Grinder
Appliance Craft	Coffee Pot

Note that to make the report more readable and more compact, we deselected *Squeeze to minimum width* and suppressed page numbers.

Displaying Summed Values

The Summary option adds the values of numeric fields. When you use the Summary option, multiple records are read from the data source, but only one summary line is produced.

If you use the Summary option with a non-numeric field—such as an alphanumeric, text, or date field—the Report Painter will not add the values; instead, it will display the last value retrieved from the data source. This may not be useful.

Tip: You can also perform calculations on individual fields. For details, see *Performing a Calculation on a Numeric Column* on page 3-26.

Procedure How to Display Summary Data in Report Painter

Select the *Sum* button on the Columns toolbar. (Detail is selected by default.)

Your selection is applied to any fields you select while that button is highlighted. This enables you to choose different display options within the same report.

Tip: Once a field is in the Report Painter window, you can change its display mode by selecting the field and clicking either the Detail or Sum button.

Example Creating a Summary Report

Suppose that you want to see total sales for your various retailers. The following example shows how to create a summary report of total sales for Gotham Grinds stores in each region.

1. Open the GGSALES data source in the Report Painter.
2. Identify your sort column. Click the *By* button on the Report Painter toolbar then double-click or drag *REGION* from the Fields tab of the Object Inspector.
3. Identify your summary column. Click the *Sum* button on the Report Painter toolbar then double-click or drag *DOLLARS* from the Fields tab of the Object Inspector.
4. Format the Dollar Sales column. Right-click *Dollar Sales* in the Report Painter window and select *Format*. Click *Decimal* in the Format Types box. Select *Floating dollar -- M* from the Edit Options list. Click *OK*.

5. Run the report by clicking the *Run* button on the toolbar. The report displays in the browser.

Region	Dollar Sales
Midwest	$11,400,665.00
Northeast	$11,392,310.00
Southeast	$11,710,379.00
West	$11,652,957.00

6. Note that to make the report more readable and more compact, we deselected *Squeeze to minimum width* and suppressed page numbers.

Performing a Calculation on a Numeric Column

You can use built-in operators to perform calculations directly on the values of numeric fields, and display the results of the calculations in your reports. With one exception (percent) these operators only work in Summary mode. For example, you can:

- Calculate the average of field values.
- Determine the minimum or maximum of field values.
- Calculate the percent value of field and count values.
- Determine the square and average of squared values.
- Sum and count numeric values.
- Retrieve the first or last record.

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

Procedure How to Perform an Operation on a Column

1. Select the column in the Report Painter window.
2. Select the Prefix Operator pull-down list in the General toolbar.

   or

   Right-click the column and select Options from the shortcut menu to open the Field Properties General tab opens.
3. Select an operator from the drop down list.

Tip: In the Report Painter, the list of available operators adjusts to show those that are appropriate for the type of field you select. For details, see *Operations You Can Perform on Fields* on page 3-27.

Reference Operations You Can Perform on Fields

For details on these prefix operators, see *Creating Reports With the WebFOCUS Langua*ge.

Prefix	Function
Cnt	Counts the number of occurrences of the field.
CT	Produces a cumulative total of the specified field. **Note:** This operator can only be used in subheadings and subfootings.
ST	Produces a subtotal value of the specified field at a sort break in the report. **Note:** This operator can only be used in subheadings and subfootings.
Ave	Computes the average value of the field.
Tot	Counts the occurrences of the field for use in a report heading.
Asq	Computes the average sum of squares for standard deviation in statistical analysis.
Max	Generates the maximum value of the field.
Min	Generates the minimum value of the field.
Pct	Computes a field's percentage based on the total values for the field. The PCT operator can be used with Detail as well as Summary fields.
RPct	Computes a field's percentage based on the total values for the field across a row.
PctCnt	Computes a field's percentage based on the number of instances found.

Prefix	Function
CntDst	Counts the number of distinct values within a field when using -REMOTE. For other modes of operation, this behaves like CNT.
Fst	Generates the first physical instance of the field.
Lst	Generates the last physical instance of the field.

Displaying Missing Data

By applying the All operator to a field.

Imagine, for example, that you want to create a salary report that highlights salary increases, but lists the names of all employees in the company. When reporting against a hierarchical data source like FOCUS, you can display segment instances that lack descendants b both those that received increases and those that did not. When you apply the All operator to the field that contains employee names, WebFOCUS displays the names but inserts a character indicating that there is no data present for any missing field values in the report; in this case, that means the salary increase information. (The default "missing data" character is a period.) See *Including a Missing Segment Instance With the All Operator* on page 3-29 for an illustration.

All can be applied to display field and sort fields. It can be applied to multiple fields in a request and combined with operators that perform calculations on the selected fields. For details, see *Operations You Can Perform on Fields* on page 3-27.

Note: If your request includes selection criteria that screen fields in segments that are missing instances, the report omits the parent instances even when you use the All operator. For details, see *Handling Missing Data* in *Creating Reports With WebFOCUS Language*.

Procedure How to Include a Missing Segment Instance in a Report

In Report Painter window:

1. Select a column that you want to include in the report even if there are missing instances of data for related fields in the report.
2. Choose *Options* from the Properties menu.

   or

   Right-click and select Options from the shortcut menu.
3. The Field Properties General tab opens.
4. Select the *All* operator from the Prefix drop-down list.

Example Including a Missing Segment Instance With the All Operator

The following request displays the salary history of each employee. The report is sorted by last name (LAST_NAME), first name (FIRST_NAME), and date of increase (DAT_INC), with the ALL operator applied to LAST_NAME. Notice that the names Davis and Gardner appear in the report even though they did not receive salary increases.

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

Sorting Data

Sorting enables you to group or organize report information vertically and horizontally, in rows and columns, and specify a display sequence.

The *sort field* organizes the rows and columns and controls the 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 display when their values change.

You sort a report using *By* and *Across* options:

- *By* displays the sort field values vertically, creating rows. The Report Painter displays vertical sort fields in the left-most columns of the report.
- *Across* displays the sort field values horizontally, creating columns. The Report Painter displays horizontal sort fields across the top of the report.
- *By* and *Across* used in the same report create rows and columns, producing a grid or matrix.

Sorting Rows

You can sort report information vertically using the By option. As the Report Painter displays sort field values vertically, it creates rows.

You can include up to 32 vertical (By) sort phrases in a request (31 if you combine vertical sorting with the Detail display option).

If you are sorting vertically, you can:

- Control the placement of vertical sort fields.
- Choose the number of sort records to display.
- Add underlines, blank lines, and page breaks at sort breaks.
- Reset the page number after a sort break.
- Group numeric data into ranges.
- Rank data numerically.
- Sort and aggregate a report column.
- Add a dynamic table of contents to an HTML report in order to quickly navigate and analyze multiple levels of sorted data. For details, see *Navigating Sort Groups From a Table of Contents* on page 3-43.

For related information see *Additional Sorting Options* on page 3-36.

Procedure How to Sort Rows (Report Painter)

1. Click the *By* button on the Columns toolbar to sort vertically (creating rows).
2. From the Fields tab in the Object Inspector, double-click the field you wish to use for sorting, or drag the sort field from the Fields tab to the Report Painter window. The sort field appears in the left column of the Report Painter window.

Example Sorting Vertically

The following report displays all employee IDs (EMP_ID) sorted vertically by DEPARTMENT.

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

Notice that the sort field DEPARTMENT automatically appears as the left column in the report. The sort field values (MIS and PRODUCTION) display when the sort field changes.

Procedure How to Control the Placement of a Vertical Sort Field on a Report

Ordinarily, vertical sort fields appear in the left hand column of a report. To control the placement of sort fields in a report, choose one of the following options from the Report Options Output tab.

Default field placement

Prevents or restricts the relocation of sort fields.

Custom field placement

Enables you to move sort fields.

Reset custom field placement to default

Restores the default placement of fields.

Procedure How to Display a Specific Number of Sort Values

You can choose the number of records to display in your report. For example, you can display the top five salaries in a report that sorts by current salary.

1. Right-click a vertical sort field (BY only) and select *Options* from the shortcut menu, then select the *Sort* tab.
2. From the Sorting tab, type the number of sort values to display in the *Limit* field in the Sort Order box.

Note: The *Limit* option only applies to a vertical sort (BY) field. If you select *Sort Descending,* you see the chosen number of highest values. If you choose *Sort Ascending,* you see the chosen number of lowest values.

Procedure How to Add an Underline, Blank Line, or Page Break at a Vertical Sort Break

You can use formatting options to enhance the readability and usefulness of a report. These options apply only to a sort (By) field. To add underlines, skipped lines, or page-breaks at each sort break:

1. Right-click a sort (*BY*) field and select *Options* from the shortcut menu, then select the *Sort* tab.
2. In the Sorting tab, choose a formatting option(s) from the Actions box:

   Underline

   Include a horizontal line across the width of a report after the value of the selected sort field changes. (To apply this action in HTML reports, turn on the Cascading Style Sheets option in the Report Options Output tab.)

   Skip Line

   Skip a line on a report when the value of the selected sort field changes. (To apply this action in HTML reports, turn on the Cascading Style Sheets option in the Report Options Output tab.)

   Page Break

   Start a new report page when the value of a selected sort field changes.

   No Split

   Break sort fields logically and regenerate the field heading on the next page or screen.

   Restart Page Numbering

   Resets the page number to one at the sort break. The Page-break option must be selected.

   Fold Line

   Causes columns to be placed on a separate line when the value of the sort field changes. (The Fold Line feature is not supported in HTML reports.)

Procedure How to Group Numeric Data Within a Range

This option only applies to a numeric *By* field.

You can group sort field values together and define the range of each group. For example, in a report that lists employees by salary, instead of showing each individual salary, you can group employees by salary increments of $5000.

1. Right-click a numeric sort field (BY only) and select *Options* from the shortcut menu, then select the *Sort* tab.
2. From the Grouping tab, select the *In-Groups-Of* check box.
3. Type the sort field increment in the *Intervals* field box and the grouping limit in the *Group Limit* field box.
4. Click *OK*.

Procedure How to Group Numeric Data Into Tiles

This option only applies to a numeric *By* field.

You can group numeric data into any number of tiles (percentiles, deciles, and so on) 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.

1. Right-click a numeric sort field (BY only) and select *Options* from the shortcut menu, then select the *Sort* tab.
2. From the Grouping tab, select the *Tiles of* check box.
3. Click *OK*.

Procedure How to Rank Data Numerically

When you sort reports vertically, you can indicate the numeric rank of each row.

1. Right-click a By field and select *Options* from the shortcut menu, then click the *Sort* tab.
2. From the Ranking tab, click the *Ranked* check box and click *OK*.
3. Select either the *Highest* or *Lowest* radio button to indicate the ranking order.
4. To limit the number of ranked fields, type the limit in the *Limit* field box.

A numerical ranking appears on each line of the report with the default column heading, RANK.

Procedure How to Aggregate and Sort Report Columns

You can apply aggregation and sorting simultaneously to numeric columns in your report in one pass of the data. You can also sort based on calculated values.

You apply column-based sorting to a report one column at a time. The records can be sorted in either ascending or descending sequence.

1. Right-click on a numeric column and choose *Order Report By* from the shortcut menu.

   The selected column becomes invisible and is moved to first column position in the report.

2. Repeat the previous step if you wish to select another column for aggregate sorting.

   Each selected column is made invisible and moved to the first column position.

To turn aggregate sorting off, right-click the invisible column and deselect *Order Report By*. The column remains invisible and functions as a normal By column.

To delete the invisible column, select it and click the *Delete* key.

Sorting Columns

You can sort report information horizontally using the Across option. As the Report Painter displays sort field values horizontally, it creates columns.

You can have up to five horizontal sort fields per report request. Each one can retrieve up to 95 sort field values. Your report can include up to 256 columns. The total number of Across columns in a report is equal to the total number of across sort field values multiplied by the total number of display fields.

Procedure How to Sort Columns (Report Painter)

1. Click the *Across* button on the Columns toolbar to sort horizontally (creating columns).
2. From the Fields tab in the Object Inspector, double-click the field you wish to use for sorting, or drag the sort field from the Fields tab to the Report Painter window.

Example Sorting Horizontally

This report totals each department's salary outlay (CURR_SAL), and sorts horizontally by DEPARTMENT.

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

Note that the sort field DEPARTMENT appears as a label at the top of the report and the sort field values appear as column titles.

Sorting Using Multiple Fields

You can organize information in a report using more than one sort field. When several sort fields are used, the sequence of the sort fields determines the sorting order: the first By or Across field sets the major sort break, the second By or Across field sets the second sort break, and so on. Each successive sort is nested within the previous one.

Procedure How to Sort Using Multiple Fields (Report Painter)

1. Click the *By* or *Across* button on the Columns toolbar to sort vertically or horizontally.
2. From the Fields tab in the Object Inspector, double-click the field you wish to use for sorting, or drag the sort field from the Fields tab to the Report Painter window.
3. Repeat steps 1 and 2. The field you select will be used as a sort field, along with any previous (higher level) sort fields.
4. Repeat as many time as necessary. (See *Sorting Rows* on page 3-30 and *Navigating Sorted Data From a Multi-level Report TOC* on page 3-48 for limitations.)

Example Sorting With Multiple BY Fields

You can select several vertical sort fields, nesting one within another, as with DEPARTMENT and LAST_NAME in this example.

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

Example Sorting Using Multiple ACROSS Fields

The following report sorts the sum of current salary (CURR_SAL) horizontally, first by department (DEPARTMENT), then by job code (CURR_JOBCODE).

DEPARTMENT			
MIS		PRODUCTION	
CURR_JOBCODE			
A17	B04	A15	A17
$27,062.00	$21,780.00	$26,862.00	$29,700.00

Sorting Rows and Columns to Create a Matrix

You can create a simple matrix report by sorting both rows and columns. When you include both vertical (By) and horizontal (Across) sort fields in a report request, information is sorted down the report and across the report, turning it into a matrix of information that you read like a grid. A matrix report can have several By and Across sort fields.

Procedure How to Create a Matrix (Report Painter)

1. Click the *By* button on the Columns toolbar and select one or more vertical sort fields.
2. Click the *Across* button on the Columns toolbar and select one or more horizontal sort fields.
3. Click the *Detail or Sum* button on the Columns toolbar and select one or more fields to add to the report.

Tip: You can also create a matrix using the Sort Groups tab in the Object Inspector. See *Sorting in Groups to Create a Combined Detail/Summary Report* on page 3-39 for more information.

Example Creating a Simple Matrix

The following report displays total salary outlay sorted *across* departments and *by* job codes.

	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	

Additional Sorting Options

The following options give you additional control over the organization of data in your reports. You can:

- Sort in ascending or descending order.
- Group sort fields logically on a page.
- Rank sort fields by highest or lowest values.
- Limit the number of ranked values.
- Add subheading and subfootings at sort breaks.
- Add subtotals at sort breaks.
- Set conditions for the display of sort-based subheading, subfootings, and page breaks.
- Prevent unnecessary re-sorting of data.

Procedure How to Arrange Field Values in Ascending/Descending Sort Order

You can change the sort order from ascending to descending, or vice versa, for alphanumeric (A to Z; Z to A) and numeric (1-10; 10-1) fields.

- Right-click the field and select *Options* from the shortcut menu, then click the *Sort* tab. From the Sorting tab, choose *Highest* to sort values from highest to lowest.
- Right-click the field and select *Options* from the shortcut menu, then click on the *General* tab. In the Sort box, choose *Lowest* to sort values from lowest to highest.

Procedure How to Keep Logically Grouped Sort Fields Together After a Page Break

You can break sort fields logically and regenerate the field heading on the next page or screen.

1. Right-click the field and choose *Options* from the shortcut menu, then click the *Sort tab*.
2. Select the *Sorting* tab, then select *No Split* from the Actions box.

Note: Only one No Split option is allowed per report.

Procedure How to Add a Subheading or Subfooting at a Sort Break

1. Select the sort field from the Report Painter window.
2. Do one of the following:
   - Click the *SubHeading (or SubFooting)* button on the Columns toolbar.
   - Choose *Subheading (or Subfooting)* from the Insert menu.

   A Subheading (or Subfooting) object area is added to the Report Painter window.
3. Place the cursor in the object area to add text.

Tip: To view the boundaries for all object areas, click the Report Options button on the General toolbar. Select the View tab and click the Boundaries check box.

For related information see *How to Display a Conditional Subheading, Subfooting, or Page-Break* on page 3-38.

Procedure How to Display a Conditional Subheading, Subfooting, or Page-Break

You can control when subheadings, subfootings, and page-breaks appear based on conditions you supply. The condition must be satisfied in order for the subheading, subfooting, or page-break to be displayed. You accomplish this using the When option.

1. Place the cursor in the object area (that is, subheading, subfooting, or page-break) in the Report Painter window.
2. Choose *When* from the *Properties* menu or the shortcut menu for the selected object. The When Dialog box opens. For details, see *When Dialog Box* in Appendix B, *Writing Expressions*.
3. You can use this dialog box to create an expression that determines when the subheading, subfooting or page-break should be displayed. You can also click the *Assist* button to open the Expression Builder, which is designed to help you create an expression.

For details on the Expression Builder and When dialog box, see Appendix B, *Writing Expressions*.

Example Embedding a Value in a Subheading or Subfooting

To specify the department name in a subheading field:

1. Open the EMPLOYEE data source in the Report Painter.
2. Type the following in the Subheading field:

   ```
   DEPARTMENT IS
   ```

3. Place the cursor where you want the field value to be inserted.
4. Double-click the field DEPARTMENT from the Fields window. The subheading field then shows the following:

   ```
   DEPARTMENT IS <DEPARTMENT
   ```

When the report displays, the department name for each department appears in the subheading as follows:

```
DEPARTMENT IS MIS
DEPARTMENT IS PRODUCTION
```

Procedure How to Prevent the Report Painter From Sorting Data

If the data you are accessing for your report is already in the correct sort order, you can prevent the Report Painter from re-sorting it by clicking the *Report Options* button on the General toolbar and then selecting the *Output* tab. Click *Sorted Data (TABLEF)* in the Data box.

This feature provides a very fast method of retrieving data if it is already stored in the order required for display, and no further sorting is required.

Sorting in Groups to Create a Combined Detail/Summary Report

You can produce complex reports that sort information in groups to display both summary and detailed information in the *same* report. These reports (sometimes called multi-verb requests) contain more than one display option (Sum, Detail); they also group fields within the request in order to be able to manipulate the fields in each group separately. For example, you can produce *one* report that lists the total salary for all departments in a company, the total salary for each department, and the last names and individual salaries of the employees within each department.

You can implement group sorting in the Object Inspector Sort Groups pane. All actions you perform in the Sort Groups pane immediately affect the fields in the Report Painter window.

In creating a request that produces a combined detail/summary report, a meaningful relationship must exist among the separate sort condition sets. The Report Painter automatically enforces the following rules:

- Up to sixteen Sum and Detail columns and their associated sort conditions can be used in a request.
- The first Sort Group in a report can contain a Sum column alone or a By column preceding a Sum column. For other Sort Groups, a By column must precede a Sum columns.
- Detail data in the report may appear only in the last column.
- WHERE and IF criteria apply to the records selected for the report as a whole.

Procedure How to Create and Manipulate Sort Groups

1. Drag the fields you want to include in your report from the Fields tab in the Object Inspector to the Report Painter window. Include multiple instances of fields you want to sum at various levels.

2. The fields are added as Detail columns by default. Click the Sort Groups tab and notice that all the fields are in Sort Group 1.

3. Select each column you want to sort by and click the *By* button. Then click each column you want to sum and click the *Sum* button.

   Alternatively, you can right-click each field in the Sort Group panel and choose *Change to By* or *Change to Sum*. These changes are immediately reflected in the Report Painter window.

4. You are now ready to break out your sort groups.

   Note: The first Sort Group can contain a Sum column alone or a By column followed by a Sum column; all other Sort Groups must have one or more By columns followed by a Sum column.

   - **To form your first sort group:**

     Drag a *Sum* column and drop it directly onto the Sort Group 1 folder. The dragged column becomes the first column in the group and in the Report Painter window.

     or

     Drag a *Sum* column and drop it onto a By column.

     The Sort Groups tab is refreshed to display the first Sort Group as you specified. Other fields are now listed in Sort Group 2.

   - **To form another sort group,** drag a Sum column onto a By column.

     Once again, the Sort Group pane is refreshed. The Sum column follows the associated By column in the Report Painter window and the remaining fields are collected in the next Sort Group.

     Repeat this process for each group you wish to create.

5. If your report contains a Detail field, it will be moved to the last column in the report, and designated as its own sort group.

Example Creating a Detail/Summary Report

Suppose that you want to see total sales at different levels within your enterprise. The following example shows how to create a report of total sales for all Gotham Grinds stores by state, total sales for each Gotham Grinds store, and sales for each product.

1. Open the GGSALES data source in the Report Painter.
2. Double-click or drag *ST*, *STCD, PRODUCT, DOLLARS*, *DOLLARS*, and *DOLLARS* from the Fields tab of the Object Inspector. The first instance of *DOLLARS* will show total sales for each state. The second instance will show total sales for each store. The third instance will show total sales for each product.
3. Select the first instance of the Dollar Sales column in the Report Painter window and click the *Sum* button in the Painter's toolbar. The other two instances of Dollar Sales automatically become summary columns.
4. Select the *State* column in the Report Painter window and click the *By* button in the Painter's toolbar. Repeat this step for the *Store ID* and *Product* columns.
5. Click the Sort Groups tab in the Object Inspector. All the report columns are in Sort Group 1.
6. To form your first sort group, drag the first instance of *DOLLARS* and drop onto *ST*.

   The Sort Group pane is refreshed. The remaining fields are now listed in Sort Group 2.
7. To form your second sort group, drag the second instance of *DOLLARS* and drop onto *STCD*.

   The Sort Group pane is refreshed. The remaining fields are now listed in Sort Group 3.
8. Select the third Dollar Sales column in the Report Painter window and click the *Detail* button.

9. Run the report by clicking the *Run* button on the toolbar. The report displays in the browser.

State	Dollar Sales	Store ID	Dollar Sales	Product	Dollar Sales
CA	$7,642,272.00	R1040	$3,772,014.00	Biscotti	$24,060.00
					$20,880.00
					$19,006.00
					$19,005.00
					$18,564.00
					$17,120.00
					$16,515.00
					$15,070.00
					$14,976.00
					$14,366.00
					$12,782.00
					$11,900.00
					$10,850.00
					$9,422.00
					$8,508.00
					$6,747.00
					$5,907.00
					$4,580.00
					$4,190.00
					$3,984.00
					$2,445.00
					$2,128.00
					$1,996.00
					$1,030.00
				Capuccino	$25,005.00
					$23,282.00

Note that to make the report more readable and more compact, we deselected *Squeeze to minimum width* and suppressed page numbers.

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.

The TOC also enhances the display of groups of data. You can view one section (or page) of a report at a time, or you can view all sections at once. You can control this feature with a page break. For more information, see *Customizing Report Sections for Display* on page 3-54.

The TOC displays all values of the first (highest level) vertical sort field, as well as the values of any lower level By fields designated 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 section 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 car 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.
- Remove the TOC. This feature is useful 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 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 *Creating Reports With WebFOCUS Language*.
- **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 *Creating Reports With WebFOCUS Language*.

For more information, see:

- *Adding a Single-level TOC to a Report* on page 3-44
- *Adding a Single-level TOC to a Page Heading* on page 3-47
- *Navigating Sorted Data From a Multi-level Report TOC* on page 3-48
- *Navigating Sorted Data From a Multi-level Page Heading TOC* on page 3-51

Procedure How to Add an HTML TOC or Disable the TOC Feature

1. From the Report Painter, right-click a By column in the report and select *Table of Contents*. A cascading menu displays.
2. Choose one of the following options:
   - *Report* to embed the TOC in the executed report as an expandable tree control.
   - *Heading* to add the By columns as the last objects in the page heading. The TOC appears in a drop-down list in the heading when the report is executed.
   - *None* to turn the HTML TOC feature off.

     Tip: Click the *Properties* tab in the Object Inspector to verify that the Table of Contents is turned on.

or

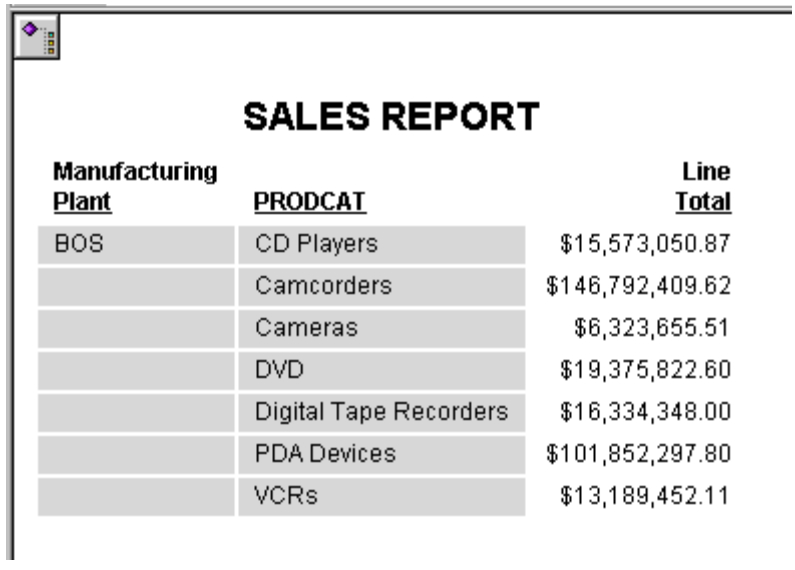
1. Right-click the first By column in the Report Painter window and select *Options*. The Field Properties dialog box opens.
2. Select the General tab.
3. Select *Report* or *Heading* in the Table of Contents section of the tab.
4. To turn the HTML TOC feature off, select *None* in this section of the tab.

Example Adding a Single-level TOC to a Report

1. After selecting the Centord data source to report against, open the Report Painter.

   Tip: To verify that the output format is set to HTML, click the *Report Options* button, select the Output tab, and ensure that HTML appears in the Select Format drop-down list.
2. Add the following fields from the Object Inspector: PLANT, PRODCAT, and LINEPRICE.
3. Select the LINEPRICE column in the Report Painter window and click the *Sum* button.
4. Select the PLANT and PRODCAT columns and click the *By* button.
5. Right-click the *first* By column (PLANT) and choose *Table of Contents*, then choose *Report* from the cascading menu.
6. Add and center the page heading SALES REPORT.

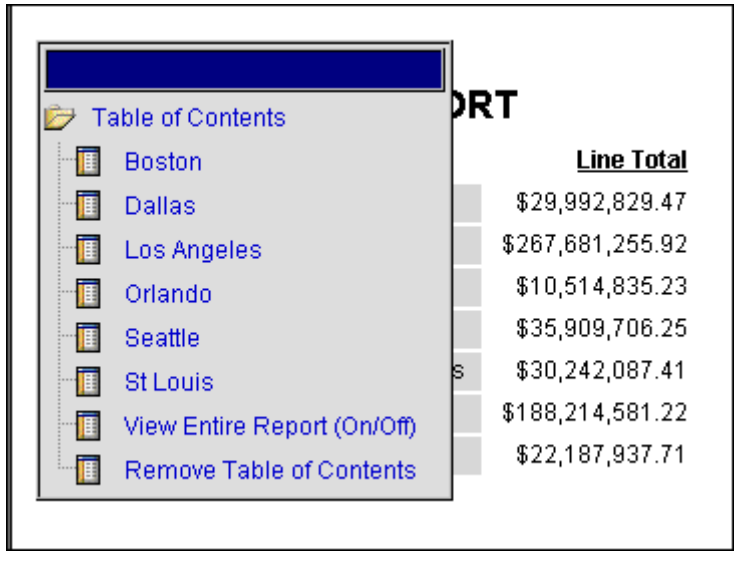
7. Run the report; the TOC object displays in the upper left corner.



SALES REPORT

Manufacturing Plant	PRODCAT	Line Total
BOS	CD Players	$15,573,050.87
	Camcorders	$146,792,409.62
	Cameras	$6,323,655.51
	DVD	$19,375,822.60
	Digital Tape Recorders	$16,334,348.00
	PDA Devices	$101,852,297.80
	VCRs	$13,189,452.11

8. Double-click the TOC icon to display a list of the sort values for PLANT, with two viewing options.

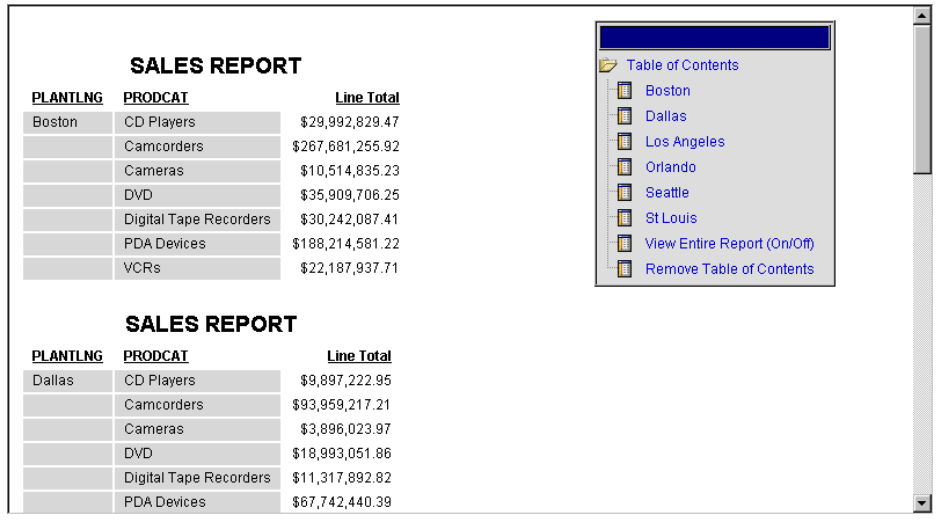


You can move the TOC anywhere on the screen by clicking the blue area above the Table of Contents and then dragging the TOC. You can also move it by double-clicking a location in the report at which to position the TOC.

9. On the TOC, click each plant (city) to see the related information. The selected plant flashes to highlight it in the window. You can display any portion of the report by clicking that value in the TOC.

You have the following options:

- Click *View Entire Report* to display all data values in the report (the first two plants are shown in the example).



- Click *Remove Table of Contents* to remove the TOC.
- Double-click anywhere in the report area to redisplay the TOC.
- Click *Table of Contents* to collapse the TOC list. Click *Table of Contents* again to expand it.

Tip: You can customize the look and feel of the TOC object by editing a .css file. Go to \ibi\DevStudio*xx*\ibi_html\javaassist\intl\En\toc.css. Do not forget to make a backup copy.

Note: To display all columns of data so that they have the same width, use one of the following options:

- Wrap. See *How to Wrap Data Automatically by Changing a Column's Width* on page 3-82.
- Squeeze. See *How to Squeeze Columns* on page 3-83.

Example Adding a Single-level TOC to a Page Heading

1. After selecting the Centord data source to report against, open the Report Painter.

   Tip: To verify that the output format is set to HTML, click the *Report Options* button, select the Output tab, and ensure that HTML appears in the Select Format drop-down list.

2. Add the following fields from the Object Inspector: PLANT, PRODCAT, and LINEPRICE.

3. Select the LINEPRICE column in the Report Painter window and click the *Sum* button.

4. Select the PLANT and PRODCAT columns and click the *By* button.

5. Right-click the *first* By column (PLANT) and choose *Table of Contents*, then choose *Heading* from the cascading menu.

   The PLANT field is inserted in the page heading.

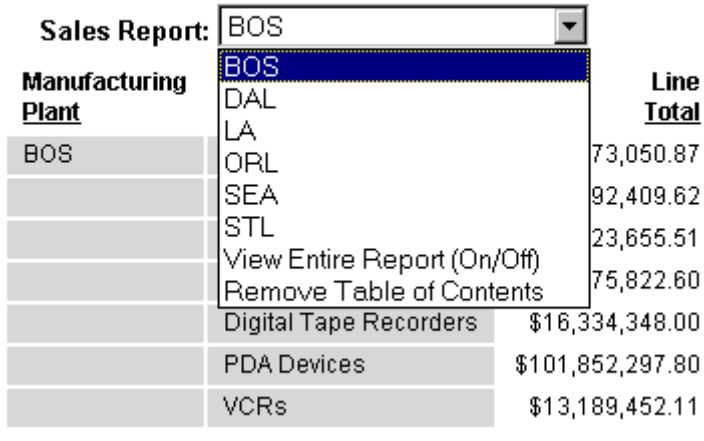
6. Enter the following text in the page heading so that it looks like this:

   Sales Report: <PLANT

   Change the font size to 10.

7. Run the report; the TOC is displayed in the page heading drop-down list.

   Expand the drop-down list to display the sort values for PLANT and the viewing options.



8. On the TOC, click each plant (city) to see the related information. The selected plant flashes to highlight it in the window. You can display any portion of the report by clicking that value in the TOC.

   You have the following options:

   - Click *View Entire Report* to display all data values in the report.
   - Click *Remove Table of Contents* to remove the TOC.
   - Double-click anywhere in the report area to redisplay the TOC.

Navigation Behavior in a Multi-level TOC

If you select a value in a multi-level TOC, that value flashes (that is, it is highlighted in gray) to draw attention to it. It also moves to the top of the window for viewing.

If the selected value is already viewable in the window, and the remaining report will fit in the window, the value flashes, but the report does not scroll.

Example Navigating Sorted Data From a Multi-level Report TOC

To generate a lengthy report for the purpose of illustration, this example prints the field PROJECTED_RETURN (that is, it uses the Detail function for the field).

In this example you will add a dynamic HTML TOC as an object in the upper left corner of a report and display a hierarchy consisting of multiple levels of sort fields, beginning with the highest level.

1. After selecting the Short data source to report against, open the Report Painter.

   Tip: To verify that the output format is set to HTML, click the *Report Options* button, select the Output tab, and ensure that HTML appears in the Select Format drop-down list.

2. Add the following fields from the Object Inspector: PROJECTED_RETURN, CONTINENT, REGION, COUNTRY, HOLDER, and TYPE.

3. Select the CONTINENT, REGION, COUNTRY, HOLDER, and TYPE columns and click the *By* button.

4. Right-click the *fifth* By column (TYPE) and choose *Table of Contents*, then choose *Report* from the cascading menu.

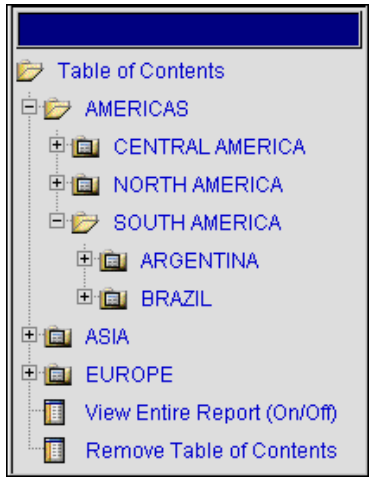
5. Run the report; the TOC is displayed in the upper left corner.

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

6. Double-click the TOC. Select *View Entire Report* and scroll down to see the data for the three continents.

Scroll back to the top of the report. Select *AMERICAS*. Your selection flashes to highlight it in the window. If you scroll down now, you will see that the report contains values only for the Americas.

7. Click the + sign next to AMERICAS in the TOC, and then click the + sign next to SOUTH AMERICA.



The field values ARGENTINA and BRAZIL are listed in the TOC. These are values of COUNTRY. To see the field name of a value in the TOC, place the cursor over that value.

8. Select BRAZIL. BRAZIL flashes, and the associated data moves into the window.

		BRAZIL	COMM	OVERNIGHT	.180
					.180
					.180
					.180
					.180
					.180
					.180
				ST. NOTES	.140
					.140
					.140
					.140
					.140
					.140
					.140
			GOVT	CASH	.110
					.110
					.110
					.110
					.110
					.110

9. Continue to drill down 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 (link) in the TOC momentarily highlights that value in the report and, if necessary, adjusts the report display to move the value into view.
   - If you click *Table of Contents*, the TOC collapses, but you can continue to scroll through the data, expand the TOC again, and make additional selections.

Example Navigating Sorted Data From a Multi-level Page Heading TOC

To generate a lengthy report for the purpose of illustration, this example prints the field PROJECTED_RETURN (that is, it uses the Detail function for the field).

1. After selecting the Short data source to report against, open the Report Painter.

   Tip: To verify that the output format is set to HTML, click the *Report Options* button, select the Output tab, and ensure that HTML appears in the Select Format drop-down list.

2. Add the following fields from the Object Inspector: PROJECTED_RETURN, CONTINENT, REGION, COUNTRY, HOLDER, and TYPE.

3. Select the CONTINENT, REGION, COUNTRY, HOLDER, and TYPE columns and click the *By* button.

4. Right-click the first three By columns (CONTINENT, REGION, and COUNTRY) one at a time and choose *Table of Contents*, then choose *Heading* from the cascading menu.

   These fields are inserted in the page heading.

5. Enter the following text in the page heading so that the heading looks like this:

   PROJECTED RETURN
   For: <CONTINENT For: <REGION For: <COUNTRY

   Change the font size of the second line to 10.

6. Run the report. It contains three HTML TOCs in the drop-down lists in the second line of the page heading, one for each sort field specified in the request.

PROJECTED RETURN

For: AMERICAS **For:** CENTRAL AMERICA **For:** GUATEMALA

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

7. 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 and lower level drop-down lists. Said another way, they are all part of the same higher level sort group, and, therefore, within the same page break.

   The selected value, NORTH AMERICA, flashes and moves to the top of the window; from there you can scroll to see the related data.

NORTH AMERICA	CANADA	COMM	OVERNIGHT	.190
				.190
				.190
				.190
				.190
				.190
				.190
			ST. NOTES	.100
				.100
				.100
				.100
				.100
				.100
				.100
		GOVT	CASH	.040
				.040
				.040
				.040
				.040
				.040
				.040

   If you select information already in your field of view, the value will flash to draw your attention to that location, but the display will not change.

8. 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 city (HONG KONG) in the FAR EAST region.

9. Continue to experiment with other selections.

Customizing Report Sections for Display

Data in a report with a TOC is grouped into sections based on the sort fields.

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 the data based on a lower level sort field.

Example Customizing Report Sections

To generate a lengthy report for the purpose of illustration, this example prints the field PROJECTED_RETURN (that is, it uses the Detail function for the field).

1. After selecting the Short data source to report against, open the Report Painter.

   Tip: To verify that the output format is set to HTML, click the *Report Options* button, select the Output tab, and ensure that HTML appears in the Select Format drop-down list.

2. Add the following fields from the Object Inspector: PROJECTED_RETURN, CONTINENT, REGION, COUNTRY, HOLDER, and TYPE.

3. Select the CONTINENT, REGION, COUNTRY, HOLDER, and TYPE columns and click the *By* button.

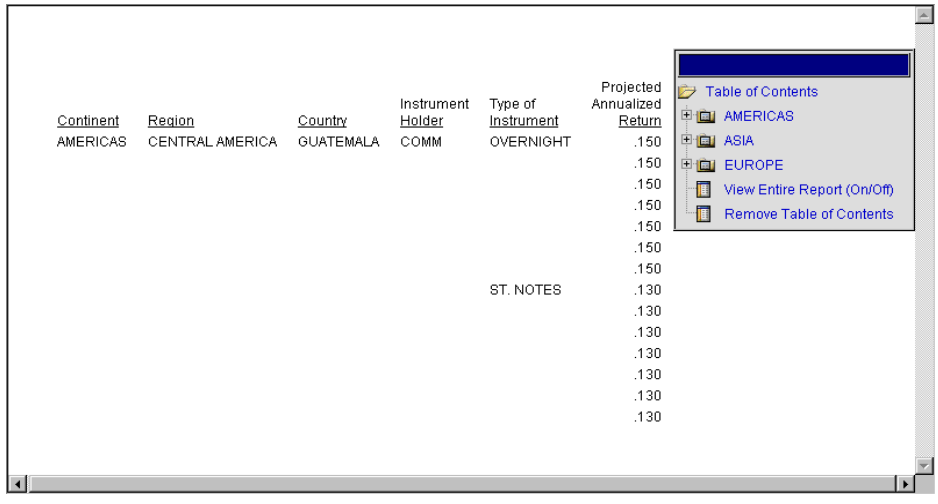
4. Right-click the column HOLDER and select *Options* from the menu. On the Field Properties dialog box, select the Sort tab. Under Actions, click *Page Break*. Click *OK* to close the dialog box.

   This step generates a page break on the report each time the value of HOLDER changes.

5. Right-click the *fifth* By column (TYPE) and choose *Table of Contents*, then choose *Report* from the cascading menu.

6. Run the report. The TOC is displayed in the upper left corner, and only one section of the report—the data for the instrument holder COMM—is displayed.

   Double-click the TOC to expand it, and move it outside the report data.



HTML Table of Contents Limits

The TOC feature:

- Applies to HTML output.
- Is supported with Internet Explorer Version 5.5 and later.
- Does not support the Dialogue Manager command -HTMLFORM.
- 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.

If you have installed ReportCaster, you can distribute a report with an HTML TOC by including the commands SET BASEURL=HTTP://*webserver* and ON TABLE PCHOLD FORMAT HTML BYTOC [*n*] in the report request.

Including a Total or Subtotal

To help you and others interpret the detailed information presented in a report, the Report Painter enables you to summarize numeric information using column and row totals, grand totals, and subtotals. These summary lines may be used to clarify or highlight information in numeric or matrix reports.

Calculating a Row or Column Total

You can add totals for rows or columns of numbers:

- Column totaling produces a final row on the report, which contains the totals for each column of numbers.
- Row totaling produces a new column containing the sum of all numbers in each row.

Procedure How to Hide/Display Totals for all Columns

1. Click the *Report Options* button on the General toolbar and then select the *Output* tab.
2. In the Totals box, click *Show Column Totals* to display a total for every column on the report.

   or

   Deselect *Show Column Totals* to hide the display of column totals.

Procedure How to Hide/ Display Row Totals

1. Click the *Report Options* button on the General toolbar and then select the *Output* tab.
2. In the Totals box, click *Show Row Totals* to display a total for every row on the report.

   or

   Deselect *Show Row Totals* to hide the display of row totals.

Adding a Section Total or Grand Total to a Report

Frequently, reports contain detailed information that is broken down into subsections for which simple column and row totals do not provide adequate summaries. In these instances, it is more useful to look at subtotals for particular sections and a grand total at the end of the report.

In general, subtotals produce totals every time a specified sort field value changes. The Report Painter provides several options for creating section subtotals and grand totals:

- **Subtotal and Sub-total.** Use Subtotal or Sub-total to add up individual values, such as columns of numbers, each time the named sort field changes value. Subtotal shows column totals each time the named sort field changes value. Sub-total shows column totals each time the named sort field and any higher-level sort fields change values.
- **Summarize and Recompute.** Summarize and Recompute should be used instead of Subtotal and Sub-total to recalculate calculated values. Summarize works like Sub-total in that it recalculates values at every sort break. In contrast, Recompute recalculates only at the specified sort break, like Subtotal.
- **Recap.** Recap enables you to use subtotal values in a calculation. The subtotal values are not displayed; only the result of the calculation is shown on the report. For related information see Chapter 10, *Creating Reports With WebFOCUS Language*.

To further control when subtotals are produced, you can use the When option with any subtotaling command. Subtotal commands are independent of record selection phrases. For details, see Appendix B, *Writing Expressions*.

Procedure How to Add a Subtotal

1. Select the By sort field in the Report Painter window.
2. Click the *SubTotal* button on the Columns toolbar.

   A Subtotal field appears in the Report Painter window indicated by the word *TOTAL.
3. You can add to or type over *TOTAL.

Subtotal displays a total for columns containing numeric values only when a specified sort field changes values.

Example Showing a Subtotal and a Total

The following report on employee salaries shows each department's total salary expense, as well as a grand total for all departments.

DEPARTMENT	LAST_NAME	CURR_SAL
MIS	BLACKWOOD	$21,780.00
	CROSS	$27,062.00
	GREENSPAN	$9,000.00
	JONES	$18,480.00
	MCCOY	$18,480.00
	SMITH	$13,200.00
*TOTAL DEPARTMENT MIS		$108,002.00
PRODUCTION	BANNING	$29,700.00
	IRVING	$26,862.00
	MCKNIGHT	$16,100.00
	ROMANS	$21,120.00
	SMITH	$9,500.00
	STEVENS	$11,000.00
*TOTAL DEPARTMENT PRODUCTION		$114,282.00
TOTAL		$222,284.00

Procedure How to Add a Subtotal on Several Sort Levels

1. Select the lowest level By sort field in the Report Painter window for which you want a total.
2. Choose *Sub-total (Subtotal outer sort fields also)* from the Insert menu.

   A Subtotal field appears in the Report Painter window indicated by the word *TOTAL.
3. You can add to or type over *TOTAL.

Sub-total displays a total for columns containing numeric values when a specified sort field, and any preceding (higher level) sort field(s) change values.

Procedure How to Suppress a Subtotal for One Item in a Sort Group

1. Select the By subtotal object area in the Subtotal field window.
2. Choose *Multilines* from the Properties menu.

   or

   Right-click and select *Multilines* from the shortcut menu.

Multilines displays subtotal lines only when the specified sort field contains more than one record.

Procedure How to Add a Subtotal for a Computed Field

1. Select the By sort field in the Report Painter window. For related information, see Chapter 5, *Creating Temporary Fields*.
2. Choose *Recompute* from the Insert menu.

   A recomputed field appears in the Report Painter window of the report indicated by the word *TOTAL.
3. You can add to or type over *TOTAL.

Recompute displays totals for columns containing numeric values, and recalculates temporary fields containing information such as ratios using subtotals each time a specified sort field changes values.

Procedure How to Add a Subtotal for a Computed Field on Several Sort Levels

To calculate a subtotal on a computed field when a specific sort field or a higher-level sort field changes:

1. Select the lowest level By sort field in the Report Painter window for which you want a total.
2. Choose *Summarize (Recompute outer sort fields also)* from the Insert menu.
3. You can add to or type over this text.

Summarize displays totals for columns containing numeric values and recalculates temporary fields each time a specified sort field or preceding sort fields (higher levels) change values.

Procedure How to Return a Default Title for the Object Area

1. Select the subtotal field.
2. Choose *Use Default Text* from the Properties menu for the selected object area.

   or

   Right-click and select *Use Default Text* from the shortcut menu.

The default title is returned to the object area.

Procedure How to Suppress a Subtotal for a Field

1. Right-click a column to which subtotaling has been applied and choose *Options* from the shortcut menu. The Field Properties General tab opens.
2. In the Output box, deselect the *Show Subtotal* check box.

Procedure How to Create a Subtotal Calculation

To use subtotal values in a calculation and display the result of the calculation (not the subtotal value) on the report:

1. Select a By field in the Report Painter window.
2. Choose *Recap* from the Insert menu. The Recap dialog box opens. For details, see Appendix B, *Writing Expressions*.
3. Type a field name in the Field combo box.
4. Type the format directly in the Format box or click the *Format* button to display the Format dialog box. For details, see Chapter A, *Assigning Field Formats*.
5. Enter a calculation in the window.
6. Click *OK*.

Recap computes subtotals based on user-supplied calculations. New values are displayed each time the specified sort field value changes.

Selecting Data

You can produce a report based on selected data, or a subset of the records in a data source. You do this by specifying certain selection criteria; the Report Painter includes in the report only the records that meet those conditions.

For example, you might want a report that lists only those employees hired since the beginning of 2001. If your data source contains the field START_DATE, you would specify record selection criteria in which the START_DATE is greater than 12/31/00.

There are three types of record selections you can create: Where, If, and Where Total.

- Where enables you to display only those field values that meet your needs.
- If enables you to perform Boolean tests (TRUE/FALSE) as well as the same tests you can perform with Where.
- Where Total enables you to select records based on the aggregate value of a field—for example, on the sum of a field's values, or on the average of a field's values.

You can also:

- Embed variables in your selection criteria; the Report Painter prompts for a value when your application is run.
- Create a list of acceptable values for a field. This list is used to populate drop-down menus in the Report Layout Painter to facilitate the creation and running of parameterized reports. For related information on the Report Layout Painter, see *Designing a User Interface for a Web Application With the Report Layout Painter* in *Developing Reporting Applications*.

Procedure How to Add Record Selection Criteria

To add record selection criteria:

1. Depending on the type of field you want to select records from (Detail, Sum), do one of the following:
   - If you want data evaluated before it is retrieved, click the *Where/If* button on the Columns toolbar to open the Report Options dialog box at the Where tab.
   - If you want data evaluated based on a Boolean expression, click the *Where/If* button on the Columns toolbar. Then, select the *If* tab.
   - If you want data selected after all the data has been retrieved and processed, click the *Where/If* button on the Columns toolbar. Then, select the *Where Total* tab. For details, see When Dialog Box and Report Options Where/If Tab.

   Choose one of the following:

   - Click the *Assist* button to display the Expression Builder dialog box. The Expression Builder dialog box assists you in constructing selection criteria. This dialog box is also available from the Report Assistant, the Graph Assistant, and the When dialog box. For details about the Expression Builder, see *Using the Expression Builder* in Appendix B, *Writing Expressions*.
   - Type your expression directly in the Expression box.

     Note: If you are typing an expression with multiple criteria directly into the Where or Where Total dialog box, you must explicitly include parentheses to control the order of evaluation. For details about order of evaluation, see *Order of Evaluation* in Appendix B, *Writing Expressions*.
2. Click *OK* to confirm your expression. The Report Painter checks your syntax before exiting; if you have made any errors, you will be unable to exit until you fix them.

Example Creating Record Selection Criteria

Suppose that you want to see total sales for specific products. The following example shows how to create a report of the Gotham Grinds Cappuccino and Espresso sales for each store within each region.

1. Open the GGSALES data source in the Report Painter.
2. Identify and format your report columns.
   a. Identify your sort columns. Click *By* on the Report Painter toolbar and double-click or drag *REGION*, *STCD*, and *PRODUCT* from the Fields tab of the Object Inspector.
   b. Identify your summary column. Click Sum on the Report Painter toolbar and double-click or drag *DOLLARS* from the Fields tab of the Object Inspector.
   c. Format the Dollar Sales column. Right-click Dollar Sales in the Report Painter window and select Format. Click *Decimal* in the Format Types box. Select *Floating dollar -- M from the Edit Options list*. Click *OK*.
3. Apply selection criteria:
   a. Click the *Where/If* button on the Columns toolbar to open the Report Options dialog box at the Where tab.
   b. Click *Assist* to open the Expression Builder.
   c. Select *PRODUCT* from the Fields list.
   d. Select Is *EQUAL to* from the Relations list.
   e. Click *Values* to retrieve a list of data available for the PRODCAT field, then:
   f. Select *Cappuccino* from the drop-down list and click Add.
   g. Click the drop-down list again and select *Espresso*, then click *Add*.
   h. Click *OK*. Your new expression is added to the Expression Builder's list of expressions.
   i. Click *OK* to return to the *Where/If* dialog box.
   j. Click *OK* to return to the Report Painter window.

4. Run the report by clicking the *Run* button on the toolbar. The report displays in the browser.

Region	Store ID	Product	Dollar Sales
Midwest	R1019	Espresso	$455,365.00
	R1020	Espresso	$420,439.00
	R1250	Espresso	$419,143.00
Northeast	R1044	Capuccino	$174,344.00
		Espresso	$248,356.00
	R1100	Capuccino	$158,995.00
		Espresso	$279,373.00
	R1109	Capuccino	$208,756.00
		Espresso	$322,378.00
Southeast	R1041	Capuccino	$352,161.00
		Espresso	$317,389.00
	R1088	Capuccino	$274,812.00
		Espresso	$279,644.00
	R1200	Capuccino	$317,027.00
		Espresso	$256,539.00
West	R1040	Capuccino	$306,478.00
		Espresso	$267,809.00
	R1244	Capuccino	$279,830.00
		Espresso	$338,270.00
	R1248	Capuccino	$309,197.00
		Espresso	$301,538.00

Note that to make the report more readable and more compact, we deselected *Squeeze to minimum width* and suppressed page numbers.

Retrieving a Certain Number of Records

You can retrieve a specified number of records on a report. It is useful to limit record retrieval when:

- You are designing a new report and need only a few records from the data source to test the design.
- You already know the number of records that meet the test criteria and want to stop the search after that number has been retrieved. This reduces the total retrieval time.

Procedure How to Retrieve a Certain Number of Records

1. Select the *Where/If* button on the Columns toolbar to open the Report Options dialog at the Where tab.
2. Select the *Retrieval Limits* tab.
3. Enter the number of records to retrieve in the Record Limit box.
4. Click *OK*.

When you run the report, only that number of records displays. You can also restrict record retrieval. See also *Reading a Certain Number of Records* on page 3-64.

Reading a Certain Number of Records

You can specify the maximum number of physical records read. Retrieval stops at that point.

Procedure How to Read a Certain Number of Records

To specify the maximum number of records to read:

1. Select the *Where/If* button on the Columns toolbar to open the Report Options dialog at the Where tab.
2. Select the *Retrieval Limits* tab.
3. Enter the number of records to retrieve in the Read Limit box.
4. Click *OK*.

   Note: This feature is only available for non-FOCUS data sources.

Creating a List of Acceptable Values

You can create a list of acceptable values for one or more selection criteria (Where statements) and use each set of values to run a parameterized report. The user is prompted for a value when the report is run.

If you call the Report Painter from the Report Layout Painter and create a procedure that defines acceptable values for one or more fields, the values populate drop-down lists from which a user can choose. For information about the Report Layout Painter, see *Designing a User Interface for a Web Application With the Report Layout Painter* in *Developing Reporting Applications*.

Procedure How to Create a List of Acceptable Values for a Parameter

1. Click the Report Options button on the General toolbar and select the Where/If tab

   or

   Click the *Where/If* button on the Columns toolbar.
2. Click *Assist* in the Where tab to open the Expression Builder.
3. Double-click a field name from the list on the left side of the window to add it to the Column to filter column.

   If you want to change the field name in the Column to filter column, click the down arrow and select a different field name from the list.
4. Click the down arrow in the Logical Relations column to select a relation from the drop-down list.
5. Click the down arrow in the Compare Type column and select Parameter from the drop-down list.
6. Double-click the Compare Value column. The Variable Editor opens.
7. In the Name input box, type a name for the variable. This name will appear as the Column title if the field is added to the report.
8. Enter a message that will prompt the user to select a value. This is an optional entry.
9. Click the *And* or *Or* radio button in the Multi-Select area to add values for fields you want to include in your list of valid values.
10. Click the *Add* button. The Add Accept Value dialog box opens.

11. Select one of the following:

- Click the *Value* radio button, then select the same field you chose in step 3.

or

- Click the *Range* radio button to multi-select the other values you want to include in your list.

Note: Selecting *Range* is optional. You cannot select the Value and Range options at the same time. If you select Range, you must select two values, the highest or lowest values in the range.

The values are shown in the Accept List.

12. Click *OK*.

Procedure How to Edit Multiple Values

1. Click the Report Options button on the General toolbar and select the Where/If tab

or

Click the *Where/If* button on the Columns toolbar.

2. Click *Assist* in the Where tab to open the Expression Builder.

3. Double-click a field name from the list on the left side of the window to add it to the Column to filter column.

4. Click the down arrow in the Logical Relations column to select a relation from the drop-down list.

5. Click the down arrow in the Compare Type column and select Value from the drop-down list.

6. Double-click the Compare Value column. The Edit Multiple Values dialog box opens.

7. Click the *View Data* button and select a value from the list.

8. Double-click the value or click *Add* to add the value to the list.

Tip: Repeat this process to add other values to the list.

9. Click *OK*.

The values are shown in the Compare Value column.

Procedure How to Specify a Range of Values for Variables in Your Report

1. Click inside the Fields tab on the Object Inspector.
2. Right-click a field and select *New Amper Variable Field*.

   The Variable Editor opens.
3. In the Name input box, type a name for the variable. This name will appear as the Column title if the field is added to the report.
4. Optionally, provide text for the message that prompts a user to supply a value for the variable.
5. Click *Add*. The Add Accept Value dialog box opens.
6. Click the *Fields* radio button and select one or more fields from the activated list.
7. Click the *Range* radio button and select two fields from the activated list.
8. Click *OK* to return to the Variable Editor dialog box where you can see the range you specified in the Accept List.

Procedure How to Compare the Selected Field to Another Field

1. Click the Report Options button on the General toolbar and select the Where/If tab

   or

   Click the *Where/If* button on the Columns toolbar.
2. Click *Assist* in the Where tab to open the Expression Builder.
3. Double-click a field name from the list on the left side of the window to add it to the Column to filter column.

   If you want to change the field name in the Column to filter column, click the down arrow and select a different field name from the list.
4. Click the down arrow in the Logical Relations column to select a relation from the drop-down list.
5. Click the down arrow in the Compare Type column and select Field from the drop-down list.
6. Click the down arrow in the Compare Value column to select another field in the data source to compare it to the selected field.
7. Click *OK*.

Reference Variable Editor and Add Accept Value Dialog Box

The Variable Editor and the Add Accept Values dialog box are used to:

- **Create a variable field** as a column in order to be able to control report output. For example, you can define a variable as &COST, and allow a user to select DRETAIL_COST or DEALER_COST at run time.
- **Define lists of acceptable values** that can be used to populate a drop-down list from which a user can make a selection at run time.

The dialog boxes include the following fields:

Name

If you are defining a list of acceptable values, this field displays the name of the variable that you specify in the Expression Builder. See *How to Create a List of Acceptable Values for a Parameter* on page 3-65.

If you are creating a Variable field, enter its name in this box. See *How to Create a Variable Field in Your Report* on page 3-21.

Prompt

An optional entry that prompts the user to supply a value for the variable or to select a value from those you identify as acceptable.

Accept List

Displays the values of the selected field, as specified in the Add Accept Values dialog box.

The Add Accept Values dialog box includes the following radio buttons:

Constant

Enables you to enter the exact values that a user can select from the drop-down list. Separate multiple entries in the Constant input line with commas.

This is another technique for selecting acceptable values and produces the same result as selecting from the list of fields or values.

Field

Enables you to select the field names you want to include in an Accept list for a variable field.

Values

Enables you to select the values you want to include in an Accept list for a selection criterion.

Range

Enables you to specify a range of values rather than a list of acceptable values.

Adding a Page Heading or Footing

You can add a page heading and/or a page footing to a report. A page heading is text that appears at the top of every page of a report. A page footing is text that appears at the bottom of every page.

You can specify whether the page heading and/or page footing is left justified, right justified, or centered. Individual lines in the page heading or footing can be assigned a different justification. For example, you can have a two-line page heading in which the first line is right justified and the second line is centered.

The heading or footing can display the current page count and total page count.

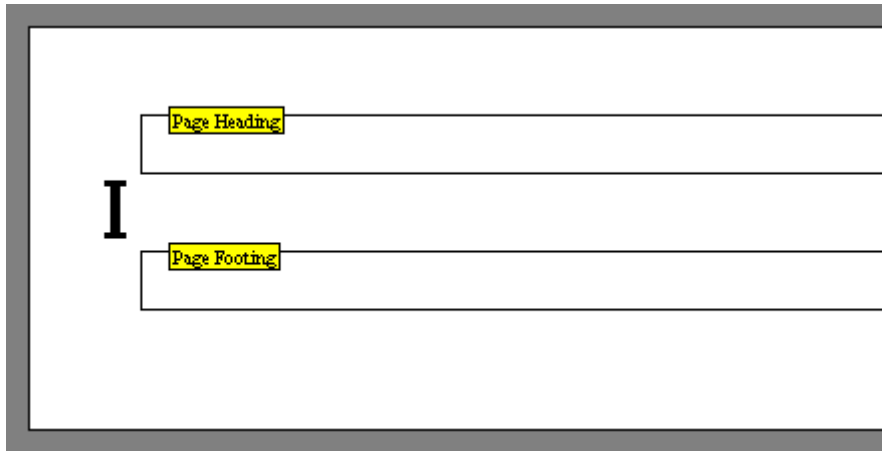
If you are sorting the data in a report, you can add subheading and subfootings at sort breaks. For details, see *How to Add a Subheading or Subfooting at a Sort Break* on page 3-37.

Procedure How to Add a Page Heading or Footing

To add a heading or a footing to a report:

1. Click the *Report Options* button on the General toolbar. The Report Options dialog box opens.
2. Click the *View* tab and then select the *Boundaries* check box in the General box.
3. Click *OK*.

   The Page Heading and Page Footing objects display:



Note: If you previously specified a subheading, subfooting, or subtotal, those fields also display.

4. Position the cursor in the page heading or footing by clicking your left mouse button in the heading or footing area.
5. Type the heading or footing text.
6. To embed field values in a page heading or footing:
   a. Place the cursor in the page heading/footing where you want to embed the value.
   b. Double-click a field from the Fields tab in the Object Inspector.
7. To justify a line in the page heading/footing:
   a. Highlight the line you want to justify.
   b. Right-click the highlighted line and select *Justify* from the shortcut menu. Select the justification option from the cascading menu.
8. To place the footing at the bottom of the page, right-click and select *Footing Bottom* from the shortcut menu.

You can also perform a calculation or other operation on a field value in a page heading or footing.

Example Embedding a Field Value in a Page Heading or Page Footing

Suppose that you want to see total sales at different levels within your enterprise. The following example shows how to create a report of total sales for Gotham Grinds within each region and city and embed the total sales quota in the page heading.

1. Open the GGSALES data source in the Report Painter.
2. Identify and format your report columns.
   a. Identify your sort columns. Click By on the Report Painter toolbar and double-click or drag *REGION* and *CITY* from the Fields tab of the Object Inspector.
   b. Identify your summary column. Click Sum on the Report Painter toolbar and double-click or drag *DOLLARS* from the Fields tab of the Object Inspector.
   c. Format the Dollar Sales column. Right-click Dollar Sales in the Report Painter window and select Format. Click *Decimal* in the Format Types box. Select *Floating dollar -- M* from the Edit Options list. Click *OK*.

3. Add a page heading:

a. Click the *Report Options* button on the General toolbar to open the Report Options dialog box.

b. Click the *View* tab, select the *Boundaries* check box in the General box, and then click *OK*.

c. Position the cursor in the page heading by clicking your left mouse button in the heading area. Delete *PAGE <Page Number* and type the following in the heading area, adding two spaces after the equal sign:

Total Budget Dollars =

Embed the total sales quota in the heading.

d. Place the cursor after the two spaces then double-click or drag *BUDDOLLARS* from the Fields tab in the Object Inspector.

e. Highlight *<BUDDOLLARS*. Right-click and choose *Prefix Operators* then *TOT* from the shortcut menu. The field appears as <TOT.BUDDOLLARS, indicating that it will be totaled when the report is run.

f. Press the Enter key twice to leave two lines between the heading and your report content.

4. Run the report by clicking the *Run* button on the toolbar. The report displays in the browser.

Total Budget Dollars = 46220799

Region	City	Dollar Sales
Midwest	Chicago	$3,924,401.00
	Houston	$3,714,978.00
	St. Louis	$3,761,286.00
Northeast	Boston	$3,707,986.00
	New Haven	$3,782,049.00
	New York	$3,902,275.00
Southeast	Atlanta	$4,100,107.00
	Memphis	$3,687,057.00
	Orlando	$3,923,215.00
West	Los Angeles	$3,772,014.00
	San Francisco	$3,870,258.00
	Seattle	$4,010,685.00

Note that to make the report more readable and more compact, we deselected *Squeeze to minimum width* and suppressed page numbers.

Positioning an Object in a Heading or Footing

You can specify the position of a heading or footing element using the Position dialog box. You can position the following elements in a report heading:

- Embedded field
- Heading text
- Page Number field

Note: For HTML reports, ensure that you have turned on the Cascading Style Sheets option in the Report Options Output tab.

Procedure How to Position an Object in a Heading or Footing

1. Select the element in the heading or footing (the element can be a field, text, or a page number). To do this, drag your cursor over the element until it is highlighted.
2. Right-click the selected element and choose *Position* from the shortcut menu.

   The Position dialog box opens.
3. Select one of the four radio buttons. Depending on the radio button selected, you are required to enter a parameter in the entry window. See *Position Dialog Box* on page 3-73 for details.
4. Click *OK*.

Reference Position Dialog Box

The Position dialog box has the following fields/options:

After previous item (default)

By default, any object in your heading is placed one space from the previous object.

Distance from left margin

Select this option to position the object in relation to the left margin of the report.

In the entry window, type the distance between the left margin and the element, in the units specified.

Distance from the previous element

Select this option to position the object in relation to the element immediately to the left of the object you are positioning.

In the entry window, type the distance from object being positioned to the object to its left, using the units specified.

Align with report fields

Select this option to line up the element with a field in the report. From the drop-down list box, click the down arrow and choose the report field with which you want to align the selected element.

Note: For HTML reports, ensure that you have turned on the Cascading Style Sheets option in the Report Options Output tab.

Tip: You can switch the units to centimeters in the Position dialog box by choosing Page Setup from the File menu. Then click the Centimeters radio button in the Units box.

Aligning an Embedded Field in a Heading or Footing

You can align an embedded field in a page heading, page footing, subheading, or subfooting with columns in the HTML table for the body of the report. This feature works within the limitations of HTML and browser technologies to provide formatting flexibility.

This feature applies to HTML output and Excel 2000 output, which uses HTML alignment.

Note: To align another field on the same line, you must remove spaces between the embedded fields. Then right-click the embedded field and select *Align*. The number you enter is now the column position from previously selected field.

Procedure How to Align an Embedded Field in a Heading or Footing

To align an embedded field in a heading or a footing:

1. Double-click the embedded field in the page heading, page footing, subheading, or subfooting to highlight it.
2. Right-click the highlighted embedded field and select *Align* to open the Align dialog box.
3. In the Align dialog box, enter the number of the column with which the field should be aligned. For example, to align the field with the fifth column, enter 5.

Reference The HEADALIGN Feature

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 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. 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 HEADLIGN=BODY, you can align the subtotals in the same columns as the data that's being totaled.
- HEADALIGN=INTERNAL puts the heading items in an embedded HTML table inside the main (body) table. This allows the heading items to be aligned vertically with each other, independent of the data, since the widths of the heading items don't affect the width of the report columns and vice versa.

To compare sample output, see *Using Headings, Footings, Titles, and Labels* in *Creating Reports With WebFOCUS Language*.

To break a text string into multiple parts for manipulation across columns in an HTML table, you can use <+0> spot markers in the request.

You can use HEADALIGN options in conjunction with the COLSPAN keyword. COLSPAN allows heading items to span multiple table columns, thereby providing additional flexibility in how you can design your headings.

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.

HEADALIGN is not supported for PDF reports.

Note: To align another field on the same line, you must remove spaces between the embedded fields. Then right-click the embedded field and select *Align*. The number you enter is now the column position from previously selected field

For a summary of other alignment methods, see *Using Headings, Footings, Titles, and Labels* in *Creating Reports With WebFOCUS Language*.

Aligning Decimals in a Multi-Line Heading or Footing

You can align decimal points when the data being displayed has varying numbers of decimal places. 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 doesn't 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 numbers.

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 more information, see *Using Headings, Footings, Titles, and Labels* in *Creating Reports With WebFOCUS Language*.

Procedure How to Align Decimals in a Heading or Footing

To determine the width of a heading or footing item:

1. Identify the maximum number of characters in a field. You can refer to the format specification in the Master File or in a command such as a DEFINE to determine the number.
2. Double-click the embedded field in the page heading, page footing, subheading, or subfooting to highlight it.
3. Right-click the highlighted embedded field and select *Decimal Alignment* to open the Decimal Alignment dialog box.
4. In the Width field, enter the maximum number of field characters you determined in step 1.
5. Choose one of the following justification types for the heading or footing:

   Left
   Justifies the heading or footing.

   Right
   Justifies the heading or footing. This value is the default.

   Center
   Centers the heading or footing.

Decimal

Specifies how far in from the right side of a column you want to place your 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 you have specified for this item. For more information, see *Using Headings, Footings, Titles, and Labels* in *Creating Reports With WebFOCUS Language*.

Adding a Report Heading or Footing

You can add a report heading and/or report footing to a report. A report heading is text that appears above the page heading at the top of the report's first page. A report footing is text that appears below the page footing at the bottom of the report's last page.

The report heading and footing options are especially useful if you only want certain text to appear at the top of the first page or at the bottom of the last page. For instance, if you are creating a sales report, you can type "Sales report for [your company]" in the report heading and "Report created by [your name]" in the report footing.

You can specify whether the report heading and/or report footing is left justified, right justified, or centered. Individual lines in the report heading and/or footing can be assigned a different justification. For example, you can have two lines in a report heading where the first line is right justified and the second line is center justified.

Procedure How to Add a Report Heading or Footing

1. Click the *Report Options* button on the General toolbar to open the Report Options dialog box.
2. Select the *View* tab and choose either the *Show Report Head* or *Show Report Foot* check box.
3. At the cursor, type the desired heading or footing, or double-click a field from the Fields tab in the Object Inspector to add it to the heading or footing.
4. To justify a line in the report heading/footing:
   a. Highlight the line you want to justify.
   b. Click the appropriate justification button on the Font toolbar.

Procedure How to Insert the Current Date

1. Place the cursor in the object area (that is, subheading, subfooting, or page-break) in the Report Painter window.
2. Right-click and select *Insert Date* from the shortcut menu.

   or

   Select *Insert Date* from the Properties menu.

3. Select the date format from the cascading menu.
4. Click *OK*.

You can change the display of the date format. See Appendix A, *Assigning Field Formats* for more information.

Adding the Current Page Number and Total Page Count

You can insert the current page number and the total page count in the page heading or footing of a report.

Procedure How to Add the Current Page Number

1. Right-click in the page heading or page footing.
2. Select *Insert Page Markers*, and click *Current Page Number* from the cascading menu.

A field marker indicates placement of the current page number.

Procedure How to Add the Total Page Count

1. Right-click in the page heading or page footing.
2. Select *Insert Page Markers*, and click *Page Count* from the cascading menu.

A field marker indicates placement of the current page count.

Formatting a Column

The Report Painter provides a variety of options that enable you to customize the display of columns in your reports.

Procedure How to Change a Column Title

By default, the column title is the field name or Title attribute in the Master File, if specified. To change the column title on the report:

1. Right-click a column in the Report Painter window and choose *Column Title* from the shortcut menu.

   The Title dialog box opens.
2. At the cursor location, type the new column title.
3. Click *OK*.

The new title appears over the field in the report.

Note: Click the *Default* button in the Title dialog box if you want to reinstate the default title of a field.

Reference Title Dialog Box

Title Window

Displays the default column title of the selected field. Highlight the text and type the new column title.

Default

Reinstates the default title of a field.

Procedure How to Change the Format and Edit Options of a Column

1. Select the column in the Report Painter window.
2. Choose *Format* from the Properties menu.

   or

   Right-click and select *Format* from the shortcut menu.

   The Format dialog box opens. For details, see Chapter A, *Assigning Field Formats*.
3. Change the format by selecting the appropriate radio button in the Format Types box.
4. Scroll the list of edit options and select the one(s) you wish to change.
5. Click *OK*.

Note:

- Click the *Default* button if you want to reinstate the default format or edit options.
- This feature does not apply to sort fields.

Procedure How to Assign a Background Color to a Column

1. Right-click the column and select *Options* from the shortcut menu.

   The Field Properties window opens at the Style tab.
2. Select one of the following from the Active Object Area drop-down list:
   - *Column Title and Data*
   - *Column Data*
   - *Column Title*
3. In the Background Coloring area, click *Single Color* to activate the *Select Colors...* button. The Color dialog box opens.
4. Select a color and Click *OK*.

Procedure How to Assign Alternating Background Colors to Rows Within Columns

1. Right-click the column and select *Options* from the shortcut menu.

   The Field Properties window opens at the Style tab.

2. Select *Column Data* from the Active Object Area drop-down list. (The Alternating Colors button is only activated for this object area.)

3. In the Background Coloring area, click *Alternating Colors* to activate the *Select Colors...* button. The Choose Background Colors dialog box opens.

4. Click a check box to activate the drop-down list next to it.

5. Click the down arrow to open the drop-down list.

6. Select a color.

   Repeat this process for other rows you want to assign colors to.

7. Click *OK.*

Procedure How to Remove a Background Color From a Column

1. Right-click the column and select *Options* from the shortcut menu.

   The Field Properties window opens at the Style tab.

2. Select one of the following from the Active Object Area drop-down list:

   - *Column Title and Data*
   - *Column Data*
   - *Column Title*

3. In the Background Coloring area, click *None*.

4. Select a color and Click *OK*.

Procedure How to Copy the Background Color From One Column to Another

You can copy the background color characteristics from one column to another.

1. Select the column(s) that you want to apply styling to by simultaneously clicking your mouse and pressing the Shift key.

2. Select the column that contains the styling you want to apply and keep the Shift key pressed as you click it.

3. Click the *Match Background Color* button on the Quick Style toolbar, and then select the column(s) you want to apply the formatting to.

To copy all formatting characteristics (including font, grid, background color, and conditional styling) from one column to another, click the *Match All* button on the Quick Style toolbar.

Procedure How to Set the Page Color for the Report

1. From the Report menu, select Styling. The Report Options dialog box opens at the Style tab.
2. In the Graphical area, click the *Set Page Color* button.
3. Choose a color and click *OK*.

Procedure How to Justify a Report Column

You can align alphanumeric and numeric report columns with either the left or right column margin, or in the center by performing the following steps:

1. Select the column in the Report Painter window.
2. Click the *Left*, *Center*, *Right*, or *Default* button on the Font toolbar.
3. Select *Default* if you want to reinstate the default column alignment. By default, alphanumeric fields are left-aligned and numeric fields are right-aligned.

Procedure How to Add a Blank Space to a Report Column

1. Right-click the column in the Report Painter window and select *Column Spacing* from the shortcut menu.

   The Column Spacing window opens.
2. Enter the amount of blank space to leave to the left or right of the column in the measurement unit specified.
3. Click *OK*.

Procedure How to Increase Column Width

1. Left-click the column to select it.
2. Position the cursor on the right column border. The cursor will resemble a small horizontal arrow.
3. Left-click and drag the border to the desired column width.

Tip: To restore the default column width, select *Reset Column Width* from the Properties menu.

Procedure How to Wrap Data Automatically by Changing a Column's Width

1. Right-click the column in the Report Painter window and select *Options* from the shortcut menu.

   The Field Properties window opens.

2. Click the *Style* tab and select the *Wrap* radio button from the Column Width box.
3. Enter a column width in the measurement unit specified.
4. Click *OK*.

Note: For HTML reports, ensure that you have turned on the Cascading Style Sheets option in the Report Options Output tab.

Procedure How to Truncate Report Column Values

1. Right-click the column in the Report Painter window and select *Options* from the shortcut menu.

   The Field Properties window opens.

2. Click the *Style* tab and select the *Truncate* radio button from the Column Width box.
3. Enter a column width in the measurement unit specified.
4. Click *OK*.

To indicate that a field value has been truncated in the report browser, the Report Painter places an exclamation point (!) after every alphanumeric and text field value and an asterisk (*) after every numeric field value.

Note: For HTML reports, ensure that you have turned on the Cascading Style Sheets option in the Report Options Output tab.

Procedure How to Compress a Column

1. Right-click the column in the Report Painter window and select *Options* from the shortcut menu.

   The Field Properties window opens.

2. Click the *Style* tab and select the *Minimum Width* radio button from the Column Width box.
3. Click *OK*.

This is selected by default. Minimum width sets the width of the column according to the widest value or heading in the field.

Note: For HTML reports, ensure that you have turned on the Cascading Style Sheets option in the Report Options Output tab.

Procedure How to Set the Maximum Column Width

1. Right-click the field in the Report Painter window and select *Options* from the shortcut menu.

   The Field Properties window opens.

2. Click the *Style* tab and select the *Maximum Width* radio button from the Column Width box.

3. Click *OK*.

Maximum width sets the width according to the length defined in the field format.

Note: For HTML reports, ensure that you have turned on the Cascading Style Sheets option in the Report Options Output tab.

Procedure How to Squeeze Columns

To remove extra blank space between report columns, select *Output* from the Report menu. Then select the *Squeeze to minimum width* check box in the Data box. This is the default setting.

Since this may change the width of the report at run time, the report may look different in the Report Painter window.

Note: For HTML reports, ensure that you have turned on the Cascading Style Sheets option in the Report Options Output tab.

Procedure How to Stack Column Titles and Data Vertically to Decrease Report Width

You can stack columns over one another by performing the following steps:

1. Right-click the column in the Report Painter window and choose *Options* from the shortcut menu.

2. From the General tab, select *New Line* (OVER) in the Output box.

Note: OVER is not available for sort fields.

Procedure How to Make a Column Invisible/Visible

To make a column invisible, right-click the column in the Report Painter window and choose *Visible* from the shortcut menu. The field is grayed out in the Report Painter window and will not be visible in the report output, but may still be used in the report—for instance, as part of a calculation.

To make a column visible, right-click the field in the Report Painter window and choose *Visible* from the shortcut menu. The grayed background is removed and the field is visible in the report output.

Procedure How to Show/Hide an Invisible Column

Click the *Show/Hide Invisible Fields* button on the General toolbar.

Choosing an Output Format

Before running a report from the Report Painter, you can quickly switch the output format in which it will display. Your choices are HTML (the Report Painter default), PDF, PS (PostScript), and Excel 2000. You can also choose FOCUS Default to implement whichever of the previous formats was set as an environment parameter. For related information, see *Setting Preferences* under *Getting Started* in online help.

Note:

- You can apply the same styling and formatting options to a PostScript (PS) report as you can to a PDF report. You cannot, however, apply a drilldown to a PostScript report.
- To view a PostScript Report, you must install a PostScript Viewer, such as GhostViewer

The format you choose in the Report Painter applies only to the current execution of the report. (If you wish to change the default display format for all subsequent reports created in the Report Painter, select *Options* from the Windows menu in the Applications Explorer, and specify a display format.)

If you choose HTML format, you can also:

- Enable On-demand paging, a feature that speeds the delivery of HTML output to your browser. For details, see *How to Request On-Demand Paging for an HTML Report* on page 3-87, and Chapter 5, *Viewing and Printing Reports and Graphs*.
- Enable Automatic Drill Down in OLAP-enabled reports. Auto Drill Down enables you to automatically link to the next lower level in a defined Dimension hierarchy or Measures list by clicking a related data value in the body of the OLAP-enabled report while the OLAP Control Panel is closed. See *How to Enable Auto Drill Down for an OLAP Report* on page 3-87. For details, see Chapter 11, *Using OLAP Analysis*.
- Control the positioning of the redesigned OLAP Control Panel or request the original version of the OCP. See *How to Control the Display of the OLAP Control Panel and OLAP Selection Panel* on page 3-88. For details, see Chapter 12, *Manipulating Data in an OLAP-enabled Report*.

- Identify an external Cascading Style Sheet (CSS) or use an internal Cascading Style Sheet to take advantage of improvements in the display of HTML reports in browsers. For details about external CSS, see *How to Apply an External Cascading Style Sheet to an HTML Report* on page 3-87 and *Creating Reports With WebFOCUS Language*. For information about internal CSS, see *How to Apply an Internal Cascading Style Sheet to an HTML Report* on page 3-87.
- Type a name for an HTML report in the Title bar caption field box. It will appear in the browser's title bar.

Procedure How to Set a Display Format From the Report Options Output Tab

1. Choose *Output* from the Report menu.
2. From the *Display Format* drop-down list, choose *HTML*, *PDF, PS, Excel 2000,* or *FOCUS Default*.
3. HTML, PDF, and Excel reports are displayed in your browser. PS (PostScript) reports are displayed in a PostScript Viewer, such as GhostViewer. For details, see Chapter 5, *Viewing and Printing Reports and Graphs*.

Procedure How to Set a Display Format From the Output Format Toolbar

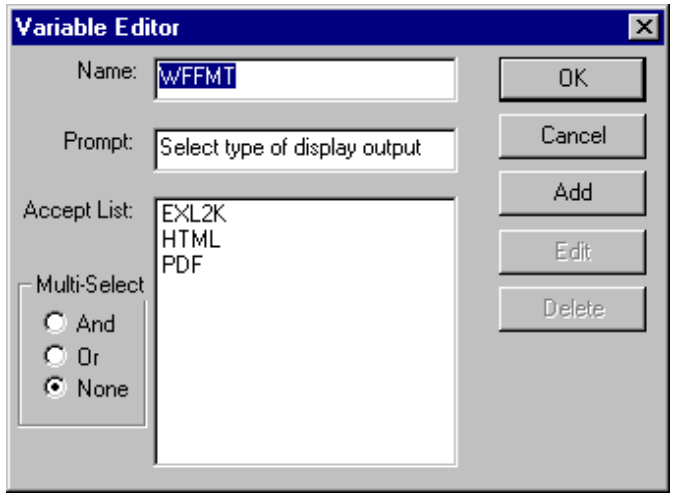
1. Click the arrow to the right of the Output Format toolbar.
2. Choose *HTML, PDF, PS, Excel 2000,* or FOCUS Default from the drop-down list.
3. HTML, PDF, and Excel reports are displayed in your browser. PS (PostScript) reports are displayed in a PostScript Viewer, such as GhostViewer. For details, see Chapter 5, *Viewing and Printing Reports and Graphs*.

Tip: If you wish to change the default display format beyond a single report execution, select *Options* from the Windows menu in the Explorer, and choose a different display format.

Procedure How to Prompt the User for a Display Format

1. Choose *Output* from the Report menu.
2. From the Select Format drop-down list, choose *User*, and click *Edit User Format*.

   The Variable Editor opens.



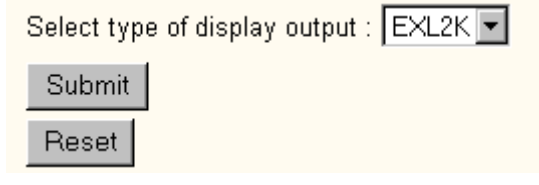
3. For the Name, enter a name for the variable, or accept the default value. The variable name is used in the procedure syntax to represent the value that the user will supply:

   ```
   ON TABLE SET ONLINE-FMT &WFFMT
   ```

4. For the Prompt, enter the text that will prompt the user for the display format, or accept the default value.
5. Do not change any values in the Accept List.

   Note: The only valid values in the Accept list are HTML, PDF, PS, and EXL2K.

6. For Multi-Select, click *None*. (The user cannot select more than one display format.)
7. Click *OK* to make the changes and close the dialog box.
8. Click *OK* to close the Report Options dialog box.
9. In the Report Painter, run the report. A default HTML form prompts for the display format.



10. To run the report outside of the Report Painter, create an HTML form.

Procedure How to Request On-Demand Paging for an HTML Report

This option causes the server to send the report to your browser one page at a time. You can use controls on your browser to display the next or previous page, all pages, or to navigate to a specific page.

This procedure assumes that the required setup has been done to enable on-demand paging and that your procedures are being run remotely against a WebFOCUS Reporting Server. For details about on-demand paging, see *Navigating With On-Demand Paging* in Chapter 5, *Viewing and Printing Reports and Graphs*.

1. Choose *Output* from the Report menu.
2. Select *HTML* from the Display Format drop-down list.
3. Click the *On-demand Paging* radio button in the Display Format box.

Procedure How to Apply an Internal Cascading Style Sheet to an HTML Report

1. Choose *Output* from the Report menu.
2. On the Output tab, click the down arrow next to *Cascading Style Sheets* and click *On*.

Procedure How to Apply an External Cascading Style Sheet to an HTML Report

Note: The user must create the external CSS (Cascading Style Sheet) file and save it to an alias on the Web server.

You can identify external Cascading Style Sheets from the Report Painter's Style tab.

1. Choose *Styling* from the Report menu.
2. On the Style tab, click the *Style File Selection* button. The Style File Selection dialog box opens.
3. Enter a URL in the External Cascading Style Sheet URL field.
4. Click *OK*.

Procedure How to Enable Auto Drill Down for an OLAP Report

Auto Drill enables you to transform an OLAP report immediately, by drilling down on Dimensions and Measures, without opening the OLAP Control Panel.

1. Choose *Output* from the Report menu.
2. Select *HTML* from the Display Format drop-down list. (OLAP analysis is only supported for HTML reports.)
3. Select an Automatic Drill Down option:
   - *Dimension* to enable automatic drill down functionality for dimensions.

- *All* to enable automatic drill down functionality for dimensions and measures.

Tip: Although you turn on Auto Drill from the Report Painter, you must OLAP-enable your report by right-clicking the procedure in the Explorer and selecting OLAP from the shortcut menu.

Procedure **How to Control the Display of the OLAP Control Panel and OLAP Selection Panel**

1. Choose *Output* from the Report menu.
2. Select *HTML* from the Display Format drop-down list. (OLAP analysis is only supported for HTML reports.)
3. Select an OLAP Panel option:
   - *None* (the default) turns off OLAP by removing OLAP and OLAPPANE settings from the procedure.
   - *Control Panel* opens the OLAP Control Panel (OCP) and generates -OLAP ON code in the procedure.
   - *Top Panel* opens the OCP, and the OLAP graphical selection pane above your browser. This option generates -OLAP ON and ON TABLE SET OLAPPANE TOP code in the procedure.
   - *Bottom Panel* opens the OCP, and the OLAP graphical selection pane below your browser. This option generates -OLAP ON and ON TABLE SET OLAPPANE BOTTOM code in the procedure.

Tip: Although you can specify the position of the OLAP Control Panel from the Report Painter, you must OLAP-enable your report by right-clicking the procedure in the Explorer and selecting OLAP from the shortcut menu.

Styling With Fonts, Colors, and Grids

You can style a report or objects in a report by changing font size and style, adjusting colors, and adding grids.

If you have worked with HTML you know that you do not always have complete control over how your report or document looks in any given Web browser because browsers interpret HTML code and display it according to their local configurations. Nevertheless, the Report Painter works with HTML to provide you with as much styling control as possible. In fact, since Web browsers have gotten better at handling fonts and fonts sizes, you can apply a greater range of fonts and font styles to report element in HTML reports.

To further improve the display of HTML output you can:

- Enable internal Cascading Style Sheets (CSS) from the Report Painter. This option enables HTML output to interpret certain StyleSheet attributes that were not previously supported.
- Apply an external CSS to an HTML report. For more information, see *Creating Reports With WebFOCUS Language*.

For PDF reports output may be affected by limitations Adobe Acrobat Reader.

Procedure How to Specify a Font for a Report Element

The Report Painter allows you to apply a number of fonts and font styles to columns and the contents of object areas. You can apply fonts to any element of the report using the Font toolbar, from which you can also specify whether to apply font styles to Titles only, Data only, or Titles and Data.

1. Select a column or highlight an element in an object area.
2. For a column, click a component button to specify whether you want to style data, title, or both.
3. Click a button on the Font toolbar to specify the style you want to apply. For details, see *The Font Toolbar* on page 3-5.

Procedure How to Copy Font Characteristics From One Column to Another

You can copy font characteristics from one column to another.

1. Select the column(s) that you want to apply styling to by simultaneously clicking your mouse and pressing the Shift key.
2. Select the column that contains the styling you want to apply and keep the Shift key pressed as you click it.
3. Click the *Match Font* button on the Quick Style toolbar, and then select the column(s) you want to apply the formatting to.

To copy all formatting characteristics (including font, grid, background color, and conditional styling) from one column to another, click the *Match All* button on the Quick Style toolbar.

Procedure How to Apply and Remove a Grid in an HTML Report

To add or remove the grid that appears around your report:

1. Click the Report Options button on the General toolbar.
2. In the Style tab, click the *Select Grid* button. The HTML Grid dialog box opens.

   Note: If grids are on, you cannot use the Borders feature.

3. Click the *On* or *Off* radio button.
4. Click *OK*.

Tip: If you choose to turn grids on, you can improve the grid display in HTML reports by using internal Cascading Style Sheets.

Procedure How to Add A Grid in a PDF Report

You can apply a grid to an entire report, a column, or another object area, such as a heading or footing.

To set a global report grid (that will apply to all objects you subsequently add to the report):

1. From the Report menu, select Styling. The Report Options dialog box opens at the Style tab.
2. Click the *Select Grid* button. The Grid dialog box opens. Make your grid selection:
   - Click the down arrow in the Grid drop-down list box and select:

     Horizontal & Vertical to insert lines between rows and columns.

     Horizontal to insert lines between rows.

     Vertical to insert lines between columns.
   - Select a line style radio button (light or heavy).
   - Choose a line style (light or heavy).

     Note: By default, the *None* radio button is selected. If you do not select a line style, no grid lines will be shown.
   - Apply the grid to:

     Report to apply a grid to the entire report.

     Data to apply a grid only to the data component of a column.

     Title to apply a grid to only the title component of a column.
3. Click *OK*.

Note: If grids are on, you cannot use the Borders feature.

To apply a grid to a column:

1. Right-click the column and select Options. The Field Properties dialog box opens at the Style tab.
2. Click the down arrow in the Active Object area's drop-down list and select:

   Column Title and Data to apply grids to the column title and data.

Column Data to apply to apply grids to column data.

Column Title to apply grids to column title.

3. Click the *Select Grid* button. The Grid dialog box opens. Make your grid selections:
   - Choose a grid type (Horizontal & Vertical; Horizontal; Vertical).
   - Choose a line style (light or heavy).

     Note: By default, the *None* radio button is selected. If you do not select a line style, no grid lines will be shown.
   - Indicate whether to apply the grid to the Report, Data, or Title.
4. Click *OK*.

To apply a grid to another object area:

1. Right-click the object area and select *Grid*. The Grid dialog box opens.
2. Make your grid selections:
   - Choose a grid type (*Horizontal & Vertical; Horizontal; Vertical)*.
   - Choose *a line style (light or heavy)*.

     Note: By default, the *None* radio button is selected. If you do not select a line style, no grid lines will be shown.
   - Indicate whether to apply the grid to the Report, Data, or Title.
3. Click *OK*.

Procedure How to Copy Grid Characteristics From One Column to Another

You can copy grid characteristics from one report column to another.

1. Select the column(s) that you want to apply styling to by simultaneously clicking your mouse and pressing the Shift key.
2. Select the column that contains the styling you want to apply and keep the Shift key pressed as you click it.
3. Click the *Match Grid* button on the Quick Style toolbar, and then select the column(s) you want to apply the formatting to.

To copy all formatting characteristics (including font, grid, background color, and conditional styling) from one column to another, click the *Match All* button on the Quick Style toolbar.

Reference Grid Dialog Box for Object Areas in a PDF Report

For a PDF report, the Grid dialog box has the following fields/options:

Grid

Specifies a grid type:

- Select Horizontal & Vertical from the drop-down box to insert lines between rows and columns.
- Select Horizontal from the drop-down box to insert lines between rows.
- Select Vertical from the drop-down box to insert lines between columns.

LineStyles

Can be light or heavy.

Apply

- Report. Applies Grid to the entire report.
- Data. Applies Grid only to the data component of a column.
- Title. Applies Grid only to the title component of a column.

For related information, see *How to Apply and Remove a Grid in an HTML Report* on page 3-89.

Procedure How to Remove a Grid

1. Right-click the column and select Options. The Field Properties dialog box opens at the Style tab.
2. Click the *Select Grid* button. The Grid dialog box opens.
3. Choose *None*.
4. Click *OK*.

Procedure How to Add Borders to an HTML or PDF Report

You can add borders to an entire report, a column, or another object area, such as a heading or footing.

Note: You must remove grids from the report, column, or object area before you can apply borders.

You can set borders to a report globally, so that they will apply to all objects you subsequently add to the report. To set global borders:

1. From the Report menu, select Styling. The Report Options dialog box opens at the Style tab.
2. Click the *Select Borders* button. The Borders dialog box opens.

   By default, the Make All Borders The Same option is selected. To specify border settings for the top, bottom, left, and right borders, click the Make All Borders the Same check box to turn off that option. Make your border selections:

   - Click the down arrow in the Width drop-down list box and select:

     OFF to turn borders off.

     LIGHT to apply thin border lines.

     MEDIUM to apply medium border lines.

     HEAVY to apply thick border lines.
   - Click the down arrow in the Style drop-down list box and select a line style.
   - Click the down arrow in the Color drop-down list and select a color.

   After you make border width, style, and color selections you can see them in the Borders Preview window in the Borders dialog box.

   Note: By default, the *None* radio button is selected. If you do not select a border width, style, or color, no borders will be shown.
3. Click *OK*.

To apply a border to a column:

1. Right-click the column and select Options. The Field Properties dialog box opens at the Style tab.
2. Click the down arrow in the Active Object area's drop-down list and select:

   Column Title and Data to apply grids to the column title and data.

   Column Data to apply to apply grids to column data.

   Column Title to apply grids to column title.
3. Click the *Select Borders* button. The Borders dialog box opens.

   By default, the Make All Borders The Same option is selected.

   To specify border settings for the top, bottom, left, and right borders, click the Make All Borders the Same check box to turn off that option.
4. Make your border selections:

   - Click the down arrow in the Width drop-down list box and select:

     OFF to turn borders off. (This is the default.)

     LIGHT to apply thin border lines.

     MEDIUM to apply medium border lines.

     HEAVY to apply thick border lines.
   - Click the down arrow in the Style drop-down list box and select a line style.
   - Click the down arrow in the Color drop-down list and select a color.

   After you make border width, style, and color selections you can see them in the Borders Preview window in the Borders dialog box.

   Note: If the *OFF* option is selected in the Width drop-down list, no borders will be shown.
5. Click *OK*.

To apply a border to another object area:

1. Right-click the object area and select *Borders*. The Borders dialog box opens.
2. By default, the Make All Borders The Same option is selected.

   To specify border settings for the top, bottom, left, and right borders, click the Make All Borders the Same check box to turn off that option.
3. Make your border selections:
   - Click the down arrow in the Width drop-down list box and select:

     OFF to turn borders off. (This is the default.)

     LIGHT to apply thin border lines.

     MEDIUM to apply medium border lines.

     HEAVY to apply thick border lines.
   - Click the down arrow in the Style drop-down list box and select a line style.
   - Click the down arrow in the Color drop-down list and select a color.

   After you make border width, style, and color selections you can see them in the Borders Preview window in the Borders dialog box.

   Note: If the *OFF* option is selected in the Width drop-down list, no borders will be shown.
4. Click *OK*.

Styling or Positioning an Individual Item in a Text String

Inserting a spot marker in a text string in an object area allows you to separate the string into items that can be styled or positioned individually. You can insert a spot marker for this purpose in any object area.

Procedure How to Style or Position an Individual Item in a Text String

1. Select *Show Markers* from the View menu to display spot markers.
2. Place the cursor in the position at which to insert a spot marker.

   Right-click the object area and select *Insert Spotmarker* from the shortcut menu.

   Report Painter inserts a spot marker to the right of the cursor. A spot marker looks like <+0>.
3. To style an individual item in a text string, highlight the entire item and right-click it. Select *Fonts* from the shortcut menu.

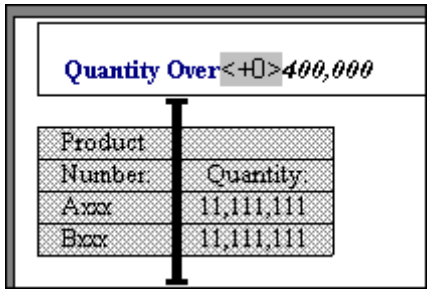
   Choose the styling preferences from the Font dialog box.

   To position an individual item in the text string, highlight the entire item and right-click it. Select *Position* from the shortcut menu.

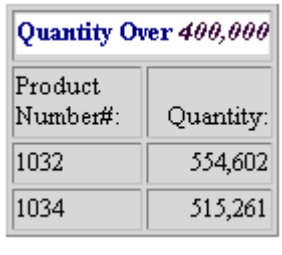
   Choose the desired position from the Position dialog box.

Example Separating Text Items For Individual Styling

In this sample procedure, a spot marker is inserted in the page heading text to separate it into two items—Quantity Over and 400,000—which are then styled individually:



In the sample output, Quantity Over is displayed in bold, while 400,000 is displayed in bold italic:



Defining a Conditional Report Style

You can assign a conditional style to a report element. Conditional styling allows you to define conditions that determine when to apply particular fonts, point size, text style, foreground and background color, vertical or horizontal grids, and drill down procedures to your report's data when the report is run.

To apply conditional styling, first you define a *global* condition. Then, you apply that condition to a report element.

Example **Applying Conditional Styling to a Report**

Suppose that you want to highlight employee salaries in excess of $20,000.

1. Select the field SALARY in the Report Painter and create the condition: When SALARY is greater than or equal to $20,000.
2. Then apply a style to the condition that will appear when the statement is true.

File Edit Window Help

Salary Increase: Production Department

LAST_NAME	FIRST_NAME	SALARY	PCT_INC	AMT_INC
BANNING	JOHN	**$29,700.00**	.00	.00
BLACKWOOD	ROSEMARIE	**$21,780.00**	.00	.02
		.	.	.01
CROSS	BARBARA	**$27,062.00**	.05	.01
		$25,775.00	.00	.01
GREENSPAN	MARY	$9,000.00	.04	.00
		$8,650.00	.00	.00
IRVING	JOAN	**$26,862.00**	.10	.02
		$24,420.00	.00	.02
JONES	DIANE	$18,480.00	.04	.02
		$17,750.00	.00	.01
MCCOY	JOHN	$18,480.00	.15	.00
MCKNIGHT	ROGER	$16,100.00	.07	.01

You can also include variables that enable you to insert a new conditional value each time the report is run. So if the next week you wanted to highlight all salaries that exceed $75,000, you would create a variable condition that prompts you for a number each time the report is run.

Note: If you plan to apply a customized style template, you must do so before you define any conditional styling attributes, or those attributes will be overwritten. For additional information on style sheets, see the *Creating Reports With WebFOCUS Language* manual.

Procedure How to Access the Edit Condition Dialog Box for a Column

Conditions are created, applied, and styled in the Edit Condition dialog box.

1. Right-click the column in the Report Painter window and select *Options* from the shortcut menu.

   The Field Properties dialog box opens.

2. From the Style tab, click the *Edit Conditions* button.
3. The Condition List dialog box opens.
4. Click *New*.
5. The Edit Condition dialog box opens.

Procedure How to Access the Edit Condition Dialog Box for a Report

Conditions are created, applied, and styled in the Edit Condition dialog box.

1. Choose *Styling* from the Report Menu. The Report Options dialog box opens at the Style tab.
2. From the Style tab, click the *Edit Conditions* button.
3. The Condition List dialog box opens.
4. Click *New*.
5. The Edit Condition dialog box opens.

Procedure How to Access the Conditional Styling Dialog Box for an Object Area

1. Highlight an item (text or field) in an object area.
2. Right-click the item.
3. Select *Conditional Styling* from the shortcut menu.

For details, see *Conditional Styling Dialog Box* on page 3-107 and associated procedures.

Procedure How to Create a Global Condition for a Report

A global condition applies to any component in a report if you choose to apply a condition. Once a condition is defined, you can apply the condition to any object.

Note: You can assign styling after the condition is met. See *How to Associate a Style With a Condition in an Object Area* on page 3-100, *How to Associate a Style With a Condition for a Column* on page 3-101, or *How to Associate a Style With a Condition for a Report* on page 3-101.

Before you begin, review *How to Access the Edit Condition Dialog Box for a Report* on page 3-98.

Conditions are created, applied, and styled in the Edit Condition dialog box.

1. Choose *Styling* from the Report Menu. The Report Options dialog box opens at the Style tab.
2. From the Style tab, click the *Edit Conditions* button.
3. The Condition List dialog box opens.
4. Click *New*.
5. The Edit Condition dialog box opens.
6. Type a name for the condition or accept the default.
7. Select the field for which you want to define a condition from the Field box.
8. Select a relation from the Relations list.
9. Specify a value by doing one of the following:
   - Type a literal value in the Value box.

     or
   - Click the *Values* button to display existing database values and select a value.

     or
   - Click *Another Field* to display other fields in the report and select a field.
10. Click *OK*.

    The condition is now added to the Condition List in the Condition List dialog box, from which it can be applied to one or more columns or to an object area.

    Note: To create another condition, repeat steps 4 to 10.

11. Click *OK* again to return to the Style tab on the Report Options dialog box.

The default condition name (e.g., COND0001) appears in the Applying to Condition field box.

The condition you created appears in the Condition Rule box.

You can apply styling to the condition after it is met. See *How to Associate a Style With a Condition in an Object Area* on page 3-100, *How to Associate a Style With a Condition for a Column* on page 3-101, or *How to Associate a Style With a Condition for a Report* on page 3-101.

For related information about conditional styling of data visualization bar graphs, see Chapter 9, *Visualizing Trends in Reports*.

Procedure How to Associate a Style With a Condition in an Object Area

Before you begin, review *How to Access the Conditional Styling Dialog Box for an Object Area* on page 3-98.

1. Select a defined condition from the Conditional Styling dialog box.

2. Choose one or combination of the following:

- Click the *Font* button to specify conditions such as font, font style and size, color and effects.
- Click the *Background* button to select a background color.
- Click the *Grid* button to select a line style (only for PDF reports).
- Click the *Drill down* button to embed a procedure. For more information on drill down, see *Creating a Drill Down Procedure* on page 3-124.

3. Click *OK*. The style is associated with the condition and you return to the Report Painter window.

Procedure How to Associate a Style With a Condition for a Column

Before you begin, review *How to Access the Edit Condition Dialog Box for a Column* on page 3-98.

1. Select a defined condition from the Applying to Condition dialog box in the Style tab.
2. In the Graphical area of the Style tab, choose one or combination of the following:
   - Click the *Select Font* button to specify conditions such as font, font style and size, color and effects.
   - Click the *Select Grid* button to select a line style (only for PDF reports).
   - Click the *Select Border*s button to select a line style.

     Note: To apply the Borders option to HTML reports, you must turn on the Cascading Style Sheets option on the Output tab.
   - In the Background Coloring area, click the *Single Color* radio button to select a background color.
3. Click *OK*. The style is associated with the condition and you return to the Report Painter window.

Procedure How to Associate a Style With a Condition for a Report

Before you begin, review *How to Access the Edit Condition Dialog Box for a Report* on page 3-98.

1. Select a defined condition from the Applying to Condition dialog box in the Style tab.
2. In the Graphical area of the Style tab, choose one or combination of the following:
   - Click the *Select Font* button to specify conditions such as font, font style and size, color and effects.
   - Click the *Select Border*s button to select a line style.

     Note: To apply the Borders option to HTML reports, you must turn on the Cascading Style Sheets option on the Output tab.
   - Click the Visualize button if you want to select conditional styling criteria for data visualization bar graphs. For more information, see Chapter 9, *Visualizing Trends in Reports*.
   - In the Background Coloring area, click the *Single Color* radio button and then the *Select Colors* button to select a background color.
3. Click *OK*. The style is associated with the condition and you return to the Report Painter window.

Procedure How to Clear Associated Styling for a Column

Before you begin, review *How to Access the Edit Condition Dialog Box for a Column* on page 3-98.

1. Select a defined condition from the Applying to Condition dialog box in the Style tab.
2. Click the *Clear Associated Styling* button.

Note: If you change your mind and want to keep the conditional styling, click *Cancel* on the Style tab. The condition will appear in the Applying to Condition dialog box the next time you access Field Properties dialog box.

Procedure How to Clear Associated Styling for a Report

Before you begin, review *How to Access the Edit Condition Dialog Box for a Report* on page 3-98.

1. Select a defined condition from the Applying to Condition dialog box in the Style tab.
2. Click the *Clear Associated Styling* button.

Note: If you change your mind and want to keep the conditional styling, click *Cancel* on the Style tab. The condition will appear in the Applying to Condition dialog box the next time you access Report Options dialog box.

Procedure How to Edit a Condition

Before you begin, review *How to Access the Edit Condition Dialog Box for a Column* on page 3-98 or *How to Access the Edit Condition Dialog Box for a Report* on page 3-98.

1. Select a condition from the Applying to Condition field box on the Style tab of the Report Options dialog box.
2. Click the *Edit* button or double-click the selected condition.

   The Edit Condition dialog box opens.
3. Select a field name from the Fields window.
4. Select a relation from the Relations list box.
5. Specify the value by choosing one of the following:
   - Type a literal value in the Value box.

     or
   - Click the *Values* button to display existing database values and select a value.

     or
   - Click *Another Field* to display other fields in the report and select a field.

6. Click *OK*. You return to the Conditional List dialog box.
7. Click *OK* again to return to the Style tab in the Report Options dialog box.

Note: Once a condition is changed, all objects that the condition is applied to will be affected.

Procedure How to Add a Condition to a Column

1. Right-click the column in the Report Painter window and select *Options* from the shortcut menu.

   The Field Properties dialog box opens.
2. Select a condition from the Applying to Condition field box on the Style tab of the Field Properties dialog box.
3. The Condition List dialog box opens, displaying conditions for the column or object.
4. Select a condition from the Condition list box or create a new condition.
5. Click *OK*. You return to the Conditional Styling dialog box.

Note:

- A condition determines the rule for conditional styling, but not the style; therefore, you must define the style.
- A plus sign appears next to an applied condition that also has styling associated to it in the Applying to Condition field box.

Procedure How to Add a Condition to a Report

1. Choose *Styling* from the Report Menu. The Report Options dialog box opens at the Style tab.
2. Select a condition from the Applying to Condition field box on the Style tab of the Report Options dialog box.
3. Select a condition from the Applying to Condition field box on the Style tab of the Report Options dialog box.
4. The Condition List dialog box opens, displaying conditions for the column or object.
5. Select a condition from the Condition list.
6. Click *OK*. You return to the Conditional Styling dialog box.

Note:

- A condition determines the rule for conditional styling, but not the style; therefore, you must define the style.
- A plus sign appears next to an applied condition that also has styling associated to it in the Applying to Condition field box.

Procedure How to Add a Condition to an Object Area

Before you begin, review *How to Access the Edit Condition Dialog Box for a Column* on page 3-98.

1. Select the object area.
2. Highlight the item you want to style, then right-click it and choose *Conditional Styling*.
3. The Conditional Styling dialog box opens, displaying conditions for the column or object.
4. Select a condition from the Condition list or create a new condition.
5. Click *OK*. You return to the Conditional Styling dialog box.

Note: A condition determines the rule for conditional styling, but not the style; therefore, you must define the style.

Procedure How to Rearrange the Order of Conditions Applied in a Column

1. Right-click the column in the Report Painter window and select *Options* from the shortcut menu.

   The Field Properties dialog box opens.
2. Select a condition from the Applying to Condition field box on the Style tab of the Report Options dialog box.
3. Click the *Move Condition Up* or *Move Condition Down* button.

Note: Order is significant because conditions are applied in the order listed. For example, if the first and last conditions are both true, the style in the last condition will override the style in the first.

Procedure How to Rearrange the Order of Conditions Applied in a Report

1. Choose *Styling* from the Report Menu. The Report Options dialog box opens at the Style tab.
2. Select a condition from the Applying to Condition field box on the Style tab of the Report Options dialog box.
3. Click the *Move Condition Up* or *Move Condition Down* button.

Note: Order is significant because conditions are applied in the order listed. For example, if the first and last conditions are both true, the style in the last condition will override the style in the first.

Procedure How to Rearrange the Order of Conditions Applied in an Object Area

Before you begin, review *How to Access the Edit Condition Dialog Box for a Column* on page 3-98.

1. Open the Conditional Styling dialog box for the selected column or object area.
2. Select a condition from the *Conditions attached to this object* check box, then click the *Up* or *Down* button.

Note: Order is significant because conditions are applied in the order listed. For example, if the first and last conditions are both true, the style in the last condition will override the style in the first.

Procedure How to Delete a Condition From a Column

1. Right-click the column in the Report Painter window and select *Options* from the shortcut menu.

   The Field Properties dialog box opens.
2. Select a condition from the Applying to Condition field box on the Style tab of the Field Properties dialog box.
3. Click the Edit Conditions button. The Condition List dialog box opens.
4. Select a condition from the Condition list.
5. Click *Delete*. (If the condition is in use and you still want to delete it, click Yes when you are prompted.)
6. Click *OK*. You return to the Style tab on the Field Properties dialog box.

Note: These steps remove the condition from the selected object only; it does not delete the condition. The condition is still available to be added to other objects in the report.

Procedure How to Delete a Condition From a Report

1. Choose *Styling* from the Report Menu. The Report Options dialog box opens at the Style tab.
2. Select a condition from the Applying to Condition field box on the Style tab of the Field Properties dialog box.
3. Click the Edit Conditions button. The Condition List dialog box opens.
4. Select a condition from the Condition list.
5. Click *Delete*. (If the condition is in use and you still want to delete it, click Yes when you are prompted.)
6. Click *OK*. You return to the Style tab on the Field Properties dialog box.

Note: These steps remove the condition from the selected object only; it does not delete the condition. The condition is still available to be added to other objects in the report.

Procedure How to Remove a Condition From an Object Area

Before you begin, review *How to Access the Conditional Styling Dialog Box for an Object Area* on page 3-98.

1. Right-click the column or object area, then open the Conditional Styling dialog box.
2. Select a condition from the box: Conditions attached to this object.
3. Click the *Remove* button.
4. Click *OK*.

Note: These steps remove the condition from the selected object only; it does not delete the condition. The condition is still available to be added to other objects in the report.

Procedure How to Copy a Condition From One Column to Another

You can copy a condition from one column to another.

1. Select the column(s) that you want to apply styling to by simultaneously clicking your mouse and pressing the Shift key.
2. Select the column that contains the styling you want to apply and keep the shift key pressed as you click it.
3. Click the *Match Conditional Styling* button on the Quick Style toolbar, and then select the column(s) you want to apply the formatting to.

To copy all formatting characteristics (including font, grid, background color, and conditional styling) from one column to another, click the *Match All* button on the Quick Style toolbar.

Procedure How to Conditionally Execute a Drill Down Procedure

1. Right-click the column in the Report Painter window and select *Options* from the shortcut menu.

   The Field Properties dialog box opens.
2. Click the Drill Down tab.
3. Click the *Edit Conditions* button.
4. The Condition List dialog box opens.
5. Click *New*.
6. The Edit Condition dialog box opens.
7. Select a condition from the Condition list box or create a new condition.
8. Click *OK* to return to the Drill Down tab.
9. Click OK to close the Field Properties dialog box and return to the Report Painter.

The Drill Down dialog box opens. For details, see *Drill Down Dialog Box for Object Areas* on page 3-127.

Reference Conditional Styling Dialog Box

The Conditional Styling dialog box has the following fields/options:

Conditions attached to this object

Displays the name(s) of previously defined conditions attached to the selected object in the Report Painter.

Add

Creates or adds a condition to the selected object. Clicking Add opens the Condition List dialog box.

Remove

Deletes a previously defined condition attached to the selected object. Select a condition from the Conditions attached to this object list box, and click the Remove button.

Edit

Edits a previously defined condition. Select a condition from the Conditions attached to this object list box, and click the Edit… button. The Edit Condition dialog box opens.

Up/Down

Rearranges the order of conditions applied. Select a condition from the Conditions attached to this object list box, and click the up or down button.

Note: The order of conditions is significant because they are applied in the order listed. For example, if the first and last conditions are both true, the style in the last condition will override the style in the first.

When

Displays criteria defined for the condition selected from the Conditions attached to this object list box.

Text appears as

Displays the styles applied to the condition selected from the Conditions attached to this object list box. To change the style of the selected condition, press one of the following buttons:

Font specifies a font, style, size, and color.

Background adds a background color to the report values.

Grid applies a grid to the report values.

Drill Down embeds a procedure in the selected object.

Reference Condition List Dialog Box

The Condition List dialog box has the following fields/options:

Condition

Lists conditions applied or available to be applied to the selected object or report.

New

Enables you to create a condition in the Edit Condition dialog box.

Delete

Deletes the selected conditions from the selected object. Select a condition from the Condition list box and press the Delete button.

Edit

Edits the criteria for the selected condition. The Edit Condition dialog box opens. For more information, see the *Edit Condition Dialog Box* on page 3-109.

Reference Edit Condition Dialog Box

The Edit Condition dialog box has the following fields/options:

Condition

Displays the name of the condition being created or edited. To change the default name (e.g., COND0001), highlight the text and type a new name.

Field

Displays a list of the columns that appear in the report.

Relation

Displays a list of possible relationships between the selected report column and either a literal value or another field that it will be compared to.

Value

Specifies a literal value or other field to which the selected field is being compared in the When statement. The available choices depend on the radio button selected under Compare Type.

Compare Type

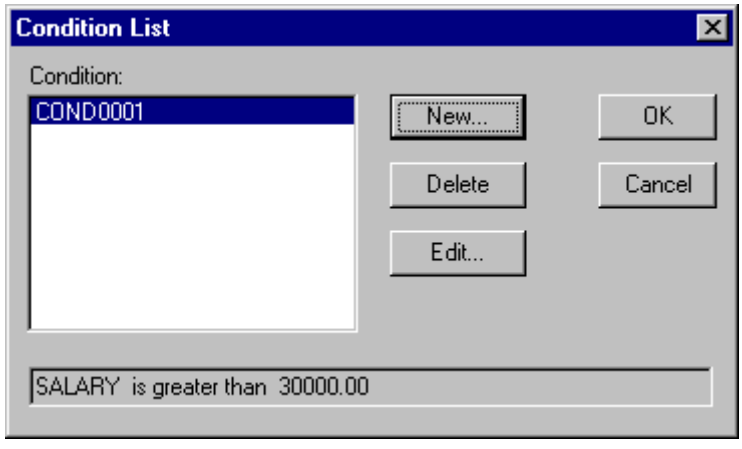
Chooses the type of comparison to make to the field selected in the Field section. Select:

Value to compare the selected field to a literal value. Press the Value button for a list of data records.

Another Field to compare the selected field to another field in the data source.

Example Viewing a Condition in the Conditional Styling Dialog Box

The following Conditional Styling dialog box displays the condition COND0001: Salary is greater than or equal to $20,000.00. This condition causes all instances to appear in Times Roman, Bold, and highlighted as indicated in the box labeled Text appears as:



Example Creating a Report With Conditional Styling

Tip: For an example of conditional styling with data visualization bar graphs, see *Defining Conditions for Data Visualization Bar Graphs* in Chapter 9, *Visualizing Trends in Reports*.

Suppose that you want to highlight certain values in a report. The following example shows how to create a report that highlights Gotham Grinds vendors who have ordered 300 or more units.

1. Open the GGORDER data source in the Report Painter.
2. Double-click or drag *VENDOR_NAME*, *PRODUCT_DESCRIPTION*, and *QUANTITY* from the Fields tab of the Object Inspector into the Report Painter.
3. Open the Edit Condition dialog box to create a condition for *Ordered Units*:
   a. Right-click *Ordered Units* in the Report Painter window and select *Options* from the shortcut menu to open the Field Properties dialog box.
   b. From the *Style* tab click the *Edit Conditions* button to open the Condition List dialog box.
   c. Click *New* to open the Edit Condition dialog box.

4. Create a condition and name it *ordgt300*.
   a. Type *ordgt300* in the Condition box.
   b. Select *QUANTITY* from the Field list.
   c. Select *Is greater than or equal to* from the Relations list.
   d. Click the *Values* button and select *300* from the Value window.
   e. Click *OK* to return to the Condition List dialog box with the defined condition displayed.
   f. Click *OK* to return to the Style tab.
5. Add a font style to the condition.
   a. Click *ordgt300* in the Applying to Condition list box to apply the styling options to this condition.
   b. In the Graphical area of the Style tab, click the *Select Font* button to open the Font dialog box.
   c. Select *Bold* from the Font Style list and select the *Underline* check box.
   d. Click *OK* to return to the Style tab.
6. Add a background color.
   a. In the Graphical area of the Style tab, go to the Background Coloring area and click the *Single Color* radio button and then the *Select Colors* button.
   b. Select the color yellow in the Color dialog box.
   c. Click *OK* to return to the Style tab and check the styles you have applied in the Sample box.
   d. Click *OK* on the Field Properties dialog box.
   e. Click *OK* to return to the Report Painter window.

7. Run the report by clicking the *Run* button on the toolbar. The report displays in the browser.

Vendor Name	Product	Ordered Units
Coffee Connection	Hazelnut	**300**
Coffee Connection	Hazelnut	117
European Specialities,	French Roast	126
European Specialities,	French Roast	86
European Specialities,	French Roast	49
NY Ceramic Supply	Mug	289
NY Ceramic Supply	Mug	231
ThermoTech, Inc	Thermos	**347**
Appliance Craft	Coffee Grinder	265
Appliance Craft	Coffee Pot	**309**
Ridgewood Bakeries	Scone	37
Ridgewood Bakeries	Scone	**325**
Delancey Bakeries	Biscotti	**399**
West Side Bakers	Croissant	93
West Side Bakers	Croissant	**433**

Note that to make the report more readable and more compact, we deselected *Squeeze to minimum width* and suppressed page numbers.

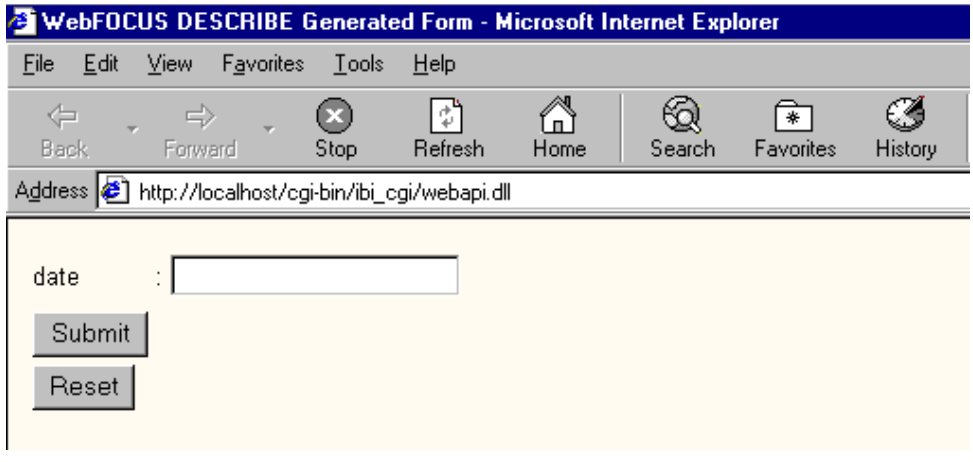
Example Creating a Condition With Variable Values

Suppose you want a report that conditionally highlights values. The following example shows how to create a report of the total number of orders for each Gotham Grinds store and highlight those orders placed on a specific day.

1. Open the GGORDER data source in the Report Painter.
2. Identify your report columns.
   - **a.** Identify your sort columns. Click *By* on the Report Painter toolbar. Double-click or drag *VENDOR_NAME*, *ORDER_DATE*, and *STORE_CODE* from the Fields tab in the Object Inspector.
   - **b.** Identify your detail column. Click *Detail* on the Report Painter toolbar. Double-click or drag the *QUANTITY* from the Fields tab of the Object Inspector.
3. Add a page heading.
   - **a.** Select *Output* from the Report menu. The Report Options dialog box opens.
   - **b.** Click the *View* tab, select the *Boundaries* check box in the General box, and then click *OK*.
   - **c.** Position the cursor in the page heading by clicking your left mouse button in the heading area and type the following in the heading area:

     Information On Orders Placed On = &date.
   - **d.** Press the Enter key to bring your cursor to the next line.
4. Open the Edit Condition dialog box to create a condition for *Vendor Name*, *Order Date*, *Store Code*, and *Ordered Units*.
   - **a.** Choose *Styling* from the Report menu.
   - **b.** Select *Data* from the Active Object drop-down list.
   - **c.** Click *Edit Conditions* and then click *New* on the Edit Condition dialog box to create a new condition.
5. Create a condition and name it *rundate*.
   - **a.** Type *rundate* in the Condition box.
   - **b.** Select *ORDER_DATE* from the Field list.
   - **c.** Select *Is equal to* from the Relations list.
   - **d.** Type the variable *&Date* in the Value box.
   - **e.** Click *OK* to return to the Condition List dialog box.
   - **f.** Click *OK* to return to the Style tab on the Report Options dialog box.

6. Add a background color.
   a. In the Graphical area of the Style tab, go to the Background Color group box and click the *Single Color* radio button and then the *Select Colors* button.
   b. Select the color light grey in the Color dialog box.
   c. Click *OK* to return to the Style tab.
   d. Click *OK* again to return to the Report Painter.
7. Run the report by clicking the *Run* button the toolbar. You are prompted for a date.



8. Type *01/01/96* and click *Submit*.

Information On Orders Placed = 01/01/96

Vendor Name	Order Date	Store Code	Ordered Units
Appliance Craft	01/01/96	R1019	265
			309
		R1020	133
			51
		R1040	50
			91
		R1041	292
			93
		R1044	89
			303
		R1088	354
			246
		R1100	235
			217
		R1109	110
			286
		R1200	315
			331
		R1244	191
			122
		R1248	220
			258
		R1250	332
			134
	02/01/96	R1019	148
			58
		R1020	380

Adding an Image

You can add graphical elements, such as a corporate logo or a graph, and background patterns, such as a watermark, to your reports. You can place graphic report images on every page, and within the headings and footings of a report.

The image must exist as a separate graphic image file in the following formats for use in a report:

For Bitmap files (.gif), GIF files (.GIF), JPEG files (.JPEG), JPG files (.JPG), Enhanced Metafiles (.EMF), and Windows Metafiles (.WMF).

- For HTML reports, GIF (.GIF) or JPG (.JPG).
- For PDF (or PS) reports, GIF (.GIF).

Tip: Since GIF images are supported in all report formats, using GIF images ensures that your images appear whether you display your report as HTML or PDF.

You can insert individual images in a report or reference a report field to use as the file name for the image. When referencing a report field, you must have a field in the data source whose values identify the image file names.

In both cases, the image file must be in the application path(s) or you must include the image file's fully qualified path. Images used in HTML reports must reside on the Web server; images used in PDF (or PS) reports must reside on the WebFOCUS Reporting Server. You can specify a local file or identify an image elsewhere on the network using a URL.

You can also:

- Specify the position of an image in relation to the object area in which it is embedded.
- Specify its height and width (scale).
- Adjust its location in the report.
- Update the image to the latest available version.
- Preview the image in a Preview pane, without running the report.
- View the following image properties in the Object Inspector: the location of the image, image name, positioning on page, and size.

Note that a graph can be saved as a .GIF or a .JPG file and incorporated as a graphical image into a Web page. For details on saving graphs as images, see *Chapter 19, Creating a Graph With Graph Assistant*.

Procedure How to Include a Single Image in a Report

1. Choose *Images* from the Report menu or click the *Report Options* button in the General toolbar and select the *Images* tab.
2. Select the *Filename* radio button (default) in the Source box and type the path of the image in the entry field.

   or

   Click the *Browse* button and select the image file from the Open dialog box.
3. Click the *Add* button.

The image file and its path appear in the list box.

Procedure How to Include Image(s) When the Field Record Value Is a Graphic File

1. Choose *Images* from the Report menu or click the *Report Options* button in the General toolbar and select the *Images* tab.
2. Select the *Field* radio button.
3. Choose a field from the drop-down box.
4. Click the *Add* button.

   The field name appears in the list box.
5. Click Add.

Procedure How to Specify the Position of an Image

1. Choose *Images* from the Report menu or click the *Report Options* button in the General toolbar and select the *Images* tab.
2. Select the image from the Image List box.
3. Enter the desired (X,Y) coordinates in the Position fields.

   The position of the image is in relation to the report object in which the image is embedded (for example, Page Footer).

or

1. Click the Images tab located at the bottom of the Report Painter.
2. Drag and drop an image anywhere in the Report Painter window.

Note: Since the Report Painter uses internal Cascading Style Sheets (CSS) to position images in HTML reports, ensure that you have turned on the Cascading Style Sheets option from the Output tab in the Report Options dialog box. However, this ability to position the image through CSS does not allow you to insert a line break after the image. If you want to insert a line break after an image, you must turn off the Cascading Style Sheets option.You can turn off the CSS option from the Output tab in the Report Options dialog box.

Procedure How to Scale the Size of an Image

1. Choose *Images* from the Report menu or click the *Report Options* button in the General toolbar and select the *Images* tab.
2. Select the image from the Image List box.
3. Select the *Custom* radio button.
4. Enter the desired height (X) and width (Y) coordinates in the Size fields.

By default the image is rendered at its original size; it can then be resized. To return to the original size, select the *Default* button.

Note: For HTML reports, ensure that you have turned on the Cascading Style Sheets option in the Report Options Output tab

Procedure How to Change the Location of an Image

1. Choose *Images* from the Report menu or click the *Report Options* button in the General toolbar and select the *Images* tab.
2. Select the image from the Image List box.
3. Select one of the locations from the *Location* drop-down list: page, background, page footer, page header.

   If you add a subfooting, subheading, subtotal, report heading, or report footing to your report, these object areas are also listed to enable you to attach an image to these locations.
4. Click *OK*.

Procedure How to Preview an Image

1. Choose *Images* from the Report menu or click the *Report Options* button in the General toolbar and select the *Images* tab.
2. Select the image from the Image List tab.
3. Click the *Preview* tab in the Image List tab.
4. The image is displayed in the right pane in the Preview tab.

Procedure How to Update an Image in a Report

To ensure that the current version of an image is included in a report:

1. Choose *Images* from the Report menu or click the *Report Options* button in the General toolbar and select the *Images* tab.
2. Select the image from the Image List tab.
3. Click the *Include as Reference* check box.
4. Click *OK*.

Procedure How to Delete an Image From a Report

1. Choose *Images* from the Report menu or click the *Report Options* button in the General toolbar and select the *Images* tab.
2. Select the image from the Image List tab.
3. Click the *Delete* button.
4. Click *OK*.

Example Placing an Image in a Report

Suppose you want to enhance the appearance of your reports by including a graphical image. The following example shows how to add the Gotham Grinds logo in the heading of a sales report.

1. Open the GGSALES data source in the Report Painter.
2. Identify and format your report columns.
   a. Identify your sort columns. Click *By* on the Report Painter toolbar. Double-click or drag *UNITS* and *DOLLARS* from the Fields tab of the Object Inspector.
   b. Identify your detail columns. Click *Detail* on the Report Painter toolbar. Double-click or drag *ST* and *PRODUCT* from the Fields tab of the Object Inspector.
   c. Format the Dollar Sales column. Right-click Dollar Sales in the Report Painter window and select Format. Click *Decimal* in the Format Types box. Select *Floating dollar -- M from the Edit Options list*. Click *OK*.

3. Add a page heading and center it.
   a. Click the *Report Options* button on the General toolbar to open the Report Options dialog box.
   b. Click the *View* tab, select the *Boundaries* check box in the General box, and then click *OK*.
   c. Position the cursor in the page heading by clicking your left mouse button in the heading area. Delete *PAGE <Page Number* and type the following in the heading area:

      State Sales by Product
   d. Press the Enter key twice to create two blank lines between the report heading and the report columns.
   e. Highlight the report heading. Click the right mouse button, select Justify, and click *Center* from the cascading menu.
4. Add the Gotham Grinds logo to the heading.
   a. Place the cursor on the first line of the Page Heading then right-click and choose *Images* to open the Report Options dialog box at the Images tab.
   b. Ensure that *File Name*, is selected in the Source box (default). Click *Browse*.
   c. Browse to the c:\ibi\Apps\Samples\Repostry\gotham\app directory, select the file gglogo.gif and open it.
   d. Click *Add* to save the location of the image file.
   e. Click *OK* to return to the Report Painter window.

5. Run the report by clicking the *Run* button on the toolbar. The report displays in the browser.

State Sales by Product

State	Product	Unit Sales	Dollar Sales
CA	Biscotti	1724	$24,136.00
		1604	$24,060.00
		1392	$20,880.00
		1715	$20,580.00
		1462	$19,006.00
		1267	$19,005.00
		1326	$18,564.00
		1421	$18,473.00

Note that to make the report more readable we deselected *Squeeze to minimum width*.

Applying an External Style Sheet

A quick way to style your report is to choose one of the prepared external style sheets that are provided with the product. You can quickly choose an external style sheet and display the report, then choose another and display the report again, until you arrive at the most suitable presentation.

You can also customize a template and save the customized version for use with other reports.

Procedure **How to Apply an External Style Sheet to a Report (Report Painter)**

1. Select *Styling* from the Report menu. The Report Options dialog box opens at the *Style* tab.
2. Click the Style File Selection button. The Style File Selection dialog box opens.
3. Select an existing style sheet from the Choose StyleSheet Source drop-down list. When you run your report, the style will be applied automatically.

Tip: You can also apply a prepared external style sheet from the Report Assistant. For details, see Chapter 2, *Creating Reports With the Report Assistant*.

Procedure **How to Customize an External Style Sheet (Report Painter)**

1. Select *Styling* from the Report menu. The Report Options dialog box opens at the *Style* tab.
2. Click the *Style File Selection* button. The Style File Selection dialog box opens.
3. Select a style sheet from the Choose StyleSheet Source drop-down list and click *OK*.
4. Make styling changes to your report.
5. Click the *Style File Selection* button again.
6. Type a name of the name for the customized style sheet in the Choose Stylesheet Destination input box.

When you save the report, the new external style sheet is saved and added to the list of available style sheets.

Tip: You can also apply a prepared external style sheet from the Report Assistant. For details, see Chapter 2, *Creating Reports With the Report Assistant*.

Procedure How to Reset Default Report Painter Styling

The Report Painter sets some styling options in reports that you can override by applying a an external style sheet. However, if you wish to reset the default styling,

1. Select *Styling* from the Report menu. The Report Options dialog box opens at the *Style* tab.
2. Click the Style File Selection button. The Style File Selection dialog box opens.
3. Choose *Embedded* from the Choose StyleSheet Source drop-down list and click *OK*.

Procedure How to Suppress Report Styles

Select *Styling* from the Report menu. Choose *None* in the Choose Destination StyleSheet drop-down list.

Controlling Output Destinations

When you run a report you can control where the output is sent. You can send it directly to the screen, to a printer, to a Winform, or an HTML frame. The default output for a report is to the screen.

Procedure How to Direct Report Output to the Screen

1. Select *Output* from the Report menu to open the Report Options Output tab.
2. Choose *Screen* from the Output Device drop-down list.

Procedure How to Direct Report Output to a Printer

1. Select *Output* from the Report menu to open the Report Options Output tab.
2. Choose *Printer* from the Output Device drop-down list. (This is the default.)

The report will be sent directly to your default printer, rather than displaying on the screen.

Procedure How to Direct Report Output to an HTML Frame

1. Select *Output* from the Report menu to open the Report Options Output tab.
2. Choose Object from the Output Device drop-down list.
3. Type the frame name in the *HTML Named Frame* box.

Note: If you are a Managed Reporting user, please contact your Managed Reporting Administrator for the HTML frame name.

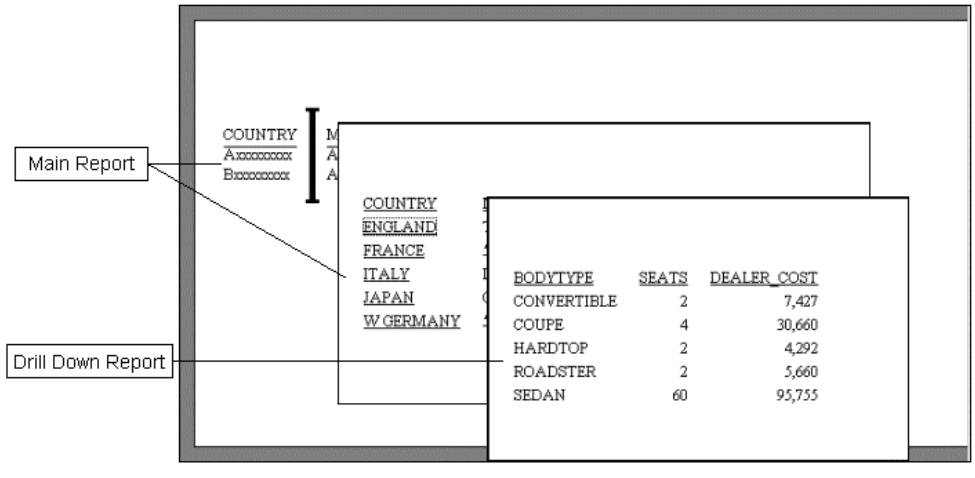
Creating a Drill Down Procedure

The drill down feature enables you to add one or more layers of detail to a report by embedding procedures into the report. A drill down "procedure" can be:

- Any type of executable object, such as a report or graph.
- A link to a URL from an HTML or PDF report, or to a JavaScript from an HTML report.
- A link to a Maintain case (function).
- A link to a Maintain procedure.

Once the base (summary) report appears in the browser, you can "drill down" to selected data or to a URL or script (or procedure). For example, if you run a report on the country and title of all cars imported into the United States, and you have embedded the appropriate procedures in the report and defined the correct parameters, you can drill down on:

- **ENGLAND,** to view a more detailed report on the sales of all English cars.
- **JAGUAR,** to see specific information about the Jaguar.
- A summary report row, to view the values behind each field in the row.



You can also define conditions that determine when to run an embedded drill down procedure. For example, suppose you have embedded a procedure in the country column of the summary report, but you want your drill down report to appear only for England. You can define a condition that enables the embedded drill down only when country equals England. For more information, see *Defining a Conditional Report Style* on page 3-97.

Note: To apply a customized report style, you must do so before you define any drill down attributes or those attributes will be overwritten. For additional information on style sheets, see the *Creating Reports With WebFOCUS Language* manual.

Procedure How to Execute a Drill Down Procedure

When a report with drill down capability appears in the browser, the hyperlinked values are underlined.

To view a drill down procedure:

1. Run the summary report.
2. Move the cursor over the underlined hyperlinks.
3. Click the hyperlink you wish to drill down on and click the left mouse button. The detail procedure is executed and the output displays in the browser.

Note: The browser can be programmed to open a new window for each drill down report. However, at present, if you are viewing an HTML report, the detailed report replaces the summary report in the browser. You can click the *Back* button on the toolbar to recall the summary report. For details on using the browser's toolbar and status bar, see Chapter 5, *Viewing and Printing Reports and Graphs*.

Creating a Hyperlink in an HTML or PDF Report

From a hyperlink in an HTML or PDF report, you can access other reports, documents, or Web sites, or perform other actions. The browser supports two kinds of hyperlinks:

- Drill Down hyperlinks enable you to create a series of drill down reports by linking the procedures that generate these reports.

  With a dynamic hyperlink, or drill down, a user's click in the browser passes the value of the clicked report object to the linked procedure or CGI script. The passed value dynamically determines what the user sees next.

- URL hyperlinks enable you to link to other HTML documents, Web sites, or non-World Wide Web resources, such as e-mail applications. The URLs can reference CGI scripts that require parameters. For an illustration, see *Creating a URL Hyperlink With Parameters* on page 3-137.

  You can define a hyperlink from any field or image in a report by selecting the report component in the Report Painter and referencing the HTML document's URL using the Drill Down dialog box.

Note: You can also use coded Style Sheets for this task; see *Creating Reports With WebFOCUS Language*.

Attaching or Opening a Drill Down Procedure in the Report Painter

To drill down to a more detailed level of information in a report, you attach a procedure to one or more columns or to another object area in a report, while you are in the Report Painter. When you run the report, the values in the chosen column become "hot spots" that, when selected, run the underlying procedure or link to a specified URL.

You attach drill down (detail) procedures with the Drill Down dialog box. You can also open a detail procedure, for viewing or modification, from this dialog box.

Procedure How to Attach a Detail Procedure to a Column or Other Object Area

To attach a detail procedure to a column or columns:

1. Right-click a column (or columns) in the Report Painter and select *Options* from the shortcut menu. The Field Properties dialog box opens.
2. Click the Drill Down tab.
3. From the Active Object Area drop-down list, select the column component (Column Title and Data, Column Data, or Column Title) from which you want to drill down. See *Field Properties Drill Down Tab* on page 3-163.
4. From the Drilldown Definition drop-down list, select *Execute Procedure*.
5. In the Procedure Name field, type the name of an existing detail procedure, or select a procedure from the drop-down list.
6. Click *OK*.

To attach a detail procedure to another object area (for example, a heading or footing):

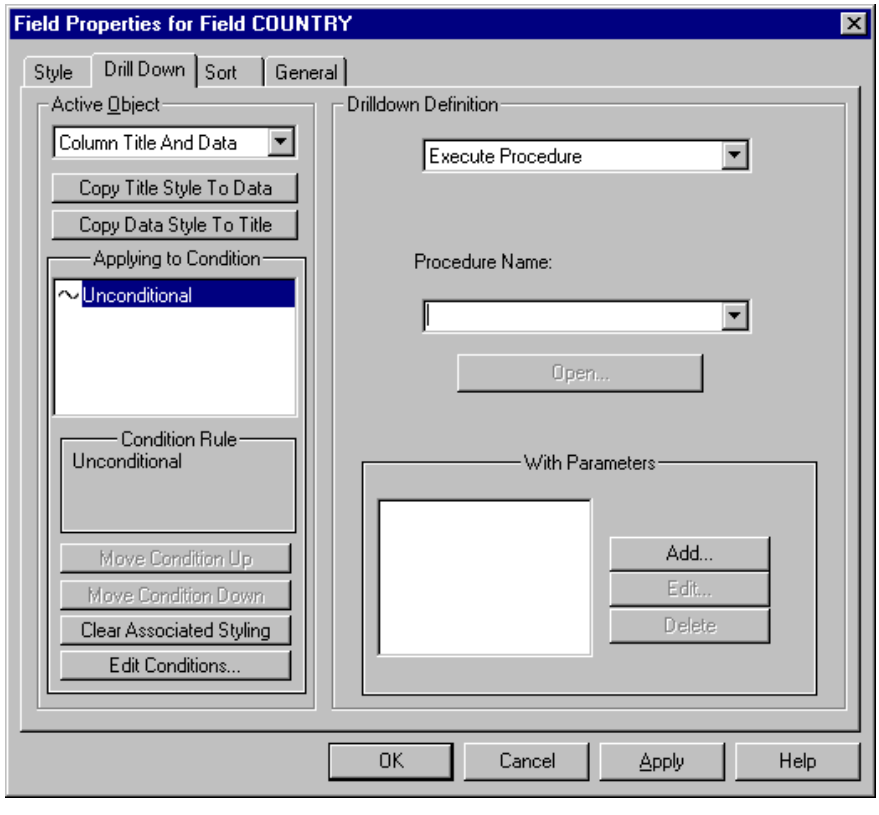
1. Right-click the object area and choose *Drill Down* from the shortcut menu.
2. Proceed as above.

Procedure How to Open a Detail Procedure

1. Right-click a column in the Report Painter and select *Options* from the shortcut menu. The Field Properties dialog box opens.
2. Click the Drill Down tab.
3. In the Procedure Name field, type the name of an existing detail procedure, or select a procedure from the drop-down list.
4. Click *Open*.
5. Developer Studio asks if you want to save changes to the current summary procedure. Click *Yes*.

   The detail procedure opens in the Procedure window, where you can open a component for viewing or modification in a new instance of Report Painter. When you are finished, you return to the summary procedure in the previous instance of Report Painter.

Reference Drill Down Dialog Box for Object Areas



Use the following options in the Drill Down dialog box to supply information required to link a report to another report, a URL, JavaScript, Maintain case, or Maintain procedure. The Drill Down dialog box has the following fields:

Active Column Object

From the drop-down list, select the component from which the user can drill down—Column Title And Data, Column Data, and Column Title.

Drilldown Definition

Choose one of the following from the Drilldown Definition drop-down list:

Execute Procedure

Select the *Execute Procedure* and type the name of a procedure you want to link to in the Procedure Name field, or choose the drill down procedure from the drop-down list.

URL

Select *URL* and type the URL address you want to link to in the entry field.

This option is available only for HTML and PDF reports.

Note: You must type the complete URL (starting with http://).

URL from field

Select the *URL from field*; then select the field name from the drop-down list to indicate that the URL you are referencing is the value of the indicated report field.

For example, if your database contains a field such as E_MAIL whose values are the e-mail addresses for every employee, you could select the field E_MAIL in the Drill Down dialog box as the URL, using the URL from field option, and supply the proper parameters. This would enable a user to click a last name in the Web browser, which would open the e-mail application with the e-mail address of the individual selected.

This option is available only for HTML reports.

Javascript

Select the *Javascript* to invoke a JavaScript function.

This option is available only for HTML reports.

Maintain Procedure

Provides a link to a Maintain procedure.

Maintain Procedure Compiled

Provides a link to a compiled Maintain procedure.

Maintain Case

Provides a link to a Maintain Case.

Note: A Maintain Case is also known as a Function.

With parameters

Displays the parameters defined for the selected drill down procedure or URL in the Drill Down Parameter dialog box.

Add

Opens the Drill Down Parameter dialog box, which enables you to create parameters for the selected drill down procedure.

Edit

Edits the selected parameter.

Delete

Deletes the selected parameter.

Creating a Parameter

Parameters allow you to specify criteria and conditions for the drill down report. By defining parameters, you can control the amount and type of information to retrieve for the drill down report.

For example, you can create parameters in the drill down report as amper (&) variables that prompt you for a value at run time. When the main report is run, you supply a value for the parameter using the drill down feature.

Procedure How to Create a Drill Down Parameter

From the drill down report (the report that provides the detail information):

1. Choose *Where/If* from the Report menu.

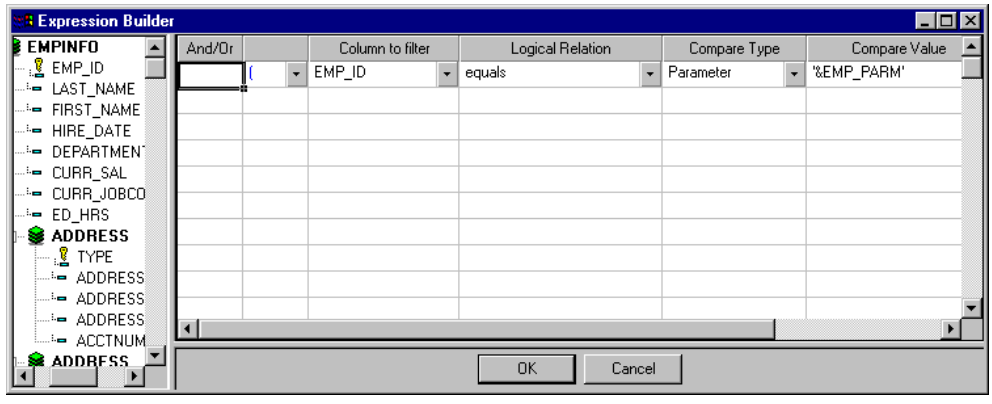
   or

   Click the *Where/If* button on the Columns toolbar.

2. Click the *Assist* button.

   The Expression Builder dialog box opens. For details, see *Using the Expression Builder* in Appendix B, *Writing Expressions*.

3. Create an expression that compares the parameter against a report field that appears in both reports.



4. Click *OK*.

Note: If the drill down report contains a -DEFAULT statement that sets a default value to the same variable passed from the main report, the variable value in the -DEFAULT statement overwrites the variable value passed from the main report. Therefore, the output in the drill down report reflects the default value passed from the -DEFAULT statement; it does not reflect the value passed from the main report.

Procedure How to Pass a Parameter From the Main Report

To add the ability to call the drill down report and pass parameters, do the following from the *main* report:

1. In the Report Painter window, right-click the object or objects that you want to "drill down" on and select *Options* from the shortcut menu.

   The Field Properties dialog box opens.

2. Click the Drill Down tab.

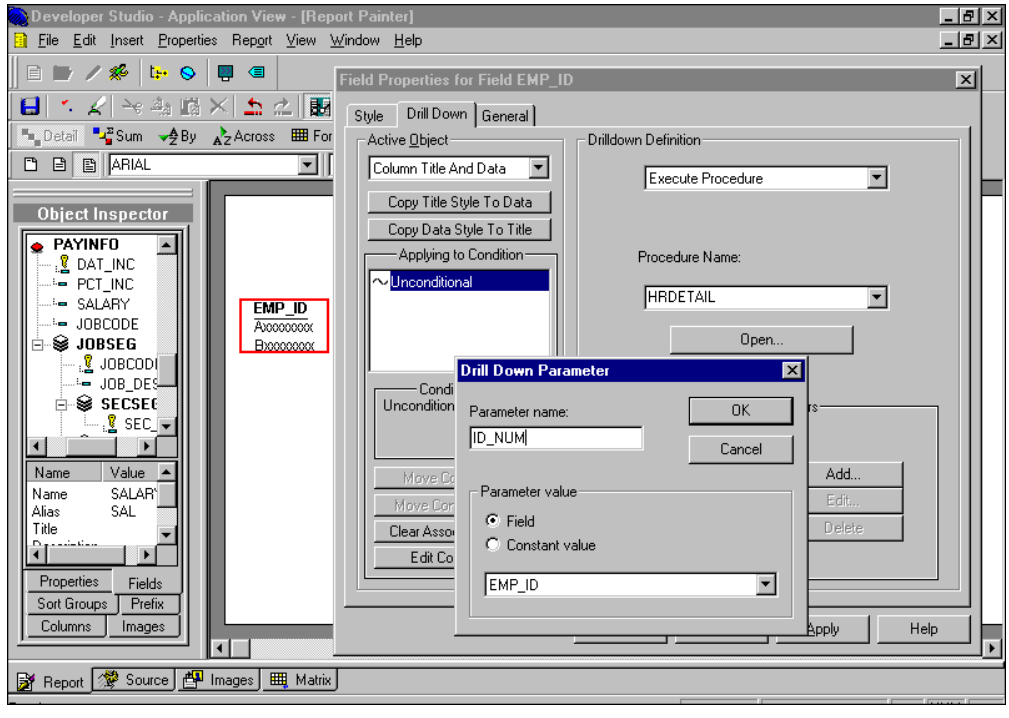
3. Select *Execute Procedure* from the Drilldown Definition drop-down list, and select the appropriate procedure from the Procedure Name drop-down list. See *Attaching or Opening a Drill Down Procedure in the Report Painter* on page 3-126.

4. Click the *Add* button.

   The Drill Down Parameter dialog box opens.

5. Type the name of the parameter you created in the drill down report in the Parameter name entry field.

Note: When passing parameters to a drill down procedure, you must use local variables (&variables). Global variables (&&variables) cannot be used as drill down parameters.



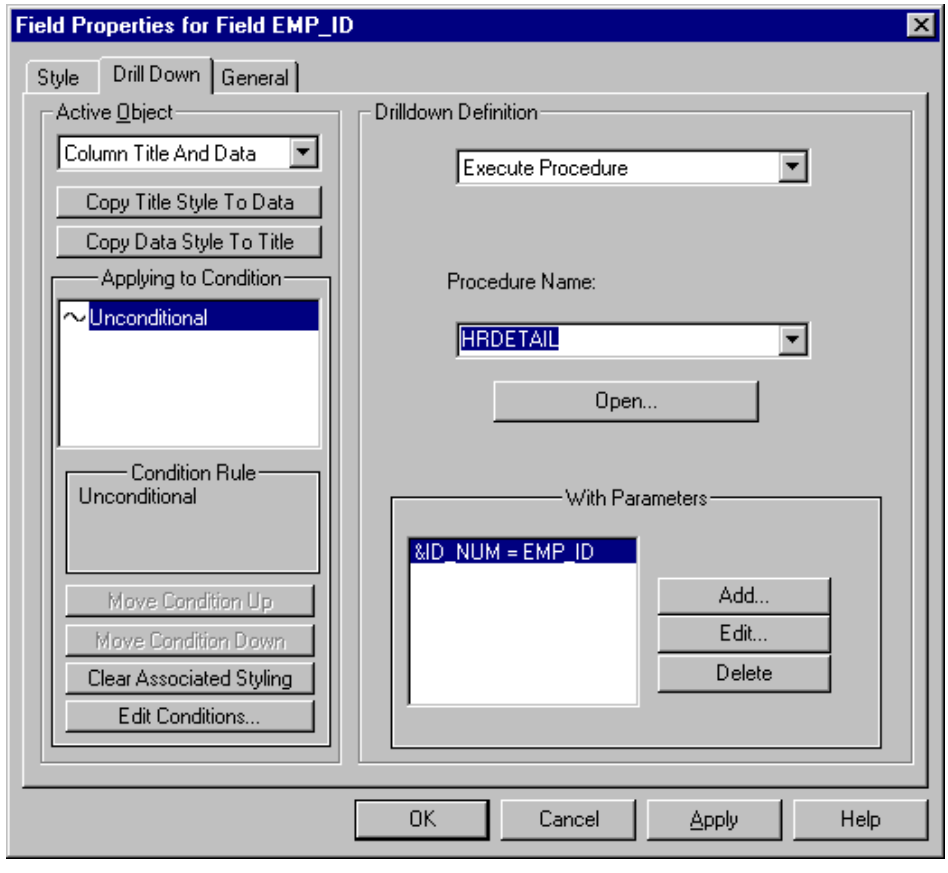
When you pass the parameter to the drill down report, you must set a value for it in the Drill Down Parameter dialog box: either a field or a constant value:

- *Field* picks up the value of the selected field from the point at which the user clicks the hyperlink. Click the arrow and select a report field from the list.
- *Constant value* sets the parameter to a specified value. Type a value in the entry field.

  Note: If the drill down report contains a -DEFAULT statement that sets a default value to the same variable passed from the main report, the variable value in the -DEFAULT statement will overwrite the variable value passed from the main report. Therefore, the output in the drill down report will reflect the default value passed from the -DEFAULT statement; it will not reflect the value passed from the main report.

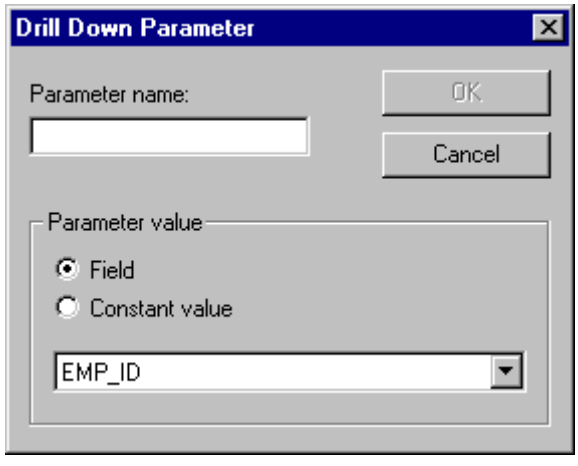
6. Once a value has been supplied, click *OK* to return to the Drill Down tab on the Field Properties dialog box.

The parameter is added to the With Parameters list box.



Reference Drill Down Parameter Dialog Box

You use the Drill Down Parameter dialog box to supply parameters that the CGI script or drill down report might require.



Parameter name

Enter the name of the parameter that the linked FOCUS procedure or linked CGI script expects.

Parameter Value

Assign a value to the parameter:

Field picks up the value of the selected field from the point at which the user clicks the hyperlink. Click the arrow and select a report field from the list.

Constant value sets the parameter to a specified value. Type a value in the entry field.

Note: If the drill down report contains a -DEFAULT statement that sets a default value to the same variable passed from the main report, the variable value in the -DEFAULT statement overwrites the variable value passed from the main report. Therefore, the output in the drill down report reflects the default value passed from the -DEFAULT statement; it does not reflect the value passed from the main report.

Sample Drill Down Procedures

The following examples illustrate how to drill down to a detail report by passing parameters and how to hyperlink to a URL by passing parameters.

Example Creating Drill Down Reports

Suppose you want to create a summary report that allows for drill-down to details from the summary values. The following example shows how to create a main report of total sales and sales quotas for all Gotham Grinds stores by state. The State column in the main report will provide hyperlinks to a secondary report of detail sales and quota figures.

Part I: Create the secondary report (the report to drill down to)

1. Open the GGSALES Master File in the Report Painter.
2. Identify and format the detail columns for the secondary report.
   - **a.** Double-click or drag *ST*, *DOLLARS*, and *BUDDOLLARS* from the Fields tab of the Object Inspector into the Report Painter.
   - **b.** Select *State* and click *By* on the Report Painter toolbar.
   - **c.** Format the *Dollar Sales* and Budget Dollars columns. Right-click Dollar Sales in the Report Painter window and select *Format*. Click *Decimal* in the Format Types box. Select *Floating dollar -- M* from the Edit Options list. Click *OK*. Repeat the same steps for *Budget Dollars*.
3. Create a parameter:
   - **a.** Click the *Where/If* button on the Columns toolbar to open the Report Options dialog box at the Where tab.
   - **b.** Click *Assist* to open the Expression Builder dialog box.
   - **c.** Select *ST* from the Fields list.
   - **d.** Select *Is EQUAL to* from the Logical Relation list.
   - **e.** Select *Parameter* from the Compare Type drop-down list.
   - **f.** Double-click the Compare Value field. The Variable Editor dialog box opens.
   - **g.** Type *PARAMETER* in the Name field.
   - **h.** Click *OK*. Your new expression is added to the Expression Builder's list of expressions.
   - **i.** Click *OK* to return to the Where tab.
   - **j.** Click *OK* to return to the Report Painter window.
4. Close the Report Painter and save the secondary report.

Part II: Create the main report and link it to the secondary report

1. Open the GGSALES data source in the Report Painter.
2. Identify and format the summary columns for the main report.
   a. Click *By* on the Report Painter toolbar and double-click or drag *ST* from the Fields tab of the Object Inspector into the Report Painter.
   b. Click *Sum* on the Report Painter toolbar and double-click or drag *DOLLARS* and *BUDDOLLARS* from the Fields tab of the Object Inspector.
   c. Format the Dollar Sales and Budget Dollars columns. Right-click *Dollar Sales* in the Report Painter window and select *Format*. Click *Decimal* in the Format Types box. Select *Floating dollar -- M* from the Edit Options list. Click *OK*. Repeat the same steps for Budget Dollars.
3. Link the secondary report to the main report:
   a. Right-click *State* in the Report Painter window and select *Options* from the shortcut menu to open the Field Properties dialog box.
   b. Click the Drill Down tab.
   c. Select *Execute Procedure* from the Drilldown Definition drop-down list.
   d. Select your secondary report from the Procedure Name drop-down list.
   e. Click *Add* to open the Drill Down Parameter dialog box.
   f. Type *PARAMETER* in the Parameter name entry field. This passes a parameter to the secondary report from the main report.

      Note: By default, the *Field* radio button is selected and the field ST appears in the drop down list box located in the Parameter value box.
   g. Click *OK*. Note that the parameter, &PARAMETER = ST, appears in the With parameters list box. This means the value of state that the user drills down on will be passed to the drill down procedure in the variable &PARAMETER.
   h. Click *OK* to return to the Report Painter.

4. Run the report by clicking the *Run* button on the toolbar. The main report appears in the browser.

State	Dollar Sales	Budget Dollars
CA	$7,642,272.00	$7,586,347.00
CT	$3,782,049.00	$3,832,202.00
FL	$3,923,215.00	$3,870,405.00
GA	$4,100,107.00	$4,247,597.00
IL	$3,924,401.00	$3,866,856.00
MA	$3,707,986.00	$3,818,397.00
MO	$3,761,286.00	$3,646,838.00
NY	$3,902,275.00	$3,926,333.00
TN	$3,687,057.00	$3,689,979.00
TX	$3,714,978.00	$3,680,679.00
WA	$4,010,685.00	$4,055,166.00

5. To run the secondary report, place your cursor over *CA* in the State column to reveal the drill down icon (a hand). Double-click *CA*.

The secondary report lists detailed sales and quota figures for California.

State	Dollar Sales	Budget Dollars
CA	$25,005.00	$17,568.00
	$23,282.00	$14,640.00
	$23,153.00	$19,008.00
	$22,785.00	$21,960.00
	$21,780.00	$19,760.00
	$19,966.00	$21,945.00
	$19,872.00	$23,044.00
	$19,162.00	$18,576.00
	$18,096.00	$15,390.00
	$17,916.00	$16,808.00
	$17,853.00	$24,178.00
	$17,820.00	$19,725.00
	$17,765.00	$17,590.00

Note that to make the reports more compact, we suppressed page numbers.

Example Creating a URL Hyperlink With Parameters

The following example shows how to link a report that lists the name of each company employee to a CGI script that looks up his/her phone number and displays it in your browser.

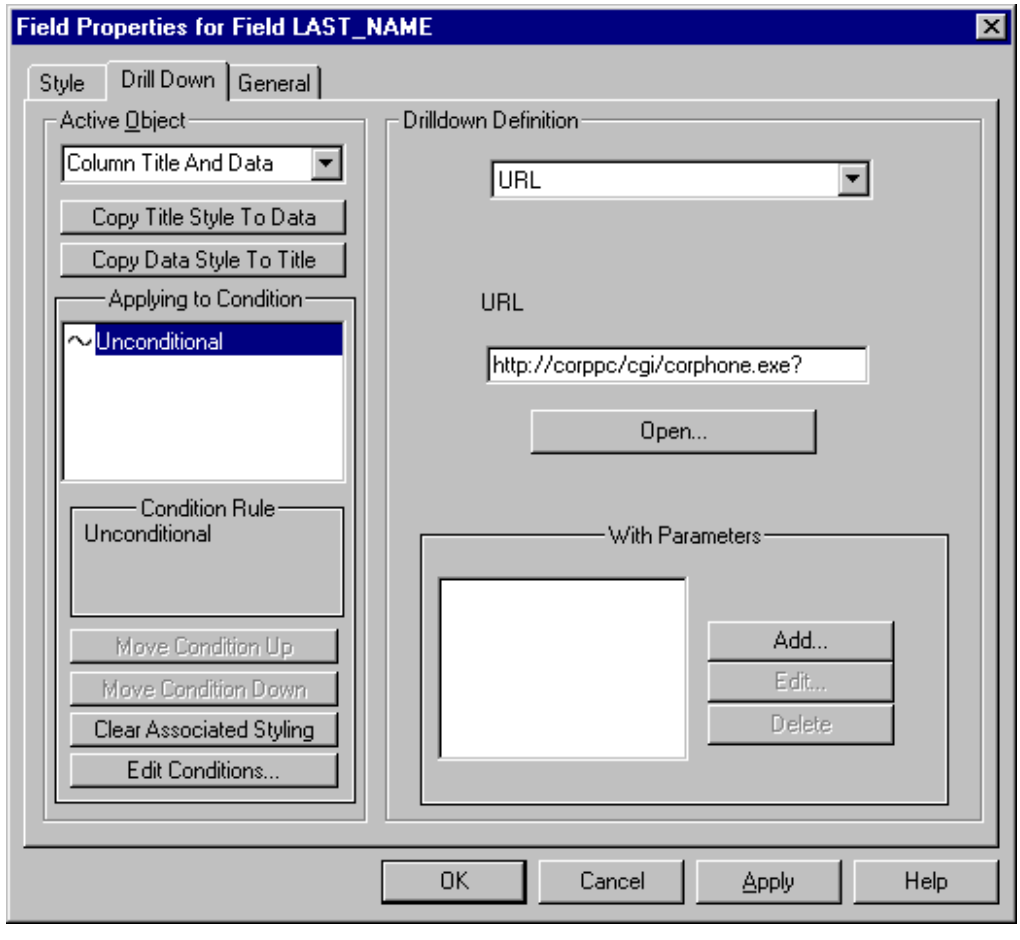
1. Open the EMPLOYEE data source in the Report Painter.
2. Double-click or drag LAST_NAME and FIRST_NAME from the Fields tab of the Object Inspector.
3. Add a report footing.
   a. Select *View* from the Report menu. The Report Options dialog box opens at the View tab.
   b. Click the *Show Report Foot* check box in the General area.
   c. At the cursor, type the following:

      Click on a last name to look up a phone number
4. Right-click the field LAST_NAME in the Report Painter window and select *Options*.
5. Click the *Drill Down* tab on the Field Properties dialog box:
6. Select *URL* from the Drilldown Definition drop-down list.

7. Enter the following URL of the CGI script that provides the phone numbers:

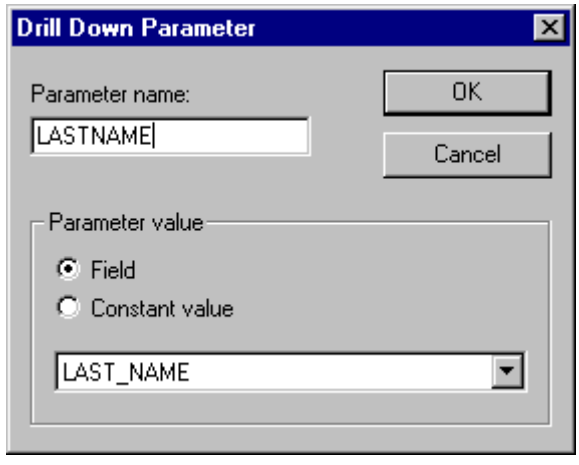
http://corppc/cgi/corphone.exe?

Note: You must include a question mark at the end of the URL when you are executing CGI scripts that require parameters.



8. Click the *Add…* button.

The Drill Down Parameter dialog box displays:



9. Enter the name of the parameter that the CGI script expects and supply a value, which in this case is the field LAST_NAME.

10. Click *OK* to return to the Drill Down tab in the Field Properties dialog box.

11. Click *OK* to return to the Report Painter window.

12. Run the report by clicking the *Run* button on the toolbar. The report displays in the browser.

Last Name	First Name
BLACKWOOD	ROSEMARIE
CROSS	BARBARA
GREENSPAN	MARY
JONES	DIANE
MCCOY	JOHN
SMITH	MARY
Click on a last name to look up a phone number	

Drilling Down to a Maintain Procedure

You can attach a Maintain procedure to a field or fields in a report from the Drill Down dialog box.

Drilling down to a Maintain procedure is only supported when the procedure is executed from a Web browser such as Netscape or Internet Explorer.

Procedure How to Drill Down to a Maintain Procedure

To access the Drill Down dialog box:

1. Right-click the field(s) in the Report Painter window and select *Options* from the shortcut menu.

   The Field Properties dialog box opens.

2. Click the Drill Down tab.
3. Select *Maintain Procedure* from the Drilldown Definition drop-down list.

   or

   If the procedure is compiled, select *Maintain Procedure Compiled* from the check box. (Consult your Maintain developer to determine if your procedure is compiled.)

4. Type the name of the drill down procedure in the *Procedure* name field.
5. Click *OK*.

Reference Drilling Down to a Maintain Procedure on a Secured Maintain Server

If the Maintain procedure you are drilling down to is on a secured Maintain Server, in order to pass data from the report to the Maintain procedure you need to define additional parameters for name and password. For details on creating drill down parameters, see *How to Create a Drill Down Parameter* on page 3-129.

For security concerns, it is suggested that a fictitious name and password is used because the entire path to the CGI (including name and password) is disclosed in your browser's status window.

The following is a list of parameters that must be defined when drilling down to a Maintain Procedure on a secured Maintain Server.

Parameter	**Value**
IBIC_*user*	Represents the user name and in most cases it is case sensitive.
IBIC_*pass*	Represents the user password and in most cases it is case sensitive.

For related information, see *Maintain Syntax for CGI Coding* on page 3-142.

Reference Drilling Down to a Maintain Procedure in a Multi-Server Environment

If you are drilling down to a Maintain procedure on a specific server, in order to pass data from the report to the Maintain procedure you must define additional parameters for the server and outbound communications. For details on creating drill down parameters, see *How to Create a Drill Down Parameter* on page 3-129.

The following is a list of parameters that must be defined when drilling down to a specific Maintain Server.

Parameter	**Value**
IBIC_*server*	Represents the node name in the ODIN.CFG.
IBIS_*outbound*	Represents whether server communication is turned on or off. This value should be set to on.

For related information, see *Maintain Syntax for CGI Coding* on page 3-142.

Reference Maintain Syntax for CGI Coding

The Maintain Development Environment (MDE) provides design tools that encapsulate the necessary CGI code for many of its FORM operations. It does not usually require additional CGI programming by developers.

For example, Maintain FORMS uses the CGI to output HTML to the client. In turn, the client uses the CGI to send the response back to Maintain.

For development situations that go beyond the normal use, CGI parameter data can be retrieved implicitly from within a Maintain Procedure.

For syntax illustrations, see *Retrieving a CGI Parameter Data Within a Maintain Procedure* on page 3-142, *Calling Maintain Using the URL* on page 3-142, and *Calling Maintain Using HTML FORMS* on page 3-142.

Example Retrieving a CGI Parameter Data Within a Maintain Procedure

```
MAINTAIN
MODULE IMPORT (WEBBASE2 ERRORS);
Case Top
Declare FoundKeyName/i1 = IWC.FindAppCgiValue (KeyName, KeyValue);
EndCase
END
$$KeyName   Name of CGI Parameter
$$KeyValue Maintain Variable to receive Parameter Data
$$FoundKey Name   0 = Not Found / 1 = Found
```

Example Calling Maintain Using the URL

```
http://www/cgi-ibi/ibi_cgi/ibiweb.exe?IBIF_cmd=MNTCON%20EX%20cgivars&
IBIS_passthru=on
```

Example Calling Maintain Using HTML FORMS

```
<HTML>
<BODY onLoad='document.form.submit();'>
<FORM NAME='form' ACTION='/ibi_cgi/ibiweb.exe' METHOD='POST'>
<input TYPE='hidden' name='IBIF_cmd' value='MNTCON EX name_of_fex'>
<...>
</BODY>
```

Setting Up the Report Page

You can specify the type of media you are printing on, page margins, mailing label types, and other page characteristics from a Page Setup dialog box. You can also set and control page numbering in your reports from the Report Painter.

Procedure **How to Set up Your Page**

Choose *Page Setup* from the File menu.

The Page Setup dialog box opens. Here you can define a variety of layout specifications. For details, see *Page Setup Dialog Box* on page 3-143.

Reference **Page Setup Dialog Box**

Open the Page Setup dialog box by choosing Page Setup… from the Layout menu. The Page Setup dialog box has the following fields/options:

Only use paper types supported by current printer

Clear this check box to choose a paper type from the Paper type drop-down box that reflects an output device other than your current printer.

Paper Type

Displays a list of paper types or media to choose from.

Units

Indicates the unit of measurement for page margins (inches or centimeters).

Note: For HTML reports, ensure that you have turned on the Cascading Style Sheets option in the Report Options Output tab.

Page orientation

- Select Portrait to print a report on a page that is taller than it is wide (vertically).
- Select Landscape to print on a page that is wider than it is tall (horizontally).

Page margins

Displays values that indicate the top, left, bottom, and right margins of the report page.

Note: For HTML reports, ensure that you have turned on the Cascading Style Sheets option in the Report Options Output tab.

Painter defaults

- Click *Set* to save the current page settings as your default page settings. These default page settings will be applied to all new reports created in the Report Painter from this point forward.
- Click Use to apply the new default page settings to a report created previously with different page settings.

Mailing Labels

Activates the Mailing Labels section of the dialog box where you can define the label's dimensions. For details, see *Creating Mailing Labels* on page 3-146.

Label type

Specifies a label type, which, when selected, automatically defines the label's dimensions.

Select a label from the drop-down list box.

Note: The Mailing Labels check box must be selected to activate this box.

Label grid

Indicates the number of columns and rows on the label sheet.

Note: These dimensions can only be altered if you have selected User defined label as the Label type.

Label margins

Indicates the values of the top and left margin of each label.

Label dimensions

Indicates the width and height of each label.

Note: These dimensions can only be altered if you have selected User defined label as the Label type.

Print order

- Select Down page to print the labels from top to bottom.
- Select Across page to print the labels from left to right.

Distance between labels

Indicates the distance between each label, horizontally and vertically.

Note: These dimensions can only be altered if you have selected User defined label as the Label type.

Prompt for starting label

Prompts you to specify the column and row of the label you wish to start printing from. Each time the report is run, a dialog box appears asking you to enter a column and row.

Procedure How to Control Page Numbering in Report Output

1. Choose *Output* from the Report menu.

   The Report Options dialog box opens.

2. In the Page Number box, select one of the following:

   - *ON* to number the pages and display the page number on the upper left-hand corner of the page.
   - *OFF* to suppress page numbering.
   - *OFF without lead space (NOLEAD)* to suppress page numbering and the two leading blank lines normally on each page.
   - *Use Current FOCUS setting* to number the page according to the values assigned to the PAGE-NUM Set parameter.

   For information on Set parameters, see *Developing Reporting Applications*.

Procedure How to Set up an HTML Report With On-demand Paging

You can paginate HTML reports using on-demand paging, a feature that causes the Web server to send an HTML report to your browser one page at a time.

This feature requires that the report be run remotely against the WebFOCUS Reporting Server.

When this feature is in effect, your browser displays a Viewer Control Panel that enables you to navigate to the next or previous page, all pages, or to a specific page.

1. Choose *Output* from the Report menu.

   The Report Options dialog box opens.

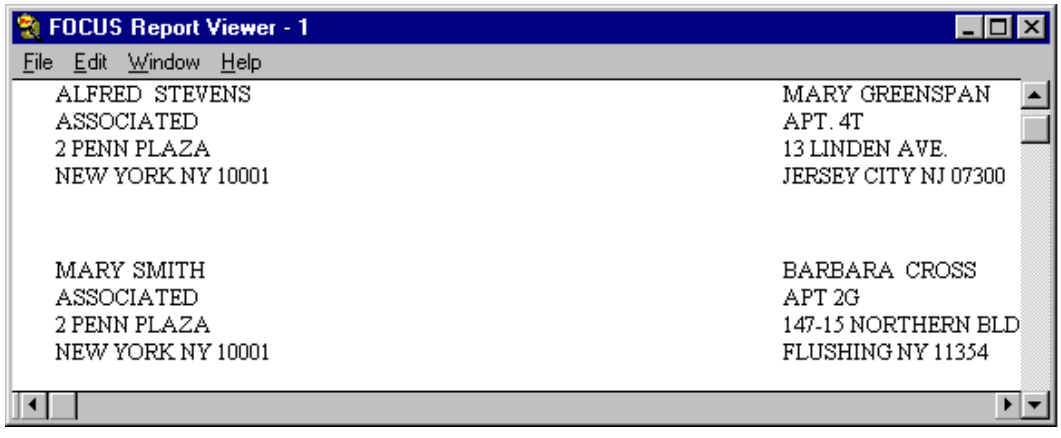
2. Select *HTML* from the Display Format drop-down list, then select the *On-demand Paging* check box.

When you run the report, it displays in your browser along with the Viewer Control Panel. For details on navigating through multi-page Web reports, see Chapter 5, *Viewing and Printing Reports and Graphs*.

Creating Mailing Labels

Report Painter enables you to create and print mailing labels by adjusting your page setup.

To use this feature with HTML reports, ensure that you have selected the Cascading Style Sheets option in the Report Options Output tab.



The process for setting up your page to create mailing labels consists of five steps:

1. Specify the page layout using the Page Setup dialog box.
2. Add the field(s) you want to sort by.
3. Assign a page break to the sort field so that each record is printed on a separate label, and hide the sort field so that it doesn't appear on the page.
4. Suppress page numbering.
5. Create the label as a report heading.

You can set up your page specifically to create mailing labels using options in the Page Setup dialog box, which you access from the File menu. For details, see *Page Setup Dialog Box* on page 3-143. For an illustration that you can use as a model, see *Creating Labels* on page 3-148.

Procedure How to Choose a Label Type

In the Page Setup dialog box:

1. Select the *Mailing Labels* check box. The Mailing Labels section becomes active.
2. Select a label type from the Label type drop-down box.
3. Click *OK*.

Procedure How to Set Parameters for a Label Not Available as a Label Type

In the Page Setup dialog box:

1. Select the *Mailing Labels* check box. The Mailing Labels section becomes active.
2. Select *User defined label* from the Label type drop-down box. Type values for the following:

   Label grid

   Enter the number of columns and rows.

   Label margins

   Type values that indicate the top and left margin of each label.

   Label dimensions

   Type values that indicate the width and height of each label.

   Distance between labels

   Type values that indicate the distance between each label, horizontally and vertically.
3. Click *OK*.

Procedure How to Choose the Row and Column of the Starting Label

In the Page Setup dialog box, select the *Prompt for starting label* check box.

Each time the report is run, a dialog box prompts you to specify the row and column of the label from which you want to start printing.

Procedure How to Print Labels From Top to Bottom, Left to Right

In the Page Setup dialog box, select *Down Page* from the Print Order box.

Procedure How to Print Labels From Left to Right, Top to Bottom

In the Page Setup dialog box, select Across Page from the Print Order box.

Example Creating Labels

Suppose you want to create mailing labels to distribute a report by postal mail. The following example shows how to create mailing labels for the Gotham Grinds store managers.

1. Open the GGSTORES data source in the Report Painter.
2. Specify the page layout for your labels.
   a. Choose *Page Setup* from the File menu to open the Page Setup dialog box.
   b. Select the *Mailing Labels* check box to activate the mailing label section, and define the label's dimensions.
   c. Ensure that *User defined label*, the default label type, is selected in the Label type drop-down box.
   d. Type the following information in the corresponding sections of the Page Setup dialog box:

Label grid	
Columns: 2	Rows: 10
Label margins	
Top: 0.6	Left: 0.256
Label dimensions	
Width: 4.0	Height: 1.0
Distance between labels	
Horiz: 0.188	Vert: 0.0

   e. Click *OK* to return to the Report Painter window.
3. Add your sort column. Click the *By* button on the Report Painter toolbar and double-click or drag *STORE_CODE* from the Fields tab of the Object Inspector.
4. Assign a page break and hide the sort field.
   a. Right-click *Store ID* in the Report Painter window and choose *Options*. Click on the Sort tab and select the *Page Break* check box in the Actions box. Click *OK* to return to the Report Painter window.
   b. Right-click *Store ID* in the Report Painter window and uncheck *Visible* from the shortcut menu.

5. Suppress page numbering.
   a. Choose *Output* from the Report menu to open the Report Options dialog box.
   b. In the Page Number box, select *OFF without lead space (NOLEAD)* to suppress page numbering and the two leading blank lines normally on each page. Click *OK* to return to the Report Painter window.
6. Create the label as a report heading.
   a. Click the *Report Options* button on the General toolbar to open the Report Options dialog box.
   b. Click the *View* tab, select the *Boundaries* check box in the General box, and then click *OK*.
   c. Position the cursor in the page heading by clicking your left mouse button in the heading area. Type the following in the heading area:

      Attn:
   d. Press the space bar to leave a blank space after it.
   e. Double-click or drag *ADDRESS1* from the Fields tab of the Object Inspector. Press the Enter key to bring your cursor to the next line.
   f. Double-click or drag *STORE_NAME* from the Fields tab of the Object Inspector. Press the Enter key to bring your cursor to the next line.
   g. Double-click or drag *ADDRESS2* from the Fields tab of the Object Inspector. Press the Enter key to bring your cursor to the next line.
   h. Double-click or drag *CITY* from the Fields tab of the Object Inspector. Insert a comma and a space then double-click or drag *STATE*. Add two spaces and double-click or drag *ZIP*.

7. Run the report by clicking the *Run* button on the toolbar. The page of labels displays in the browser exactly as it will be printed.

```
ATTN: HENRY RYAN
GOTHAM GRINDS #1019
34 BETHEL BLVD
HOUSTON , TX 77201

ATTN: MARY MULLER
GOTHAM GRINDS #1020
79 RICHMOND LANE
CHICAGO , IL 60601

ATTN: PAT SMILEY
GOTHAM GRINDS #1040
34 LAKERS LANDING
LOS ANGELOS , CA 90001

ATTN: GEORGIA PEACH
GOTHAM GRINDS #1041
96 OLYMPICS AVENUE
ATLANTA , GA 30314
```

Business Intelligence Features

You can enable or invoke a number of advanced business intelligence tools from the Report Painter. These include:

- Financial analysis using the Financial Report Painter, a graphical interface for the Financial Modeling Language. The Financial Report Painter enables you to perform sophisticated row-based calculations on data.
- Trend analysis through data visualization based on bar graphs applied to columns or measures of numeric data. Data visualization is supported from the Report Painter and from the OLAP Control Panel.
- Knowledge Mapping, which allows you to create reports that include dynamic pop-up menus, drag and drop capabilities, and intelligent drill downs.

Procedure How to Access the Financial Report Painter

In the Report Painter window:

1. Add the fields you want to include in the report.
2. Select the column that you want to use as the *For* field and click the *For* button on the Columns toolbar. The selected *For* field allows the report to be structured on a row-by-row basis in the Financial Report Painter.
3. Click the *Matrix tab* on the Report Painter window.

   The Financial Report Painter's Design grid opens.

For details, see Chapter 2, *Creating Reports With Financial Report Painter*.

Procedure How to Enable Data Visualization Graphics (Report Painter)

1. Open the report in which you wish to insert visualization bar graphs in the Report Painter.
2. Right-click a column containing numeric data and select *Visualize* from the shortcut menu.

   The Data Visualization dialog box opens.
3. Turn on the check box next to *Visualize*. This activates the option and also invokes the bar graph when you subsequently run the report.

For details, see Chapter 9, *Visualizing Trends in Reports*.

Procedure How to Enable Knowledge Mapping

1. From the Report menu, select Output. The Report Options dialog box opens.
2. Check the *Knowledge Map Source Report* option in the Knowledge Mapping box to specify your source report.

Once you have enabled the Knowledge Mapping feature for a report, you can specify the properties of your Knowledge Map report.

Running and Saving a Report

After creating a report in the Report Painter you can run it to quickly see the results displayed in your browser. For details, see Chapter 5, *Viewing and Printing Reports and Graphs*.

When you close the browser you return to the Painter, where you can edit the report request and rerun it.

Depending on your output destination, the report may be sent to the printer, a Winform, an HTML form or saved as an output file in a variety of reusable formats, rather than being displayed on your screen. For details, see *Controlling Output Destinations* on page 3-123. For related information, see Chapter 5, *Viewing and Printing Reports and Graphs* and Chapter 7, *Saving and Reusing Report Output*.

After creating or editing a report request you can save it in the Report Painter without leaving the tool. You can also save a request as you exit any reporting tool.

Procedure How to Run a Report From Report Painter

Choose one of the following methods:

- From the General toolbar, click the *Run* button.

  or

- Choose *Run* from the File menu.

Tip: If you are running a report that has been flagged for remote execution on a WebFOCUS Reporting Server, the report will automatically be run remotely. If you wish to invoke remote execution for a report that has not been explicitly flagged for remote execution, select Run Remote from the File menu.

Similarly, you can run a report locally from a reporting tool even if it has been flagged for remote execution by selecting Run Local from the File menu. The original setting (whether local or remote) is temporarily overridden, then reinstated for future use.

Procedure How to Save a Report Request in Report Painter

Select *Save* from the File menu. The report is saved as a component in the procedure in which it was created.

Report Painter Limitations

The following topics describe several features that are available in the WebFOCUS language, but are not supported in the Report Painter.

Parsing Limitations

The Report Painter cannot currently parse reports (FOCEXECs) with the following WebFOCUS verbs, phrases, or logical relations used for record selection in WHERE and IF expressions.

If you attempt to open or edit a report that contains syntax that the Report Painter cannot parse, a message box will be displayed indicating the error.

Unsupported Verbs

The Report Painter cannot parse the following verbs:

```
LIST
ADD
```

Unsupported Phrases (Parsing)

The Report Painter cannot parse the following phrases and syntax:

```
SUP-PRINT
```

The Report Painter cannot parse the following phrases and syntax that use AND. These phrases are supported if AND is not used.

```
[AND] ROW-TOTAL
[AND] COLUMN-TOTAL
ON TABLE [PAGE-BREAK AND] SUBHEAD
ON TABLE [PAGE-BREAK AND] SUBFOOT
ON TABLE RECAP
```

Unsupported Logical Relations in WHERE and IF Expressions

The Report Painter cannot parse the following logical relations used for record selection in IF or WHERE expressions:

```
EXCEEDS
IS-MORE-THAN
IS-LESS-THAN
SIMILAR
FROM
IS-FROM
TO
FROM lower TO upper
```

```
NOT-FROM lower TO upper
LIKE
IS NOT LIKE
```

Report Painter Syntax Limitations

The Report Painter does not currently support the syntax described in the following topic. However, it does recognize these verbs and phrases and parse reports (FOCEXECs) containing them, without displaying an error message.

If you attempt to open or edit a report that contains syntax that the Report Painter recognizes but does not support, that syntax will be removed from the FOCEXEC in the Report Painter.

Unsupported Phrases

The following phrases and syntax are not currently supported by the Report Painter and will be omitted from the FOCEXEC:

```
BY ROWS OVER
ACROSS COLUMNS
FOR OVER
```

Report Painter Features Not Supported by HTML

Since your browser controls the interpretation of HTML commands, a few of the standard report styling features found in the Report Painter are not supported in the HTML document output. However, several of these features (noted with asterisks *) are supported if you turn on the Cascading Style Sheets option in the Report Options Output tab.

- Page Layout, including Mailing labels *
- Justify
- Column Width to control wrapping *
- Page Number
- Positioning object area elements *
- Under Line *
- Skip Line *
- Page Break

For related information on Style Sheets, see *Creating Reports With WebFOCUS Language*.

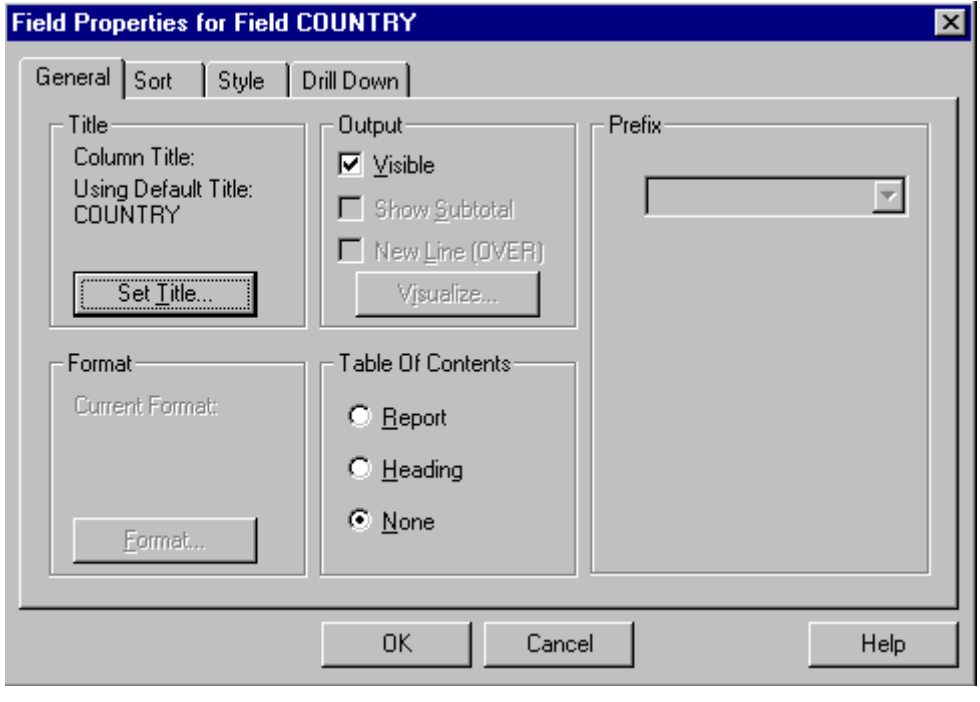
Field Properties and Report Options Dialog Boxes

The Report Painter provides two sets of tabbed dialog boxes that handle a wide range of tasks for columns and reports. Although there are alternative ways to accomplish some of these tasks (from right-click menus, toolbar buttons, and menu bar options), when in doubt you can always:

- Right-click a column and choose *Options* to open the Field Properties dialog box at the General tab. From there you click the Sort, Style, and Drill Down tabs.
- Click the *Report Options* button on the General toolbar to open the Report Options dialog box at the Style tab. From there you can click the Output, Where/If, Compute, View, and Images tabs.

  You can also access each Report Option tab directly from the Report menu.

Reference Field Properties General Tab



Select a column in the Report Painter Window and choose *Options* from the shortcut menu. The Field Properties dialog box opens at the General tab, which includes the following fields:

Title

Displays default column title. Click the *Set Title* button to open the Title dialog box, where you can type a new column title.

Note: If you do not want the column's title to be underlined in an HTML report, check the Don't Underline Title check box in the Title dialog box.

Format

Displays the column's current format.

Click the *Format* button to open the Format dialog box, where you can change: format type (alphanumeric, numeric, date, text); length; decimal places (for numeric fields); edit options (for numeric and date fields), and other date information. For details see Appendix A, *Assigning Field Formats*.

Output

- *The Visible* check box (selected by default) enables you to control whether a column is displayed in the report, or hidden. If you deselect *Visible* the column is grayed out in the Report Painter window, but can still be used in calculations.
- The *Show Subtotal* check box enables you to control the display of calculated subtotals on a column-by-column basis.
- Select *New Line (OVER)* to place field names over one another. This is one way to decrease the width of a report, particularly when you are sorting horizontally (Across).
- Click the *Visualize* button to open the Data Visualization dialog box, where you can enable a data visualization bar graph for the data in the selected numeric column. For details, see *Data Visualization Dialog Box* in Chapter 9, *Visualizing Trends in Reports*.

Table of Contents

Applies a dynamic table of contents to the first By field in an HTML report. This enables you to display every value of the highest-level sort field as a hyperlink, then toggle between a display of the entire report and of a designated section.

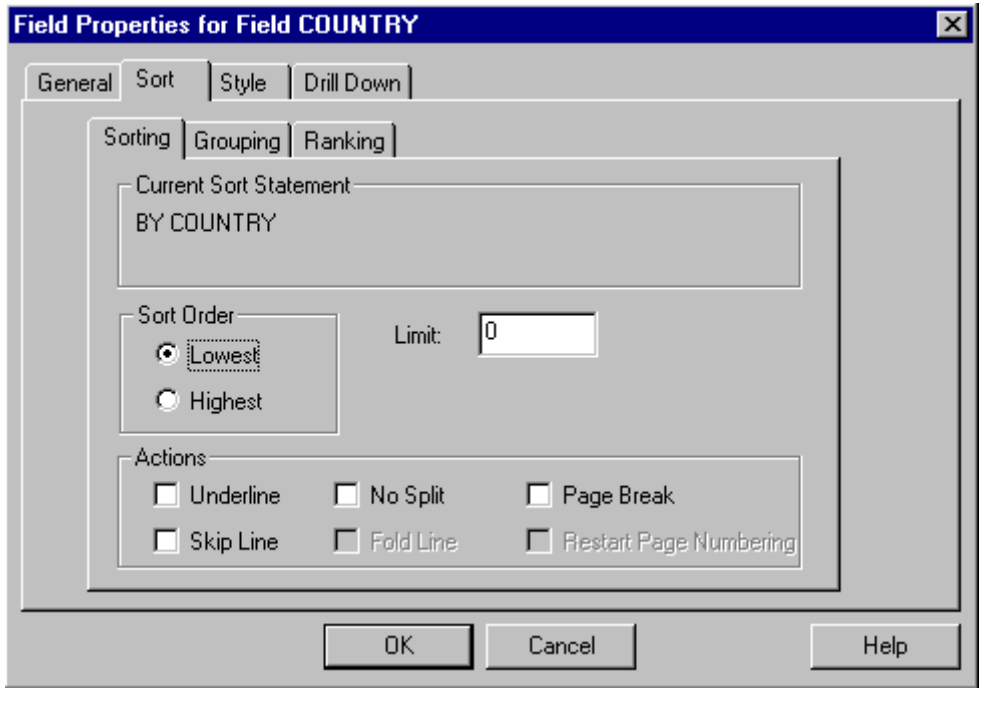
- Select the *Report* check box to position the TOC icon in the upper left corner of the executed report.
- Select the Header check box to position the TOC as an object in the page heading.
- Select None to turn the feature off.

For details, see *Navigating Sort Groups From a Table of Contents* on page 3-43.

Prefix

Select an operator to perform a calculation or other manipulation directly on the values of a field and display the results in your report. The operator is applied to a single column and affects only that column. The list adjusts to display appropriate operators for the selected field. Note, however, that most operators apply to numeric fields that are being summed. For a list of operator, see *Operations You Can Perform on Fields* on page 3-27.

Reference Field Properties Sort Tab



Select a column in the Report Painter Window and choose *Options* from the shortcut menu. The Field Properties dialog box opens. Click the Sort tab; this tab displays only when the selected column has been designated as a sort column (either By or Across). For details, see *Sorting Data* on page 3-29.

Sorting tab

Current Sort Statement

Reflects the sort conditions that are in effect. Appears on all Sort tabs.

Sort Order

You can change the sort order of values in a column from ascending to descending, or vice versa: for alphanumeric (A to Z; Z to A) or numeric (1-10; 10-1).

Select *Lowest* for ascending order (lowest to highest).

Select *Highest* for descending order (highest to lowest).

Limit

If entered, this value limits the number of sort values to display. When used with Sort ascending, Limit displays the chosen number of lowest values; with Sort descending, it displays the chosen number of highest values. Limit is only supported for By fields.

Actions

These options are available from all Sort tabs. (Not all of these features are supported with HTML reports.)

Underline

Includes a horizontal line across the width of a report after the value of the selected sort field changes. (To apply this action in HTML reports, turn on Cascading Style Sheets in the Report Options Output tab.)

Skip Line

Skips a line on a report when the value of the selected sort field changes. (To apply this action in HTML reports, turn on Cascading Style Sheets in the Report Options Output tab.)

Page Break

Starts a new report page when the value of a selected sort field changes. (This feature is not supported in HTML reports.)

No Split

Breaks sort fields logically and regenerates the field heading on the next page or screen.

Restart Page Numbering

Resets the page number to one at the sort break. The Page-break option must be selected.

Fold Line

Causes columns to be placed on a separate line when the value of the sort field changes. (This feature is not supported in HTML reports.)

Grouping tab

In Groups Of

Select this option to group sort field values in specified increments.

Intervals

Defines the increment (for example, in groups of 1000, 5000, etc.).

Group limit

If specified, this value limits the number of groups of the specified interval to be retrieved.

You can combine these selections with the list of *Actions* defined above.

Ranking tab

Ranked

Includes a column with a numeric rank for each row in a vertically sorted report.

Lowest

Choose lowest to rank in ascending order.

Highest

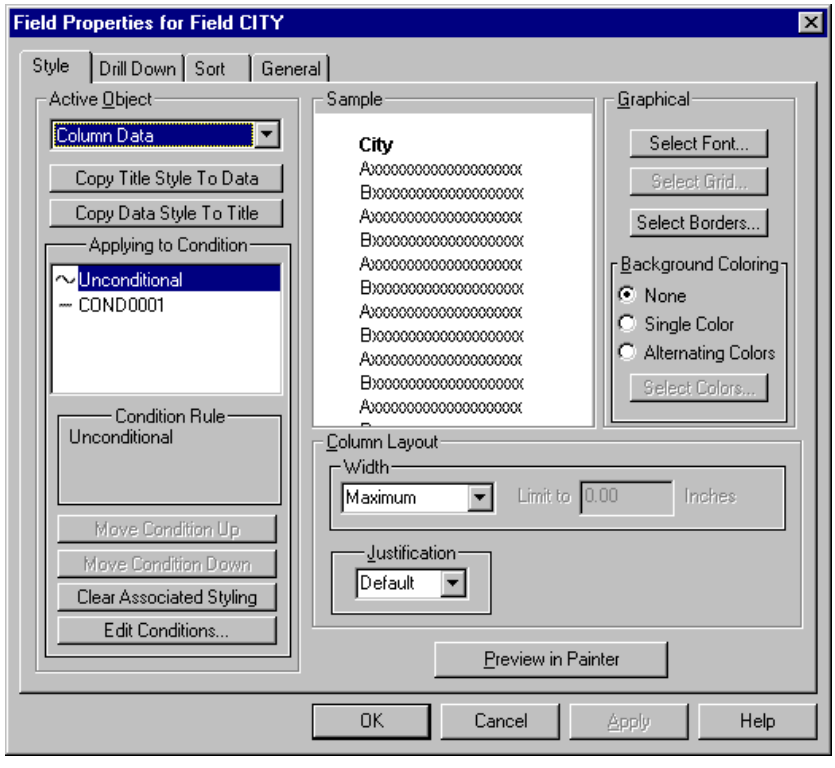
Choose highest to rank in descending order.

Limit

If specified, this value limits the number of ranked values to be retrieved.

You can combine these selections with the list of *Actions* defined above.

Reference Field Properties Style Tab



Right-click a column in the Report Painter window and choose *Options* from the shortcut menu. The Field Properties dialog box opens at the Style tab.

Active Object

Object areas such as Column Title and Data, Column Data, and Column Title can be selected from the Active Object drop-down list. You can apply conditions, colors, grids, borders, or conditions to an object area.

Copy Title Style to Data

Copies the column's title styling (conditional or unconditional) attributes to the column's data component.

Copy Data Style to Title

Copies the column's data conditional styling (conditional or unconditional) attributes to the column's title component.

Applying to Condition

Displays existing conditions created with the Condition List and Edit Condition dialog boxes.

Condition Rule

Displays the selected condition rule(s) you created in the Edit Condition dialog box.

Move Condition Up/Move Condition Down

Rearranges the order of conditions applied in a column. Order is significant because conditions are applied in the order listed. For example, if the first and last conditions are both true, the style in the last condition will override the style in the first.

Clear Associated Styling

Clears associated styling for a column. Select a defined condition from the Applying to Condition dialog box in the Style tab and click this button.

Edit Conditions

Launches the Edit Conditions dialog box. Click *New* to launch the Condition List dialog box, where you can create a new condition or edit an existing one. You can define conditions that control when to apply particular fonts, point size, text style, grids, color, and drill down procedures.

Column Layout

Choose the Width or Limit to option.

Note: To use these features in HTML reports, you must turn on the Cascading Style Sheets option in the Report Options Output tab.

Width

Choose one of the following options from the Width drop-down list:

- *Maximum*

  Sets the width according to the length defined in the field format.

- *Minimum*

  Sets the width of the column according to the widest value or heading in the field. This is selected by default.

- *Truncate*

  Enables you to specify where to truncate the column width based on the specified units (inches or centimeters). To indicate that a field value has been truncated in the browser, WebFOCUS places an exclamation point (!) after every alphanumeric and text field value and an asterisk (*) after every numeric field value.

- *Wrap*

Enables you to specify where to wrap data based on the specified units (inches or centimeters).

For related information, see *Formatting a Column* on page 3-78.

Limit to:

Enables you to specify where to truncate or wrap data based on the specified units (inches or centimeters).

Note that The Limit to option is only activated when Truncate or Wrap is selected.

Justification

Select a justification option for the selected column: left margin, right margin, center, or default to reinstate the default setting (left for alphanumeric columns; right for numeric columns).

Preview in Painter

Enables you to preview a styling attribute in the Report Painter window (in addition to the Sample window in the Style tab).

Select Font

Click the *Select Font* button to open the Font dialog box, where you can specify the font, font style, size, effects, and color for the selected object.

Select Grid

Opens the Grid dialog box, from which you can apply a grid to the selected column. For PDF reports, you can specify a grid type (horizontal, vertical, horizontal and vertical) and a Line style (light or heavy).

These options are not supported in HTML reports. For more information, see *Report Options Style Tab* on page 3-167. For details, see *Styling With Fonts, Colors, and Grids* on page 3-88.

Select Borders

Opens the Borders dialog box, from which you can apply borders to the selected column. For details, see *How to Add Borders to an HTML or PDF Report* on page 3-93.

Note: If grids are on, you cannot use the Borders feature.

Background Coloring

You can apply a background color to: *Column Title and Data, Column Data,, or Column Title*.

Choose one of the following options

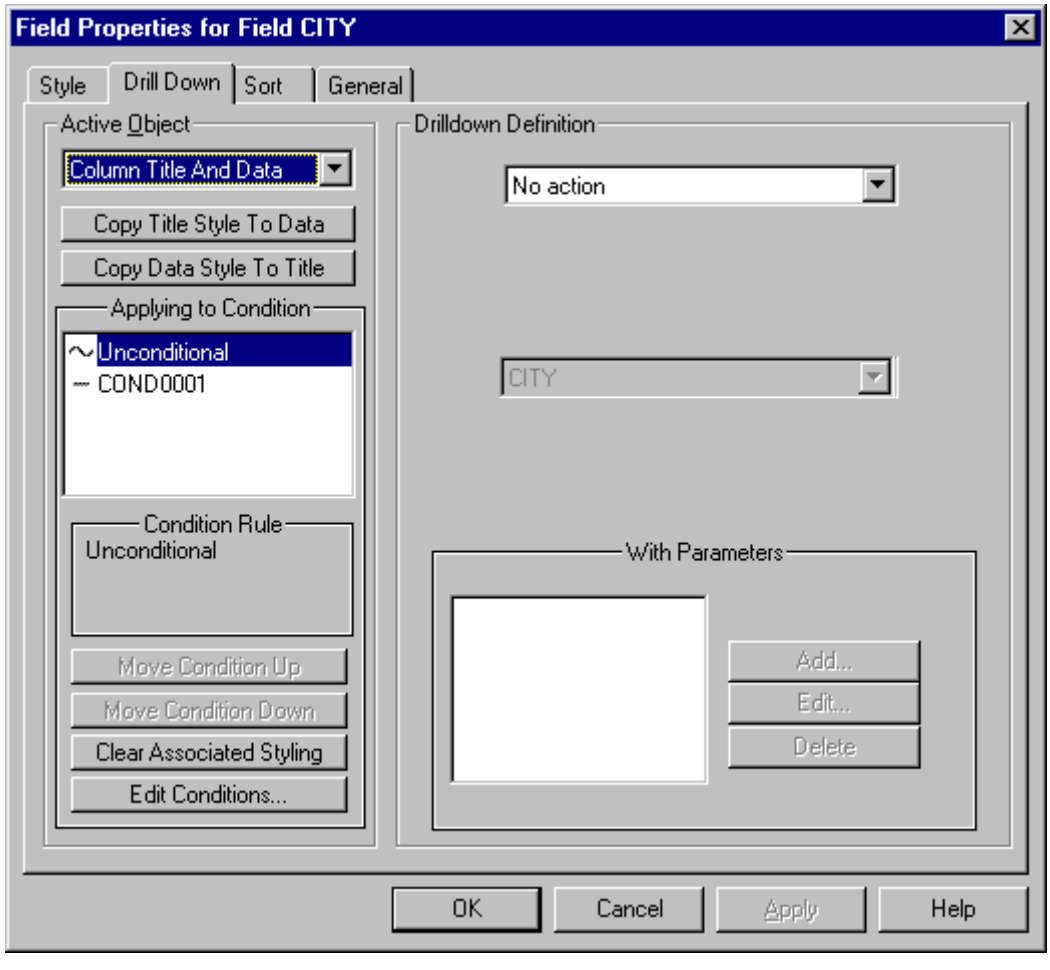
- *Single Color*

  Opens the Color dialog box, from which you can select one background color.

- *Alternating Colors*

Click the *Alternating Colors* radio button and then the *Select Colors* button to open the Choose Background Color dialog box. You can then assign alternating background colors to rows within columns. For more information, see *How to Assign Alternating Background Colors to Rows Within Columns* on page 3-80.

Reference Field Properties Drill Down Tab



Right-click a column in the Report Painter window and choose *Options* from the shortcut menu. The Field Properties dialog box opens. Click the Drill Down tab. Use the following options to supply information required to link a report to another report, a URL, JavaScript, Maintain procedure, or Maintain Case. For details, see *Creating a Drill Down Procedure* on page 3-124.

Active Object

Select one of the following from the drop-down list. The drill down action is applied to the selected object:

- Column Title and Data
- Column Data
- Column Title

Copy Title Style to Data

Copies the column's title styling (conditional or unconditional) attributes to the column's data component.

Copy Data Style to Title

Copies the column's data conditional styling (conditional or unconditional) attributes to the column's title component.

Applying to Condition

Displays existing conditions created with the Condition List and Edit Condition dialog boxes. The value Unconditional means that any drill-down reports applied to the column will be applied unconditionally to the column.

Condition Rule

Displays the actual condition if a condition is selected in the Applying to Condition dialog box.

Move Condition Up/Move Condition Down

Rearranges the order of conditions applied to the drill down report. Conditions are applied in the order listed. For example, if the first and last conditions are both true, the last condition will override the first.

Clear Associated Styling

Removes the current styling from the condition.

Edit Conditions

Opens the Condition List dialog box, from which you create a new condition, edit an existing condition, or delete a condition.

Drilldown Definition

Caution: Before you select a Drilldown Definition, specify the object to which the action will be applied (that is, column title and data, column data only, or column title only).

No action

Select *No action* to specify that no drill down link will be executed.

Execute Procedure

Select *Execute Procedure* and enter the name of a procedure to link to in the Procedure Name field, or choose the detail procedure from the drop-down list. Click *Open* to open the Procedure window for the detail report.

URL

Select *URL* and enter the address to link to in the URL field. Click *Open* to open the specified URL in a web browser.

This option is only available for HTML and PDF reports.

URL from field

Select *URL from field* and choose a field name from the drop-down list to indicate that the URL referenced is the value of that field.

For example, if the data source contains a field such as E_MAIL whose values are the e-mail addresses of every employee, select E_MAIL from the Field drop-down list as the URL, and supply the proper parameters. This action enables a user to click a last name in the Web browser, which opens the e-mail application with the e-mail address of the individual selected.

This option is only available for HTML reports.

Javascript

Select *Javascript* to execute a JavaScript function. Enter the name of the function in the Javascript field.

This option is only available for HTML reports.

Maintain Procedure

Provides a link to a Maintain procedure. Enter the name of the procedure in the Procedure Name field. For details, see *Drilling Down to a Maintain Procedure* on page 3-140.

Maintain Procedure Compiled

Provides a link to a compiled Maintain procedure. Enter the name of the procedure in the Procedure Name field. For details, see *Drilling Down to a Maintain Procedure* on page 3-140.

Maintain Case

Provides a link to a Maintain Case. Enter the name of the case in the Procedure Name field.

Note: A Maintain Case is also known as a Function.

Entry field

Enter the required value here, or choose one from the drop down list.

With Parameters

Displays the parameters defined for the selected procedure or URL in the Drilldown Definition field.

Add

Enables you to create parameters for the selected procedure or URL. Opens the Drill Down Parameter dialog box.

Edit

Enables you to edit the selected parameter.

Delete

Deletes the selected parameter.

OK

Applies the selections and closes the dialog box.

Cancel

Closes the dialog box without applying the selections.

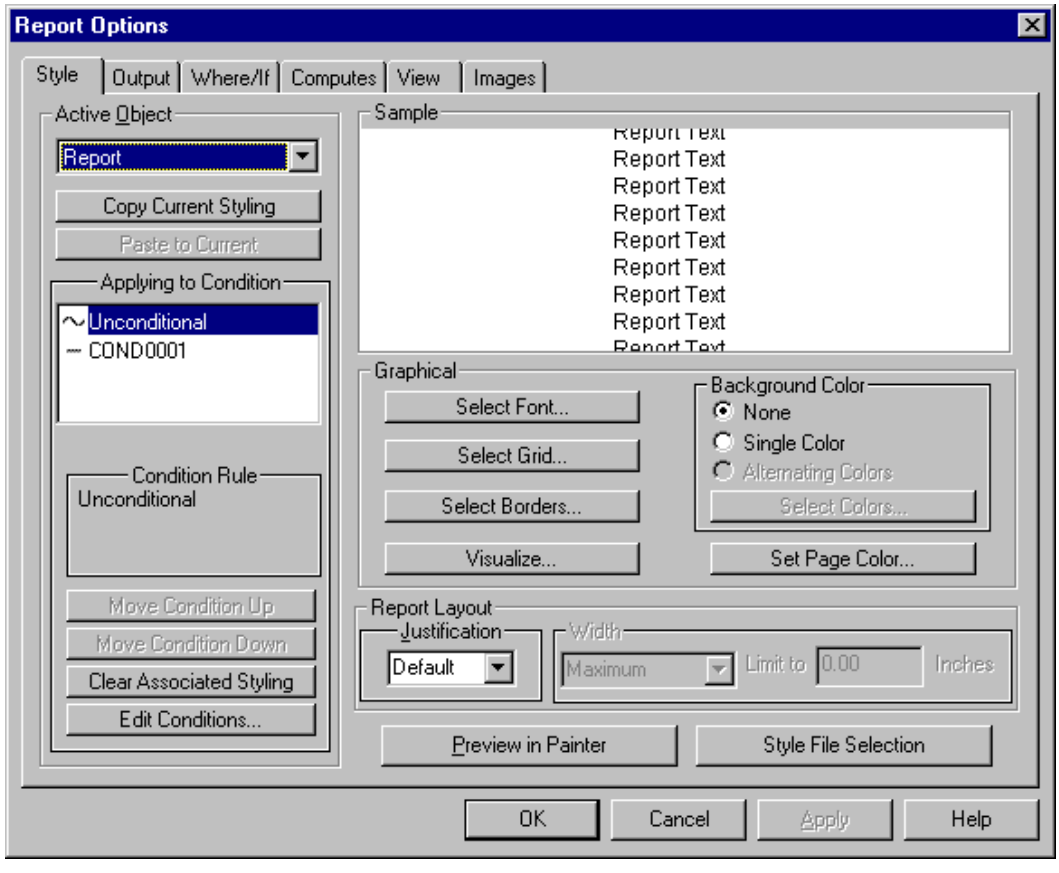
Apply

Applies the selections but leaves the dialog box open.

Help

Opens the help system.

Reference Report Options Style Tab



Active Object

Choose one of the following object areas from the Active Object drop-down list: Report, Title, Data, Table Heading, Table Footing, Heading, Footing, Subhead, Subfoot, Subtotal, Across Column, or Across Title.

You can apply conditions, colors, grids, borders, or conditions to an object area.

Copy Current Styling

Copies the current styling attributes from the object area selected in the Active Object drop-down list.

Paste to Current

Pastes the copied style to the object area selected in the Active Object drop-down list.

Applying to Condition

Displays existing conditions created with the Condition List and Edit Condition dialog boxes.

Condition Rule

Displays any condition rule(s) you created in the Edit Condition dialog box.

Move Condition Up/Move Condition Down

Rearranges the order of conditions applied in a column. Order is significant because conditions are applied in the order listed. For example, if the first and last conditions are both true, the style in the last condition will override the style in the first.

Clear Associated Styling

Clears associated styling for a column. Select a defined condition from the Applying to Condition dialog box in the Style tab and click this button.

Edit Conditions

Launches the Edit Conditions dialog box. Click *New* to launch the Condition List dialog box, where you can create a new condition or edit an existing one. You can define conditions that control when to apply particular fonts, point size, text style, grids, color, and drill down procedures.

Select Font

Click the *Select Font* button to open the Font dialog box, where you can specify the font, font style, size, effects, and color for the selected object.

Select Grid

Opens the Grid dialog box, from which you can apply a grid to the selected column. For PDF reports, you can specify a grid type (horizontal, vertical, horizontal and vertical) and a Line style (light or heavy).

These options are not supported in HTML reports. For more information, see *Report Options Style Tab* on page 3-167. For details, see *Styling With Fonts, Colors, and Grids* on page 3-88.

Select Borders

Opens the Borders dialog box, from which you can apply borders to the selected column. For details, see *How to Add Borders to an HTML or PDF Report* on page 3-93.

Note: If grids are on, you cannot use the Borders feature.

Visualize

Click the *Visualize* button to open the Data Visualization dialog box, where you can insert data visualization bar graphs that correspond to the data in all numeric columns. Note that you cannot turn the data visualization feature on from the Report Options Style tab; that must be done from the Field Properties General tab or the right-click menu for a selected column. However, you can style the bar graphs from the Report Options Style tab. For details, see *Data Visualization Dialog Box* in Chapter 9, *Visualizing Trends in Reports*.

Background Color

You can apply a background color to the report or to an object area selected in the Active Object drop-down list.

Choose one of the following options

- *Single Color*

  Opens the Color dialog box, from which you can select one background color.

- *Alternating Colors*

  Click the *Alternating Colors* radio button and then the *Select Colors* button to open the Choose Background Color dialog box. You can then assign alternating background colors to rows within columns. For more information, see *How to Assign Alternating Background Colors to Rows Within Columns* on page 3-80.

Set Page Color

Allows you to select a color to apply to the entire report page.

Justification

Select a justification option for the selected column: left margin, right margin, center, or default to reinstate the default setting (left for alphanumeric columns; right for numeric columns).

Width

Choose one of the following options from the Width drop-down list:

- *Maximum*

  Sets the width according to the length defined in the field format.

- *Minimum*

  Sets the width of the column according to the widest value or heading in the field. This is selected by default.

- *Truncate*

Enables you to specify where to truncate the column width based on the specified units (inches or centimeters). To indicate that a field value has been truncated in the browser, WebFOCUS places an exclamation point (!) after every alphanumeric and text field value and an asterisk (*) after every numeric field value.

- *Wrap*

  Enables you to specify where to wrap data based on the specified units (inches or centimeters).

For related information, see *Formatting a Column* on page 3-78.

Limit to:

Enables you to specify where to truncate or wrap data based on the specified units (inches or centimeters).

Note that The Limit to option is only activated when Truncate or Wrap is selected.

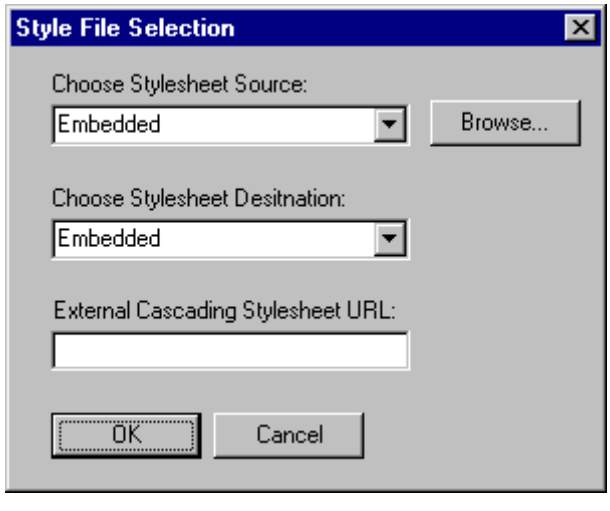
Preview in Painter

Enables you to preview a styling attribute in the Report Painter window (in addition to the Sample window in the Style tab).

Style File Selection

Launches the Style File Selection dialog box, where you can apply or customize external cascading style sheets. See *Style File Selection Dialog Box* on page 3-170 for more details.

Reference Style File Selection Dialog Box



Choose Style Sheet Source:

Select a style sheet from the Choose Style Sheet Source drop-down list. When you run your report, the style sheet will be applied automatically.

If you wish to reset the default styling, choose *Default* in the Choose Style Sheet Source drop-down list.

Choose Style Sheet Destination

If you customize a style sheet, type the name of the customized style sheet in the External Cascading Style Sheet URL input box. When you save the report, the new style sheet is saved and added to the list of available templates.

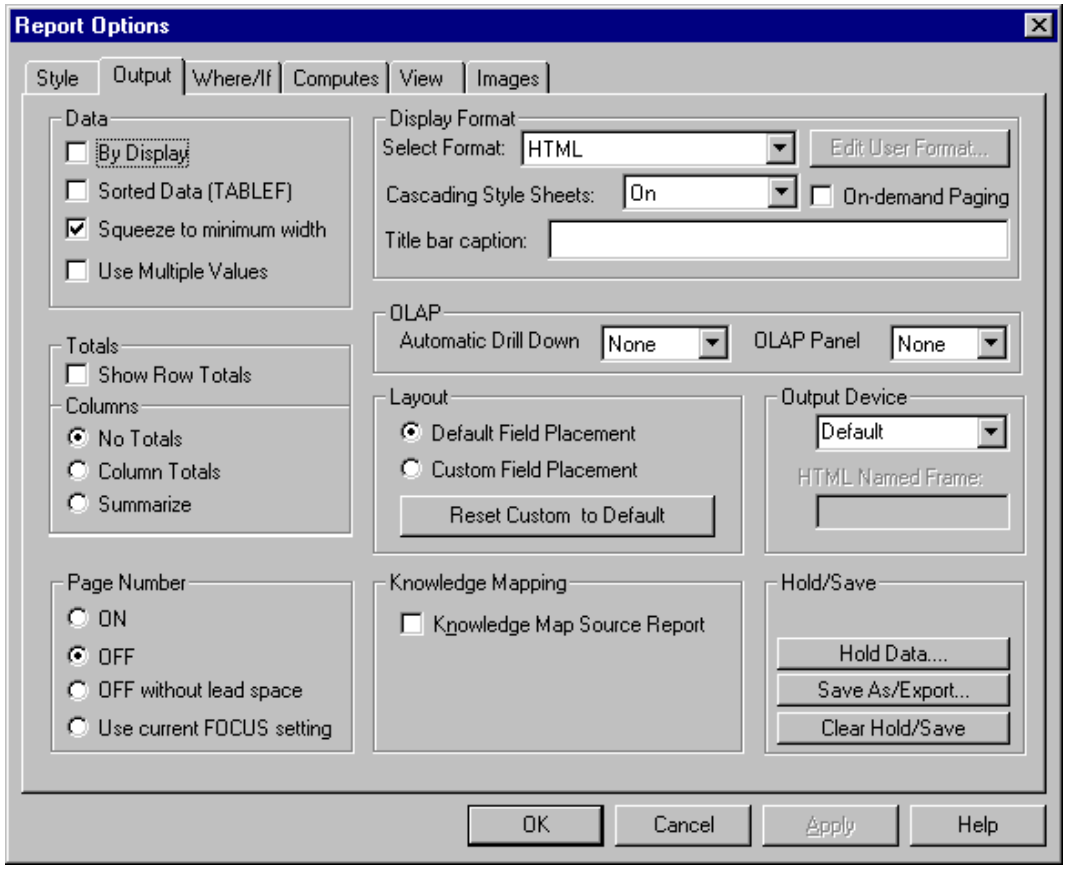
To suppress report styles, choose *None* in the Choose Style Sheet Destination drop-down list.

External Cascading Style Sheet URL

Type the name a Cascading Style Sheet in this input box.

The user must create the external CSS (Cascading Style Sheet) file and save it to an alias on the Web server. For more information, see *How to Apply an External Style Sheet to a Report (Report Painter)* on page 3-122.

Reference Report Options Output Tab



Data

- Click *By Display* to display the value of each sort field for every record in the report.
- Click *Sorted Data (TABLEF)*. If the data you are accessing is already in the correct sort order, you can prevent WebFOCUS from re-sorting it by selecting *Sorted Data (TABLEF)* from the Report Options Output tab. This feature provides a very fast method of retrieving data if it is already stored in the order required for display, and no further sorting is required.
- Click *Squeeze to minimum width* to remove extra blank space between columns. To use with HTML reports, you must enable the Cascading Style Sheets option on the Report Options Output tab.

- Click *Use Multiple Values* to allow you to add the same data value to multiple rows in the FML matrix. For example, the same value can exist as a single value in one row, as part of a range in another row, and in a calculation in a third row.

  For data that has not been structured as a hierarchy, values continue to be listed in the FOR field values panel after being used in a row. Without this option, values are removed from the list after being used.

  In a hierarchy, a used value remains in the FOR field values panel, where it is displayed in red to indicate that it has already been added to the matrix.

  In both instances, you can reuse the value as required. For more information, see Chapter 10, *Creating Reports With Financial Report Painter*.

Totals

Select the *Show Row Totals* check box to display a total for every row in the report.

Columns

- Select the *No Totals* radio button to suppress the display of totals.
- Select the *Column Totals* radio button to display a total for every column in the report.
- Select the *Summarize* radio button to recalculate values at a sort break.

Page Number

- Click *ON* to number the pages and display the page number on the upper left-hand corner of the page.
- Click *OFF* to suppress page numbering.
- Click *OFF without lead space* to suppress page numbering and the two leading blank lines normally on each page.
- Click *Use Current FOCUS setting* to number the page according to the values assigned to the SET PAGE-NUM command.

Display Format

Choose one of the following display formats for the current report: *HTML*, *PDF, Excel 2000, PS, FOCUS default,* or *User*.

HTML, PDF, Excel 2000, and PS reports are displayed in your browser.

Edit User Format

This button is enabled when the display format is User. It opens the Variable Editor dialog box, which allows you to assign a variable as the display format. This feature enables a user to select the report's display format.

Cascading Style Sheets

Cascading Style Sheets improve many display options for HTML reports. Enable this option to take advantage of a variety of formatting enhancements.

On-demand Paging

Displays one page of HTML report output and navigational controls. Use navigational controls to change the report page displayed in your browser.

Title bar caption

The name that you type for an HTML report in this field will appear in the browser's title bar.

OLAP

Automatic Drill Down controls access to automatic drill downs in an OLAP report:

- *None* disables automatic drill downs.
- *Dimensions* enables automatic drill downs on dimensions in an OLAP report.
- *All* enables automatic drill downs on dimensions and measures.

OLAP Panel controls display of the OLAP Control Panel (OCP) and the OLAP GUI selection pane:

- *None* (default) turns off OLAP (removes OLAP and OLAPPANE settings).
- *Control* opens OCP and generates -OLAP ON code in the procedure.
- *Top* opens OCP and the OLAP GUI selection panel above your browser (generates -OLAP ON and ON TABLE SET OLAPPANE TOP in the procedure).
- *Bottom* opens OCP and the OLAP GUI selection panel below your browser (generates -OLAP ON and ON TABLE SET OLAPPANE BOTTOM code in the procedure).
- *Hidden* displays the Dimensions button and Measures button in the report, but not the OLAP button.

Layout

- Click the *Default Field Placement* radio button to prevent the relocation of sort fields.
- Click the *Custom Field Placement* radio button to move sort fields from their default locations.
- Click the *Reset Custom to Default* button to restore the default placement.

Output Device

- Select *Printer* to send the report to a printer.
- Select *Screen* to display the report on the screen.
- Select *Default* to direct output to whichever of the options you set previously as the default.
- Select *Object* to direct output to an HTML frame.

HTML Named Frame

This field is enabled when the output device is Object. Enter the name of an HTML frame to which output will be directed.

Knowledge Mapping

Click the *Knowledge Map Source Report* check box to specify a source report.

Note: This feature is only supported in Managed Reporting in the current release.

Hold/Save

- Click *Hold Data* to open the Hold dialog box, where you specify the type of file in which to store the report output, and assign the file a unique name. For some formats, a Master File is created with the output file.
- Click *Save As/Export* to open the Save As/Export dialog box, where you choose the type of file in which to store the report output, assign the file a unique name, and, if you wish, store the file in a particular directory.
- Click *Clear Hold/Save* to clear the Hold and Save files. You must do this to send the output to the screen or printer rather than saving the output to a file, or to change the previously selected Hold or Save format.

For details on Hold and Save options, see Chapter 7, *Saving and Reusing Report Output*.

Reference Report Options Where/If Tab

You can apply three types of record selection: Where, If, and Where Total.

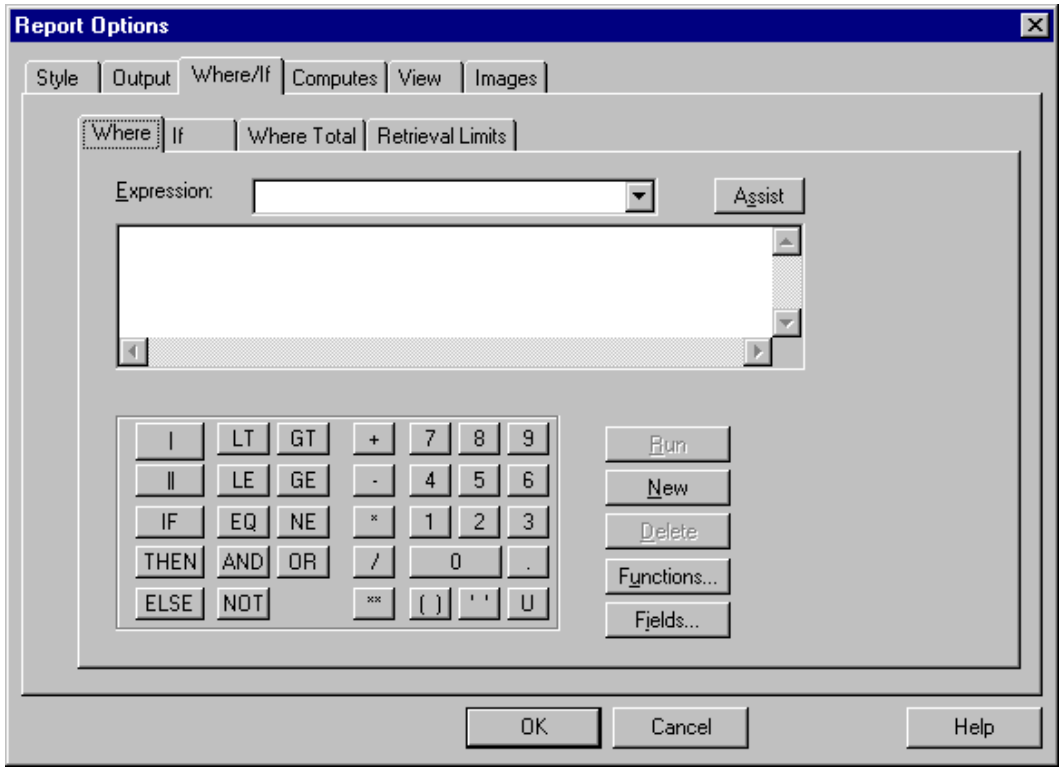
- **Where** enables you to display only those field values that meet your needs.
- **If** enables you to perform Boolean tests (TRUE/FALSE) as well as the same tests you can perform with Where.
- **Where Total** enables you to select records based on the aggregate value of a field—for example, on the sum of a field's values, or on the average of a field's values.

Note: With the exception of the operators on the calculator, the options on the Where, If, and Where Total tabs are identical.

You can also limit the number of records retrieved or read from the Retrieval Limits tab.

For details, see *Selecting Data* on page 3-60.

Where tab



Expression

Displays all previously defined selection criteria expressions attached to the report.

Assist

Opens the Expression Builder, a tool designed to assist you in building expressions for record selection. For details, see *Using the Expression Builder* in Appendix B, *Writing Expressions*.

Calculator

Provides numbers and operators that you can use to create numeric, alphanumeric, and conditional expressions. For details, see Appendix B, *Writing Expressions*.

Click the desired number or operator to add it to the expression box.

- To enclose a value in parentheses, click the **( )** key in the calculator. Parentheses affect the order in which FOCUS performs the specified operations. For information on when to use parentheses, see Appendix B, *Writing Expressions*.

- To enclose a value in single quotation marks, click the **''** key in the calculator. Use single quotation marks to enclose alphanumeric and date literals.
- To convert entries in the expression box to uppercase, click the **U** key in the calculator. Note that field names are case sensitive.

New

Saves the current expression, then clears the tab so that a user can create another expression.

Functions button

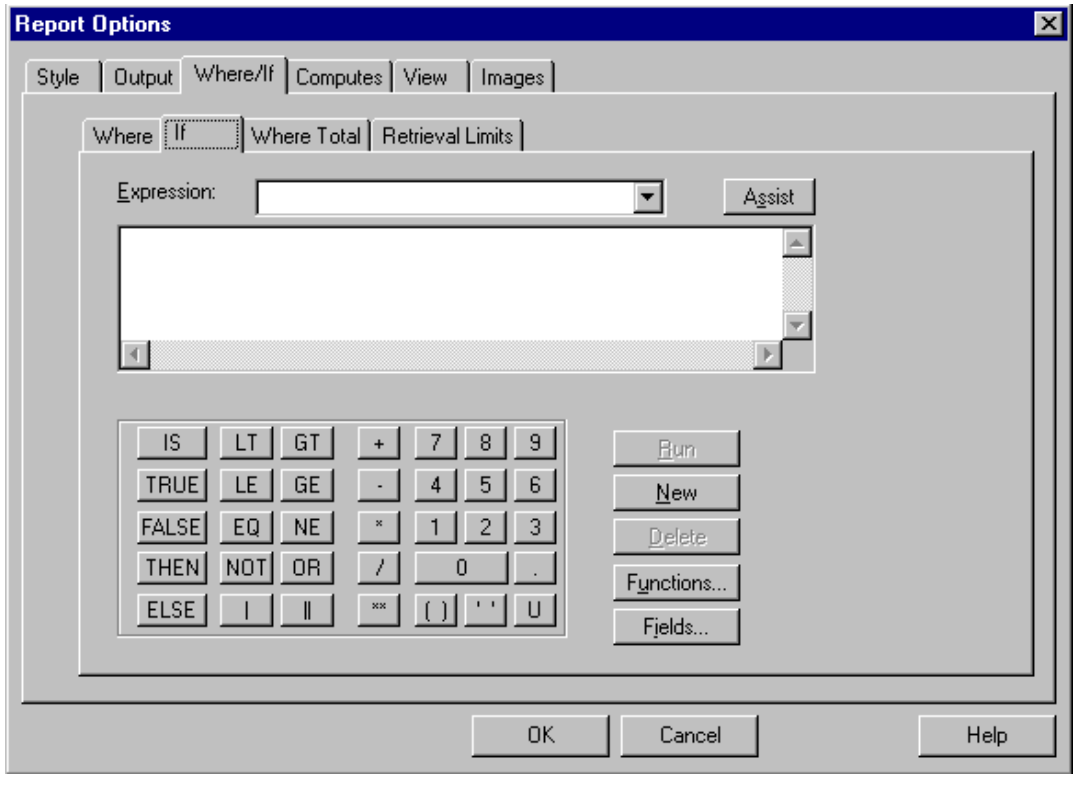
Opens the Functions window, which lists all available built-in functions. (A function is a program that returns a value.)

Double-click the desired function to add it to the expression box. Then, in the expression box, highlight each argument and substitute the value or field name you wish to use. For details, see the *Using Functions* manual.

Fields button

Opens the Fields window, which lists all the fields in the data source. Select the fields that you want to use in an expression. To adjust the information that you see in the Fields list window (for example, to display field formats and aliases, along with the field name), right-click in the window and select display options from the pop-up menu.

If tab



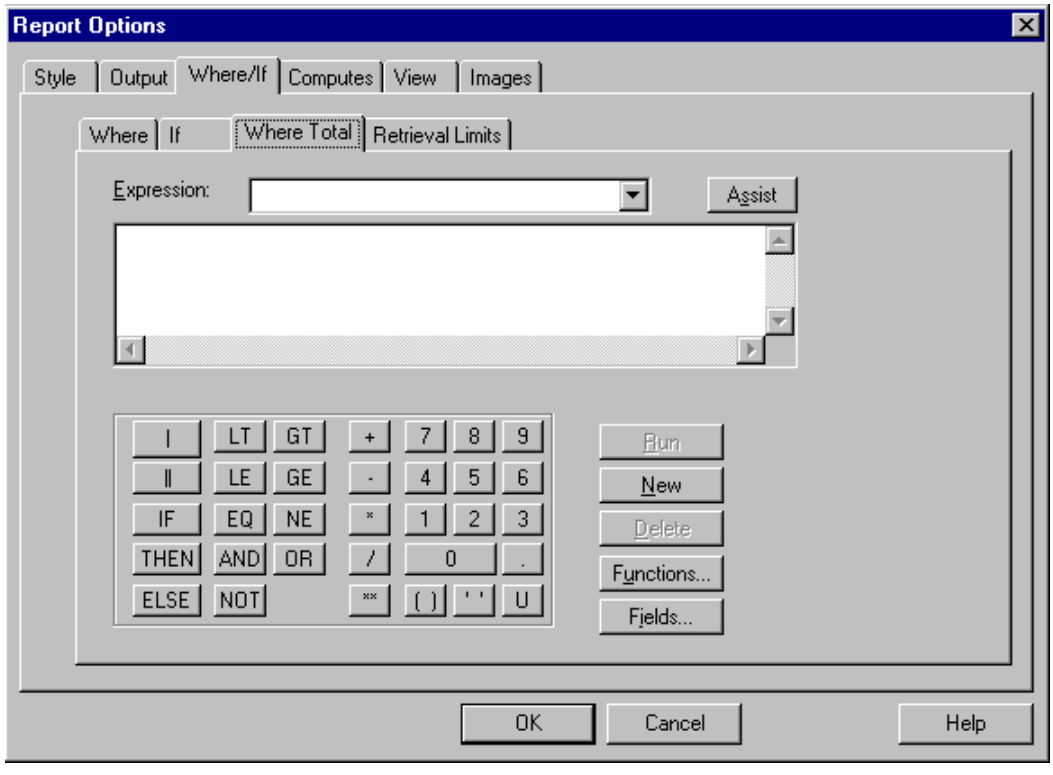
Calculator

Provides numbers and operators that you can use to create numeric, alphanumeric, and conditional expressions. In addition, the If tab calculator includes TRUE/FALSE operators that you can use in constructing Boolean tests, and an IS operator.

Click the desired number or operator to add it to the expression box.

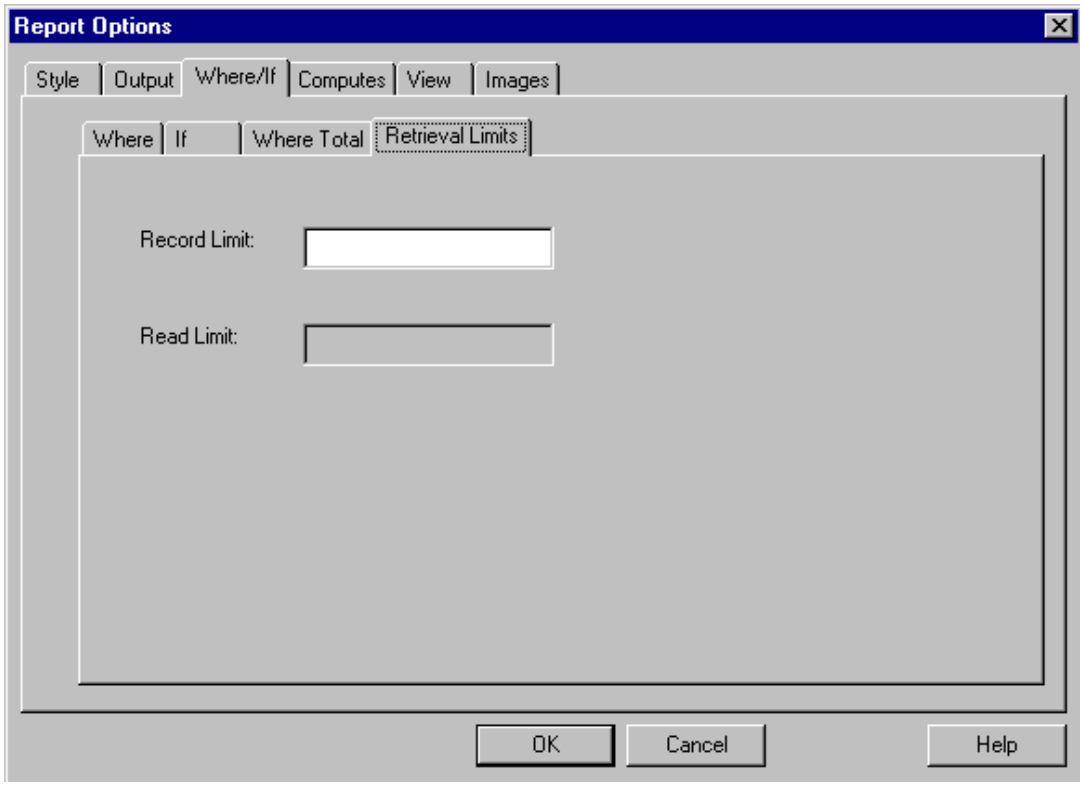
- To enclose a value in parentheses, click the **( )** key in the calculator. Parentheses affect the order in which the specified operations are performed. For information on when to use parentheses, see Appendix B, *Writing Expressions*.
- To enclose a value in single quotation marks, click the **' '** key in the calculator. Use single quotation marks to enclose alphanumeric and date literals.
- To convert entries in the expression box to uppercase, click the **U** key in the calculator. Note that field names are case sensitive.

Where Total tab



This tab includes the same options as the Where tab, but selects records after all data has been retrieved and processed.

Retrieval Limits tab



Record Limit

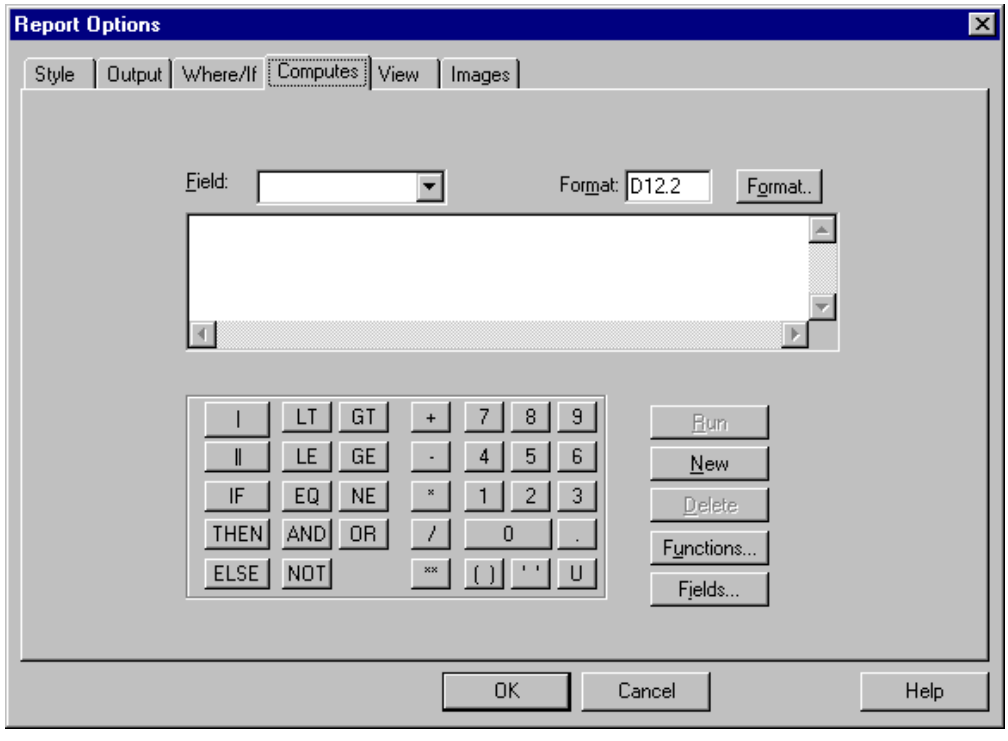
Retrieves a specified number of records on a report. When you run the report, only that number of records will display.

Read Limit

Specifies the maximum number of physical records read. Retrieval stops at that point.

Note: This feature is only available for non-FOCUS data sources.

Reference Report Options Computes Tab



The Compute tab includes the following fields and options for creating expressions.

Field box

Displays the name of the calculated value. Assign a field name to the value you wish to calculate.

When editing a calculated value, click the down arrow on the Field combo box, and select the field you wish to edit. When you select a field, the corresponding information appears in the Format box, and the expression box. You can edit the information, eliminate the field, or run it.

Format box

Displays the field type, field length, and display options. The field type can be alphanumeric, numeric, or date.

Format button

Opens the Format dialog box, where you can assign format information to the calculated value: format type (alphanumeric, numeric, date, text); length; decimal places (for numeric fields); edit options (for numeric and date fields), and other date information. For details, see Appendix A, *Assigning Field Formats*.

Expression box

Displays the expression used to evaluate the field.

Type the expression, or use the Fields list, Calculator, and Functions list to help you create the expression.

Calculator

Provides numbers and operators that you can use to create numeric, alphanumeric, and conditional expressions. Click the desired number or operator to add it to the expression box.

- To enclose a value in parentheses, click the **( )** key in the calculator. Parentheses affect the order in which the specified operations are performed. For information about order of evaluation, see *Order of Evaluation* in Appendix B, *Writing Expressions*.
- To enclose a value in single quotation marks, click the **' '** key in the calculator. Use single quotation marks to enclose alphanumeric and date literals.
- To convert entries in the expression box to uppercase, click the **U** key in the calculator. Note that field names are case sensitive.

Functions button

Opens the Functions window, which lists all available built-in functions. (A function is a program that returns a value.)

Double-click the desired function to add it to the expression box. Then, in the expression box, highlight each argument and substitute the value or field name you wish to use. For details, see the *Using Functions* manual.

Fields button

Opens the Fields window, which lists all the fields in the data source.

As you create your temporary field, the fields in the data source you are reporting against are listed in a secondary Fields window that shows field names and descriptions by default. To adjust the information that you see in the Fields list window (for example, to display field formats and aliases, along with the field name), right-click in the window and select display options from the pop-up menu.

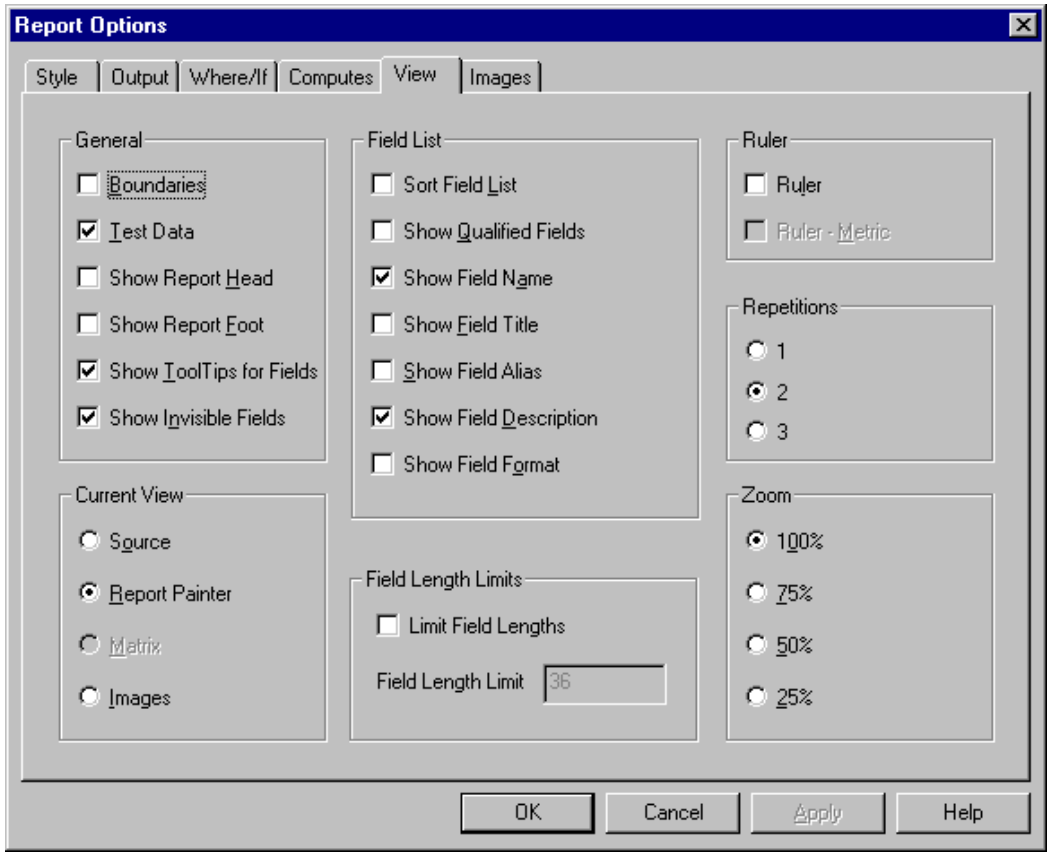
New button

Clears the entry box, including the Field combo box and the corresponding expression. It also returns the format to the default value D12.2, and places the cursor in the Field combo box so you can begin to create a new field.

OK button

Checks the syntax for your calculated value and displays a warning message; you cannot exit until the errors are fixed. When the syntax is correct and you click OK, the Compute tab closes. You can continue building your report.

Reference Report Options View Tab



General

Select *Boundaries* to show/hide the boundaries for report objects, such as headings and footings. If you have previously specified a subheading, subfooting, or subtotal, those objects also display.

Select *Test Data* to display test data in a design mode.

Select *Show Report Head* to display the report heading.

Select *Show Report Foot* to display the report footing.

Select *Show Tool Tips for Fields* to display tool tips.

Select *Show Invisible Fields* to display hidden fields (that is, fields that are grayed out in the Report Painter window).

Current View

Click *Source* to display the report source code in the text editor.

Click *Report Painter* to display the report in the Report Painter window.

Click *Matrix* to display the report as a matrix if a For field is specified in a financial report.

Click *Images* to displays graphic images.

These views are also available from tabs below the Report Painter window.

Field List

Select one or more options to control the display of field information on the Computes and Where/If tabs:

- *Sort Field List* alphabetizes the field names in the Fields window.
- *Show Qualified Fields* lists the field names in the Fields window as qualified field names.
- *Show Field Name* shows/hides the full field name in the Fields window, as provided in the Master File. This option is selected by default.
- *Show Field Title s*hows/hides the field's column title in the Fields window, as provided in the Master File.
- *Show Field Alias s*hows/hides the alternate field name in the Fields window, as provided in the Master File.
- *Show Field Description s*hows/hides descriptive information about the field in the Fields window, as provided in the Master File.
- *Show Field Format* shows/hides in the Fields window the field's usage attributes, which include the field's length and format.

Field Length Limit

This field is enabled when you check *Limit Field Lengths*. Enter a number that represents the maximum length of a field or maximum number of characters that can appear in the report.

Ruler

Click *Ruler* to show/hide a standard ruler at the top of the Report Painter window.

Click *Ruler - Metric* to show/hide a metric ruler at the top of the Report Painter window.

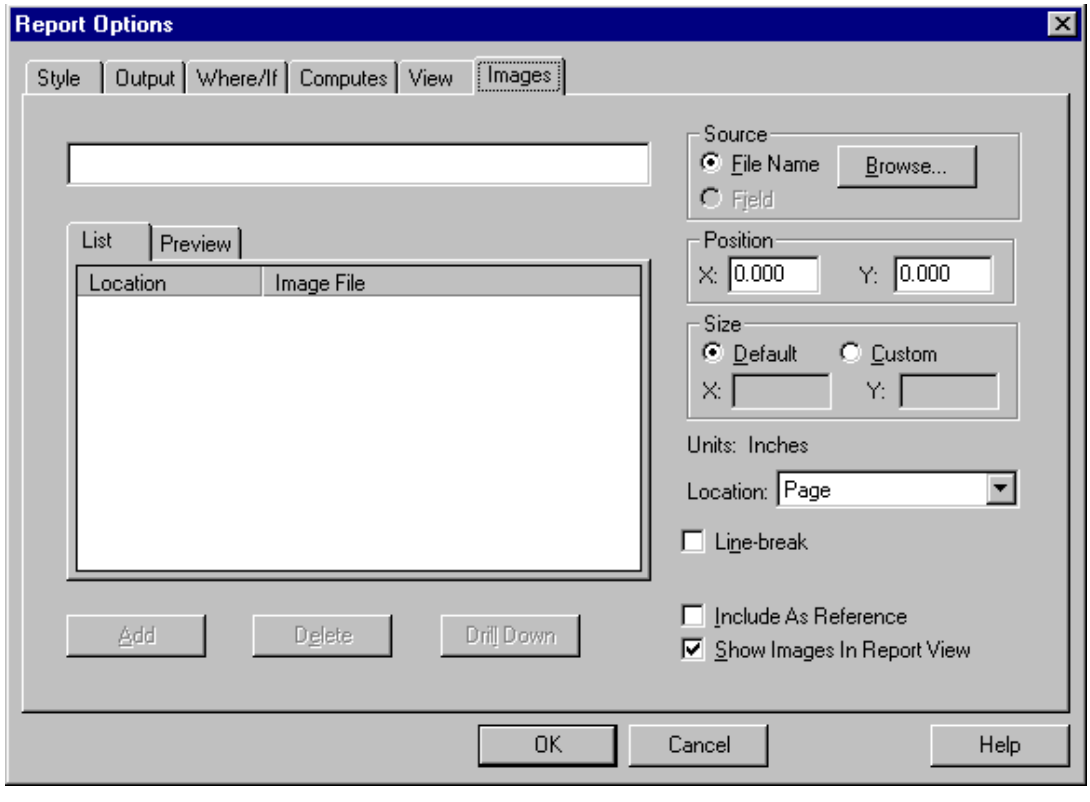
Repetitions

Select 1, 2, or 3 to specify the number of test data instances that appear for a field. The default value is 2.

Zoom

Specify the size (magnification/scale) of the Report Painter window: 100%, 75%, 50%, or 25%. The default value is 100%.

Reference Report Options Images Tab



Entry field

Enter the image file being added to the report, including its path, or select a file or field from the Source box. Your selection will be reflected in the Entry field.

Source

Identifies the source of the graphic image:

Select *Filename* to enter the path and exact file name of the image in the entry field, or click the *Browse* button to select an image.

Select *Field* to enter the report field that points to the images, where the value of each record corresponds to a graphic image file name that you have placed on the path or you have inserted in the field's data source.

Add

Adds the graphic image displayed in the entry field to the list box window.

List box

Displays a list of the images or fields you have added to the report.

Position

Specifies the starting position of the image in relation to the report object in which the image is embedded (for example, Subheading). Specify the X and Y coordinates.

Note: To use these features in HTML reports, you must turn on the Cascading Style Sheets option in the Report Option Output tab

Size

Scales the image to a desired width and height. The default behavior is to render the image at its original size.

Select the Custom radio button and specify the height and width in the X and Y boxes.

Note: To use these features in HTML reports, you must turn on the Cascading Style Sheets option in the Report Option Output tab.

Units: Displays the unit of measurement—inches or centimeters.

Delete

Deletes the image from the report or the selected object.

Select the image name or field name in the list box and click the Delete button.

Location

Select one of the locations from the *Location* drop-down list: page, background, page footer, page header.

If you add a subfooting, subheading, subtotal, report heading, or report footing to your report, these object areas are also listed to enable you to attach an image to these locations.

CHAPTER 4

Creating a Graph With Graph Assistant

Topics:

- Content Analysis: Determining Graphing Objectives
- For details, see Universal Concatenation in Chapter 15, Merging Data Sources.Accessing the Graph Assistant
- Selecting a Graph Type
- Selecting Values for the X and Y Axes
- Creating Multiple Graphs
- Refining the Data Set For Your Graph
- Displaying Missing Data Values in a Graph
- Applying Conditional Styling to a Graph
- Linking Graphs to Other Resources
- Adding Labels to a Graph
- Applying Custom Styling to a Graph
- Running, Saving, and Printing Your Graph

Graphs often convey meaning more clearly than data listed in tabular format. Using the Graph Assistant, 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 Chapter 9, *Visualizing Trends in Reports*.

Content Analysis: Determining Graphing Objectives

Developer Studio 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/connection that you want them to make.

3. Begin developing your graph.

4. Refine your graph:

   Are the labels meaningful/useful?

   How can the data be organized in a meaningful way? Consider customizing the scales you use with your graph.

For details, see *Universal Concatenation* in Chapter 15, *Merging Data Sources*.

Accessing the Graph Assistant

Procedure You can access the Graph Assistant from the Explorer in Developer Studio.

How to Access the Graph Assistant

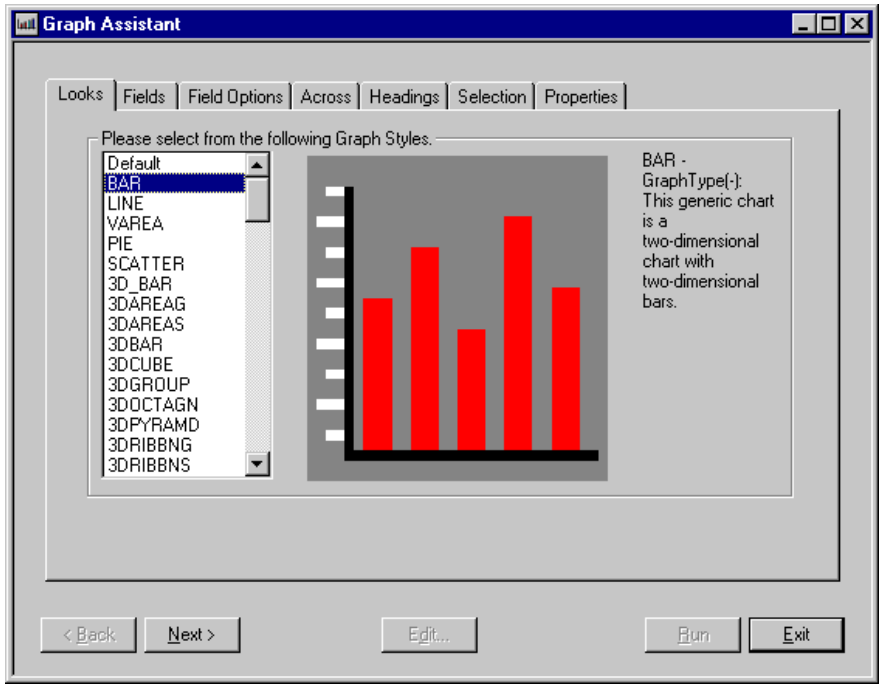
1. From the Explorer, right click the Procedures folder within the Application you would like to create your graph in and select *New*.
2. Enter a name for the new procedure in the New Procedure dialog box and click *OK*.
3. Click a component connector (diamond), then drag the mouse to the Graph component on the toolbar.
4. Select the data source for your graph from the File Description List dialog box and click *OK*. The Graph Assistant opens.

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. The basic graph types include line graphs (connected point plots), bar graphs, pie graphs, and scatter graphs. Use the brief descriptions (see *Graph Types* on page 4-4) 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.

The Looks tab of the Graph Assistant provides a list and brief descriptions of the many graph types and styles available in Developer Studio.

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. There is a description of each available graph type on the Looks tab of the Graph Assistant.

- **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 be displayed without connecting lines (making them appear like scatter graphs) and scatter graphs can be displayed with connecting lines (making them appear 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.

Procedure How to Select a Graph Type

1. Highlight a graph style from the Graph Styles list on the Looks tab of the Graph Assistant.

   A thumbnail image and a brief description of the graph are provided when you highlight a graph style. Be sure to read the description of the graph before selecting a graph style. Certain graph types require a particular number and/or type of data values; therefore, if your data does not satisfy the requirements then your graph will not accurately represent your data.
2. Once you have found the graph style you desire, click *Next* to continue creating your graph.

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.

Procedure How to Select Scales

1. Click the Properties tab of the Graph Assistant.
2. Click *Y Axis*.
3. Find the *Log Scale* check box. When this option is checked, the Y-axis scale will use logarithmic scaling. When unchecked, the Y-axis scale will use linear scaling.

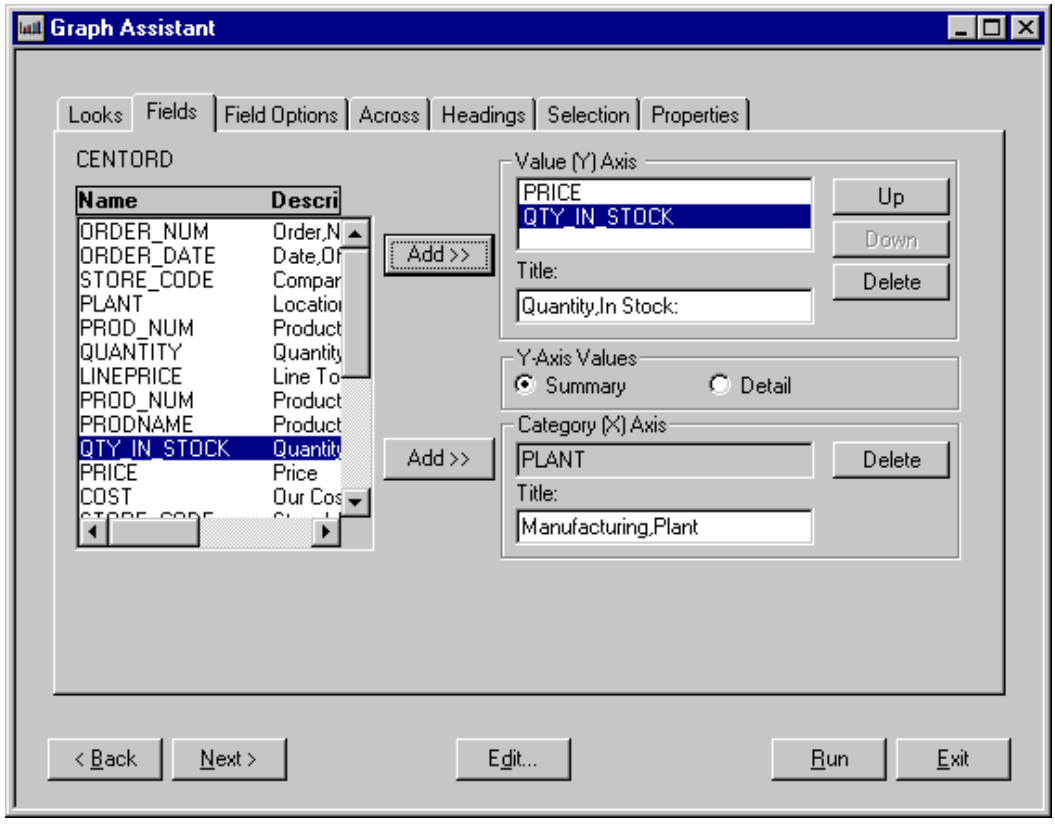
Selecting Values for the X and Y Axes

The values you select for the X- and Y-axes determine what data is displayed in the graph you are creating, and how it appears.

You can select and label the X and Y axes values from the Fields tab in the Graph Assistant.

You can also:

- Select a second horizontal category (X axis), which will produce multiple graphs. For details, see *Creating Multiple Graphs* on page 4-11.
- Temporarily hide the display of a Y-axis field. For details, see *Hiding the Display of a Y-Axis Field* on page 4-8.
- Interpolate X and Y axis values using linear regression.



Procedure How to Select Values for the Y-Axis

1. Click the *Fields* tab from the Graph Assistant.
2. Highlight a field in the Fields box and then click the *Add* button to the left of the Value (Y) Axis group box to add it to the Value (Y) axis. You can also select a field (or fields) from the Fields list and drag and drop it to the Value (Y) axis.

   To add more than one field name at a time:

   a. Press the *Ctrl* key.

   b. Click the field names you wish to include.

   c. Drag and drop or use the *Add* button to add all the selected fields to the Value (Y) Axis group box.

Note: The display field(s) determines the vertical Y-axis of the graph. When the number of Y-axis labels is greater than one, the labels do not display along the Y-axis. Instead, the labels display in a legend that provides the names of the fields being graphed.

Procedure How to Select Values for the X-Axis

1. Click the *Fields* tab from the Graph Assistant.
2. Highlight a field in the Fields box and then click the *Add* button to the left of the Category (X) Axis group box to add it to the Category (X) axis. You can also select a field from the Fields list and drag and drop it to the Category (X) axis.

Reference Graph Assistant Fields Tab

Fields window

Displays a list of field names from the selected data source.

Value (Y) Axis

Lists the vertical (Y-axis) fields that have been added from the Fields window.

To move the position of the field within the graph, select the field in the Value (Y) Axis list and click the *Up* or *Down* button.

To delete a field, select the field in the Value (Y) Axis list and click the *Delete* button.

Title (Y-axis)

An optional title for the Y-axis may be entered here.

Y-Axis Values

Summary indicates a graph that aggregates data by the Category (X) axis field. This is the default.

Detail plots each Y-axis field value on a record-by-record basis. If the selected X-axis value is numeric, a scatter graph will be generated; if the selected X-axis value is alphanumeric, a line graph will be generated.

Category (X) Axis

Lists the horizontal (X-axis) field that has been selected from the Fields window.

Title (X-axis)

An optional title for the X-axis may be entered here.

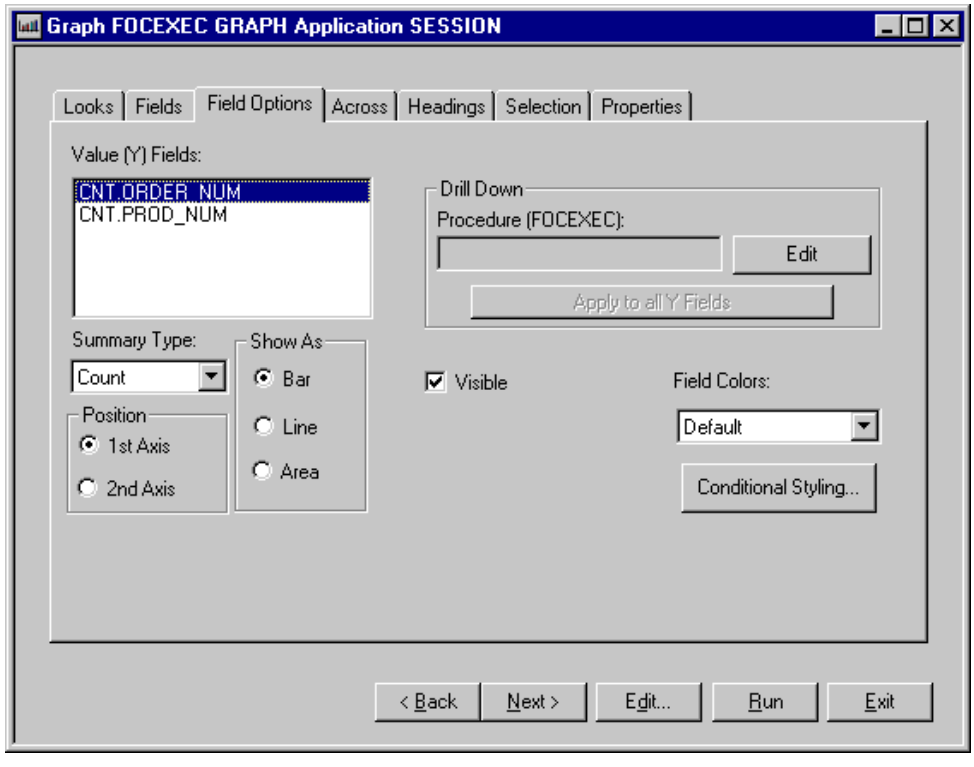
Hiding the Display of a Y-Axis Field

You can hide the display of a Y-axis field in a graph. This is useful when you want to temporarily remove a particular Y-axis field, while retaining all of the original graph properties.

To temporarily hide a Y-axis field, use the Visible check box on the Field Options tab of the Graph Assistant. By default, the check box is selected for each Y-axis field. If there are no Y-axis fields, the check box is disabled.

Procedure How to Hide the Display of a Y-Axis Field

1. Click the *Field Options* tab of the Graph Assistant.
2. From the Value (Y) Fields box, highlight the Y-axis field you want to hide.
3. Deselect the *Visible* check box.



Assigning Characteristics to Y-Axis Values

You can assign a characteristic for each Y-axis field in your graph. The characteristics, or prefix operators, are defined in the following table.

Summary Type	Description
ASQ	Average Square
AVE	Average
CNT	Count
FST	Show first in group
LST	Show last in group
MAX	Maximum
MIN	Minimum
PCT	Percentage
PCT.CNT	Count Percentage
RPCT	Row Percentage
SUM	Total
TOT	Heading Total

Procedure How to Assign Characteristic to Y-Axis Values

1. From the Fields tab, select the Summary radio button under Y-axis values.
2. Click the *Field Options* tab.
3. From the Value (Y) Fields list, select the field you would like to assign a characteristic (or prefix operator) to.
4. Select the characteristic from the Summary Type drop-down list.

The field name in the Value (Y) Fields list is updated with the appropriate prefix. For example, if you have a field named SEQ_NO and select the Average Square summary type, the field name changes to ASQ.SEQ_NO.

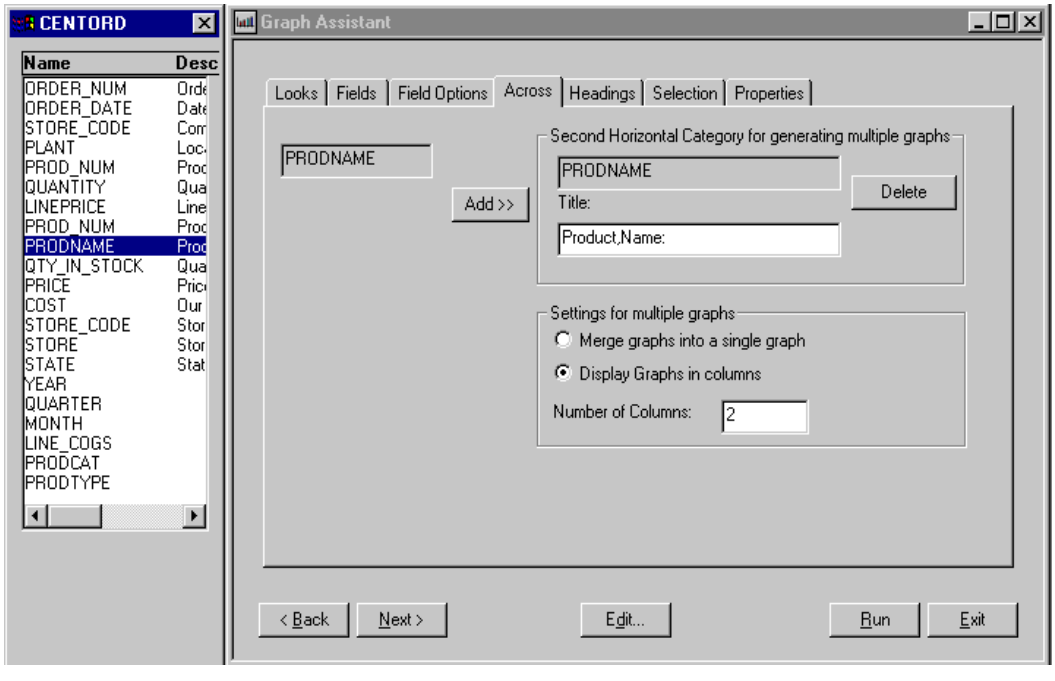
Creating Multiple Graphs

You can create multiple graphs by selecting a second horizontal category (X-axis).

The number of graphs created depends on the number of values in the field you select. For example, if you select a field with two values, two graphs are generated. If you select a field with ten values, ten graphs are generated.

You can select the second horizontal category from the Across tab in the Graph Assistant.

Multiple graphs can be displayed in either merged format or in columns. For details, see *Merging Multiple Graphs* on page 4-12 and *Displaying Multiple Graphs in Columns* on page 4-13.



Procedure How to Create Multiple Graphs

1. Click the Across tab of the Graph Assistant.
2. Select a field from the Fields list window and click *Add*. You may change the title or accept the field name as the title.

Merging Multiple Graphs

When you create a graph with a second horizontal category, multiple graphs are generated. You can merge these graphs into a single graph.

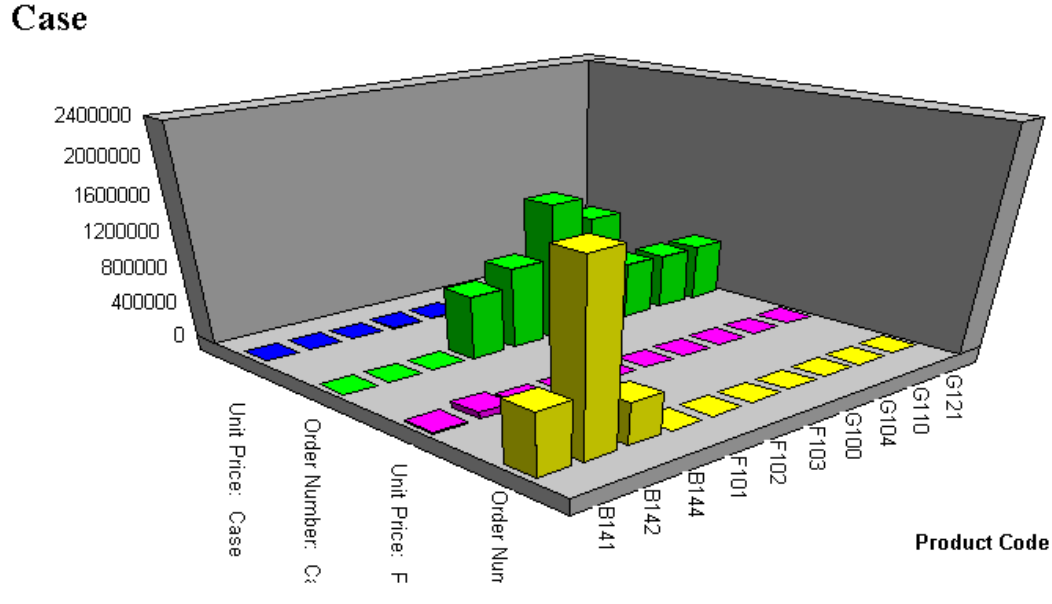
You can do this from the Across tab in the Graph Assistant.

Procedure How to Merge Multiple Graphs

1. Click the Across tab of the Graph Assistant.
2. Add a field to the Second Horizontal Category box.
3. Select the *Merge graphs into a single 3D graph* radio button. When you run your graph, the display shows an X, Y, and Z axis to represent the dual X-axis and the Y-axis.

Example Merging Multiple Graphs

The following illustrates a graph with two horizontal, or X-axes, categories (PRODUCT_ID and PACKAGE_TYPE) that have been merged.



Displaying Multiple Graphs in Columns

When you create a graph with a second horizontal category, multiple graphs are generated. You can display these graphs in columns.

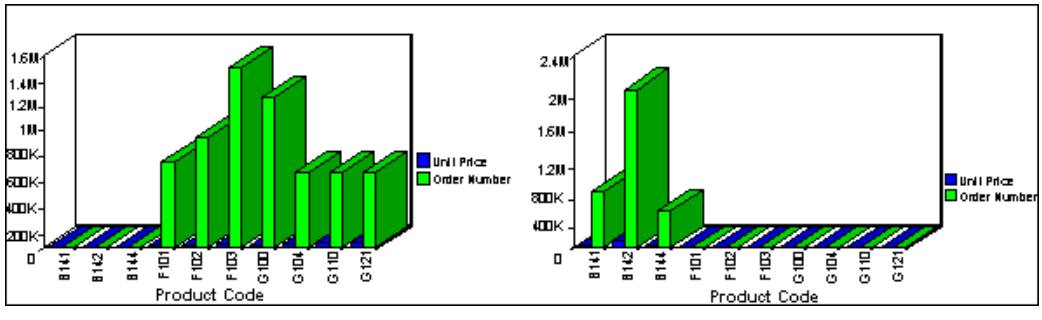
You can do this from the Across tab in the Graph Assistant.

Procedure How to Display Multiple Graphs in Columns

1. Click the *Across* tab of the Graph Assistant.
2. Add a field to the Second Horizontal Category box.
3. Select the *Display Graphs in Columns* radio button. This is the default selection.
4. Select the number of columns to display the graphs. The default value of 0 displays all of the graphs in one single column, one underneath the other. Selecting a number of 1 or greater places the graphs in an HTML table, with the number of cells across the table corresponding to the number of columns specified.

Example Displaying Multiple Graphs in Columns

The following illustrates a graph that has a second horizontal category. The multiple graphs that are generated appear in 2 columns since the Display graphs in columns radio button was selected when creating the graph.



Reference Graph Assistant Across Tab

Fields Window

Provides a list of all the fields in the current data source.

Second Horizontal Category for generating multiple graphs

Displays the field you have selected for the second horizontal (X-axis) category.

Title

Enter a title for the second horizontal category (X-axis) here.

Settings For Multiple Graphs

Select one of the following radio buttons when creating multiple graphs:

Merge Graphs into a single graph

When this radio button is selected, the multiple graphs generated by the second horizontal category will be merged into a single graph.

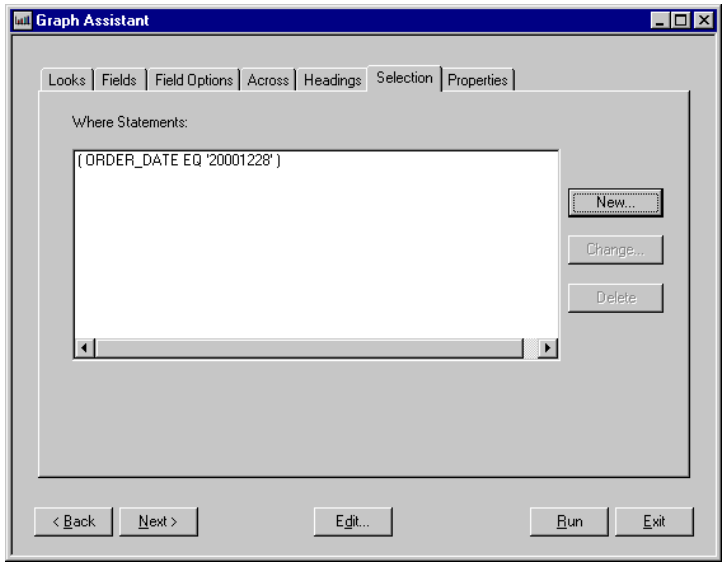
Display Graphs in Columns

To display multiple graphs in columns, click this radio button and enter the number of columns you wish in the *Number of Columns* box.

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 creating WHERE statements, see *Using the Expression Builder* in Appendix B, *Writing Expressions*.



Reference **Graph Assistant Selection Tab**

New

Allows you to create a new WHERE statement.

Change

Lets you edit an existing WHERE statement.

Delete

Lets you delete an existing WHERE statement.

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 displays on the zero line. In line graphs, a solid line connects the missing value with the succeeding value. In area graphs, the area displays on the zero line.
- **Graph as gap.** In all graph types (bar, line, or area), missing values display 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 displays in the graph. In area graphs a transparent area displays down to the zero line and then up to the succeeding value.
- **Interpolated dotted line.** In a line graph, missing values display 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.

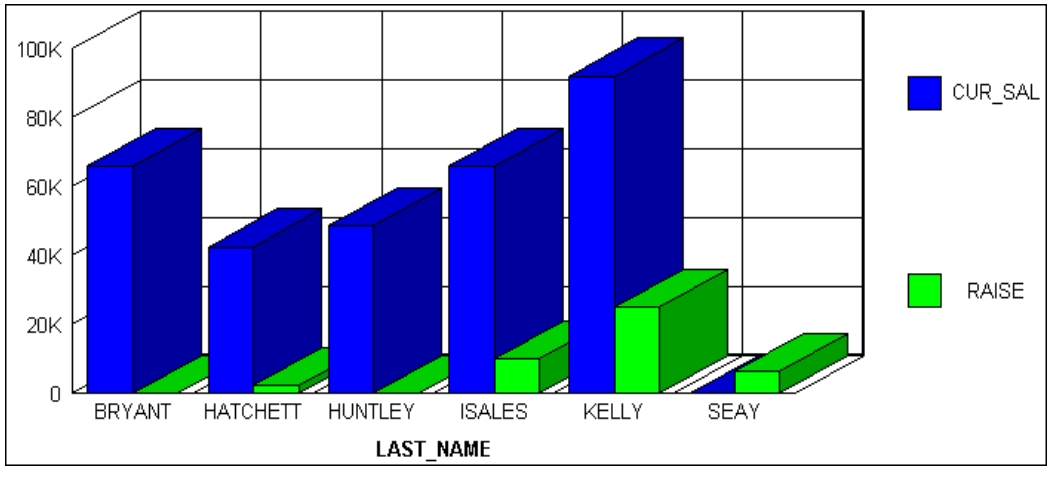
Procedure **How to Display Missing Values in a Graph**

1. In the Graph Assistant, click the Properties tab.
2. Click the Y-axis sub-tab.
3. From the Missing Values drop-down list select one of the following values:
   - Graph as zero.
   - Graph as gap.
   - Dotted line to zero.
   - Interpolated dotted line.

For details on missing value options, see *Displaying Missing Data Values in a Graph* on page 4-16.

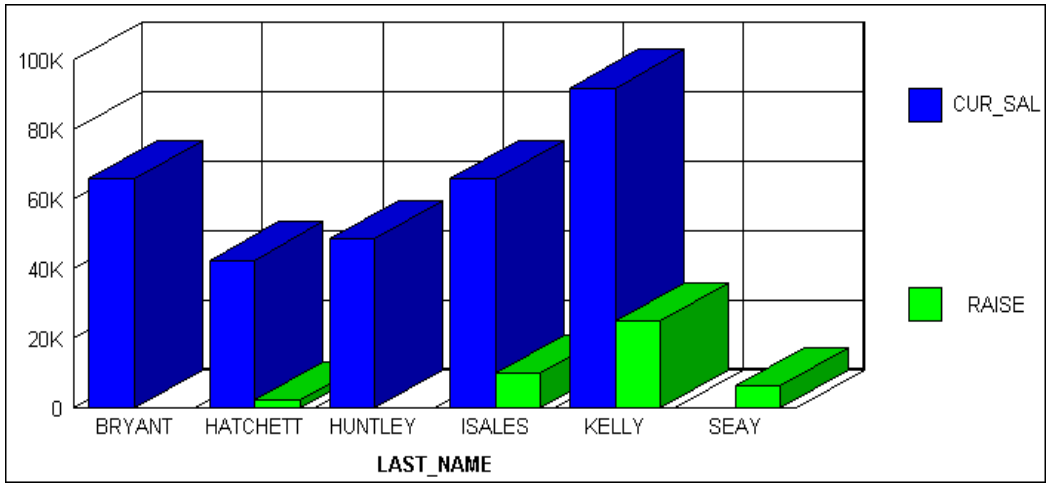
Example Displaying Missing Values as Zero In a Graph

The following illustrates how missing values display in a bar graph when designated to display as zero. The CURR_SAL value for Seay is missing, as well as the RAISE value for Bryant and Huntley.



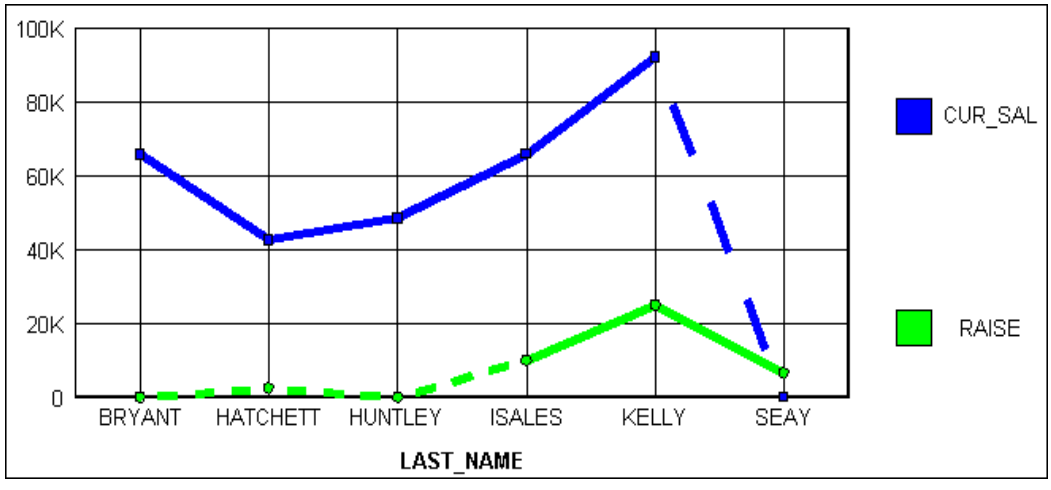
Example Displaying Missing Values as a Gap

The following illustrates how missing values display in a bar graph when designated to display as a gap. The CURR_SAL value for Seay is missing, as well as the RAISE value for Bryant and Huntley.



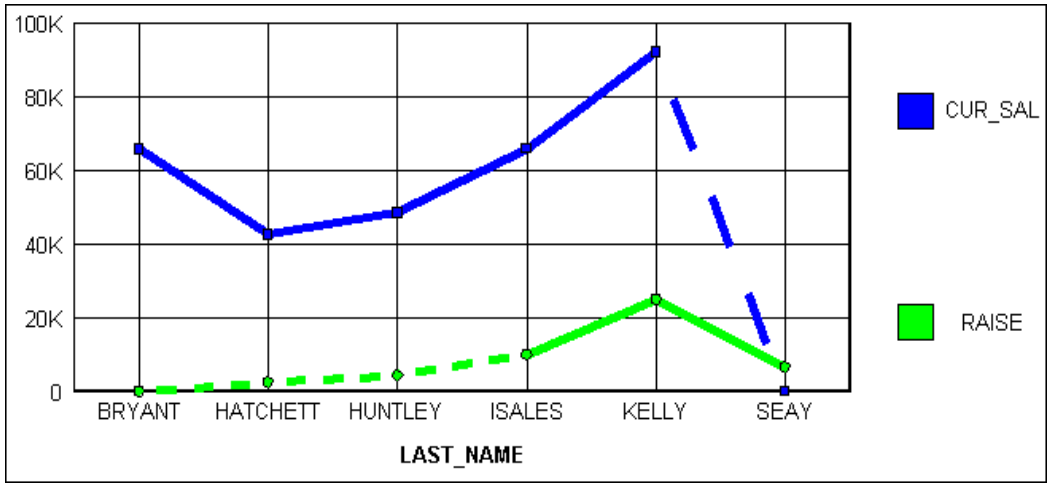
Example Displaying Missing Values as a Dotted Line to Zero

The following illustrates how missing values display in a line graph when designated to display as a dotted line to zero. The CURR_SAL value for Seay is missing, as well as the RAISE value for Bryant and Huntley.



Example Displaying Missing Values as an Interpolated Dotted Line

The following illustrates how missing values display in a line graph when designated to display as an interpolated dotted line. The CURR_SAL value for Seay is missing, as well as the RAISE value for Bryant and Huntley.



Applying Conditional Styling to a Graph

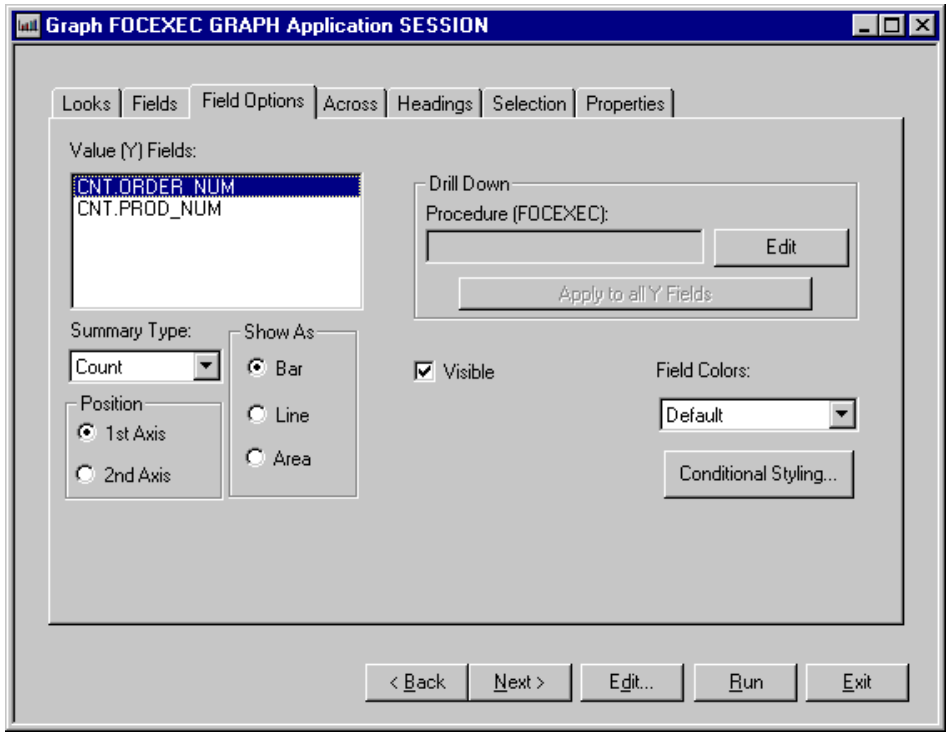
You can add further value to your graph by using conditional styling to highlight certain defined data with specific styles and colors.

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 from the Field Options tab of the Graph Assistant.



Procedure How to Apply Conditional Styling to a Graph

1. From the Field Options tab of the Graph Assistant, highlight the field (from the Value Y Fields list) where you wish to apply conditional styling and click the *Conditional Styling…* button.
2. From the Conditional Styling dialog box, click *Add*.
3. From the Condition List dialog box, click *New*.

   The Edit Condition dialog box opens.
4. Type a name for the condition or accept the default.
5. Select the field for which you want to define a condition from the Field window.
6. Select a relation from the Relations list.
7. Specify a value by doing one of the following:
   - Type a literal value in the Value box.

     or
   - Click the *Values* button to display existing data source values and select a value.
8. Click *OK*.

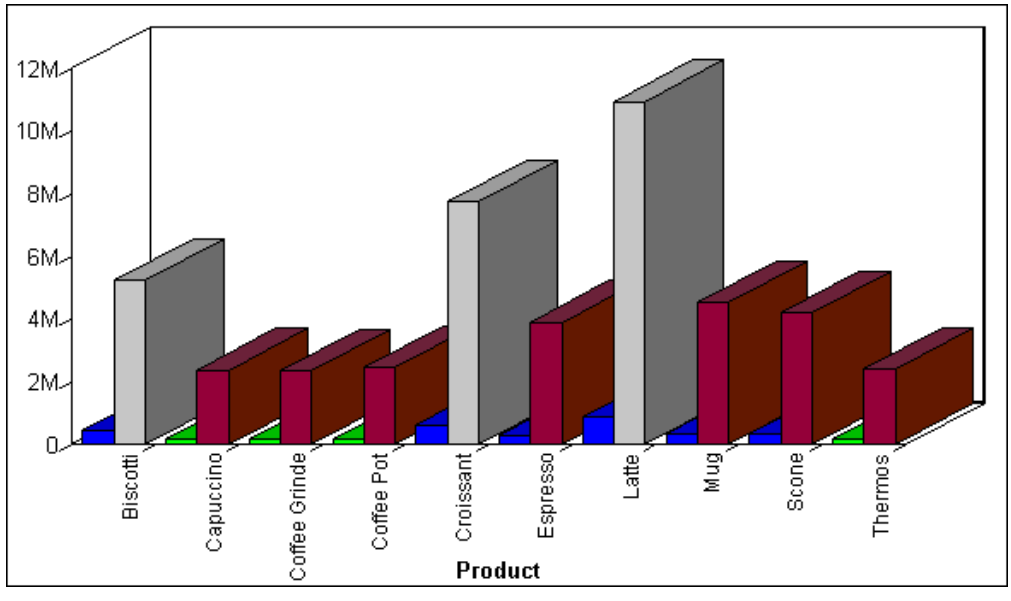
   The condition is now added to the Condition List in the Condition List dialog box.

   Tip: To create another condition, repeat steps 3 to 8.
9. After creating all of your conditions, click *OK* from the Condition List dialog box.
10. To attach a style to the condition, highlight the condition in the Condition List and click the *Color* button.
11. Select a color from the drop down list and click *OK*.
12. After applying styles to all the desired conditions, click *OK* to return to the Graph Assistant.

Example Applying Conditional Styling to a Graph

The following illustrates how you can apply conditional styling to a graph. In this example:

- Blue is specified as the default color for all data in the graph.
- Firebrick is specified as the color for data in the DOLLARS column.
- Silver is specified as the color for data in the DOLLARS column when the value is greater than five million.
- Lime is specified as the color for data in the UNITS column when the value is less than two hundred thousand.



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 or URL.

Procedure **How to Link a Graph to Other Resources**

1. Click the *Field Options* tab in the Graph Assistant.
2. Select the value from the Value (Y) Fields list.
3. Click the *Edit* button in the Drill Down field. The Drill Down dialog box opens.
4. Select either *Execute Procedure (FOCEXEC)* or *Execute URL* radio button.

   You can select the *No action* radio button to disable a drill-down link.
5. If you are linking your graph to a:
   - URL, type the URL in the URL text box. If you don't want the URL to display when a user mouses over a link in the graph, you can enter an alternate comment in the Alternate Comment for Hyperlink text box.
   - Procedure, select the procedure from the hierarchy.
6. Use the *Add* button to add any parameters. For details, see *Creating Parameters* on page 4-23.
7. Click *OK*.

Note: You can disable drill-down by following steps 1-3 above and then selecting the *No Action* radio button from the Drill Down dialog box.

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.

Procedure How to Create Parameters

1. In the drill-down procedure (this is the procedure you will be drilling down to), select *Where/If* from the Selection menu. The Where/If dialog box opens.
2. Click the *Assist* button. The Expression Builder dialog box opens. For details, see *Using the Expression Builder* in Appendix B, *Writing Expressions*.
3. Create an expression that compares the parameter against a field that appears in both the main procedure and the drill down procedure.
4. Click *OK*.

To add the ability to call the drill-down procedure and pass parameters from the graph:

1. In the Graph Assistant Field Options tab, select the object (Value Y Field) that you would like to "drill down" on.
2. Click the *Edit* button in the Drill-Down field.

   Note: Be sure not to click the Edit… button at the bottom of the Graph Assistant, which calls the Graph Editor.

   The Drill Down dialog box opens.
3. Select the Execute Procedure (FOCEXEC) or URL radio button.
4. Click the *Add* button in the Drill Down dialog box.

   The Drill Down Parameter dialog box opens.

5. Type the name of the parameter you created in the drill down procedure in the Parameter name entry field.

   When passing parameters to a drill-down procedure, you must use local amper variables (&variables). Global amper variables (&&variables) cannot be used as drill-down parameters. Also, when entering your parameter name it is not necessary to type an ampersand (&) before the parameter name. This will create a global amper variable that cannot be used as a drill-down parameter.When you pass the parameter to the drill down procedure, you must set a value for it in the Drill Down Parameter dialog box. If you select:

   Field

   The parameter will be set to the corresponding value of the object the user drills down on in the specified field.

   Constant value

   The parameter is set to the specified value.

   Note: If the drill down report contains a -DEFAULT statement that sets a default value to the same amper variable passed from the main report, the amper variable value in the -DEFAULT statement will overwrite the amper variable value passed from the main report. Therefore, the output in the drill-down report will not reflect the value passed from the main report. Instead, the output will reflect the default value passed from the -DEFAULT statement.

6. Once a value has been supplied, click *OK* to open the Drill Down dialog box.

   The parameter is added to the With parameters list box.

7. Repeat Steps 8 through 11 to add any other necessary parameters.

   You can apply the same drill down procedure to all value (Y) fields by clicking the *Apply to all Y Fields* button in the Fields Option tab dialog box.

Reference Graph Assistant Field Options Tab

Value (Y) Fields

Lists the fields selected for the Y-axis.

Summary Type

Select a summary type for the Y-axis field selected in the Value (Y) Fields list.

Position

Select which field(s) should be displayed on a second axis. To display a particular field on a second axis, select the field from the Value (Y) Fields list and then select the *2nd Axis* radio button.

Show As

Specify the style (Bar, Line or Area) in which the graph represents a particular data series.

The Show As group only applies when you have selected a bar, line or area graph from the Looks tab.

Drill Down/Edit

Add drill-down capability to a graph here.

Field Color

Select the display color for the field currently selected in the Value (Y) Fields list.

Conditional Styling...

Apply conditional styling to a graph here.

Visible

When deselected, allows you to temporarily hide the display of a Y-axis field.

Apply to All Y Fields

Applies the same drill down procedure to all value (Y) fields.

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.

From the Headings tab of the Graph Assistant, you can add titles, headings, and footings and customize them. For details on customizing see, *Customizing Fonts in a Graph* on page 4-29.

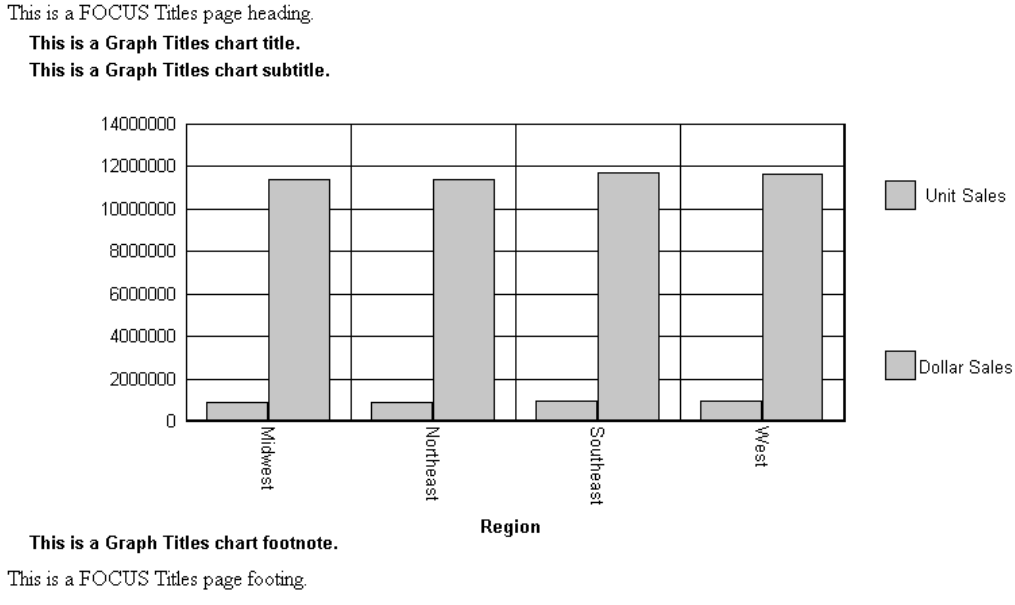
Note that there is a 95 character limit for Graph Titles.

Note: If your graph labels or legends are not displaying correctly when you run your graph, see *How to Change Color Settings* on page 4-47 for details on correcting this.

Reference

Location of Headings and Footings in Graph Output

The following illustrates where FOCUS Titles and Graph Titles appear in graph output. Note that none of the headings in this sample have been formatted and appear in their default format. Also note that the Graph Titles chart title will display in the graph output as well as in your browser's title bar.



Procedure How to Add a Heading or Footing to Your Graph

1. Click the *Headings* tab of the Graph Assistant.
2. Click the *FOCUS Titles* sub-tab.
3. Enter the text for the heading on the Page Heading tab. Enter the text for the footing on the Page Footing tab.

Procedure How to Add a Field to a Graph Heading or Footing

1. Click the *Headings* tab of the Graph Assistant.
2. Click the *FOCUS Titles* sub-tab.
3. Place your cursor where you would like the field to appear in either the heading or footing.
4. Select the field from the Fields List window.

   The currently selected field is shown in the Field box.
5. Click the *Add Field Name* button.

Procedure How to Add Titles, Subtitles, and Footnotes to a Graph

1. Click the *Headings* tab of the Graph Assistant.
2. Click the *Graph Titles* sub-tab.
3. Enter the text for the Chart Title, Chart Subtitle and Chart Footnote in the respective boxes.

Note: There is a 95 character limit for Graph Titles.

Reference Graph Assistant Headings Tab (FOCUS Titles)

Fields Window

Provides a list of all the fields in the current data source. Note that this is a separate window from the Graph Assistant.

Field

The currently selected field is displayed in this box.

Page Heading

Enter the text for the heading in the Page Heading box.

Page Footing

Enter the text for the footing in the Page Footing box.

Add Field Name

Use this to add a field to a heading or a footing.

Reference Graph Assistant Headings Tab (Graph Titles)

Chart Title

Enter text for the chart title here. The chart title will display in the graph output as well as in your browser's title bar.

Chart Subtitle

Enter text for the chart subtitle here.

Chart Footnote

Enter text for the chart footnote here.

Font

To change the font style or size, click *Style Title*, *Style Subtitle*, or *Style Footnote* button for the respective text box (Chart Title, Chart Subtitle, Chart Footnote).

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 display along the Y-axis. Instead, the labels display 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 change the titles for the x and y axis from the Fields tab in the Graph Assistant.

Applying Custom Styling to a Graph

Using the Graph Assistant, you may customize your graph using the sub-tabs (Graph, X-axis, Y-axis, Pie) on the Properties tab. The customizations you can apply to your graph include customizing fonts, X and Y-axes orientation, output destination, graph on server, label locations for all graph types, legend location and much more.

Customizing Fonts in a Graph

You can change the font for the X and Y-axis data and labels, legend text, headings, footings, subheadings, and footnotes. From the text properties dialog box you can select the:

- **Font.** Select the font type. Note that depending on what fonts you have installed on your machine, some fonts in the text properties dialog box may not be distinguishable from other fonts. In particular, Monospaced and Dialog Input may look the same as well as Dialog and San Serif.
- **Style.** Select the text style from normal, italic, bold, underline, or shadow.
- **Size.** Select the font size.
- **Text Color.** Select the font color.
- **Text Justification.** Select left, center, or right justification.
- **Text Rotation.** Select *Vertical - Bottom to top*, *Vertical - Top to bottom*, or *Horizontal*. You can apply the rotation to the *Title* or *Data*, depending on what is selected in Set Style for.

As you make changes to the text properties, sample text displays to the right and reflects all selections. You can also wrap the text by checking the *Wrap* check box. Note that when you select the Wrap option, text only wraps to the next line if there is not enough room to display the entire text in the chart.

The text properties dialog box can be invoked from many places in the Graph Assistant. Depending on where it is invoked from, different options are available.

Procedure How to Change X Axis Label Fonts

1. Click the *Properties* tab of the Graph Assistant.
2. Click the *X Axis* subtab.
3. Click *Style Labels*. The X Axis Properties dialog box opens.
4. Select the font properties. You can change the fonts for the data text and for the x-axis title text by selecting either the *Data* or *Title* radio button.
5. Click *OK*.

Procedure How to Change Y Axis Label Fonts

1. Click the *Properties* tab of the Graph Assistant.
2. Click the *Y Axis* subtab.
3. Click *Style Labels*. The Y1 Axis Label Properties dialog box opens. If you are selecting fonts for the Y2 axis, the Y2 Axis Label Properties dialog box opens, which contains the same options.
4. Select the font properties. You can change the fonts for the data text and for the y-axis title text by selecting either the *Data* or *Title* radio button.
5. Click *OK*.

Procedure How to Change Graph Legend Fonts

1. Click the *Properties* tab of the Graph Assistant.
2. Click the *SettingsGraph* subtab.
3. Click *Style Legend Text*. The Legend Properties dialog box opens.
4. Select the font properties.
5. Click *OK*.

Procedure How to Change Graph Title Fonts

1. Click the *Headings* tab of the Graph Assistant.
2. Click the *Graph Titles* sub-tab.
3. Click *Style Title*, *Style Subtitle*, or *Style Footnote* for the title font you wish to change. Depending on the option you select, the Heading Properties, Subheading Properties or Footnote Properties dialog box opens.
4. Select the font properties.
5. Click *OK*.

Reference Heading Properties Dialog Box

Font

Select the font type.

Style

Select the font style.

Size

Select the text size.

Color

Select a text color from the drop-down list.

Text Rotation

- Vertical - Bottom to top. Displays text in a vertical orientation that reads from bottom to top.
- Vertical - Top to bottom. Displays text in a vertical orientation that reads from top to bottom.
- Horizontal. Displays text in a horizontal orientation that reads left to right.

Text Justification

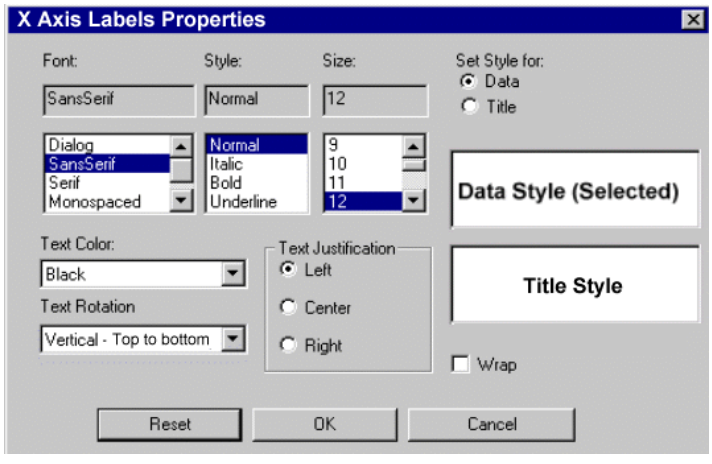
Select if the text will be left, center, or right justified.

Wrap

Check this to wrap the text.

Reference X Axis Label Properties Dialog Box

This dialog box displays the options available in the X Axis Label Properties dialog box.



Font

Select the font type.

Style

Select the font style.

Size

Select the text size.

Text Color

Select a text color from the drop-down list.

Text Rotation

- Vertical - Bottom to top. Displays text in a vertical orientation that reads from bottom to top.
- Vertical - Top to bottom. Displays text in a vertical orientation that reads from top to bottom.
- Horizontal. Displays text in a horizontal orientation that reads left to right.

Text Justification

Select if the text will be left, center, or right justified.

Set Style For

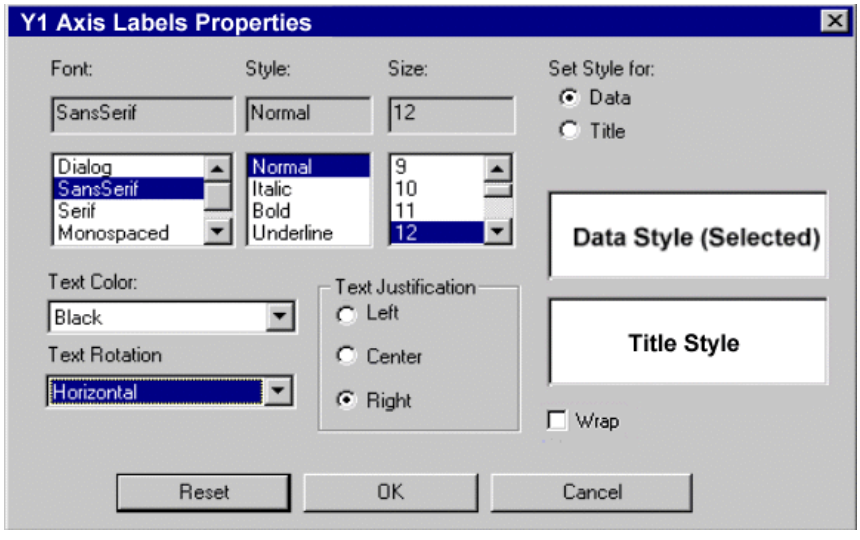
Select to style Title or Data.

Wrap

Check this to wrap the text.

Reference Y Axis Label Properties Dialog Box

This dialog box displays the options available in the Y Axis Label Properties dialog box.



Font

Select the font type.

Style

Select the font style.

Size

Select the text size.

Text Color

Select a text color from the drop-down list.

Text Rotation

- Vertical - Bottom to top. Displays text in a vertical orientation that reads from bottom to top.
- Vertical - Top to bottom. Displays text in a vertical orientation that reads from top to bottom.
- Horizontal. Displays text in a horizontal orientation that reads left to right.

Text Justification

Select if the text will be left, center, or right justified.

Set Style For

Select to style Title or Data.

If you have selected more than one Y-axis field, the Title option will not be available in the Label Properties dialog box. The Data option will be selected by default.

Wrap

Check this to wrap the text.

Reference Legend Properties Dialog Box

Font

Select the font type.

Style

Select the font style.

Size

Select the text size.

Text Color

Select a text color from the drop-down list.

Text Rotation

- Vertical - Bottom to top. Displays legend text in a vertical orientation that reads from bottom to top.
- Vertical - Top to bottom. Displays legend text in a vertical orientation that reads from top to bottom.
- Horizontal. Displays legend text in a horizontal orientation that reads left to right.

Text Justification

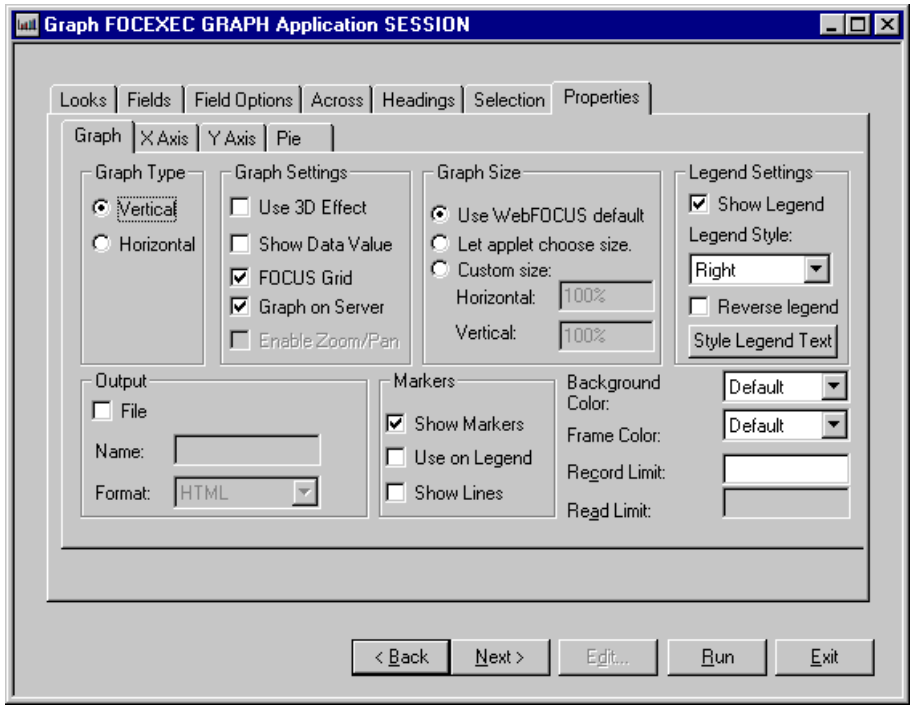
Select if the text will be left, center, or right justified.

Wrap

Check this to wrap the text.

Reference

Graph Assistant Properties Tab (Graph)



Graph Type

Select either vertical or horizontal orientation for Bar, Line, or Area graphs. The default selection is vertical. If horizontal is selected, the X-axis will appear along the side of the graph while the Y-axis will appear along the bottom.

Graph Settings

Use 3D Effect

Applies 3D effects to your graph. This option is only available for bar, line, area, and pie graphs.

Show Data Values

Select if you wish data values to be displayed on your graph or not. If this box is unchecked, data values will not be displayed. If this box is checked, data values will be displayed.

FOCUS Grid

Grids are parallel lines drawn across a graph at the vertical and horizontal class marks on the axes. Check this box if you wish grid lines displayed. This option is only available on connected point plots, histograms, bar charts, and scatter diagrams.

Graph on Server

Runs the graph on a server (rather than your local machine) and produces the graph as an HTML file with a GIF image. Graph on Server cannot be used when the Enable Zoom & Pan box is checked.

This option is only available in if it was configured during installation.

Enable Zoom & Pan

Allows you to zoom on a graph. This feature is available for all graphs except radar, polar, 3D, pie, spectral, and stock graphs. Enable Zoom & Pan cannot be used when the Graph on Server box is checked.

Graph Size

Select the WebFOCUS default size, let the applet application choose the size, or set a custom size for horizontal (width) and vertical (height), both in pixels.

Legend Settings

Show Legend

Check this to display the legend in your graph.

Legend Style

Select the position of the legend's text. You may select to have the legend's text on the right or left side, above or below the legend, or inside the legend.

Reverse Legend Order

Enables the display of the graph legend in reverse order. This is generally most helpful when Reverse Order of Groups is selected.

Style Legend Text

Select the font style, color, and justification.

Output

Selecting the *File* check box saves graph output in HTML, GIF or JPEG format under the file name you assign.

Markers

Select how you wish markers (shapes that represent data points) displayed on your graph.

- Show Markers will show marker shapes at the data points on line graphs.
- Use on Legend will show marker shapes on the graph legend.
- Show Lines is the default in the Markers group. When this check box is deselected, marker shapes will show on a line graph, but connecting lines will not be drawn.

Background Color

Select a background color for the current graph.

Frame Color

Select a frame color for the current graph.

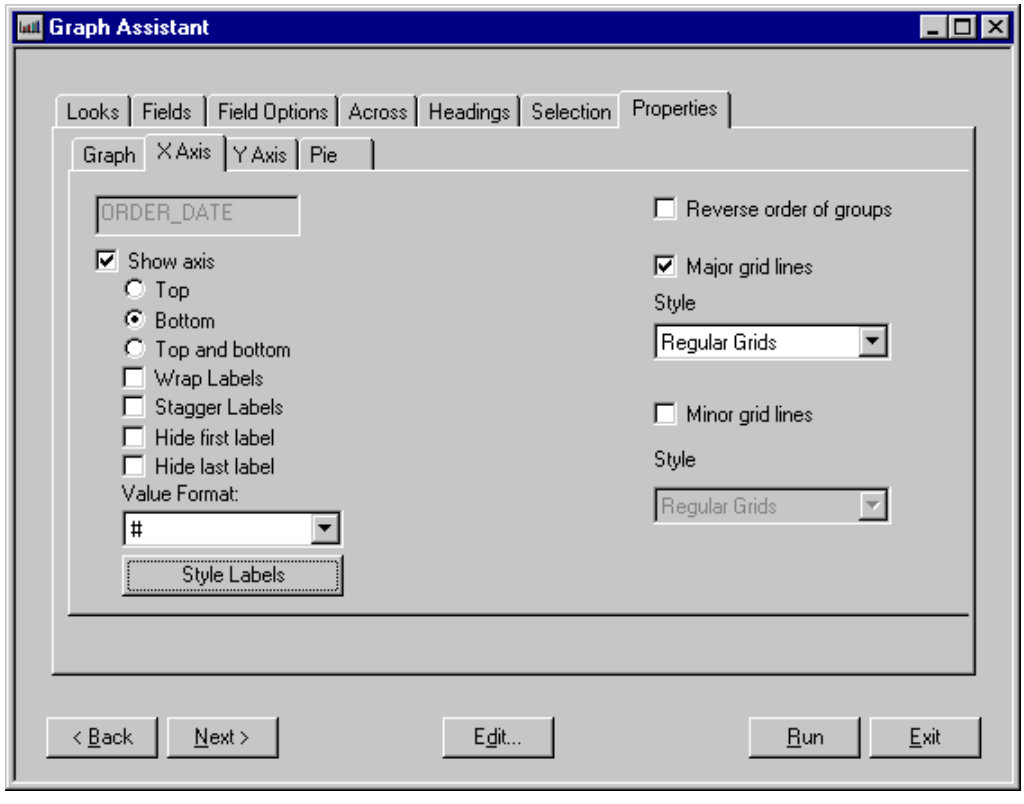
Record Limit

Record limits are used to limit the amount of data that will be displayed or used in your report or graph. If you are using a non-FOCUS data source, you may combine Record Limit with Read Limit to reduce how many records are read from the data source. The Read Limit option is not available with FOCUS data sources.

Read Limit

Read limits are used to limit the amount of records retrieved (or read) from the data source. The Read Limit option is not available with FOCUS data sources.

Reference Graph Assistant Properties Tab (X-Axis)



Show axis

- Top - X-axis labels appear above vertically oriented graphs and to the right of horizontally oriented graphs.
- Bottom - X-axis labels appear below vertically oriented graphs and to the left of horizontally oriented graphs. (This is the default.)
- Top and Bottom - X-axis labels appear both above and below vertically oriented graphs and to both the left and right of horizontally oriented graphs.
- Wrap Labels - When this box is checked, X-axis labels will wrap.
- Stagger Labels - When this box is checked, X-axis labels will be staggered.
- Hide first label - When this box is checked, the first X-axis label will not be displayed.
- Hide last label - When this box is checked, the last X-axis label will not be displayed.

Value Format

Allows you to select a format for the display of X-axis values. You can only change the display format if your x-axis values are numeric and the graph style is bubble, histogram (bar), or scatter. For details, see *Value Formats* on page 4-44.

Style Labels

Select and style the fonts for the X-axis.

Reverse order of groups

When checked, enables the display of the groups (X-axis) data in reverse order. When unchecked, the graph will display groups in natural order.

Major grid lines

Divide a graph at regular intervals according to the scale. Major grid lines cross their axis line at the exact location of the scale label. Styles include:

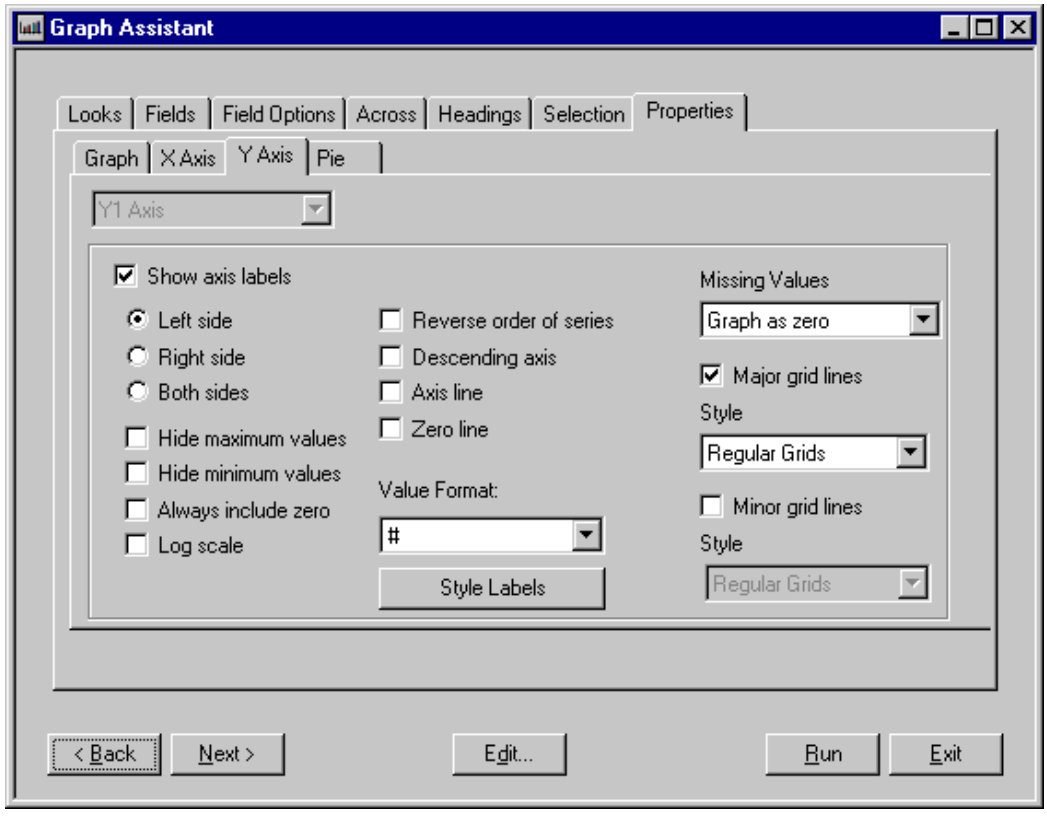
- Regular Grids - Normal grid lines that are the height of the frame.
- Grids and Ticks - Normal grid lines that extend outside the frame.
- Inner Ticks - Small tick marks from the frame edge inward.
- Outer Ticks - Small tick marks from the frame edge outward.
- Spanning Ticks - Small tick marks that span the frame edge.

Minor grid lines

Divide a graph at regular intervals according to the scale. Minor grid lines cross their axis line at equal intervals between major grids/ticks; they never align directly with a scale label. Styles include:

- Regular Grids - Normal grid lines that are the height of the frame.
- Grids and Ticks - Normal grid lines that extend outside the frame.
- Inner Ticks - Small tick marks from the frame edge inward.
- Outer Ticks - Small tick marks from the frame edge outward.
- Spanning Ticks - Small tick marks that span the frame edge.

Reference Graph Assistant Properties Tab (Y-Axis)



Axis Selection List Box

If you have more than one Y-axis, select which axis you would like to apply properties to here, either Y1 Axis or Y2 Axis.

Show axis labels

- Left Side - Y-axis labels will appear on the low (bottom or left) side of the graph.
- Right Side - Y-axis labels will appear on the high (top or right) side of the graph.
- Both Sides - Y-axis labels will appear on both the low and high sides of the graph.
- Hide Maximum Value - When checked, the largest Y-axis label will not be displayed.
- Hide Minimum Value - When checked, the smallest Y-axis label will not be displayed.
- Always include Zero on Scale - Includes zero on the Y-axis scale when checked.
- If you have manually set your scale range to exclude zero, this property will be ignored.
- Log Scale - When checked, the Y-axis scale will use logarithmic scaling. When unchecked, the Y-axis scale will use linear scaling.

Reverse order of series

When checked, enables the display of the series (Y-axis) data in reverse order. When unchecked, the graph will display its series in natural order.

Descending Axis

Inverts the direction of the Y-axis so values of zero or less are displayed at the top of the graph, while values greater than zero are displayed at the bottom of the graph.

Axis Line

Enables the display of the Y-axis base line.

Zero Line

Enables the display of the Y-axis Zero line when zero is within the Y-axis range.

Value Format

Allows you to select a format for the display of Y-axis values. For details, see *Value Formats* on page 4-44.

Style Labels

Select and style the fonts for the Y-axis.

Missing Values

Displays 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.
- Graph as gap.
- Dotted line to zero.
- Interpolated dotted line.

Major Grid Lines

Divide a graph at regular intervals according to the scale. Major grid lines cross their axis line at the exact location of the scale label. Styles include:

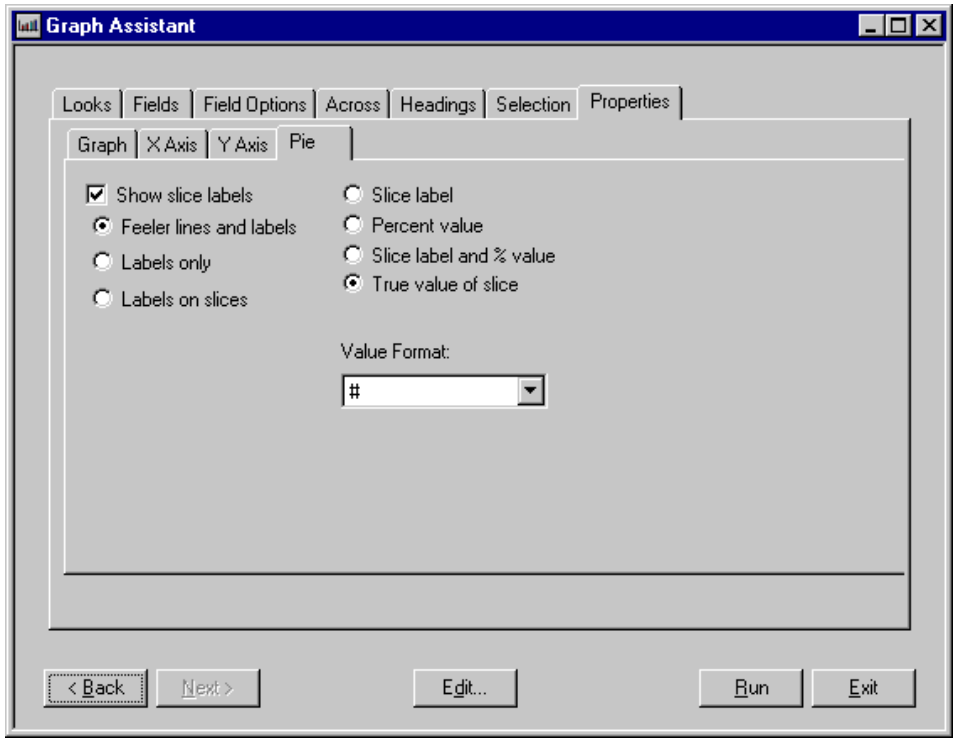
- Regular Grids - Normal grid lines that are the height of the frame.
- Grids and Ticks - Normal grid lines that extend outside the frame.
- Inner Ticks - Small tick marks from the frame edge inward.
- Outer Ticks - Small tick marks from the frame edge outward.
- Spanning Ticks - Small tick marks that span the frame edge.

Minor Grid Lines

Divide a graph at regular intervals according to the scale. Minor grid lines cross their axis line at equal intervals between major grids/ticks; they never align directly with a scale label. Styles include:

- Regular Grids - Normal grid lines that are the height of the frame.
- Grids and Ticks - Normal grid lines that extend outside the frame.
- Inner Ticks - Small tick marks from the frame edge inward.
- Outer Ticks - Small tick marks from the frame edge outward.
- Spanning Ticks - Small tick marks that span the frame edge.

Reference Graph Assistant Properties Tab (Pie)



Show Slice Labels

When checked, enables the display of feelers and data text in a pie graph.

- Feeler Lines and Labels - Shows both feelers and data text.
- Labels Only - Shows only data text.
- Labels on Slices - Shows data text on slices.

A feeler is a line or set of lines that stretch from a pie slice label to its pie slice. Feelers are visual aids that help you know that a particular number belongs to a particular pie slice.

Slice Label

When this radio button is selected, the Y-axis label will display at the end of the feeler.

Percent Value

When this radio button is selected, the Y-axis value expressed as a percentage is displayed at the end of the feeler.

Slice Label and % Value

When this radio button is selected, the Y-axis label and its value expressed as a percentage are displayed at the end of the feeler.

True Value of Slice

When this radio button is selected, the Y-axis value is displayed at the end of the feeler.

Value Format

Allows you to select a format for the display of Y-axis series values. For details, see *Value Formats* on page 4-44.

Value Format cannot be used in combination with Slice Label.

Reference Value Formats

The following table gives a description of all the value formats.

List Box Display	Description
#	123 = 123
#%	123 = 12,300%
#.#%	123 = 12,300.0%
#.##%	123 = 12,300.00%
$#.##	123 = $123.00
$#	123 = $123
#K	1,234 = 1K
$#K	1,234 = $1K
#M	1,234,567 = 1M
$#M	1,234,567 = $1M
#B	1,234,567,891 = 1B
$#B	1,234,567,891 = $1B
#T	1,234,567,891,234 = 1T
$#T	1,234,567,891,234 = $1T

Setting the Graph Height and Width

The width (or horizontal axis) of each graph, which includes any surrounding text, is automatically set to 770 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.

The height (or vertical axis) of your graph is automatically set to 405 pixels.

The vertical axis is automatically set 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.

Procedure How to Set the Graph Height and Width

1. Click the *Properties* tab of the Graph Assistant.
2. Click the *OptionsGraph* sub-tab.
3. In the Graph Size field, select the *Custom size* radio button.
4. Enter the horizontal (width) value and the vertical (height) value, both in pixels.

   The horizontal value can be any number between 20 and 985.

   The vertical value can be any number between 20 and 518.

Customizing Graphs With the Graph Editor

The Graph Editor is an interactive graphical tool that allows you to modify a graph without having to edit the code manually. The Graph Editor applies and displays the changes you make to the graph.

When invoked from the Graph Assistant, the Graph Editor will edit the graph's code when you save changes.

For details on using the Graph Editor, see Chapter 14, *Customizing Graphs With the Graph Editor*.

Running, Saving, and Printing Your Graph

When you run your graph, you may print the output directly from the browser.

Note: If your graph labels or legends are not displaying correctly when you run your graph, see *How to Change Color Settings* on page 4-47 for details on correcting this.

Procedure How to Save Your Graph From the Graph Assistant

1. Click *Save* or *Save As* from the Graph Assistant.
2. From the Save New Standard Report dialog box, enter a name for the graph.

Note: If you are editing an existing graph, clicking Save will automatically save the edits to the current graph file. You will not be prompted to name the file again.

Procedure How to Save Your Graph to a File

1. Click the *Graph* sub-tab of the Properties tab in the Graph Assistant.
2. Click the *File* check box in the Output field.
3. Name your file in the text box provided.
4. Select either *HTML*, *GIF*, or *JPEG* from the format drop-down list. The default is HTML.
5. Click *Run*. The output file will be saved in the \conf\edatemp directory.

Note: You may open your output file by selecting *Open* from the File menu in your browser.

When saving a graph as a GIF file, if the graph contains a second horizontal category (that is an ACROSS field that produces multiple graphs), the value in the HEADING will not be saved as part of the GIF file. Instead, the ACROSS field name will be embedded in the graph's page heading to identify the graph.

Procedure How to Run Your Graph

After creating your graph in the Graph Assistant, click *Run* from any tab in the Graph Assistant to view your graph output.

Procedure How to Print Your Graph

1. Run your graph.
2. From the browser, select *Print* from the File menu.

Procedure How to Change Color Settings

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:
   - 65536 or a higher color count for Windows NT.
   - High Color or True Color for Windows 95.
4. Click *OK*.

If you use different color settings from this recommended value, your graphs may display in grayscale format.

CHAPTER 5

Viewing and Printing Reports and Graphs

Topics:

- Viewing Reports in Your Browser
- Drilling Down for Details
- Navigating Through Multi-page Web Reports
- Controlling Viewer Display Options
- Using the Clipboard
- Printing Report and Graph Output

Your reports and graphs are displayed in your default browser. When you run a report, a visual image of all of the data values that you have requested are collected and automatically displayed in your browser.

Since Developer Studio uses Microsoft Internet Explorer files, Internet Explorer release 5.5 or 6.0 must be installed on your workstation.

Viewing Reports in Your Browser

You can view HTML, PDF, and Excel 2000 reports in your browser.

Example **HTML Report in Your Browser**

The following sample report shows Gotham Grinds store revenue information in your browser.

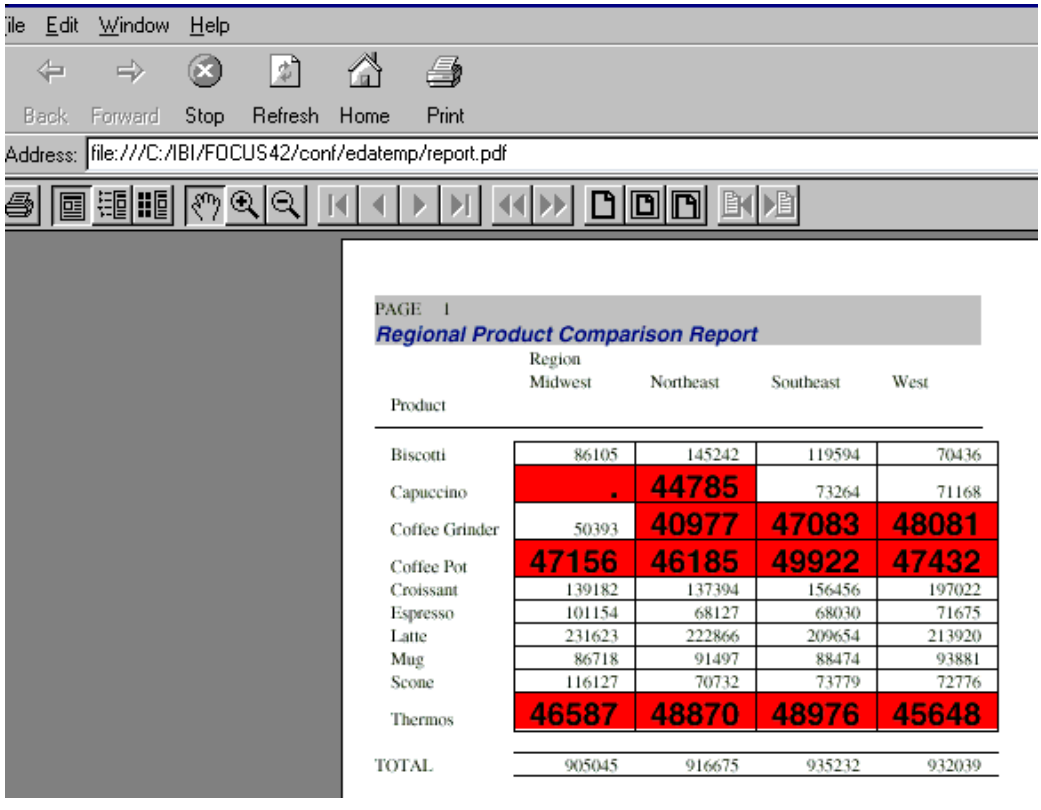
Store Revenue Report
for December 1997

Coffee	Espresso	$20,378
	Latte	$25,031
Food	Biscotti	$2,600
	Croissant	$22,581
	Scone	$31,083
Gifts	Coffee Grinder	$1,728
	Coffee Pot	$9,821
	Mug	$10,026
	Thermos	$14,454
*TOTAL GOTHAM GRINDS #1019		$137,702

Example **PDF Report With Acrobat Reader Controls**

PDF format opens in Acrobat Reader, which is invoked by your browser. Unlike HTML, which does not observe certain styling options, PDF format shows all styles as you define them in the Report Painter or in a report request.

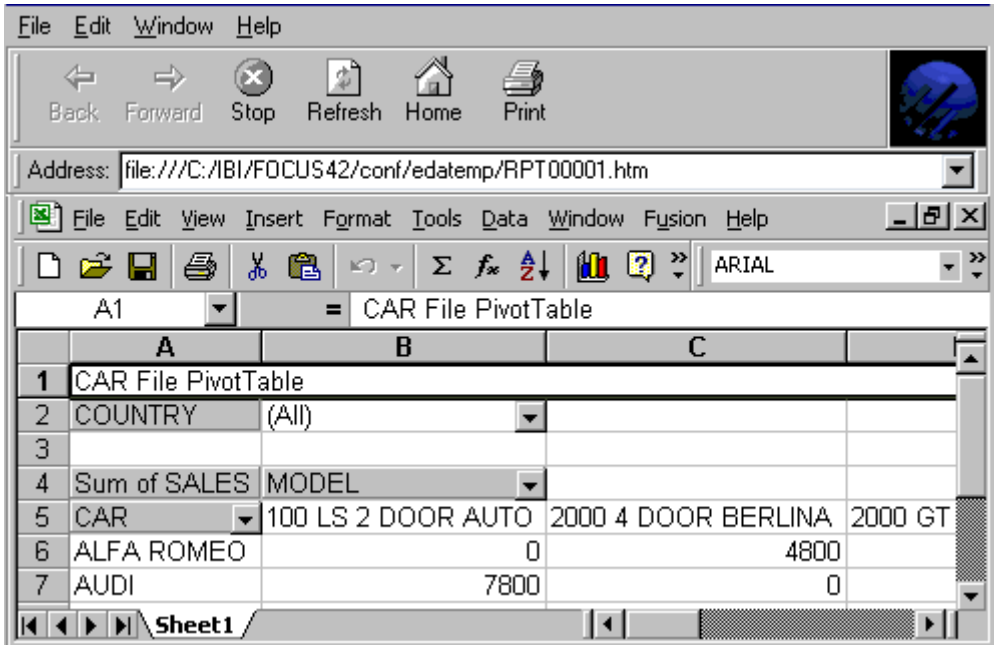
The full range of Acrobat Reader navigation options are available through your browser.



Product	Region Midwest	Northeast	Southeast	West
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
TOTAL	905045	916675	935232	932039

Example **Excel 2000 Report in the Your Browser**

The following shows an example of a report in Excel 2000 format. When the report is run, Excel 2000 launches within your browser, offering complete Excel 2000 functionality.



Displaying Graphs in Your Browser

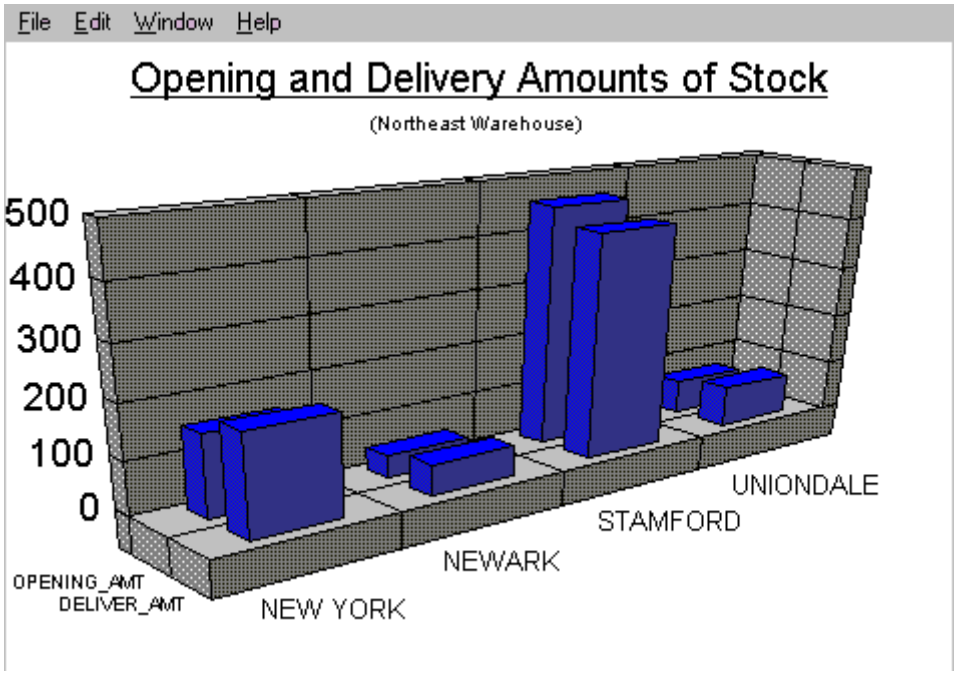
When you create and run a graph in the Graph Assistant, your output automatically appears in your browser.

You can further customize your graph by using the graph editor, which is accessible on every tab of the Graph Assistant by clicking the Edit... button.

For details, see Chapter 19, *Creating a Graph* and Chapter 14, *Customizing Graphs With the Graph Editor*.

Example **Sample Graph in Your Browser**

This graph was created and run using the Graph Assistant.



Drilling Down for Details

Your browser supports drill down functionality. That means you can drill down to other reports (located locally on your workstation or remotely on a server) or to URLs for details. Once a drill down link is defined, the "hot spots" in your report are underlined (similar to a hyperlink in a web page). For details on linking to reports and URLs, see *Creating a Drill Down Procedure* in Chapter 3, *Creating Reports With the Report Painter*.

Navigating Through Multi-page Web Reports

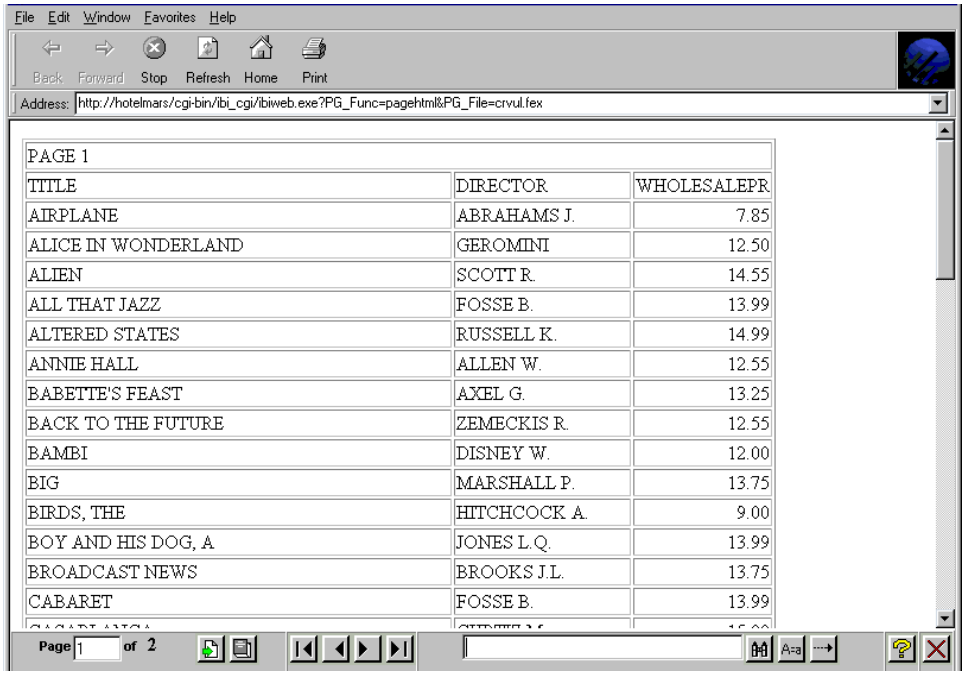
Normally, after the Web server receives the output from the WebFOCUS application server, it returns the entire report output to your browser. The on-demand paging facility provides significant performance advantages by downloading one page of HTML report output to your browser, instead of the entire report. When you request data using on-demand paging, the WebFOCUS Reporting Server receives the entire report, but sends only the first page to your browser and holds the remaining pages on the server's disk, awaiting your signal to send other sections of the report.

Your browser window is divided into two frames: the upper frame displays one page of report output. The lower frame provides controls that you use to display report pages and search report output for specific strings. For details, see *Navigating With On-Demand Paging* on page 5-9.

Note: This feature is only available if you are running HTML reports remotely on the WebFOCUS Reporting Server.

Example **HTML Report With On-Demand Paging**

Here is an example showing HTML report output in your browser using on-demand paging. Note that the first page appears in the main panel, with navigational controls in the panel below.



PAGE 1		
TITLE	DIRECTOR	WHOLESALEPR
AIRPLANE	ABRAHAMS J.	7.85
ALICE IN WONDERLAND	GEROMINI	12.50
ALIEN	SCOTT R.	14.55
ALL THAT JAZZ	FOSSE B.	13.99
ALTERED STATES	RUSSELL K.	14.99
ANNIE HALL	ALLEN W.	12.55
BABETTE'S FEAST	AXEL G.	13.25
BACK TO THE FUTURE	ZEMECKIS R.	12.55
BAMBI	DISNEY W.	12.00
BIG	MARSHALL P.	13.75
BIRDS, THE	HITCHCOCK A.	9.00
BOY AND HIS DOG, A	JONES L.Q.	13.99
BROADCAST NEWS	BROOKS J.L.	13.75
CABARET	FOSSE B.	13.99

Setting Up for On-Demand Paging

To set up for on-demand paging and to display report pages in your browser you must do the following:

- **Format the report output as HTML.** On-demand paging requires that report output be formatted as HTML. If your report default is HTML format, you can simply create a new HTML report. If HTML is not the default, you can set format to HTML from the Report Painter or Report Assistant. See *How to Format a Report as HTML* on page 5-7.

- **Enable on-demand paging.** This setting activates on-demand paging for your report. You can enable on-demand paging through the Report Painter or Report Assistant. See *How to Enable On-Demand Paging for HTML Reports* on page 5-7.
- **Select a WebFOCUS Reporting Server to run the report on.** You must select a WebFOCUS Reporting Server to see on-demand paging results. If you do not select a server, you will be prompted to select a server when you run the report.
- **Run the report.** When you run the report, on-demand paging delivers the first page of the report output to your browser and holds the remaining pages on the server's disk.

  A page of report output is determined by the number of lines per page. You can set your browser to display a specified number of lines per page using the SET LINES command. You issue this command either using the Set tool or by manually including it in your request from the Text Editor or Command Console. If you do not specify a value for the SET LINES command, your browser defaults to 57 lines per page. For more information on set commands, see *Customizing Your Environment* in *Developing Reporting Applications*.

Procedure How to Format a Report as HTML

- In Report Assistant, select *HTML* from the Display Format drop-down list on the Properties tab.

  or

- In Report Painter, click the *Report Options* button and select the *Output* tab. Select *HTML* from the Display Format box.

Procedure How to Enable On-Demand Paging for HTML Reports

- In Report Assistant, select *On-Demand Paging* on the Properties tab for a report that you have already formatted as HTML.

  or

- In Report Painter, select *Report Options* from the toolbar, and select *On-demand paging* on the Output tab.

  or

- In the Text Editor or Command Console, administrators and developers can add SET WEBVIEWER=ON syntax to a procedure to enable the on-demand paging attribute. The SET command may be placed outside or within the TABLE request. See *HTML Report in Your Browser* on page 5-2 for an example.

Example Report Procedure Syntax for On-Demand Paging

Administrators and developers can initiate on-demand paging using syntax, as shown in the following example:

```
SET WEBVIEWER=ON

TABLE FILE MOVIES
PRINT DIRECTOR WHOLESALEPR
BY TITLE

ON TABLE SET ONLINE-FMT HTML
END
```

The following report request generates the same report output. In this request the SET commands are placed within the TABLE request.

```
TABLE FILE MOVIES
PRINT DIRECTOR WHOLESALEPR
BY TITLE
ON TABLE SET WEBVIEWER ON

ON TABLE SET ONLINE-FMT HTML
END
```

To see the output generated by these procedures refer to *HTML Report in Your Browser* on page 5-2.

Procedure How to Add a WebFOCUS Environment

1. In the Environments List dialog box, click *Add*.

   The WebFOCUS Environment Properties window opens.

2. Enter the information about the environment you want to add. You must specify options for the following:

   - Web Server properties.
   - WebFOCUS Client properties.
   - WebFOCUS Server properties.
   - Managed Reporting/ReportCaster properties. These properties need to be sent only when you use a Managed Reporting environment or Report Caster.
   - Project Development. This needs to be set only when more than one environment is available.

3. After setting your properties, click *OK*.

For more information, see *Managing the WebFOCUS Environment* in *Developing Reporting Applications*.

Navigating With On-Demand Paging

When on-demand paging is enabled, your browser displays one page of report output and navigational controls. You use the navigational controls to change the report page displayed in your browser.

Your browser consists of two frames: the Report Frame and the Viewer Control Panel frame. The Report Frame is the larger frame and contains one page of report output. When you first run a report, the Report Frame contains the first page of report output.

The Viewer Control Panel frame contains the controls you use to navigate through the report and to search for a string. The navigational controls allow you to display the next or previous page, the first or last page, or to display a specific page. You use the searching function to have your browser locate a page of the report that contains a search string you specify.

Procedure How to Navigate Through a Report (Browser Control Panel)

Your browser's Control Panel offers several ways to view pages in your report:

- To display a specific page:
  - **a.** Enter a page number in the Page input box.
  - **b.** Click the *Go to Page* button.
- To display the previous or the next page in sequence, click the *Previous* or *Next* arrow button.
- To display the first or last page of the report, click the *First Page* or the *Last Page* button.

To download the entire report to your browser as a single document, click the *All Pages* button. Your browser displays the entire report without your browser's Control Panel. You can return to viewing a single page of your report by clicking the *Back* button on your browser's toolbar.

Controlling Viewer Display Options

From your browser, you can set the screen position and size for subsequent viewing windows. You can also open multiple viewing windows and set the viewing window to maximize upon opening.

In addition, in your browser you can turn on a status bar and toolbar with controls for navigation, text searches, and printing.

Procedure How to Set Internet Options

If you are viewing a report in your browser, you can control browsing, printing, searching, accessibility, and a wide range of other functions from the standard Internet Options dialog box.

To access this dialog box, choose *Internet Options* from the Window menu.

Procedure How to Turn on Your Browser Status Bar

Select *View* from the menu, and select *Status Bar* from the cascading menu that displays.

Procedure How to Turn on and Use Your Browser Toolbar

When you view a report in your browser you can display and use the toolbar:

Select the *View* menu, and select *Toolbar* from the cascading menu that displays.

Once displayed you can use the buttons on your browser toolbar to perform the following operations:

Back

Retrieves the previous report if you have opened multiple reports during your reporting session.

Forward

Retrieves next report if you have opened multiple reports during your reporting session.

Stop

Stops the report and cancels retrieval.

Refresh

Refreshes the page as in a browser.

Home

Displays the first report retrieved if you have opened multiple reports during your reporting session.

Print

Displays the standard Windows Print dialog box.

Using the Clipboard

To copy report output to the Windows Clipboard, choose one of the following methods:

- Select the text with your cursor, then choose *Copy* from the Edit menu.

- Choose *Select All* from the Edit menu, then choose *Copy* from the Edit menu.

Printing Report and Graph Output

Use the standard Windows Print dialog boxes to specify pages to print, orientation (portrait/ landscape), number of copies, and print order (odd/even).

Procedure How to Print a Report or Graph

- From your browser's File menu, choose *Print…* to open the standard Windows Print dialog box.
- In the Explorer, open the Procedures folder, right-click a procedure, and select *Print*. The report prints.

Enter your print specifications in these dialog boxes.

Reference Print Dialog Box

The Print dialog box has the following fields/options:

Name

Select the name of the printer you want to use from the drop-down list.

Properties

Opens your printer's Document Properties dialog box where you can specify page setup and other document options.

Print to File

Enables you to save data to local or networked folders.

Number of copies

Is the number of copies you wish to print in the Copies entry box.

Print range

Is one of the following:

All prints all pages of a document.

Current Page prints the page in which the cursor is currently located.

Pages prints a range of pages. Enter the page range in the From and To fields.

Print frames

Is one of the following:

As laid out on screen prints the screen exactly as it is.

Only the selected frame prints the frame whose text is selected.

All frames individually prints all frames individually.

Print all linked documents

Prints all documents linked to the current document.

CHAPTER 6

Creating Temporary Fields

Topics:

- What Is a Temporary Field?
- Defining a Virtual Field
- Creating a Calculated Value
- Calculating Trends and Predicting Values
- Creating Temporary Fields Unrelated to Master Files

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; it 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.

Kinds of Temporary Fields

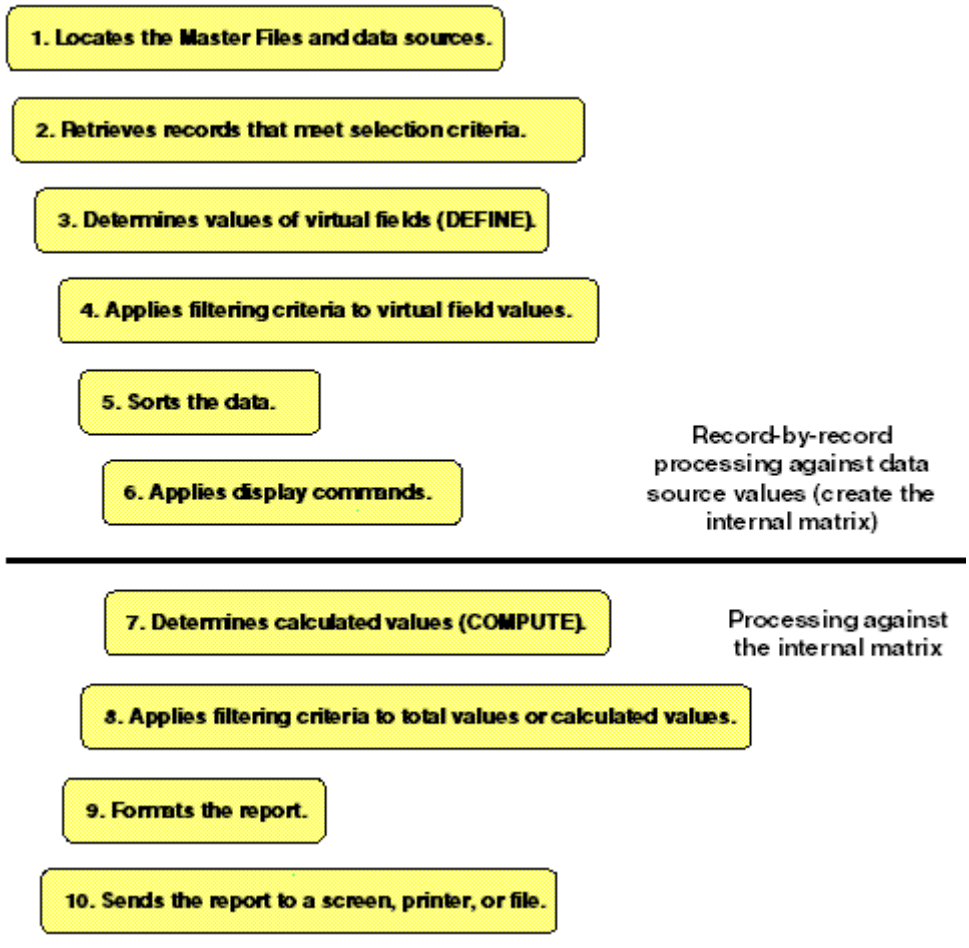
You can use two kinds of temporary fields—a *virtual field* and a *calculated value*—which differ in how they are evaluated:

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 virtual field is in effect until it is cleared.

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.

Reference Evaluation of Temporary Fields

Temporary fields are evaluated in the following order:



Example 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 on each retrieved record.

The output is:

DELIVER_AMT	OPENING_AMT	DRATIO	CRATIO
760	724	28.41	1.05

Reference Selecting a Temporary Field

The following will 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 your data. You cannot use a calculated value since it is evaluated after the data is sorted. If you wish to use a calculated value for sorting, you must create an extract file that contains the report data, then re-sort the extract file.

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.

  For more information, see the *Describing Data With Graphical Tools* manual.

- **In a procedure.** A virtual field created in a procedure lasts only for that procedure.

Tip: If your environment supports the KEEPDEFINE parameter, you can set KEEPDEFINE to ON to protect virtual fields from being cleared by a subsequent . For details see Chapter 8, *Joining Data Sources*, and the documentation on SET parameters in the *Developing Reporting Applications* manual.

Reference

Usage Notes for Creating Virtual Fields

- To join structures using a virtual field, make sure the Define follows the Join. Otherwise, the Join will clear the temporary field. See Chapter 8, *Joining Data Sources*, for an explanation of reporting on joined 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.
- WITH can be used to move the logical home for the virtual field to a lower segment than it would otherwise be assigned to (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 16,000 characters. This limit may be increased at installation time. Please refer to your installation guide. For WebFOCUS 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 Chapter 1, *Creating Reports Overview*.
- Virtual fields are only available when the data source is used for reporting. Virtual fields cannot be used with MODIFY.

- A Define expression 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 *Developing Reporting Applications* manual).

Procedure *Rotating a Data Structure for Enhanced Retrieval* **in Chapter 16, *Improving Report Processing*How to Create a Virtual Field**

To define a virtual field (Define object) in a procedure:

1. Right-click the procedure in the Procedures folder and choose *Open* from the shortcut menu. The Procedure (FOCEXEC) window opens.
2. Click and hold a component connector (yellow diamond) at the point where you want to include the virtual field in the procedure, then click the *Define* button on the component connector toolbar.
3. The Open dialog box opens. Select the Master File from which you want to create the virtual field and click *Open*.

   The Define dialog box opens. For details see *Note: Administrators and developers should note that date options set in a virtual field will override date options set in the Master File or with a SET command.Define Tool* on page 6-8.
4. Type the name of the virtual field in the Field input box.
5. Enter an expression in the expressions box. See specific procedures for details on assigning alphanumeric, numeric, date, and CLOB formats. For information on expressions, see Appendix B, *Writing Expressions*.

   You can also use a function in an expression by clicking the *Functions* tab in the Define dialog box. For details on functions, see the *Using Functions* manual.

Note: If you want to make a virtual field available for use with all procedures during your session, issue the DEFINE command from the Command Console. The virtual field is retained for the duration of the session.

Procedure How to Assign an Alphanumeric Format With the Define Tool

In the Define tool window:

1. Click the *Format...* button.

   The Format dialog box opens.

2. Select the *Alphanumeric* radio button in the Format Type list.

   The default length is 20. It appears in the Length spin box.

3. To assign a different length, specify a number between 1 and 256 in the Length spin box.

4. Click *OK*.

The format dialog box closes. The selected format appears in the Format box.

For more information on field formats, see Appendix A, *Assigning Field Formats*.

Procedure How to Assign a Numeric Format With the Define Tool

1. Click the *Format...* button.

2. The Format dialog box opens.

3. Select one of the following radio buttons in the Format Type list:

Floating Point	default length 7.2
Integer	default length 5
Decimal	default length 12.2
Packed	default length 12.2

   The default length appears in the Length spin box. The Decimal spin box shows the number of decimal places for Floating Point, Decimal, and Packed.

4. To assign a different length, specify a number between 1 and 9 for Floating Point, between 1 and 11 for an Integer, between 1 and 20 for Decimal, or between 1 and 33 for Packed in the Length spin box.

5. To assign a different number of decimal places for Floating Point, Decimal, or Packed, specify the desired number in the Decimal spin box.

6. If you wish to include numeric display options, select these options in the Edit Options list box.

7. Click *OK*.

The format dialog box closes. The selected format appears in the Format box.

For more information on field formats, see Appendix A, *Assigning Field Formats*.

Procedure **How to Assign a Date Format With the Define Tool**

In the Define tool window:

1. Click the *Format...* button.

   The Format dialog box opens.

2. Select the *Date* radio button in the Format Type list.

   The default date display option is MDY. It appears in the Date Format combo box.

3. To assign a different option, click the down arrow to the right of the Date Format combo box.

   The Date Format drop-down list appears.

4. Choose the desired option.
5. Click *OK*.

The format dialog box closes. The selected format appears in the Format box.

For more information on field formats, see Appendix A, *Assigning Field Formats*.

Reference **Note:** Administrators and developers should note that date options set in a virtual field will override date options set in the Master File or with a SET command.**Define Tool**

The Define tool has the following fields/options:

Field

Displays the name of the temporary field.

When creating a field, type the name you wish to assign.

When editing a field, click the down arrow on the Field combo box, and select the field you wish to edit. The drop-down list shows all virtual fields for the current data source. When you select a field, the corresponding information appears in the Format box, and the expression box. You can edit the information, eliminate the field, or run it.

Add

When selected, it indicates that the current temporary field definitions should be added to the list of temporary fields previously defined for the same data source.

If this button is not selected, the current set of temporary fields replaces those previously defined for the same data source.

In Application View, this action marks all definitions created during the current use of the Define tool to be added to other virtual fields defined for the same data source during earlier use of the tool.

Note: You can define and execute several virtual fields during a single use of the Define tool. However, unless you select Add, running the current list will erase other virtual fields created outside of the Master File for the same data source. Virtual fields created in the Master File remain in effect.

Clear

When selected, it clears any current temporary field definitions you previously added to the list of temporary fields.

Format button

Opens the Format dialog box, where you assign a format to the temporary field. For details about format options, see *Appendix A, Assigning Field Formats*.

Format box

Displays the field type, field length, and display options. The field type can be alphanumeric, numeric, or date. See Appendix A, *Assigning Field Formats*.

Expressions box

Displays the expression used to evaluate the field.

Type the expression or use the Fields list, calculator, and functions list to help you create the expression.

Calculator buttons

Provide numbers and operators that you can use to create numeric, alphanumeric, Boolean, and conditional expressions.

Click the desired number or operator to add it to the expression box.

- To enclose a value in parentheses, click the *( )* key in the calculator. Parentheses affect the order in which the specified operations are performed. For information on when to use parentheses, see *Order of Evaluation* in Appendix B, *Writing Expressions*.
- To enclose a value in single quotation marks, click the ' ' key in the calculator. Use single quotation marks to enclose alphanumeric and date literals.
- To convert entries in the expression box to uppercase, click the *U* key in the calculator. Note that field names are case sensitive.

For information on operators, see Appendix B, *Writing Expressions*.

Close

Closes the Define tool.

Check

Displays the Define phrase in code, and specifies any errors.

New

Clears the tool's entry fields, including the Field combo box and the corresponding expression. It also returns the format to the default value D12.2, and places the cursor in the Field combo box so you can begin to create a new field.

Delete

Deletes the temporary field identified in the Field box. The field is no longer available.

Defined Fields

Lists the names of the temporary fields already associated in the Master File.

Fields List

Lists the fields defined in the Master File.

Functions

Lists available built-in functions. (A function is a program that returns a value.)

Double-click the desired function to add it to the expression box. Then, in the expression box, highlight each argument and substitute the value or field name you wish to use. For details see the *Using Functions* manual.

Example Creating a Virtual Field

Using information in the sample data source EMPLOYEE, the following example shows how to create a virtual field, INCREASE, to calculate the annual salary increase each employee will receive. This example assumes that you have already created a procedure with which you want to use this virtual field.

1. Open a procedure in which you want to create a virtual field then open the Define tool from the component connector toolbar.

   The Open dialog box opens.
2. Select the *EMPLOYEE* Master File and click *Open*.
3. Type *INCREASE* in the Field input box.
4. Click the *Format...* button.

   The Format dialog box opens.
5. Confirm that the *Decimal* radio button is selected under Format Types.
6. Click the down arrow in the Length spin box to specify the field length 8. Leave the number 2 in the Decimal field.
7. Select the *Floating dollar--M* option in the Edit Options list box.
8. Click *OK* to make the changes and return to the previous dialog box.
9. Click the *Fields List* tab, then double-click *CURR_SAL*.
10. Enter the following in the Expressions window:

    * .05
11. Click the *decimal (.)* button, then the *0* and *5* buttons.

    The expression for the Define field now appears as: CURR_SAL * .05
12. Click *Close*.

    A dialog box prompts you to save your changes.
13. Click *Yes*.

You can then select the new field, INCREASE, in the Fields window of the reporting tools.

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.

Procedure How to Add a Virtual Field to a Set of Virtual Fields

1. In the Define dialog box, type the field name in the Field input box.

2. Enter the desired expression in the expression box. For information on expressions, see Appendix B, *Writing Expressions*.
3. Select the *Add* radio button.
4. Click *Close*.

Displaying Virtual Fields

You can display all virtual fields with the ? DEFINE command. You can also access this information in the Define tool.

Procedure How to Display Virtual Fields

Click the *Defined Fields* tab in the Define tool.

Clearing a Virtual Field

A virtual field created in a procedure is cleared by the following:

- A new list of virtual fields for the same data source without the Add option selected.
- 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.

Procedure How to Delete a Virtual Field

In the Define tool window, with the field in the Field combo box, click *Delete*.

The field is no longer available.

Increasing the Speed of Calculations in Virtual Fields

Virtual fields can be compiled into machine code in order to increase the speed of calculations.

You can prevent virtual fields from being compiled and have them interpreted at execution time by changing the setting of the DEFINES SET parameter. Calculations are then interpreted each time the calculation is performed which increases the execution time of the procedure.

In order to compile calculations, there must be a C compiler available on Windows NT/2000 and UNIX. On OS/390, calculations are compiled directly into machine code. If for any reason compilation fails, WebFOCUS will automatically suppress the SET DEFINES=COMPILED option and revert to the default. For details on this parameter, see the *Developing Reporting Applications* manual.

Syntax How to Set Compilation of Virtual Fields

```
SET DEFINES = {COMPILED|OLD}
```

where:

`COMPILED`

Compiles virtual fields.

`OLD`

Does not compile virtual fields. This value is the default.

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. You can create a dynamic format by writing an expression using the Define tool inside or outside of the Report Painter.

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 will reflect the different currency formats for each country.

Procedure How to Create a Virtual Field Containing Dynamic Formatting

In the Define tool:

1. Type the name of the virtual field in the Field input box.
2. Click *Format* and type *A8* (Alphanumeric, 8 characters). Click *OK*.
3. Type the expression in the Expressions window or use the Fields list, calculator, or functions list to help you create the expression. The expression should contain the parameter values necessary for defining the dynamic formatting. All expressions must be written in uppercase. For details, see *Setting Appropriate Formats for Different Currencies* on page 6-14.
4. Click *Close*.
5. When prompted, save your changes.

You can apply dynamic formatting to a report column. For details, see *How to Format a Report Column Using Dynamic Formats* on page 6-14.

Procedure How to Format a Report Column Using Dynamic Formats

1. Right-click a report column in the Report Painter and select *Format*.
2. Click the *Dynamic* radio button on the Format window.
3. Select the field with the desired dynamic format from the Format Field drop-down list.
4. Click *OK* to format the report column.

For an overview of this two-part process, see *Applying Dynamically Formatted Virtual Fields to Report Columns* on page 6-13.

Example Setting Appropriate Formats for Different Currencies

The following example demonstrates how the dynamic field format can be used to set different currency formats for specific countries in a report.

1. Open the procedure for which you want to create the virtual field, then open the Define tool from the component connector toolbar.

   The Open dialog box opens.
2. Select the *CAR* Master File and click *Open*.

   The Define tool opens.
3. Type *MYFORMAT* in the Field box.
4. Click the *Format* button. Select the *Alphanumeric* radio button, and specify *8* as the length. Click *OK*.

5. Click the *Functions* tab and double-click *DECODE*. The DECODE function appears with placeholders for its arguments.
6. Type the following expression, replacing the placeholder fields with specific values that define the decimal precision for each currency: *DECODE COUNTRY ('ENGLAND' 'P15.2C' 'JAPAN' 'P15.0' ELSE 'P15.2M')*
7. Click *Close*.
8. When prompted, save your changes.
9. Select *Report* from the Connector toolbox, and at the Open dialog box, select *CAR* from the list of Master Files. Click *Open*.
10. In the Report Painter, double-click the *COUNTRY* and *SALES* fields in the Fields list.
11. Select the *SALES* column and click the *Sum* button on the Columns toolbar.
12. Right-click the *SALES* column and select *Format*.
13. Click the *Dynamic* radio button and select the *MYFORMAT* field from the Format Field drop-down list.
14. Click *OK* to apply the formats associated with the MYFORMAT field to the SALES column.
15. Select the *COUNTRY* column and click the *By* button on the Columns toolbar.
16. Save your changes, and exit the Report Painter.
17. Run the report.

COUNTRY	SALES
ENGLAND	12,000.00
FRANCE	$.00
ITALY	$30,200.00
JAPAN	78030.
W GERMANY	$88,190.00

Notice that the SALES column displays the format variations you defined for each country in the DECODE function.

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.

Use the Computes tab to create a calculated value. You can access the Computes tab only when you are creating reports in the Report Painter.

Reference **Usage Notes for Calculated Field Values**

The following apply to the use of calculated values:

- If you specify any optional Compute expressions (such as, AS, IN, or NORPINT), and you compute additional fields following these phrases, you must repeat the Compute expression before specifying the additional fields.
- You can rename and justify column totals and row totals. .
- Expressions in a Compute expression can include fields with prefix operators. For more information on valid expressions, see Appendix B, *Writing Expressions*.
- Fields referred to in a Compute expression are counted toward the display field limit and appear in the internal matrix.

Procedure **How to Create a Calculated Value**

In the Report Painter:
.i.creating calculated values:Computes tab;
.i.Computes tab;

1. Choose *Computes* from the Report menu.
2. The Report Options window opens with the Computes tab open.
3. Type the field name in the Field input box.
4. Enter the desired expression in the expression box. For information on expressions, see Appendix B, *Writing Expressions*.
5. Click *OK*.

Procedure **How to Assign an Alphanumeric Format With the Computes Tab**

1. Click the *Format…* button.
2. The Format dialog box opens.
3. Select the *Alphanumeric* radio button in the Format Type list.

   The default length is 20. It appears in the Length spin box.

4. To assign a different length, specify a number between 1 and 256 in the Length spin box.
5. Click *OK*.

The format dialog box closes. The selected format appears in the Format box.

For more information on field formats, see Appendix A, *Assigning Field Formats*.

Procedure How to Assign a Numeric Format With the Computes Tab

1. Click the *Format…* button.
2. The Format dialog box opens.
3. Select one of the following radio buttons in the Format Type list:

   The default length appears in the Length spin box. The Decimal spin box shows the number of decimal places for Floating Point, Decimal, and Packed.
4. To assign a different length, specify a number between 1 and 9 for Floating Point, between 1 and 11 for an Integer, between 1 and 20 for Decimal, or between 1 and 33 for Packed in the Length spin box.
5. To assign a different number of decimal places for Floating Point, Decimal, or Packed, specify the desired number in the Decimal spin box.
6. If you wish to include numeric display options, select the desired ones in the Edit Options list box.
7. Click *OK*.

The format dialog box closes. The selected format appears in the Format box.

For more information on field formats, see Appendix A, *Assigning Field Formats*.

Procedure How to Assign a Date Format With the Computes Tab

1. Click the *Format…* button.
2. The Format dialog box opens.
3. Click the *Date* button in the Format Types section.

   The Date Formats dialog box opens. The default date display option is MDYY.
4. To assign a different option, click the down arrow to the right of the Date drop-down list and choose the desired option.
5. Optionally, select *Enable Edit Options* to apply date edit options.

   The Edit Options section becomes active. You can now select formats from the Month, Day, and Actual Date drop-down lists.

6. Optionally, select a default century by entering a century in the Century field, and specify a base date for this century in the Base date field.
7. If your field is a date-time field, select an option from the Time Options drop-down list.

   This drop-down list is available only when the field is a date-time field.
8. Click *OK*.

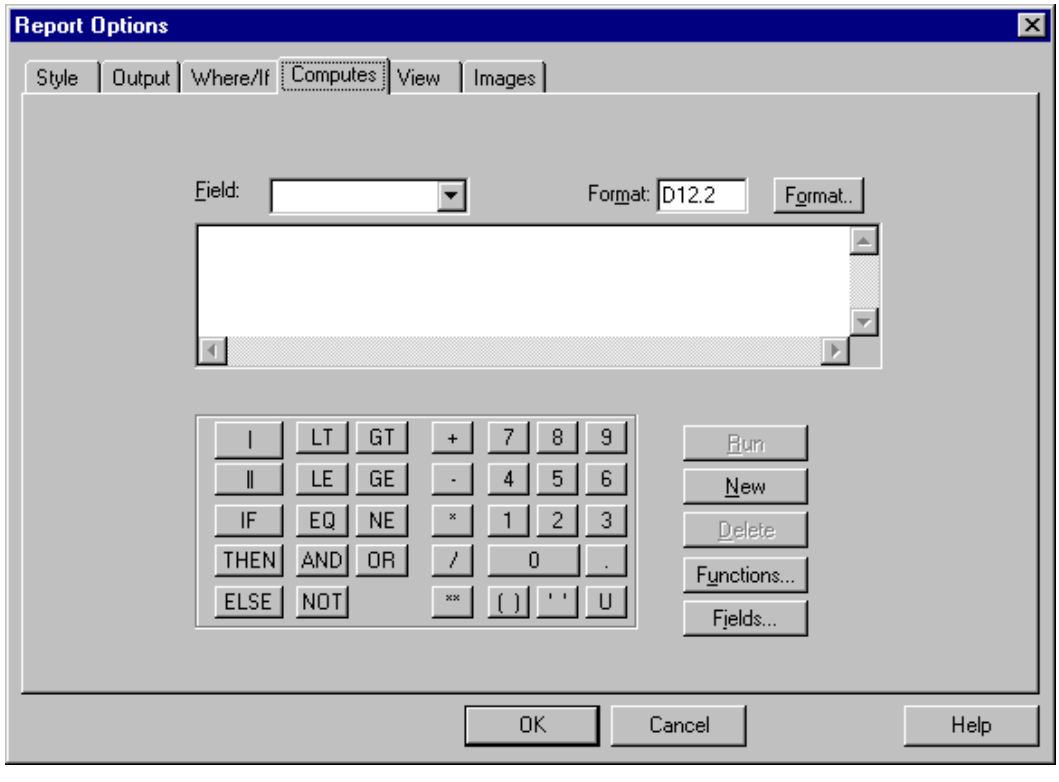
   The Date Formats dialog box closes, and you are returned to the Format dialog box.
9. Click *OK*.

   The format dialog box closes. The selected format appears in the Format box.

Note: Administrators and developers should note that date options set in a COMPUTE field override date options set in the Master File or SET command.

For more information on field formats, see Appendix A, *Assigning Field Formats*.

Reference Report Options Window Computes Tab



The Compute tab includes the following fields and options for creating expressions.

Field

Displays the name of the calculated value. Assign a field name to the value you wish to calculate.

When editing a calculated value, click the down arrow on the Field combo box, and select the field you wish to edit. When you select a field, the corresponding information appears in the Format box, and the expression box. You can edit the information, eliminate the field, or run it.

Format box

Displays the field type, field length, and display options. The field type can be alphanumeric, numeric, or date.

Format button

Opens the Format dialog box, where you can assign format information to the calculated value: format type (alphanumeric, numeric, date, text); length; decimal places (for numeric fields); edit options (for numeric and date fields), and other date information. For details see the Format dialog box. For details, see *Assigning Field Formats for Reporting (Format Dialog Box)* in Appendix A, *Assigning Field Formats*.

Expressions box

Displays the expression used to evaluate the field.

Type the expression, or use the Fields list, Calculator, and Functions list to help you create the expression.

Calculator buttons

Provide numbers and operators that you can use to create numeric, alphanumeric, and conditional expressions. Click the desired number or operator to add it to the expression box.

- To enclose a value in parentheses, click the **( )** key in the calculator. Parentheses affect the order in which the specified operations are performed. For information on when to use parentheses, see Chapter 1, *Creating Reports Overview*.
- To enclose a value in single quotation marks, click the **' '** key in the calculator. Use single quotation marks to enclose alphanumeric and date literals.
- To convert entries in the expression box to uppercase, click the **U** key in the calculator. Note that field names are case sensitive.

Functions

Opens the Functions window, which lists all available built-in functions. (A function is a program that returns a value.)

Double-click the desired function to add it to the expression box. Then, in the expression box, highlight each argument and substitute the value or field name you wish to use. For details see the *Using Functions* manual.

Fields...

Opens the Fields window, which lists all the fields in the data source. To adjust the information that you see in the Fields list window (for example, to display field formats and aliases, along with the field name), right-click in the window and select display options from the pop-up menu.

New

Clears the entry box, including the Field combo box and the corresponding expression. It also returns the format to the default value D12.2, and places the cursor in the Field combo box so you can begin to create a new field.

OK

Checks the syntax for your calculated value and displays a warning message; you cannot exit until the errors are fixed. When the syntax is correct and you click OK, the Compute tab closes. You can continue building your report.

Cancel

Exits the Computes tab without saving changes.

Displaying Calculated Values

You can display calculated values with the ? COMPUTE command. You can also view calculated values directly in the Computes tab.

Procedure How to Display Calculated Values

In the Computes tab, click the *down arrow* at the right of the Field combo box, and select the desired field.

The corresponding information appears in the Field combo box, the Format box, and the expression box.

or

In the Query Subjects box, select *COMPUTES* and click *OK*.

Procedure How to Delete a Calculated Value

In the Computes tab:

1. Click the *down arrow* at the right of the Field combo box.

   This action displays a drop-down list that shows all the calculated values for this report.

2. Choose the desired field.

   This action displays the corresponding information in the Field combo box, the Format box, and the expression box.

3. Click the *Delete* button.

The field is no longer available.

Using Positional Column Referencing With Calculated Values

In a Compute expression, 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 using the same field name in a variety of ways. The 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.

Using ACROSS With Calculated Values

If the Compute expression is issued immediately following an Across phrase, only a recap type of the calculation is performed once for all columns.

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.

Screening on Calculated Values

You can screen on values produced by Compute expressions by using the WHERE TOTAL test, as described in Chapter 4, *Selecting Records for Your Report*.

Calculating Trends and Predicting Values

You can calculate trends in numeric data and predict values beyond the range of values stored in the data source by using the Forecast feature.

The calculations you can make to identify trends and forecast values are:

- **Simple moving average** calculates a series of arithmetic means using a specified number of values from a field. For details, see *Using a Simple Moving Average* on page 6-26.
- **Exponential moving average** calculates a weighted average between the previously calculated value of the average and the next data point. For details, see *Using an Exponential Moving Average* on page 6-29.
-
- **Linear regression analysis** derives the coefficients of a straight line that best fits the data points and uses this linear equation to estimate values.

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 user's responsibility. 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 expression. 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 expression. No trend values display in the report; instead, the original column will be 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 as well as the original field when it is referenced in the display command. The new field will contain 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 field must be a summary field.

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 expression.

Procedure How to Calculate Trends and Predict Values

1. With the By or Across field you want to use for your calculations, click *Forecast*.

   The Forecast dialog box displays.

2. If you want to change the name of the output field from FRCSTFLD, enter the name of the field in the Field Name field.

3. Select an input field from the Step 1: Choose a Measure drop-down list.

   If you select the same field as the field you selected in Step 1, this field will not be displayed even if it is included in a display command.

4. Select the increment to count each instance of the By or Across field from the Step 2: Choose the Interval spin box.

5. Select the number of predictions to be calculated from the Forecast field from the Step 3: Choose Number of Predictions spin box.

6. Select the method with which you want the Forecast results calculated from the Step 4: Choose a Method drop-down list. The options are:

   Moving Average calculates a series of arithmetic means using a specified number of values from a field.

   Exponential Average calculates a weighted average between the previously calculated value of the average and the next data point.

   Linear Regression derives the coefficients of a straight line that best fits the data points and uses this linear equation to estimate values.

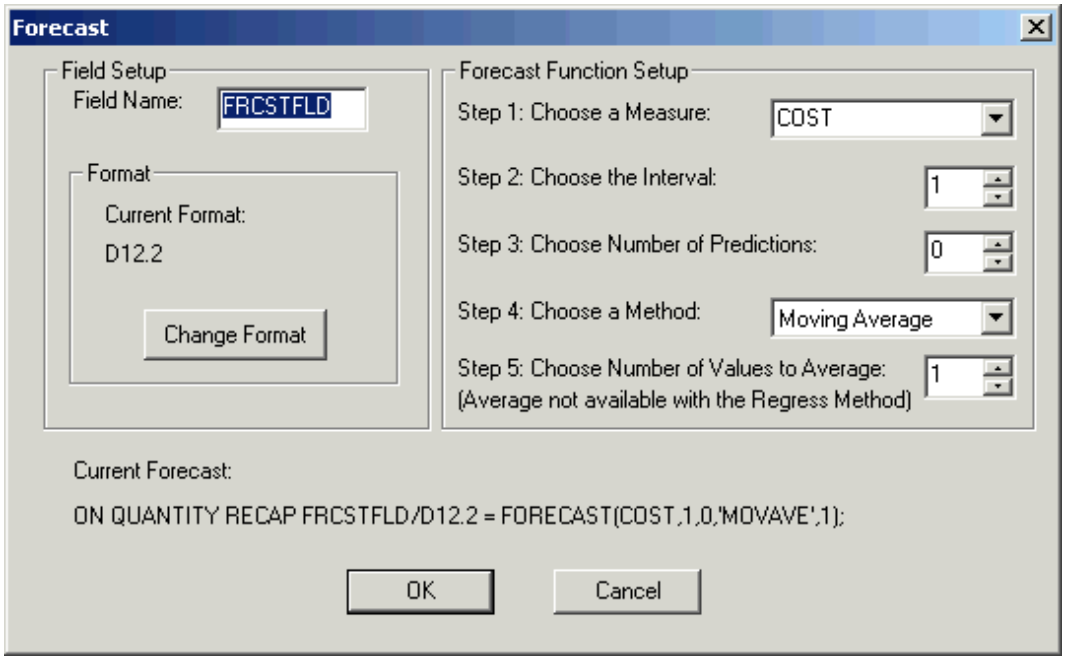
7. Select the number of values to average from the Step 5: Choose Number of Values to Average spin box.

   This option is not available with Linear Regression.

8. Optionally, change the default field format by clicking the *Change Format* button and selecting the format from the Format dialog box.

9. Click *OK*.

Reference Forecast Dialog Box



The Forecast dialog box contains the following fields/options:

Field Setup

Field Name

Is the Forecast field's name.

Current Format

Displays the Forecast's format.

Change Format

Opens the Format dialog box.

Forecast Functions Setup

Step 1: Choose a Measure

Is the field to be used to calculate the Forecast field.

Step 2: Choose the Interval

Is the increment by which to count instances of the By or Across field.

Step 3: Choose Number of Predictions

Is the number of predictions to be calculated.

Step 4: Choose a Method

Is the Forecast method to use to predict values. The options are:

Moving Average calculates a series of arithmetic means using a specified number of values from a field.

Exponential Average calculates a weighted average between the previously calculated value of the average and the next data point.

Linear Regression derives the coefficients of a straight line that best fits the data points and uses this linear equation to estimate values.

Step 5:Choose Number of Values to Average

Is the number of values to use to calculate the average that is used to predict values.

Current Forecast

Displays the code created by the Forecast dialog box.

Reference

Usage Notes for FORECAST

- The sort field used for Forecast must be in numeric or date format.
- When using simple moving average and exponential moving average methods, data values should be evenly spaced in order to get meaningful results.
- When using a Recap expression with Forecast, the expression can contain only the Forecast expression. 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 expression 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 expressions and up to seven additional Forecast Recap expressions.
- The left side of a Recap expression used for Forecast supports the CURR attribute for currency conversions.
- A request that creates a new field using the linear regression method with a summary field produces a regression based on the detail data values, not the summed values. This is not true if the linear regression method is used to replace an existing field.

Reference FORECAST Limits

The following are not supported with a Recap expression 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.
- FORECAST for the FOCUS GRAPH facility; it is supported for the iWay GRAPH facility.
- 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 in time, 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 last data point because the calculation requires *all* 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 last row at which point there are enough values to calculate the moving average with the number of values specified.

Example **Calculating a Simple Moving Average**

In Report Painter:

1. Add the *MONTH*, *REGION*, *QUANTITY* and *LINE_COGS* fields to the report.
2. Select the *MONTH* field and click *By*.
3. Select the *QUANTITY* field and click *Sum*.
4. Select the *REGION* field and click *Where/If*.

   The Report Options window opens with the Where/If tab open.
5. Enter the expression *REGION EQ 'EAST'* in the Expressions window, and click *OK*.
6. Click *Forecast*.

   The Forecast dialog box opens.
7. Enter *MOVING_AVE* in the Field Name input box.
8. Select *LINE_COGS* from the Step 1: Choose a Measure drop-down list.
9. Specify *3* in the Step 3: Choose Number of Predictions spin box.
10. Specify *3* in the Step 5: Choose Number of Values to Average spin box.
11. Click *OK*.
12. Run the request.

The output is:

MONTH	Region:	Quantity:	Line Cost Of Goods Sold	MOVING_AVE
01	EAST	62,552	14,395,550.00	14,395,550.00
02	EAST	144,998	32,044,767.00	23,220,158.50
03	EAST	241,560	55,623,466.00	34,021,261.00
04	EAST	233,431	53,601,098.00	47,089,777.00
05	EAST	213,495	48,083,093.00	52,435,885.67
06	EAST	230,919	54,300,878.00	51,995,023.00
07	EAST	164,507	35,880,448.00	46,088,139.67
08	EAST	100,999	22,908,580.00	37,696,635.33
09	EAST	7,101	1,590,711.00	20,126,579.67
10	EAST	102,416	21,291,015.00	15,263,435.33
11	EAST	131,447	28,227,951.00	17,036,559.00
12	EAST	57,691	13,128,044.00	20,882,336.67
01		0	.00	20,746,110.56
02		0	.00	18,252,163.74
03		0	.00	19,960,203.65

In the report, the number of values to use in the average is 3 and there are no QUANTITY or LINE_COGS values for the generated MONTH values.

Each MOVING_AVE field is computed using LINECOGS values where a value exists. The calculation of the moving average begins in the following way:

The first MOVING_AVE value (14,395,550.00) is equal to the first LINE_COGS value.

- The second MOVING_AVE value (23,220,158.50) is the mean of LINE_COGS values one and two: (14,395,550.00 + 23,220,158.50) /2.
- The third MOVING_AVE value (34,021,261.00) is the mean of LINE_COGS values one through three: (14,395,550.00 + 23,220,158.50 + 55,623,466.00) / 3.
- The fourth MOVING_AVE value (47,089,777.00) is the mean of LINE_COGS values two through four: (23,220,158.50 + 55,623,466.00 + 53,601,098.00) /3.

For predicted values beyond the supplied values, the calculated MOVING_AVE values are used as new data points to continue the moving average. The predicted MOVING_AVE values (starting with 20,746,110.56 for MONTH 01) are calculated using the previous MOVING_AVE values as new data points. For example, the first predicted value (20,746,110.56) is the average of the data points from months 11 and 12 (28,227,951.00 and 13,128,044.00) and the moving average for month 12 (20,882,336.67). The calculation is: 20,746,110.56 = (28,227,951.00 + 13,128,044.00 + 20,882,336.67)/3.

Using an Exponential Moving Average

The exponential moving average 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 and *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 average calculated is used as the next data value, making every predicted value a constant equal to the last calculated average.

Example Calculating a Single Exponential Smoothing Column

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

Example Calculating an Exponential Average

In Report Painter:

1. Add the *MONTH*, *REGION*, *QUANTITY* and *LINE_COGS* fields to the report.
2. Select the *MONTH* field and click *By*.
3. Select the *QUANTITY* field and click *Sum*.
4. Select the *REGION* field and click *Where/If*.

   The Report Options window opens with the Where/If tab open.
5. Enter the expression *REGION EQ 'EAST'* in the Expressions window, and click *OK*.
6. Click *Forecast*.

   The Forecast dialog box opens.

7. Enter *EXP_AVE* in the Field Name input box.

8. Select *LINE_COGS* from the Step 1: Choose a Measure drop-down list.

9. Specify *3* in the Step 3: Choose Number of Predictions spin box.

10. Select *Exponential Average* from the Step 4: Choose a Method drop-down list.

11. Specify *3* in the Step 5: Choose Number of Values to Average spin box.

12. Click *OK*.

13. Run the request.

The output is:

MONTH	Region:	Quantity:	Line Cost Of Goods Sold	EXP_AVE
01	EAST	62,552	14,395,550.00	14,395,550.00
02	EAST	144,998	32,044,767.00	23,220,158.50
03	EAST	241,560	55,623,466.00	39,421,812.25
04	EAST	233,431	53,601,098.00	46,511,455.13
05	EAST	213,495	48,083,093.00	47,297,274.06
06	EAST	230,919	54,300,878.00	50,799,076.03
07	EAST	164,507	35,880,448.00	43,339,762.02
08	EAST	100,999	22,908,580.00	33,124,171.01
09	EAST	7,101	1,590,711.00	17,357,441.00
10	EAST	102,416	21,291,015.00	19,324,228.00
11	EAST	131,447	28,227,951.00	23,776,089.50
12	EAST	57,691	13,128,044.00	18,452,066.75
01		0	.00	18,452,066.75
02		0	.00	18,452,066.75
03		0	.00	18,452,066.75

In the report, the number of values to use in the average is 3 and there are no QUANTITY or LINE_COGS values for the generated MONTH values.

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.

Example Calculating a Double Exponential Smoothing Column

The double exponential smoothing method better estimates the trend in the data points than the single smoothing method:

The output is:

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:

Note: 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's 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. You may need to use nonlinear optimization techniques to find the optimal constants.

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.

Example 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.

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.

$$m = (\sum xy - (\sum x * \sum y) / n) / (\sum x^2 - (\sum x)^2 / n)$$
$$b = (\sum y) / n - (m * (\sum x) / n)$$

where:

n

Is the number of data points.

y

Are the data values (dependent variables).

x

Are the sort field values (independent variables).

Trend values as well as predicted values are calculated using the regression line equation.

Example **Calculating a Linear Regression Field**

In Report Painter:

1. Add the *MONTH*, *REGION*, *QUANTITY* and *LINE_COGS* fields to the report.
2. Select the *MONTH* field and click *By*.
3. Select the *QUANTITY* field and click *Sum*.
4. Select the *REGION* field and click *Where/If*.

   The Report Options window opens with the Where/If tab open.
5. Enter the expression *REGION EQ 'EAST'* in the Expressions window, and click *OK*.
6. Click *Forecast*.

   The Forecast dialog box opens.
7. Enter *LINEAR_REG* in the Field Name input box.
8. Select *LINE_COGS* from the Step 1: Choose a Measure drop-down list.
9. Specify *3* in the Step 3: Choose Number of Predictions spin box.
10. Select *Linear Regression* from the Step 4: Choose a Method drop-down list.
11. Click *OK*.
12. Run the request.

The output is:

MONTH	Region:	Quantity:	Line Cost Of Goods Sold	LINEAR_REG
01	EAST	62,552	14,395,550.00	15,541.10
02	EAST	144,998	32,044,767.00	14,849.21
03	EAST	241,560	55,623,466.00	14,157.32
04	EAST	233,431	53,601,098.00	13,465.43
05	EAST	213,495	48,083,093.00	12,773.54
06	EAST	230,919	54,300,878.00	12,081.64
07	EAST	164,507	35,880,448.00	11,389.75
08	EAST	100,999	22,908,580.00	10,697.86
09	EAST	7,101	1,590,711.00	10,005.97
10	EAST	102,416	21,291,015.00	9,314.08
11	EAST	131,447	28,227,951.00	8,622.18
12	EAST	57,691	13,128,044.00	7,930.29
01		0	.00	7,238.40
02		0	.00	6,546.51
03		0	.00	5,854.62

FORECAST Reporting Techniques

You can use Forecast multiple times in one request. However, the Forecast requests must all specify the same sort field, interval, and number of predictions. Only the RECAP field, method, field used to calculate the Forecast values, and number of points to average can change. 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 expression for the Forecast field as a placeholder. The data type (I, F, P, D) must be the same in the Compute expression and the Recap expression.

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 always a constant other than zero. Rows in the report output that represent actual records in the data source will display this constant. Rows that represent predicted values will display zero. You can also propagate this field to a HOLD file.

Example 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:

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

Example 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 on 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:

Category	PERIOD	Unit Sales	MOVAVE	Dollar 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

Example 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_COST	DATA_ROW	PREDICT	MPG	FORMPG
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

Creating Temporary Fields Unrelated to Master Files

The temporary fields you create with the Define and Compute expressions are tied to a specific Master File, and in the case of values calculated with the Compute expression, 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 Information Builders-supplied functions. Data types are defined with each argument. When substituting values for these arguments, the value's 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. For details, see *Using Functions*.

Syntax **How to Define a Function**

```
DEFINE FUNCTION name (argument1/format1,..., argumentn/formatn)
[tempvariablea/formata = expressiona;]
    .
    .
    .
[tempvariablex/formatx = expressionx;]
name/format = [result_expression];
END
```

where:

name

Is the name of the function. 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 and their formats.

format1...formatn

Are the formats of the function arguments.

If an argument's format is alphanumeric, the argument value must be alphanumeric. Shorter arguments are padded on the right with blanks, and longer arguments are truncated.

If an argument's format 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.

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.

Reference 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 FOCUS command.
- When an expression tries to use a cleared function, an error displays.
- Function names are limited to eight characters.
- Argument names are limited to twelve characters. There is no limit to the number of arguments.
- 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:

  ```
  (FOC1956) DEFINE FUNCTION %1 used after CLEAR or DEFINE.
  ```

- You cannot call DEFINE functions from Dialogue Manager commands.

Procedure How to Display DEFINE Functions

```
? FUNCTION
```

Example 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
```

Syntax How to Clear DEFINE Functions

```
DEFINE FUNCTION {name|*} CLEAR
```

where:

name

Is the name of the function name to clear.

*

Clears all active DEFINE functions.

CHAPTER 7

Saving and Reusing Report Output

Topics:

- Types of Output Files
- Creating Output Files
- Clearing HOLD and SAVE Files
- Output File Formats
- Saving Reports as HTML Output
- Saving Reports as Print Display Output: PDF, PS
- Saving Reports as Excel 2000, Excel 97, and Excel Output

When you run a report request, by default the data values that you request are collected and presented in a viewable form complete with column headings and other formatting features. You can take those same data values and, instead of formatting them for viewing, use them to create a new file, data source, or spreadsheet.

When you create a report request, you have many choices for displaying, reusing, and distributing your report output. You can:

- Store your report output for reuse by another FOCUS procedure or a variety of other applications, including most popular spreadsheet programs and Relational Database Management Systems.
- Publish your report in a format that facilitates distribution to a large audience. For example:
  - Storing your report output in a file for viewing with popular applications (Excel, Word, etc.).
  - Publishing your report output on the Web or corporate Intranet.

Types of Output Files

You decide which type of output file you need by considering what you plan to do with the output after you capture it. You can even capture the output multiple times in several different formats. Each output file is classified as one of the following types: Save or Hold.

SAVE Files

A SAVE file is the output of a report request stored in a format that can be used by a variety of applications. The default Save format is ALPHA, an ASCII text file containing your data values as printable characters. Depending on the format type you specify, you can use a Save file as input to other programming languages, applications, and WebFOCUS facilities. For example, you can create a Save file as a Microsoft Excel spreadsheet or as a Web page. For details see the procedure *How to Create a SAVE File* on page 7-4.

A SAVE file does not necessarily retain the spacing between columns and the other formatting features that are supported when report output displays on your screen; the values are formatted as required by the type of Save file you create. For information about the types of SAVE files see *SAVE File Formats* on page 7-9.

A special type of SAVE file is the SAVB file. A SAVB file is the same as a SAVE file except that numeric data is stored in internal format (BINARY), which means that it is not viewable on your screen without conversion. You can use the SAVB file as input to a variety of applications; for example, you can use it as the transaction file for a Microsoft Visual Basic program.

HOLD Files

In its purest form, a HOLD file is the output of a report request stored in a file that you can use as input to another WebFOCUS procedure. When a HOLD file is created for this purpose, a corresponding Master File is created along with the HOLD file. For example, you can create a HOLD file in FOCUS data source format. WebFOCUS automatically creates two files: a new FOCUS data source (.foc) containing the records that your request retrieves and a new Master File (.mas) that describes the fields in those records. You can then create new report requests that extract data from the HOLD file.

There are several reasons you might want to create such a HOLD file. You may want to extract the few fields you need from a large data source for faster and more efficient retrieval, or you may need to store virtual field values or summary values calculated in one request for further processing in another request.

You can also use data in the server environment and automatically transfer files you create to your local computer using special types of files called PCHOLD files. Both the data source and, when created, the internal Master File (.mas) are automatically transferred to the personal computer running Developer Studio. PCHOLD formats are particularly valuable when you wish to run a report remotely and save the data output files on a local workstation or transfer the files from a Web Server to a browser.

In addition, you can produce a local Master File when executing HOLD commands remotely on a server. Your remote HOLD command *automatically* delivers a copy of the Master File to the PC so you can create new reports against the extracted data using the Report Painter. This process eliminates the step of having to transfer the Master File from the server, perform a PCHOLD, or physically create the Master File locally.

You can create both HOLD and PCHOLD files in formats that can be used (like SAVE files) by a variety of other applications. Since these applications do not require Master Files, the report output is extracted in the requested format, but no Master File is created.

For more information, see *HOLD File Formats* on page 7-11 and *How to Create a HOLD File* on page 7-7. You may also wish to refer to topics in *Describing Data With Graphical Tools* for information on how to create Master Files and how to generate Master File synonyms from existing schema with a wizard.

Creating Output Files

Creating an output file is just like creating any report request except that you must identify which type of output file you want to create and, optionally, a format type and a name for the output file.

Output Files: When to Create Them

You can create an output file in two ways:

- Within a report request using the Report Painter.

  You would want to create the output file directly in the report request if it is a standard report that is part of an application, or if you know you will need a particular type of output file every time a user runs the request.

- Outside of a request after running it in your browser.

  You may want to create an output file *after* running the report request if you need to view the report output before determining whether to create the output file, or if you want to create more than one type of output file to use for different purposes.

You can even create one output file in a request and additional output files after running the request.

Output Files: Where to Put Them

When you create a HOLD file, the file is automatically saved in a default location that was specified during installation, or in the directory specified by the TEMPDIR parameter. Administrators and developers can use the SET TEMPDIR command to assign a location for WebFOCUS temporary files and HOLD files.

HOLD files should not be moved to a new location because if they are, they may not be found when you try to use them in a WebFOCUS procedure.

SAVE files are not bound by the same constraint since they are not meant to be used as input to a WebFOCUS procedure. You can provide a complete file specification that places your SAVE file in a new location from the Save As/Export dialog box. However, you should make sure that any file you create is accessible to the application that will use it. Refer to the appropriate documentation for any application you plan to use with a Save file. For more information, see *How to Create a SAVE File* on page 7-4.

Output Files: How to Create Them

You can create output files within a report request or after running the request and viewing the report output. Your graphical tools support both options.

Procedure How to Create a SAVE File

To create a SAVE file, follow these instructions.

1. Choose the Save As/Export option using one of the following ways:
   - Choose *Output* from the Report menu and click the Save As/Export button in the Hold/Save area of the Output tab.

     or
   - Choose Save/As Export from the File menu in your browser.

   A Save/As Export dialog box opens.
2. Select a file type from the *Save as type* drop-down list box. For a list of available formats, see *SAVE File Formats* on page 7-9.
3. Enter a name for your file in the File Name box.

   Note: You can enter a name in UNC (Universal Naming Convention) format. The UNC enables you to enter a server name without entering the explicit path to the server. However, in order to take advantage of this feature, you must first attach to the server. For details on attaching to a server or mapping network drives, see your network administrator.
4. Select a location for your file using the Save In list box.
5. For HTML and PDF reports, you can also select the language coding option you wish to use from the Encoding drop-down list.

Reference Save As/Export Dialog Boxes

You use the Save As/Export dialog boxes to create SAVE files.

Options in these dialog boxes include the following:

File Name

Is where you enter a file name for your Save file. Generally, the appropriate suffix for the type of file you have selected is displayed.

Note: You can enter a name in UNC (Universal Naming Convention) format. The UNC enables you to enter a server name without entering the explicit path to the server. However, in order to take advantage of this feature, you must first attach to the server. For details on attaching to a server or mapping network drives, see your network administrator.

Save File as Type

Determines a file type for your Save file. For a list of available formats, see *SAVE File Formats* on page 7-9.

Save In

Determines the directory and drive where your file is saved. (This option is not supported from your browser.)

Encoding

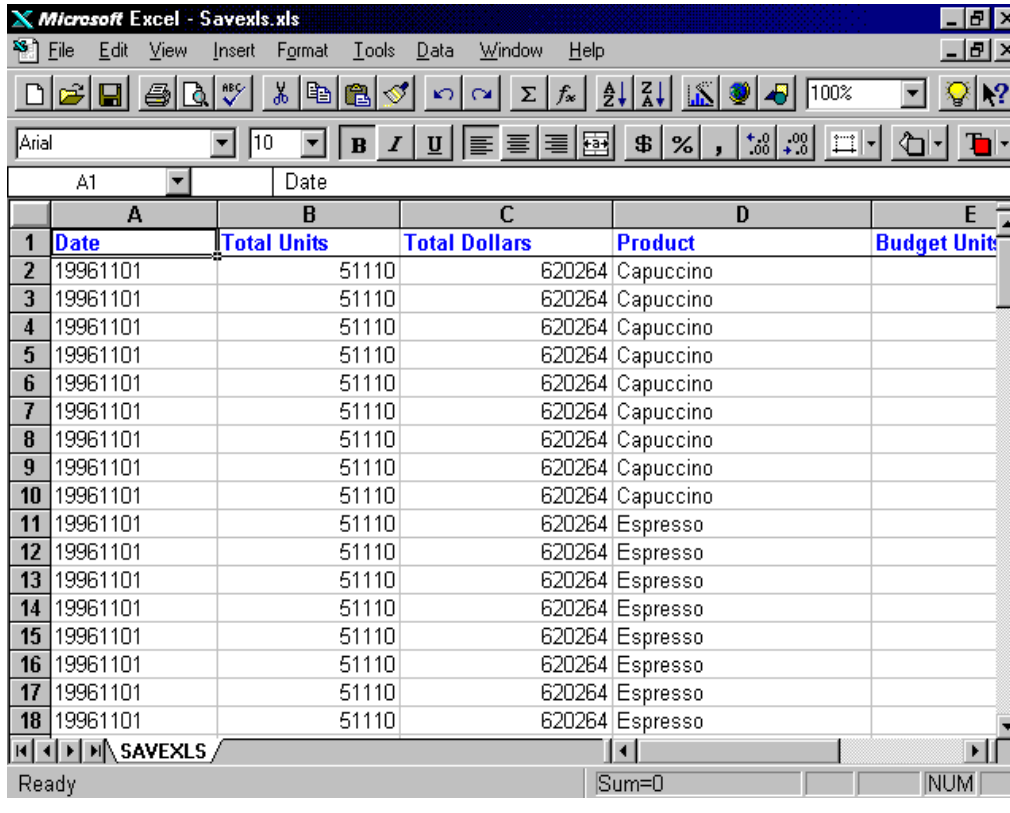
This option only appears if Save As/Export is selected from your browser. It enables you to select the language coding option you wish to use:

- **Western European (Windows).** This is the default setting.
- **Unicode**
- **Unicode (UTF-8)**
- **User-defined**
- **Vietnamese (Windows)**
- **Western European (ISO)**

Example Creating an Excel Worksheet

The following Report Painter example saves the report output as an Excel worksheet (named savexls.xls) by first selecting Save As/Export from the Report menu and then selecting EXCEL format from the Save As/Export dialog box:

You can open the resulting output file in Microsoft Excel:



	A	B	C	D	E
1	Date	Total Units	Total Dollars	Product	Budget Units
2	19961101	51110	620264	Capuccino	
3	19961101	51110	620264	Capuccino	
4	19961101	51110	620264	Capuccino	
5	19961101	51110	620264	Capuccino	
6	19961101	51110	620264	Capuccino	
7	19961101	51110	620264	Capuccino	
8	19961101	51110	620264	Capuccino	
9	19961101	51110	620264	Capuccino	
10	19961101	51110	620264	Capuccino	
11	19961101	51110	620264	Espresso	
12	19961101	51110	620264	Espresso	
13	19961101	51110	620264	Espresso	
14	19961101	51110	620264	Espresso	
15	19961101	51110	620264	Espresso	
16	19961101	51110	620264	Espresso	
17	19961101	51110	620264	Espresso	
18	19961101	51110	620264	Espresso	

Note: See *Saving Reports as Excel 2000, Excel 97, and Excel Output* on page 7-23 for examples of output saved in new formats supported with Microsoft Excel 2000.

Procedure How to Create a HOLD File

1. Choose *Output* from the Report menu. The Report Options dialog box opens at the Output tab.
2. Click the *Hold Data*... button in the Hold/Save section.

   The Hold dialog box opens.
3. Select a format from the Hold Format drop-down list. In the Report Painter, the default is *No hold file*. For details see *HOLD File Formats* on page 7-11.
4. To change the file name of the HOLD file, select the default name (HOLD) and type a new name in the File Name box.

   Tip: This is advisable to avoid having your file overwritten the next time you create a Hold file.
5. Click *OK*. When you run the report, output is saved in a HOLD file. If the selected HOLD format requires an accompanying Master File that file is also created.

Reference Hold Dialog Box

You use the Hold dialog box to create Hold files. Options in the Hold Dialog Box include the following:

Hold Format

Determines the type or format for your output file. For a list of available formats, see *HOLD File Formats* on page 7-11.

If your report already sends output to a Hold file, and you want to see the report in a browser, select *No Hold File* from this list. This feature is only applicable in Report Painter.

Tip: Remember to reset the Hold format for subsequent executions of the query if you want to Hold the output.Remember to reset the Hold format for subsequent executions of the query if you want to Hold the output.

If you are not concerned about saving output files to a particular location and you do not require a HOLD Master, you can choose a SAVE file format from the Hold dialog box, as well as from the Save As/Export dialog boxes. See *Save As/Export Dialog Boxes* on page 7-5.

Name

Determines the name of your Hold file. The default name is HOLD. If you use the default name, each time you create a Hold file the new file will overwrite the previous one.

Index Fields

Displays only when you select FOCUS or FUSION data source format. Enables you to choose the fields you want to index.

Clearing HOLD and SAVE Files

In the Report Painter, you can change the properties of the report so that it does not save the output to an output file, but sends the output to the screen or printer instead. To do so, you must first clear the HOLD and SAVE files.

Procedure **How to Clear HOLD and SAVE Files**

In the Report Painter:

1. Click the *Report Options* button on the toolbar, and select the *Output* tab.
2. Click the *Clear Hold/Save* button in the Hold/Save section.

or

1. Click the *Report Options* button on the toolbar, and select the *Output* tab.
2. Click the *Hold Data...* button in the Hold/Save section.

   The Hold dialog box opens.
3. Select *(No Hold File)* from the Hold Format drop-down list.

The request is modified; when you run it, the output is no longer saved to an output file.

Output File Formats

Each type of output file supports specific format types. For details see *SAVE File Formats* on page 7-9 and *HOLD File Formats* on page 7-11.

SAVE File Formats

The following is a list of file formats available for SAVE files from the Report Painter.

Administrators and developers can request all formats by issuing the appropriate WebFOCUS command from the Command Console or by creating a procedure in the Text Editor.

Format	Output	Extension
ALPHA	Saves report data in character (ASCII) format. Alpha is the default value.	.ftm
COMMA	Saves all the columns of the report request and creates a CSV (Comma Separated Values) file. Alphanumeric fields are enclosed in quotation marks. Columns are separated by commas.	.prn
DBASE	Creates an extract file in dBase format that includes column headings in the first row. **Note:** You can import a DBASE extract file into MS Access but not into Excel. To import a DBASE extract file into Excel, you can create an Excel file directly from WebFOCUS using the EXCEL or EXL2K format.	.dbf
DIF	Saves the entire report, including the report data, column headings, footings, and subtotals, and creates a DIF (Data Interchange Format) file that can be easily imported into most spreadsheet packages.	.dif
DOC	Captures the entire report output, including headings, footings, and subtotals, and creates a text file that can be easily incorporated into most word processing packages. DOC format uses an ASCII form-feed character to indicate page control information.	.doc
EXCEL	Saves the report output as a Microsoft Excel worksheet.	.xls

Format	Output	Extension
HTML	Creates an output file that contains an HTML document. For more information, see *Saving Reports as HTML Output* on page 7-15. **Note:** This SAVE format varies depending on your release of Internet Explorer. In release 4.0, the option is HTML. In release 5.0, the options are: Web page, complete; Web page, HTML only; Web Archive, single file. If HTML is your report format in the Report Painter, the report is automatically saved in HTML format.	.htm/.html
PDF	Saves the report output in Adobe's Portable Document Format, which allows precise placement of output (all formatting options) on the printed page so the report looks exactly as it would when printed. For more information on PDF files, see *Saving Reports as Print Display Output: PDF, PS* on page 7-16.	.pdf
RTF	Saves the report output in a Rich Text Format file.	.rtf
TABT	Creates an extract file in tab delimited format that includes column headings in the first row.	.tab
WK1	Saves report output as a Lotus 1-2-3 worksheet.	.wk1
WP	Saves the entire report output, including titles, headings, and footings, and creates a text file (with IBM OEM codes) that can be easily incorporated into most word processing packages.	.wp

HOLD File Formats

The following is a list of file formats available for Hold files. (Note that several formats support PCHOLD variations for transferring remotely-created output from a host to a local workstation or from a Web Server to a browser.)

These formats are supported in the WebFOCUS language and in the Report Painter (RP). The PCHOLD variations are only supported in the Report Painter.

Format	Output	Extension
ALPHA PCHOLD ALPHA	Saves the report output as MS-DOS text data; also creates a Master File.	.ftm
BINARY	Saves the report data and stores numeric fields as internal binary numbers; also creates a Master File. BINARY is the default format.	.ftm
COMMA	Saves all the columns of the WebFOCUS report request and creates a CSV (Comma Separated Values) file. Alphanumeric fields are enclosed in quotation marks. Columns are separated by commas.	.prn
DBASE PCHOLDDBASE	Creates an extract file in dBase format that includes column headings in the first row.	.dbf
DB2	Captures the report data and creates an IBM DB2 data source table.	n/a
DIF PCHOLD DIF	Captures the entire report, including the report data, column headings, footings, and subtotals, and creates a DIF (Data Interchange Format) file that can be easily imported into most spreadsheet packages.	.dif
DOC PCHOLD DOC	Saves the report output as MS-DOS text with layout and line breaks.	.doc
EXCEL PCHOLD EXCEL	Saves the report output as a Microsoft Excel worksheet.	.xls

Format	Output	Extension
EXL2K PCHOLD EXL2K	Generates fully styled reports in Excel 2000 HTML format. Requires Excel 2000 on your PC. For details see *Saving Reports as Excel 2000, Excel 97, and Excel Output* on page 7-23.	.xht
EXL2K PIVOT PCHOLD EXL2K	Generates fully styled reports in Excel 2000 HTML format, with added pivoting capabilities. Requires Excel 2000 on your PC. For details see *Saving Reports as Excel 2000, Excel 97, and Excel Output* on page 7-23.	.xht
FOCUS	Captures the report data and creates a FOCUS data source.	.foc
FUSION	Captures the report data and creates a Fusion multi-dimensional data source.	.fus
HOLD PCHOLD	Saves the report output as MS-DOS text data with Master File.	.ftm
HTML PCHOLD HTML	Creates an output file that contains an HTML (Web) document. The PCHOLD variation also transfers the data from a Web Server to a browser. For more information, see *Saving Reports as HTML Output* on page 7-15.	.htm
HTMTABLE PCHOLD HTMTABLE	Creates an output file that contains an HTML table, not a complete HTML document. The PCHOLD variation also transfers the data from a Web Server to a browser. For more information, see *Saving Reports as HTML Output* on page 7-15.	.htm

Format	Output	Extension
PDF PCHOLD PDF	Saves the report output in Adobe's Portable Document Format, which allows precise placement of output (all formatting options) on the printed page so the report looks exactly as it would when printed. For more information on PDF files, see *Saving Reports as Print Display Output: PDF, PS* on page 7-16.	.pdf
PCHOLD LOTUS	Saves all the columns of the report request and creates a file in which columns are separated by commas.	n/a
PostScript (PS)	Saves the report as a PostScript document. You must have installed a third party tool capable of displaying PS. See *Saving Reports as Print Display Output: PDF, PS* on page 7-16.	.ps
RTF	Saves the report output in a Rich Text Format file.	.rtf
SAVB	Saves the report data and stores numeric fields in binary format. When this option is used, the default format is BINARY.	.ftm
SAVE	Saves the report data as MS-DOS text data, storing numeric fields in character format. When this option is used, the default format is ALPHA (however, no Master File is created).	.ftm
SQLDBC	Creates an extract file stored in the Teradata Server.	n/a
SQLINF	Captures the report data and creates an Informix data source table.	n/a
SQLMAC	Saves report output as a Microsoft Access database table.	n/a

Format	Output	Extension
SQLMSS	Captures the report data and creates a Microsoft SQL Server data source table.	n/a
SQLSYB	Captures the report data and creates a Sybase data source table.	n/a
SQLODBC	Captures the report data and creates a file or data source table using the current ODBC data source driver.	n/a
SQLORA	Captures the report data and creates an Oracle data source table.	n/a
TABT PCHOLD TABT	Creates an extract file in tab delimited format that includes column headings in the first row.	.tab
WP PCHOLD WP	Saves the entire report output, including titles, headings, and footings, and creates an MS-DOS text file (with IBM OEM codes) with no line breaks. This file can be easily incorporated into most word processing packages.	.wp
WK1	Captures the report output data and creates a file that can be imported into Lotus 1-2-3	.wk1

Saving Reports as HTML Output

WebFOCUS enables you to save your report output with all of the HTML formatting necessary to view the document using a your browser. See Chapter 5, *Viewing and Printing Reports and Graphs* for an illustration.

WebFOCUS provides two format options for reports that create HTML documents:

Format	What it does...	Related Viewing Tool
HTML document (.htm)	Saves report output as an HTML document, which can be opened in any Web browser that supports tables. (Netscape Navigator 3.0 and higher and Microsoft Internet Explorer 3.0 and higher both support tables.) This format is useful if users need to see report output that is ready to display.	Web browsers
HTMTABLE file (.htm)	Saves report output as an HTML table that can be incorporated into an existing Web page. This format is useful when you want to run a report dynamically in WebFOCUS using up-to-the-minute data, and view the report output in a customized Web page.	Web browsers

Procedure How to View Reports as HTML

If you choose HTML format from the Report Painter, you can run your report and it will be saved as an HTML document.

In Report Painter, click the *Report Options* button and select the *Output* tab. Select *HTML* from the Display Format drop-down list.

The report it is displayed in HTML format in your browser. For an illustration see Chapter 5, *Viewing and Printing Reports and Graphs*.

Saving Reports as Print Display Output: PDF, PS

The PDF HOLD and SAVE formats enable you to produce fully formatted PDF output—for example, headings, footings, and titles, correctly aligned on the physical pages. PDF format also supports StyleSheets that contain drill down parameters and links to arbitrary URLs and embedded GIF images in report, page, and sort headings and footings.

For details about PDF format, see *Creating Reports With WebFOCUS Language*.

When you create PDF output:

- By default, the output file is named HOLD.PDF.
- If you specify the optional AS file name, the file name that you supply (1-8 characters) is used in place of the default file name HOLD.
- If you issue a FILEDEF for the file name, the PDF output is created in the file you specify in the FILEDEF.

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 Chapter 8, *Choosing a Display Format*, in *Creating Reports With WebFOCUS Language*.

With the exception of drill-downs, all of the report formatting features that are supported for PDF are also supported for PostScript output.

For more information about PS format, see Chapter 8, *Choosing a Display Format,* in *Creating Reports With WebFOCUS Language*.

Reference Required Software Configuration for PDF Report Display

You need Adobe Acrobat Reader Version 3.01 or higher in order to display the PDF output in your browser. The appearance of the report in your browser looks precisely as it would when printed. The Adobe Acrobat Reader is an Internet standard that is available for Windows 95, Windows NT, UNIX, and Macintosh.

Note: You can view PDF reports with the full Adobe Acrobat product (that you can purchase), or with Acrobat Reader, which is free.

When creating a PDF HOLD file, the output is saved on the PC and can be viewed without using your browser. Acrobat Reader can be used directly.

If you did not install Adobe Acrobat Reader when you installed Developer Studio, it is available:

- For download from Adobe System Inc.'s Web site. Go to http://www.adobe.com. This download is free of charge.

Acrobat Reader is used as a plug-in to your browser. You can view PDF-formatted reports with no additional setup or configuration.

Acrobat Reader is required only to *display* the PDF output. No third-party products are required to *produce* the PDF output.

Reference StyleSheet Features in PDF

All StyleSheet features that are supported for PostScript behave identically for PDF, unless otherwise noted in this section. The output produced by PDF is identical to that produced by PostScript (subject to font availability).

PostScript fonts are used and can be scaled to any point size. The fonts that are supported are Courier (fixed width), Times (proportional width), and Helvetica (proportional width). The font styles that can be used are Normal (default), Bold, Italic, Underline, and combinations of these. Note that the font style Outline, which is available for PostScript, is not available for PDF. Also, the support for ISO Latin font encoding that is present in PostScript is not available for PDF.

The following StyleSheet features are not supported with PDF (HTML only):

- JAVASCRIPT (drill down to JavaScript)
- TARGET
- COLSPAN
- HEADALIGN
- IMAGEALIGN
- IMAGEBREAK
- PAGEMATRIX, GUTTER

Reference Support for Drill-Downs in PDF Files

PDF supports the creation of hyperlinks (drill downs). You can create a hyperlink to drill down to or from a PDF report, to drill down to a graph, or link to a Web page.

When you drill down from one report to another report, do not use the following characters:

- + (plus sign)
- # (number sign)
- & (ampersand)
- \ (backslash)

Note: PDF does not support drill downs when sorting across column.

For more information on creating and using hyperlinks (drill downs), see Chapter 12, *Manipulating Data in an OLAP-enabled Report*.

Reference Differences Between PDF and HTML Formats

The following are the differences between PDF and HTML formats:

PDF

- Supports .GIF images only.
- Has no PDF equivalent to HTML-formatted forms or HTML tables.
- Does not support dynamic features that require JavaScript code, such as OLAP reports.

HTML

- Supports JavaScript hyperlinks.
- Supports .GIF, .JPEG, and other image formats.

Combining Multiple Reports Into a Single PDF or PS File

You can combine multiple reports into a single PDF or PS file using the Compound Report Constructor. This tool enables you to concatenate reports with styled hold formats (for example, PDF, HTML, PS, EXL2K, etc.) into one PDF 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. The Compound Report Constructor allows you to 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. See the ReportCaster documentation for details about this product.

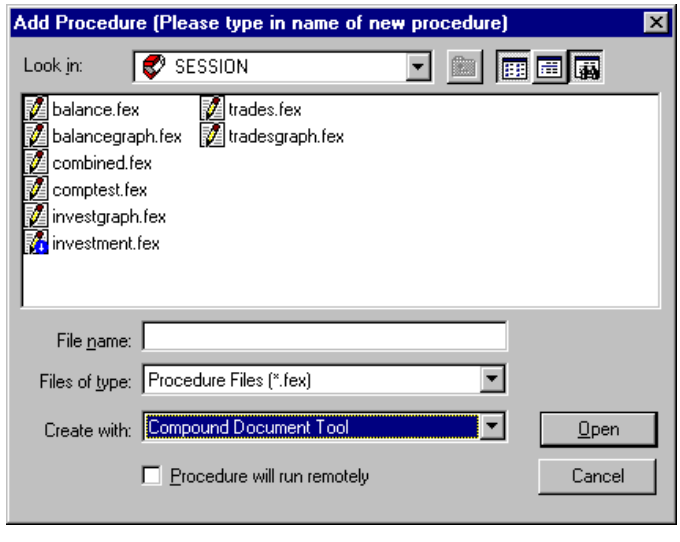
To combine multiple reports into a single PDF or PS file, you must create a new type of procedure, the WebFOCUS Compound Report. This procedure does the following:

- Collects, situates, and executes individual procedures.
- Enables you to set or suppress page breaks between individual reports.
- By suppressing a page break between two procedures, you can display multiple reports on a single page.

Procedure How to Launch the Compound Report Constructor

1. Access the Compound Report Constructor by right-clicking the Procedures folder under any application.
2. Click *New* and then *Procedure* from the cascading menu.

   The Add Procedure dialog box opens.



3. In the Look in drop-down list, select the name of the application for which you are creating a report procedure.

   The display box lists all the Master Files currently associated with the selected application.

4. In the File name field, type a name for the new procedure; do not include an extension. Developer Studio automatically appends the extension .fex.

5. In the Files of type drop-down list, accept the default, *Procedure Files (*.fex)*.

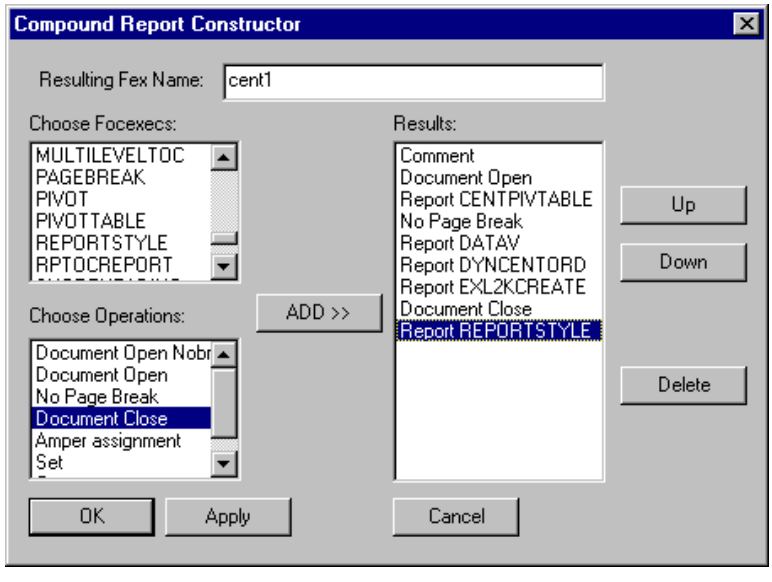
6. In the Create with drop-down list, select *Compound Document Tool*.

7. Optionally, click the *Procedure will run remotely* check box to run the procedure on a remote server. You can also designate a procedure to run remotely after you have created it. See *Developing Reporting Applications* for more information.

8. Click Open. The Compound Report Constructor dialog box displays.

   For more information about the Compound Report Constructor dialog box, see *Compound Report Constructor Dialog Box* on page 7-20.

Reference Compound Report Constructor Dialog Box



Resulting Fex Name

Displays the procedure name you previously entered in the New Procedure dialog box.

Choose Focexecs

Lists procedures that you can use to create a Compound Report.

Note: This tool does not prohibit a user from adding incompatible procedures to the Compound Report procedure, but ignores them when the procedure is executed.

Choose Operations

Highlight an operation and click the *ADD* button or simply double-click it to add it to the Results field:

Document Open

You must select this option prior to adding any other operation to the Results field box, and it must be the first operation displayed in the list. This option is required to activate the report concatenation process and must be listed as the first operation in the Results section.

Document Open Nobreak

Select this option to start the concatenation process and suppress the page break between the first two reports. By default, each report is displayed on a separate page.

No Page Break

Specify *No Page Break* to indicate where reports should display continuously without a page break. This option only affects the subsequent report listed in the Results section.

Page breaks are inserted between reports by default unless you specify this option.

Document Close

This option must precede the final report and is required to close the concatenation process.

Amper assignment

Select this option to specify values for any parameters that may be included in the Compound Report. You must add this option to the Results field prior to adding the corresponding report.

Set

Click this operation to launch the Set tool. The Set tool lists commands you can employ during a Developer Studio session.

Comment

Use this to add a comment to the procedure.

If you want to remove an operation from the Results field box, highlight it and click the *Delete* button.

Note: You can place individual reports, breaks, sets, etc. in any order by highlighting and clicking the Up and Down buttons located to the right of the Results field box.

Reference Usage Notes for the Compound Report Constructor

Individual reports can be opened and edited in the Report Painter, but a Compound Report cannot be opened in its entirety in the Report Painter.

- When you combine reports with different formats other than PDF, certain stylesheet attributes and reporting capabilities available to HTML and other styled formats may not be compatible with a PDF report format. Since the Compound Report Constructor generates a PDF document, some of these options may not appear in the final concatenated report, or may result in an incomplete request. In most cases, WebFOCUS will ignore unsupported options and substitute default PDF output. However, in some circumstances, it may be necessary to reformat the report to comply with standard PDF behavior.

Note:

- Compound reports cannot be nested or contain another Compound Report.
- You can save or hold the output from a compound report. For details, see *Output File Formats* on page 7-9.

Procedure How to Use the Compound Report Constructor

To create a compound report with the Compound Report Constructor, perform the following steps:

1. From the *Choose Focexecs* field box, select the procedures for which you want to create a Compound Report. Add a procedure to the Results field by double-clicking it or by highlighting it and then clicking the *ADD* button.

   For more information, see *Compound Report Constructor Dialog Box* on page 7-20.
2. From the *Choose Operations* field box, add an operation to the Results field by double-clicking it or by highlighting it and then clicking the *ADD* button.
3. When you have finished selecting the operation, click *Apply*.
4. Click *OK* to save your report.

Procedure How to Combine Report Formats and Graphs in a Compound Report

For more information, see Chapter 8, *Choosing a Display Format*, in *Creating Reports With WebFOCUS Language*.

Procedure How to Run a Compound Report

After you have created your report, you can run it from the details pane in Developer Studio.

1. Right-click a procedure in the details pane.
2. Select *Run* from the context menu or click the *Report Options* button on the main toolbar.

The Compound Report displays in your browser. You can also schedule and run your report with ReportCaster. For more information about ReportCaster, see your ReportCaster documentation.

Saving Reports as Excel 2000, Excel 97, and Excel Output

You can display a report as one of several kinds of Microsoft Excel spreadsheets. The report opens in Excel within a Web browser.

You can display a report as an:

- **Excel 2000 worksheet (format EXL2K).** The Excel 2000 format supports most StyleSheet attributes, allowing for full report formatting. The computer on which the report is being displayed must have Microsoft Excel 2000 or higher installed.

  In addition, WebFOCUS supports two Excel 2000 variations: EXL2K FORMULA and EXL2K PIVOT. When either of these formats is specified additional processing is done.

  - **Excel 2000 FORMULA** (EXL2K FORMULA). If you display a report using the format variation EXL2K FORMULA, the resulting spreadsheet will contain Excel formulas that calculate and display the results of any type of summed information (such as column totals, row totals, and sub-totals).
  - **Excel 2000 PivotTable** (format EXL2K PIVOT). PivotTable is an Excel tool for analyzing complex data, much like WebFOCUS OLAP. Note that a report displayed as a PivotTable spreadsheet may not retain its formatting if you insert an additional field from the pivot cache, move a column's position, or remove a field from the PivotTable.
- **Excel 97 spreadsheet** (format EXL97). Excel 97 is an HTML-based display format that opens in Excel 97 or higher and supports report formatting and drill-downs. The computer on which the report is being displayed must have Microsoft Excel 97 installed.
- **Excel spreadsheet** (format EXCEL). Excel is a binary display format with limited formatting support. (Although it does not support text fields, Excel 2000 format does.) The computer on which the report is being displayed must have Microsoft Excel installed.

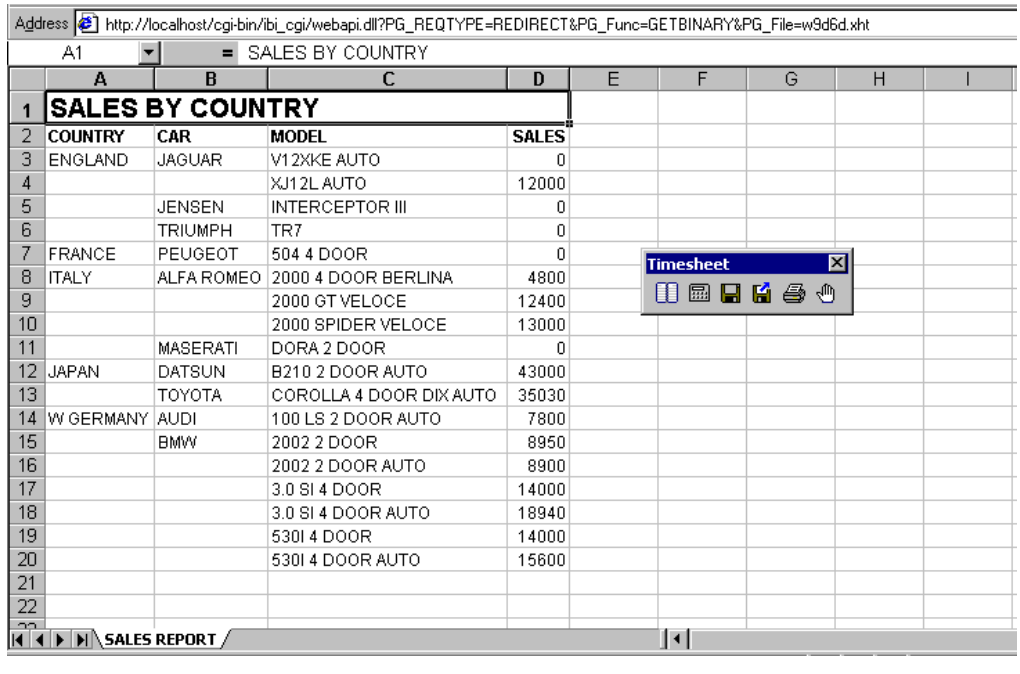
For details about displaying reports in Excel formats, see Chapter 8, *Choosing a Display Format,* in *Creating Reports With WebFOCUS Language*.

Example How to Create an EXL2K Report in Internet Explorer

The following example illustrates how to create a report in EXL2K format:

1. After selecting the Car data source to report against, open the Report Painter.
2. Type SALES BY COUNTRY in the heading area.
3. Add the following fields from the Object Inspector: COUNTRY, CAR, MODEL, and SALES.
4. Select the SALES column and click the *Sum* button.
5. Select the COUNTRY, CAR, and MODEL columns and click they *By* button.
6. Select *Output* from the Report menu. The Report Options dialog box opens at the Output tab.
7. Set your report output format to Excel 2000 by selecting *Excel 2000* from the Select Format drop-down list.
8. In the Title bar caption field box, type Sales Report.

The output is:



	A	B	C	D
1	SALES BY COUNTRY			
2	COUNTRY	CAR	MODEL	SALES
3	ENGLAND	JAGUAR	V12XKE AUTO	0
4			XJ12L AUTO	12000
5		JENSEN	INTERCEPTOR III	0
6		TRIUMPH	TR7	0
7	FRANCE	PEUGEOT	504 4 DOOR	0
8	ITALY	ALFA ROMEO	2000 4 DOOR BERLINA	4800
9			2000 GT VELOCE	12400
10			2000 SPIDER VELOCE	13000
11		MASERATI	DORA 2 DOOR	0
12	JAPAN	DATSUN	B210 2 DOOR AUTO	43000
13		TOYOTA	COROLLA 4 DOOR DIX AUTO	35030
14	W GERMANY	AUDI	100 LS 2 DOOR AUTO	7800
15		BMW	2002 2 DOOR	8950
16			2002 2 DOOR AUTO	8900
17			3.0 SI 4 DOOR	14000
18			3.0 SI 4 DOOR AUTO	18940
19			530I 4 DOOR	14000
20			530I 4 DOOR AUTO	15600
21				
22				

Notice that the tab name has been changed from the Excel default, Sheet1, to a more descriptive name, which you specified in the Title bar caption field box in the Output tab of the Report Options dialog box.

Reference Font Support for EXL2K Format

The EXL2K format supports fonts that are available on both the server and the client. Be sure to verify the existence of a particular font on both the client and the server before saving a report in the EXL2K format.

Reference Unsupported Date and Numeric Formats

The following formats are not supported in EXL2K; they will translate into Excel's General format and possibly produce unpredictable results:

- YY, Y, M, D, JUL, and I2MT.
- Any date format with a Q (quarter).
- Any packed-decimal (P) date formats.
- Any alphanumeric (A) date formats.
- Fixed Dollar (N) formats.
- Multiple format options. Only single format options are supported when using FORMAT EXL2K. For example, the formats I9C and I9B are supported, but I9BC is not.

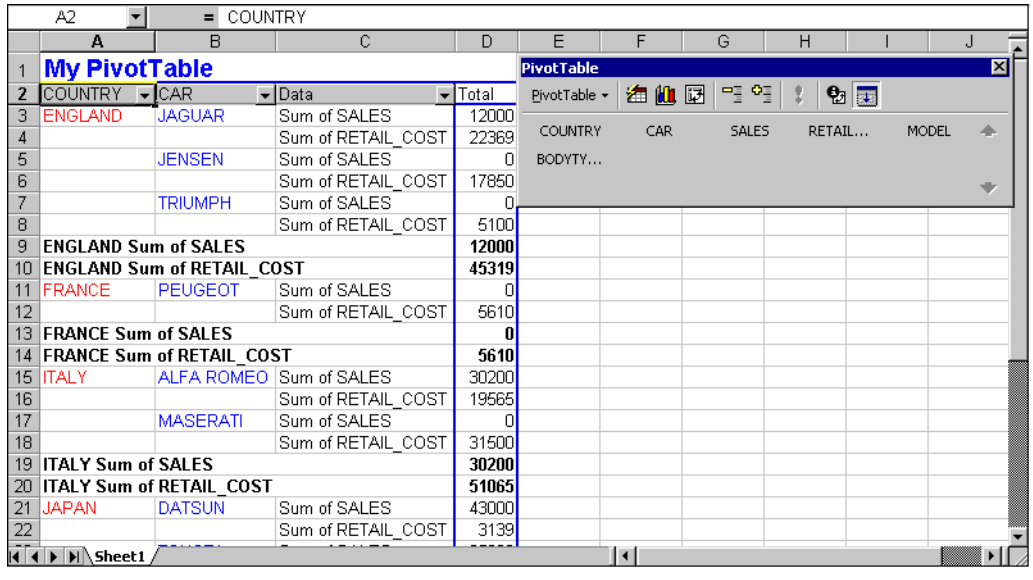
Reference Using Date Separators in Excel

In order to use a "-" as a separator between month, day, and year in Excel, you must change the default date separator for Windows®. This setting can be located under Regional Options in the Control Panel.

Using PivotTables in Excel 2000

The power of EXL2K format derives in large measure from its ability to take advantage of PivotTables. The PivotTable is a tool used in Microsoft Excel to analyze complex data much like the OLAP tool in WebFOCUS. It allows you to drag and drop data fields within a PivotTable, providing different views of the data, such as sorting across rows or columns.

Report requests can be created within WebFOCUS and sent as output to a fully formatted Excel PivotTable. The ON TABLE PCHOLD FORMAT EXL2K PIVOT command will generate an Excel PivotTable in your browser.



When FORMAT EXL2K PIVOT is enabled, two data streams are created:

- The first data stream is the PivotTable file.

  The PivotTable file (.xht) is an HTML file with embedded XML. The HTML file contains all the information that is displayed in your browser.

- The second data stream is the PivotTable cache file (.xml).

  The PivotTable cache file is a metadata type of file. It contains all the fields specified in the procedure and links internally to the PivotTable file. The PivotTable cache file can contain data fields called CACHEFIELDS, which populate the PivotTable toolbar, but do not initially display in the report. CACHEFIELDS can be dragged and dropped from the PivotTable toolbar into the PivotTable when required for analysis.

For more information about PivotTables, see *Creating Reports With WebFOCUS Language*.

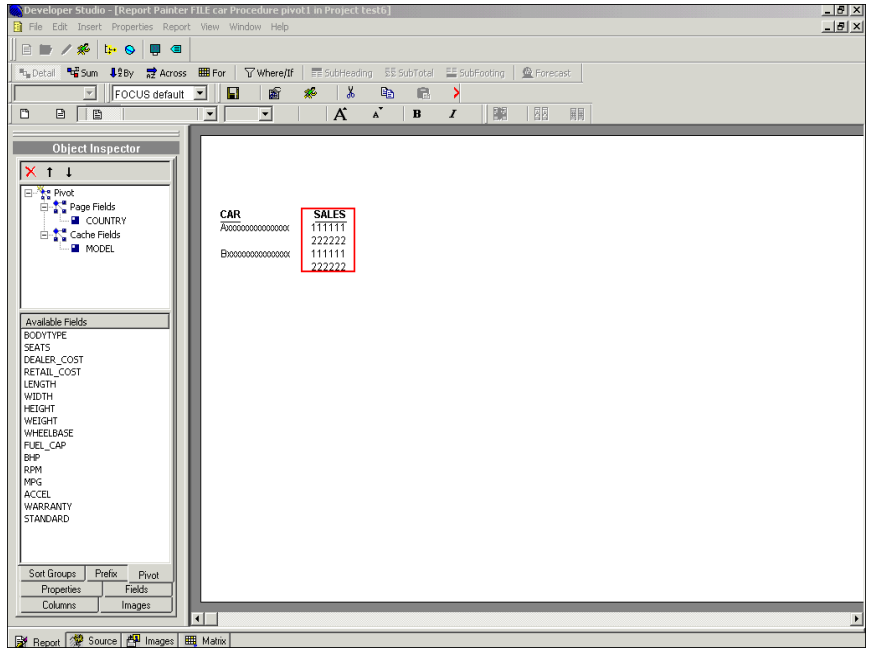
Example How to Populate a PivotTable

The following example illustrates how to generate a PivotTable:

1. After selecting the Car data source to report against, open the Report Painter.
2. In the heading area, type *CAR File PivotTable*.
3. Press the Enter key to add another line to the heading, and type *Sum of Sales by Car*.
4. Add the following fields from the Object Inspector: SALES and CAR.
5. Select the SALES column in the Report Painter window and click the *Detail* button.

   Note: You must click the *Detail* button because the PRINT command must be used. The PivotTable is generated by the PRINT command in combination with the BY, ACROSS, PAGEFIELDS and CACHEFIELDS phrases. See Chapter 8, *Choosing a Display Format,* in *Creating Reports With WebFOCUS Language*.
6. Select the CAR column and click the *By* button.
7. Select *Output* from the Report menu. The Report Options dialog box opens at the Output tab.
8. Click the *Hold Data* button on the Output tab.
9. Select *Excel 2000 Pivot (EXL2K PIVOT)* from the Hold Format drop-down list.
10. Click *OK* to close the Hold dialog box, and click *OK* again to close the Report Options dialog box.

11. Click the *Pivot* tab on the Object Inspector.

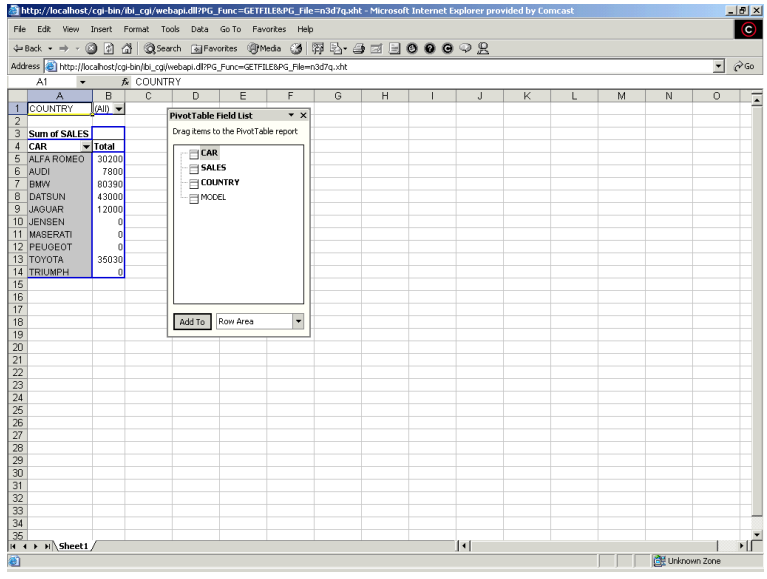


12. Click COUNTRY in the Available Fields box and drag it to the Page Fields dimension in the Pivot hierarchy.

13. Click MODEL in the Available Fields box and drag it to the Cache Fields dimension in the Pivot hierarchy.

14. Run your report.

The report displays the PivotTable in Excel 2000. All fields (including PRINT, BY, and ACROSS fields, and PAGEFIELDS and CACHEFIELDS) appear in the toolbar.



Viewing a Report in Excel 97 Format

The EXL97 format allows you to view reports in Excel 97, which supports full styling and drill-down capability.

When you specify EXL97 format, an HTML-based file is generated with an extension of .e97. The appropriate MIME type is automatically assigned to designate Excel as the active application for this file type.

When using the Microsoft Internet Explorer browser and Excel 97, the Excel client opens in the background and the report launches in your browser. You may see the Excel application open and minimize while viewing your report; leave Excel open when viewing the spreadsheet.

Once the report is generated, you can save the document as an Excel spreadsheet locally on your PC. In Excel 97, you will be prompted to save the document as a Microsoft Excel Workbook with an .xls extension. This will save the file as a binary Excel document.

For more information about Excel 97 format, see Chapter 8, *Choosing a Display Format*, in *Creating Reports With WebFOCUS Language*.

Format EXL97 is fully compatible with Excel 2000 and Excel 2002.

Note: Although format EXL97 is available, there are some limitations when compared to the Excel 2000 (EXL2K) format. See *Limitations for FORMAT EXL97* on page 7-32. Future enhancements in the area of Excel integration will primarily be made to the EXL2K format. We recommend upgrading to Excel 2000 or higher so you can take full advantage of our Excel integration, as well as all future enhancements.

Example

How to View a Report in EXL97 Format

The following example illustrates how a report displays in EXL97 Format.

1. After selecting the Centord data source to report against, open the Report Painter.
2. In the heading area, type *Order Revenue in Excel 97*.
3. Add the following fields from the Object Inspector: LINEPRICE, ORDER_DATE, and ORDER_NUM.
4. Select the LINEPRICE column in the Report Painter window and click the *Sum* button.
5. Select the ORDER_DATE and ORDER_NUM columns and click the *By* button.
6. Select *Output* from the Report menu. The Report Options dialog box opens at the Output tab.
7. Click the *Hold Data* button on the Output tab.
8. Select *Excel 97 (EXL97)* from the Hold Format drop-down list.
9. Click *OK* to close the Hold dialog box, and click *OK* again to close the Report Options dialog box.
10. Use the SET ACCESSIBLE=508 command to create a heading as a separate table. (See *Limitations for FORMAT EXL97* on page 7-32 for details.)

    To add the command, do one of the following:

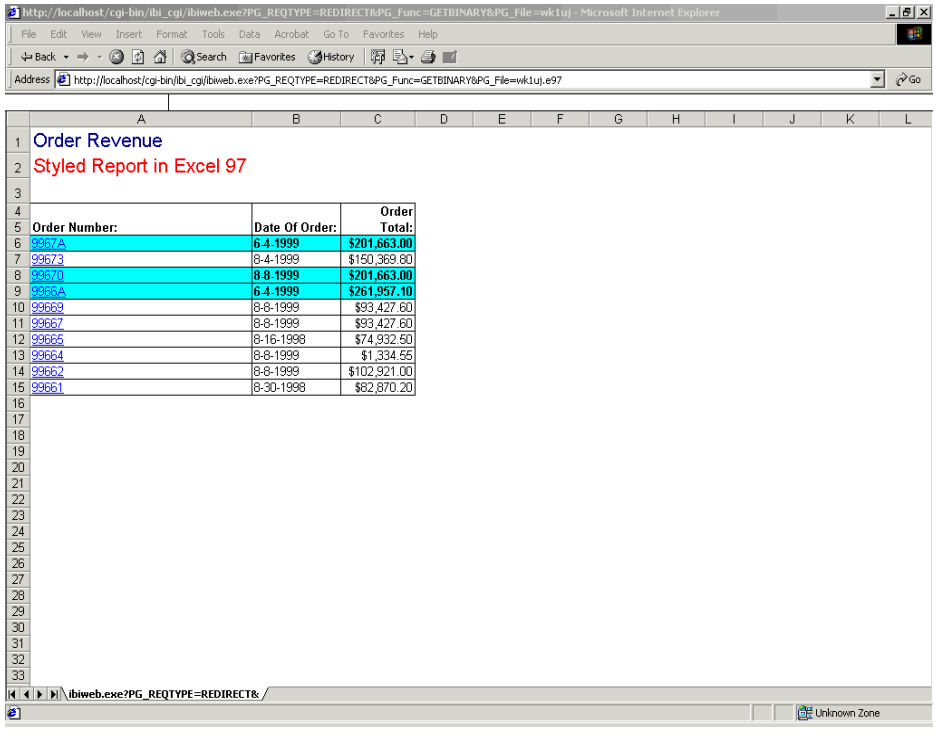
    - Minimize the Report Painter window to return to the Task Viewer. Click and hold a component connector (yellow diamond). Open the *Other* component and type the SET ACCESSIBLE=508 command in the Text Editor. Save and close the Other component and click *Yes* to update the procedure.

    or

    - Click the Source tab at the bottom of the Report Painter window to open the Text Editor. Add the SET ACCESSIBLE=508 command before the rest of the code. Save and close the Text Editor and click *Yes* to update the procedure.

11. Run your report.

The output is:



Reference Limitations for FORMAT EXL97

- This format is only compatible with Excel 97 or higher. This format is not compatible with Excel 95 or any versions of Excel prior to Excel 95.
- Excel 97 does not support Cascading Style Sheets (CSS). Any styling specified in a report that uses CSS (SET HTMLCSS=ON) will not be respected in Excel 97. The WRAP=*n* feature is not supported with EXL97 since this feature requires CSS.
- WebFOCUS uses nested HTML tables when generating a heading, which may cause a problem in EXL97. As an alternative, use the SET ACCESSIBLE=508 command. This creates the heading as a separate table.

  Page numbers display by default and are placed in the heading. We recommend that you turn page numbering off (SET PAGE-NUM=OFF) or use the SET ACCESSIBLE command in conjunction with page numbering
- All numeric and date formatting options that are not supported for EXL2K are also not supported for EXL97. In addition, negative numbers displayed with brackets, trailing zeroes after the decimal, and leading zeros will not display with EXL97 reports. Note that dates are typically translated into Excel's General format, which can cause problems with sorting and other Excel features.
- PivotTables are not supported with EXL97. (EXL2K PIVOT is the only valid PivotTable format.)
- You may experience unpredictable results if redirection is turned off for EXL97. Redirection is set in the MIME table and should be on by default.

If you are using a Netscape® browser, you may have to assign the .e97 extension to the Excel MIME type manually the first time you run a report.

CHAPTER 8

Joining Data Sources

Topics:

- What Is a Join?
- Types of Joins
- Joining Different Kinds of Data Sources
- Creating a Join With Graphical Tools
- Saving a Join
- Customizing a Join
- Creating Multi-Field Joins
- Working With Joins
- Using Conditional Joins
- Reporting With a Join
- Cluster Joins

If a report requires data from two or more related data sources, you can temporarily join the files and report from them as if they were one. Joined files remain physically separate, but are treated as one data source structure throughout the session or until you clear the Join.

Using the Join Editor, you can create:

- **Dynamic joins.** These joins are used to join two or more related data sources and create a virtual structure for reporting.
- **Conditional joins (WHERE-based).** These joins use expressions to specify joins based on conditional criteria, not just on equality between fields.
- **Joins based on virtual fields (DEFINE-based).** These joins use virtual host fields that you can join to real cross-referenced fields.
- **Outer joins.** When a report displays all matching rows plus all rows from the host file that lack corresponding cross-referenced rows, the join is called a left *outer join*.

You can also create a new file structure for reporting by joining existing synonyms of relational tables using the Cluster Joins editor. For more information, see *Cluster Joins* on page 8-27.

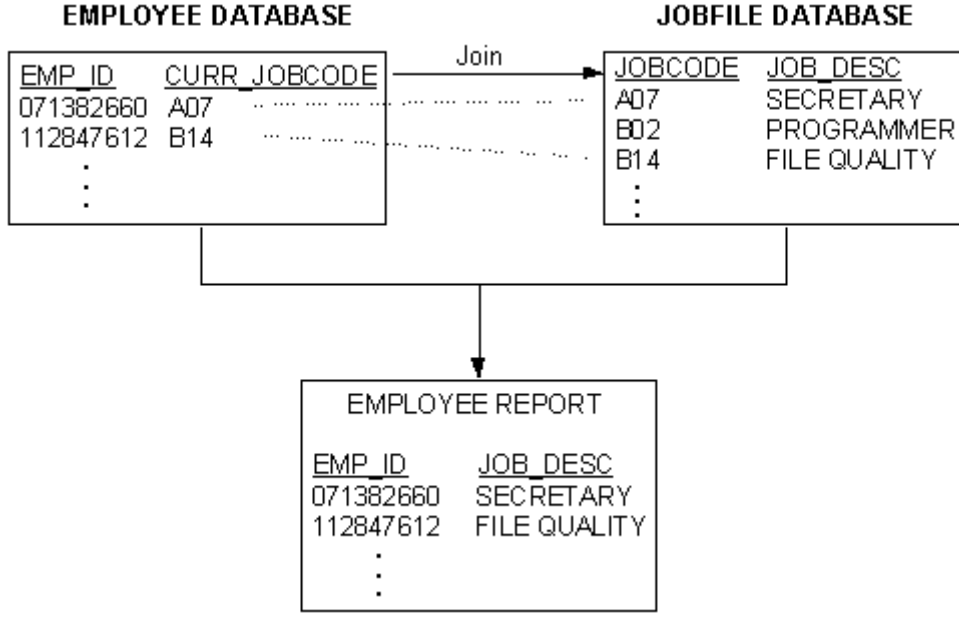
What Is a Join?

A Join is a temporary connection between two or more data source files that share at least one common field. For example, since the EMPLOYEE data source includes a job code field and the JOBFILE data source also includes a job code field, you can join the two data sources.

The field format and the type must be the same for the common fields, but the field name need not be the same.

Once you join two files, each time a record is retrieved from the first file (host file), it also retrieves the matching records from the second file (cross-referenced file).

The following diagram illustrates how Developer Studio can associate each employee in the EMPLOYEE data source with a job description in the JOBFILE data source:



The data source on the left is the host file. The data source on the right is the cross-referenced file.

Types of Joins

The following section describes the type of joins you can create using the Join Editor.

Dynamic Joins

Dynamic joins allow you to join two or more related data sources and create a virtual structure for reporting. The data sources remain physically separate, but Developer Studio treats them as a single structure. Dynamic joins include:

- Conditional joins
- Unique joins
- Non-unique Joins
- Outer joins

You can use dynamic joins for the duration of your session or until you clear the Join. Dynamic joins can read data from the joined data sources via the TABLE and GRAPH facilities.

Conditional Joins

Conditional joins use WHERE-based syntax to specify joins based on conditional 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 can join employee ID in the host file to employee ID in the cross-referenced file to determine which employees took training courses in a given date range (the WHERE condition). For information on how to create conditional joins, see *Using Conditional Joins* on page 8-25.

Unique and Non-Unique Joins

The Join Editor allows you to create unique and non-unique joins. 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 join.

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 employee ID in a company's employee data source to employee ID in a data source that lists all the training classes offered by that company would result 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.

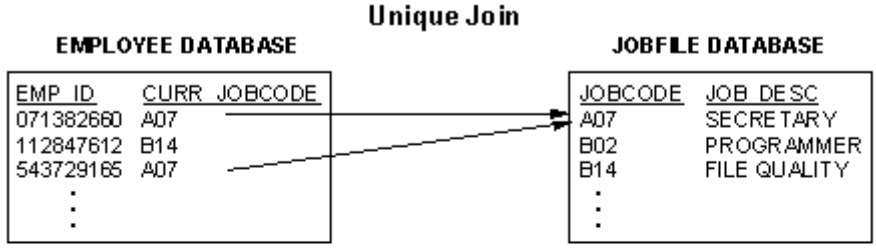
When you create a dynamic or conditional join using the Join Editor, you can specify whether the join is unique or non-unique.

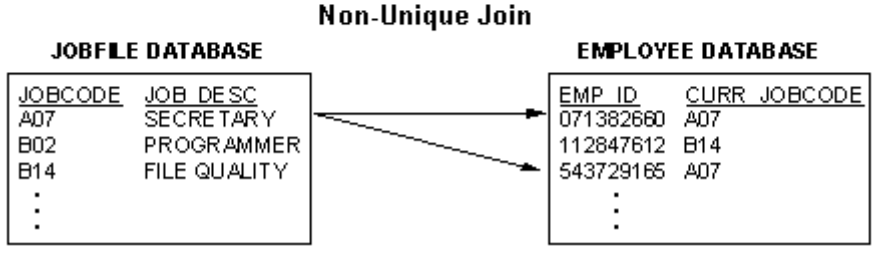
Reference **Descriptions of Unique and Non-Unique Joins**

Type	Description	Example
Unique (one-to-one)	Each host record has at most one matching record in the cross-referenced file.	If you join EMPLOYEE to JOBFILE, each employee can have only one job code.
Non-unique (one-to-many)	Each host record can have many matching records in the cross-referenced file.	If you join JOBFILE to EMPLOYEE, one job code can match many employee records. **Note:** See *Data Source Requirements for Cross-Referenced Fields* on page 8-7 for a discussion of special conditions that apply to the cross-referenced file in a Join.

Example Unique and Non-Unique Joins

The following diagrams illustrate unique and non-unique Joins:





Joins Based on Virtual Fields

Joins that are based on virtual fields use DEFINE-based syntax to create a virtual field in the host file that you can then 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 join a virtual field to more than one real field in more than one cross-referenced file using separate Join commands, each referring to the same host file. For information on how to create Joins based on virtual fields, see *Using a Virtual Field as the Join Field* on page 8-15.

Outer Joins

When a report omits host rows that lack corresponding cross-referenced rows, the join is called an *inner join*. When a report displays all matching rows plus all rows from the host file that lack corresponding cross-referenced rows, the join is called a left *outer join*. Outer joins are supported when SET ALL=ON is performed.

Note: When the SET ALL=ON setting is applied, it will impact all joins in the procedure and they will be treated as outer joins.

Host Records With No Matching Cross-Referenced Records

Sometimes there is no matching record in the cross-referenced file. A host record that has no matching cross-referenced record is called a *short path*.

The report that results when a host record lacks a corresponding cross-referenced record depends on the following factors:

- The type of Join.

  With a non-unique Join, the value of the ALL parameter controls short path behavior. The default value, OFF, eliminates all host records that lack a matching cross-referenced record. Use the Set tool to change the ALL value, if necessary. For more information about the Set tool, see *Customizing Your Environment* in *Developing Reporting Applications*.

  With a unique Join, a missing cross-referenced record never causes Developer Studio to eliminate a host record from a report. Instead, default values (zero for numeric fields and blank for alphanumeric fields) are supplied for missing cross-referenced fields.

- The types of data sources participating in the Join.

  Since relational data source engines can join relational data sources efficiently, Developer Studio passes this task to them whenever possible.

Joining Different Kinds of Data Sources

In addition to joining FOCUS data sources, you can join other kinds of data sources. For example, you can join a FOCUS data source to a DB2 table. The fact that the data sources are from different systems is transparent to you as long as you have the appropriate data adapter installed for each non-FOCUS data source you want to access.

You must consider the following when joining files:

- You cannot join files protected by the DBA (Database Administration) security feature to unprotected (non-DBA) files. You can, however, join files protected by different DBA passwords. See *Creating Master Files for FOCUS and Relational Data Sources* in *Describing Data With Graphical Tools*.
- You cannot join comma-delimited files.
- In addition to these considerations, the Join field from the cross-referenced file may have to satisfy other conditions, as described in *Data Source Requirements for Cross-Referenced Fields* on page 8-7.

Data Source Requirements for Cross-Referenced Fields

Developer Studio supports a wide variety of data sources. In most cases, you can join any data source to any other data source as long they share at least one common field. This is sometimes called a universal Join.

In general, the host field in a Join can be any field. However, some fields may not be valid as cross-referenced fields.

Certain data sources impose additional restrictions on cross-referenced fields. For example:

- Some data sources require the cross-referenced field to have an index. An index in a data source is similar to an index in a book. Just as you look up a topic in an index to find the correct page without reading the entire book, the database system looks up a field value in its index so it can go to the correct location without reading the entire data source.
- Some data sources require the cross-referenced field to be a key. A key is a field (or group of fields) that distinguishes one record from another. In the EMPLOYEE data source, the employee ID is the key. Its value identifies a particular employee's record.

For details see *Joining Cross-Referenced Fields in Specific Types of Data Sources* on page 8-7.

Reference

Joining Cross-Referenced Fields in Specific Types of Data Sources

The following table describes conditions that apply when you join cross-referenced fields in specific types of data sources:

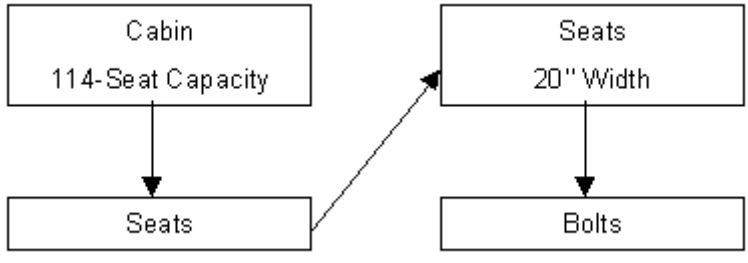
Type of File	Conditions for Join
FOCUS	The cross-referenced field must be indexed.
Relational (DB2/2, Oracle, Microsoft SQL, Sybase Server, Informix, MS SQL OLAP Services, Microsoft Access, Hyperion ESSBase, ODBC, EDA)	Any field can be the cross-referenced field.
Fixed sequential	Any field can be the cross-referenced field, but it must be sorted the same way as the host field. If the cross-referenced file contains only one segment, the host file must have a segment declaration.

Joining a Data Source to Itself: The Recursive Join

There may be situations in which you need to join a data source to itself. As an example, consider a data source that lists parts for an airplane. Some parts, such as cabins, are made up of smaller parts, such as seats. Therefore, this data source has:

- A root segment with an instance for every part, including its description.
- A descendant segment connecting a part to each of its subparts.

Certain subparts may themselves be composed of smaller parts. If you join the subpart segment to the root segment, you can go from a subpart record to its description record in the root segment, to its component part records, as shown in the following diagram:



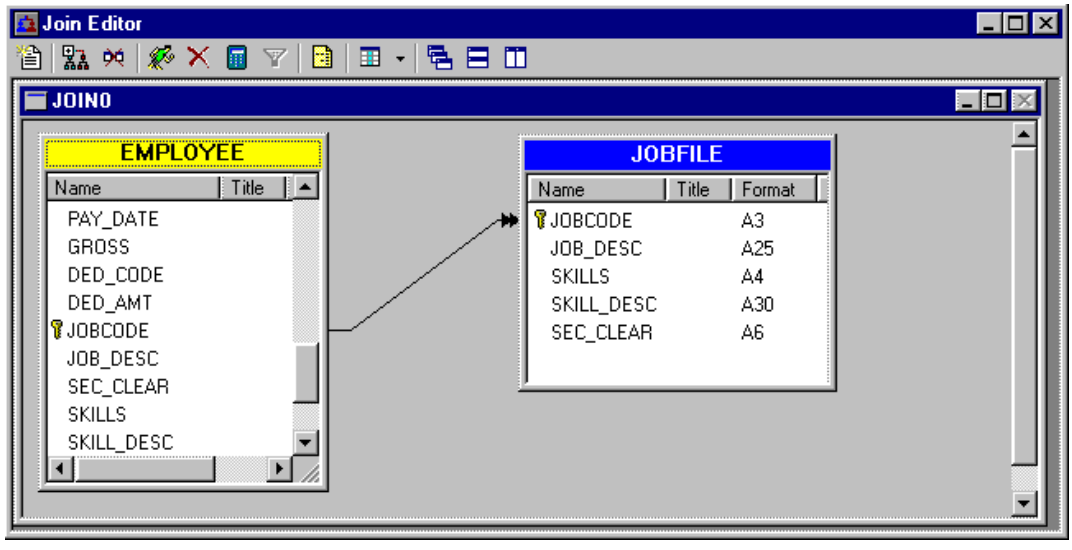
Creating a Join With Graphical Tools

The Join Editor provides a graphical method for creating and manipulating Joins. You must specify a host file, then a cross-referenced file to create a join.

You create the Join as an object, separate from any other object or procedure. You are responsible for placing the Join object in the correct position within your procedure (that is, before a Define, Report, or Graph), and for running it. The Join remains active for the entire session, unless you explicitly clear it.

You can open the Join Editor from either the toolbar or from a reporting tool. Before the tool opens you will be asked to select a host file.

The Join Editor displays both files and, ordinarily, a default Join:



- A Join is represented by a connector line from the host Join field to the cross-referenced Join field. A single arrow indicates a unique Join; a double arrow indicates a non-unique Join.
- Developer Studio automatically creates a Join between the files if they both have fields with the same formats (and, for a FOCUS file, if the cross-referenced field is indexed). You can use the default Join as it is, or you can customize the Join. If multiple fields have the appropriate format, the default Join is not created unless one of these fields has the same name as the host field. In this case you must specify a join explicitly. See *Customizing a Join* on page 8-13 for details.
- A host file is indicated by a yellow caption. A cross-referenced file is indicated by a blue caption.
- Indexed fields have a key icon in front of the field, and virtual fields have a define icon in front of the field. A virtual field is a temporary field that does not actually exist in the data source; its value is computed based on an expression you write. Once created, the virtual field is treated as if it were a field in the data source. For more information see Chapter 5, *Creating Temporary Fields*.
- By default, the list of field names in each data source displays in the Join window. You can change the display to show the following additional information about each field, if it is available in the Master File: alias, format, title, and description.

Reference Join Editor Toolbar

When you access the Join Editor a toolbar opens below the title bar. You can access the following commands from the toolbar:

Button	Command	Description
	New Join	Creates additional concurrent joins. See *Customizing a Join* on page 8-13 for more information.
	Add File	Selects a cross-referenced file to join to the host file you have already selected. See *How to Create Additional Joins* on page 8-14 for more information.
	Clear Join	Launches the Join Clear window. See *How to Clear a Join* on page 8-23 for more information.
	Run Join	Runs a join.
	Delete	Deletes a selected object (table or join).
	Define Field	Launches the Join Define in File dialog box to create a virtual field in the host file.
	Create/Edit Selection	Launches the WHERE Expression Builder to create WHERE criteria and change the join type to a conditional join.
	Show/Hide Source Code	Shows or hides the FOCUS code generated by the Join Editor.
	Show/Hide Field List Columns	Shows or hides the following field descriptions: • Name • Alias • Title • Description • Format

Button	Command	Description
	Cascade	Creates a cascade view of multiple joins (default).
	Horizontal Tile	Splits the Join Editor horizontally when working with multiple joins.
	Vertical Tile	Splits the Join Editor vertically when working with multiple joins.

Procedure How to Create a Join

If you want to define a Join in a procedure:

1. Right-click the procedure in the Procedures folder and choose *Open* from the shortcut menu. The Procedure (FOCEXEC) window opens.
2. Click and hold a component connector (yellow diamond) at the point where you want to include the virtual field in the procedure, then click the *Join* button on the component connector toolbar.
3. The File Description List dialog box opens.
4. Choose a Master File for the data source you wish to use as your host file. Click *OK*. The Join Editor opens showing a Fields window for the host file that you selected.
5. To add a cross-referenced data source to the Join, click the *Add Files* button on the toolbar or choose *Add Files...* from the File menu.

   The File Description List opens again.

   Select a cross-referenced file.
6. Click *OK*.
7. A default Join is created if the host and cross-referenced files share appropriate fields. If a default Join is not created, follow the instructions in *Customizing a Join* on page 8-13 to create your own.
8. If you want to make a Join available for use with all procedures during your session, issue the JOIN command from the Command Console. The JOIN is retained for the duration of the session or until you change it. See *Chapter 19, Using the Command Console* in *Developing Reporting Applications* for details.

Procedure How to Add Information About Fields to Join Field Lists

The Field list for each data source being joined displays the field names by default. To help you build meaningful joins you can add information about the listed fields.

With the Join Editor open, click the *Show/Hide Field List Columns* button on the toolbar or click the View menu.

Select any or all of the following items: Name, Alias, Title, Description, Format. A check mark displays next to your selections. Name and Descriptions are checked by default.

The selected information categories appear as headings in the field list for each joined file. Details will appear if the corresponding information is included in the Master File.

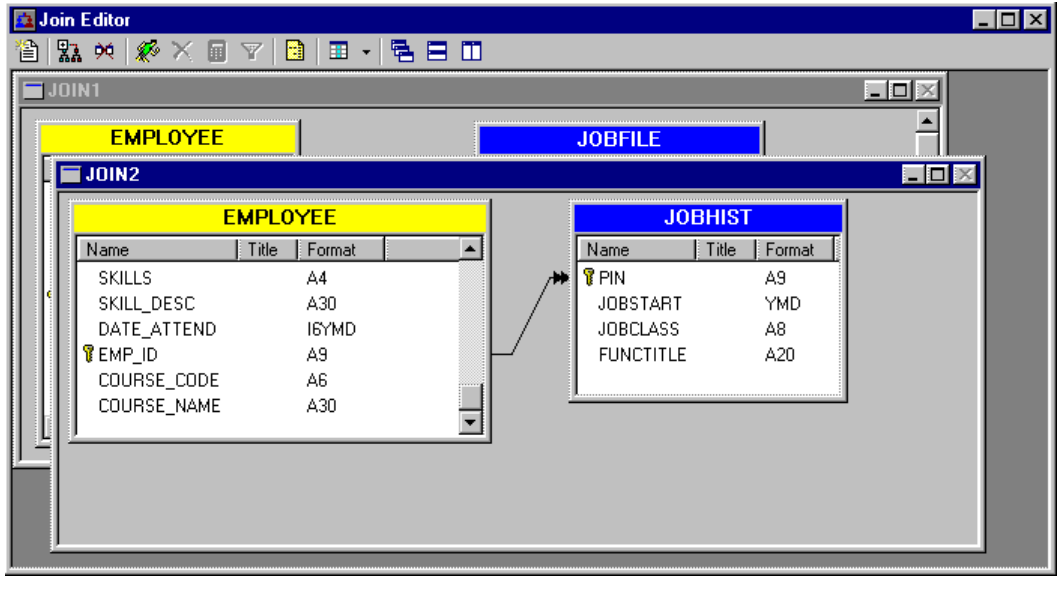
Expand the window to see the additional field list columns.

Saving a Join

When you exit the Join window, you are prompted to save your work. If you save the Join, it is added to the procedure in which it has been created. See *How to Create Additional Joins* on page 8-14.

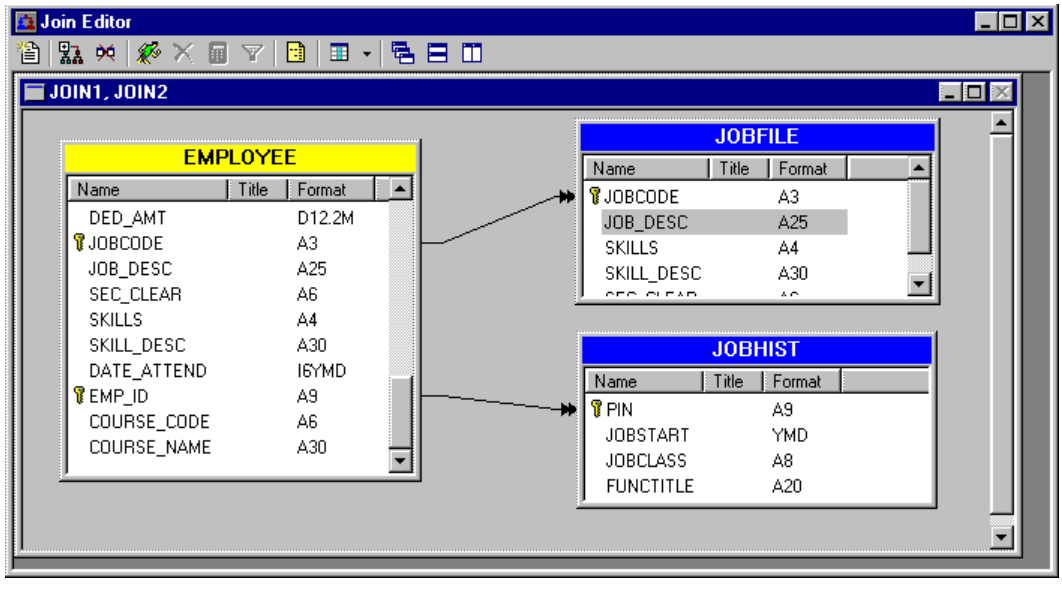
Example Rearranging Saved Joins

The Join Editor may automatically rearrange your saved Joins to display Joins that use some of the same files in one panel of the Join window. The following two Joins share a host file:



Tip: If the field names you wish to join are different, as in the join for EMP_ID and PIN in the right panel above, you must drag and drop EMP_ID or PIN to make the connection.

Note: If you close the Join window and then reopen it, the two Joins display in the same panel:



Customizing a Join

You can customize an existing Join by changing the files or fields involved. If no default Join was created, you can use the same technique to specify a connection explicitly.

You can also change the Join name, make the Join unique, use a virtual field as the Join field, and add tag names to the Join files.

For related information see *Working With Joins* on page 8-23.

Procedure How to Remove a File From the Join

1. Click on the Fields window of the file you want to remove.
2. Click the *Delete* button on the toolbar or press the Delete key on your keyboard.

If you delete the host file, all cross-referenced files are automatically deleted.

Procedure How to Delete a Join

To delete the existing Join:

1. Right-click the Join connector line.
2. Select *Delete* from the shortcut menu.

You can also select the Join connector line and click the *Delete* button on the toolbar.

The files remain in the window with no connector line between them.

Procedure How to Specify Join Fields

To create your own Join (after deleting the existing Join, if necessary):

1. Select a field in the host file panel.
2. Click and hold the selected field.
3. Drag the selected field from the host file panel onto the matching field located in the cross-referenced file panel.
4. Release the mouse button.

A Join connector line displays.

Reference Usage Notes for Specifying Join Fields

- You can multi-select fields in the host file to join to a single field in the cross-referenced file when both are FOCUS files. For other file types (for example, EDA, Oracle, DB2, and so on) you must join a host field to a cross-referenced field, one pair at a time. See *Creating Multi-Field Joins* on page 8-19 for more information.
- For non-FOCUS joins, you can join a maximum of 16 fields from each file.

Procedure How to Create Additional Joins

You can leave the Join editor window open and create another Join by:

- Clicking the *New Join* button.

  or

- Choosing *New Join* from the File menu.

You can define up to 16 concurrent Joins.

Procedure How to Make a Join Unique

By default, each Join is non-unique.

To make the Join unique:

1. Right-click the Join connector line.
2. Deselect *Join to All* from the shortcut menu.

Changing the Join Name

A default name is automatically assigned to each Join.

You can use the Join name to later clear the Join and to prevent another Join from overwriting it. If you remove the Join name completely, any subsequent unnamed Join will overwrite this Join.

Procedure How to Change or Remove the Default Join Name

1. Right-click the Join connector line and select *Join Name* from the shortcut menu. The Join Name dialog box displays the default Join name.
2. Edit or delete the name in the Join Name box and click *OK*.

Note: The following words cannnot be used as a Join name: ALL, AND, AS, IN, JOIN, TAG, TO, WITH.

Procedure How to Display Current Join Structures

To display a list of joined data sources, select the following query subject in the Query tool or issue the command from the Command Console:

? JOIN

This displays every Join currently in effect.

Using a Virtual Field as the Join Field

A virtual field is a temporary field that you describe in a Master File or procedure. The value of the virtual field is calculated and treated as part of the data source.

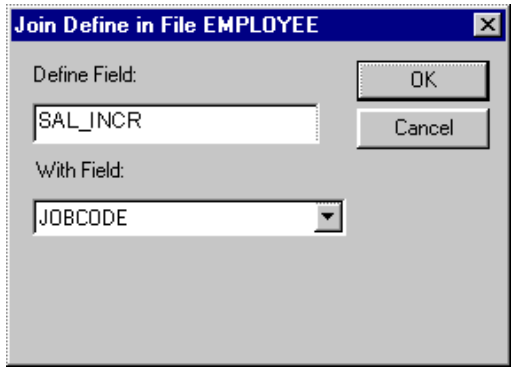
Consider the following factors before making a virtual field the host field in a Join:

- If you create the virtual field in a procedure rather than in the Master File, you must make sure the virtual field runs *after* the Join runs because a Join clears all existing virtual fields.
- You must delete the existing Join connector line, if there is one, before creating the Join on the virtual field. You cannot join multiple fields with this option. The virtual field must be the only Join field.

Procedure How to Use a Virtual Field as the Join Field

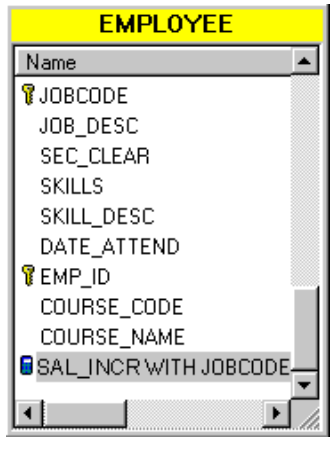
1. Click on the caption in the host file's Fields window to make it active.
2. Click the *Define Field* button on the toolbar.

   The Join Define in File dialog box opens.



3. You must associate the virtual field with a segment of the data source:
   a. Enter the name of the virtual field in the Define Field box.
   b. In the With Field drop-down box, choose the name of *any* real field from the segment in which you want to put the virtual field, and click *OK*.

   The virtual field displays in the host file's Fields window:



4. To complete the Join, drag the mouse pointer from the virtual field to a matching field in the cross-referenced file.

You cannot join multiple fields with this option. The virtual field must be the only Join field.

Reference Join Define in File Dialog Box

The Join Define in File dialog box has the following fields/options:

Define field

Identifies the virtual field that is the host field in the Join.

With Field

Associates the virtual field with a segment in the data source. Select any field from the segment in which you want to place the virtual field.

Adding a Tag Name

Tag names provide a way of making identical field names unique. They function as aliases for the file names in the Join. Tag names are useful when you join a file to itself (see *Joining a Data Source to Itself: The Recursive Join* on page 8-8) because in such a Join all field names, segment names, and file names are the same in the host and cross-referenced files.

A procedure can use a file's tag name as a qualifier for field names and aliases in the file.

If you create a report using a recursive Join *without* tag names, the field names in the cross-referenced file are prefixes with the first four characters of the Join name.

Procedure How to Add a Tag Name

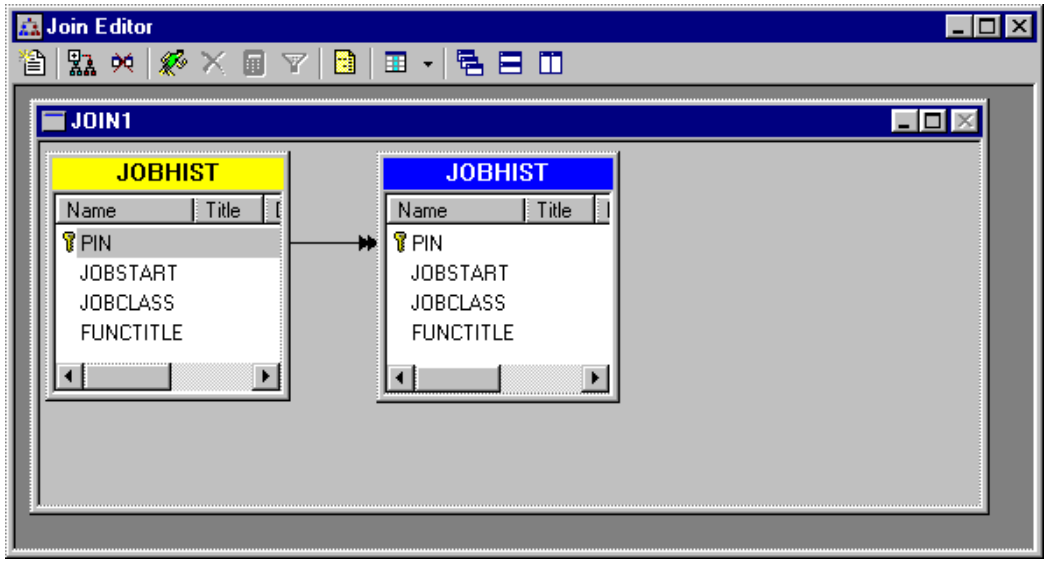
To add a tag name to a file in the Join:

1. Double-click the caption in the file's Fields window. The File Properties window displays.
2. Enter a tag name for the file in the Tag Name field and click *OK*.

   Note: The following words cannnot be used as a tag name: ALL, AND, AS, IN, JOIN, TAG, TO, WITH.

Example Impact of Tag Names on Join Syntax

The following example illustrates the effect of tag names on the Join syntax:



If you add the tag name FILE1 to the host file, and the tag name FILE2 to the cross-referenced file, the following Join is created:

```
-Create a relationship between your databases (JOIN)-
JOIN PIN IN JOBHIST TAG FILE1 TO ALL PIN IN JOBHIST TAG FILE2 AS JOIN1
```

A report can refer to the field names in the host file with the qualifier FILE1 and in the cross-referenced file with the qualifier FILE2; for example, FILE1.JOBSTART and FILE2.JOBSTART. For additional information see *How to View Join Syntax* on page 8-24.

Creating Multi-Field Joins

In some cases, you may want to join more than one host field to a single cross-referenced field. The procedure, as well as the relationship, differs for joins between two relational data sources, joins between two FOCUS data sources, and joins between relational and FOCUS data sources.

There are two types of multi-field joins:

- Multi-field joins in which you join multiple host fields to multiple cross-referenced fields.
- Concatenated joins in which the field resulting from the concatenation of two host fields joined to a single cross-referenced field.

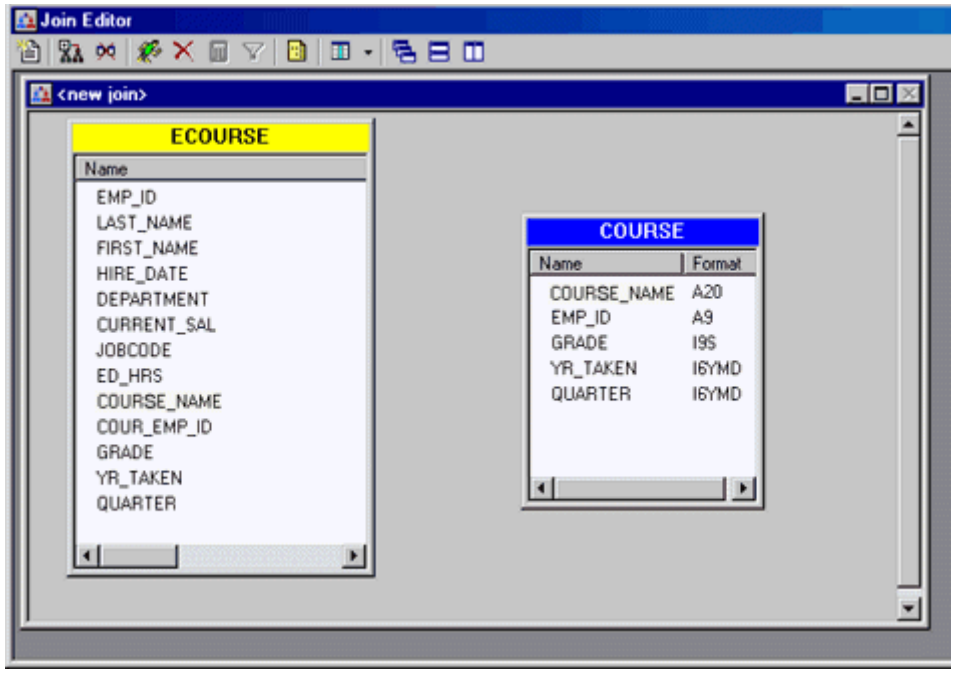
The following table lists the types of joins allowed between files:

Host	Cross-Referenced	Supported Multi-Field Join Constructions
SQL*	SQL	You can join two SQL files with a multi-field construction. You cannot directly join two SQL files with a concatenated join. You can, however, use a Define-based join to achieve the same result that a concatenated join would produce between two SQL files. For more information on using a Define-based join, see *Customizing a Join* on page 8-13.
FOCUS	FOCUS	You can use only the concatenated join construction to join two FOCUS host fields to a single FOCUS cross-referenced field.
SQL	FOCUS	You can use only the concatenated join construction to join two SQL host fields to a single FOCUS cross-referenced field.
FOCUS	SQL	You can join a FOCUS file and an SQL file with multi-field join construction. You cannot join a FOCUS file and an SQL file with a concatenated join. You can, however, use a Define-based join to achieve the same result that a concatenated join would produce between these files. For more information on using a Define-based join, see *Customizing a Join* on page 8-13.

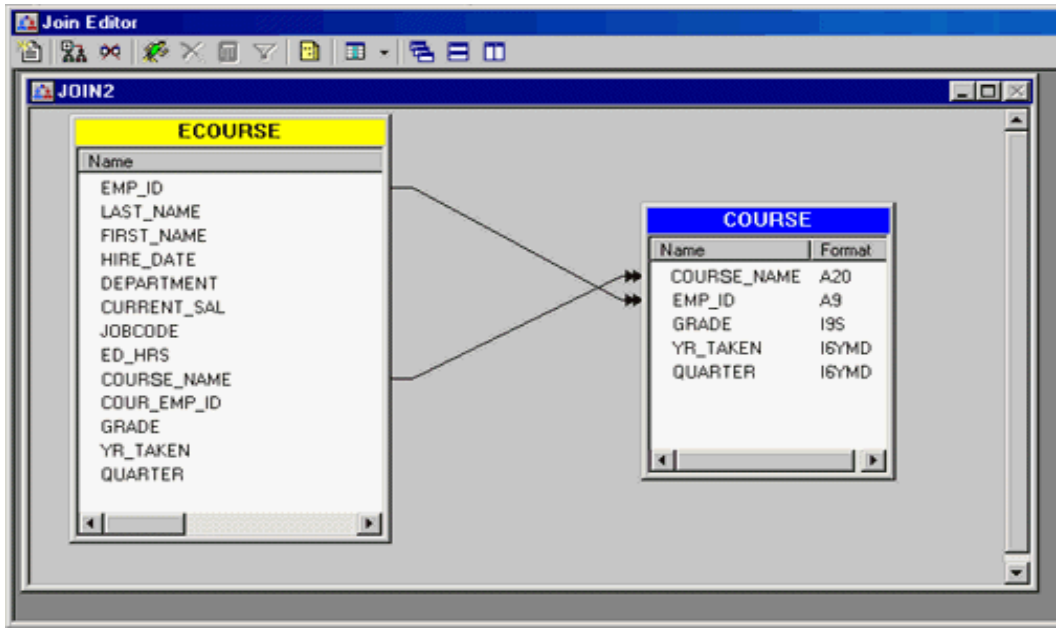
* SQL represents all relational data sources.

Example Creating a Multi-Field Join for Relational Data Sources

This example uses two relational data sources: ECOURSE, the host file, and COURSE, the cross-referenced file. ECOURSE contains the fields COURSE_NAME and EMP_ID, while COURSE also contains the fields COURSE_NAME and EMP_ID. These fields have the same format.



To join the COURSE_NAME and EMP_ID host fields to their corresponding cross-referenced fields, you would join each host field separately to the cross-referenced field. See *Creating a Join With Graphical Tools* on page 8-8 for the procedure to join a host field to a cross-referenced field. This procedure results in the following join structure:



This join construction represents one join. Developer Studio retrieves matching records across this join only when:

- COURSE_NAME in the file ECOURSE equals COURSE_NAME in the file COURSE.

  and

- EMP_ID in the file ECOURSE equals EMP_ID in the file COURSE.

Creating a Concatenated Join

You can use the concatenated join construction between two FOCUS files and between a host relational file and a cross-referenced FOCUS file. This is the only type of multi-field join construction you can use between these files.

In a concatenated join, first the two host fields are combined, then the resulting field is joined to the cross-referenced field.

Example Creating a Concatenated Join for FOCUS Data Sources

This example uses two FOCUS files: EMPLOYEE, the host file, and HOBBIES, the cross-referenced file. EMPLOYEE contains the fields FIRST_NAME and LAST_NAME, and HOBBIES contains the field FULL_NAME.

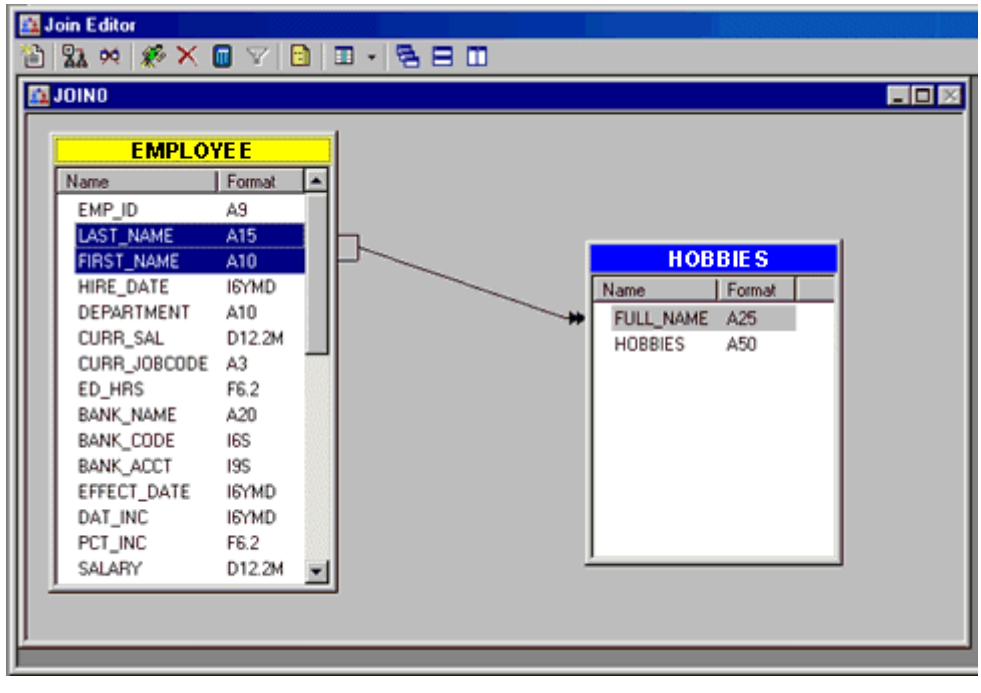
To join the host fields to the cross-referenced field:

1. Click *FIRST_NAME* and then click *LAST_NAME* in the EMPLOYEE file.

   Both field names are highlighted.

2. Click and hold the *FIRST_NAME* field.
3. Drag the mouse until you position the Join icon over the FULL_NAME field in the cross-referenced file.
4. Release the mouse button.

   The concatenated host field is joined to the cross-referenced field FULL_NAME. Developer Studio graphically represents this join in the following manner:



The fields FIRST_NAME and LAST_NAME are not joined to FULL_NAME, rather FOCUS joins the virtual field created from the concatenation of FIRST_NAME and LAST_NAME to FULL_NAME.

Working With Joins

Once a Join exists, you can retrieve it, report from it, view its syntax, and clear it. Clearing a join makes it inactive.

Procedure How to Retrieve a Join

To retrieve a Join:

1. Right-click a procedure folder in the Explorer and select *Open* from the shortcut menu.
2. Right-click a Join component in the procedure window and select *Open*.

The Join window opens, displaying your saved Join.

Procedure How to Run a Join

Running a Join links the data sources and makes the fields from both files available in a report.

If the Join window is already open, displaying a Join, click the *Run* button or choose *Run* from the File menu.

Procedure How to Clear a Join

1. Click the *Clear Join* button or choose *Clear Join* from the File menu. The Join Clear dialog box displays:

2. Select the join or joins you want to delete from the Available Joins list. To delete all joins, select All Joins (*).

3. Click the ▶▶ button.

   The selected joins display in the Joins to Clear list.

4. Click *OK*.

Note: You can also clear a join that is already in effect from a previous procedure and does not appear in the list of available joins. Type the name of the join in the *Available Joins* field you want to clear and click *OK*.

Reference Join Clear Dialog Box

The Join Clear dialog box has the following fields/options:

Available Joins

Lists all current joins.

Joins to Clear

Displays the joins that will be deleted when you click *OK*.

▶▶

Moves the selected joins to the Joins to Clear list.

◀◀

Moves the selected joins to the Available Joins list.

Procedure How to Copy a Join From One Procedure to Another

1. Open the procedure that contains a Join component.
2. Open the procedure to which you wish to copy that component.
3. Drag the Join component to the component connector in the second procedure where you want the Join to appear.

Procedure How to View Join Syntax

You can quickly view the underlying syntax created by the Join Editor.

Click the *Show/Hide Source Code* button or choose *Focexec* from the View menu. Syntax similar to the following displays in an editor window:

```
-Create a relationship between your databases (JOIN)-
JOIN PIN IN JOBHIST TAG FILE1 TO ALL PIN IN JOBHIST TAG FILE2 AS JOIN1
```

Procedure How to View Qualified Field Names

1. Choose *Options* from the Window menu.
2. Select the Reporting tab.
3. Check *Show fully qualified field names*.

Reference Join Properties Window

To view or modify the properties of a join, right-click on the join and select *Properties* or double-click the join. The Join Properties window displays.

The Join Properties window has the following fields/options:

Selected Fields

Displays the field that has been joined from the host file to the cross-referenced file. A single arrow indicates a unique join, and a double arrow indicates a non-unique join.

Join Name

Displays the name of the join. To change the default join name, type a new name in this field and click *OK*.

Note: The join name must be unique and cannot exceed eight characters.

Join Type

Indicates the type of join (unique or non-unique). To change the join type, click the *Unique* or *Non Unique* radio button, and click *OK*.

Using Conditional Joins

Using conditional joins, 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 all relational data adapters. Because each data source differs in its ability to handle complex conditional criteria, the optimization of the WHERE syntax differs depending on the specific data sources involved in the join and the complexity of the conditional criteria.

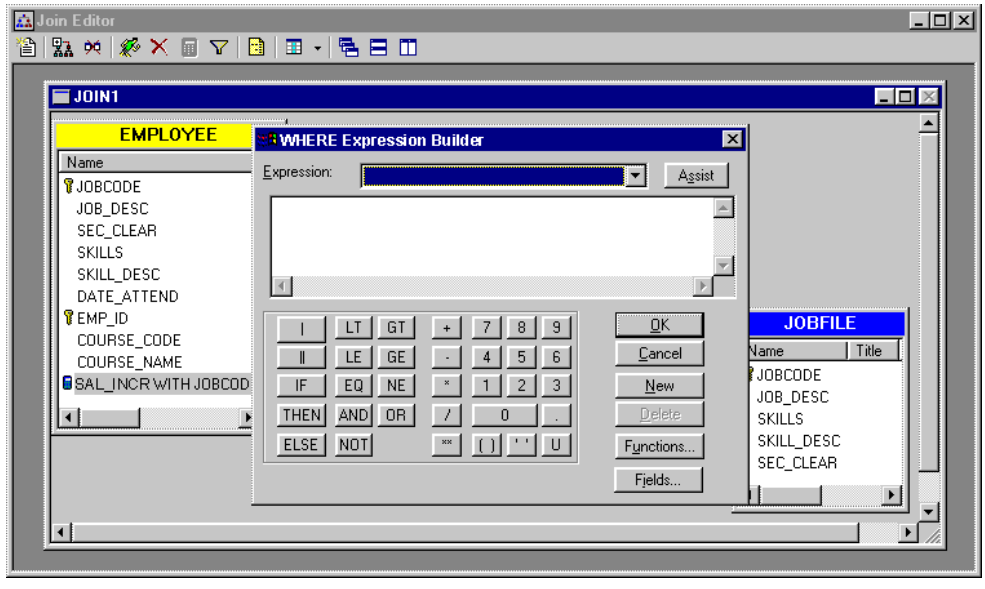
To display a list of joined data sources, select the following query subject in the Query tool or issue the command from the Command Console:

? JOIN

This displays every join currently in effect and indicates any that are based on conditional criteria.

Procedure How to Create Conditional Joins

1. Click the *Add File* button and select the tables you want to use.
2. Drag and drop common fields between the tables to establish a join.
3. Select the join and click the *Create/Edit Selection* button. The WHERE Expression Builder displays:



4. Click *OK* to return to the Join Editor once you have specified your WHERE criteria.

If you need to change the join type or join name, double-click the conditional join to launch the Join Properties window.

Reporting With a Join

With a Join in effect, you can use fields from all joined data sources in a report or graph.

Procedure How to Report With a Join

From an open procedure in which you have created a Join component:

1. Click the *Report* or *Graph* button on the component connector toolbox. The File Description List dialog box opens.
2. Select the host file from a joined set of files.
3. For a graph, click *OK*.

   For a report, click either *Paint* or *Assist*.

The Fields window for the reporting tool lists all fields from the joined data sources. You can choose any of the fields for your report or graph.

Cluster Joins

Cluster Joins allow you to create a new file structure by joining existing synonyms of two or more relational tables. Use Cluster Joins to create new views in metadata by joining together physical tables.

The new Master File description that is created combines the fields of the joined tables within a single file. The Access File from the combined file contains information about the actual location of the data sources and the Join information.

Note: You can create Cluster Joins only when using tables with the same format (SUFFIX) for relational tables.

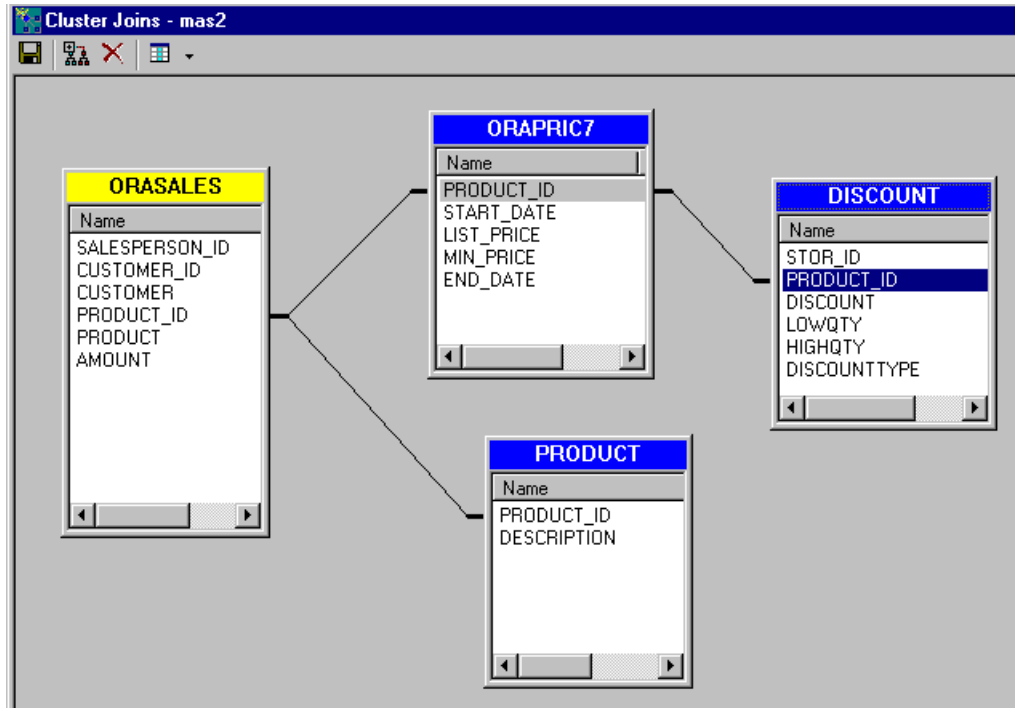
Launching the Cluster Joins Editor

You can launch the Cluster Joins editor from the File menu or from the Explorer.

Procedure How to Launch the Cluster Joins Editor From the File Menu

To launch the Cluster Joins editor from the File menu, perform the following steps:

1. Select the Master Files folder.
2. Click *File* and select *Cluster Joins*. The File Description List for Join window displays.
3. Select a relational Master File. Click *OK*. The Cluster Joins editor displays:



To launch the Cluster Joins editor from the Explorer, perform the following steps:

1. Select the Master Files folder.
2. Right-click and select *Cluster Joins*. The File Description List for Join window displays.
3. Select a relational Master File. Click *OK*. The Cluster Joins editor displays.

Reference Cluster Joins Toolbar

When you access the Cluster Joins editor, a toolbar opens below the title bar. You can access the following commands from the toolbar:

Button	Command	Description
	Save	Saves a cluster join.
	Add File	Adds a table to the work area. **Note:** This button is disabled when working with FOCUS tables.
	Delete	Deletes a selected object (table or cluster join). **Note:** This button is disabled when working with FOCUS tables.
	Show/Hide Field List Columns	Shows or hides the following field descriptions: • Name • Alias • Title • Description • Format

Choosing Fact Tables

You are prompted with a list of available Master Files (synonyms) based on the application that is currently active. Select a Master File and click *OK*.

Click the *Add table* icon in the toolbar to add multiple tables. You can apply a Join that is based on common field types.

You must add the central Fact table first and then add additional tables, which are joined to the Fact table.

Editing Master Files With the Cluster Joins Editor

You can edit a Master File with the Cluster Joins editor from the File menu or Explorer.

Procedure How to Edit a Master File With the Cluster Joins Editor

1. Select the Master File you want to edit.
2. Right-click and select *Edit With Cluster Joins*. The Cluster Joins editor displays with the Master File you selected.

   or

1. Select the Master File you want to edit.
2. Click *Edit With Cluster Joins* from the File menu.

CHAPTER 9

Visualizing Trends in Reports

Topics:

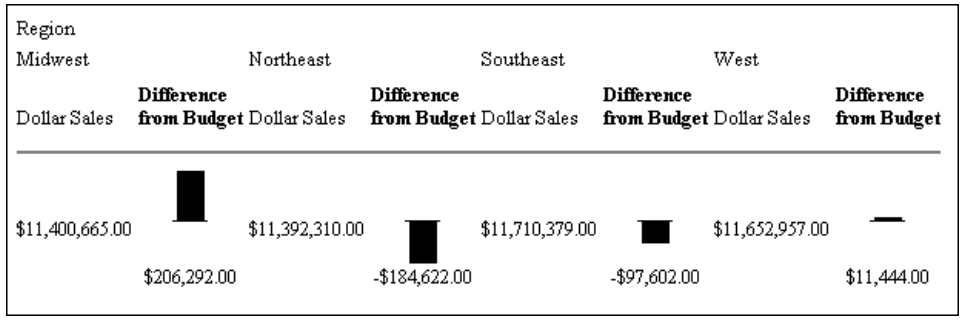
- Data Visualization
- Associating Bar Graphs With Measures
- Associating Bar Graphs With Columns

To make your HTML, PDF, and PostScript 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.

Data Visualization

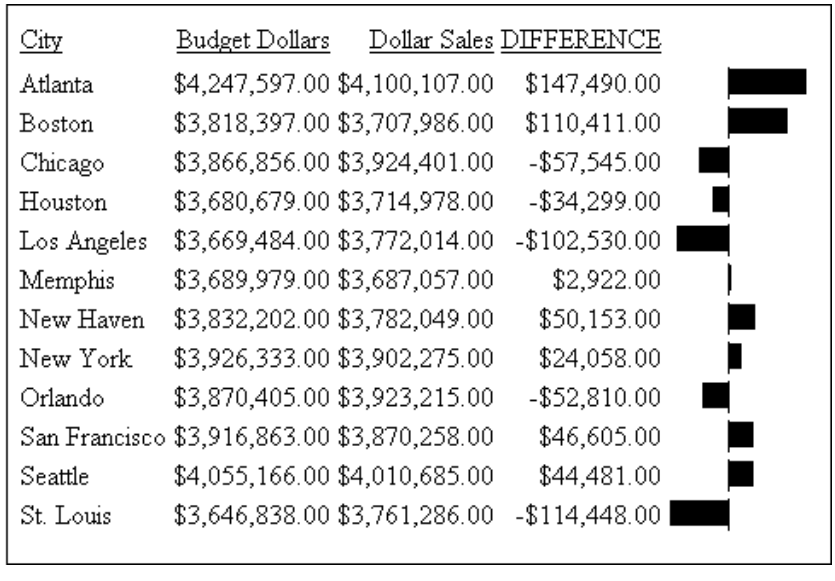
You can apply data visualization to vertical or horizontal bar graphs.

- **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.



Bar graphs that emanate above the zero line represent positive values, while bar graphs that emanate below the zero line represent negative values.

- **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.



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 field formats, see Appendix A, *Assigning Field Formats*.

You can display data visualization bar graphs in:

- OLAP-enabled HTML reports, where bar graphs are applied to Measures. See *Associating Bar Graphs With Measures* on page 9-3.
- Other HTML, PDF, or PostScript reports, where bar graphs are applied to columns. See *Associating Bar Graphs With Columns* on page 9-10.
- You can also apply data visualization bar graphs to columns by adding a StyleSheet declaration to a procedure that includes the GRAPHTYPE attribute. For details, see the *Creating Reports With WebFOCUS Language* manual.

Associating Bar Graphs With Measures

From the OLAP selections panel or the OLAP Control Panel, you can associate data visualization bar graphs with any numeric Measure that appears in the report output.

The type of bar graph that you can apply depends on the placement of the Dimensions included in the report. If all report Dimensions are listed in the Drill Down box, you can apply a horizontal bar graph to the specified Measures. If a dimension is listed in the Drill Across box, you can apply a vertical bar graph to the specified Measures.

For more information about OLAP-enabled reports, see Chapter 11, *Using OLAP Analysis,* and Chapter 12, *Manipulating Data in an OLAP-enabled Report*.

Data Visualization Bar Graph Attributes

Following are the default attributes used to display data visualization bar graphs applied from the OLAP selections panel or OLAP Control Panel:

Bar graph attribute	Default value
Color	Positive values: Blue Negative values: Red
Length	Vertical bar graph: 60 pixels Horizontal bar graph: 80 pixels
Width	The size of the font in the report output is used to define a default value for the width of the bar graph.

Note: Currently, you cannot modify bar graph attributes from the OLAP selection panel or the OLAP Control Panel. This feature will be addressed in a subsequent release. See *Associating Bar Graphs With Columns* on page 9-10 for information about how to modify bar graph attributes.

Applying Data Visualization Bar Graphs to Measures

You can apply data visualization bar graphs to any numeric Measure listed in the Measures box. To indicate the Measures for which you want to display bar graphs, you click the check box located to the left of each Measure. This check box has three states that control the display modes for the Measure:

Check box state	Display Mode for the Measure
Check mark	Displays the Measure.
Graph icon	Applies a bar graph to the Measure and displays both the Measure and its associated bar graph.
Blank box	Does not display the Measure or an associated bar graph.

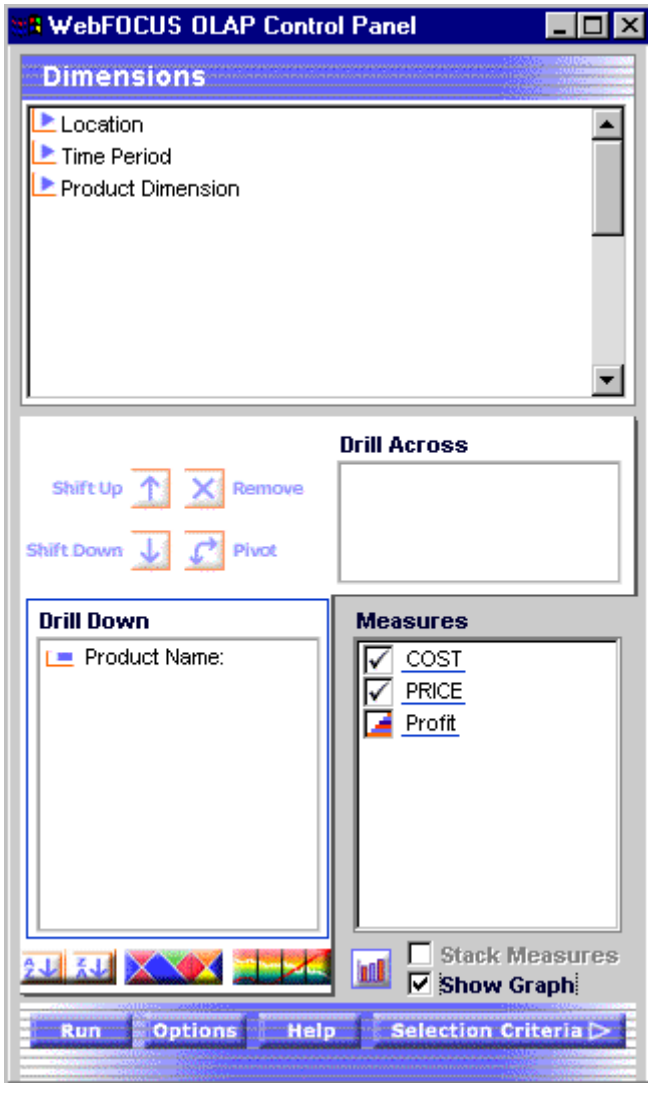
You click the check box next to a Measure until it reflects the display mode you want. For an illustration *Determining the Display Mode for Measures* on page 9-5.

If an OLAP-enabled report request contains a NOPRINT Measure, that Measure is not displayed in the report. The Measure box, however, does list the Measure with a blank check box. To deactivate NOPRINT and display this Measure, click the check box once. To display the associated bar graph, click the check box again.

Note: The three-state check box is *not* active when you apply Stack Measures to your report. If you apply Stack Measures, you can only choose to display or not display a Measure; you cannot apply bar graphs to any Measure. Once you apply bar graphs to a Measure, you cannot apply the Stack Measure feature to the report. In other words, these features are mutually exclusive.

Determining the Display Mode for Measures

The following graphic shows the location of the Measures box in the lower right corner of the OLAP Control Panel.



The state of each Measure's check box determines how the Measure displays in the report output. From the above figure, you can determine:

- The COST and PRICE Measures will display in the report output (check mark in the boxes).
- The Profit Measure and its associated bar graph will display in the report output (Graph icon in the box).
- The same symbols display when you click the Measures arrow in the OLAP selections panel.

Procedure How to Apply Data Visualization Bar Graphs to a Measure

From the OLAP selections panel:

1. Click the arrow to the left of *Measures*, then click the check box beside each measure to which you want to add a bar graph. The check mark in the box is replaced with the Graph icon. (To apply data visualization graphics to a NOPRINT Measure, you may have to click the check box twice.)
2. Click *Run*. The new report output is displayed with the associated bar graphs.

OR

1. Click the *OLAP* button in the OLAP selections panel to open the OLAP Control Panel. The Measures box is displayed in the lower right corner.
2. If Stack Measures is applied to the report, click the *Stack Measures* check box to turn off this feature.
3. You can apply data visualization bar graphs to as many numeric Measures as you want.

   To apply data visualization bar graphs to a Measure, click the check box to the left of the Measure. To apply data visualization graphics to a NOPRINT Measure, click the check box twice. The check mark in the box is replaced with the Graph icon. This icon indicates that data visualization bar graphs are applied to the Measure. (If you have not done so in step two, this also deactivates the Stack Measures feature.)
4. After you select all the Measures for which you want to display bar graphs, click *Run*. The new report output is displayed with the associated bar graphs.

Procedure How to Remove Data Visualization Bar Graphs From a Measure

1. From the Measures drop-down list in the OLAP selections panel or the Measures box in the OLAP Control Panel, click the check box for any Measure to which you have applied data visualization bar graphs.

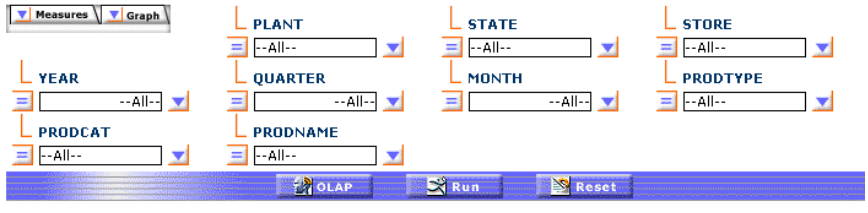
   This removes the Graph icon and displays a blank check box indicating that the Measure will not appear in the report output when you run the report.

2. To display the Measure, click the same check box again. A check mark appears in the box.

3. Click *Run* to display the new report output, where the Measure displays without its associated bar graph.

Example Applying Data Visualization Bar Graphs to Measures

Suppose that you want to associate data visualization bar graphs with the Profit column in the following report in order to represent visually the differences between the Costs for and the Prices of your various Products. You have created the following OLAP-enabled report:



PAGE 1			
Product Name:	Our Cost:	Price:	Profit
110 VHS-C Camcorder 20 X	744,759.00	1,043,859.00	299100
120 VHS-C Camcorder 40 X	796,943.00	1,227,723.00	430780
150 8MM Camcorder 20 X	1,303,440.00	1,732,489.00	429049
2 Hd VCR LCD Menu	185,889.00	257,939.00	72050
250 8MM Camcorder 40 X	251,520.00	313,614.00	62094
330DX Digital Camera 1024K P	32,437.00	45,477.00	13040
650DL Digital Camcorder 150 X	940,750.00	1,191,175.00	250425
750SL Digital Camcorder 300 X	105,750.00	140,859.00	35109
AR2 35MM Camera 8 X	64,385.00	88,835.00	24450
AR3 35MM Camera 10 X	13,395.00	18,189.00	4794
Combo Player - 4 Hd VCR + DVD	1,166,404.00	1,610,364.00	443960
DVD Upgrade Unit for Cent. VCR	754,909.00	1,080,769.00	325860
QX Portable CD Player	245,916.00	419,796.00	173880
R5 Micro Digital Tape Recorder	297,459.00	383,679.00	86220
ZC Digital PDA - Standard	233,313.00	280,163.00	46850
ZT Digital PDA - Commercial	1,376,805.00	1,968,555.00	591750

To associate data visualization bar graphs with the Profit column:

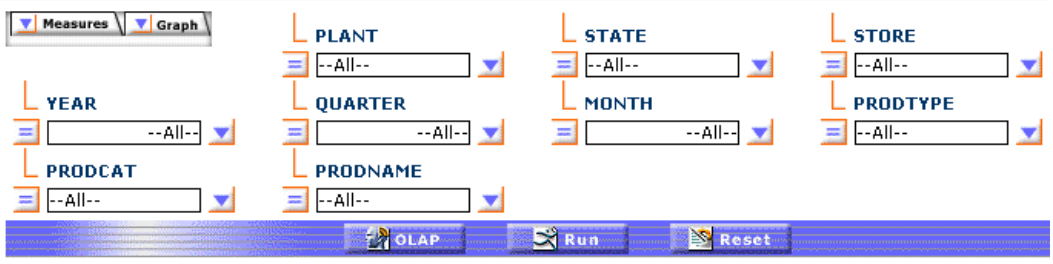
1. Click the Measures drop-down list in the report (or open the OLAP Control Panel by clicking the *OLAP* button).

   The check marks indicate that the Measures will display in the report output.

2. Click the *Profit* check box again.

   The Graph icon replaces the check mark. This icon indicates that the Measure will display with its associated bar graph.

3. Click the *Run* button to display the new report output.



PAGE 1

Product Name:	Our Cost:	Price:	Profit	
110 VHS-C Camcorder 20 X	744,759.00	1,043,859.00	299100	
120 VHS-C Camcorder 40 X	796,943.00	1,227,723.00	430780	
150 8MM Camcorder 20 X	1,303,440.00	1,732,489.00	429049	
2 Hd VCR LCD Menu	185,889.00	257,939.00	72050	
250 8MM Camcorder 40 X	251,520.00	313,614.00	62094	
330DX Digital Camera 1024K P	32,437.00	45,477.00	13040	
650DL Digital Camcorder 150 X	940,750.00	1,191,175.00	250425	
750SL Digital Camcorder 300 X	105,750.00	140,859.00	35109	
AR2 35MM Camera 8 X	64,385.00	88,835.00	24450	
AR3 35MM Camera 10 X	13,395.00	18,189.00	4794	
Combo Player - 4 Hd VCR + DVD	1,166,404.00	1,610,364.00	443960	
DVD Upgrade Unit for Cent. VCR	754,909.00	1,080,769.00	325860	
QX Portable CD Player	245,916.00	419,796.00	173880	
R5 Micro Digital Tape Recorder	297,459.00	383,679.00	86220	
ZC Digital PDA - Standard	233,313.00	280,163.00	46850	
ZT Digital PDA - Commercial	1,376,805.00	1,968,555.00	591750	

Notice that the report now contains a new column to the right of the Profit Measure. This column displays a horizontal bar chart comprised of bar graphs that represent the individual data values for the Profit Measure.

Associating Bar Graphs With Columns

You can apply data visualization bar graphs to columns in a report from the Report Painter, and define triggering conditions that determine when those bar graphs will be displayed and how they will look.

Procedure **How to Apply Data Visualization Bar Graphs to a Column**

1. Open the report in the Report Painter.
2. Right-click a column containing numeric data and select *Visualize* to open the Data Visualization dialog box.
3. Click *Visualize* to activate the option and invoke the bar graph when you subsequently run the report.
4. Click the drop-down box to choose a color for the bar graphs, or accept the default (black). The color you select will be applied to all bar graphs.
5. Accept the defaults for maximum length and for the width of the bar graphs, or set a custom measurement. See *Data Visualization Dialog Box* on page 9-13 for more information about defaults and customization options.

   Tip:

   If you set custom measurements or color and then decide you want the default values, you can reset them by clicking the Default Values button.

   or

   If you wish to apply different colors to bar graphs to reflect different conditions, click the *New* button in the Condition List area of the Style tab. For details, see Chapter 3, *Creating Reports With the Report Painter*.
6. If you are not defining conditions for data visualization bar graphs, click *OK* to close the Data Visualization dialog box and accept your selections.
7. Click *Run*. The report opens in the browser with bar graphs inserted.

   Tip: To remove data visualization bar graphs from your report, turn off the check box next to Visualize in the Data Visualization dialog box.

Example Defining Conditions for Data Visualization Bar Graphs

You can assign a style (color) to data visualization bar graphs based on conditional statements you define. In this example you use the DIFFERENCE column to highlight those bar graphs showing gains of $100,000 or more.

1. From the Explorer, create a procedure, then open the Define tool from the component connector toolbar.
2. Choose the GGSALES data source in the File Description List dialog box and click *OK*.
3. Name the virtual field DIFFERENCE, then click the *Format* button to open the Format dialog box. Accept the default format D12.2 and choose *Floating dollar--M* in the Edit Options box. Click *OK* to close the Format dialog box and return to the Define tool.
4. In the Fields tab, double-click DOLLARS, click the minus sign (-) on the calculator, and double-click BUDDOLLARS to complete the expression.
5. Click *Check* to make the virtual field active, then close the Define tool and update the procedure.
6. Open the Report Painter from the component connector toolbar, again choosing GGSALES as the data source in the File Description List dialog box.
7. Add the following columns from the Object Inspector Fields tab: CITY, BUDDOLLARS, DOLLARS, DIFFERENCE.
8. Highlight the City column and click the *By* button. Highlight BUDOLLARS and click the *Sum* button. Notice that DOLLARS and DIFFERENCE also become Sum columns.
9. Right-click the DIFFERENCE column in the Report Painter and select *Visualize*. The Data Visualization dialog box opens.
10. Click the *Visualize* check box.
11. Click the *Conditional Styling* button. The Data Visualization Conditional Styling dialog box opens.
12. Click *New* to create a condition. The Condition List dialog box opens.
13. Click *New* to edit the new condition. The Edit Condition dialog box opens.
14. Select the *DIFFERENCE* field from the Field list.
15. Select *Is greater than or equal to* from the Relation list box.
16. Type the value *100000* in the Value box and click *OK*.

    Your edited condition is added to the Condition list in the Condition List dialog box.

17. Click *OK* in the Condition List dialog box.

The new condition is added to the Condition list in the Data Visualization Conditional Styling dialog box.

18. Highlight the condition, select *Lime* from the Color list box, and click *OK*.

19. Click *OK* to close the Data Visualization dialog box.

20. Close the Report Painter and update the procedure.

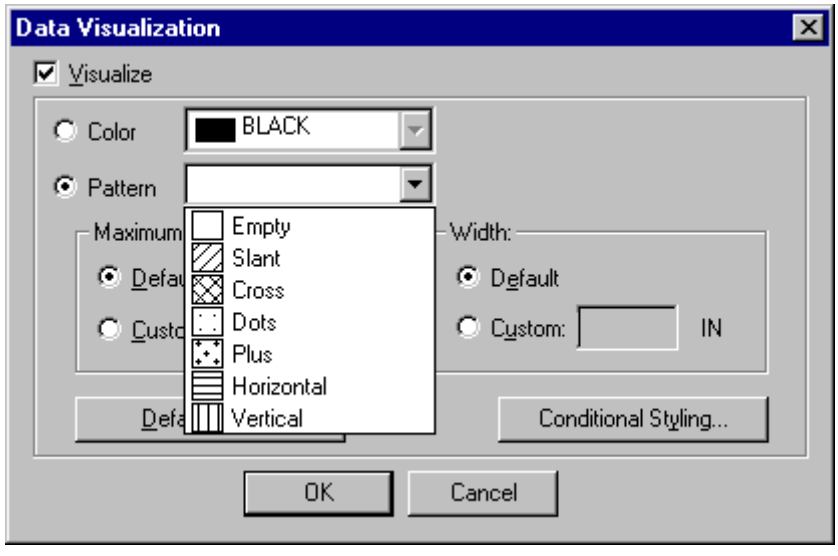
When you run the report, your new condition takes effect, showing where the sales budget was exceeded by $100,000 or greater as a lime green bar graph. (If your report is in black and white, the lime green color appears as a lighter shade of gray.)

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

Reference Data Visualization Dialog Box

You use this dialog box to define the data visualization bar graphs that appear in your report.

If you are setting conditions to control the display of bar graphs, you use the Data Visualization Conditional Styling dialog box instead of this one.



The Data Visualization dialog box contains the following fields/options:

Visualize

Initiates the Data Visualization feature.

Color

Specifies the color of the bar graphs. Select a color from the drop-down list. Black is used as the default color.

The color option is the default for HTML, PDF, and PS formats.

Pattern

Specifies the shading patterns for bar graphs. Select a shading pattern from the drop-down list.

This option is only available for PDF and PS formats to make graphs in black and white reports more readable. If the report format is HTML, the Pattern radio button is inactive because the shading option is only available for PDF and PS formats.

Scale

Specifies the relative bar graph scaling for multiple report columns under a common Across sort field to which you have applied data visualization.

Note: This option only appears if you select multiple columns with a common Across field.

Choose one of the following options from the Scale drop-down list:

Uniform

Specifies that each vertical bar graph be scaled based on the minimum and maximum values of the entire set of values compiled from each Across column to which you have applied data visualization bar graphs.

Distinct

Specifies that each vertical bar graph be scaled based on the distinct minimum and maximum values for each Across column to which you have applied data visualization bar graphs.

Maximum Length:

Specifies the length of the longest bar graph.

Default - The default length of 60 pixels is used for a vertical bar graph and of 80 pixels for a horizontal bar graph.

Custom - Sets the value for displaying 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 windows measurement units (inches, centimeters, etc.), then converted into the corresponding number of pixels.

Width:

Specifies the width of the bar graphs in a report.

Default - This value is preset based on the current font size.

Custom - Sets the value for displaying the width of the bar graphs in a report. This value must be a positive number.

This value is initially expressed in the current windows measurement units (inches, centimeters, etc.), then converted into the corresponding number of pixels.

Default Values button

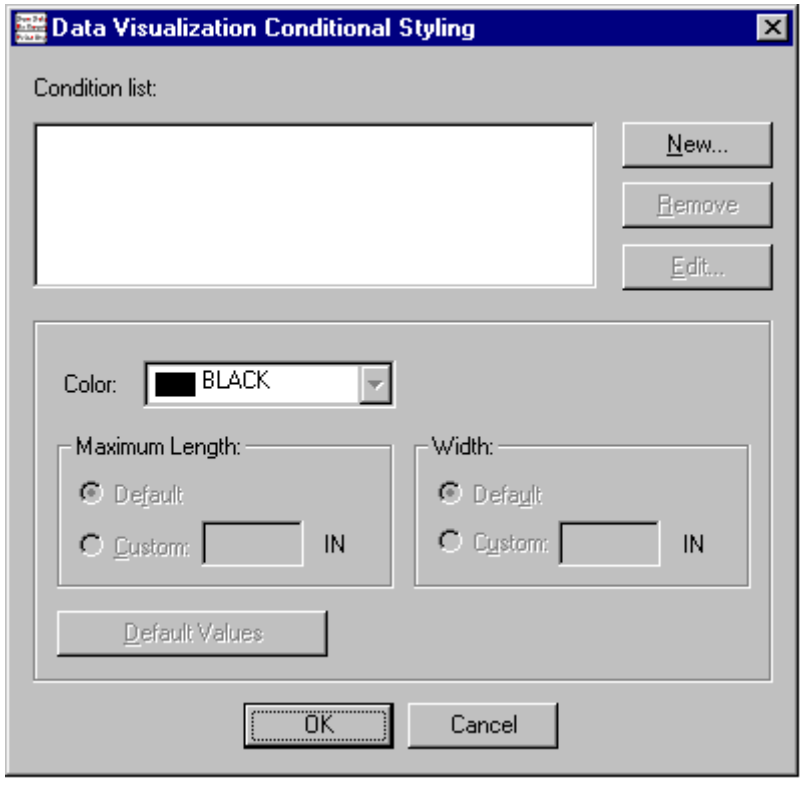
Resets all defaults.

Conditional Styling button

Opens the Data Visualization Conditional Styling dialog box where you can define conditions and colors for bar graphs.

Reference Data Visualization Conditional Styling Dialog Box

Use the Data Visualization Conditional Styling dialog box to define the colors of bar graphs based on conditions you define.



New

Opens the Condition List dialog box. For instructions on how to define conditions, see *Defining a Conditional Report Style* in Chapter 3, *Creating Reports With the Report Painter*.

Color

Specifies the colors of the bar graphs. Select a color from the drop down list. Black is used as the default color. You can select as many colors as you need to show different conditions.

Maximum Length:

Specifies the length of the longest bar graph.

Default

The default length of 60 pixels is used for a vertical bar graph and of 80 pixels for a horizontal bar graph.

Custom

Sets the value for displaying 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 Windows measurement units (inches, centimeters, etc.), then converted into the corresponding number of pixels.

Width:

Specifies the width of the bar graphs in a report.

Default

This value is preset based on the current font size.

Custom

Sets the value for displaying the width of the bar graphs in a report. This value must be a positive number.

This value is initially expressed in the current Windows measurement units (inches, centimeters, etc.), then converted into the corresponding number of pixels.

Default Values button

Resets all defaults.

CHAPTER 10

Creating Reports With Financial Report Painter

Topics:

- Starting a Financial Report
- Designing Your Financial Report
- Running a Financial Report
- Retrieving FOR Field Values From a Data Source
- Reporting Dynamically From a Hierarchy
- Supplying Data Directly
- Performing Inter-Row Calculations
- Inserting Rows of Text
- Suppressing the Display of Rows
- Saving and Retrieving Intermediate Report Results
- Formatting Financial Reports
- Adding, Inserting, and Deleting Rows
- Editing Row Types and Properties
- Adding and Deleting Columns

The WebFOCUS Financial Report Painter, and its underlying Financial Modeling Language (FML), and are designed for the special needs associated with creating, calculating, and presenting financially oriented data such as balance sheets, consolidations, profit and loss statements, budgets, and certain government mandated financial reports. These reports are distinguished from other WebFOCUS 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 some function of the data.

Using an intuitive matrix design, the Financial Report Painter enables you to model and generate real-time financial reports that handle large volumes of data, volatile data relationships, and custom charts of accounts .

The Financial Report Painter generates FML code, beginning with the FOR command that initiates the row-based orientation of financial modeling, and the OVER commands that stack the rows in the report. For details about FML syntax, see *Creating Financial Reports* in *Creating Reports With WebFOCUS Language*.

Starting a Financial Report

The Financial Report Painter is a feature of the Report Painter, from which it is accessed. You start a report in the Report Painter and complete it in the Financial Report Painter. The Report Painter retains control over report-wide and column-oriented properties of the report, while the Financial Report Painter controls the row-oriented properties. However, you can access key Report Painter dialog boxes—particularly the Report Options and Field Properties dialog boxes—directly from the Financial Report Painter, making it easy to control many report and column-based properties without switching tools.

Procedure How to Start a Financial Report

In the Report Painter:

1. Add the fields you want to include in the report, including the field that you intend to designate as your FOR field. The FOR field will allow the report to be structured on a row-by-row basis in the Financial Report Painter.

   You can include vertical (BY) and/or horizontal (Across) sort fields, however, these fields are not required, and, in fact, are frequently omitted from financial reports where sorting is controlled by the placement of FOR field values in the matrix. Nevertheless, if you wish you can include both BY phrases and Across phrases in the request.

2. You may add any of the following report elements as required: headings and footings, totals, subtotals, calculated values, and images.

3. Now select the field that you want to use as the FOR field, and click the *For* button on the Report Painter Columns toolbar. A report request can only contain one FOR field.

4. Click the *Matrix* tab at the bottom of the window.

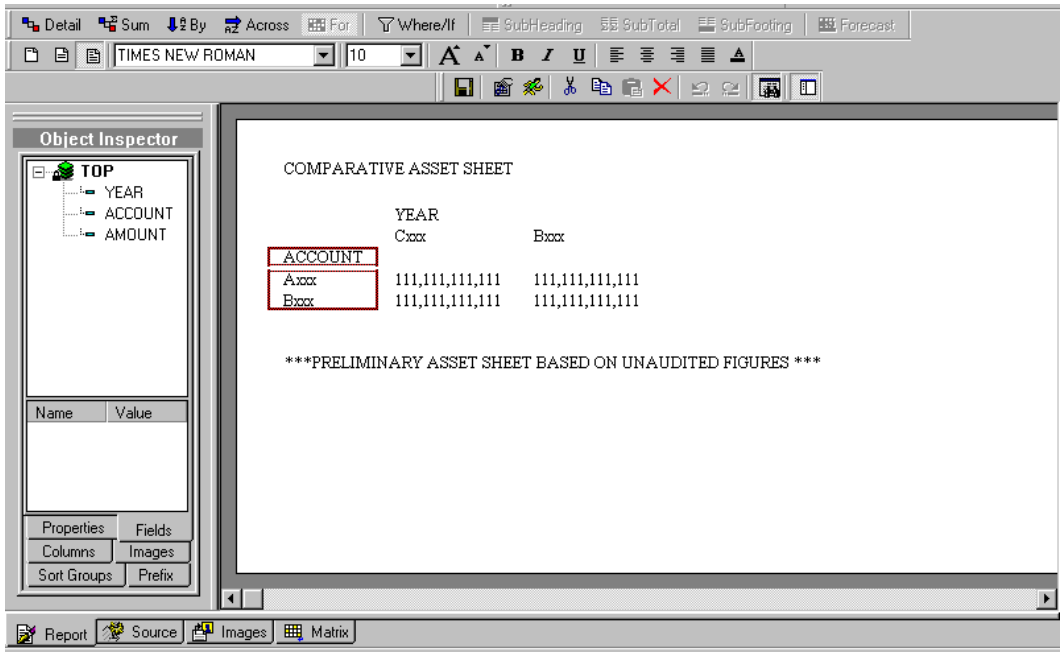
   The Financial Report Painter's Design matrix opens.

Tip: If you want to return to the Report Painter, click the Report tab below the matrix or choose Show Report Painter from the View menu.

To reopen the Financial Report Painter from the Report Painter, click the Matrix tab.

Example Report Painter With FOR Field Selected

In this example, the Comparative Asset Report is open in the Report Painter. The heading and footing are defined and the report columns are specified. ACCOUNT is designated as the FOR field and the *For* button is selected on the Report Painter Columns toolbar.



The next step is to click the Matrix tab below the Report Painter window to open the report in the Financial Report Painter. For an illustration, see *Designing Your Financial Report* on page 10-4.

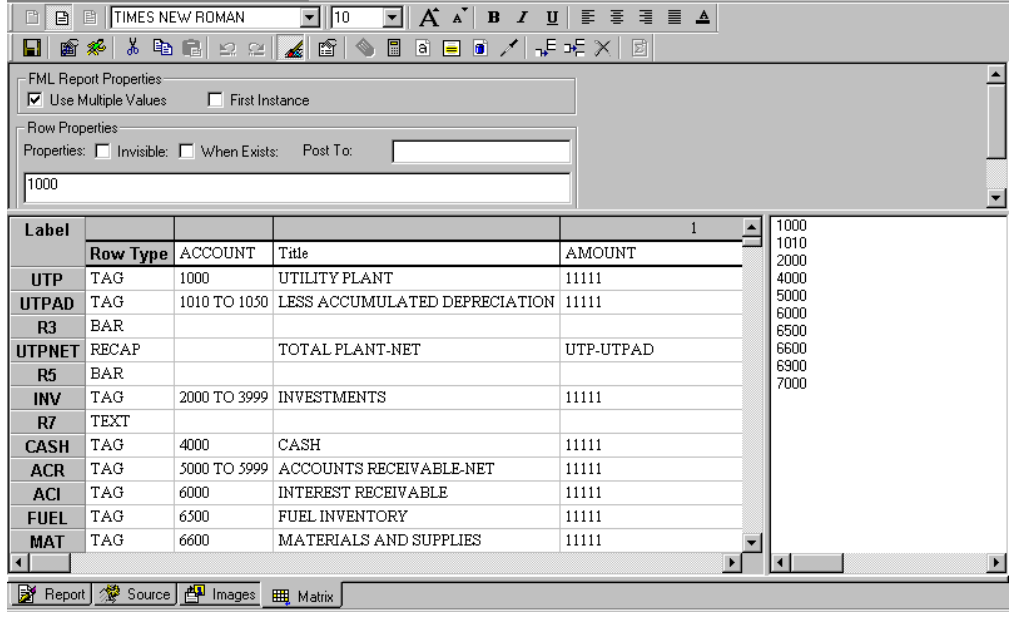
Designing Your Financial Report

Most of the work you will do in the Financial Report Painter occurs in the Design matrix, where you can add:

- Tags that represent values of the FOR field in the data source.
- Data that is not derived from a data source, including intermediate results from other reports that are posted to a file and picked up as data.
- Free text and blank lines.
- Underlines to set off the results of computations.
- Formulas for inter-row and intra-row calculations.

You can also format rows, columns, and cells in the Design matrix.

The following matrix contains a simple asset sheet contrasting the results of two years. (Note that, like all Financial Report Painter requests, this one originated in the Report Painter. See *Report Painter With FOR Field Selected* on page 10-3).



Label	Row Type	ACCOUNT	Title	1 AMOUNT
UTP	TAG	1000	UTILITY PLANT	11111
UTPAD	TAG	1010 TO 1050	LESS ACCUMULATED DEPRECIATION	11111
R3	BAR			
UTPNET	RECAP		TOTAL PLANT-NET	UTP-UTPAD
R5	BAR			
INV	TAG	2000 TO 3999	INVESTMENTS	11111
R7	TEXT			
CASH	TAG	4000	CASH	11111
ACR	TAG	5000 TO 5999	ACCOUNTS RECEIVABLE-NET	11111
ACI	TAG	6000	INTEREST RECEIVABLE	11111
FUEL	TAG	6500	FUEL INVENTORY	11111
MAT	TAG	6600	MATERIALS AND SUPPLIES	11111

1000
1010
2000
4000
5000
6000
6500
6600
6900
7000

Reference Financial Report Painter Design Matrix

The Financial Report Painter enables you to define the elements of your report request. It consists of the matrix itself, the panel containing FOR field values from the data source, a set of toolbars, and a set of Properties check boxes.

Below the matrix are four tabs that enable you to switch quickly between the Matrix view, the Source code, the Report as it appears in the Report Painter, and the Images that may have been embedded in the report.

Matrix elements:

Row labels (R1, R2, etc.)

Are supplied by default in the first column of the matrix, where they provide unique identifiers for each report row. They become important as you place various report elements in the rows of the matrix. These labels enable you to identify rows to be used in calculations. You can also use the labels to identify rows and cells for formatting.

You can replace the default labels with more meaningful labels of your own.

Row Type

Identifies the type of information included in each row of the report. This column appears by default, but initially the values are blank. The Financial Report Painter adds the row type as you define each element in the report. Row types are: TAG, DATA, RECAP, TEXT, BAR, and PICKUP.

FOR Field

Contains the field you designated in the Report Painter. FOR is the underlying command that enables row-by-row control in a WebFOCUS financial report. A report can only contain one FOR field. The data values of the FOR field, or calculations based on those values, are stacked over each other in the matrix.

Title

Lists any titles you define for rows. If no titles are specified for TAG rows, the FOR field values are displayed as default row titles. For DATA and RECAP rows, the title is blank unless provided.

You can assign multiple data values in a single row and then assign an identifying title to the group.

If you are working with hierarchical data for which captions have been defined in the Master File, the captions are displayed in the Title column. See *Reporting Dynamically From a Hierarchy* on page 10-21.

Report fields

Each field you specify in the Report Painter (including the FOR field) appears as a column title in the matrix. If you include any sort (BY) fields, they appear before the others in the report.

Column widths are initially adjusted to fit the longest item in each column. As you type into the matrix or enter values in dialog boxes, you can adjust the column widths as required by dragging or double-clicking the boundary lines.

You can include additional columns in your report without returning to the Report Painter. For details, see *Adding and Deleting Columns* on page 10-86.

FOR field values panel:

This panel displays the values of the FOR field in a resizable, scrollable window to the right of the matrix. You can add values to the Design matrix by dragging or double-clicking. You can multi-select contiguous or non-contiguous values and drag the selected group onto the matrix, where they appear on a single line, connected by the OR command.

If you are reporting against a hierarchy, the values in the panel reflect the hierarchy tree. See *Reporting Dynamically From a Hierarchy* on page 10-21.

Design toolbars:

Financial Report Painter toolbar icons, which appear above the matrix, enable you to perform the following tasks:

- Add tag values from a data source, supplementary data values, free text, underlines, and Recap formulas to the matrix.
- Post data to a file and pick up the data that you have posted.
- Add, insert, and delete rows.
- Run financial reports.
- Change font style, size, and color, and justification for invidiously cells in the matrix.
- Perform standard operations such as Save, Cut, Copy, Paste, Undo/Redo.

The toolbar icons are:

Icon	Tool Tip	Description
	Report Options	Opens the Report Painter's Report Options dialog box, which control all report-wide properties.
	Run	Runs the report.
	Design mode	Toggles between the full Design matrix and a subset of the matrix columns for preview purposes.
	Show Properties of Selected Row	Shows the properties of the selected row in the dialog box in which those properties were defined.
	Tag	Opens the TAG dialog box where you can specify values and properties for the TAG row.
	Recap calculator	Opens the RECAP dialog box where you can create an expression that derives the value of the RECAP row and assign row properties.
	Text	Opens the TEXT dialog box where you can enter a row of text, or a blank row.
	Data	Opens the DATA dialog box where you can assign properties, such as title and label, to a row whose data you supply directly in the matrix (rather than retrieving it from a data source).
	Bar	Opens the BAR dialog box where you can specify an underline character.
	Pickup	Opens the PICKUP dialog box where you can assign row properties, such as title and label, and indicate the name of a file from which to pick up a row of previously posted data.
	Add a row	Adds a blank row at the bottom of the matrix.
	Insert a row	Inserts a blank row between existing rows in the matrix.

Icon	Tool Tip	Description
	Delete a row	Removes the selected row from the matrix.
	Make Recap	Creates a RECAP row based on the sum of other values in the matrix. (This option applies when no expression is required.)
	Increase/ Decrease Size	Increases or decreases font size by one measurement at a time.
	Bold, Italic, Underline	Adds emphasis using the selected style.
	Justify	Left-, Right-, Center-justifies the characters in the selected cell, or applies the default justification.
	Color	Applies the color chosen from the palette to the characters in the selected cell.

Properties Area

The Properties area above the matrix is a resizable, scrollable region in which you can assign appropriate properties to the report or to specific row types.

If an editable cell is selected in the matrix, its content is displayed in the Properties box below the check boxes. To enter values in a selected cell, type in the Properties box and press *Enter*.

Row Properties check boxes affect individual rows:

Invisible

Suppresses the display of a row.

When Exists

Suppresses the display of a row when no data exists.

Post to

Enables you to enter the ddname for a file to which you want to post a row of output for later pickup and use.

FML Properties check boxes affect the entire report:

Use Multiple Values

Enables you to add the same data value to multiple rows in the Design matrix. For example, the same value can exist as a single value in one row, as part of a range in another row, and in a calculation in a third row.

For data that has not been structured as a hierarchy, values continue to be listed in the FOR field values panel after being used in a row. Without this option, values are removed from the list after being used.

In a hierarchy, a used value remains in the FOR field values panel, where it is displayed in red to indicate that it has already been added to the matrix.

In both instances, you can reuse the value as required.

First Instance

Applies when you are 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.

Unless this option is selected, data shared by two different parents will be counted twice in an aggregation operation. When this check box is selected, the Financial Report Painter applies the .FST prefix operator to all summed numeric columns in the report, ensuring that a shared value is only counted once.

Viewing Source Code

If you are familiar with the underlying FML syntax, as you work in the graphical tool you may wish to view the source code generated by the Financial Report Painter.

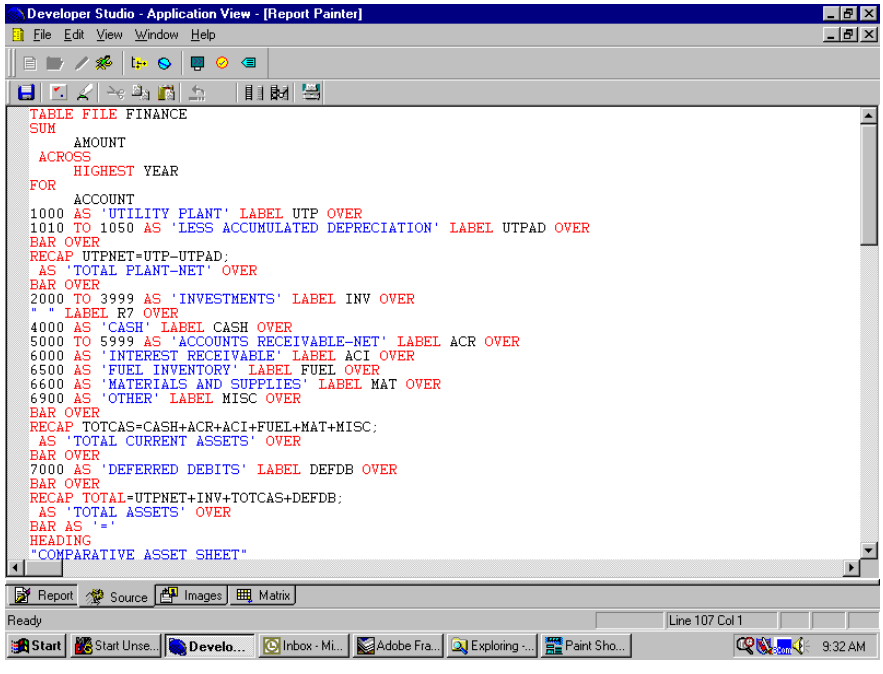
Procedure How to View Source Code

To toggle from a report request in the matrix to the corresponding code, click the *Source* tab below the Financial Report Painter.

Example Viewing FML Source Code

To open the source code window, click the *Source* tab below the matrix.

The following illustration shows the source code that corresponds to the matrix for the Comparative Asset Report in *Designing Your Financial Report* on page 10-4. Notice that the code shows both the entries made in the Report Painter, as well as those made in the Financial ReportFinancial Report Painter Painter.



Tip: While you can edit the code that is displayed in this window, we urge you not to do so. Changes to Painter-generated code may cause problems when you try to reopen the procedure in the tool.

Previewing Your Report

You will generally work in Design mode as you build your request, but you may periodically wish to toggle to Preview mode to see the columns of the matrix that will actually be represented in the report output. For an illustration of Preview mode, see *Financial Report Painter Matrix in Preview Mode* on page 10-11.

Procedure How to Toggle Between Design and Preview Modes

Click the *Design mode* icon on the Financial Report Painter toolbar. The matrix display switches to Preview mode, which shows a subset of the information in the Design matrix.

Reference Financial Report Painter Matrix in Preview Mode

In Preview mode, the Financial Report Painter displays the following:

- In the first column, a label assigned to each row in the report—R1, R2, etc., or an explicit row label that you have supplied.
- In the second column, default titles or titles you assigned to rows in the report, representing TAG values of the FOR field, RECAP values, and other row types.
- In subsequent columns, any other fields you specified for the report.

Label		1
	Title	AMOUNT
UTP	UTILITY PLANT	11111
UTPAD	LESS ACCUMULATED DEPRECIATION	11111
R3		--------
UTPNET	TOTAL PLANT-NET	UTP-UTPAD
R5		--------
INV	INVESTMENTS	11111
R7		
CASH	CASH	11111
ACR	ACCOUNTS RECEIVABLE-NET	11111
ACI	INTEREST RECEIVABLE	11111
FUEL	FUEL INVENTORY	11111
MAT	MATERIALS AND SUPPLIES	11111
MISC	OTHER	11111
R14		--------
TOTCAS	TOTAL CURRENT ASSETS	CASH+ACR+ACI+FUEL+MAT+MISC
R16		--------
DEFDB	DEFERRED DEBITS	11111

Report | Source | Images | Matrix

Running a Financial Report

You can run a report directly from the Financial Report Painter at any point in the Design cycle. You can also run the report from the Report Painter or from the Developer Studio Explorer.

Procedure How to Run a Financial Report

Click the *Run* icon on either the Financial Report Painter toolbar or the Report Painter toolbar.

The report is displayed in the browser.

Example Running a Comparative Asset Report

The following sample report was begun in the Report Painter, completed in Financial Report Painter Design matrix, and run by clicking the *Run* icon on the toolbar. If you want to review the matrix from which this report was generated, see *Designing Your Financial Report* on page 10-4. The formatting of the output is accounted for by a default style template that was applied to the report.

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
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 ***

Retrieving FOR Field Values From a Data Source

Tags identify the data values of the FOR field in your report. A report row can be associated with a tag that represents:

- A single data value of the FOR field.
- The aggregate of two or more data values of the FOR field.
- The aggregate of a range of data values of the FOR field.
- The aggregate of a related group of data values of the FOR field.

You can also identify Tag values that are organized in a parent/child hierarchy up to 99 levels deep and extending over many rows in the matrix. For details, see *Reporting Dynamically From a Hierarchy* on page 10-21.

The Tag button on the Financial Report Painter toolbar opens the TAG dialog box, in which you can define all of these variations.

Procedure How to Specify a Tag for a Single Data Value

In the Design matrix:

1. Select the row in which you want to place a tag value.

   Note: If you wish to be able to use the same value in more than one row of the matrix, click the *Use Multiple Values* check box in the FML Report Properties area above the matrix.

2. Click the *Tag* icon on the Financial Report Painter toolbar.

   or

   Right-click anywhere in the row (except on the label) and select *Change Type to* >*Tag* from the shortcut menu.

   The TAG dialog box opens at the Options tab.

3. Enter a data value, or click the *Browse* button and select one from the list. Your entry is reflected in the Tags box.
4. Click *OK* on the Options tab or select the General tab to continue.

5. Notice that the Row label (R1, etc.) displays automatically in the Label box.

   If you wish to supply an explicit row label to replace the default label (R1, etc.) on the matrix, type it into the Label input box. (The default label is retained internally.)

6. Enter a row title that you want to display on the report (optional). If you do not supply a title, the tag value is displayed.

7. Optionally, select formatting check boxes: Invisible, When Exists, Post to. For details, see *Suppressing the Display of Rows* on page 10-59 and *Saving and Retrieving Intermediate Report Results* on page 10-60.

8. Click *OK*.

The matrix now shows TAG in the Row Type column and, if you entered them, the explicit label in the Label column and the title in the Title column.

Tip: You can also drag (or double-click) a tag from the FOR field values panel to a desired location on the matrix. Then right-click in the TAG row and select Row Properties from the shortcut menu to open the TAG dialog box, where you can enter a descriptive title for the tag value and/or an explicit row label.

Procedure How to Specify a Tag for Multiple Data Values

In the Design matrix:

1. Select the row in which you want to place multiple tag values.

   Note: If you wish to be able to use the same value in more than one row of the matrix, click the *Use Multiple Values* check box in the FML Report Properties area above the matrix.

2. Click the *Tag* icon on the Financial Report Painter toolbar.

   or

   Right-click anywhere in the row (except on the label) and select *Change Type to* **>***Tag* from the shortcut menu.

   The TAG dialog box opens at the Options tab.

3. Enter a data value, or click the *Browse* button and select one from the list. Your entry is reflected in the Values box.

4. Click the *Add* button to add the value to the Tags box.
5. Enter or select another data value and click the *Add* button to add the second value to the Tags box.

   If you are familiar with FML syntax, note that this entry adds the OR phrase to your request.
6. Repeat steps 4- 6 for as many data values as necessary.
7. Click *OK* on the Options tab or select the *General* tab to continue.
8. Notice that the Row label (R1, etc.) displays automatically in the Label box.

   If you wish to supply an explicit row label to replace the default label (R1, etc.) on the matrix, type it into the Label input box. (The default label is retained internally.)
9. Enter a row title that you want to display on the report (optional). If you do not supply a title, the tag values are displayed.
10. Optionally, select a formatting check box: Invisible, When Exists, Post to. For details, see *Suppressing the Display of Rows* on page 10-59 and *Saving and Retrieving Intermediate Report Results* on page 10-60.
11. Click OK.

The matrix shows TAG in the Row Type column and, if you entered them, the explicit label in the Label column and the title in the Title column.

Tip: You can also drag (or double-click) tags from the FOR field values panel to a desired location on the matrix. (Multiple tag values may be contiguous or non-contiguous; they appear on the matrix connected by the FML keyword OR.) Then right-click in the TAG row and select Row Properties from the shortcut menu to open the TAG dialog box, where you can enter a descriptive title for the combined values and/or an explicit row label.

Procedure How to Specify a Tag for a Range of Data Values

In the Design matrix:

1. Select the row in which you want to place a range of tag values.

   Note: If you wish to be able to use the same value in more than one row of the matrix, click the *Use Multiple Values* check box in the FML Report Properties area above the matrix.

2. Click the *Tag* icon on the Financial Report Painter toolbar.

   or

   Right-click anywhere in the row (except on the label) and select *Change Type to* >*Tag* from the shortcut menu.

   The TAG dialog box opens at the Options tab.

3. In the Value box, enter the first data value in the range, or click the *Browse* button and select one from the list.

4. In the To box, enter the last data value in the range, or click the *Browse* button and select one from the list.

5. Click the *Add* button to add the beginning and ending range values to the Tags box.

   If you are familiar with FML syntax, note that this entry adds the TO phrase to your request.

6. Click *OK* or select the General tab to continue.

7. Notice that the row label (R1, etc.) displays automatically in the Label box.

   If you wish to supply an explicit row label to replace the default label (R1, etc.) in the matrix, type it into the Label input box. (The default label is retained internally.)

8. Enter a row title that you want to display on the report (optional). If you do not supply a title, the tag values are displayed.

9. Optionally, select a formatting check box: Invisible, When Exists, Post to. For details, see *Suppressing the Display of Rows* on page 10-59 and *Saving and Retrieving Intermediate Report Results* on page 10-60.

10. Click *OK*.

The matrix now shows TAG in the Row Type column and, if you entered them, the explicit label in the Label column and the title in the Title column.

Procedure How to Specify a Tag for a Related Group of Data Values

You can use the masking character ($) to identify a group of data values that are identified by common characters (for example, a group of accounts beginning with the number 10). This is useful for specifying a whole group of tag values without having to name each one.

1. Select the row in which you want to place a group of tag values.

   Note: If you wish to be able to use the same value in more than one row of the matrix, click the *Use Multiple Values* check box in the FML Report Properties area above the matrix.

2. Click the *Tag* icon on the Financial Report Painter toolbar.

   or

   Right-click anywhere in the row (except on the label) and select *Change Type to* **>***Tag* from the shortcut menu.

   The TAG dialog box opens at the Options tab.

3. In the Value box, enter the common characters for the group of tags, followed by one or more masking characters ($$)—for example, 10$$ to represent 1010, 1011, 1020, 1021, 1030, 1031.

4. Click the *Add* button to add the group of tag values to the Tags box.

5. Click *OK* or select the General tab to continue.

6. Notice that the row label (R1, etc.) displays automatically in the Label box.

   If you wish to supply an explicit row label to replace the default label (R1, etc.) in the matrix, type it into the Label input box. (The default label is retained internally.)

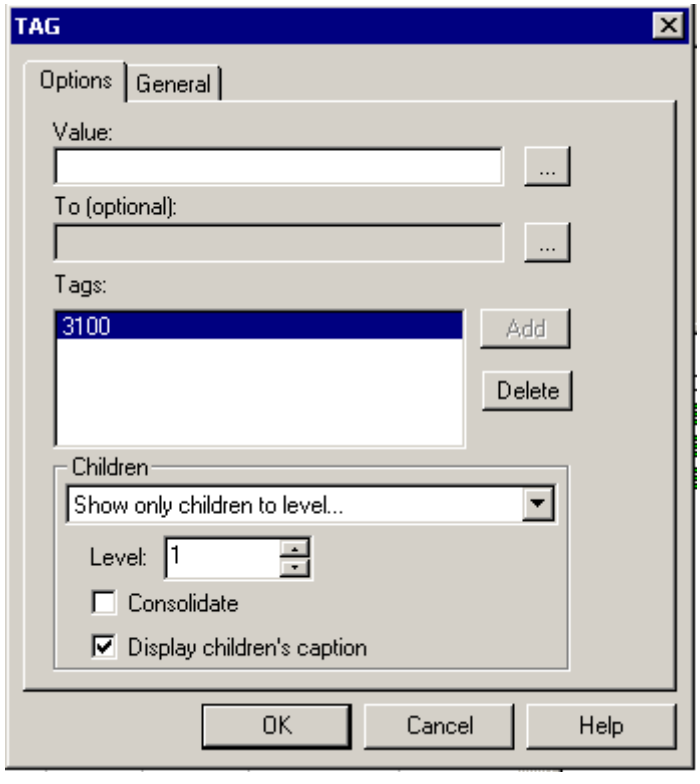
7. Enter a row title that you want to display on the report (optional). If you do not supply a title, the tag values are displayed.

8. Optionally, you can select a formatting check box: Invisible, When Exists, Post to. For details, see *Suppressing the Display of Rows* on page 10-59 and *Saving and Retrieving Intermediate Report Results* on page 10-60.

9. Click *OK*.

The matrix now shows TAG in the Row Type column and, if you entered them, the explicit label in the Label column and the title in the Title column. If you do not specify a title, the tag value and masking characters are displayed.

Reference TAG Dialog Box



Options Tab

Value

Identifies one or more data values for the TAG row.

If you are identifying a range of values, this field identifies the first data value in the range.

If you are using masking characters to specify a group of tag values with common identifying characters, enter the common and masking characters ($$) in the Values box.

To (optional)

Identifies the last data value in the range.

Tags

Displays the value(s) you have selected for the current TAG row.

Add button

Adds values to the Tags box.

Children

The following options appear on the TAG dialog box Options tab *only* when a parent/child relationship has been defined in the Master File being used for a report. In addition, an optional attribute in the Master File enables you to specify another field, which contains a descriptive caption for display in place of the hierarchy field values on the report. For related information, see *Reporting Dynamically From a Hierarchy* on page 10-21.

When you write a financial report against a hierarchy defined in the Master File, you can control data retrieval from the following options on a drop-down list:

Show selected item

Retrieves the value for the specified tag in the hierarchy.

Show selected item consolidated

Displays a single summary row for the numeric data values of all children.

Show only children

Displays the hierarchy starting with the first child of the specified parent, up to 99 levels deep. Each child instance is displayed over the next child instance. The parent level is *not* included in the output.

Successive levels of the hierarchy field are indented two spaces from the previous level. If you wish, you can change the spacing of these indents. See *How to Adjust Indents for Captions in a Hierarchy* on page 10-26.

Show only children to level... Level: n

Displays children up to the level you indicate. The default value is 1. Therefore, if *n* is omitted, direct children are displayed. Level 2 retrieves direct children and grandchildren. The parent level is *not* included in the output.

Show with all children

Displays the hierarchy starting with the specified parent. (Level 99 is equivalent to ALL.) The parent level is included in the output.

Show with children to level... Level: n

Displays the values for the specified parent tag and its children, up to 99 levels deep. The default value is 1. Therefore, if *n* is omitted, direct children are displayed. The parent level is included in the output.

You can refine your display further by choosing the following check box:

Consolidate

You can display a summary row for children up to the level indicated, displayed below the detail rows for the children being summed. Consolidate is supported with the Show children and Show with children options.

Display children's caption

You can display descriptive text defined in the Master File as a caption, in place of the FOR field values.

General Tab

Title

Enables you to specify a title for the TAG row; the title will appear on the report. This entry is optional.

For hierarchical data, the caption defined in the Master File is used for the title. The caption supplies descriptive text that can be used in place of the hierarchy field FOR values.

- If you add a parent to the matrix and specify *Show selected item,* the caption is applied. This value appears in the Title input line, where you can edit it.
- If you add a parent to the matrix and specify *Show selected item,* the caption is applied. This value appears in the Title input line, where you can edit it.
- If you add a parent and specify an option that also retrieves its children, captions for the children are displayed in the Title column. However, the cells are gray, indicating that you cannot change these titles. (This happens whether *Display children's caption* is on or off.)
- If no caption is specified in the Master File, the tag value is displayed as the title. However, you can provide a descriptive title for the row directly in the Title column on the matrix or in the Title input box on the General tab.

If you do not want the caption displayed, uncheck the *Display children's captions* box.

Label

Lists the default identification label (R1, R2, etc.) for the TAG row. You can replace the default row identification label with an explicit row label. (The default label is retained internally.)

In a hierarchy, each generated row is labeled with the specified label text. Children have the same label as their parents.

Formatting Options: The following options apply to individual rows in the report.

Invisible

Creates a TAG row for use in a calculation, but does not display the row on the report. For details, see *How to Suppress Rows* on page 10-59.

When Exists

Displays a row only when data exists for the tag value. By default, a TAG row is displayed even if no data is found for the tag values. The default character used to represent the missing data is a period (.). The When Exists check box enables you to override this convention. For details, see *How to Suppress Rows With No Data* on page 10-59.

Post to

Posts the output of a TAG row to a work file. This row can then be used as if were provided in a DATA row. For details, see *Saving and Retrieving Intermediate Report Results* on page 10-60.

Tip: You can also apply these formatting options from the Row Properties check boxes above the matrix

Reporting Dynamically From a Hierarchy

Hierarchical relationships between fields can be defined in a Master File and automatically displayed using the Financial Report Painter. 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 numeric or both alphanumeric.

For example, suppose that:

- An employee data source contains both the employee's ID and the ID of the employee's manager.

  or

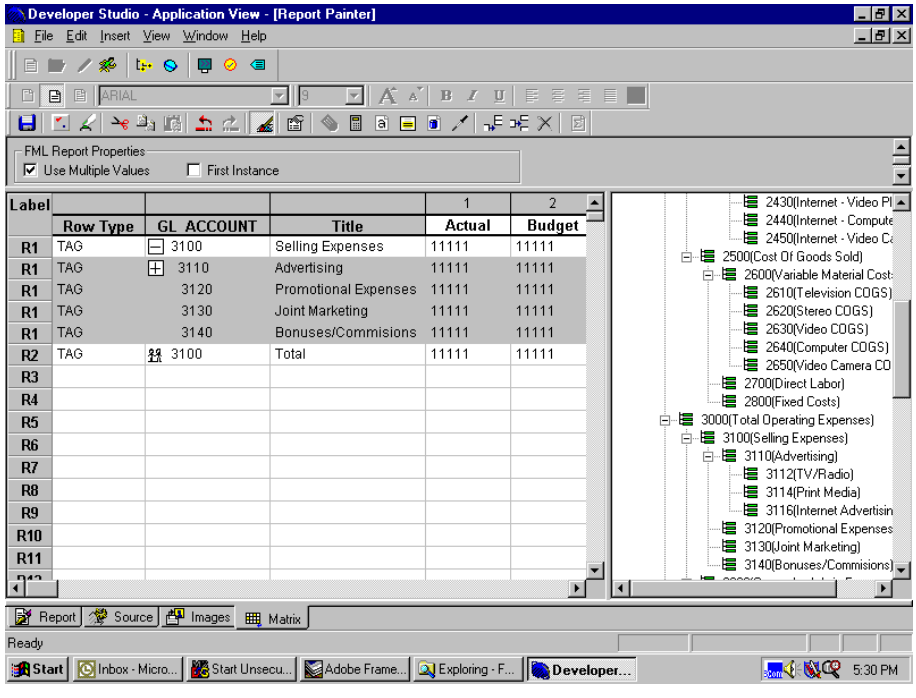
- A general ledger data source contains both an account number field and an account parent field.

By examining these fields, it is possible to construct the entire organization chart or charts of accounts structure. However, to display the chart in a traditional row-based financial report, you would have to list the employee IDs or account numbers in the request in the order in which they should appear on the report. If an employee or account is added, removed, or transferred, you would have to change the report request to reflect this change in organizational structure.

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 report request can then *dynamically* construct the rows that represent this relationship and display them in the report, starting at any point in the hierarchy.

Tip: You can construct the Master File using a text editor or the graphical Master File Editor. For details, see *Describing Data With WebFOCUS Language* and/or *Describing Data With Graphical Tools*.

In the Financial Report Painter, the hierarchy defined in the Master File is reflected in the FOR field values panel to the right of the Design matrix, as shown in the following illustration. If the hierarchy fields are defined with captions in the Master File, the resulting report indents the captions proportionate to their levels in the hierarchy.



For details about how the parent/child hierarchy is represented in the Master File, see *Describing Data With WebFOCUS Language* and/or *Describing Data With Graphical Tools*.

Note: The ability to define a hierarchy in a Master File is particularly useful when you are working with a cube data structure, such as ESSBASE. However, it can be employed with other data source types.

Procedure How to Specify Tags for Data Values in a Hierarchy

In the Design matrix:

1. Select the row in which you want to place tag values that have been organized in a parent/child hierarchy. The hierarchy is reflected in the FOR field values panel to the right of the matrix.

   Note: If you wish to be able to use the same value in more than one row of the matrix, click the *Use Multiple Values* check box in the FML Report Properties area above the matrix.

2. Click the *Tag* icon on the Financial Report Painter toolbar.

   or

   Right-click anywhere in the row (except on the label) and select *Change Type to* **>***Tag* from the shortcut menu.

   The TAG dialog box opens at the Options tab. (Note that when a hierarchy has been defined in the Master File against which you are reporting, a group of specialized options, described in steps 6-8, are included in the TAG dialog box.)

3. In the Value box, enter a value from the hierarchy tree, or click the *Browse* button and select one from the list.

4. Click the *Add* button to add the selected value to the Tags box.

5. Select the value in the Tags box to activate the hierarchy fields.

6. In the Children box, indicate what level of data you want to retrieve or consolidate in the current row of the matrix:

Show selected item consolidated

Displays a single summary row for the numeric data values of all children.

Show only children

Displays the hierarchy starting with the first child of the specified parent, up to 99 levels deep. Each child instance is displayed over the next child instance. The parent level is *not* included in the output.

Successive levels of the hierarchy field are indented two spaces from the previous level. If you wish, you can change the spacing of these indents. See *How to Adjust Indents for Captions in a Hierarchy* on page 10-26.

Show only children to level... Level: n

Displays children up to the level you indicate. The default value is 1. Therefore, if *n* is omitted, direct children are displayed. Level 2 retrieves direct children and grandchildren. The parent level is *not* included in the output.

Show with all children

Displays the hierarchy starting with the specified parent. (Level 99 is equivalent to ALL.) The parent level is including in the output.

Show with children to level... Level: n

Displays the values for the specified parent tag and its children, up to 99 levels deep. The default value is 1. Therefore, if *n* is omitted, direct children are displayed. The parent level is including in the output.

7. By default, the *Display children's caption* box is checked. This enables you to display descriptive text, defined in the Master File, in place of the hierarchy field FOR values. If you do not want the caption displayed, uncheck the *Display children's captions* box.

- If you add a parent to the matrix and specify *Show selected item,* the caption is applied. This value appears in the Title input line, where you can edit it.
- If you add a parent and specify an option that also retrieves its children, captions for the children are displayed in the Title column. However, the cells are gray, indicating that you cannot change these titles. (This happens whether *Display children's caption* is on or off.)
- If no caption is specified in the Master File, the tag value is displayed as the title. However, you can provide a descriptive title for the row directly in the Title column on the matrix or in the Title input box on the General tab.

8. If you chose an option that retrieves children in step 6, you can check the *Consolidate* box on the Options tabs to display a summary row for children up to the level indicated, immediately following the detail rows for the children being summed.

9. Click *OK* or select the General tab to continue.

10. Row label (R1, etc.) will automatically display in the Label box.

If you wish to supply an explicit row label to replace the default label (R1, etc.) in the matrix, type it into the Label input box. (The default label is retained internally.)

The same label applies to the parent level and all child levels.

11. Optionally, you can select a formatting check box from the General tag: The formatting check box options are:

- Invisible
- When Exists
- Post to

For details, see *Suppressing the Display of Rows* on page 10-59 and *Saving and Retrieving Intermediate Report Results* on page 10-60.

12. Click *OK*.

The matrix now shows TAG in the Row Type column for the parent values. Each parent value for children that has been retrieved is preceded by a plus sign (+) that you can click to display the children. The plus sign (+) becomes a minus sign (-) that you can click to roll up the child values.

If you entered an explicit label in the Label input box, this element will appear in the matrix.

If you selected the *Use Multiple Values* check box in the FML Report Properties area above the matrix, the used value remains available in the FOR field values panel. It is displayed in red to indicate that it has already been added to the matrix.

Tip: You can also drag (or double-click) a tag from the FOR field values panel to a desired location on the matrix. Then right-click in the TAG row and select Row Properties from the shortcut menu to open the TAG dialog box.

Procedure How to Adjust Indents for Captions in a Hierarchy

To clarify relationships within a hierarchy, the captions (titles) of values are indented at each level. If you wish to adjust the indents:

1. Choose *Indent* from the File menu. The Indent dialog box opens.

   If a hierarchy has not been defined in the Master File for the data you are reporting against, the Indent option does not appear.

2. Choose one of the following radio buttons:

   - *Turn indent off.* This option left-justifies titles for values at all levels of the hierarchy.
   - *Select a value of indent*, then enter an explicit measurement to represent the number of spaces to be indented based on the number of blank spaces preceding the caption text in the Master File and the unit of measurement defined in the Page Setup dialog box (inches, centimeters, or points). For example, suppose that the caption text is preceded by two blanks and the base measurement is inches. If you enter .2, each level of values in the hierarchy will be indented .2 inches for each leading space (.2" x 2) from the previous level.

Displaying an FML Hierarchy

When reporting from an FML hierarchy, you can dynamically retrieve and display hierarchical data using two variations:

- *Show only children* displays only the children, not the parent value for those children.
- *Show with children* displays the parent and then the children.

In either case, you can show all children for the specified parent, or children to a specified level in the hierarchy, up to 99 levels deep. The default hierarchy depth is one level. To highlight these relationships visually, successive levels of the hierarchy field are indented two spaces from the previous level. (If you wish, you can change the indentations. See *How to Adjust Indents for Captions in a Hierarchy* on page 10-26.)

The hierarchy is displayed sorted by the parent field and, within parent, sorted by the hierarchy field.

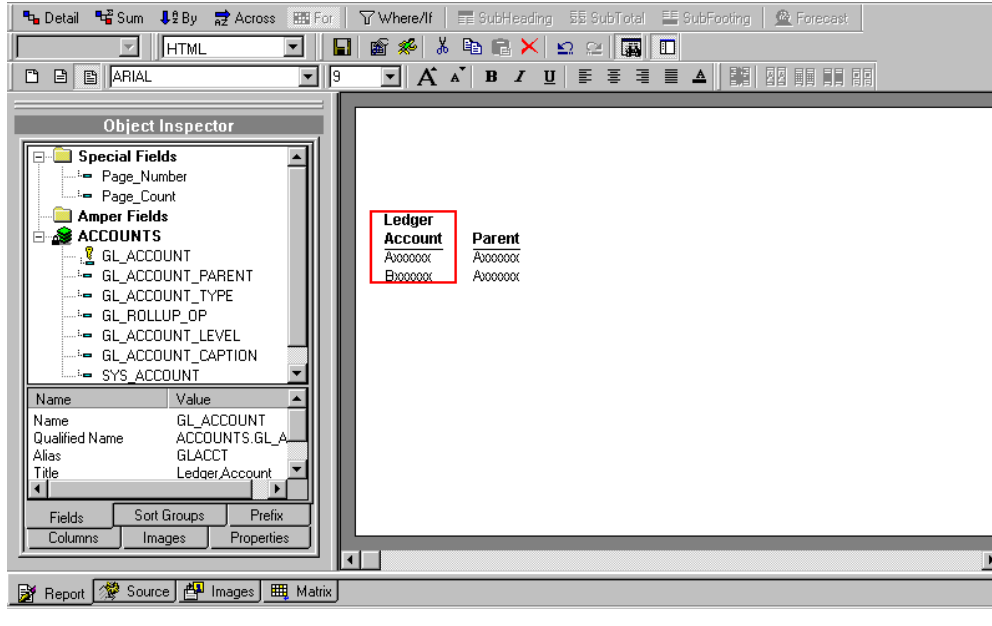
When displaying a hierarchy, you can show either detail or summary data for fields other than the For field in the request. You can also replace the For field value with a descriptive caption.

Example Displaying an FML Hierarchy With Captions

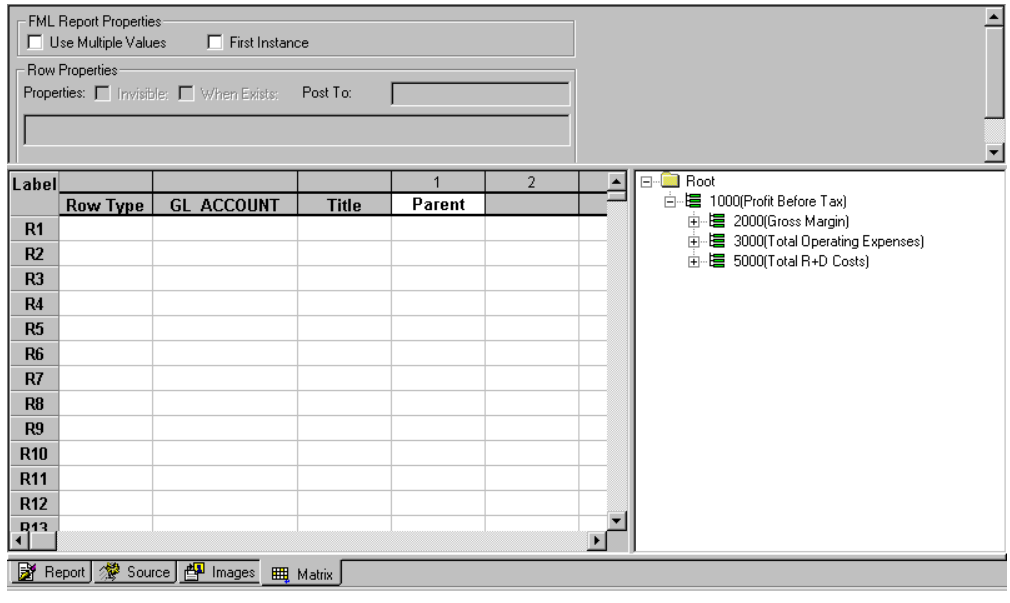
The following example displays two levels of a charts of accounts hierarchy and shows descriptive captions defined in the Master File, instead of the account numbers, in the report.

1. Create a report procedure in Developer Studio and name the file *fmlhiercaps*.
2. When prompted, choose Report Painter as your reporting tool (it is the default) and choose CENTGL as your data source. To examine this data, see *Sample Data for FML Hierarchy Examples* on page 10-44.

   The Report Painter opens with CENTGL fields listed in the Object Inspector panel.
3. Drag the field GL_ACCOUNT_PARENT into the Report Painter window; the column title associated with this field is Parent. Select *Parent* and click the *Detail* button.
4. Now drag GL_ACCOUNT into the Report Painter window; the column title associated with GL_ACCOUNT is Legder Account. Select *Ledger Account* and click the *For* button. (This will become the controlling field in your financial report.) The Report Painter looks like this:



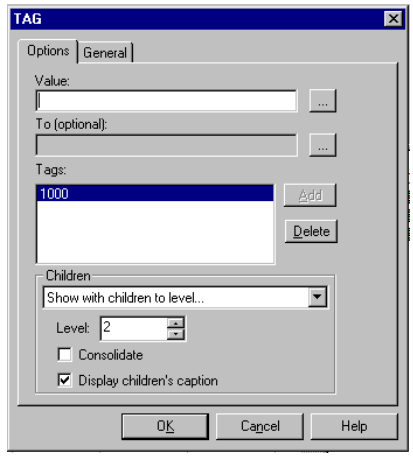
5. Click the Matrix tab below the Report Painter to open the Design matrix. Note that GL_ACCOUNT (the For field) is the title of the second column and its values appear in the For field values panel at the right of the matrix. You will be populating the matrix with these values.



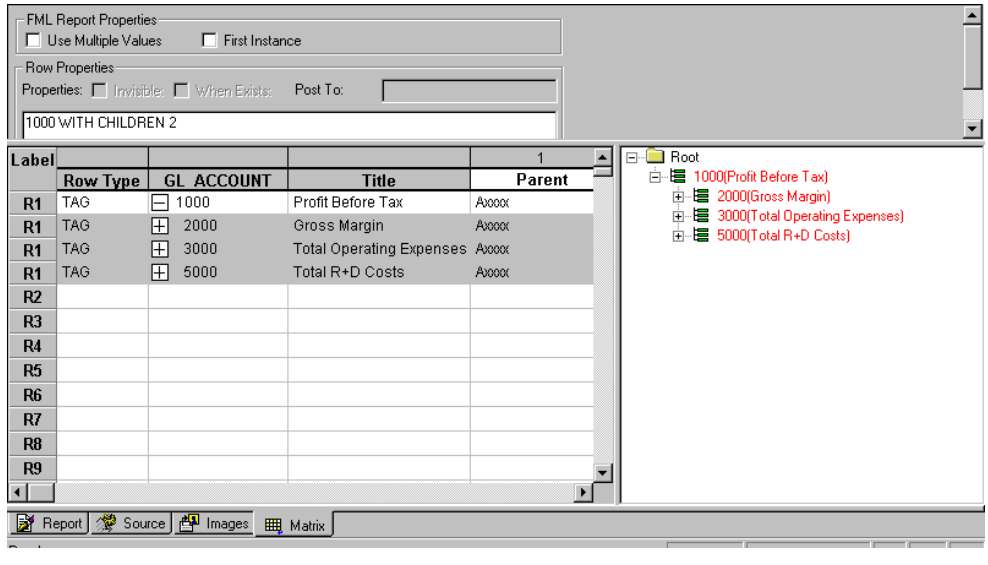
6. Begin by dragging the tag 1000 from the FOR field values panel into row R1 of the matrix. The 1000 account tag appears in the GL_ACCOUNT column.

7. In row R1, right-click 1000 and select Row Properties from the menu. The TAG dialog box opens, with 1000 listed in the Tags box.

8. In the Children box, choose *Show with children to level...* from the drop down list, then select *2* in the Level box to display two levels of the hierarchy, with account 1000 as the starting point (or parent level). The *Display children's captions* check box is selected by default. This will show the descriptive titles for the children, rather than their tag values (1000, 2000, etc.), on the report. The dialog box looks like this:



9. Click the plus (+) sign next to 1000 to expand the hierarchy one level. The matrix now looks like this:



If you wish, repeat the process to expand the hierarchy another level.

10. To add some quick styling, click the *Report Options* icon on on the toolbar above the matrix. On the Style tab, click the *Style File Selection* button (bottom right of window). The Style File Selection dialog box opens. Select the style sheet *DefaultGrid (DEFFLT1.STY)* under Style Sheet Source. Click *OK* to confirm your choice and *OK* again to return to the matrix.

11. Click the *Run* icon on the toolbar to see the report, which lists the account numbers associated with the levels of the parent/child hierarchy. The indents for the hierarchy levels are set by default.

	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

Tip: If you wanted to see the children in the hierarcy without the parent, you could choose *Show only children to level 2* in step 8, rather than *Show with children to level 2*. Without the parent line the report would look like this:

	Parent
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

Consolidating an FML Hierarchy

The Consolidate option consolidates multiple levels of the hierarchy on one line of the report output. Consolidate can be used alone or in conjunction with the Show children or Show with children options. Consolidation is designed to work with requests that use the Sum option for fields other than the For field. It is also designed to be used with detail level data, not data that is already consolidated.

- When used *alone*, the Consolidate option aggregates the parent and children on one line of the report output, summing the numeric data values included on the line.
- When used in conjunction with *Show only children*, the Consolidate option 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 will have a line in the report output and the summary for each child will include all of its children.
- When used in conjunction with *Show with children*, the Consolidate option 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 *Show only children* plus *Consolidate*.

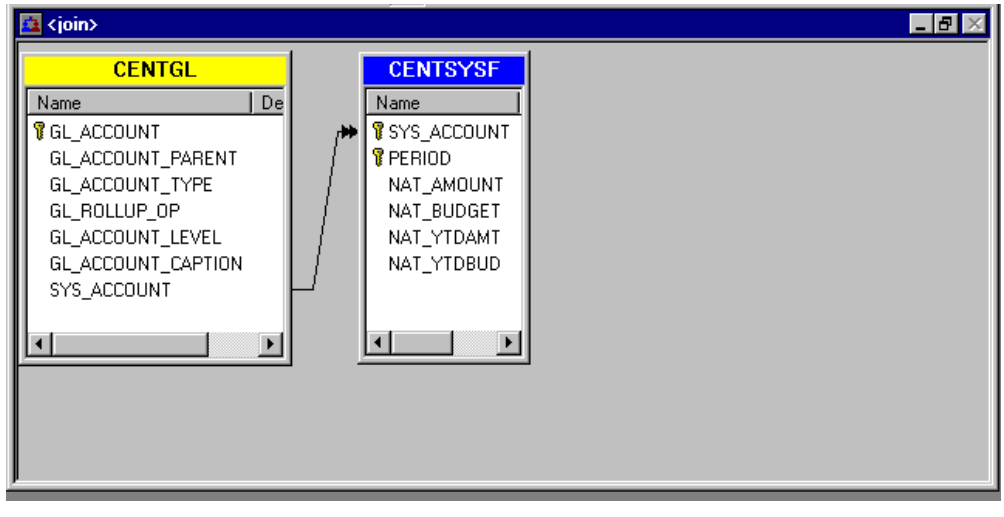
In order to use a data record in more than one line of a financial report (for example, to display both detail and summary lines or to consolidate detail data at multiple levels), select the option *Use Multiple Values* before you begin to populate the matrix.

Example Displaying One Summary Line for an FML Hierarchy

Data Detour: For this example, you will use two data sources: CENTGL and CENTSYSF. CENTSYSF contains detail level financial data. CENTGL defines the account hierarchy. To use the financial data with the account hierarchy, you will need to join the two data sources.

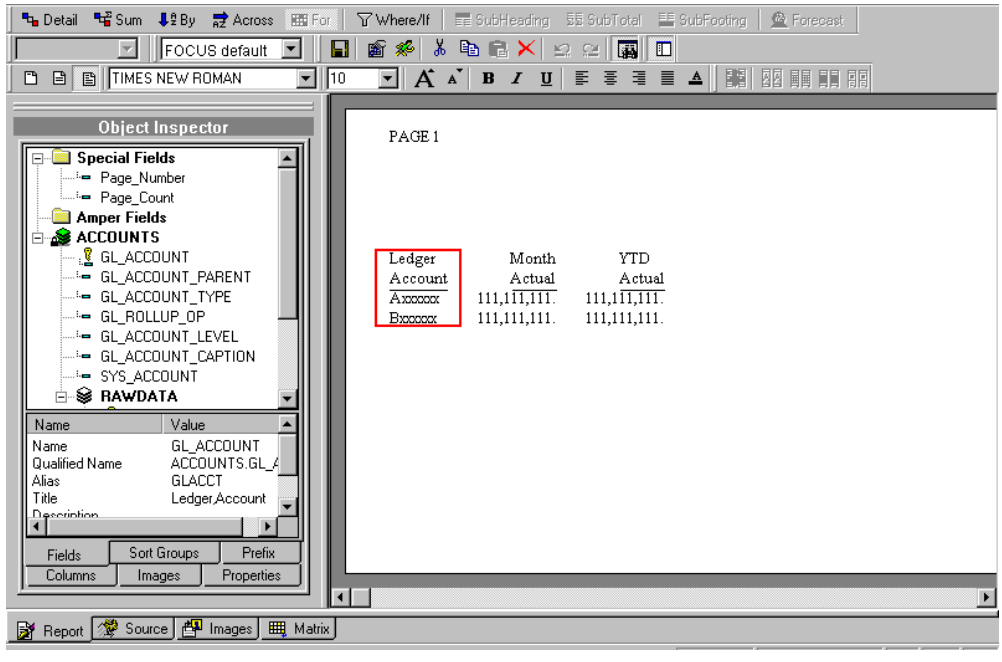
Before you complete this example, we urge you to examine the data you will be using. While you can follow the flow of this example without looking at the data, doing so will help you understand the process and the output more fully. See *Sample Data for FML Hierarchy Examples* on page 10-44. In Developer Studio, create a procedure and name the file *fmlhiersumrow*.

1. When prompted, choose Report Painter as your reporting tool (it is the default) and choose CENTGL as your host data source. The component connector window opens briefly, followed by the Report Painter, where CENTGL fields are listed in the Object Inspector panel.
2. Click the Prefix tab below the Object Inspector, right-click in the Object Inspector and choose Add New Join from the menu. When prompted, specify CENTGL as the host file. When the Join tool opens, click the *Add* icon to choose CENTSYSF as the cross-reference file. The Join is created automatically, based on the SYS_ACCOUNT field from each data source, as shown below:

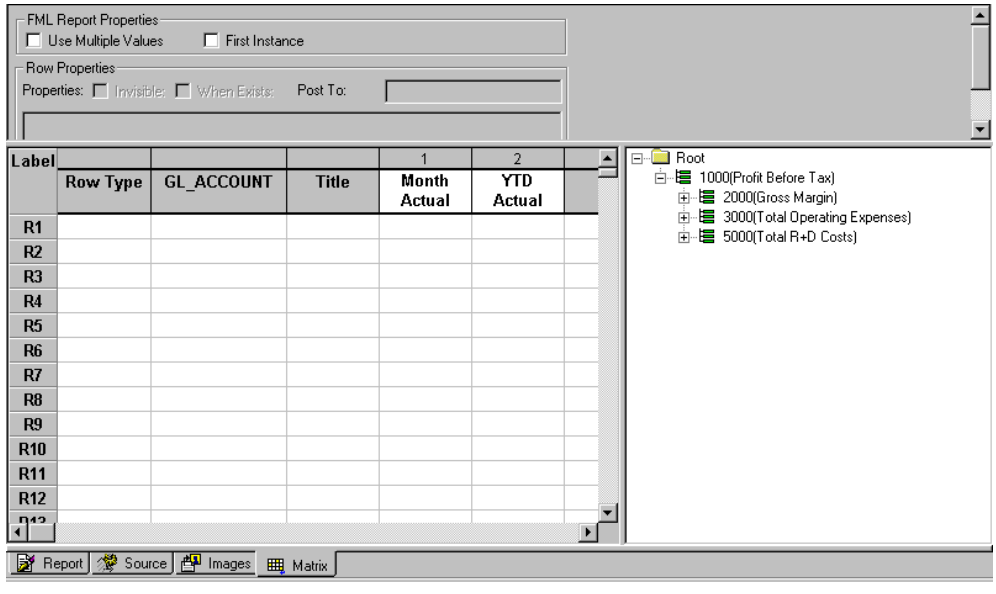


3. Run the Join and close the tool. The fields from CENTGL and CENTSYSF are now listed in the Object Inspector.
4. Drag GL_ACCOUNT (Ledger Account), NAT_AMOUNT (Month Actual), and NAT_YTDAMT (YTD Actual) into the Report Painter window.

5. Select Month Actual and click the *Sum* button; repeat for YTD Actual. Select Ledger Account and click the *For* button. (The For field will become the controlling field in your financial report.) The Report Painter now looks like this:



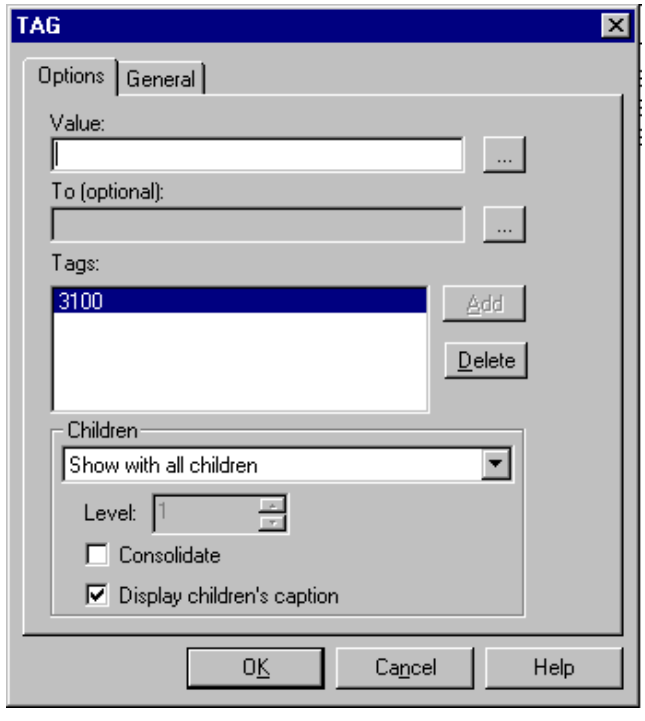
6. Click the Matrix tab below the Report Painter to open the Design matrix. Note that GL_ACCOUNT (the For field) is the title of the second column and its values appear in the For field values panel at the right of the matrix. You will be populating the matrix with these values.



7. First, click the *Use Multiple Values* check box above the matrix. The will enable you to use the same For field value more than once, to present both the detail data and the consolidation.

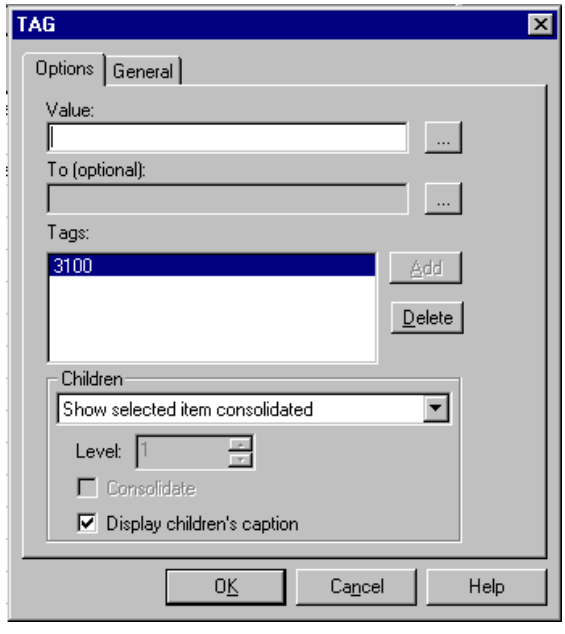
8. Now, drag 3100 onto the matrix in row R1. Right-click on 3100 and select Row Properties.The TAG dialog box opens, with 3100 in the Tags list.

9. In the Children box, select *Show with all children* and accept the default to *Display children's captions*. This will generate detail data for the parent value (3100) and all of its children, represented on the report by their descriptive captions rather than their account numbers.

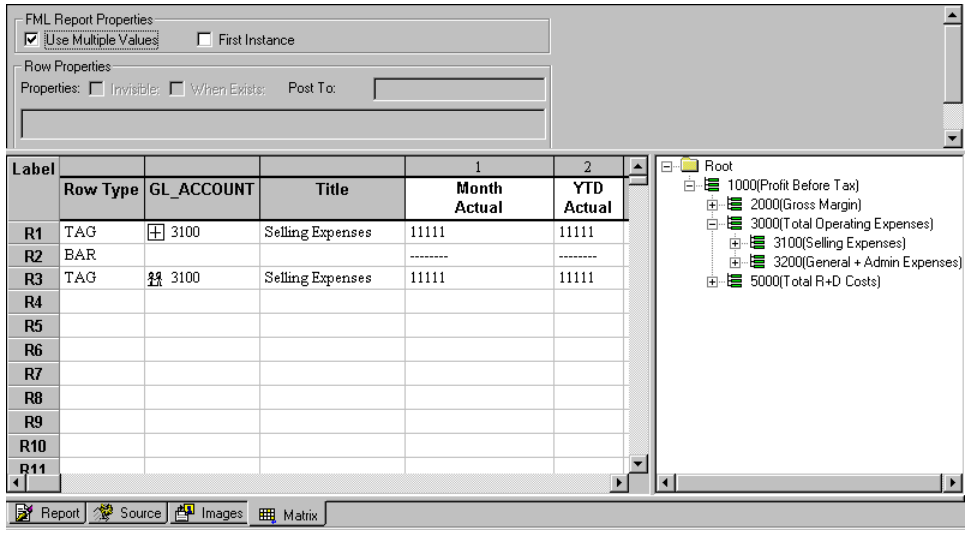


10. To add an underline below the detailed numeric data, right-click in row R2, select *Change Row type to,* and click the radio button for *Bar*. The BAR dialog box opens. Accept the default underline character.

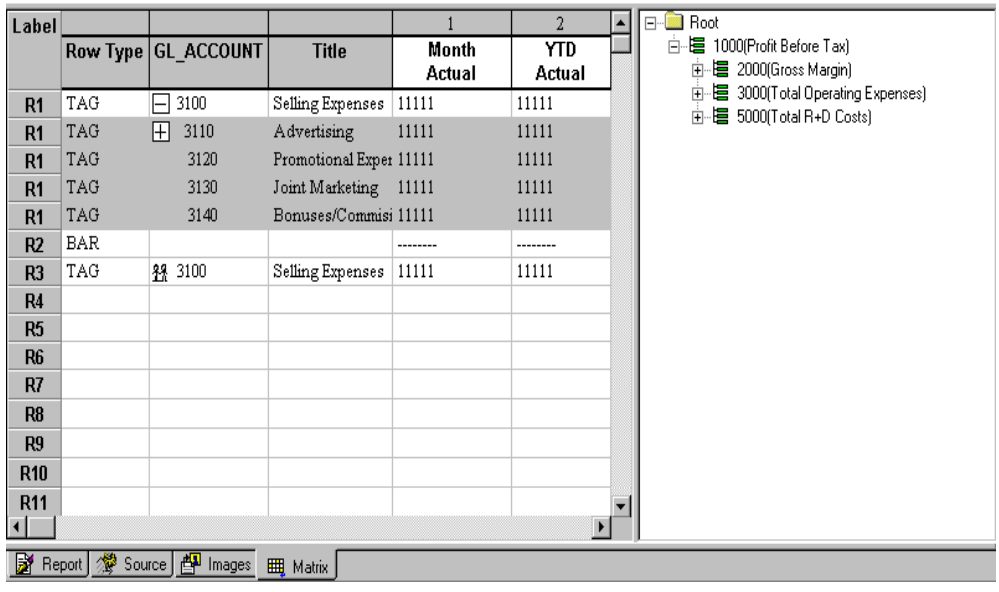
11. Drag 3100 into the matrix again. (Notice that 3100 and its children are now red to indicate that they have already been used in the matrix.) Right-click and choose Row Properties. The TAG dialog box opens. This time, in the Children box, select *Show selected item consolidated* to generate one summary line for Selling Expenses and all of its children.



The matrix now looks like this:



12. Click the plus (+) sign next to 3100 in row R1 to expand the hierarchy:



Notice that Advertising has its own children, while the other children of Selling Expenses do not. Notice also that the consolidated row, R3, has no plus sign (+) or hierarchy to expand.

13. To add some quick styling, click the *Report Options* icon on the toolbar above the matrix. On the Style tab, click the *Style File Selection* button (bottom right of window). The Style File Selection dialog box opens. Select the style sheet *DefaultGrid (DEFFLT1.STY)* under Style Sheet Source. Click *OK* to confirm your choice and *OK* again to return to the matrix.

14. Click the *Run* icon in the toolbar above the matrix to generate the following output:

	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.

Note that only accounts with no children are populated in the detail level data source (CENTSYF), therefore, no values are displayed for Selling Expenses and Advertising. The consolidation row accurately sums the detailed data.

Tip: 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:

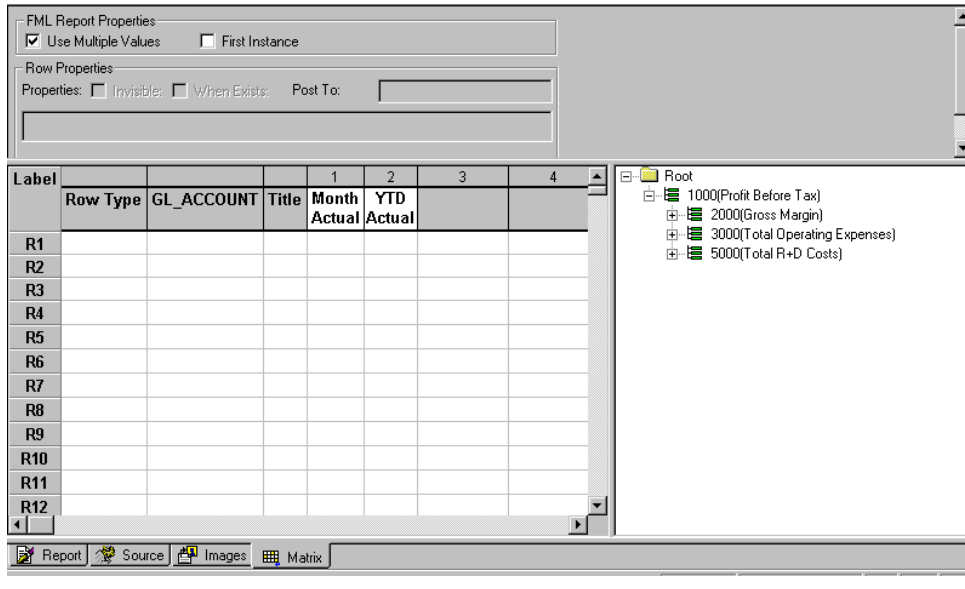
```
RECAP CHILDSUM = R2-R1;
```

Example Consolidating FML Hierarchy Data

1. Create a procedure called *fmlconsolidat* in Developer Studio, following steps 1-8 in the example, *Displaying One Summary Line for an FML Hierarchy* on page 10-32. Note that this example uses the data described in *Sample Data for FML Hierarchy Examples* on page 10-44.

   Tip: If you wish, rather than starting from scratch, you can open the matrix created in *Displaying One Summary Line for an FML Hierarchy* on page 10-32, delete the content of the matrix, and then complete the steps that follow.

2. You should be looking at an empty matrix, with *Use Multiple Value* checked.



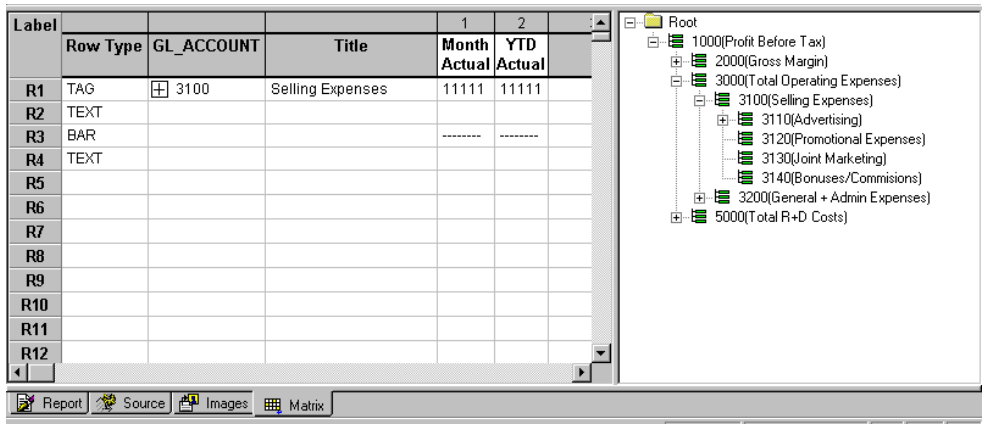
   Drag 3100 onto the matrix in row R1. Right-click on 3100 and select Row Properties. The TAG dialog box opens, with 3100 in the Tags list.

3. In the Children box, select *Show with all children* and accept the default to *Display children's captions*. This will generate detail data for the hierarchy, starting with account 3100. Descriptive captions, rather than account numbers, will display in the output.

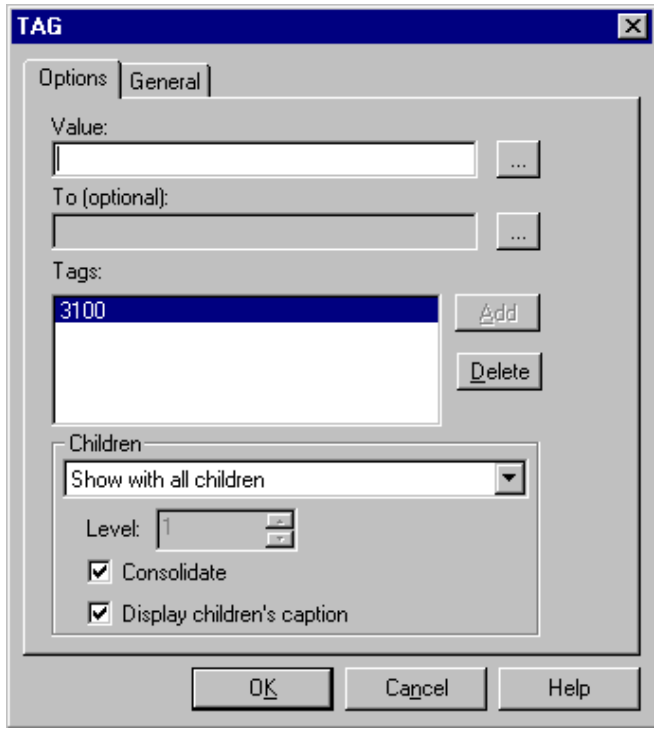
4. To separate the detailed output in the top section of the report from the consolidated output in the bottom section, you will add a blank row. Right-click in row R2 and select Change Row Type to *Text*. The TEXT dialog box opens. Leave the input box blank to specify a row with no content and click *OK*.

5. To underline the numeric columns, right-click in row R3, and select Change Row Type to *Bar*. Accept the default underline character and click *OK*.

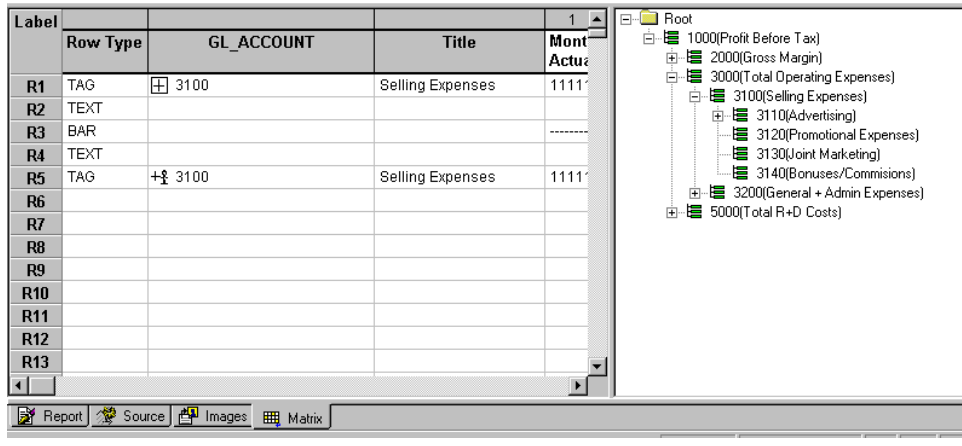
6. Repeat step 4 to make row R4 a blank line as well. The matrix now looks like this:



7. To create a consolidated line for the parent account (3100) and each direct child, drag account 3100 into row R5, right-click 3100, and choose Row Properties. In the TAG dialog box, select *Show with all children* and click the Consolidate check box.



The matrix now looks like this:



8. Before you run the report, limit the data to be retrieved to the period from 2002-2003. To do this, click the Report menu at the top of the screen and choose the Where/If tab. The Expression Builder opens. Using any method you choose, create the following expression:

```
PERIOD EQ '2002/03'
```

9. Now click the *Run* icon.

In the following output, notice that:

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 3100 (Selling Expenses): Advertising, Promotional Expenses, Joint Marketing, and Bonuses/Commissions.
- The line for Advertising is the sum of itself plus all of its children. If it had had multiple levels of children, they would all have been added into the sum. The other direct children of 3100 did 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.

Tip: If you wanted to see the children in the hierarcy without the parent, you could choose *Show only children*, rather than *Show with children*. Without the parent line the report would look like this:

	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.

What makes this reporting dynamic?

Suppose that you run this report weekly. If you ran the report today, and tomorrow another account were added as a child of 3100, next week's report would automatically reflect the change in the hierarchy, as well as changes to the data, based on the versatile parent/child declaration in the Master File. No adjustment would be needed to keep either the Master File or the report request up to date.

Reference Sample Data for FML Hierarchy Examples

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 company, 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',   $
FIELDNAME= NAT_YTDBUD     ,  ,D12.0    , TITLE='YTD,Budget',   $
```

You can create an FML hierarchy in a Master File using a text editor or the graphical Master File Editor. For details, see *Describing Data With WebFOCUS Language* and/or *Describing Data With Graphical Tools*.

Supplying Data Directly

In certain cases, you may need to include some additional constants (for example, exchange rates, inflation rates, etc.) in your model. Not all data values for the model have to be retrieved from the data source. Using the Financial Report Painter, you can supply data directly in the request. For related information, see *Saving and Retrieving Intermediate Report Results* on page 10-60.

Procedure **How to Add Data Values Directly to the Report**

1. Click the *Data* icon on the Financial Report Painter toolbar.

   or

   Right-click anywhere in the row (except on the label) and select *Data* from the shortcut menu.

   The DATA dialog box opens at the General tab.

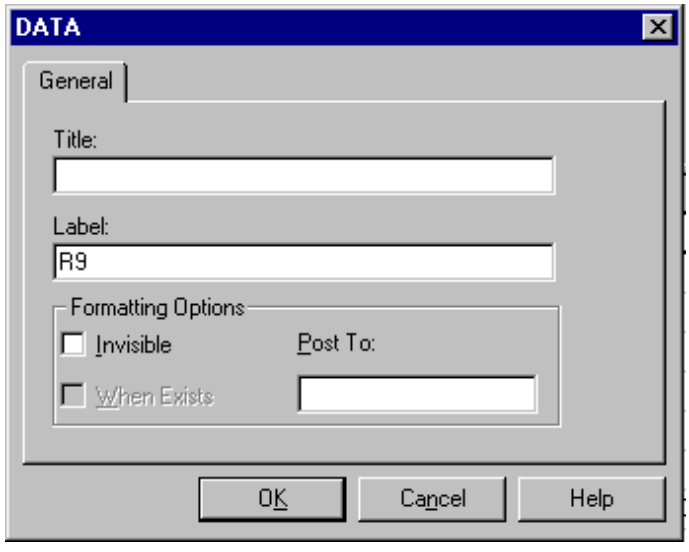
2. In the General tab, you can:

   - Type a row title.
   - Supply an explicit row label to replace the default label on the matrix. (The default label is retained internally.)
   - Select formatting options: Invisible and/or Post to. See *DATA Dialog Box* on page 10-46.

   These entries are optional.

3. Click *OK* to record your entries.
4. DATA appears in the Row Type column. Type the data values (constants) in the appropriate cells in the matrix.

Reference DATA Dialog Box



General Tab

Title

Enables you to specify a title for the DATA row; the title will appear on the report. This entry is optional.

Label

Lists the default label for the DATA row. You can replace the default row identification label with an explicit row label. (The default label is retained internally.)

Formatting Options:

The following options apply to individual rows in the report.

Invisible

Creates a DATA row for use in a calculation, but does not display the row on the report. For details, see *Suppressing the Display of Rows* on page 10-59.

Post to

Posts the output of a DATA row to a work file. This data can then be used as though it were provided in a DATA row. For details, see *Saving and Retrieving Intermediate Report Results* on page 10-60.

Tip: You can also apply these formatting options from the Row Properties area above the matrix.

Performing Inter-Row Calculations

The Recap operation in the Fincancial Report Painter enables you to perform calculations on data in the rows of a report to produce new rows. Since these calculations are performed on rows, each row referenced in the calculation must be uniquely identified either by the default label assigned by Financial Report Painter or a label you assign to the row.

To initiate a Recap operation, you must supply the format of the value that will receive the result of the calculation, and an expression that defines the calculation you wish to perform. Initially, the default row label (R1, etc.) serves as the identifying label for the calculated value. However, it is good practice to provide a more descriptive label for reference in other calculations.

In the Financial Report Painter, you can type an expression directly into the RECAP dialog box or use a tabbed dialog box to formulate your expression.

Note: If you want to create a Recap row that summarizes the data in existing rows and does not require an expression, you can use a simple alternative procedure. For details, see *How to Create a Recap Summary Row* on page 10-56.

Procedure How to Create a Recap Expression in Financial Report Painter

In the Design matrix:

1. Select the row in which you want to perform the calculation.
2. Click the *Recap icon* on the Financial Report Paintertoolbar.

   or

   Right-click anywhere in a blank row (except on the label) and select *Change Type to* > *Recap* from the shortcut menu.

   The RECAP dialog box opens at the Options tab.
3. You can perform a Recap for a single column, a range of columns, columns at specified intervals, or for all columns in a row. To perform a Recap calculation and display output for:
   - **A single column**. Select a column from the Columns drop-down list.
   - **A range of columns**. Enter the number of the first column in the *From Column* box and the number of the last column in the *To Column* box.
   - **Columns with an incremental interval**. Enter values in the *From Column* and *To Column* boxes, then enter an increment number. For example, type 2 for every other column, 3 for every third column, and so on.
   - **All columns in a row**. Click *Apply to row*. (The Columns box is disabled.)
4. Assign a format to the Recap output field. You can either enter the format in the Format box or click the *Format* button to open the Format dialog box. For details, see *Format Dialog Box* on page 10-53.
5. Type a Recap expression in the input box, and go to step 10.

   or

   Click the *Advanced* button to expand the Recap Options tab, exposing features that will assist you in building an expression that may be composed of numbers and operators (numeric, alphanumeric, Boolean, and conditional), built-in functions, sort fields, and labels. The expression you create is displayed on the Options tab box as you make your selections. This process is described in steps 6 through 9.
6. Use the Recap calculator to compose the expression that WebFOCUS will evaluate. Click numbers plus the operators you need to create numeric, alphanumeric, date, logical, and conditional expressions. For details, see Appendix B, *Writing Expressions*.

   You can also add parenthesis and single quotation marks and designate uppercase and lowercase as required by clicking the buttons below the Expression window.

7. If you wish to include a built-in function in the expression, select the function from the drop-down list. The function is added to the Expression window, along with placeholders for the required arguments. Type appropriate values over the argument placeholders, or use the tools provided to select the values you need. For details, see the *Using Functions* manual.
8. If you wish to include a row label in your expression, click the label in the Labels drop-down list. (Note that the list shows default row labels unless you have defined explicit labels.)
9. If you wish to include a vertical sort (BY) field in your expression, click the field in the By Fields drop-down list.

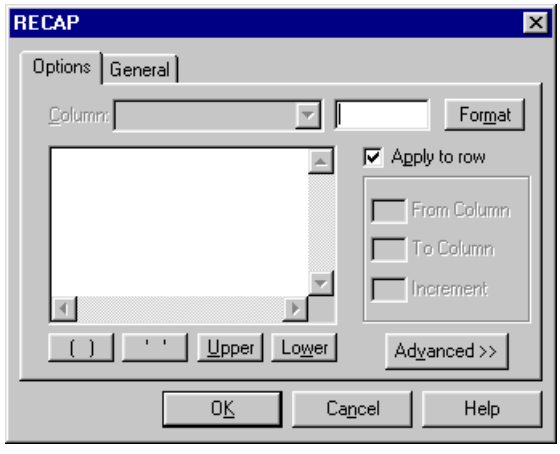
   Tip: You can use a sort field value in a RECAP command to allow the model to take different actions within each major sort break. For example, in a request sorted by REGION, the following calculation would compute a non-zero value only for the EAST region:

   ```
   IF REGION EQ 'EAST' THEN .25*CASH ELSE 0;
   ```

10. Click the General tab and type the title for the Recap calculation that you want to display on the report. Though optional, this entry is generally included in financial reports.
11. Notice that the row label (R1, etc.) displays automatically in the General tab's Label box. This label is used to reference the result of the Recap calculation. If you wish to supply an explicit row label to replace the default label on the matrix, type it into the Label box. (The default label is retained internally.) Though optional, this entry is generally included in financial reports.
12. Click *OK* to complete the expression.

RECAP appears in the Row Type column of the matrix, along with the expression, label, and title you define.

Reference RECAP Dialog Box



Options Tab

Several options in this dialog box enable you to specify the column or columns to which you want to apply a Recap formula:

Column

Identifies a single column that will contain the Recap formula; this is also the column in which the Recap output will be displayed on the report. You can choose the column from the drop-down list.

Apply to row

Indicates that the same Recap formula is to be used for all columns in the row. (The Columns box is disabled when you select Apply to row.)

From Column/To Column

Defines a range of columns to which the Recap formula is to be applied.

Increment to

Indicates an interval of columns in the range that should have the Recap formula applied. For example, a value of 2 will apply the formula to every other column.

Note: Although not directly supported by options in the Recap dialog box, there are a number of other ways in which you can identify the columns to which you want to apply the Recap calculation: column address, column value, and cell notation. To use these features, you must type the required syntax directly into the expression box in the Recap dialog box. For details, see Chapter17, *Creating Financial Reports,* in the *Creating Reports With WebFOCUS Language* manual.

Format box

Identifies the field type, field length, and display options that will be used for the Recap output. The field type can be alphanumeric, numeric, or date.

Format button

Opens the Format dialog box, which is designed to help you choose the format for your Recap output. See *Format Dialog Box* on page 10-53.

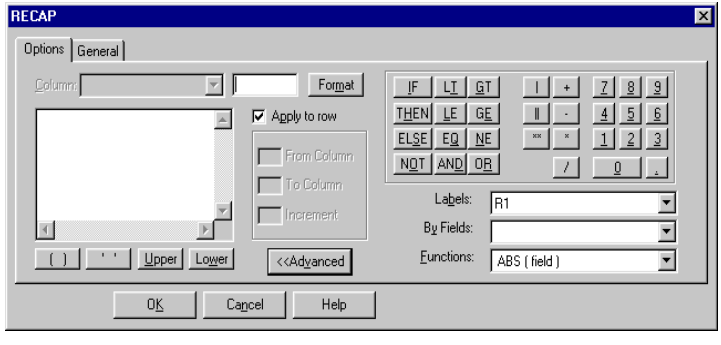
Expression box

Displays the expression used to generate the Recap output.

Type the expression, or click the *Advanced* button to expand the Options tab, exposing features that will help you create the expression.

Advanced>> button

Expands the Options tab to make it easy to add functions, numbers, operators, labels, and sort fields to your expression. Your selections are reflected in the Expression box.



Calculator

Provides numbers and operators that you can use to create numeric, alphanumeric, Boolean, and conditional expressions. Click the desired number or operator to add it to the formula in the Expression box.

Four additional buttons below the Expression box enable you to:

- Enclose a value in parentheses. Click the ( ) button to add parenthesis.

  Parentheses affect the order in which WebFOCUS performs the specified operations. For information on when to use parentheses, see Appendix B, *Writing Expressions*,.

- Enclose alphanumeric or date literals in single quotation marks. Click the ' ' button to add quotation marks.

- Convert entries in the expression box to upper or lowercase. Click the *Upper* or *Lower* button to specify case. Note that field names are case sensitive.

Labels

Lists the labels (default or explicitly defined) that you can use in your expression. Select the label you want to add from the drop-down list. Your selection is added to the formula.

By Fields

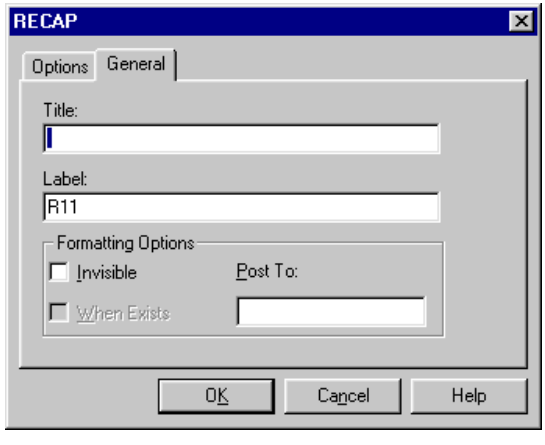
Lists the vertical sort (BY) fields that you can use in your expression. Select the fields you want to add from the drop-down list. Your selection is added to the formula.

Functions

Lists all available built-in functions that you can add to your expression. (A function is a program that returns a value.)

Select a function from the drop-down list. Then, in the Expression box, highlight each argument and substitute the value or field name you wish to use by typing or by selecting items from other drop-down lists. For details, see the *Using Functions* manual.

General Tab



Title

Enables you to specify a title for the Recap calculation; this title will appear on the report.

Label

Lists the default label for the Recap row. You can replace the default row identification label with an explicit row label that you want to reference on the left hand side of an expression. You can think of this label as a calculated value or as a variable that holds the result of the Recap calculation. It can also be used as part of the expression in subsequent Recap formulas.

Formatting Options

The following options apply to individual rows in the report.

Invisible

Creates a Recap expression for use in a calculation, but does not display its results on the report.

Post to

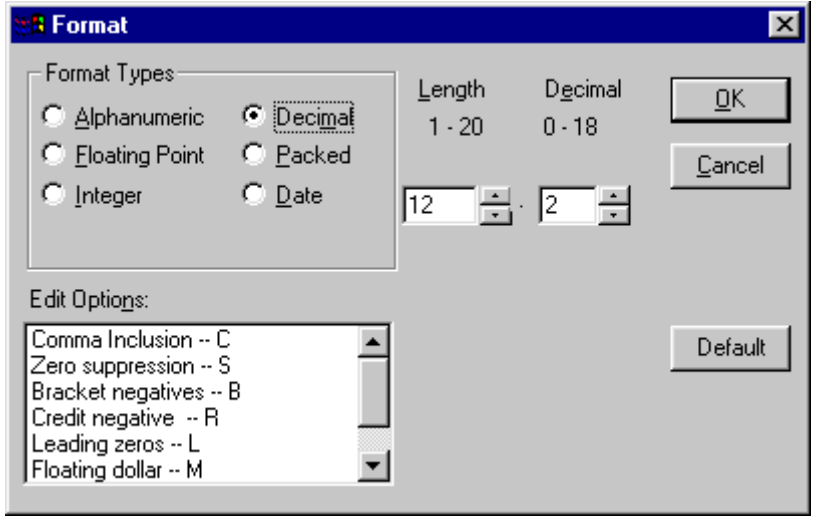
Posts the output of a Recap line to a work file. This line can then be used as though it were provided in a DATA row. For details, see *Saving and Retrieving Intermediate Report Results* on page 10-60.

Tip: You can also apply these formatting options from the Row Properties check boxes above the matrix.

Reference

Format Dialog Box

You can use the Format dialog box to define the format of the output to be generated by a Recap calculation.



Click the *Format* button to access the Format dialog box. The Format dialog box has the following fields/options:

Format Types

Specifies the format of the current field: alphanumeric, numeric, or date.

Length

Specifies the length, in characters, of a field. Enter a number in the Length box, or click the arrow buttons to specify a number. For details, see See Appendix A, *Assigning Field Formats*.

Alphanumeric	1-256 (default, 20)
Floating Point	1-9 (default, 7.2)
Integer	11(default, 5)
Decimal	20.18 (default, 12.2)
Packed	33.31 (default, 12.2)
Note: For numeric fields, include the decimal place in the length.	
Date	default, MDYY

Decimal

Specifies the number of decimal places to the right of the decimal point in a Decimal, Packed Decimal, or Floating Point field.

Edit Options

Add display options to a numeric or date field's format to control how the field will be shown in reports. For details, see For details, see Appendix A, *Assigning Field Formats*.

With Field

When checked, displays the real fields from the specified Master File. You can then select the real field that will be associated with the temporary field.

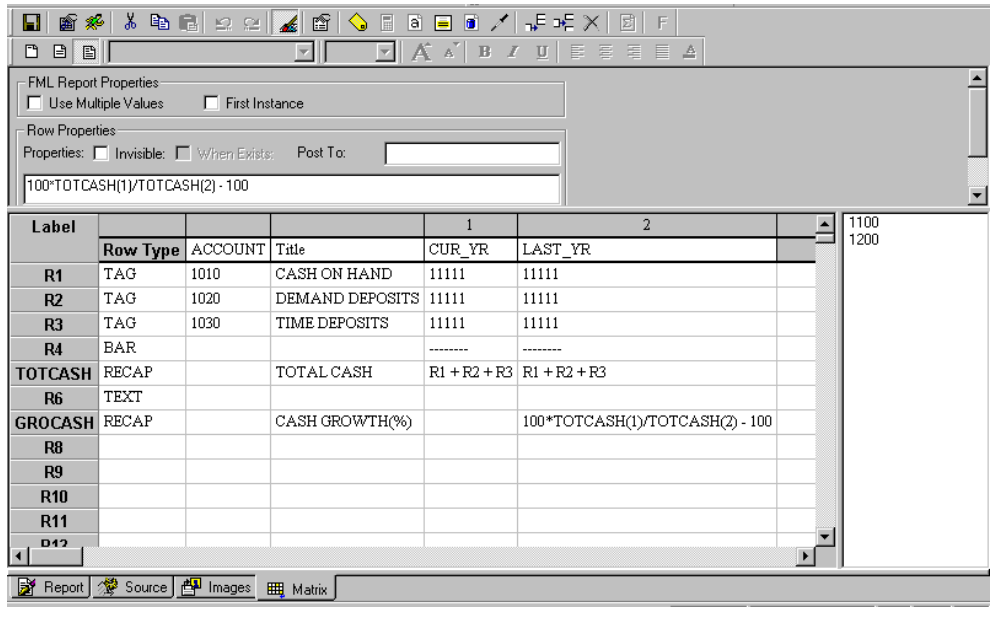
Date

Assign a date format to values that represent a date or date component.

Assign century options, the two-digit century value and the two-digit base year, to control the century values of a field.

Example Calculating Recap Expressions in the Financial Report Painter

This example shows two Recap expressions, with the second using values derived in the first.



Label				1	2
	Row Type	ACCOUNT	Title	CUR_YR	LAST_YR
R1	TAG	1010	CASH ON HAND	11111	11111
R2	TAG	1020	DEMAND DEPOSITS	11111	11111
R3	TAG	1030	TIME DEPOSITS	11111	11111
R4	BAR			--------	--------
TOTCASH	RECAP		TOTAL CASH	R1 + R2 + R3	R1 + R2 + R3
R6	TEXT				
GROCASH	RECAP		CASH GROWTH(%)		100*TOTCASH(1)/TOTCASH(2) - 100
R8					
R9					
R10					
R11					

1100
1200

The first RECAP expression calculates TOTCASH (as TOTAL CASH) by adding the values in rows 1 to 3. The results of the calculation will appear in all columns; this is designated using the *Apply to Row* check box on the RECAP Options tab. See *RECAP Dialog Box* on page 10-50.

The second RECAP expression calculates GROCASH (as CASH GROWTH (%)**:**

- TOTCASH(1) refers to total cash in column 1.
- TOTCASH(2) refers to total cash in column 2.
- The resulting calculation will appear in column 2 (LAST_YR) of the row labeled CASH GROWTH(%); this is designated in the Columns box on the RECAP Options tab.

The output is:

	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

Procedure How to Create a Recap Summary Row

To create a row in which existing data in other rows is summarized:

1. Place your cursor in a column that contains numeric data, then highlight the values you want to sum. The values to be added may be contiguous or non-contiguous.
2. Click the *Make Recap* icon on the Design toolbar.
3. A new RECAP row appears in the Row Type column, below the last row in the matrix. The formula representing the sum of highlighted values (for example, R1 + R2 +R3) is displayed in the new row, in the column that contained the values.

Tip: Use this technique when the calculation you wish to perform is a simple addition of values that does not require an expression. For an illustration of this technique, see *Emphasizing a Row Using Border Lines* on page 10-72.

Inserting Rows of Text

You can add ad hoc text in a row of a financial report. This includes the ability to add blank rows (designated as text) to improve the appearance of the report. Your entry is identified as TEXT in the Row Type column.

Procedure How to Add Text to a Financial Report

In the Design matrix:

1. Select a row in which you want to add text or create a blank row in the report.
2. Click the *Text* icon on the Financial Report Painter toolbar.

   or

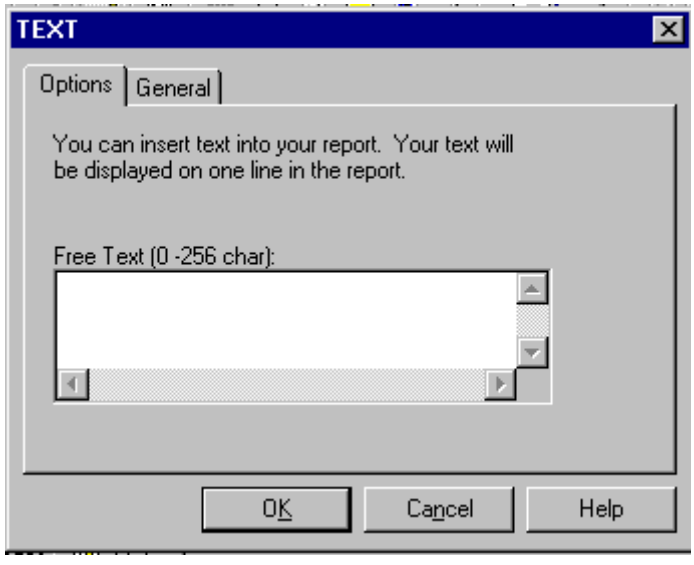
   Right-click anywhere in the row (except on the label) and select *Change Type to*> *Text* from the shortcut menu.

   The Text dialog box opens.
3. Type up to 256 characters of text in the text box, or leave the box blank.
4. Click *OK*.

TEXT appears in the Row Type column. If you entered text, its display starts in the Title column. If you left the entry box blank, an empty TEXT row is displayed.

Tip: Once you have identified a TEXT row, you can type its content directly in the Title column on the matrix.

Reference TEXT Dialog Box



Options Tab

Text box

Enter up to 256 characters of text, which will appear on the matrix starting in the Title column.

Suppressing the Display of Rows

Sometimes you may want to retrieve TAG, RECAP, or PICKUP rows or add values in DATA rows solely for use in a calculation, without wishing to display those rows on the report. The Financial Report Painter enables you to mark rows as invisible for this purpose.

You may also wish to suppress the display of a TAG row if no data is found for the values. The default character used to represent the missing data is a period (.). You can override this convention, making the display of a row dependent upon the existence of data.

Procedure How to Suppress Rows

1. Select the TAG, RECAP, PICKUP, or DATA row you want to suppress.
2. Click the *Invisible* check box in under Row Properties, above the matrix.

OR

1. Right-click anywhere in the row (except on the label) and select *Row Properties* from the shortcut menu. The appropriate dialog box for the row type opens.
2. Click the General tab and choose *Invisible*.

Procedure How to Suppress Rows With No Data

To suppress the display of a TAG row with missing data:

1. Select the row you want to suppress.
2. Click the *When Exists* check box under Row Properties, above the matrix.

OR

1. Right-click anywhere in the row (except on the label) and select *Row Properties* from the shortcut menu. The appropriate dialog box for the row type opens.
2. Select the General tab and choose *When Exists*.

Saving and Retrieving Intermediate Report Results

Many reports require results developed in prior reports. This technique requires that intermediate results be stored for reuse. An example is the need to compute net profit in an Income Statement prior to calculating equity in a Balance Sheet. In the Financial Report Painter, you can save selected rows from one or more models by posting them to a work file. These rows can then be recaptured by picking them up from the work file.

The default work file is FOCPOST. Note that this is the common WebFOCUS comma-delimited file format, so you can report from it directly if a FOCPOST Master File is available. Note also that you must perform a FILEDEF on the file to assign it a logical name (ddname) prior to executing the report. You must perform a FILEDEF before running the report that posts the data, and again before running the report that picks up the data. For details on FILEDEF operations, see the *Developing Reporting Applications* manual.

Note that you cannot prepare a financial report entirely from data that you enter directly in the matrix (for example, on a DATA row); however, if you wish, 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. These rows can then be used as though they were provided in a DATA row.

The row will be 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 of a dollar sign ($).

For example:

```
AR       , 18829,     15954,$
INV      , 27307,     23329,$
```

Procedure How to Post Data to a Work File

1. Select a TAG, RECAP, or DATA row in the Design matrix.
2. Enter the ddname of the work file in the Post To input box for Row Properties, above the matrix.

OR

1. Right-click anywhere in the row (except on the label) and select *Row Properties* from the shortcut menu. The selected Row Type dialog box opens.
2. Click the General tab and enter a ddname in the *Post To* input box under Formatting Options.

The selected row is saved in the designated work file (in comma-delimited format) from which you can then pick it up for use in another financial report.

Repeat the process for each row you wish to save to a work file (either the same file or a different one).

Note: Remember that you must perform a Filedef to assign a logical (ddname) to the work file before you execute the request.

Procedure How to Retrieve Posted Data

You can retrieve posted rows from a work file and use those rows as if they were provided in a TAG row.

Remember that you must perform a Filedef to assign a logical (ddname) to the work file before you execute the request.

From the matrix in which you want to pick up data:

1. Select the row that is to contain the picked up data. (If necessary, add or insert a blank row (see *Formatting Financial Reports* on page 10-64).
2. Click the *Pickup* icon on the toolbar.

   or

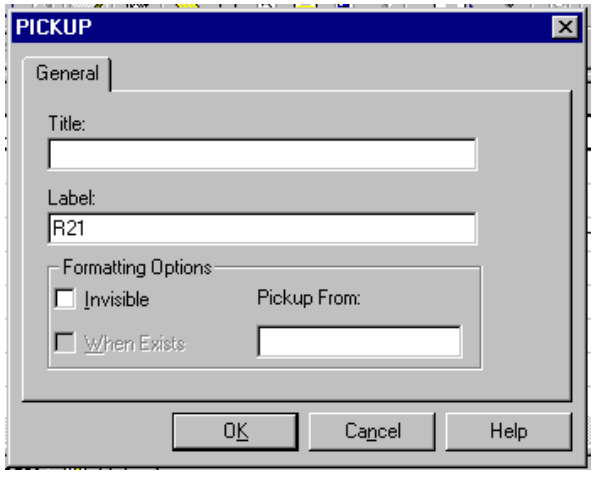
   Right-click anywhere in the row (except on the label) and select *Pickup* from the shortcut menu. The PICKUP dialog box opens at the General tab.
3. Enter a title for the PICKUP row in the Title box. This title will appear in the report.
4. If you wish to supply an explicit row label to replace the default label on the matrix, type it into the Label box. (The default label is retained internally.)
5. In the Pickup From box, enter the ddname for the work file that contains the posted data, followed by a space and the label of the data row you want to pick up.

6. If you wish to suppress the display of the PICKUP row, select the *Invisible* check box.
7. Click *OK*.

PICKUP appears in the Row Type column on the matrix, along with the label and title you have defined and the data values retrieved from the designated work file.

Repeat this process to include additional PICKUP rows in the report.

Reference PICKUP Dialog Box



General Tab

Title

Specifies a title for the picked up data; this title will appear on the report.

Label

Lists the default label for the PICKUP row. You can replace the default row identification label with an explicit row label that you want to reference in an expression.

Formatting Options

The following options apply to individual rows in the report.

Invisible

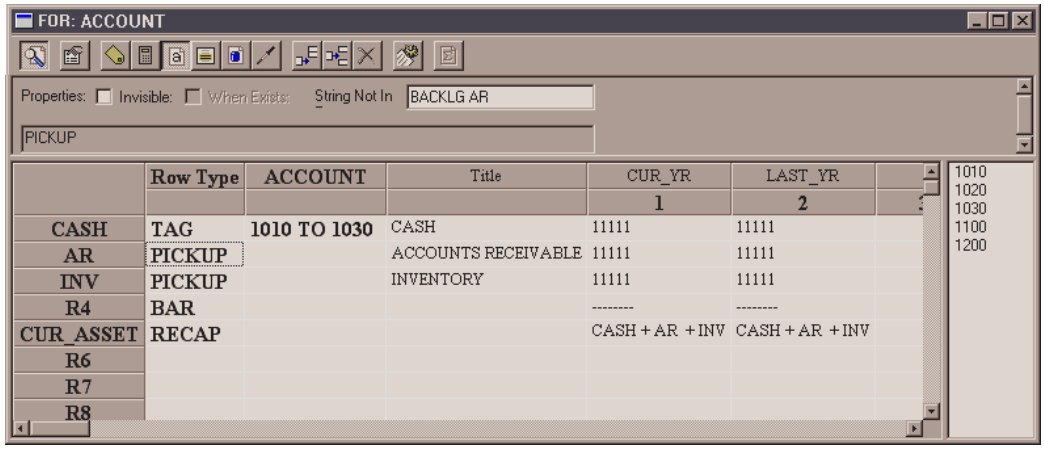
Picks up data for use in a Recap calculation, but does not display the retrieved data.

Pickup From

Is the ddname of the work file that contains the data you wish to retrieve, followed by a space and the label of the PICKUP row.

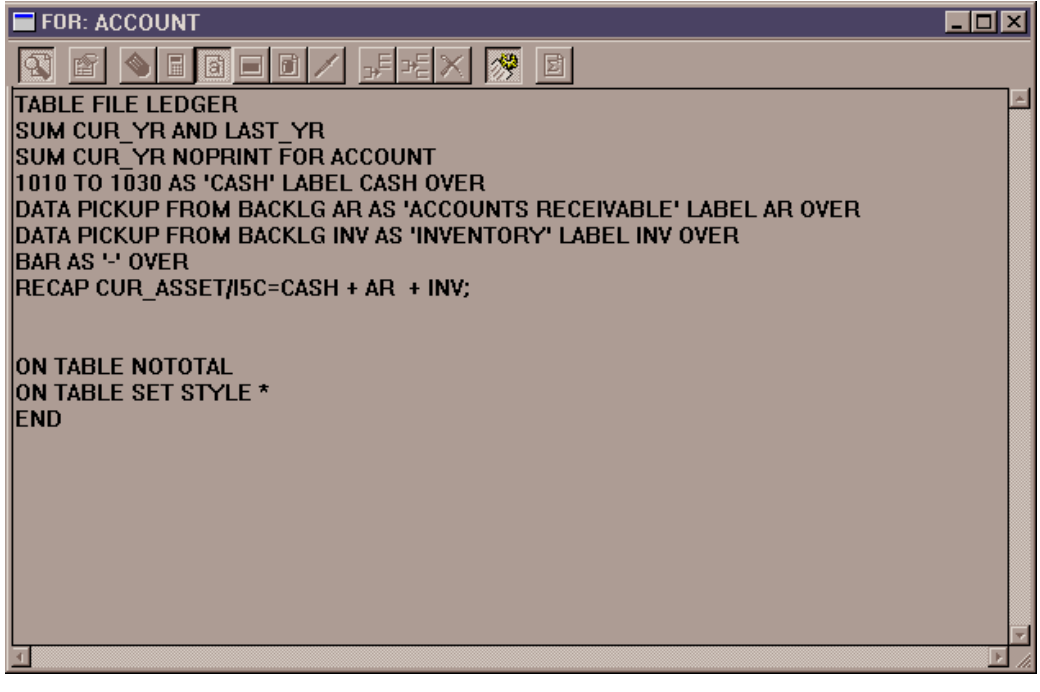
Reference Design Matrix With Pickup Rows

In the following matrix, two rows are designated as PICKUP:



Notice that the labels for these rows are referenced in the RECAP formula.

You can see the underlying source code, including the name of the work file to which the rows of data were posted, in the following screen.



Formatting Financial Reports

You can add underlines to a financial report to set off and clarify calculations and use a variety of formatting techniques to draw attention to individual columns, rows, and cells in a financial report. As in other WebFOCUS reports, certain formatting features can be triggered by conditions that you define.

You can also drill down to another procedure or a URL from a cell or column in a financial report.

For details about conditional formatting and drill down procedures, see Chapter 3, *Creating Reports With Report Painter*.

Adding Underlines

Reports that display columns of numbers frequently need to use underlines before calculations. You can specify a single or double underscore character in a BAR row.

Procedure How to Add Underlines

In the Design matrix:

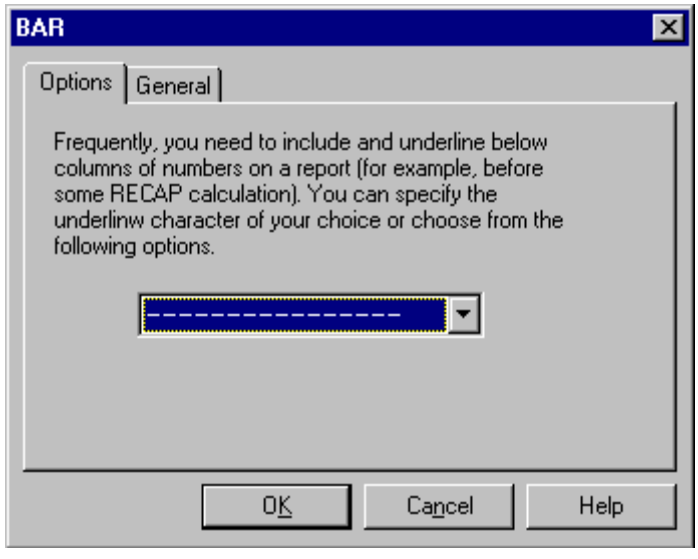
1. Select the row in which you want to add an underline.
2. Click the *Bar* icon on the toolbar.

   or

   Right-click anywhere in the row (except on the label) and select *Change Type to...> Bar*.

   The BAR dialog box opens.
3. The default BAR character is a single underscore (-). If you wish to change the underscore character, choose the double line (=) from the drop-down list on the Properties bar. (Note that in HTML reports the double line appears as a single thick line.)
4. Click *OK*.
5. BAR appears in the Row Type column. The selected symbol is displayed under columns that contain numeric data.

Reference BAR Dialog Box



Options tab

Underscore characters

You can choose a single or double line. Single is the default.

Note that the double line is not clearly distinguishable in an HTML report; it appears as a thicker single line.

Formatting Columns, Rows, and Cells

You can apply a wide range of formatting options to individual columns, rows, and cells in a financial report using options on the Field Properties Style tab. You can further refine formatting:

- For columns, by identifying the column title and column data as separate objects for styling.
- For rows, by identifying the row and title as separate objects for styling.

If you style a row and then a cell within that row, the cell styling takes precedence for the cell.

If you style a column and then a cell with that column, the cell styling takes precedence for the cell.

If you style a cell, then style a row or column that the cell is in, the cell style will remain the same.

Row and cell styling options are specific to financial reports created in the Financial Report Painter. Column styling options are identical, whether applied from the Financial Report Painter or the Report Painter.

Procedure How to Format a Column in the Design Matrix

1. Right-click a column and choose *Options* from the shortcut menu. The Field Properties dialog box opens at the Style tab.
2. Select *Column Title and Data* as the active object, or select *Column Data* or *Column Title* to style them separately.

   If you have already styled either the title or data for a column and wish to quickly apply the same formatting to the other element, click the appropriate button: *Copy Title Style to Data* or *Copy Data Style to Title*.
3. Under Column Layout, you can change column width and justification.

   Width options are:

   Maximum

   Sets the width according to the length defined in the field format.

   Minimum

   Sets the width of the column according to the widest value or heading in the field. This is selected by default.

   Truncate

   Enables you to specify where to truncate the column width based on the specified units (inches or centimeters). To indicate that a field value has been truncated in the browser, WebFOCUS places an exclamation point (!) after every alphanumeric and text field value and an asterisk (*) after every numeric field value.

   Wrap

   Enables you to specify where to wrap data based on the specified units (inches or centimeters).

   Justification options are: left, right, center, or return to the default positioning.

4. Under Graphical options, select the font characteristics, border or grid characteristics, and/or background colors that you wish to apply to the column:

   a. **For borders**, click the *Select Borders* button. The Borders dialog box opens. Select width, style, and/or color options from the drop-down lists.

      You can apply the same specifications to all border lines or vary specifications for top, bottom, right, and/or left borders.

      Note: To set borders in an HTML report, you must turn Cascading Style Sheets On. Click the *Report Options* icon on the toolbar and select the Output tab. Under *Display Options,* select HTML and verify that On is selected from the Cascading Style Sheets drop-down menu.

      When Borders is selected, Grids is disabled.

   b. **For grids,** click the *Select Grids* button. Select a line style and indicate whether to display horizontal lines, vertical lines, or both. This option applies to columns in PDF reports; it does not apply to columns in HTML reports.

      When Grids is selected, Borders is disabled.

   c. **For fonts**, click the *Select Fonts* button. The Fonts dialog box opens. Select font name, font style, font size, and/or color.

   d. **For background color**, click the *Single Color* radio button under Background Coloring, and choose a color from the palette.

      If you identify the active object as column data, the *Alternating Background Colors* button is activated. You can use this feature to assign colors to alternating rows in one or more columns.

   Click *OK* to return to the Style tab.

5. Under *Applying to condition* in the Style tab, you can define or edit a condition that controls when specified formatting options are applied to one or more columns.

6. Click *OK* to return to the matrix where many styling changes will be reflected.

7. Click the *Run* icon on the toolbar to see the column formatting options applied in the report output.

Tip: If you wish to affect other column features, click the:

- **Drill Down tab** to drill- down to another procedure, a URL, or another supported option.
- **General tab** to change the column title or field format, to make the column visible or invisible in the output, or to activate other features.

For details about defining conditional report styles and other column formatting features, see Chapter 3, *Creating Reports With Report Painter*.

Example Formatting Columns With Data Visualization Graphs and Conditional Styling

This example uses the joined data source files, CENTGL and CENSYSF (see *Sample Data for FML Hierarchy Examples* on page 10-44) and takes as it starting point the request created in *Displaying One Summary Line for an FML Hierarchy* on page 10-32. However, instead of applying a pre-defined StyleSheet, as you did in the earlier example, you will be formatting the report yourself by applying boldface to each column title, data visualization bar graphs to a numeric column to help you quickly visualize trends and relationships in your data, and conditional styling to the data in a second numeric column.

1. If you completed the referenced example, reopen the Design matrix now. Click the *Report Option* button on the toolbar and in the Style tab, click the *Style File Selection* button. In the dialog box that opens, select *Default* from the Style Sheet Source drop-down list.

   If you did not complete the referenced example, follow those instructions up to step 13, then return here.

2. Click the *Report Option* button on the toolbar and select the Output tab. Make sure that *HTML* is the selected Display format and that *Cascading Style Sheets* is turned on. You will need this feature of HTML to display the data visualization graphs. Click OK to return to the matrix.

3. Right-click the Month Actual column and select *Options* from the menu. The Field Properties dialog box opens at the Style tab.

4. Make *Column Title* the active object.

5. Click the *Select Font* button and choose *Bold* from the Font Style box.

6. Click *OK*. The column title, Month Actual, becomes bold in the matrix.

7. Repeat steps 3-6 for YTD Actual, then click the Field Properties General tab.

8. Click the *Visualize* button. The Data Visualization dialog box opens.

9. Click the *Visualize* check box and select *RED* from the Color drop-down list.

10. Click *OK*. YTD Actual becomes bold in the matrix. You won't see the affect of the data visualization graphics until you run the report.

11. Click the *Run* icon on the toolbar.

The output is:

	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.

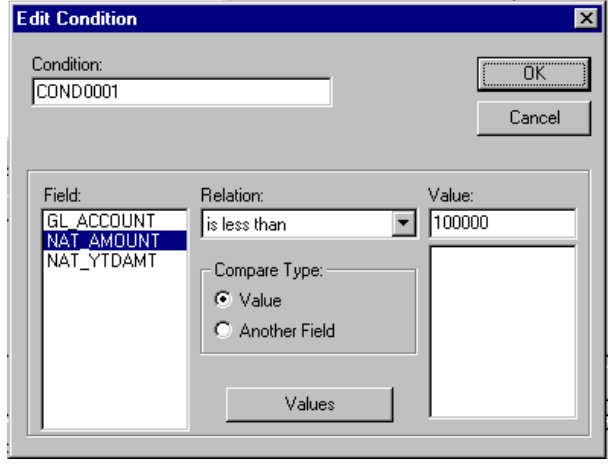
Suppose that you now want to highlight Monthly Actual Values that are less than 100,00.

12. In the Design matrix, right-click the column title Month Actual and choose Options from the menu. The Field Properties dialog box opens at the Style tab. The active item is *Column Data*. You will now define a condition to control the styling of this data.

13. Click the *Edit Condition* button. The Condition List dialog box opens.

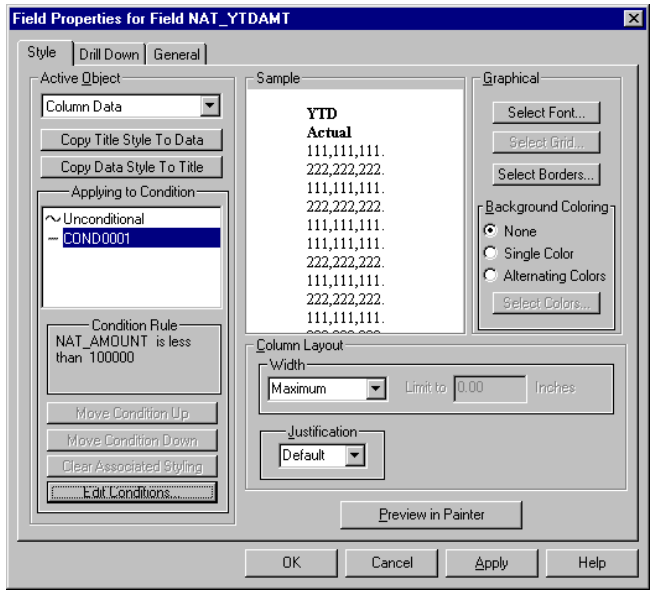
14. Click *New*. The Edit Condition dialog box opens.

15. Accept the default condition name, COND0001, then select *NAT_AMOUNT* from the Fields box, *is less than* from the Relation drop-down list, and enter *100000* in the Values box.



Click *OK*. The Condition List dialog box now shows your entries.

16. If they are correct, click *OK* again to return to the Field Properties dialog box at the Style tab, where you will define the style you want to apply when the condition is met.



17. Click the *Font* button. The Font dialog box opens.

18. Choose *Bold* from the Font Style list and click *OK*. Notice that your selection is reflected in the Sample box.

19. Click the *Run* icon. The values below 100,000 are now displayed in boldface type:

	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.

Procedure How to Format a Row in the Design Grid

1. Right-click a row label (either a default label like R1 or an explicit row label that you have assigned) and select *Options* from the shortcut menu. The Field Properties dialog box opens at the Style tab, with Row identified as the active object.
2. Under *Graphical*, at the right of the Style tab, select the font characteristics, border characteristics, and/or background colors that you wish to apply to the row.
   a. **For borders**, click the *Select Borders* button. The Borders dialog box opens. Select width, style, and/or color options from the drop-down menus.

      You can apply the same specifications to all border lines or vary specifications for top, bottom, right, and/or left borders. Click *OK*.

      Note: To set borders in an HTML report, you must turn Cascading Style Sheets On. Click the Report Options icon on the toolbar and select the Output tab. Under Display Options select HTML and verify that On is selected from the Cascading Style Sheets drop-down menu.

   b. **For fonts**, click the *Select Fonts* button. The Fonts dialog box opens. Select font name, font style, font size, and color. Click *OK*.

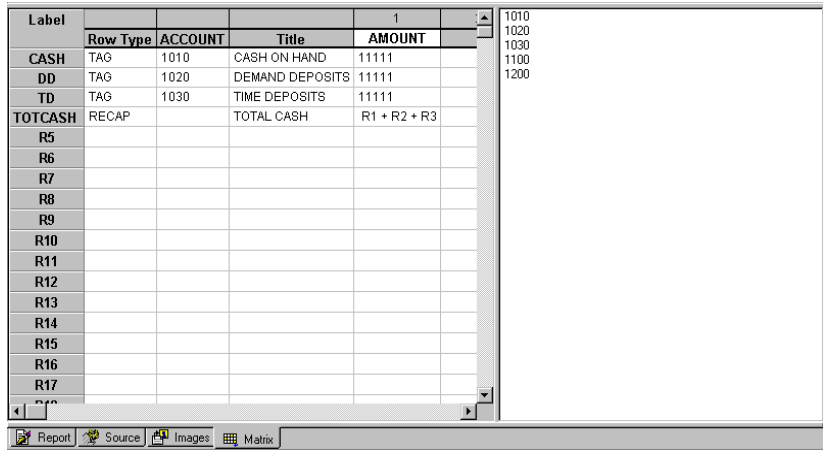
   c. **For background color**, click the *Single Color* radio button under Background Coloring and choose a color from the palette. Click *OK*.
3. Click *OK* to return to the Design matrix where many styling changes will be reflected.
4. Click the *Run* icon on the toolbar to see the row formatting options applied to the report output.

Example Emphasizing a Row Using Border Lines

The following example places a thick dashed border around the RECAP row identified by the label TOTCASH.

1. Create the report using the sample data source Ledger. In the Report Painter, designate Account as the For field and Amount as a Sum field.
2. Click the *Matrix* tab.
3. Above the matrix, select the *Use Multiple Values* check box to provide optimal flexibility in reusing tag values (although in this illustration you will use each value only once).
4. Drag the tag values 1010, 1020, and 1030 onto the matrix. Right-click each value and choose Row Properties. The TAG dialog box opens. Click the General tab and assign the labels CASH, DD, and TD to rows R1, R2, and R3, respectively. Click *OK* after each entry.
5. Create a RECAP row that totals the values of rows CASH (R1), DD (R2), and TD (R3).

   One way to quickly create a row for this simple type of calculation is to place your cursor in a column that contains numeric data and highlight the values you want to add. Then click the *Make Recap* icon on the Design toolbar to create the RECAP row. A formula representing the sum of the highlighted values (identified by their row labels) is displayed in the new row, in the column that contained the values. For information about creating more complex RECAP expressions, see *Performing Inter-Row Calculations* on page 10-47.



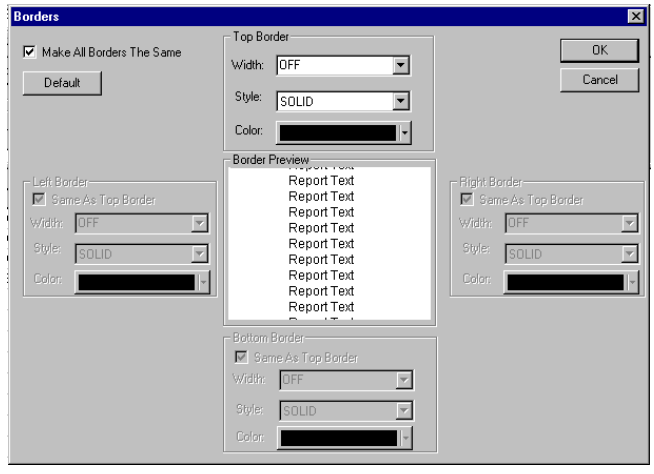
Label				1
	Row Type	ACCOUNT	Title	AMOUNT
CASH	TAG	1010	CASH ON HAND	11111
DD	TAG	1020	DEMAND DEPOSITS	11111
TD	TAG	1030	TIME DEPOSITS	11111
TOTCASH	RECAP		TOTAL CASH	R1 + R2 + R3
R5				
R6				
R7				
R8				
R9				
R10				
R11				
R12				
R13				
R14				
R15				
R16				
R17				

1010
1020
1030
1100
1200

Report Source Images Matrix

6. Click the *Report Options* icon on on the toolbar above the matrix. On the Style tab, click the *Style File Selection* button (bottom right of window). The Style File Selection dialog box opens. Select the style sheet *DefaultNoGrid* under Style Sheet Source. This will add some basic styling to your report. Click *OK* to confirm your choice and *OK* again to return to the matrix.

7. Right-click the row label TOTCASH and select *Options* from the shortcut menu.
8. Click the *Select Borders* button under Graphical options. The Borders dialog box opens.



Note: To set borders in an HTML report, you must turn Cascading Style Sheets On. Click the *Report Options* icon on the toolbar and select the Output tab. Under Display Options select *HTML* and verify that *On* is selected from the Cascading Style Sheets drop-down list.

9. To apply the same specification to the top, bottom, right, and left borders, leave the *Make All Borders the Same* check box selected.
10. In the Top Border box,
    a. Select *Medium* from the Style drop-down list.
    b. Select *Dashed* from the Style drop-down list.
11. Click *OK* to return to the Style tab and *OK* again to return to the Design matrix.

12. Click the *Run* icon.

The output is:

	AMOUNT
CASH ON HAND	8,784
DEMAND DEPOSITS	4,494
TIME DEPOSITS	7,961
TOTAL CASH	21,239

Notice that the dashed border has been placed around the entire row. The gray background is applied by a default style template that you selected in step 6.

In the following variation, specifications are applied separately to the top/bottom and the left/right border lines. A heavy black border line is placed above and below the RECAP row and a thinner dotted line is placed to the left and right of each column in the row.

1. Once again, right-click the row label TOTCASH and select Options from the shortcut menu.

2. Click the *Select Borders* button under Graphical options. The Borders dialog box opens.

3. This time, deselect the *Make All Borders the Same* check box. In the Top Border box:

  a. Select *Heavy f*rom the Width drop-down menu.

  b. Select *Solid f*rom the Style drop-down menu.

4. In the Bottom border box, click the *Same as Top Border* check box.

5. Next, in both the Left and Right Border boxes, specify Width as *Medium* and Style as *Solid*.

The output is:

	AMOUNT
CASH ON HAND	8,784
DEMAND DEPOSITS	4,494
TIME DEPOSITS	7,961
TOTAL CASH	21,239

Example Applying Boldface to a Free Text Row

1. Create the report using the sample data source Ledger. In the Report Painter, designate Account as the For field and Amount as a Sum field.
2. Click the *Matrix* tab.
3. In row R1, right-click in the Row Type column, choose *Change type to* from the shortcut menu, and select *Text*. The TEXT dialog box opens.
4. Type ---CASH ACCOUNTS-- in the input box, then right-click in the Label column of row R1 and select *Options*. The Field Properties dialog box opens at the Style tab.
5. Under Graphical, click the *Fonts* button. The Fonts dialog box opens. Select *Bold* in the Font Style list and click *OK*. Click *OK* again to return to the matrix.
6. Drag the tag values 1010, 1020, and 1030 onto the matrix.
7. Right-click in the Row Type column for tag 1010 and select Row Properties. When the TAG dialog box opens, click the General tab and enter the title CASH ON HAND in the Title input box.
8. Repeat steps 6 and 7 for tags 1020 and 1030, using the titles DEMAND DEPOSITS and TIME DEPOSITS, respectively.
9. In row R5, right-click in the Row Type column, choose *Change type to* from the shortcut menu, and select *Text* again. This time leave the input area in the Text dialog box blank to create an empty “text” row. It will appear as a skipped line in the report output.

10. In row R6, create a third text row and type ---OTHER CURRENT ASSETS--- in the input area of the Text dialog box, then right-click in the Label column of row R1 and select *Options*. The Field Properties dialog box opens at the Style tab.

11. To apply boldface to this text row, follow the instructions in step 5.

12. To complete the report, drag the tag values 1100 and 1200 into rows R7 and R8 on the matrix and enter the following row titles for tags 1100 and 1200, ACCOUNTS RECEIVABLE and INVENTORY, respectively, in the TAG dialog box.

The matrix should look as follows:

Label				1	2
	Row Type	ACCOUNT	Title	AMOUNT	
R1	TEXT		---CASH ACCOUNTS---		
R2	TAG	1010	CASH ON HAND	11111	
R3	TAG	1020	DEMAND DEPOSITS	11111	
R4	TAG	1030	TIME DEPOSITS	11111	
R5	TEXT				
R6	TEXT		---OTHER CURRENT ASSETS---		
R7	TAG	1100	ACCOUNTS RECEIVABLE	11111	
R8	TAG	1200	INVENTORY	11111	
R9					
R10					
R11					
R12					
R13					
R14					
R15					
R16					
R17					
R18					

Report | Source | Images | Matrix

13. Click the *Run* icon.

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

Note: If you were to look at the source code for this procedure, you would see the two free text rows specified using the following code:

```
TYPE=REPORT,
     LABEL=R1          ,
     STYLE=BOLD, $
TYPE=REPORT,
     LABEL=R6          ,
     STYLE=BOLD,$
```

The Financial Report Painter identifies a free text row with a row label designation.

Procedure How to Format a Cell in the Design Matrix

1. Right-click a cell and choose *Options* from the shortcut menu. The Field Properties dialog box opens at the Style tab, with *Cell* identified as the active object.
2. Under *Graphical*, select the font characteristics, border characteristics, and/or background colors that you wish to apply to the cell:
   a. **For borders**, click the *Select Borders* button. The Borders dialog box opens. Select width, style, and/or color options from the drop-down menus. Click *OK*.

      You can apply the same specifications to all border lines or vary specifications for top, bottom, right, and/or left borders.

      Note: To set borders in an HTML report, you must turn Cascading Style Sheets On. Click the *Report Options* icon on the toolbar and select the Output tab. Under Display Options, select *HTML* and verify that *On* is selected from the Cascading Style Sheets drop-down menu.

   b. **For fonts**, click the *Select Fonts* button under Graphical options. The Fonts dialog box opens. Select font name, font style, font size, and color. Click *OK*

   c. **For background color**, click the *Single Color* radio button under Background Coloring, and choose a color from the palette. Click *OK*.
3. Under *Applying to condition*, you can define or edit a condition that controls when specified formatting options are applied to a cell.
4. Click *OK* to return to the Design matrix, where most formatting changes will be reflected.
5. Click the *Run* icon on the toolbar to see the cell formatting options applied in the report output.

Note: If you wish to drill- down from the selected cell to another procedure or to a URL, click the Drill Down tab. For details, see *Drilling Down From a Column, Cell, or Row* on page 10-82.

Although certain options on the General tab are enabled when *cell* is the active object, these options will be applied to the entire column, not only to the selected cell.

Example Highlighting a Cell With Border Lines and Boldface Type

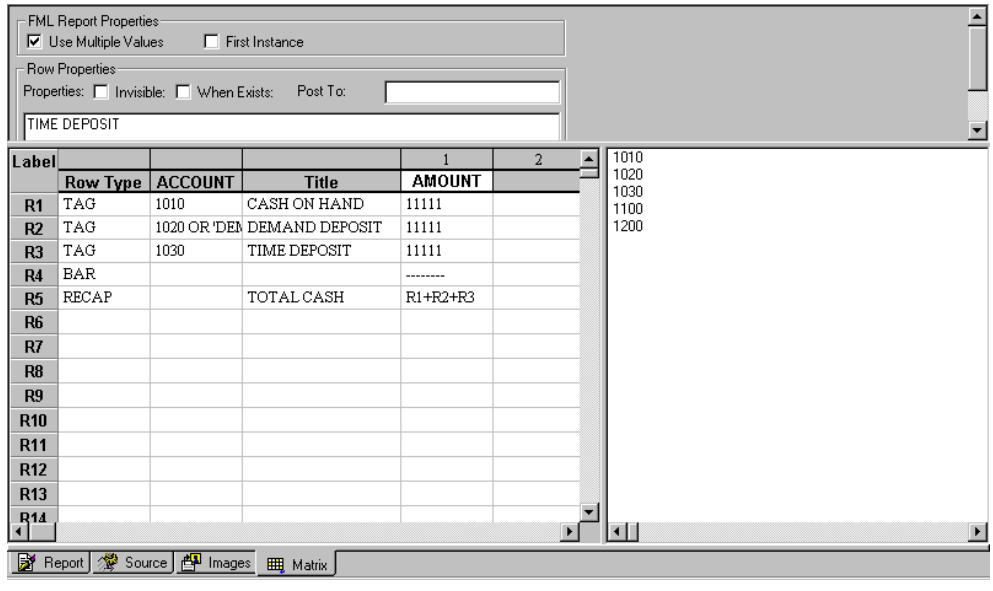
The following example places a solid line of medium thickness around a cell in the RECAP row identified by the label TOTCASH.

1. Create the report using the sample data source Ledger. In the Report Painter, designate Account as the For field and Amount as a Sum field.
2. Click the *Matrix* tab.
3. Above the matrix, click the *For Multiple* button to provide optimal flexibility in using tag values (although in this illustration you will use each value only once).
4. Drag the tag values 1010, 1020, and 1030 onto the matrix. Notice that the tag values appear in the Title column. To provide more meaningful titles, either type the following entries into the cells on the matrix or open the TAG dialog box and enter the new titles in the General tab. Replace 1010 with CASH on HAND; 1020 with DEMAND DEPOSIT, and 1030 with TIME DEPOSIT.
5. In row R4, right-click on the Row Type column, choose *Change Type to> Bar*. The BAR dialog box opens. Click *OK* to confirm the default underline character. The underline is displayed in the Amounts column, below the values to be summed.
6. In row R5, create a RECAP row that totals the values of rows R1, R2, and R3. Click OK.

   One way to quickly create a row for this simple type of calculation is to place your cursor in a column that contains numeric data and highlight the values you want to add. Then click the Recap icon on the Design toolbar to create the RECAP row. A formula representing the sum of the highlighted values (identified by their row labels) is displayed in the new row, in the column that contained the values. For information about creating more complex RECAP expressions, see *Performing Inter-Row Calculations* on page 10-47.

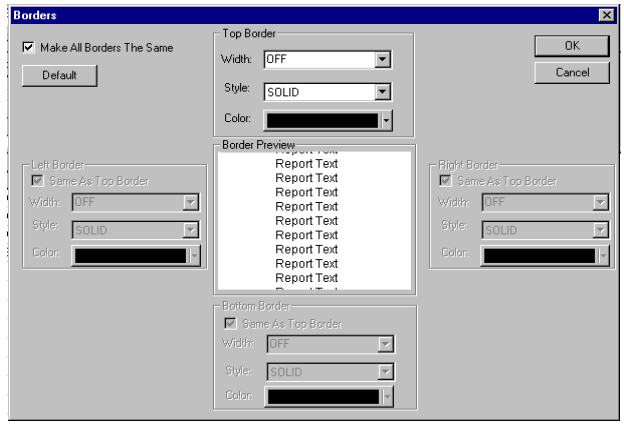
7. Change the Title for the RECAP row to TOTAL CASH.

The matrix now looks as follows:



8. Right-click the cell that contains the RECAP formula and select *Options* from the menu. The Field Properties dialog box opens at the Style tab, with Cell identified as the active object.

9. Click the *Select Borders* button under *Graphical* options. The Borders dialog box opens.



Note: To set borders in an HTML report, you must turn Cascading Style Sheets On. Click the *Report Options* icon on the toolbar and select the Output tab. Under Display *Format* select *HTML* from the drop-down list and verify that *On* is selected from the Cascading Style Sheets drop-down list.

10. To apply the same specification to the top, bottom, right, and left borders, leave the *Make All Borders the Same* check box selected.

11. In the Top Border box,

a. Select *Medium* from the Width drop-down list.

b. Select *Solid* from the Style drop-down list.

12. Click *OK* to return to the Style tab and *OK* again to return to the Design matrix.

13. Right-click the same cell and choose *Options* again. This time click the *Select Font* button and choose *Bold* from the Font Style list.

14. Click *OK* to return to the Style tab and *OK* again to return to the Design matrix.

15. Click the *Run* icon.

The output is:

	AMOUNT
CASH ON HAND	8,784
DEMAND DEPOSIT	4,494
TIME DEPOSIT	7,961
TOTAL CASH	**21,239**

The bold font style and solid border draw attention to the Total in the Amount column.

Procedure How to Apply Conditional Formatting to a Cell

To create a condition:

1. Right-click the cell in the Design matrix and select *Options* from the shortcut menu.

   The Field Properties dialog box opens at the Style tab.
2. Click the *Edit Conditions* button.
3. The Condition List dialog box opens.
4. Click *New*.
5. The Edit Condition dialog box opens.
6. Type a name for the condition or accept the default.
7. Select the field for which you want to define a condition from the Field box.
8. Select a relation from the Relations list.
9. Specify a value by doing one of the following: Type a literal value in the Value box.

   or

   Click the *Values* button to display existing database values and select a value.

   or

   Click *Another Field* to display other fields in the report and select a field.
10. Click *OK*.

    The condition is now added to the Condition List in the Condition List dialog box, from which it can be applied to one or more cells, as well as to columns or rows.

    Tip: To create another condition, repeat steps 4 to 10.
11. Click *OK* again to return to the Style tab on the Field Properties dialog box.

    The default condition name (e.g., COND0001) appears in the Applying to Condition field box.

    The condition you created appears in the Condition Rule box.

12. You are now ready to associate the condition with a style. Select a defined condition from the Applying to Condition dialog box in the Style tab.
13. In the Graphical area of the Style tab, choose one or combination of the following:
    - Click the *Select Font* button to specify conditions such as font, font style and size, color and effects.
    - Click the *Select Grid* button to select a line style (only for PDF reports).
    - Click the *Select Border*s button to select line style, width, and/or color options from the drop-down menus.

      Note: To set borders in an HTML report, you must turn Cascading Style Sheets On. Click the *Report Options* icon on the e toolbar and select the Output tab. Under Display Options select *HTML* and verify that *On* is selected from the Cascading Style Sheets drop-down list.
    - In the Background Coloring area, click the *Single Color* radio button to select a background color.

Drilling Down From a Column, Cell, or Row

The drill down feature enables you to add one or more layers of detail to a report by embedding procedures into the report. A drill down "procedure" can be:

- Any type of executable object, such as a report or graph.
- A link to a URL from an HTML or PDF report, or to a JavaScript from an HTML report.
- A link to a Maintain case (function).
- A link to a Maintain procedure.

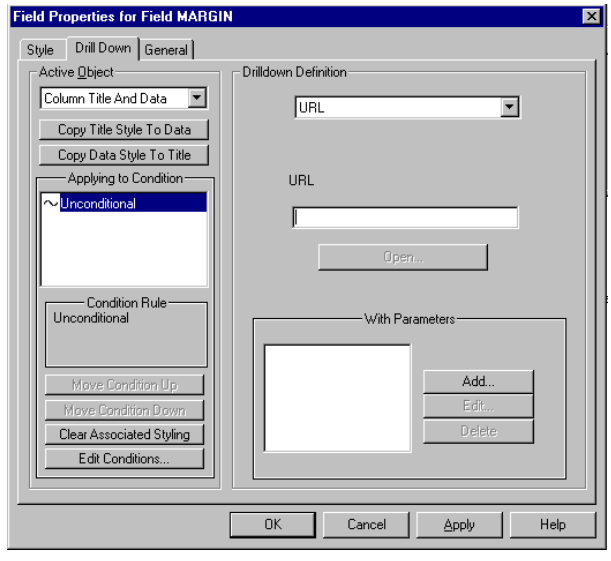
Once the base (summary) report appears in the browser, you can "drill down" to selected data or to a URL or script (or procedure). For example, if you run a report on the country and models of all cars imported into the United States, and you have embedded the appropriate procedures in the report and defined the correct parameters, you can drill down on:

- **ENGLAND,** to view a more detailed report on the sales of all English cars.
- **JAGUAR,** to see specific sales information on the Jaguar.
- A summary report row, to view the values behind each field in the row.

From either the Report Painter or the Financial Report Painter, you can drill down from a column title and its data, or from the title only, or the data only.

In addition, from the Financial Report Painter you can drill down from a single cell in the matrix or from a row or row title.

These behaviors are invoked from the Field Properties Drill Down tab. The active object box indicates the matrix element from which the drill down will be implemented. The Drill-Down Definition indicates what you want to drill down on: a URL, a procedure, or one of the other supported options.



Notice that you can also define conditions that determine when to run an embedded drill down procedure. For example, suppose you have embedded a procedure in the country column of the summary report, but you want your drill down report to appear only for England. You can define a condition that enables the embedded drill down only when country equals England.

The mechanics of establishing a drill-down relationship are the same, regardless of the active object you choose. For details about this process, see Chapter 3, *Creating Reports With Report Painter*.

Procedure How to Access the Drill Down Tab

For a column, right-click the column title,

For a cell, right-click the cell,

then choose *Options* from the shortcut menu. The Field Properties dialog box opens. Click the Drill-Down tab.

- If you select Options from a column title, *Column and Title* is the active object. However, you can change the active object to column title or column data.
- If you select Options from a cell, *Cell* is the active object. However, you can change the active object to column and title, column title, column data, row title, or row data.

Adding, Inserting, and Deleting Rows

You can add a new row at the bottom of the matrix, insert a row between existing rows, or delete a row from the matrix. The Insert Row and Add Rows dialog boxes provide the additional tabs you need to define a row of the selected type.

Procedure How to Add or Insert a Row in the Matrix

1. Click the *Add* or *Insert* icon on the toolbar.

   or

   Right-click anywhere in the row and select *Add Row* or *Insert Row* from the shortcut menu.

   The Add or Insert Row dialog box opens.

2. Choose a row type: Tag, Recap, Data, Text, Bar or Pickup.

   The Options and General tabs adjust to provide the appropriate options for the selected row type. (See topics on specific row types for additional information.)

3. Complete your entries in the Options and General tab.

4. Click *OK* to add the new row to the Row Type column in the matrix.

Procedure How to Delete a Row

Click the *Delete* icon on the toolbar.

or

Right-click anywhere in a row and select *Delete Row* from the shortcut menu.

Editing Row Types and Properties

The Financial Report Painter provides a shortcut menu as an alternative to the toolbar. You can use the shortcut menu to add rows and to change a row's type and properties.

Procedure How to Change Row Types

1. Right-click anywhere in a the row whose type you want to change (except on the row label).
2. Select *Change Type to>* from the shortcut menu.
3. You are asked to verify that you want to change the row type. Click *Yes*.
4. The Financial Report Painter displays the dialog box you need to complete your row definition. For details, see topics on each row type.

Procedure How to View or Change Row Properties

1. Right-click anywhere in a row (except on the row label).
2. Select *Row Properties* from the shortcut menu.

The dialog box for the selected row type opens.

Procedure How to Cut, Copy, and Paste Rows

To use the standard Windows Clipboard options:

1. Right-click anywhere in the row.
2. Select *Cut Row* or *Copy Row* from the shortcut menu.
3. Right-click a new location on the matrix and choose *Paste Row* from the shortcut menu.

Note: If you Cut and Paste, the row and its label are placed in the new location. If you Copy and Paste, the row contents is copied, but a default label is applied since each row requires a unique label.

Adding and Deleting Columns

Although you initially define the columns in your report in the Report Painter, as you refine your financial report you can include additional columns or delete columns directly from the Financial Report Painter.

Procedure How to Add a Column to a Financial Report

1. Right-click a column title or number and select *Add Column* or *Insert Column* from shortcut menu. The Add Column or Insert Column dialog box opens.
2. Select a field name from the *Select columns to insert* box and click *OK*. The field is either added as the last column in the report or inserted before the column in which you click.

Procedure How to Delete Columns

Right-click a column title or number and select *Delete column f*rom shortcut menu.

The column is removed from the matrix.

CHAPTER 11

Using OLAP Analysis

Topics:

- Benefits of Using OLAP
- OLAP Selections Panel
- AutoSort
- Drill Down On Measures

WebFOCUS Online Analytical Processing (OLAP) enables you to view and quickly interact with data in order to make critical business decisions. You can drill down or roll up data hierarchies, pivot fields from columns to rows (or vice versa), and slice-and-dice information by filtering or querying data sources based on specified criteria or thresholds. OLAP tools are specifically designed for highly iterative, multidimensional viewing of data and therefore are not confined to the limitations of two-dimensional reports.

The OLAP selections panel (interface), AutoSort, and Drill Down on Measures allow you to produce faster results when slicing and dicing data:

OLAP selections panel. Provides the ability to select or multi-select values from one or more fields (dimensions), through the use of drop-down lists (controls). You also can customize basic measures in the actual report rather than with the use of the WebFOCUS OLAP Control Panel (OCP). Report Assistant includes an Enable OLAP drop-down list, located directly under the Automatic Drill Down drop-down list, allowing you to turn on this feature.

AutoSort (or automatic BY TOTAL). Provides single-click automatic measure-based sorting by allowing you to click the diamond button to the left of the column title associated with a measure.

Drill Down on Measures. Provides the ability to drill down to the last dimension element under a dimension field in a dimension hierarchy by clicking any measure value in the report. The values displayed for all the measures present in the report will depend on the values of the resulting BY fields (if any) .

Benefits of Using OLAP

The OLAP model organizes data by predefining hierarchical dimensions, which are groups or lists of related fields. For example, a typical hierarchy of sales regions could be defined as the GEOGRAPHY dimension and could include the fields (in descending order) Region, State, and City. Region, the highest level in this hierarchy, would contain a list of all available regions within GEOGRAPHY. State, the second highest level in the hierarchy, would contain a list of all available states within those regions, and so on. Similarly, the elements Product Category and Product Name can be grouped in a dimension called PRODUCT.

The combination, or matrix, of two or more dimension hierarchies in an OLAP-enabled data source is called *multidimensional*. For example, the GEOGRAPHY and the PRODUCT dimensions can be combined in a matrix so that the intersections of their criteria provide specific values—for example, sales of coffee in the Northeast region.

Data are facts stored in a data source. Facts by themselves, however, are often meaningless. For example, a revenue report for the products that sold during 1997 in the Eastern region provides the following facts:

- Types of products that sold.
- Revenue for each product sold.
- Time period during which the products sold (2002).
- Region where the products sold (Eastern).

These facts do not provide much meaning because they are only compared to each other and not to any other pertinent data. The report might show that your company sold $13,258,712 worth of bookshelves during 2002, which may appear to be a large amount. However, unless you know how many units were expected to sell during 2002 in the Eastern region or how many units sold in other regions during that same time, the fact that your revenue from selling bookshelves was $13,258,712 is of little value.

To gain insight, you might wish to compare this set of data against a similar set for the previous year. This comparison would reveal which products had higher (or lower) sales than last year and by what amount (or percentage). However, this information is at a summary level and does not provide details such as the exact location (county, city, or branch) and the exact time period (quarter, month, or day) that product sales were better or worse. To ask these kinds of specific questions and to perform the top level to base level analysis necessary to find the answers requires an OLAP tool such as the OLAP Control Panel.

Working with the identical report in the OLAP Control Panel, you can quickly and easily select the region (Eastern), then drill down to the branch or sales representative level to discover the specific location where product sales differed from your expectation. Then you can click the time period field (in this case, 2002) and drill down to view quarterly or monthly detail. At this point, you can determine which products sold more or less than expected at the exact time *and* location. Your understanding of your particular business can then help you to determine why this trend or event occurred, enabling you to take action to curb a risk or exploit an opportunity in the future.

You also can drill down to the next lower level in a defined dimension hierarchy with one mouse click directly from an OLAP-enabled report (while the OLAP Control Panel is closed). When you use this feature, called AutoDrill, the report transforms immediately.

Additionally, you can perform slice-and-dice operations (including multiple selection) with a few mouse clicks directly from your report (while the OLAP Control Panel is open). With this feature, called Autoselection, each time you click a hot field (hyperlink), the field value displays in a selection list that limits the scope of your report.

OLAP analysis expands your view of the data and clarifies relationships that may not be immediately obvious when you are designing a report. To further enhance your view of the data, you can invoke a graphical representation directly from the OLAP Control Panel by invoking the Graph Panel.

From the Graph Panel you can select the measures to graph and choose from several different graph styles. You can display multiple graphs as well as display more than one style within a graph. Your report and graph(s) display simultaneously.

As with many things in the real world, you cannot view an object in two dimensions to understand its meaning. To gain an understanding, you must view the object dynamically from multiple perspectives and at various levels of depth, as well as compare it to similar items.

You can examine any data using OLAP, as long as the Master File has been set up properly. For more information, see *WebFOCUS Managed Reporting Development and Administration Web Browser Edition*.

Reference OLAP Terminology

Cube	Combination, or matrix, of two or more dimensions. The Sales02 table could include the Time, Product, and Location dimensions so that a user can view the Revenue measure for Croissants sold in Ohio during the First Quarter.
Dimension	Group or list of related elements, usually structured in a hierarchy. For example, a Location dimension could include the elements Country, Region, State, and City arranged in a hierarchy where Country is the top level and City is the base level. Dimensional data usually describes the item that is measured.
Drill down/Roll up	Manipulating a report by viewing other levels of a dimension's hierarchy. Rolling up to summary data is also called drilling up. Drill down and drill up expand or limit your view of the data by displaying more or less detail about the item(s) being measured.
Element	Item within a dimension (also field or member). For example, year, quarter, and month are elements of the Time dimension.
Hierarchy	Logical parent-child structure of elements within a dimension.
Measure	Type of item that specifies the *quantity* of another element with which it is associated. A measure typically defines how much or how many. For example, Units, Revenue, and Gross Margin are measures in the Account dimension and specify how many units were sold, how much revenue was generated, and at what profit margin, respectively.
Multidimensional	Term used to describe an OLAP-enabled data source. Derived from the OLAP model, which combines two or more dimensions to create a matrix, commonly known as a cube, in which the intersections of the criteria for the dimensions provide specific values.
Pivot	Manipulating (or rotating) the view of a report by moving a field (or a group of fields) from a column to a row, or vice versa.
Slice-and-dice	Process of applying selection criteria to multidimensional data sources based on specified criteria and thresholds to derive limited data subsets for reporting and analysis.

Variable	Type of element within a dimension that specifies the *quality* of another element with which it is associated. Typically, a variable defines who, what, where, or when. For example, Bob, Carol, and Alice are variables in the Sales Rep dimension. Pure Blend, Croissant, and Licorice are variables in the Product dimension. North America, Ohio, and Cleveland are variables in the Location dimension.

OLAP Selections Panel

The OLAP selections panel feature reduces the need for using the OLAP Control Panel by allowing you to include selection criteria in your reports with just a few clicks. You can customize the report by printing, not printing, or applying a data visualization or graph to a measure using the Measures and Graph controls. These controls are located in the top left corner of the page (if the controls are displayed at the top of the report), or towards the bottom left corner of the page (if the controls are displayed at the bottom of the report).

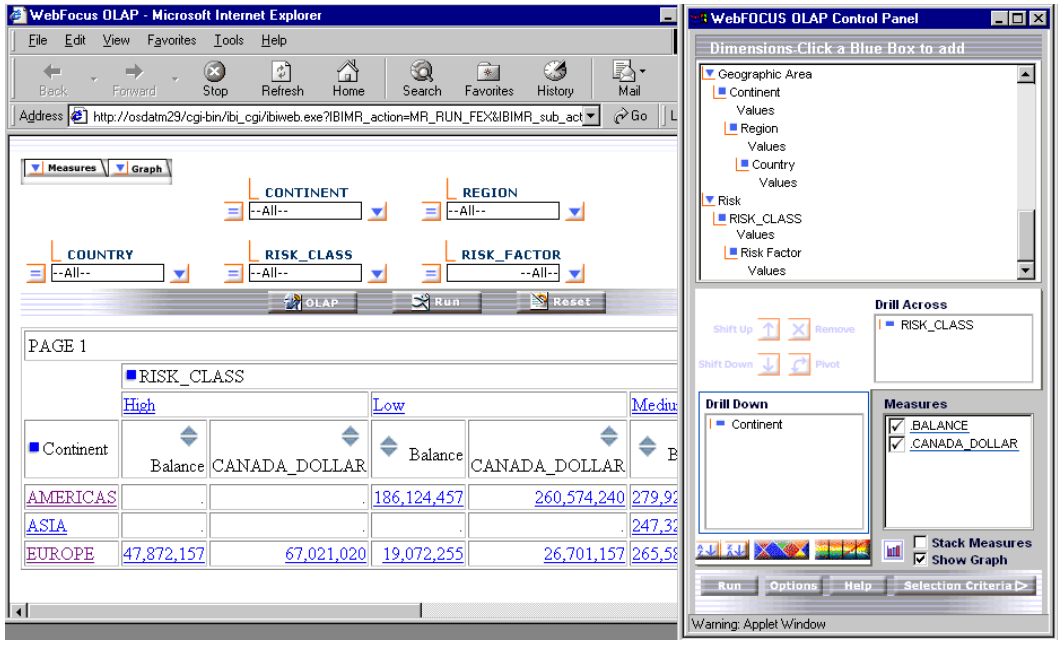
User Interface

When the OLAP selections panel feature is turned on, there is one control (drop-down list) for every dimension in the dimension hierarchy. You can multi-select values from any of the dimension controls to further simplify your report output. Each control has a relational operator button located on the left that allows you to change the relational operator before or after making your selection from the drop-down list. The name (not the alias or the title) of the dimensional field as it appears in the Master File is displayed at the top of each control.

There are also Measures and Graph controls. Each control contains a down arrow to the left that, when clicked, opens the corresponding pane. These controls allow you to make basic customizations on the measures present in your report and are located to the left of the first dimension control.

There is no separate frame to hold the OLAP button. Instead, there is a blue colored band containing an OLAP button (equivalent in functionality to the traditional OLAP button), a Run button, and a Reset button displayed directly above the report output (assuming the user has chosen to display the OLAP pane at the top of the report. Otherwise, the buttons will be below the report. All the controls display above these set of buttons.

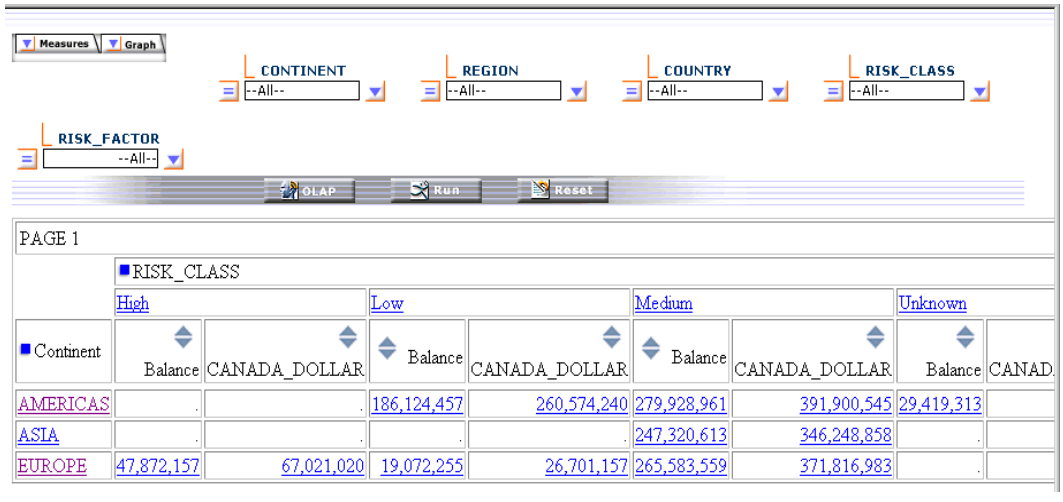
This image shows how these controls look when the OLAP selections panel feature is turned on:



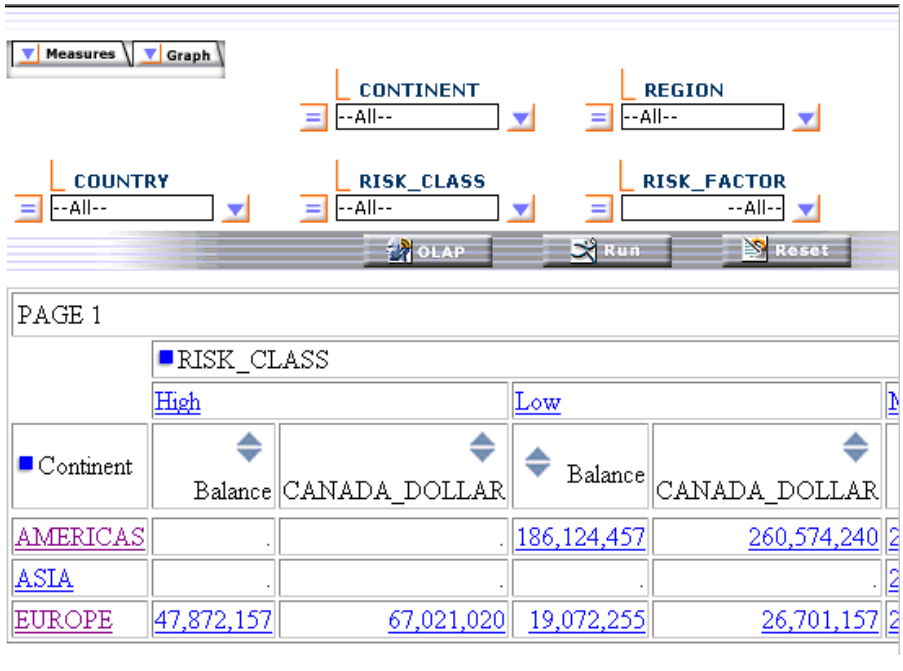
The OCP graphically reflects the look and feel of the report. With the OLAP selections panel, the controls float as you resize the report window. This allows you to see all the controls as you resize the window. The following images show how the controls are rearranged as the window is being resized.

If the window becomes too narrow or too small, some of the controls will not be visible.

View the position of the controls before resizing the report window:

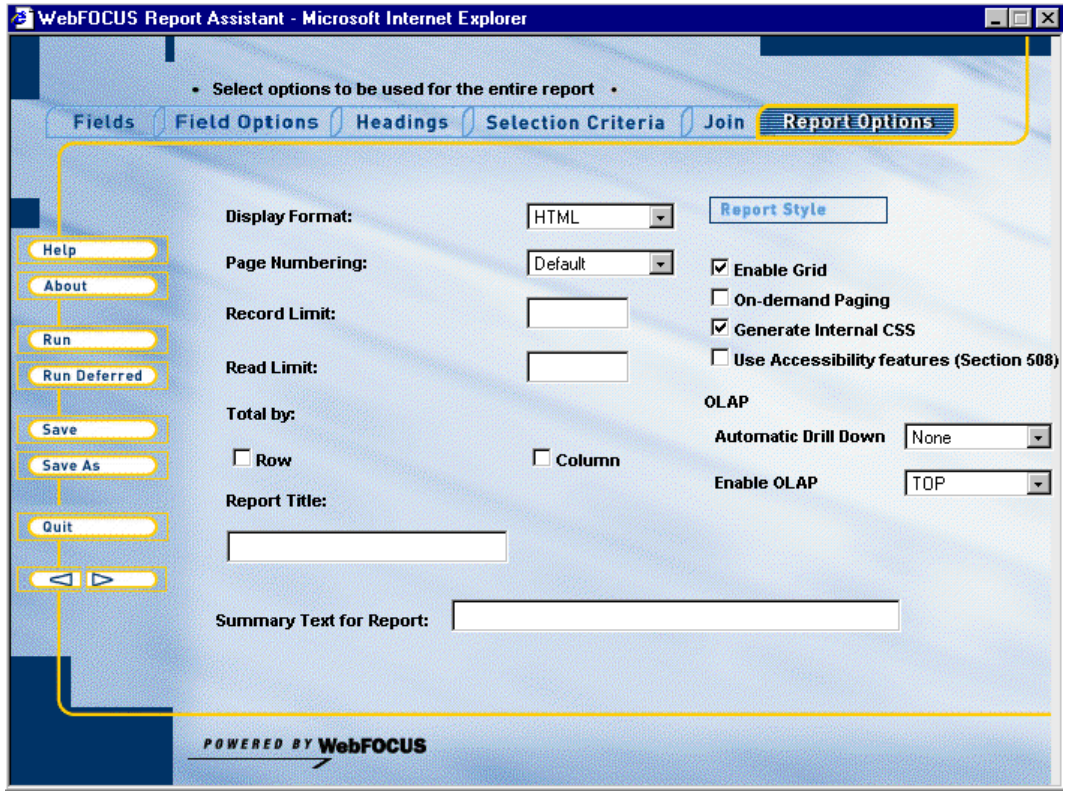


View the position of the controls after resizing the report window:



OLAP Options

To turn on the OLAP selections panel feature, you must select TOP or BOTTOM from the Enable OLAP drop-down list in Report Assistant. The Enable OLAP option is located under the Automatic Drill Down option in the OLAP section of the Report Options tab of Report Assistant.



To enable or disable the OLAP selections panel, you can choose from the following options:

- **None.** This is the default. When this option is selected, no code is generated in the procedure. If OLAPPANE is set in the procedure before changing the setting to None in Report Assistant, the setting will be removed from the procedure upon saving changes. As a result, executing the OLAP-enabled report returns the original OLAP selections panel. Also, the report will no longer be OLAP-enabled. Any -OLAP ON command will be removed from the report. If the option is selected in Report Assistant, the Run with OLAP option will be deselected.
- **CONTROL.** Report Painter generates the -OLAP ON command in the procedure which turns on the OLAP Control Panel. In Report Assistant, the Run with OLAP property is set.
- **TOP.** When you select this option, the ON TABLE SET OLAPPANE TOP setting is written to the procedure. This turns on the OLAP selections panel feature. The Measures, Graph, and Dimension controls, as well as the blue colored band containing the OLAP, Run, and Reset buttons display above the report output. In addition, in Report Assistant, the Run with OLAP property is set.
- **BOTTOM.** When you select this option, the ON TABLE SET OLAPPANE BOTTOM setting is written to the procedure. This turns on the OLAP selections panel feature. The Measures, Graph, and Dimension controls, as well as the blue colored band containing the OLAP, Run, and Reset buttons display below the report output. In addition, in Report Assistant, the Run with OLAP property is set.
- **HIDDEN.** You can turn the OLAP selections panel on but keep it hidden in an OLAP-enabled report. When you select this option, the ON TABLE SET OLAPPANE HIDDEN setting is written to the procedure. Later, if you want to view the OLAP selections panel, you can right-click any dimension or measure and select Show Panel. You can also return to the Report Options tab in Report Assistant and select TOP or BOTTOM from the Enable OLAP drop-down list to turn on the selections panel.

Blue Colored Band Containing OLAP, Run, and Reset Buttons

The buttons in the blue colored band and their functions are described below:

- **OLAP.** Opens the OCP. Its functionality is equivalent to that of the traditional OLAP button.
- **Run.** Executes the report. Its functionality is equivalent to that of the Run button available in the OCP.
- **Reset.** Resets all the controls in the report to their original state (that is, before the last changes or selections were made after the last execution of the report).

Measures and Graph Controls

The Measures and Graph controls are always located to the left of the first Dimension control. Both controls have a drop-down arrow on the left. Clicking the down arrow to the left of the Measures control opens a pane containing all the measures in the current report. There is a check box to the left of each measure showing the current display of the measure. These check boxes work the same way as those in the Measures Properties box in the OCP.

A check is present in the check box corresponding to every printed measure. If a measure is not printed, the check box is empty. If data visualization has been applied to a measure, the check box contains a graph icon indicating that bars will be graphed to the right of the data values for that particular measure if the report contains no ACROSS fields or right above the data values if the report contains at least one ACROSS field.

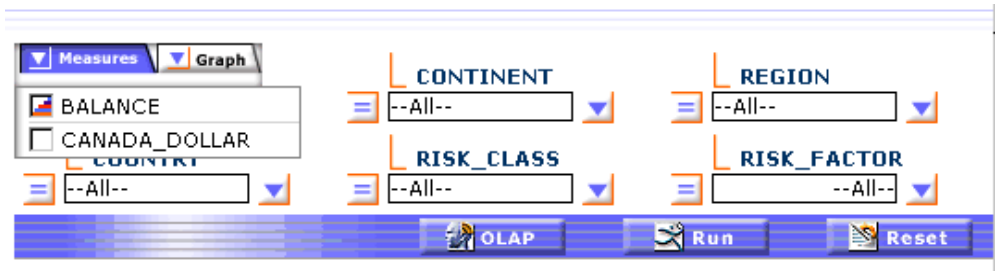
Thus, if there is a check in the check box next to a numeric measure, you can click it once to apply data visualization, click it a second time to make the measure not display (the check box will be empty), and click it a third time to put back the check to indicate the measure will be displayed. Since data visualization only applies to numeric measures, if there is a check next to a non-numeric measure, clicking the check box once removes the check, leaving the check box empty and clicking the check box a second time puts back the check.

Example **Using the Measures Control**

This example shows a measure that is not displayed (CANADA_DOLLAR) and data visualization applied to a measure (BALANCE). OLAPPANE=TOP is applied.

```
-OLAP ON
TABLE FILE SHORT
SUM BALANCE CANADA_DOLLARS
BY CONTINENT
BY RISK_CLASS
ON TABLE SET OLAPPANE TOP
ON TABLE SET ONLINE-FMT HTML
END
```

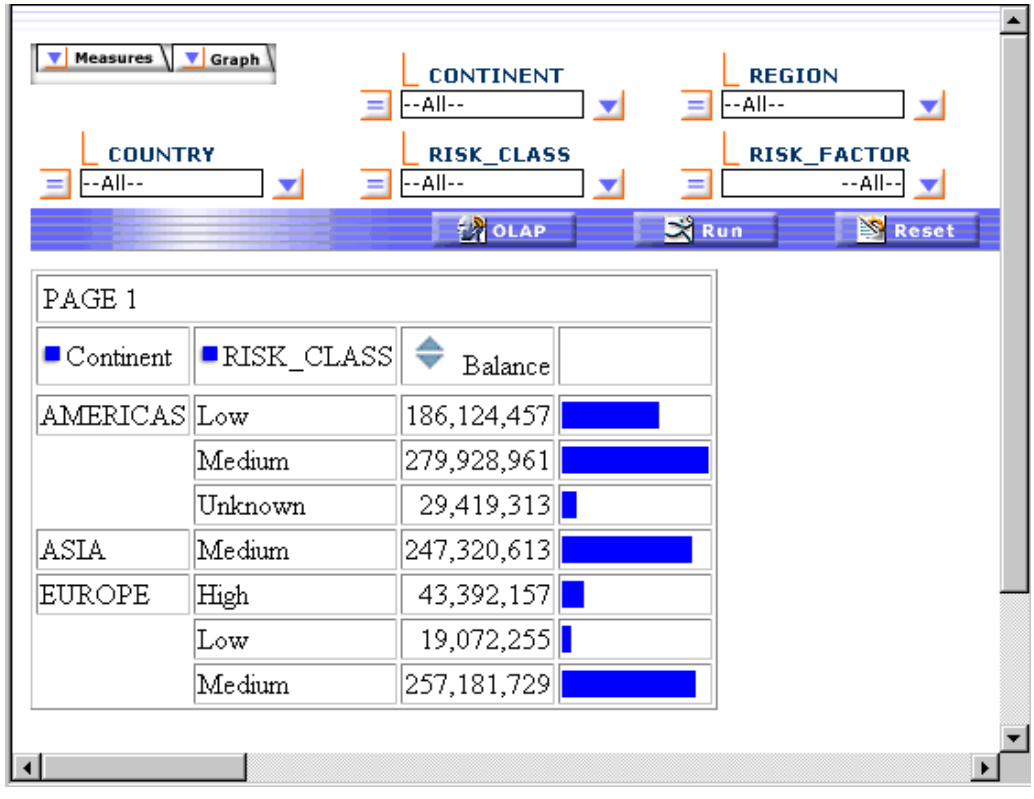
Running the procedure above produces the report output below:



PAGE 1			
Continent	RISK_CLASS	Balance	CANADA_DOLLAR
AMERICAS	Low	186,124,457	260,574,240
	Medium	279,928,961	391,900,545
	Unknown	29,419,313	41,187,038
ASIA	Medium	247,320,613	346,248,858
EUROPE	High	43,392,157	60,749,020
	Low	19,072,255	26,701,157
	Medium	257,181,729	360,054,421

In the window above, the Measures control is open to show how this sample report is customized. The blank check box next to CANADA_DOLLAR indicates that the CANADA_DOLLAR measure will not be printed. The small graph icon inside the check box next to BALANCE indicates that data visualization will be applied to the BALANCE measure.

Clicking Run generates the report output below:



Graph Control

Clicking the down arrow to the left of the Graph control opens a pane that contains all the numeric measures in the current report. There is a check box to the left of each measure and a graph button to the right of each measure. All check boxes are unchecked by default and all graph buttons are grayed (inactive) by default. When you check a check box associated with a measure, the graph button to the right of the measure becomes active. The following are different options for graphing a measure:

- Vertical Bar
- Vertical Line
- Vertical Area
- Horizontal Bar
- Horizontal Line
- Horizontal Area
- Pie

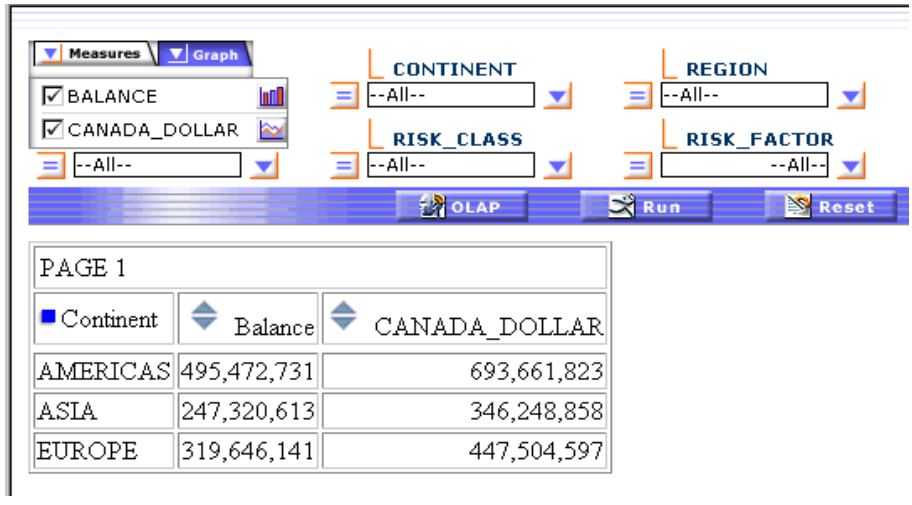
The default is Vertical Bar. If there are multiple measures in the Graph pane and you choose to graph each one of them by putting a check in their associated check boxes, all the graph buttons to the right of the measures display a vertical bar. Clicking a graph button once changes the graph icon to Vertical Line, clicking it a second time changes it to Vertical Area, and so on until clicking it a seventh time changes all graph icons back to Vertical Bar. If there are no numeric measures or if there are no sort fields (BY or ACROSS) in the report, the Graph control is grayed (inactive). Otherwise, it is active.

Example Using the Graph Control

This example shows how to graph measures using the Graph control, with OLAPPANE=TOP.

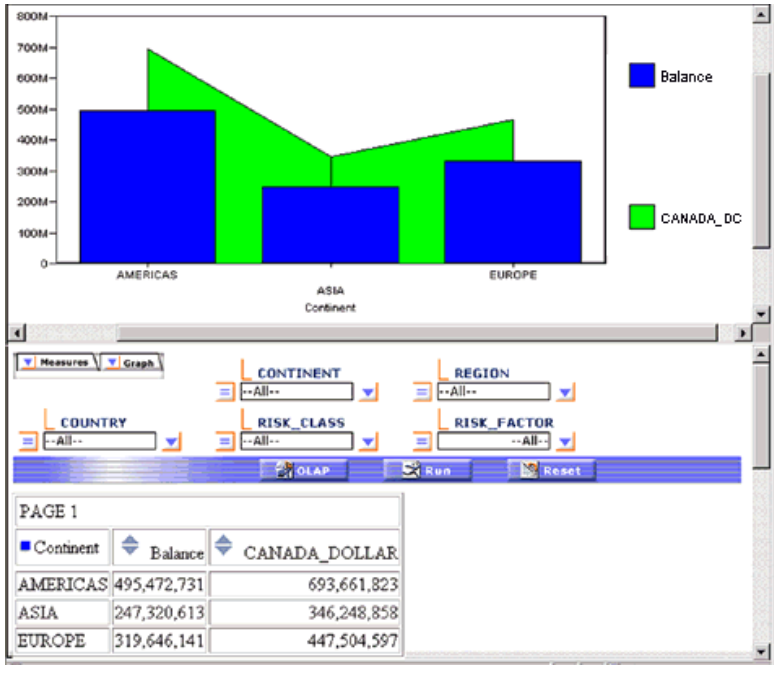
```
-OLAP ON
TABLE FILE SHORT
SUM BALANCE CANADA_DOLLARS
BY CONTINENT
ON TABLE SET OLAPPANE TOP
ON TABLE SET ONLINE-FMT HTML
END
```

Running the procedure above produces the report output below:



In the above window, the Graph control is open to show how this sample report is customized.

The BALANCE measure will be graphed as a vertical bar. The CANADA_DOLLAR measure will be graphed as a vertical area. Clicking Run generates the report output below:



The Measures and Graph controls allow you to apply data visualization or graphs to a measure, as well as to PRINT or NOPRINT the measure. Changes made in the Measures or Graph pane only take effect after you click Run.

Dimension Controls

There is a control for each dimension element in the dimension hierarchy. You can create selection criteria in your reports by clicking the down arrow on a particular dimension control and selecting a value from the list. When you click Run, the resulting report output reflects the selection made. When you click the down arrow again, the value that you selected is highlighted. You can also select multiple values by clicking the down arrow associated with a Dimension control and performing one of the following:

- Clicking a value and moving the mouse pointer up or down (depending on the values you would like to select) before releasing the mouse.
- Clicking the desired values while holding the Ctrl key on the keyboard.

As you make selections or changes in either the Measures, Graph, or the Dimension controls, the changes are reflected in the OCP. Thus, once selections or changes have been made in these controls, clicking Run anywhere in the OCP generates the same results as clicking Run that displays in the report page.

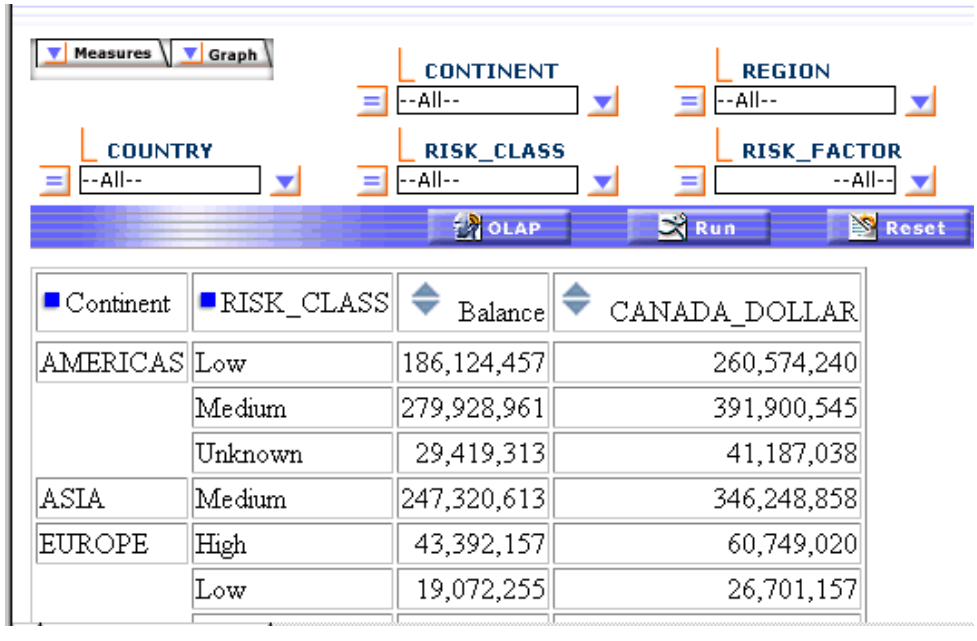
Changes made in the OCP in the Selection Criteria pane, the Measures and Graph panes, or the Measures Properties box are not reflected in the Measures, Graph, and Dimension controls. Once the report is transformed, however, after making changes in the OCP in any of these areas, the controls available in the report reflect the current state of the report.

Example Creating Selection Criteria

This example shows how to create selection criteria by selecting values from two of the dimension controls (CONTINENT and REGION), with OLAPPANE=TOP.

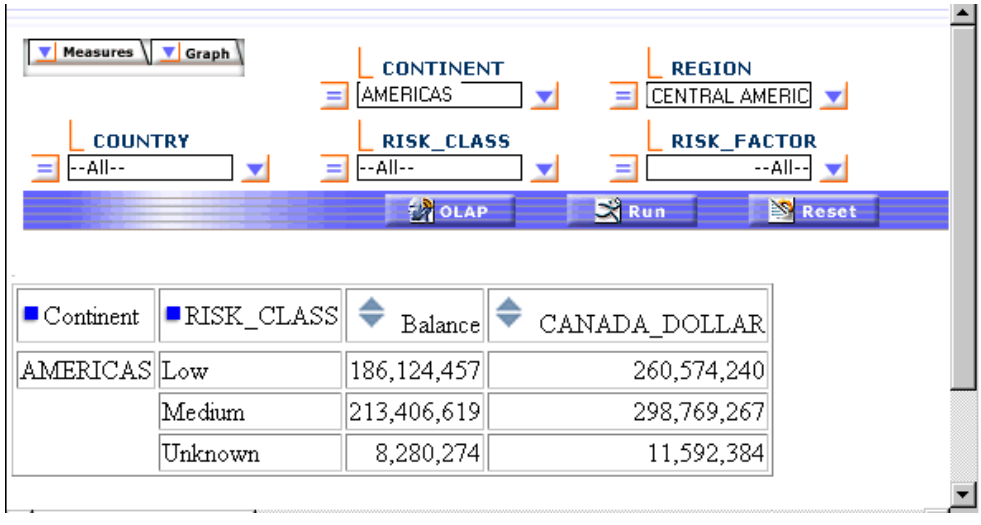
```
-OLAP ON
TABLE FILE SHORT
SUM BALANCE CANADA_DOLLARS
BY CONTINENT
BY RISK_CLASS
ON TABLE SET OLAPPANE TOP
ON TABLE SET ONLINE-FMT HTML
END
```

Running the procedure above produces the report output below:



Continent	RISK_CLASS	Balance	CANADA_DOLLAR
AMERICAS	Low	186,124,457	260,574,240
	Medium	279,928,961	391,900,545
	Unknown	29,419,313	41,187,038
ASIA	Medium	247,320,613	346,248,858
EUROPE	High	43,392,157	60,749,020
	Low	19,072,255	26,701,157

All the dimension controls show All as the selected value. This is the default. When you click a dimension control that shows All as the current selection, all the values existing in the database for that field will be available in the drop-down list. Selecting AMERICAS from the CONTINENT control and CENTRAL AMERICA and NORTH AMERICA from the REGION control generates the report shown below:



OLAP Selections Panel Interaction With Other Features

When the OLAP selections panel feature is turned on, the frame containing the traditional OLAP button is not displayed. An OLAP button displays in the blue colored band that is part of the actual report, and selection verifications that get generated through automatic drill downs (via Autodrill or Drill Down on Measures) are not displayed. Instead, the selections are highlighted in the corresponding dimension controls.

Dragging and Dropping Dimensions and Measures

You can drag and drop dimensions and measures from one position to another position in an OLAP-enabled report. You can drag and drop dimensions to and from the following drill down and drill across positions: By to By, By to Across, Across to By, and Across to Across. You can also drag and drop dimension controls from above the blue colored band to the body of the report. You can drag and drop measures to other measure positions to affect the order in which you read the measures.

Accessing Right-Click Menus in a Report

You can right-click dimensions and measures in an OLAP-enabled report to yield several choices.

When you right-click a dimension, you have the following choices:

- Delete
- New
- Move to Across/By
- Full Screen/Show Panel
- Field Info
- Help

When you right-click measures, you have the following choices:

- Sort by Highest
- Sort by Lowest
- Graph
- New
- Remove Measure
- Remove Visualization
- Forecast
- Full Screen/Show Panel
- Field Info
- Help

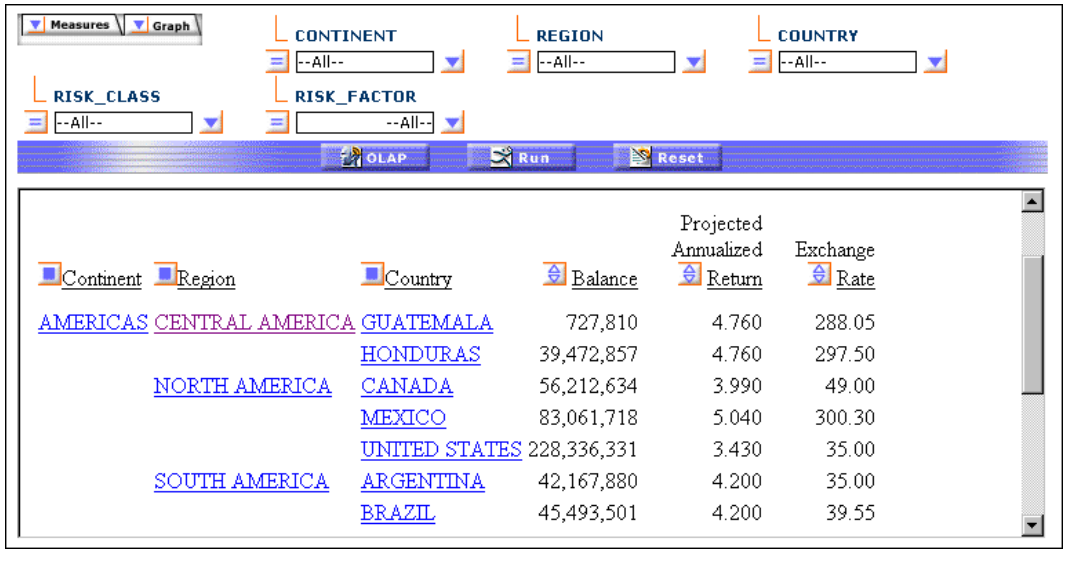
AutoSort

AutoSort allows you to automatically sort report rows by column values by clicking the diamond button to the left of the column title associated with a measure within the body of a displayed report. It allows you to apply measure-based sorting to an OLAP-enabled report one measure at a time.

User Interface

AutoSort requires fewer clicks to sort a particular measure column either from High to Low or from Low to High. The AutoSort feature changes the default behavior slightly in that clicking the diamond no longer opens the OCP to the By Total Properties box. To open the By Total Properties box, you must click the name of a measure in the Measures box.

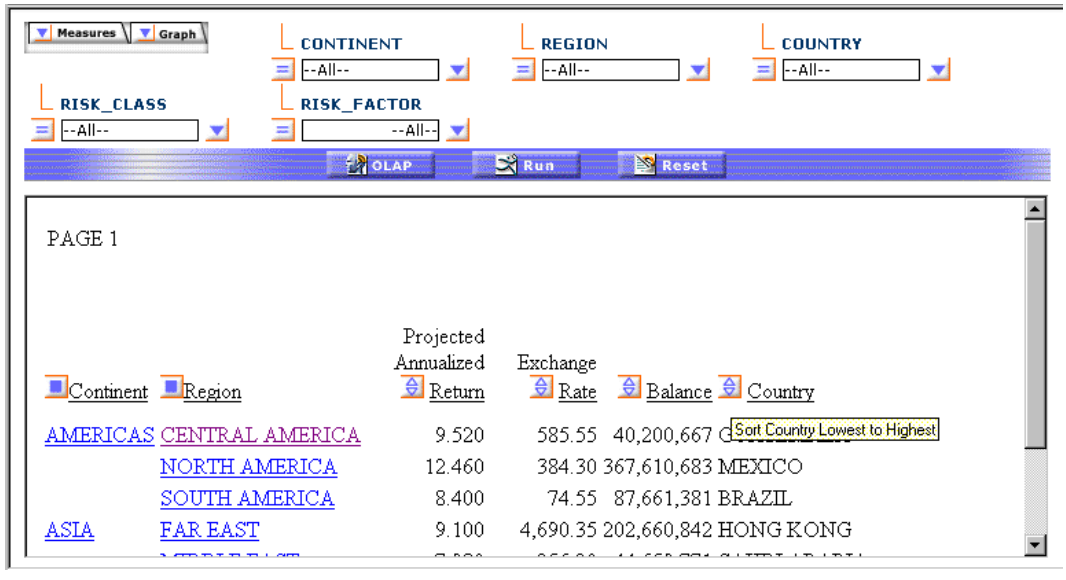
The window below shows an OLAP-enabled report with no sorted measures. This is the default.



Continent	Region	Country	Balance	Projected Annualized Return	Exchange Rate
AMERICAS	CENTRAL AMERICA	GUATEMALA	727,810	4.760	288.05
		HONDURAS	39,472,857	4.760	297.50
	NORTH AMERICA	CANADA	56,212,634	3.990	49.00
		MEXICO	83,061,718	5.040	300.30
		UNITED STATES	228,336,331	3.430	35.00
	SOUTH AMERICA	ARGENTINA	42,167,880	4.200	35.00
		BRAZIL	45,493,501	4.200	39.55

Clicking the top portion of the diamond (or diamond-shaped) button next to a measure automatically runs the report, and returns the transformed report sorted by that measure in descending order. In other words, clicking the top portion of the diamond button next to any measure automatically sorts the measure's column data from High to Low and returns the transformed report in the browser, showing the largest data value corresponding to that measure at the top of the column, and the smallest data value at the bottom of the column. If you click the bottom portion of the diamond button next to a measure, the report automatically runs, and the measure is sorted in ascending order (from Low to High) in the returned report output. See *Sorting From High-to-Low* on page 11-21.

Before applying a sort to a measure, you can place your mouse over the top or the bottom portion of the diamond button to display information in the Status bar about what the sort order will be if you clicked it. For example, in the window below, the bottom portion of Country is selected and lowest is indicated in the Status bar:



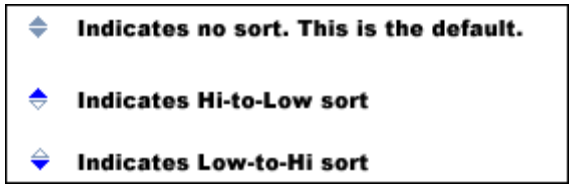
Once a measure has been sorted, clicking any half of the diamond button inverts the sort order of that measure. Thus, if the measure is sorted from High to Low, clicking either the hollow or solid half of the diamond button automatically runs the report and the measure is sorted from Low to High in the resulting report output. Also, placing your mouse over the hollow or solid half of the diamond displays in the status bar what the next sort order would be were you to click it.

At any point, placing your mouse over the diamond button associated with a measure displays the name of the measure as it appears in the Master File in Bubble Help, as shown in the above window.

Note: AutoSorting a measure while the OCP is opened causes all current changes made in the OCP to be applied, since the report is automatically executed. However, the sort order expected after AutoSorting a measure takes precedence over any sort selected in the By Total Properties box, which has not yet been applied.

Changes in AutoSort

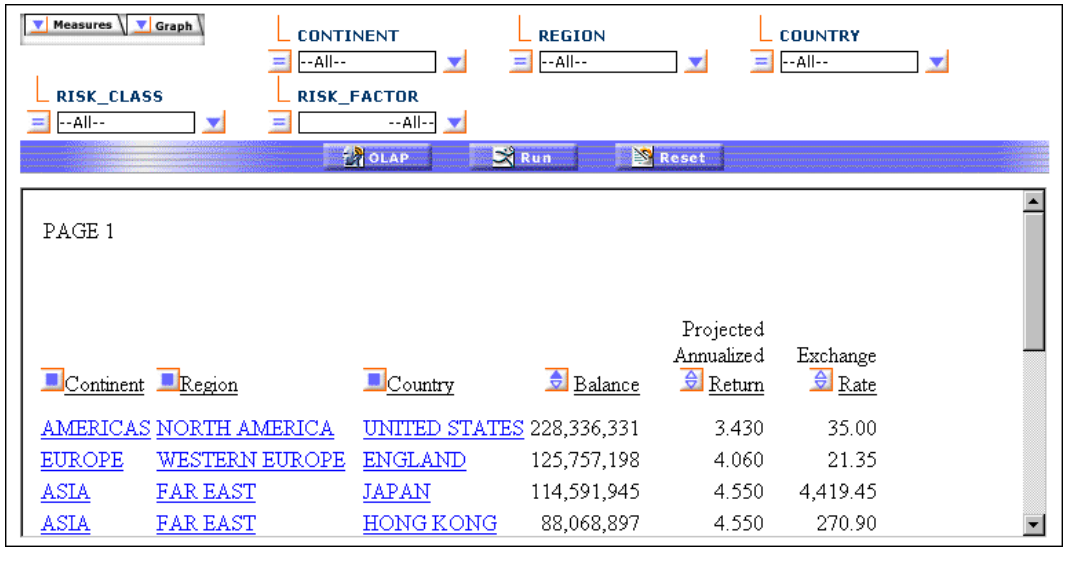
The AutoSort feature generates different HTML code for the image mapping. There are three possible choices as shown below:



The syntax is UseMap=Map_Name, where Map_Name is the name of the image corresponding to one of the diamond buttons above.

Example Sorting From High-to-Low

Assuming that the Balance measure has not been sorted, clicking the top portion of the diamond button next to the measure produces the results shown below:



Continent	Region	Country	Balance	Projected Annualized Return	Exchange Rate
AMERICAS	NORTH AMERICA	UNITED STATES	228,336,331	3.430	35.00
EUROPE	WESTERN EUROPE	ENGLAND	125,757,198	4.060	21.35
ASIA	FAR EAST	JAPAN	114,591,945	4.550	4,419.45
ASIA	FAR EAST	HONG KONG	88,068,897	4.550	270.90

The data values corresponding to the Balance measure display in descending order. This is because the Balance measure has been automatically sorted from High to Low. The top portion of the diamond button next to the Balance measure displays in a darker color to indicate the current sort order of the measure. Clicking the solid or hollow part of the diamond button inverts the sort order.

Interaction With Other Features

AutoSort is not available in a report that has stacked measures, since the diamond button is not displayed under these circumstances.

Drill Down On Measures

Drill Down On Measures allows you to drill down to another level of detail by clicking a value under a measure column. This feature works in combination with the AutoDrill feature. To turn on the Drill Down On Measures feature, you must select ALL from the Automatic Drill Down drop-down list, which is located in the OLAP section in the Report Assistant (Report Options tab). You can select from the following choices:

- **None.** This is the default. No Automatic Drill Down is available in the OLAP-enabled report. When this option is selected, any Automatic Drill Down setting already in the procedure is removed.
- **DIMENSIONS.** Turns on the AutoDrill feature.
- **ALL.** Turns on Drill Down on Measures.

Note: All screen shots for this feature, including those in the Examples section, have been captured with the OLAP selections panel feature turned OFF. See *OLAP Selections Panel Interaction With Other Features* on page 11-17 to see how the OLAP selections panel feature interacts with this feature.

When the Drill Down On Measures option is turned on, the procedure is updated with the ON TABLE SET AUTODRILL ALL setting. This setting causes all sort fields, which are also dimension elements (AutoDrill in action), as well as all measures to be hyperlinks in the OLAP-enabled report. If no sort fields, which are also dimension elements, are present in the report, the values corresponding to the currently displayed measures will not be hyperlinks. In other words, you cannot drill down on measures if there is no AutoDrill enabled sort field present in the report.

Although the entire report is activated when you turn on Drill Down On Measures, the behavior when clicking a measure value differs from the behavior when clicking a sort field value. When you click a value under a dimension sort field, the behavior is the same as when you use the AutoDrill feature. An IF statement is created on the field you clicked and that field is removed, a selection verification displays to the right of the OLAP button, and the next dimension element becomes the first BY field in the resulting report. When you drill down on a measure value, the results may be different depending on the combination of sort fields present in the report, as you can see in the following examples.

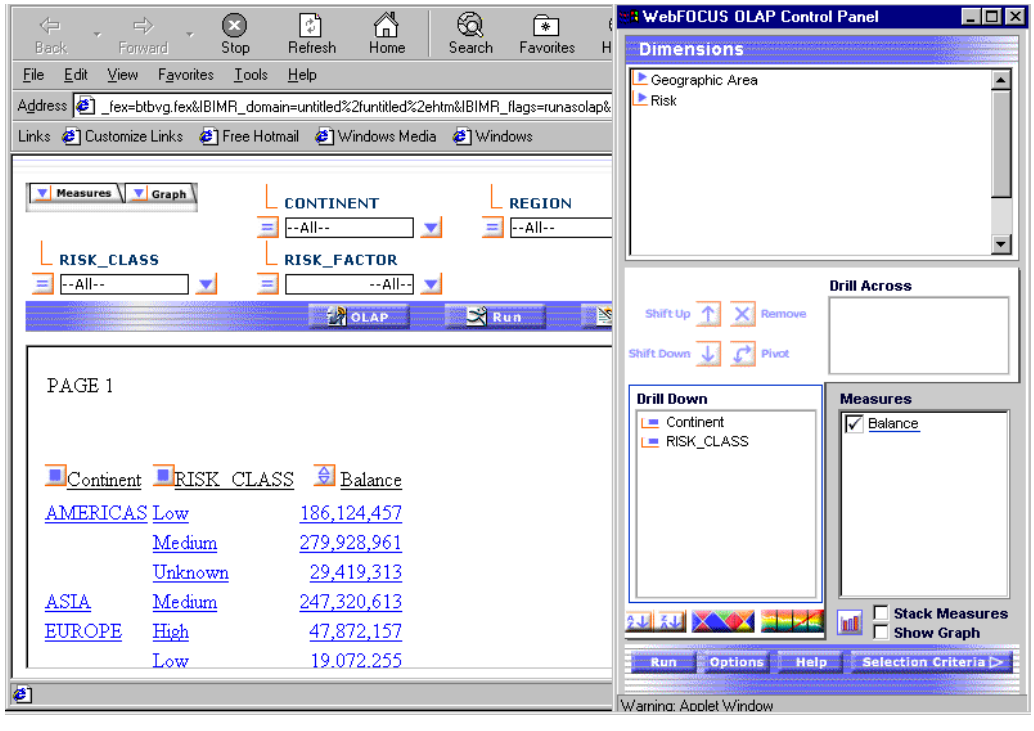
Selecting BY Fields and No ACROSS Fields

If the report contains at least one BY field and no ACROSS field, drilling down on a measure creates an IF statement on the first BY field (based on the value of the BY field in the row on which the measure value is clicked). The field is removed, a selection verification displays to the right of the OLAP button, and all of the dimension elements (if any) under the BY field that was removed become the first BY fields in the resulting report. The values displayed for the new BY fields are those that satisfy the IF statement created on the field that was removed. The measure values displayed in the resulting report depend on the values of the new BY fields.

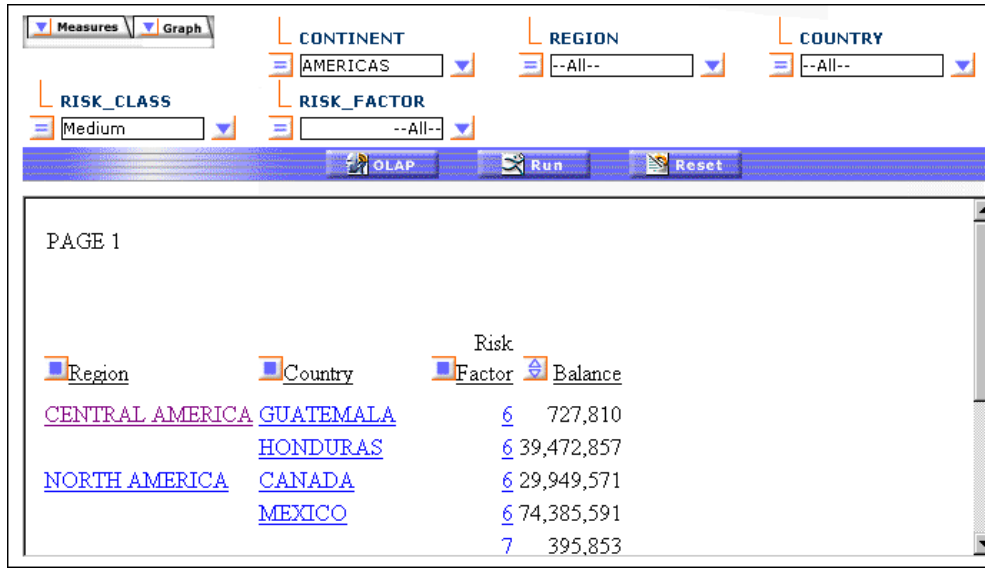
Example **Sorting With BY Fields and No ACROSS Fields**

```
-OLAP ON
TABLE FILE SHORT
SUM BALANCE
BY CONTINENT
BY RISK_CLASS
ON TABLE SET AUTODRILL ALL
ON TABLE SET OLAPPANE TOP
END
```

The following displays the report output before drilling down on the Balance measure:



Clicking the second Balance value (279,928,961) generates the following report output:



As you can see in the OCP window above, Continent and RISK_CLASS are BY fields. All the dimension elements under Continent and RISK_CLASS have now become the first BY fields, from left to right, in the resulting report output. The Continent and RISK_CLASS fields have been removed. The IF statements IF Continent EQ 'AMERICAS' and IF RISK_CLASS EQ 'Medium' have been generated, as indicated by the selection verifications to the right of the OLAP button. The data displayed for the measures in the resulting report output satisfy the values in the current BY fields.

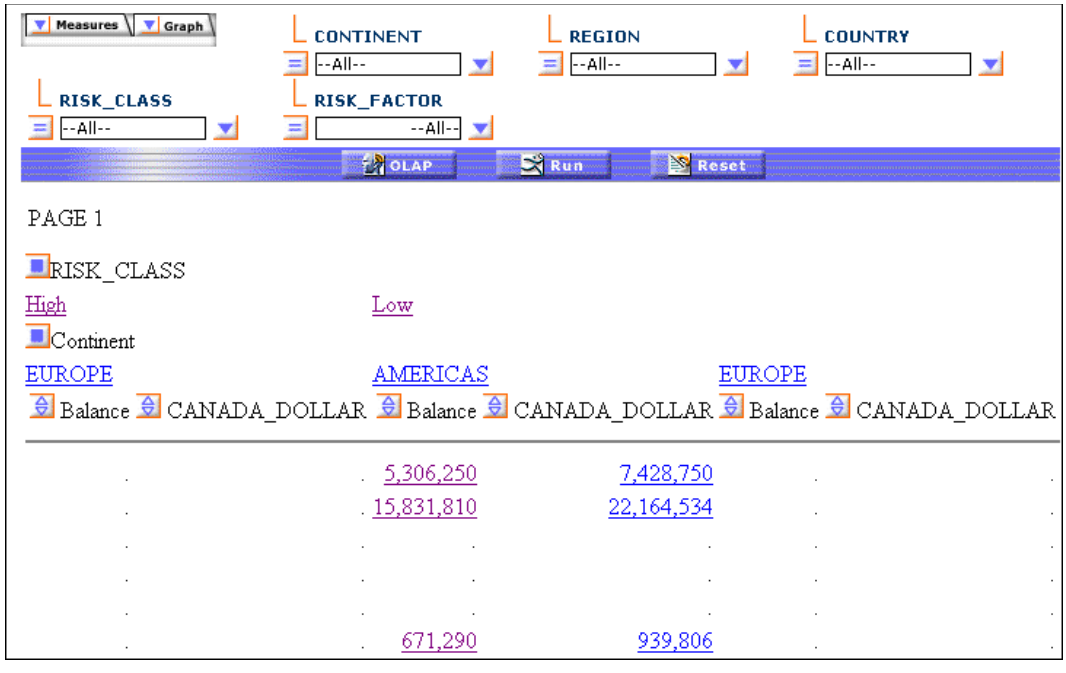
Selecting ACROSS Fields and No BY Fields

If the report contains at least one dimension ACROSS field, and no BY fields, drilling down on a measure creates an IF statement on each ACROSS field present in the report (based on the value of the ACROSS fields in the column on which the measure value is clicked). All ACROSS fields are removed from the report, a selection verification is displayed to the right of the OLAP button for each removed field, and all of the dimension elements under the removed ACROSS fields become the first BY fields from left to right in the resulting report output. The values displayed for the new BY fields are those that satisfy the IF statements created on the fields that were removed. The measure values displayed in the resulting report depend on the values of the new BY fields.

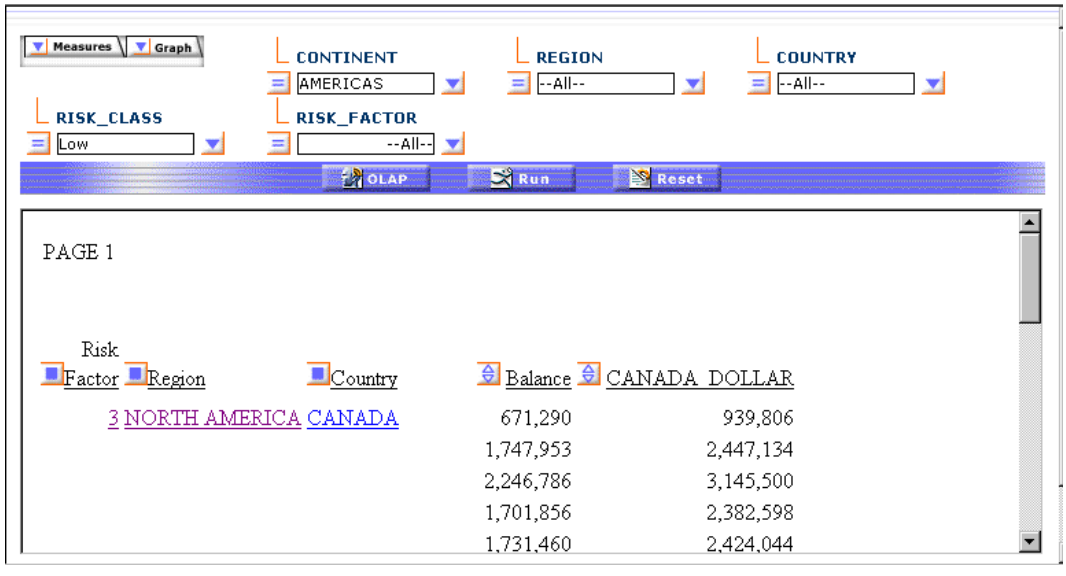
Example Sorting With ACROSS Fields and No BY Fields

```
-OLAP ON
TABLE FILE SHORT
PRINT BALANCE AND CANADA_DOLLAR
ACROSS RISK_CLASS
ACROSS CONTINENT
ON TABLE SET AUTODRILL ALL
ON TABLE SET OLAPPANE TOP
END
```

The following displays the report output before drilling down on the Balance measure:



In this example, RISK_CLASS and Continent are dimension BY fields, and you can drill down on them. Clicking the Balance value 671,290 generates the following report output:



The only dimension element under RISK_CLASS is Risk_Factor and the dimension elements under Continent are Region and Country. The resulting BY fields in the report output from left to right should be Risk_Factor, Region, and Country. The RISK_CLASS and Continent fields are removed, and the IF statements IF RISK_CLASS EQ 'Low' and IF Continent EQ 'AMERICAS' are generated, as indicated by the selection verifications to the right of the OLAP button. The data displayed for the measures in the resulting report output are those that satisfy the values in the current BY fields.

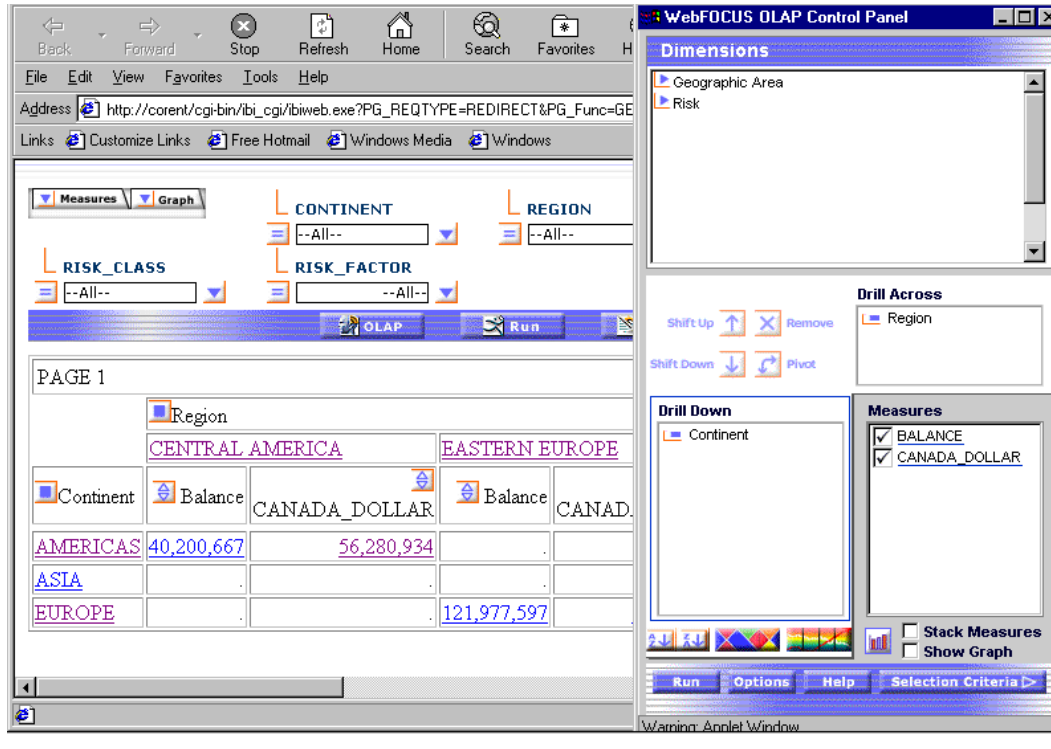
Selecting BY and ACROSS Fields Under the Same Root Dimension

If the report contains at least one BY and one ACROSS dimension field, and these fields are under the same root dimension, drilling down on a measure generates an IF statement for all BY and ACROSS dimension fields originally present in the report. The selection verification is placed to the right of the OLAP button, and only the dimension elements corresponding to the removed ACROSS fields become the new BY fields in the resulting report output.

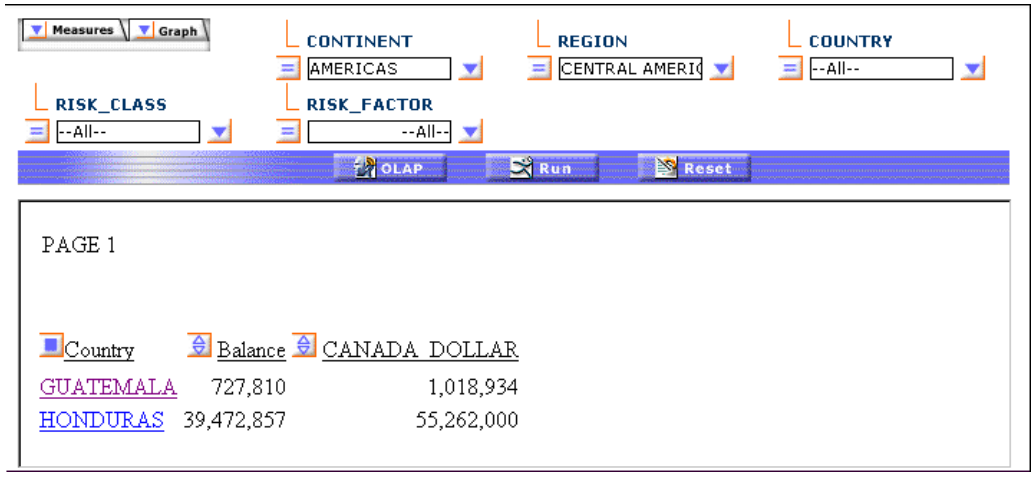
Example Sorting With BY and ACROSS Fields Under the Same Root Dimension

```
-OLAP ON
TABLE FILE SHORT
SUM BALANCE AND CANADA_DOLLAR
BY CONTINENT
ACROSS REGION
ON TABLE SET OLAPPANE TOP
ON TABLE SET AUTODRILL ALL
END
```

The following displays the report output before drilling down on the CANADA_DOLLAR measure:



As you can see in the OCP, Continent and Region are dimension sort fields. Clicking the CANADA_DOLLAR value of 56,280,934 generates the following report:



Because Continent and Region are under the same root dimension (Geographic Area) in the dimension hierarchy, only the ACROSS field (Region) is broken up to its last dimension level. Hence, the resulting BY field in the report output is Country. The Continent and Region fields are removed, and the IF statements IF Continent EQ 'AMERICAS' and IF Region EQ 'CENTRAL AMERICA' are generated, as indicated by the selection verifications to the right of the OLAP button. The data displayed for the measures in the resulting report output are those that satisfy the values in the current BY field.

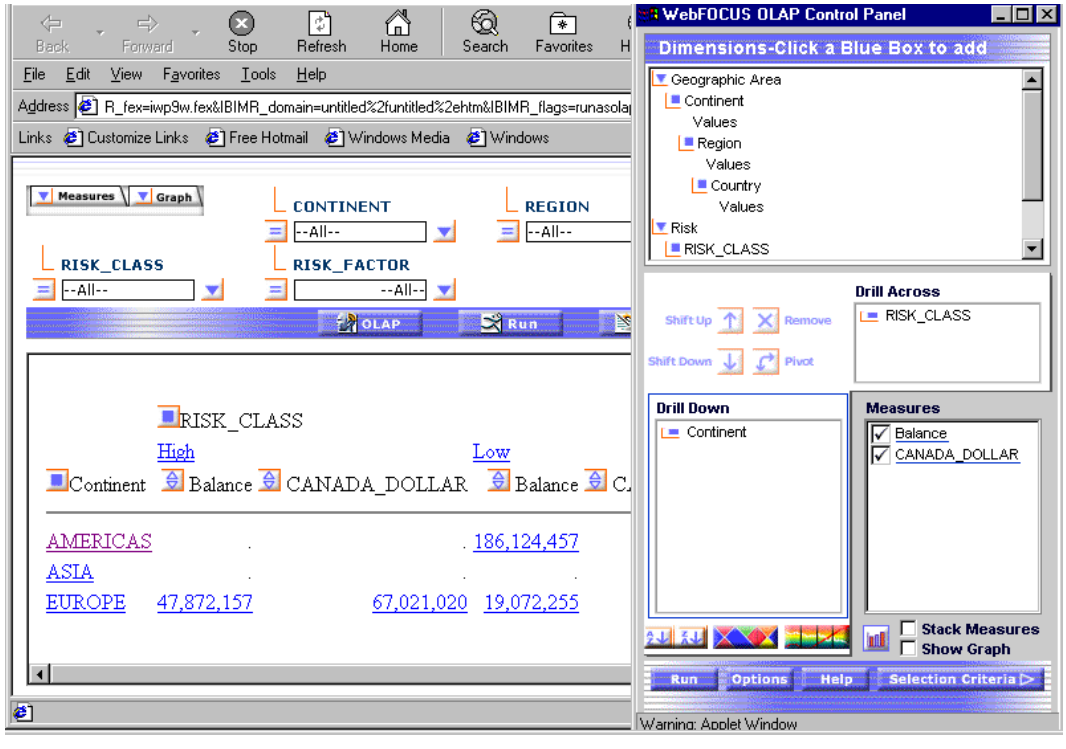
Selecting BY and ACROSS Fields Under Different Root Dimensions

If the report contains at least one BY and one ACROSS dimension field and the original dimension sort fields in the report belong to different root dimensions, then the BY fields present in the report are broken down to their last dimension level first and the ACROSS fields are broken down next. All original BY dimension fields and ACROSS fields are removed, an IF statement is generated for each removed BY and ACROSS field, and their selection verification is placed to the right of the OLAP button. All the dimension elements under the BY fields removed become the first set of BY fields from left to right. The dimension elements under the ACROSS fields removed follow the first set of BY fields from left to right in the resulting report output.

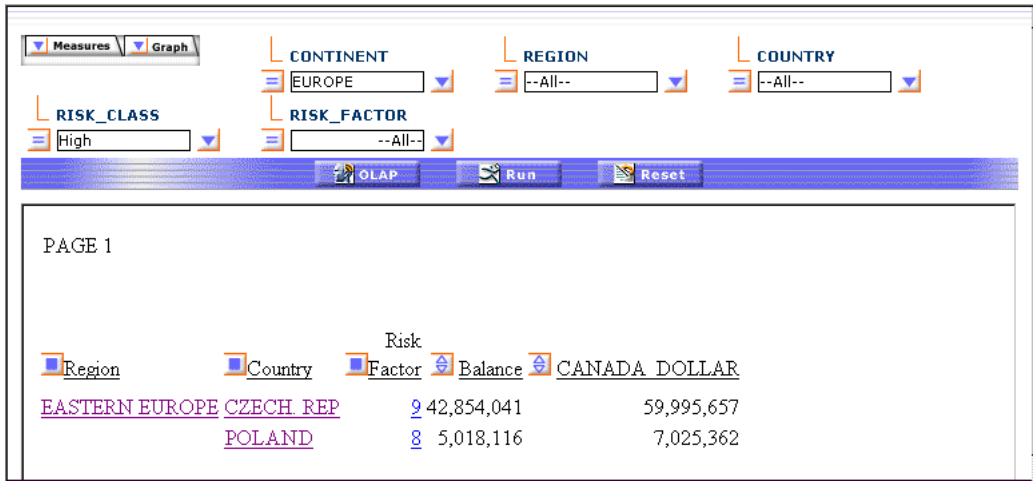
Example Sorting With BY and ACROSS Fields Under Different Root Dimensions

```
-OLAP ON
TABLE FILE SHORT
SUM BALANCE AND CANADA_DOLLAR
BY CONTINENT
ACROSS RISK_CLASS
ON TABLE SET OLAPPANE TOP
ON TABLE SET AUTODRILL ALL
END
```

The following displays the report output before drilling down on the CANADA_DOLLAR measure:



As you can see in the OCP, Continent and RISK_CLASS are dimension sort fields. Thus, clicking the CANADA_DOLLAR value of 67,021,020 generates the following report output:



Because Continent and RISK_CLASS are under the different root dimensions (Geographic Area and Risk) in the dimension hierarchy, the BY field (Continent) is broken down to its last dimension element first. Then, the ACROSS field (RISK_CLASS) is broken down to its last dimension level next.

The resulting BY fields in the report output from left to right are Region, Country, and Risk Factor. The Continent and RISK_CLASS fields are removed, and the IF statements IF CONTINENT EQ 'EUROPE' and IF RISK_CLASS EQ 'High' are generated, as indicated by the selection verifications to the right of the OLAP button. The data displayed for the measures in the resulting report output are those that satisfy the values in the current BY fields.

Selecting BY and ACROSS Fields Already Present in a Report

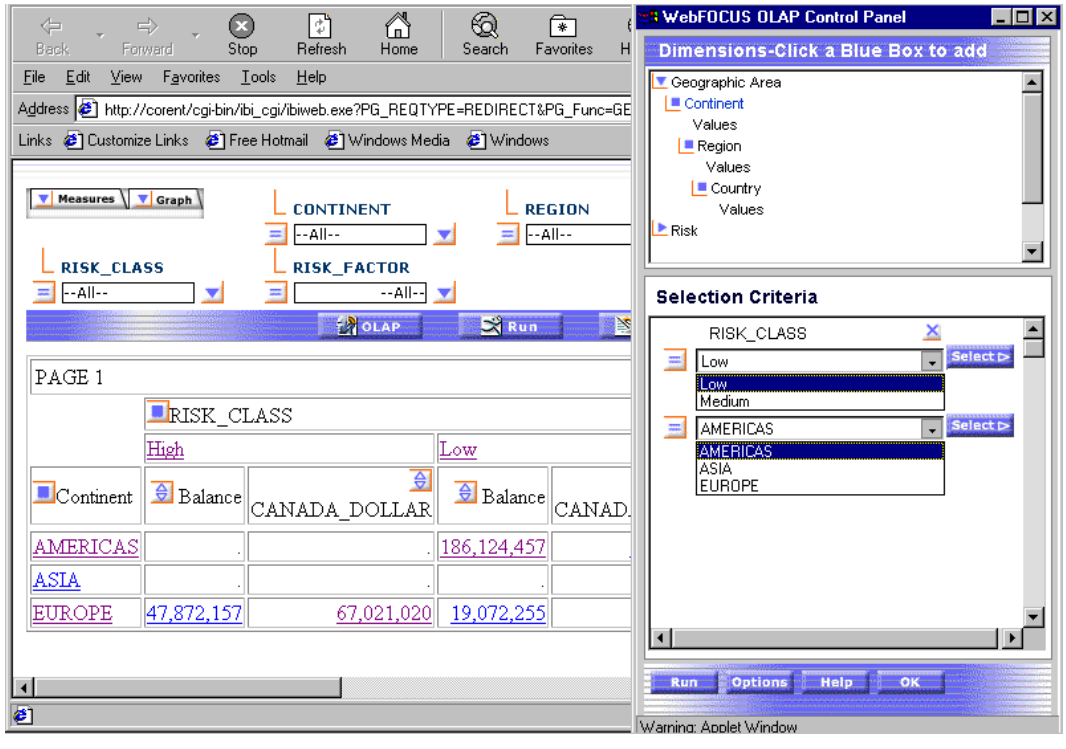
If there is a dimension sort field whose dimension element is already present in a report, the Drill Down On Measures process remains the same as described in the above cases. All dimension sort fields are removed from the report, an IF statement with its selection verification is generated for the dimension element removed, and new BY fields are generated for any dimension element under the dimension sort fields that were removed, even if these elements were originally present in the report.

As in AutoDrill, if the last level of detail has been reached, meaning that the dimension sort field present in the report is the last dimension element in the dimension hierarchy, only the values under the dimension sort field are hyperlinked. Clicking a hyperlink under the dimension sort field removes the field and generates an IF statement (whose selection verification is displayed to the right of the OLAP button) on the dimension sort field removed.

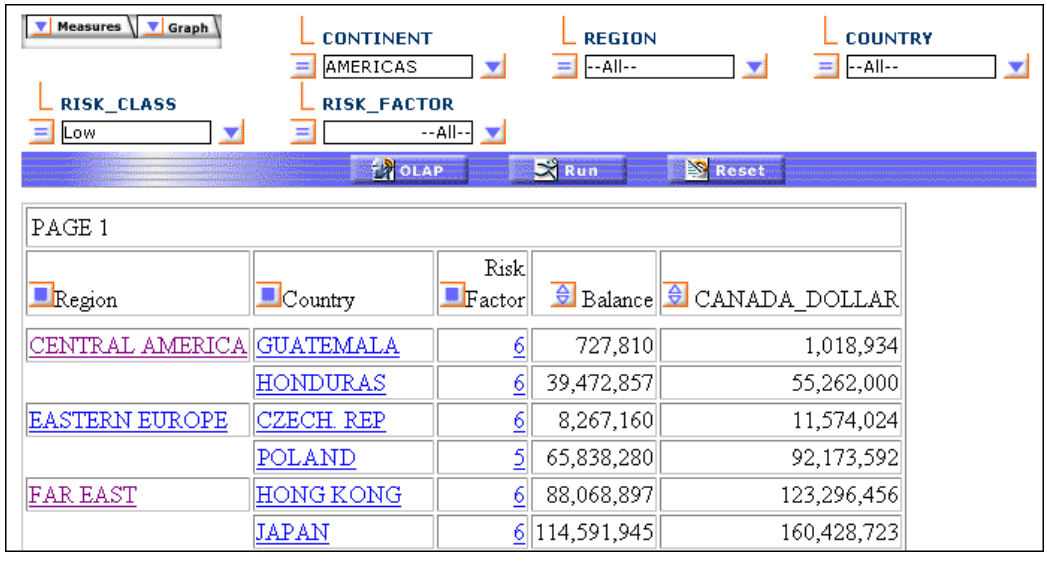
Drilling Down On Measures While the OCP Is Open

When the OCP is opened, clicking a hyperlinked measure automatically generates the selection criteria in the Selection Criteria pane. The Selection Criteria pane opens automatically showing all the resulting selection criteria. This allows you to multi select values by clicking different values under any measure or dimension sort field.

In the image below, clicking the Balance value 186,124,457 in the second Balance column generates the two selection criteria shown in the OCP, but with only Low available in the RISK_CLASS drop-down list, and only AMERICAS available in the Continent drop-down list. Clicking the Balance values 247,320,613 and 257,181,729 add Medium to the RISK_CLASS drop-down list, and ASIA and EUROPE to the Continent drop-down list.



You can click Run to drill down to the last dimension element under the RISK_CLASS and Continent sort fields (since each field is under a different root dimension; otherwise, only the RISK_CLASS field would be broken down to its last dimension level). These fields are removed and the selection verification generated for them reflects the selection criteria in the Selection Criteria pane. The following shows the resulting report output:



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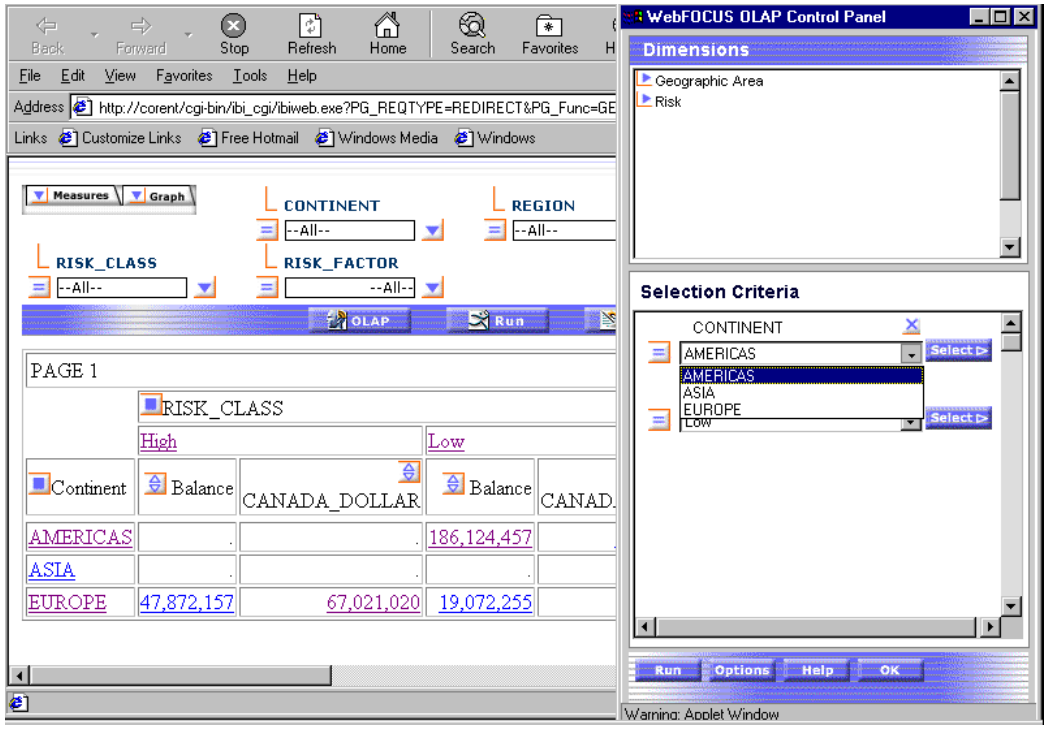
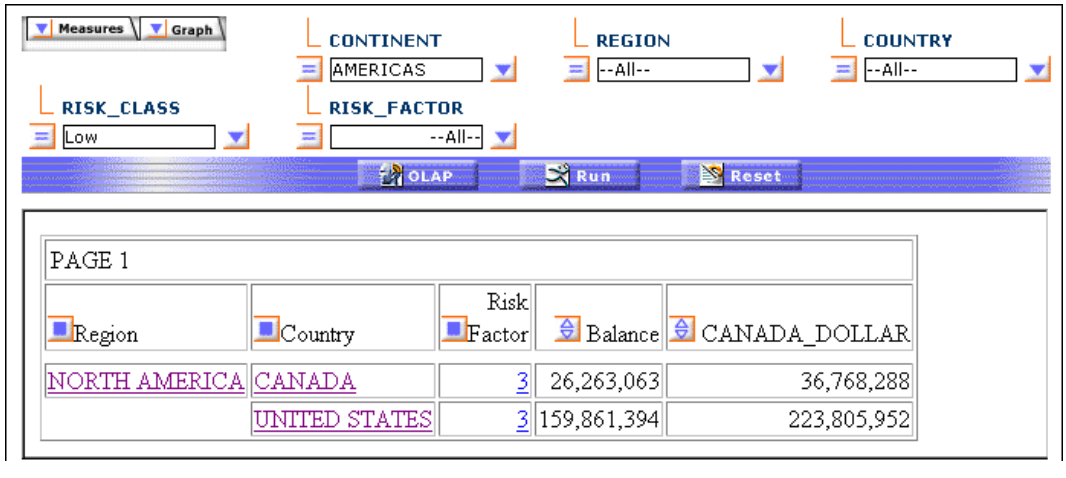
Region	Country	Risk Factor	Balance	CANADA_DOLLAR
CENTRAL AMERICA	GUATEMALA	6	727,810	1,018,934
	HONDURAS	6	39,472,857	55,262,000
EASTERN EUROPE	CZECH. REP	6	8,267,160	11,574,024
	POLAND	5	65,838,280	92,173,592
FAR EAST	HONG KONG	6	88,068,897	123,296,456
	JAPAN	6	114,591,945	160,428,723

Using the data from the example, *Sorting With BY Fields and No ACROSS Fields* on page 11-23, if you want to display the different continents that had a RISK_CLASS value of Low, click the Balance value 186,124,457 in the second Balance column, and then click the Continent values AMERICAS, ASIA, and EUROPE. The image below shows these selections, and the next image shows the resulting report output.





Limits

All ACROSS fields in the report (dimension or non-dimension) are removed from the report when autodrilling on a measure. If the fields removed are dimension fields, then the dimension elements under these sort fields become BY fields in the resulting report. A selection verification is placed to the right of the OLAP button for each removed field. Dimension fields under the dimension ACROSS fields removed become BY fields (and not ACROSS fields) in the resulting report output so as to avoid exceeding the maximum number of ACROSS values that FOCUS supports, which is 64.

Interaction With Other Features

When clicking a hyperlink under a dimension sort field while the OCP is opened, the selection criteria are automatically added in the Selection Criteria pane. This allows you to multi select values by clicking other hyperlinks under a dimension sort field. If no hyperlinks are clicked under any measure, clicking Run at this point generates the same report output as when you applied the AutoDrill functionality with the OCP opened. However, clicking a hyperlink under a measure after clicking a value under a dimension sort field overwrites the AutoDrill functionality. Instead of drilling down to the next level of detail (AutoDrill), you drill down to the last level of detail (Drill Down On Measures).

CHAPTER 12

Manipulating Data in an OLAP-enabled Report

Topics:

- Characteristics of OLAP-enabled Reports
- Using the OLAP Control Panel
- Saving an OLAP-enabled Report
- Displaying Graphs in an OLAP-enabled Report
- Sorting OLAP-enabled Reports
- Sorting Report Lines by Column Values
- Applying Selection Criteria to OLAP-enabled Reports
- Using AutoDrill
- Using AutoSelection
- Applying Selection Criteria to Date Elements
- Date Format Limitations
- StyleSheet Transformation
- Visualizing Trends in OLAP-enabled Reports
- Troubleshooting OLAP-enabled Reports

The WebFOCUS OLAP Control Panel (OCP) provides you with a versatile way to gain more insight from your report by dynamically manipulating the report data. You can generate optimal reports by using features of the OLAP Control Panel.

Note: All examples in this chapter have the OLAP selections panel feature turned OFF. For more information on using the OLAP selections panel, see Chapter 11, *Using OLAP Analysis*.

Characteristics of OLAP-enabled Reports

An OLAP-enabled report has a number of features that distinguish it from other reports.

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Store Name:	Manufacturing Plant	Product Name:	Line Total	Quantity:
AV VideoTown	BOS	110 VHS-C Camcorder 20 X	$3,837,017.68	12,972
		120 VHS-C Camcorder 40 X	$4,471,002.48	13,224
		150 8MM Camcorder 20 X	$1,556,171.32	5,723
		2 Hd VCR LCD Menu	$1,687,656.75	11,182
		250 8MM Camcorder 40 X	$435,356.88	1,277
		330DX Digital Camera 1024K P	$62,942.40	252
		650DL Digital Camcorder 150 X	$4,659,121.44	5,651
		750SL Digital Camcorder 300 X	$206,593.20	220
		AR2 35MM Camera 8 X	$359,198.60	3,873

Manufacturing Plant

OLAP BOS

- A button displays at the bottom of your report with the label OLAP.

  Click this button to view the OLAP Control Panel (OCP). For additional information, see *Using the OLAP Control Panel* on page 12-6.

  The OLAP button appears at the bottom of a graph when the OLAP-enabled procedure includes a graph request. However, the button currently is inoperative.

- A sort field (BY or ACROSS) has a blue square adjacent to it.

  When you click the blue square, the OLAP Control Panel opens. If this field is an element of a dimension, the field is highlighted in the Dimensions box. This is useful if the column has a title different from the name of the field.

- The measures (fields that make up the body of the report) have blue diamonds adjacent to them. You can click a diamond to open the OLAP Control Panel and display the properties for the selected measure.

- If your report has any selection criteria, you see them listed at the bottom of the report if you are in WebFOCUS. Note that currently, these criteria do not display at the bottom of the report in WebFOCUS (Windows version).

  Clicking the relational operator button opens the OLAP Control Panel.

- When you place the pointer over a blue square or a blue diamond adjacent to a dimension or a measure column title respectively, Bubble Help appears. Bubble Help provides a brief pop-up message with descriptive information about the report column. This information is derived from the Master File associated with the report. For details, see *Displaying Bubble Help in OLAP-enabled Reports* on page 12-5.

Dragging and Dropping Dimensions and Measures

You can drag and drop dimensions and measures from one position to another position in an OLAP-enabled report. You can drag and drop dimensions to and from the following drill down and drill across positions: By to By, By to Across, Across to By, and Across to Across. You can drag and drop measures to other measure positions to affect the order in which you read the measures.

Note: When you use the OLAP selections panel, you can also drag and drop dimension controls from above the blue colored band to the body of the report. For more information, see Chapter 11, *Using OLAP Analysis*.

Accessing Right-Click Menus in a Report

You can right-click dimensions and measures in an OLAP-enabled report to yield several choices.

When you right-click a dimension, you have the following choices:

- Delete
- New
- Move to Across/By
- Full Screen/Show Panel
- Field Info
- Help

When you right-click a measure, you have the following choices:

- Sort by Highest
- Sort by Lowest
- Graph
- New
- Remove Measure
- Remove Visualization
- Forecast
- Full Screen/Show Panel
- Field Info
- Help

Displaying Bubble Help in OLAP-enabled Reports

You can display Bubble Help for dimensions and measures in an OLAP report. Bubble Help provides a brief pop-up message with descriptive information about the report column.

Bubble Help appears only if a field description is included in the Master File associated with the report.

Procedure How to Display Bubble Help

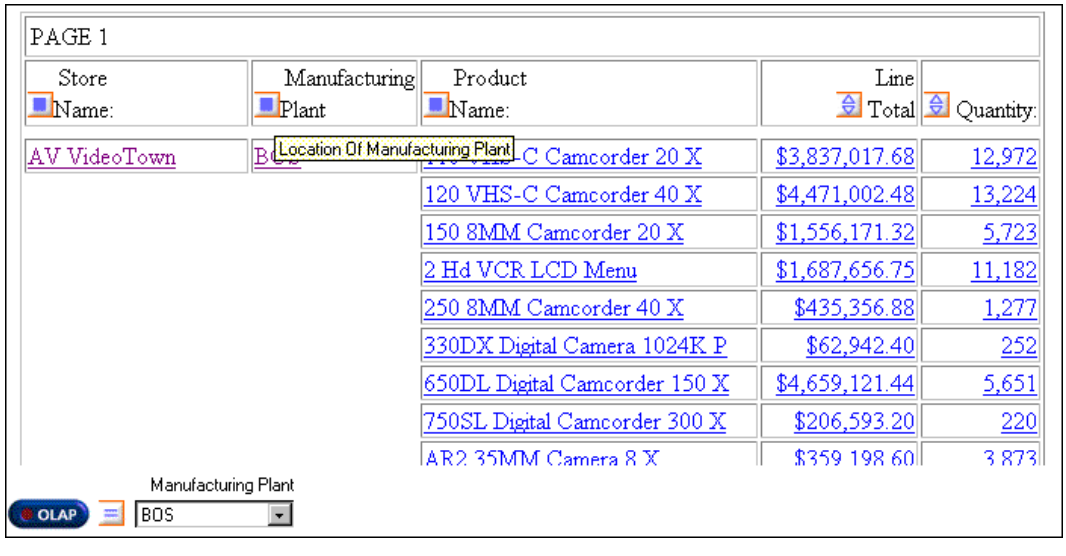
1. Run an OLAP-enabled report request. The report opens in a browser in WebFOCUS.
2. Place the mouse pointer over a blue dimension square or a blue measure diamond.

   The pointer changes to a hand icon and displays the Bubble Help message associated with the report column.

The Bubble Help message box closes after a few seconds or when you move the pointer off of the blue square or diamond.

Example Bubble Help in an OLAP-enabled Report

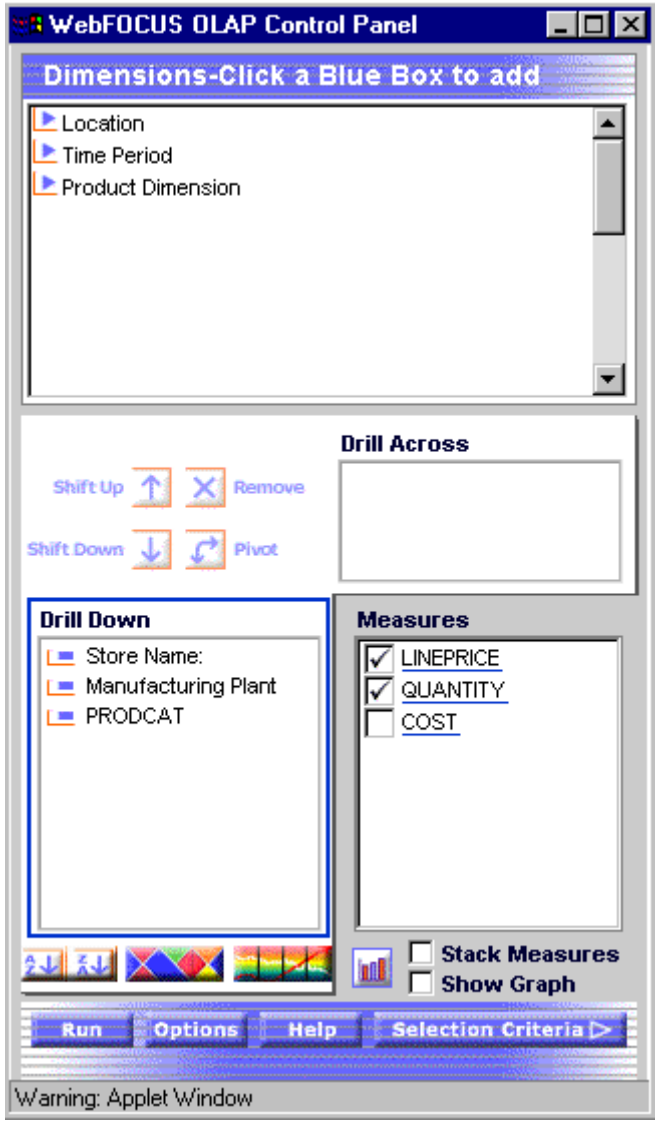
In the following OLAP-enabled report, the mouse pointer was placed over the blue square adjacent to the Manufacturing Plant column. The description of the column, Location of Manufacturing Plant (as assigned in the corresponding Master File), appears as Bubble Help.



Using the OLAP Control Panel

The OLAP Control Panel enables you to manipulate the data in an OLAP-enabled report. You can add elements to or remove elements from the report, pivot rows and columns, and apply selection criteria.

To access the OLAP Control Panel, you can click the OLAP button at the bottom of an OLAP-enabled report. The OLAP Control Panel partially overlays the report.



The OLAP Control Panel contains the following components:

- The Dimensions box contains the groups of related elements defined in your data source. The elements are usually structured in a hierarchy (for example, the Location dimension contains the Region, State, and City fields; the Region is made up of several States, and each State contains several Cities). To view the elements in a dimension, click the arrow to the left of the dimension name.

  If you open the OLAP Control Panel by clicking the square adjacent to an element (rather than clicking the OLAP button), the corresponding dimension opens, and the element is highlighted.

- The Drill Down and Drill Across boxes display the fields applied to sort the report. You can change a Drill Down field to a Drill Across field (this is called "pivoting"). You also can add and remove Drill Down and Drill Across fields. Drill Across fields are added by pivoting Drill Down fields.

- The Measures Properties box contains the body of your report (usually numeric fields). You can change the display mode of a measure by clicking the check box next to the measure. For details, see Chapter 9, *Visualizing Trends in Reports*.

Adding Data and Removing Data for an OLAP-enabled Report

You can add data to or remove data from an OLAP-enabled report in the OLAP Control Panel.

- You can add or remove elements in a dimension.
- You can add or remove measures.

Procedure How to Add an Element to an OLAP-enabled Report

To add an element to a report:

1. Select a report layout box (Drill Down or Drill Across).
2. Click the dimension or element in the Dimensions box at the top of the window. (You can view the elements in a dimension by clicking the arrow to the left of the dimension.)
3. Click *Run* to execute your report with the new settings.

Example Adding an Element to an OLAP-enabled Report

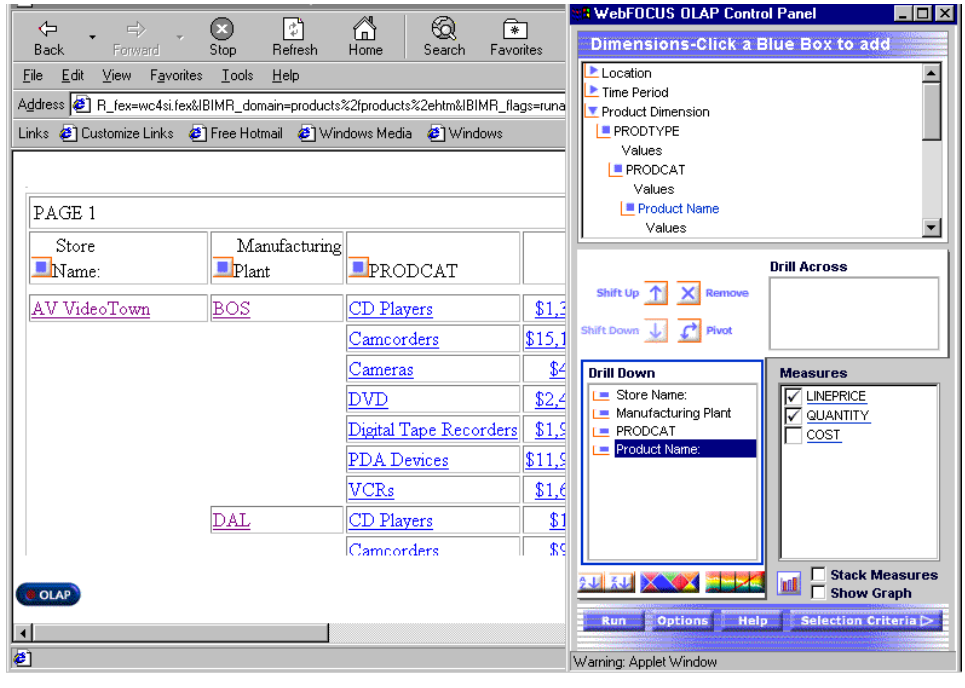
You have an OLAP-enabled report showing sales data broken out by Store Name, Product Category, and Manufacturing Plant. You want to drill down, that is, further break down the report by Product Name.

1. Click the square next to PRODCAT in the report.

   The OLAP Control Panel opens.

   The Product dimension is open, and the Product Category field is broken down into Product Name.

2. To see your report broken out by Product Name, add it to the Drill Down field box.



3. Click *Run* to execute the report.

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Store Name:	Manufacturing Plant	PRODCAT	Product Name:	Line Total	Quantity:
AV VideoTown	BOS	CD Players	QX Portable CD Player	$1,396,859.36	9,789
		Camcorders	110 VHS-C Camcorder 20 X	$3,837,017.68	12,972
			120 VHS-C Camcorder 40 X	$4,471,002.48	13,224
			150 8MM Camcorder 20 X	$1,556,171.32	5,723
			250 8MM Camcorder 40 X	$435,356.88	1,277
			650DL Digital Camcorder 150 X	$4,659,121.44	5,651

OLAP

4. The report now breaks out information for each Product.

Procedure How to Remove an Element From an OLAP-enabled Report

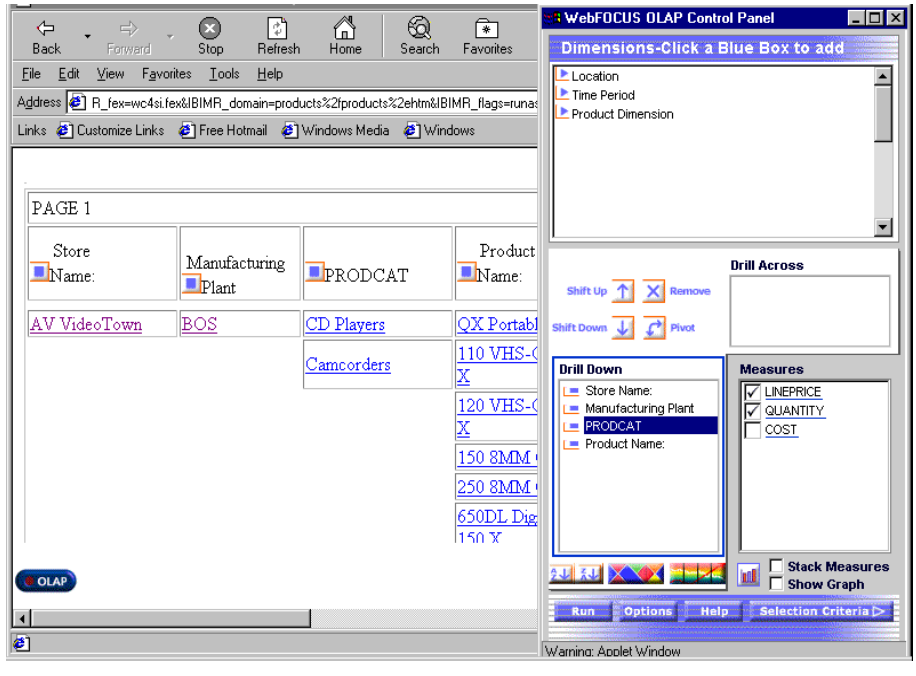
1. Select the element in the Drill Down or Drill Across box.
2. Click *Remove* .
3. Click *Run* to execute the report.

Example Removing an Element From an OLAP-enabled Report

You have an OLAP-enabled report showing Lineprice and Quantity sorted by Store Name, Manufacturing Plant, Product Category, or Product Name.

To remove Product Category from the report:

1. Click *OLAP* to open the OLAP Control Panel. (You can also click the square icon next to PRODCAT. This opens the OLAP Control Panel with Product Category highlighted.)
2. Select *PRODCAT* in the Drill Down box.
3. Click *Remove* .



4. Click *Run* to execute the report.

PAGE 1

Store Name:	Manufacturing Plant	Product Name:	Line Total	Quantity:
AV VideoTown	BOS	110 VHS-C Camcorder 20 X	$3,837,017.68	12,972
		120 VHS-C Camcorder 40 X	$4,471,002.48	13,224
		150 8MM Camcorder 20 X	$1,556,171.32	5,723
		2 Hd VCR LCD Menu	$1,687,656.75	11,182
		250 8MM Camcorder 40 X	$435,356.88	1,277
		330DX Digital Camera 1024K P	$62,942.40	252
		650DL Digital Camcorder 150 X	$4,659,121.44	5,651
		750SL Digital Camcorder 300 X	$206,593.20	220
		AR2 35MM Camera 8 X	$359,198.60	3,873

OLAP

Procedure How to Add or Remove a Measure in an OLAP-enabled Report

1. In the Measures box, select the check box next to the name of the measure to add a measure to the report.

or

Deselect the check box next to the name of the measure to remove a measure from the report.

2. Click *Run* to execute your report.

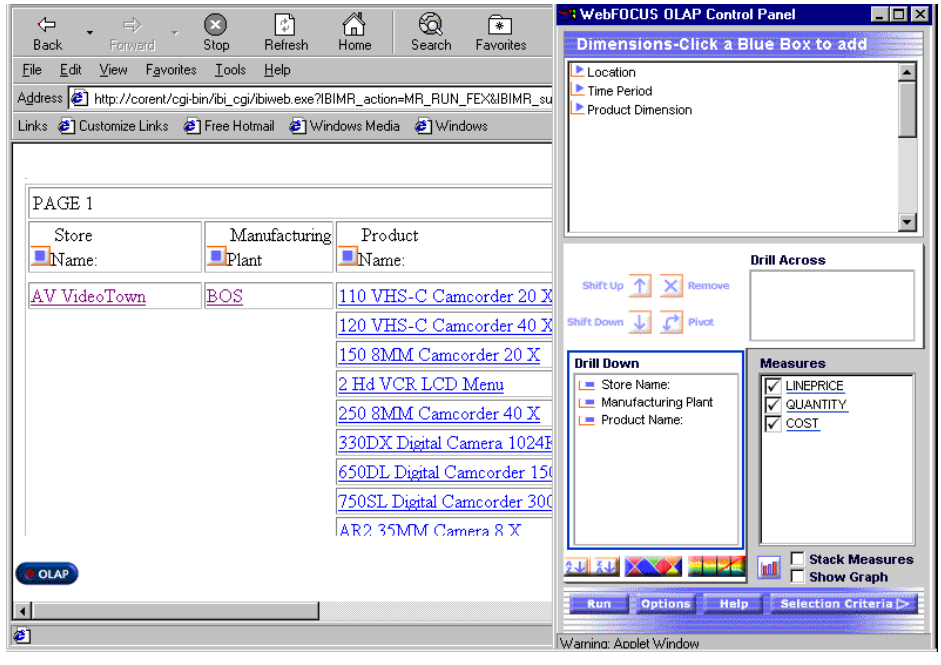
Note: You can add non-displaying measures to the OLAP-enabled report by applying the NOPRINT option to columns while creating or designing the report. You can also associate data visualization graphs with measures to track trends. For details, see Chapter 9, *Visualizing Trends in Reports*.

Example Adding a Measure to an OLAP-enabled Report

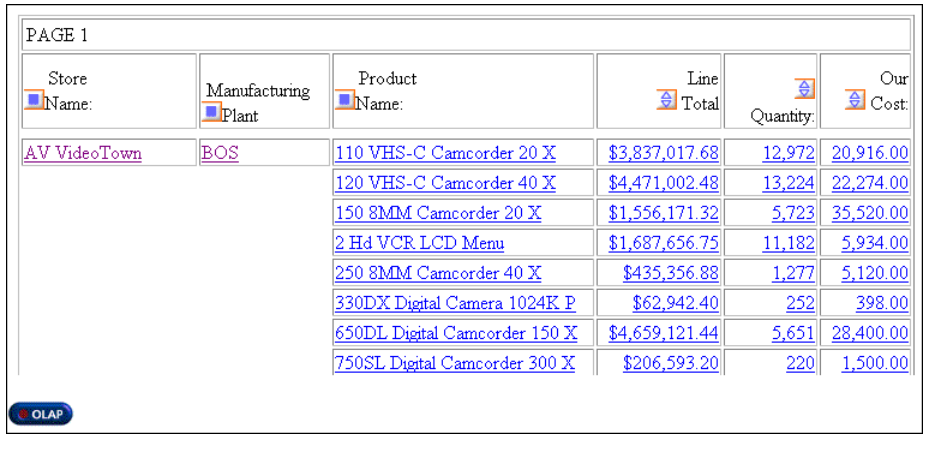
You have an OLAP-enabled report with three measures: LINEPRICE, QUANTITY, and COST, but only the LINEPRICE measure appears.

To display all three measures:

1. Select the check boxes next to the QUANTITY and COST measures.



2. Click *Run* to execute the report.



PAGE 1

Store Name:	Manufacturing Plant	Product Name:	Line Total	Quantity:	Our Cost:
AV VideoTown	BOS	110 VHS-C Camcorder 20 X	$3,837,017.68	12,972	20,916.00
		120 VHS-C Camcorder 40 X	$4,471,002.48	13,224	22,274.00
		150 8MM Camcorder 20 X	$1,556,171.32	5,723	35,520.00
		2 Hd VCR LCD Menu	$1,687,656.75	11,182	5,934.00
		250 8MM Camcorder 40 X	$435,356.88	1,277	5,120.00
		330DX Digital Camera 1024K P	$62,942.40	252	398.00
		650DL Digital Camcorder 150 X	$4,659,121.44	5,651	28,400.00
		750SL Digital Camcorder 300 X	$206,593.20	220	1,500.00

OLAP

Saving an OLAP-enabled Report

You can save your report as an Excel spreadsheet file, a PDF file, or to your application.

Procedure How to Save an OLAP-enabled Report as an Excel File

1. Click *Options*.
2. Select *Save the data in an Excel file* or *Save the data in an Excel 2000 file*.
3. Follow the instructions to export the data.

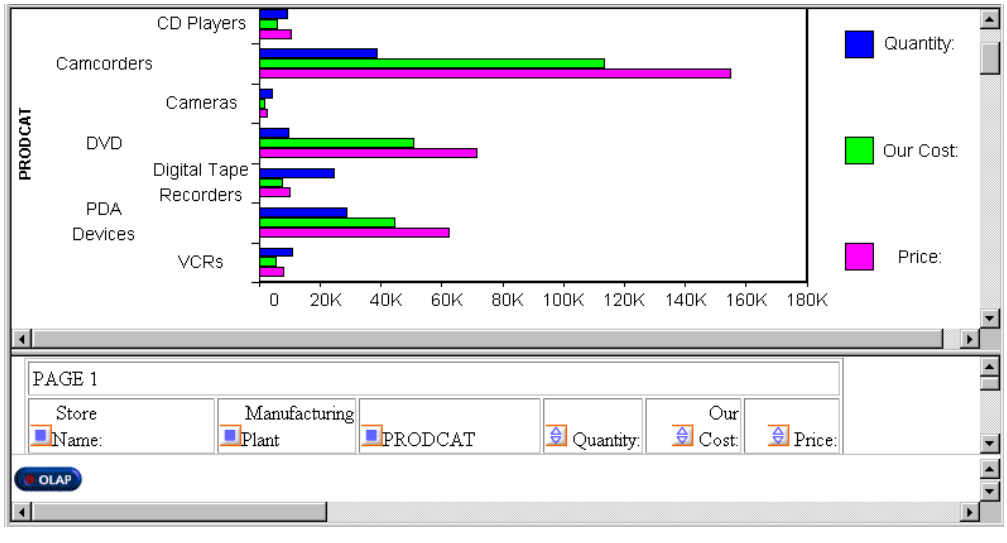
Note: After you save to Excel 2000, only explicit drill-down works. You cannot drill down via AutoDrill. The pre-Excel 2000 format does not support drill-down of any kind.

Procedure How to Display an OLAP-enabled Report in PDF Format

1. Click *Options*.
2. Select *Display as a PDF Report*. A second browser opens and launches Adobe Acrobat.

Displaying Graphs in an OLAP-enabled Report

You can graph the results of an OLAP-enabled report request directly from the OLAP Control Panel. You select the specific data elements to include and view the tabular report and a graphical representation of the identical information simultaneously in a split window. The graph appears in a frame in the top half of the window. The report displays in a frame in the bottom section of the window, and the OLAP button is located in the left bottom corner of the window.



When you select Save in My Reports, both the graph(s) and the table are saved. The other options (for example, Save the data in an Excel File) do not save the graph.

There is no limit to the number of characters in a graph legend's label, but long labels may appear truncated.

Available OLAP Graph Types

You can select from the following graph types in the OLAP Control Panel:

- Vertical Bar (default style)
- Vertical Line
- Vertical Area
- Horizontal Bar
- Horizontal Line
- Horizontal Area
- Pie

When you select a Vertical or Horizontal Bar, Line, or Area controlling graph style, a measure can display in any of those styles. For example, the first measure can display as bars, the second measure as lines, and the third measure as areas. All measures must have the same orientation (vertical or horizontal). When you choose Pie as the controlling graph style, you can display only pie charts. The default graph style is Vertical Bar. Multiple graphs are stacked.

Reference

Combining Graph Styles and Measure Styles in OLAP Graphs

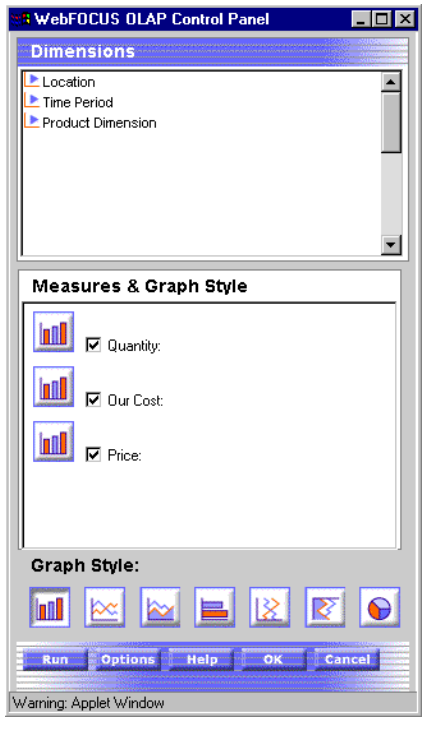
The following table lists the available combination of selections:

Controlling Graph Style	Potential Measure Styles
Vertical Bar (default)	Vertical Bar (default)
	Vertical Line
	Vertical Area
Vertical Line	Vertical Line (default)
	Vertical Bar
	Vertical Area
Vertical Area	Vertical Area (default)
	Vertical Bar

Controlling Graph Style	**Potential Measure Styles**
	Vertical Line
Horizontal Bar	Horizontal Bar (default)
	Horizontal Line
	Horizontal Area
Horizontal Line	Horizontal Line (default)
	Horizontal Bar
	Horizontal Area
Horizontal Area	Horizontal Area (default)
	Horizontal Line
	Horizontal Area
Pie	Pie

Using the OLAP Graph Panel

You display the report and the accompanying graph(s) by selecting the Show Graph check box below the Measures Properties box and then clicking the Graph button to invoke the Graph Panel.



From the Graph Panel, you can choose the measures you wish to graph, a controlling graph style, and graph styles for the measures.

The contents of the Drill Down (BY) pane and the Drill Across (ACROSS) pane determine the X-axis fields. When there are multiple drill (X-axis) fields, multiple graphs display vertically stacked in the same frame. The measures display as Y-axis fields on the graphs you display.

Note: You cannot choose to graph alphanumeric or date fields. If there are no numeric measures, the Show Graph check box and the Graph button are disabled (grayed out).

Procedure How to Display Graphs From the OLAP Control Panel

1. Invoke the OLAP Control Panel and display the Measures Properties box.

   To display the panel, click the *OLAP* button at the bottom of the report.

   or

   Click the square icon adjacent to an element.

2. Select the *Show Graph* check box (located below the Measures Properties box).

3. Click *Graph* adjacent to the Show Graph check box to open the Graph Panel.

   When the Graph Panel opens, the check boxes associated with the available measures are unchecked by default.

4. Click one of the seven buttons to select a controlling graph style for your graph.

   Each of the seven icon buttons near the bottom of the Graph Panel corresponds to a controlling graph style.

   Each button has a tool tip associated with it that describes the style of the graph that results when the button is clicked.

   The first icon is the default controlling graph style (Vertical Bar).

   If you select the Show Graph check box and click Run without selecting a controlling graph style, a graph displays with the default style (Vertical Bar).

5. Select the check box(es) for the measure(s) you wish to graph.

   The graph icon corresponding to the controlling graph style also displays on the Measure Style button next to the selected measure.

6. Click *Measure Style* to change the graph style used to represent an individual measure if your controlling graph style is Line, Bar, or Area.

   If the controlling style is Pie, all measures must be displayed as pie graphs.

   When you select different styles (other than pie; for example bar and line), the graph will be of mixed type.

7. Click *Run* to display the graph(s) and the tabular report in a split screen.

8. To return to the OLAP Control Panel with all the graph settings retained, click *OK*.

9. To return to the OLAP Control Panel and to discard the graph settings, click *Cancel*.

Note:

- If you did *not* select the Show Graph check box and you click Run, a tabular report displays *without* a graph.
- If you did *not* select the Show Graph check box, but you did select at least one measure in the Measures & Graph Style pane, when you click OK, the system automatically selects the Show Graph check box. The tabular report displays with a graph.

Sorting OLAP-enabled Reports

To customize and enhance the display of your report, you can:

- Change the order and position of sort elements.
- Pivot rows and columns.
- Order the data in your report.

Changing the Sort Position of an Element

You can change the sort position of an element in an OLAP-enabled report using a layout box (Drill Down or Drill Across) in the OLAP Control Panel. For example, you can change from sorting by State and then by Product to sorting by Product and then by State.

Procedure How to Change the Sort Position of an Element

1. Open the OLAP Control Panel.
2. Select the element in the Drill Down or Drill Across box.
3. Click *Shift Up* or *Shift Down*.
4. Click *Run* to execute your report.

Example Changing the Sort Position of an Element

You have an OLAP-enabled report displaying QUANTITY, COST, and PRICE sorted by Store Name, Manufacturing Plant, and then by Product Name and Product Category. You want to see QUANTITY, COST, and PRICE sorted by Product Category and then by Product Name.

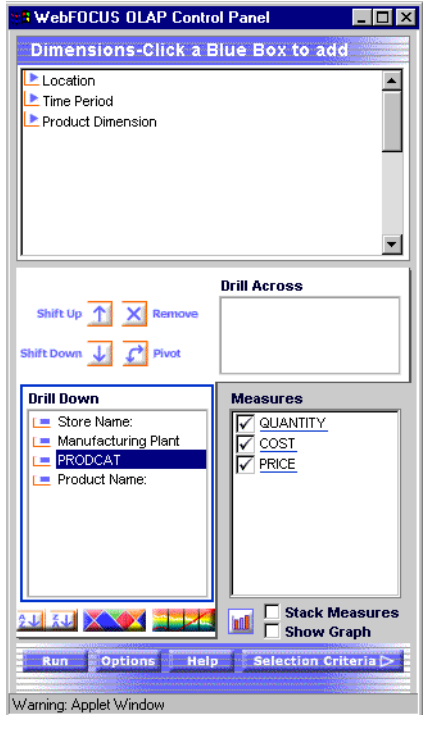
1. Click *OLAP* to open the OLAP Control Panel. (You also can click the square next to Store Name or Manufacturing Plant. This opens the OLAP Control Panel with either the dimension for Store Name or Manufacturing Plant open and Store Name or Manufacturing Plant highlighted.)
2. Select *PRODCAT* in the Drill Down box.

3. Click *Shift Down*.

PAGE 1

Store Name:	Manufacturing Plant	Product Name:	PRODCAT	Quantity:	Our Cost:	Price:
AV VideoTown	BOS	110 VHS-C Camcorder 20 X	Camcorders	12,972	20,916.00	29,316.00
		120 VHS-C Camcorder 40 X	Camcorders	13,224	22,274.00	34,314.00
		150 8MM Camcorder 20 X	Camcorders	5,723	35,520.00	47,212.00
		2 Hd VCR LCD Menu	VCRs	11,182	5,934.00	8,234.00
		250 8MM Camcorder 40 X	Camcorders	1,277	5,120.00	6,384.00

OLAP



4. Click *Run* to execute the report.

PAGE 1

Store Name:	Manufacturing Plant	PRODCAT	Product Name:	Quantity:	Our Cost:	Price:
AV VideoTown	BOS	CD Players	QX Portable CD Player	9,789	6,336.00	10,816.00
		Camcorders	110 VHS-C Camcorder 20 X	12,972	20,916.00	29,316.00
			120 VHS-C Camcorder 40 X	13,224	22,274.00	34,314.00
			150 8MM Camcorder 20 X	5,723	35,520.00	47,212.00
			250 8MM Camcorder 40 X	1,277	5,120.00	6,384.00

OLAP

Pivoting Rows and Columns

You can shift (pivot) a Drill Down field to make it a Drill Across field and vice versa in an OLAP-enabled report.

Procedure How to Pivot Rows and Columns

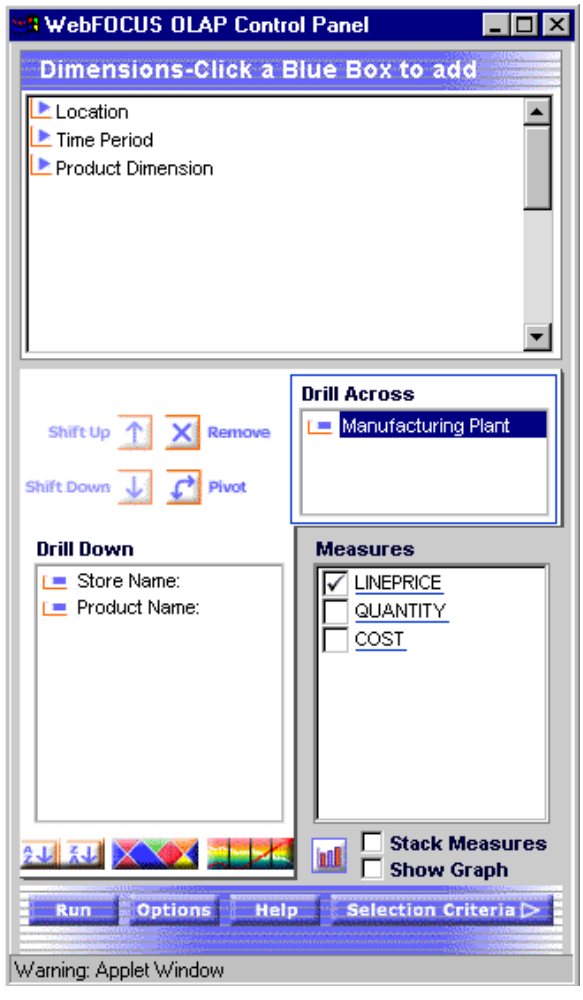
1. Open the OLAP Control Panel.
2. Select the row or column you want to pivot in the Drill Down or Drill Across box.
3. Click *Pivot* .
4. Click *Run* to execute your report.

Example Pivoting Rows Into Columns

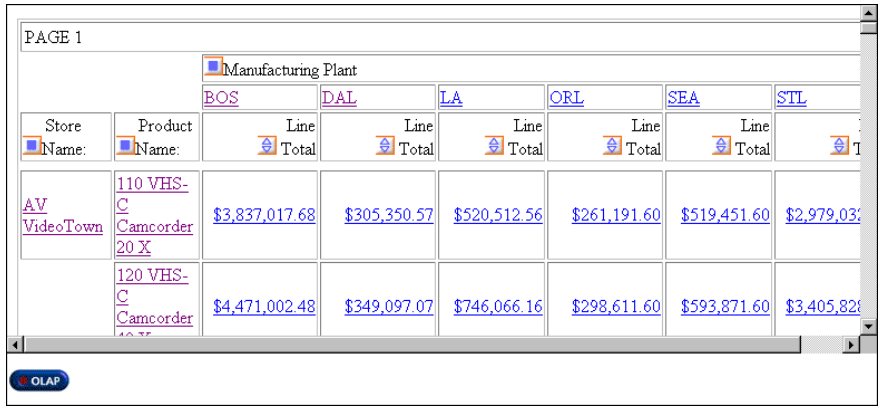
You have an OLAP-enabled report showing LINEPRICE by Store Name, Product Name, and Manufacturing Plant, with a row for each category, and the Lineprice appearing in a single column. You want to view the LINEPRICE data in several columns, with one column for each Manufacturing Plant. To do this, you *pivot* the Manufacturing Plant field from a Drill Down row to a Drill Across column.

1. Click *OLAP* to open the OLAP Control Panel. (You also can click the square next to Manufacturing Plant.)
2. Select *Manufacturing Plant* in the Drill Down box.

3. Click *Pivot* .



4. Click *Run* to execute the report.



PAGE 1							
		Manufacturing Plant					
		BOS	DAL	LA	ORL	SEA	STL
Store Name:	Product Name:	Line Total	Line Total	Line Total	Line Total	Line Total	T
AV VideoTown	110 VHS-C Camcorder 20 X	$3,837,017.68	$305,350.57	$520,512.56	$261,191.60	$519,451.60	$2,979,03
	120 VHS-C Camcorder	$4,471,002.48	$349,097.07	$746,066.16	$298,611.60	$593,871.60	$3,405,82

OLAP

Ordering the Data in a Report

You can reverse the order of one or more data elements in an OLAP-enabled report by selecting ascending or descending in the OLAP Control Panel.

See *Sorting Report Lines by Column Values* on page 12-28 for information on changing the sort order of measures.

Procedure How to Change From Ascending to Descending Order (or Vice Versa)

1. Open the OLAP Control Panel.
2. Select the element in the report layout box (Drill Down or Drill Across).
3. Click .
4. Click *Run* to execute your report.

Example Changing From Ascending to Descending Order

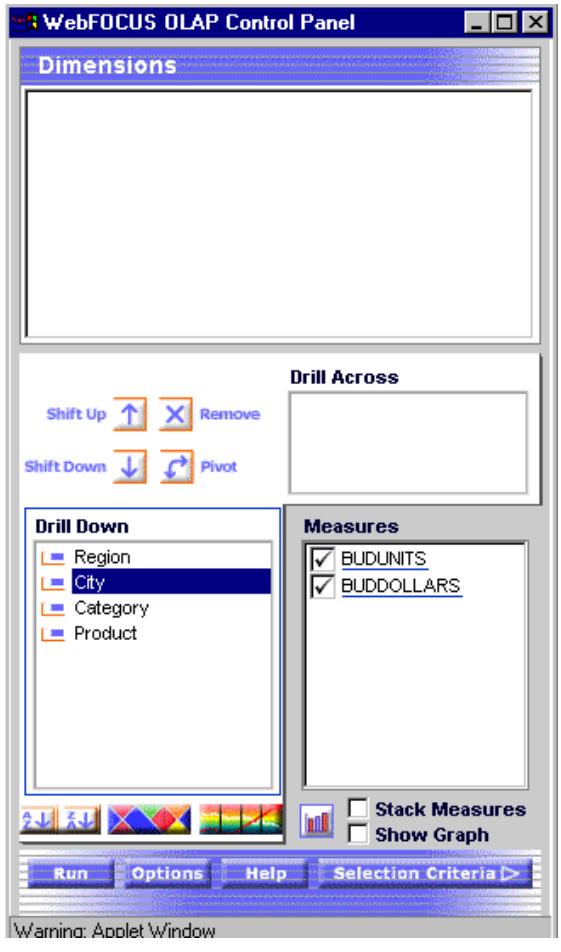
You have an OLAP-enabled report displaying Budget Units and Budget Dollars sorted by City in alphabetical order.

To sort the report in reverse alphabetical order:

1. Click *OLAP* to open the OLAP Control Panel. (You also can click the square next to City. This opens the OLAP Control Panel with the dimension for City open and highlighted.)
2. Select *City* in the Drill Down box.
3. Click .

Region	City	Category	Product	Budget Units	Budget Dollars
Midwest	Chicago	Coffee	Espresso	32416	401477
			Latte	79015	964787
		Food	Biscotti	30001	385369
			Croissant	43271	528255
			Scone	45091	567231
		Gifts	Coffee Grinder	19224	241711
			Coffee Pot	16035	208255
			Mug	30881	388612
			Thermos	14137	181159
	Houston	Coffee	Espresso	36666	439880
			Latte	77501	941677
		Food	Biscotti	27074	321857

OLAP


WebFOCUS OLAP Control Panel
Dimensions
Drill Across
Shift Up
Remove
Shift Down
Pivot
Drill Down
Region
City
Category
Product
Measures
BUDUNITS
BUDDOLLARS
Stack Measures
Show Graph
Run
Options
Help
Selection Criteria
Warning: Applet Window

4. Click *Run* to execute the report.

PAGE 1

Region	City	Category	Product	Budget Units	Budget Dollars
Midwest	St. Louis	Coffee	Espresso	32787	416875
			Latte	77141	921336
		Food	Biscotti	28764	360403
			Croissant	49327	592609
			Scone	36573	478691
		Gifts	Coffee Grinder	14779	171501
			Coffee Pot	14970	191451
			Mug	26837	324488
			Thermos	15903	189484

OLAP

Stacking Measures in Rows or Columns

When you have more than one measure, the OLAP Control Panel enables you to stack the measures of your OLAP-enabled report by either rows or columns (the default is rows). You enable this feature by clicking the Stack Measures check box in the OLAP Control Panel.

Note: You cannot apply data visualization when stacking measures. For details, see *Visualizing Trends in OLAP-enabled Reports* on page 12-60.

Procedure How to Display Stacked Measures

To stack measures in an OLAP-enabled report:

1. Open the OLAP Control Panel.
2. Select the *Stack Measures* check box to display measures in separate rows, or deselect the *Stack Measures* check box to display measures in columns.
3. Click *Run* to execute your report.

Example Displaying Measures in Stacked Rows

You have an OLAP-enabled report showing the City, and Budget Units and Budget Dollars for each City. The measures (Budget Units and Budget Dollars) are displayed in columns.

To display the measures in rows:

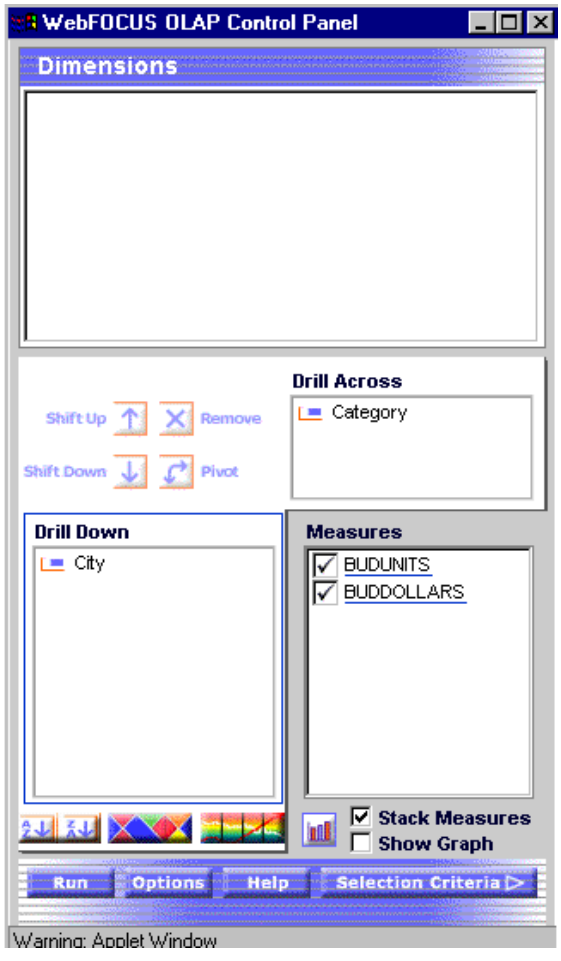
1. Click *OLAP* to display the OLAP Control Panel. (You also can click the square next to City or Category. This opens the OLAP Control Panel with the dimension for either City or Category open and City or Category highlighted.)

PAGE 1

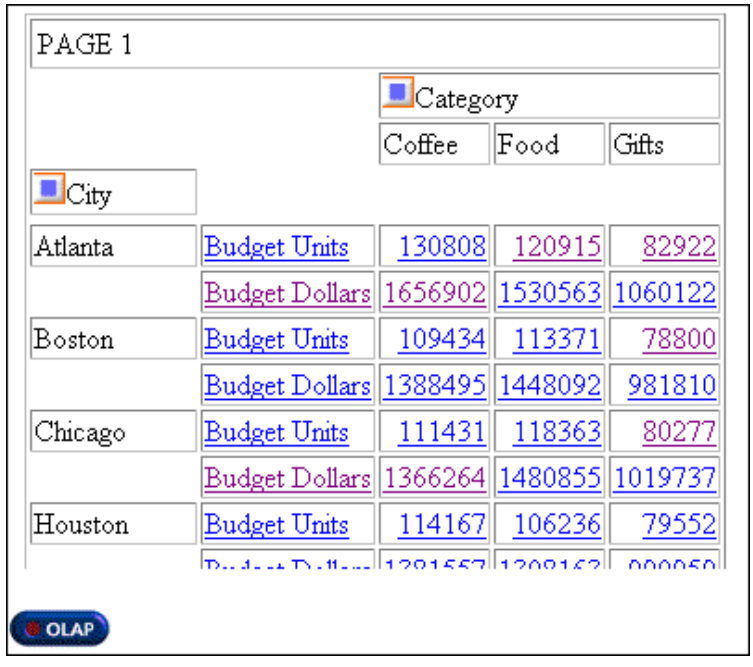
	Category					
	Coffee		Food		Gifts	
City	Budget Units	Budget Dollars	Budget Units	Budget Dollars	Budget Units	Budget Dollars
Atlanta	130808	1656902	120915	1530563	82922	1060122
Boston	109434	1388495	113371	1448092	78800	981810
Chicago	111431	1366264	118363	1480855	80277	1019737
Houston	114167	1381557	106236	1308163	79552	990959
Los Angeles	109298	1351864	106877	1339441	79462	978179
Memphis	110128	1366337	113339	1417310	72152	906332
New Haven	109201	1395283	113777	1436890	78389	1000029
New York	117285	1468684	124283	1568925	69819	888713

OLAP

2. Click the *Stack Measures* check box.



3. Click *Run* to execute the report and display the measure in a stacked row.



PAGE 1				
		Category		
		Coffee	Food	Gifts
City				
Atlanta	Budget Units	130808	120915	82922
	Budget Dollars	1656902	1530563	1060122
Boston	Budget Units	109434	113371	78800
	Budget Dollars	1388495	1448092	981810
Chicago	Budget Units	111431	118363	80277
	Budget Dollars	1366264	1480855	1019737
Houston	Budget Units	114167	106236	79552

OLAP

Sorting Report Lines by Column Values

The OLAP Control Panel enables you to sort report lines by column values. Sorting on the values of a measure column enables you to gain a new view of the existing data and perform further analysis from a different perspective.

You apply measure-based sorting to an OLAP-enabled report one measure at a time. First, you select a measure from the Measures box in the OLAP Control Panel. Then you click the measure name to open the Measures Properties box where you can define the sort criteria:

- You can change the sort order from descending to ascending.
- You can choose to view a limited number of records.

Procedure How to Sort Report Lines by Column Values

1. From an OLAP-enabled report:
   - Click the blue diamond next to the measure description. The OLAP Control Panel opens, with the properties box for the selected measure overlaying the Measures box.

     Or
   - Click the *OLAP* button to open the OLAP Control Panel. Click the measure name. The properties box displays for that measure.
2. Click a measure in the Measures box.

   Note:
   - Do not click the Measures check box. Clicking the check box either displays or hides a measure in a report or applies data visualization. It does not open the properties box.
   - The Sort box is checked specifying that the sort criteria you select for this measure will be applied.
3. Select the *High-to-Low* or *Low-to-High* radio button to change the sort order of the measure values. The default sort order is high to low.

   The sort order indicators in the properties box are:
   - The selected sort order radio buttons.
   - The text Highest or Lowest next to the Subset value field.
4. Click *OK* to apply the selected sorting options.

   The properties box is overlaid with the Measures Properties box. The measure description appears in blue to indicate that sorting has been applied to the measure.
5. Click *Run* to display the report with sorting applied to the selected measure.

   The blue diamond of the measure to which you applied sorting, changes to reflect the sort order of the measure. If the sort order is High to Low, the top half is dark blue. If the sort order is Low to High, the bottom half is dark blue.

   Note: If an OLAP request contains an ACROSS field, the measures appear several times in the report, once for each of the different Across values. If the user applies sorting to a measure, the sort is performed on the first column occurrence of this measure. This behavior occurs even if you click the blue diamond next to a different occurrence of this measure.

Example **Viewing a Report With Sorting Criteria Applied to a Measure**

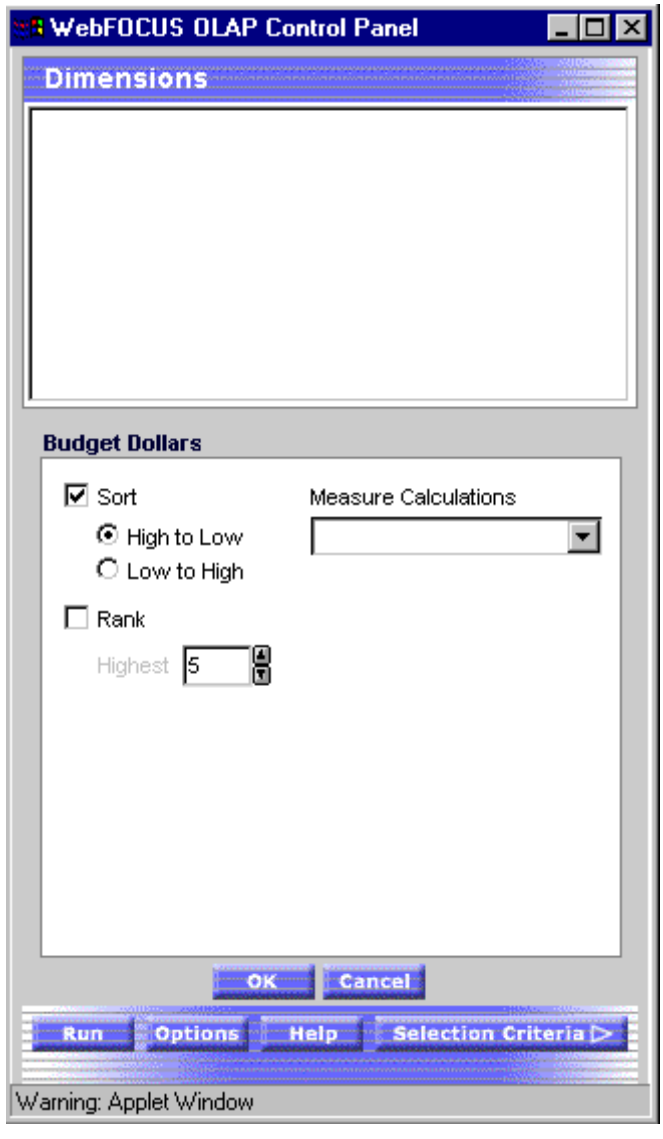
You have an OLAP-enabled report showing Budget Dollars and Budget Units sorted by Product, State, and City. You want to see which locations have the top-selling products.

PAGE 1

Product	State	City	Budget Dollars	Budget Units
Biscotti	CA	Los Angeles	243607	19378
		San Francisco	273054	21943
	CT	New Haven	587501	46404
	FL	Orlando	516984	41242
	GA	Atlanta	568743	44362
	IL	Chicago	385369	30001
	MA	Boston	616766	48246
	MO	St. Louis	360403	28764
	NY	New York	644415	50502
	TN	Memphis	426292	34945

OLAP

1. From the Measures box, open the Measures Properties box for Budget Dollars.



The Sort box is checked, specifying that sorting by the values in the Budget Dollars measures will occur. The sort order is high to low.

2. Click *OK* to apply the selected sorting options. The properties box closes.

3. Click *Run* to execute the report.

Notice that the products are ranked by Budget Dollars, but the column order of the report remains the same.

PAGE 1

Product	State	City	Budget Dollars	Budget Units
Latte	CA	San Francisco	982579	79035
Latte	IL	Chicago	964787	79015
Latte	WA	Seattle	954267	72634
Latte	CT	New Haven	953855	74427
Latte	GA	Atlanta	945555	76180
Latte	TX	Houston	941677	77501
Latte	MA	Boston	941438	73874
Latte	NY	New York	922776	73411
Latte	MO	St. Louis	921336	77141
Latte	FL	Orlando	886465	72975

OLAP

Procedure How to View a Subset of Data When Sorting Report Lines by Column Values

You can select to view only a subset of the total number of records in your report.

1. From an OLAP-enabled report:
   - Click the blue diamond next to the measure description. The OLAP Control Panel opens, with the Measures Properties box for the selected measure overlaying the Measures box.

     or
   - Click the *OLAP* button to open the OLAP Control Panel. Click the measure name. The Measures Properties box displays for the selected measure.
2. Click a measure in the Measures box.

   Note: Do not click the Measure check box. Clicking the check box either displays, graphically visualizes, or hides a measure in a report. It does not open the properties box for the selected measure.
3. Verify that the Sort check box is selected. When the Sort check box is selected, sort criteria apply to the selected measure.
4. Select the *Rank* check box in the properties box.
5. Specify the number of sort field values to be included in the report as follows:
   - Use the spin buttons located to the right of the word Highest or Lowest (the sort indicator) to increase or decrease the number of sort fields.

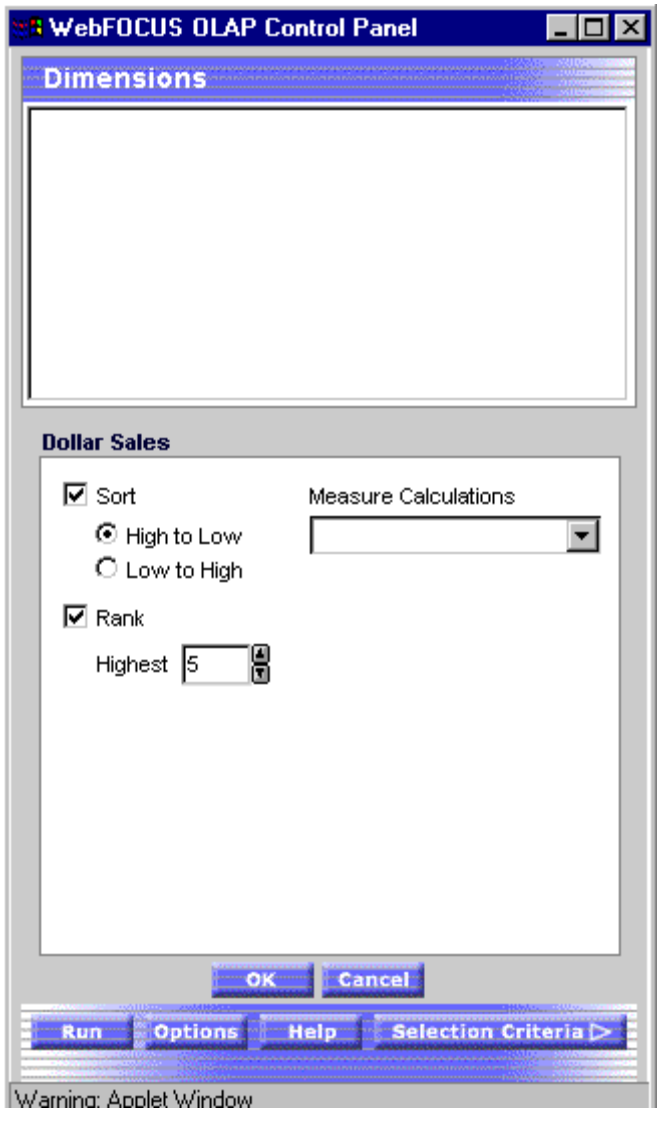
     or
   - Position the cursor in the value field and type a number.

   Highest or Lowest displays to the left of the value field and reflects the sort order.

   The default number of sort field values is 5.
6. Click *OK*. The properties box is overlaid with the Measures box. The OLAP Control Panel displays the measure description in blue to indicate that sorting has been applied to the measure.
7. Click *Run* to display the report.

Example **Using Measure-based Sorting to View a Group of High or Low Values**

You want to view the Product, State, and City information for the top five sales values. You can create this report by applying sorting to the Dollar Sales measure and specifying a rank of the highest five Dollar Sales values.



The following report appears:

PAGE 1

Product	State	City	Budget Dollars	Dollar Sales
Latte	IL	Chicago	964787	978340
Latte	MO	St. Louis	921336	966981
Latte	TX	Houston	941677	938245
Latte	CA	San Francisco	982579	935862
Latte	NY	New York	922776	928026

OLAP

Procedure How to Remove Sorting Criteria From a Measure

By removing sorting criteria from a measure, you delete the underlying specification to sort the report lines by the measure values. You do not change whether the measure appears in the report. The check box preceding the measure description continues to specify whether the measure is included as a column within the report.

1. From an OLAP-enabled report:
   - Click the blue diamond next to the measure description. The OLAP Control Panel opens, with the properties box for the selected measure overlaying the Measures box.

     or
   - Click the *OLAP* button to open the OLAP Control Panel. Click the blue measure name. The properties box displays for that measure.
2. Click a measure in the Measures box from which you want to remove sorting.

   Note: Do not click the Measure check box. Clicking the check box either displays, graphically visualizes, or hides a measure in a report. It does not open the properties box for the selected measure.
3. Clear the *Sort* check box to remove sorting criteria from the measure.
4. Click *OK*.

   The properties box is overlaid with the Measures box. The OLAP Control Panel displays the measure name in black to indicate that sorting is not applied to this measure.

Suppressing Subtitles When Sorting by Measure Values

Subtitles are the subtotals, subheadings, and subfootings that you may include in your report. When sorting is applied to a measure, the generation of subtitles is suppressed. Subtitles are suppressed because they relate to a specific sort field in a report and may become meaningless when the report is resorted by the measure column values.

Applying Selection Criteria to OLAP-enabled Reports

You can restrict (slice-and-dice) your data using the Selection Criteria panel. This panel helps you define selection criteria quickly and easily. For example, if you want a report that lists only certain products belonging to a specific product family (for example, LINEOFBUS), you would specify selection criteria in which the Product Family is equal to LINEOFBUS by using the = relational operator.

Your report is also limited to values belonging to the parent categories in the dimensions hierarchy. For example, if you are retrieving values based on the Eastern region, only the states that belong to the Eastern region appear in your report. Your report does not list all fifty states. Previously, if no ACCEPT list was defined, the first 500 values in the data source were retrieved.

Limiting applies only to formats that retrieve a list of values and is not available in the Date Selection panel.

The active operator appears to the left of the drop-down list. For a list of all the supported operators, see *Selection Criteria Relational Operators* on page 12-36.

Reference **Selection Criteria Relational Operators**

The Selection Criteria option provides several relational operators:

Operator	Displays Records That...
=	Are equal to the criteria you specified. This is the default operator.
≠	Are not equal to the criteria you specified.
≤	Are less than or equal to the criteria you specified.
<	Are less than, but not equal to the criteria you specified.

Operator	Displays Records That...
≥	Are greater than or equal to the criteria you specified.
>	Are greater than, but not equal to the criteria you specified.
⊂	Contain the criteria you specified. **Note:** This operator is available only for alphanumeric fields.
⊄	Do not contain the criteria you specified. **Note:** This operator is available only for alphanumeric fields.

Note: You can select more than one value using the same relational operator.

The Selection Criteria option provides the following relational operators when selecting a range of dates:

Operator	Diaplays Records Where...
R	The value in the indicated date field falls within the specified range. **Note:** To use this relational operator, you must select the Range check box in the Date Selection panel.
~~R~~	The value in the indicated date field does *not* fall within the specified range. **Note:** To use this relational operator, you must check the Range check box in the Date Selection panel.

Note: You can select only one range of dates at a time.

Procedure How to Apply Selection Criteria to an OLAP-enabled Report

1. Click *Selection Criteria*.
2. Click one or more elements in the Dimensions box.
3. Click *Relations* to the left of an element in the Selection Criteria panel to specify a relationship (for example, =, >, or <).
4. Click *Select*.

   A new panel opens, displaying a list of acceptable values for the selected element.

   - If your Managed Reporting Administrator has defined an ACCEPT list of acceptable values, these values display.
   - If there is no ACCEPT list, only values applied within the dimension hierarchy display.
5. Select one or more values from the list or type a value. Click *OK* to confirm your choices.
6. In the Selection Criteria panel, you can continue defining selection criteria. When you are done, click *OK*.
7. Click *Run* to execute your report.

Procedure How to Remove Selection Criteria

1. Select the selection criteria you want to remove.
2. Click *Delete*.
3. Click *OK* to confirm your choice and return to the OLAP Control Panel.
4. Click *Run* to execute your report.

Procedure How to Change Selection Criteria

1. Click the relational operator in the OLAP-enabled report to open the OLAP Control Panel. You must click the OLAP button or an element in the Dimensions box to open the OCP as the relational operator does not display.
2. Type a different value in the text box or select one or more values from the list.

   The value you type must be in the same case as the value in the data source.

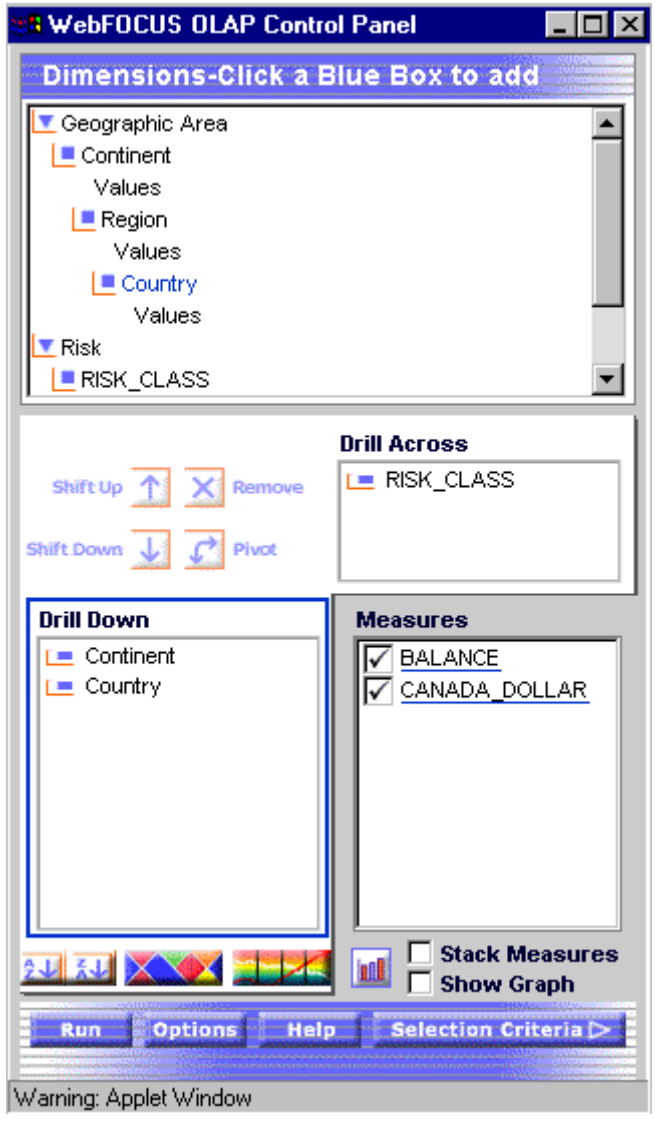
   To deselect a value, hold down the Ctrl key while clicking the value.

   Note: You can input only one value in the text box. If you select more than one value from the list, only the first value appears. However, all values appear in your report.
3. Click *OK* to return to the Selection Criteria panel and view the value next to the relational operator.
4. Click *OK* again to confirm your choice and return to the OLAP Control Panel.
5. Click *Run* to execute your report.

Example Applying Selection Criteria

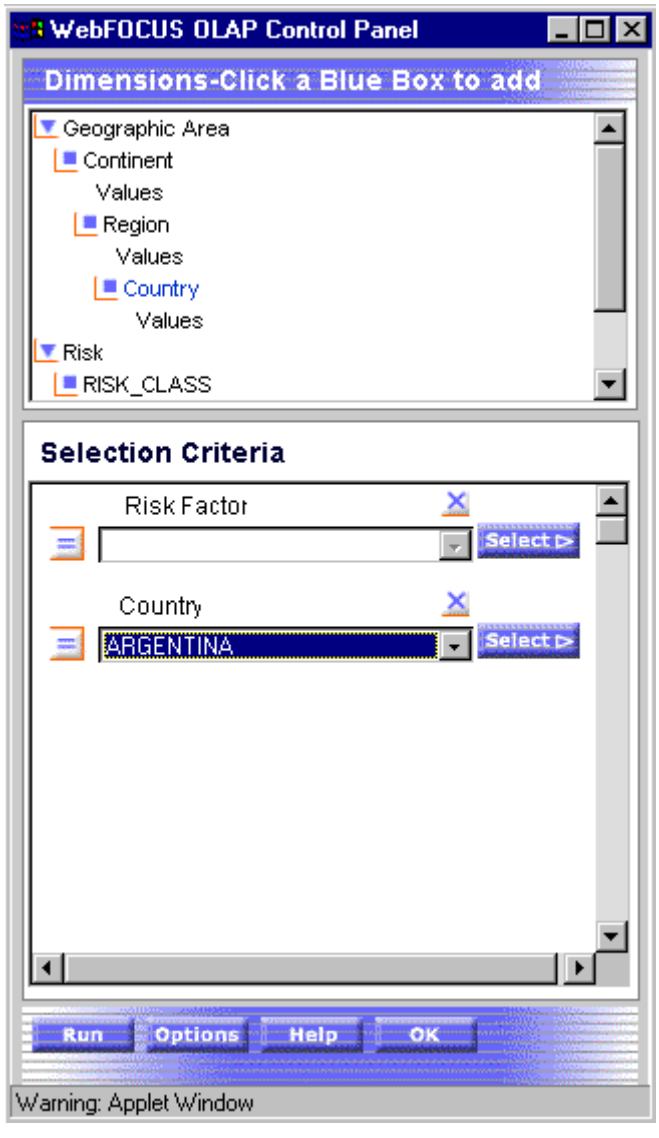
You want to restrict the information in your report to the Countries, Argentina and Brazil.

1. Click *Selection Criteria* to open the Selection Criteria panel.



2. In the Dimensions box, click *Country*.

The Country element of the Geographic Area dimension appears in the Selection Criteria panel with a drop-down list.



The equal sign (=) on the button to the left of the Country box indicates that your report will contain data only for those rows where Country is equal to the values that you supply.

3. Click *Select* to open a selection panel listing every Country that has been defined.

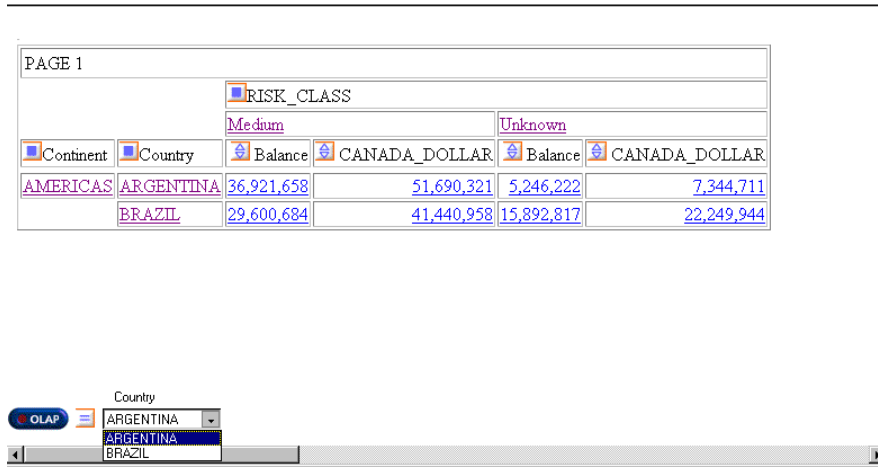
   Your Managed Reporting Administrator can define a list of acceptable values for the Country field in the Master File using the ACCEPT attribute.

4. Select *Argentina* and *Brazil* from the list.

5. Click *OK* to return to the Selection Criteria panel.

6. Click *OK* to return to the OLAP Control Panel.

7. Click *Run* to execute your report.



PAGE 1					
		RISK_CLASS			
		Medium		Unknown	
Continent	Country	Balance	CANADA_DOLLAR	Balance	CANADA_DOLLAR
AMERICAS	ARGENTINA	36,921,658	51,690,321	5,246,222	7,344,711
	BRAZIL	29,600,684	41,440,958	15,892,817	22,249,944

Information displays at the bottom of the report telling you that you are restricting the report to Country: Argentina and Brazil (Brazil is the next value in the drop-down list).

Using AutoDrill

AutoDrill provides single-click automatic drill-down to the next lower level in a defined dimension hierarchy. You can drill down to the next lower level in a defined dimension hierarchy by clicking a related data value within the body of an OLAP-enabled report while the OLAP Control Panel is closed. With one click, you can transform the report immediately.

You can enable AutoDrill in output that supports this feature. Currently, AutoDrill is supported only in OLAP-enabled reports. To enable AutoDrill, select DIMENSIONS from the Automatic Drill Down drop-down list on the Report Options tab of Report Assistant.

The Drill Down (or BY) and Drill Across (or ACROSS) fields become hyperlinks. Explicit drill downs in the stylesheet (if they exist) take precedence over AutoDrill hyperlinks. If you click a hyperlink associated with an explicit drill-down, the behavior will be the behavior defined in the stylesheet rather than what is expected for AutoDrill.

Administrators can refer to the *WebFOCUS Managed Reporting Administrator's Manual* for details on how to save a transformed report as a Standard Report. Administrators who also work in WebFOCUS (Windows version) can refer to *Describing OLAP-enabled Data* in online help for this information.

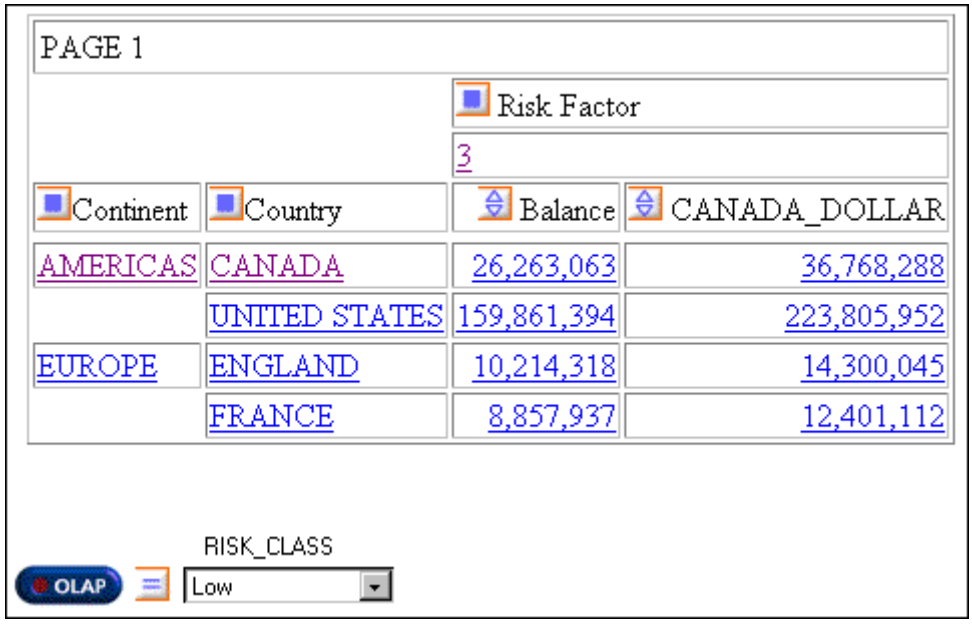
If you save your report in an Excel 2000 file, only explicit drill down works. Drill down via AutoDrill will not work. Pre-Excel 2000 format does not support drill down of any type.

Drill Down on Measures provides the ability to drill down to the last dimensional element under a dimension field in a dimension hierarchy by clicking any measure in a report. For details on Drill Down on Measures, see Chapter 11, *Using OLAP Analysis*.

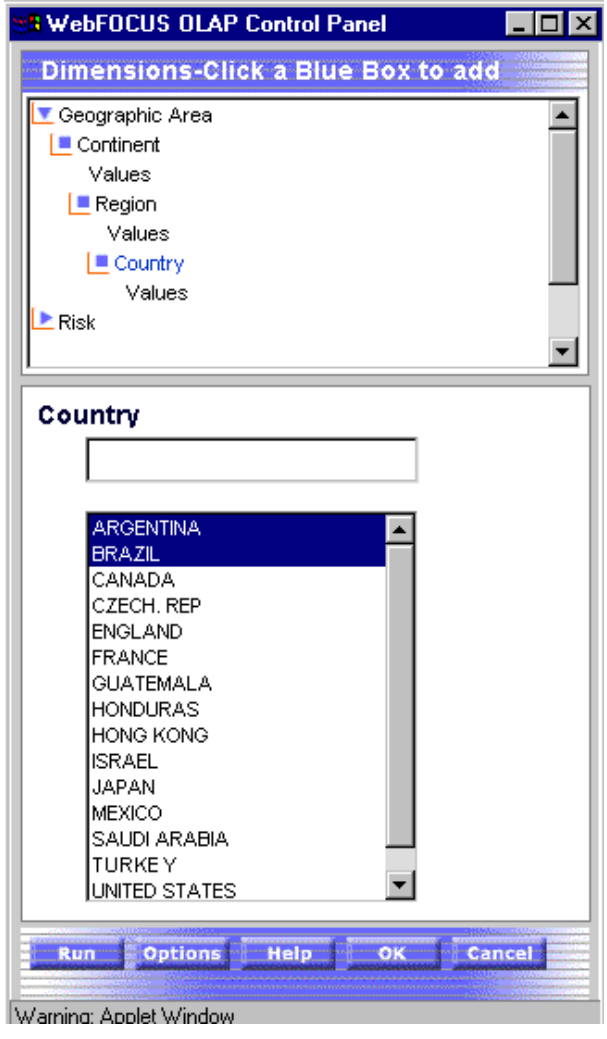
Using AutoSelection

Autoselection provides multiple selection capability so you can limit the scope of your report by simply clicking specific report elements. Just as you can limit the scope of your report by invoking the Selection Criteria interface, you can perform the same slice and dice (including multiple selection) with fewer mouse clicks directly from your report (while the OLAP Control Panel is open).

Each time you click a hyperlink (Drill Down or Drill Across field) in the report, the field value displays in a selection list at the bottom of the report. The field values limit the scope of the report. When you click Run, the report transforms. This is called Autoselection.



Another way of performing Autoselection and reducing the number of required mouse clicks is by clicking the Values subelement defined in the dimension hierarchy in the OLAP Control Panel. The following displays the Values subelements and the Selection Criteria panel in the OLAP Control Panel.



After a value has been added, you can select another value from the report, continue to customize the report using other features of the OLAP Control Panel, or transform the report by clicking Run.

When you run your report after making your selections, the selection values display to the right of the OLAP button at the bottom of your report.

Applying Selection Criteria to Date Elements

You can apply selection criteria to date elements just as you apply them to other types of elements. However, instead of selecting from a list of values, you choose the selection criteria from a Date selection panel containing the appropriate controls for the date format. When you apply selection criteria to date elements, the results are limited by the date(s) you select. For example, you can select to view data associated with a particular date or to exclude data from the specified date.

The OLAP Control Panel provides a Date selection panel that enables you to select a full date format (YYMD) or a partial date format (YMM) that includes only the month or year, and to specify a quarter of the year when applying selection criteria to date elements.

The Master File specifies the date formats available for selection criteria. Additionally, you can select a range of dates by specifying a from and to date. The from date indicates the beginning of a range and the to date indicates the end of a range. The date format must contain a year to enable the Range check box.

For a table describing the selection criteria operators, see *Selection Criteria Relational Operators* on page 12-36.

For more information on available date formats when applying selection criteria, see *Date Format Limitations* on page 12-59. For more information on specifying date formats, see the *Describing Data With WebFOCUS Language* manual.

Note: Selection criteria can be specified for date fields that are defined within a dimension. The Administrator defines the available dimensions in the Master File.

The following Date selection panel displays a full date with the option to select a range of dates:

Procedure How to Apply Selection Criteria to Individual Date Fields

1. From the OLAP Control Panel, click *Selection Criteria*.
2. Select one or more date elements in the Dimensions box.

   If you select more than one date element, each element is listed separately in the Selection Criteria panel with its own Select button.
3. Click a relations button to the left of an element in the Selection Criteria panel to specify a relationship (for example, =, >, or <).
4. Click *Select*.

   The Date selection panel opens displaying the controls for the dimension's date format. For example, if the date format is YYM, only the year and month controls appear.
5. Specify a date using the spin controls, drop-down lists, or by typing the value.

   If your date format includes edit masking such as Y.M.D, the date always displays with forward slashes in the Date selection list box, Selection Criteria panel, and in the drop-down list at the bottom of the report. However, the date edit mask always displays as specified within the body of the report.
6. Click *Add* to display the date in the Selections list box.
7. Click *OK* to return to the Selection Criteria panel and view the selected date.

   You can continue defining selection criteria.

   When you are done, click *OK*.
8. Click *Run* to execute your report.

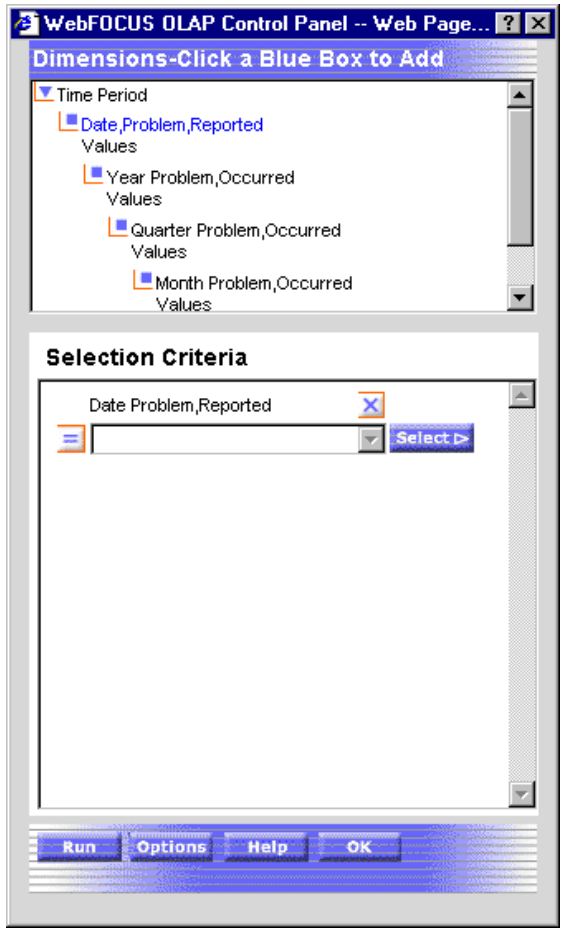
Note: The Date selection panel displays only when a supported date format is provided. For more information on available date formats, see *Date Format Limitations* on page 12-59.

Example Applying Selection Criteria to Individual Date Fields

You want to restrict the information in your report to data associated with the date June 6, 2001.

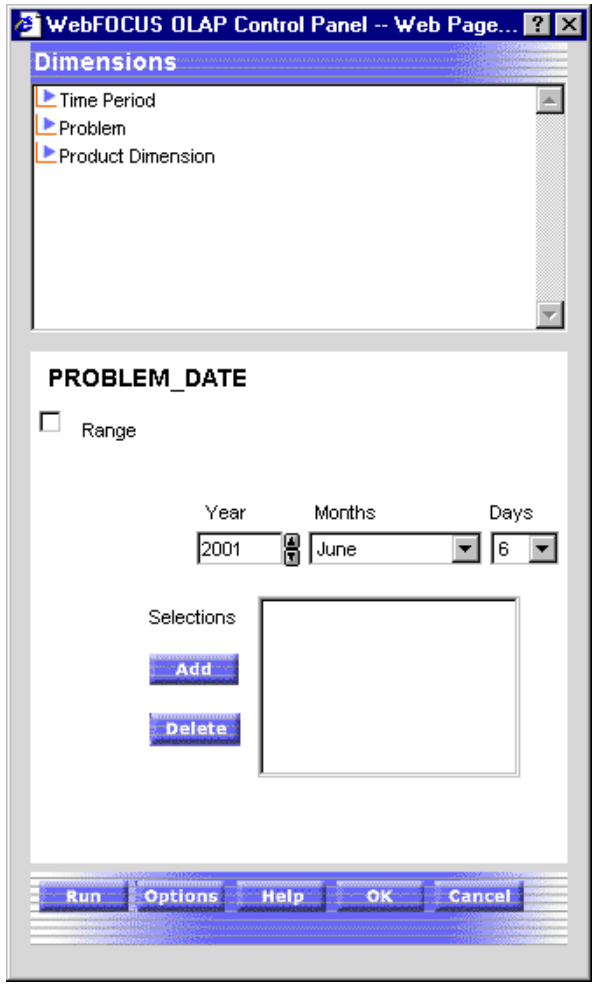
1. From the OLAP Control Panel, click *Selection Criteria*.
2. In the Dimensions box, click *Date Problem Reported*.

   The date element of the Time Period dimension appears in the Selection Criteria panel with a drop-down list.



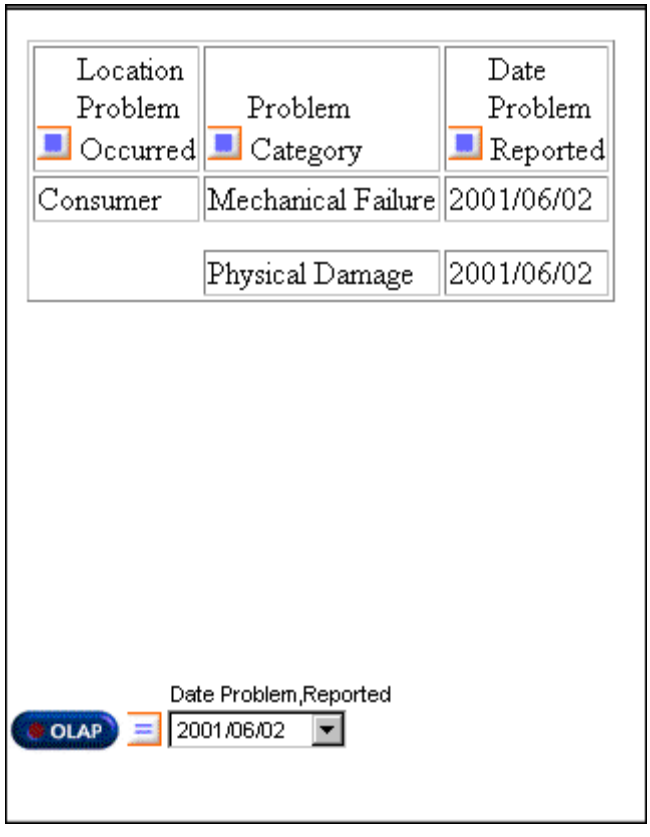
The relational operator to the left of the Date box indicates that your report will contain data only for those rows where date is equal to the values that you enter.

3. Click *Select*. The Date selection panel opens:



4. Change the year to 2001 in the Year box by using the spin buttons or typing the value.
5. Select *June* from the Months drop-down list to change the calendar month.
6. Select *6* from the Days drop-down list to change the calendar day.
7. Click *Add*. The date you selected appears in the list.
8. Click *OK* to return to the Selection Criteria panel.
9. Click *OK* to return to the OLAP Control Panel.
10. Click *Run* to execute your report.

The date element displays at the bottom of the window.



Procedure How to Apply Selection Criteria to a Date Range

1. From the OLAP Control Panel, click *Selection Criteria*.
2. Click one or more date elements in the Dimensions box.

   If you select more than one date element, each element is listed separately in the Selection Criteria panel with its own Select button.
3. Click *Select* to open the Date Selection panel.
4. Click the *Range* check box.

   From and To drop-down lists open displaying the controls for the dimension's date format. For example, if the date format is YYM, only the year and month controls appear.

   By default, the current date appears.

   Note: You can apply selection criteria to a range of dates only if the date format contains a year. For more information on available date formats, see *Date Format Limitations* on page 12-59.
5. Specify a date using the spin controls, drop-down lists, or by typing the value.

   Note: Values entered are restricted to valid values for each date component control.
6. Click *OK* to return to the Selection Criteria panel.
7. To view both the from and to dates of the range selected, click the down arrow on the drop-down list.
8. Click a relational operator to the left of an element in the Selection Criteria panel to specify a relationship, and click *OK*.

   Only the range equal and range not equal relational operators are available.
9. Click *Run* to execute your report.

Example Applying Selection Criteria to a Range of Date Fields

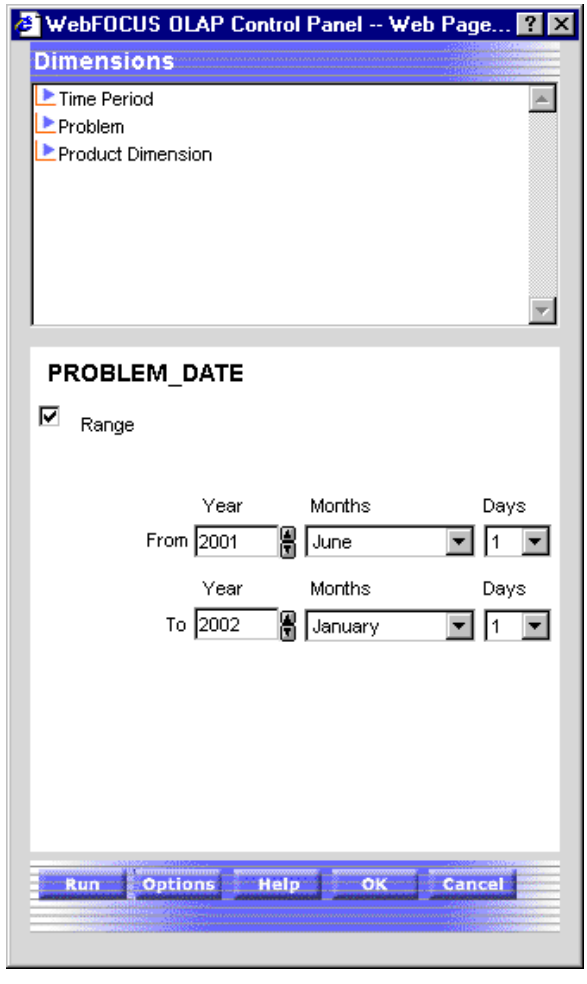
You want to restrict the information in your report to data associated with dates ranging from June 1, 2001 to January 1, 2002.

1. From the OLAP Control Panel, click *Selection Criteria*.
2. In the Dimensions box, click *Date Problem Reported*.

   The date element of the Time Period dimension appears in the Selection Criteria panel with a drop-down list.
3. Click *Select*. The Date selection panel opens.
4. Select the *Range* check box.

   From and To drop-down lists open where you can enter a range of dates. By default, the current date appears.
5. Specify the From date as follows:
   - **a.** Change the current year to 2001 by using the spin buttons.
   - **b.** Select *June* from the Months drop-down list to change the current calendar month.
   - **c.** Select *1* from the Days drop-down list to change the current calendar day.

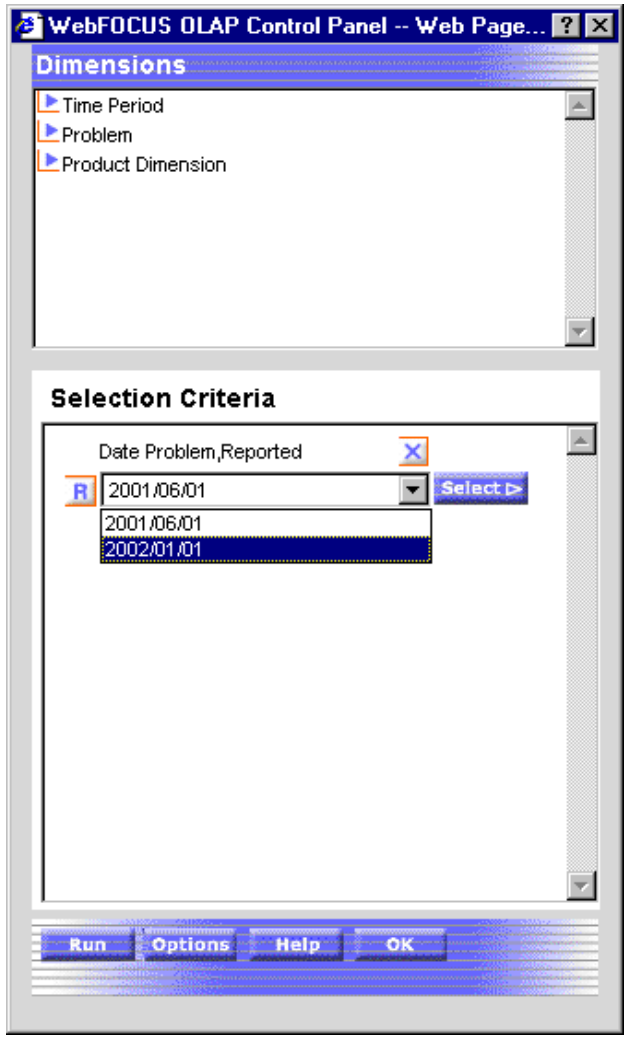
6. Specify the To date as follows:
   a. Change the current year to 2002 by using the spin buttons.
   b. Select *January* from the Months drop-down list to change the current calendar month.
   c. Select *1* from the Days drop-down list to change the current calendar day.



7. Click *OK* to return to the Selection Criteria panel.

To view the range of dates, click the down arrow in the drop-down list.

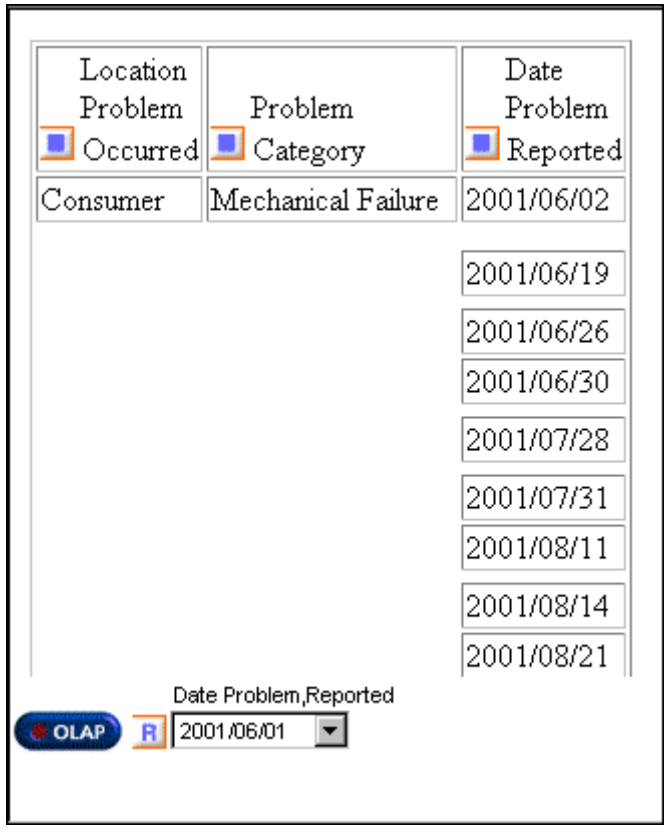
Then, click *OK* again.



8. Click *Run* to execute your report.

The date element displays at the bottom of the screen.

To view the range of dates, click the arrow in the drop-down list.



Adding and Deleting Dates Using the Selections List Box

The Selections list box enables you to view a list of dates that have been selected previously. You can create a list of dates by selecting a date value(s) from the date controls and adding it to the Selections list box. After a date has been added to this list box, you can either select it or remove it from the list.

Note: You cannot add or delete a range of dates in the Selections list box. To remove a range, delete the dimension from the Selection Criteria panel.

Procedure How to Add Dates to the Selections List Box

1. Click the *OLAP* button located at the bottom of the browser screen to open the OLAP Control Panel.
2. Click *Selection Criteria* to open the Selection Criteria panel.
3. Click *Select* to open the Date selection panel.
4. Provide the full or partial date you want to add by using the spin buttons, drop-down lists, or by typing the value.
5. Click *Add*. The date appears inside the Selections list box.

Procedure How to Delete Dates From the Selections List Box

1. Click the *OLAP* button located at the bottom of the browser screen to open the OLAP Control Panel.
2. Click *Selection Criteria* to open the Selection Criteria panel.
3. Click *Select* to open the Date selection panel.
4. Select one or more dates that you want to remove from the Selections list box.
5. Click *Delete*. The date is removed.

Date Format Limitations

The following limitations apply to date formats when applying selection criteria to date elements:

- The Date selection panel does not support Julian dates. However, if you are using Julian dates, the OLAP Calendar still opens.
- The Date selection panel does not allow you to select a day of the week.

  When you provide a date format that is supported by the Date selection panel (wrMtrDYY), the Date selection panel is invoked and selects the date.

  Currently, there is no display option that enables you to select a day of the week.
- Dates containing only a day format (D, I2D, A2D) are not supported when using the Date selection panel. Instead, the data source provides a list of values.
- The Range check box is enabled on the Date selection panel when the date format contains a year and is one of the following formats:
  - New date format (smart dates: for example, YMD, MDY, YYMD, MDYY)
  - A4YY
  - I4YY
  - I8YYMD
  - A8YYMD
  - I6YYM
  - A6YYM

Define Century and Year Threshold

When handling dates using two-digit year values, or when specifying a range of dates, the Master File should specify values for DEFCENT (define century) and YRTHRESH (year threshold) to ensure that the appropriate century is referenced.

When specifying DEFCENT and YRTHRESH in the Master File, the Date selection panel allows you to select only from the specified date range. For example, if the DEFCENT is 19 and the YRTHRESH is 80, the Date selection panel only allows the selection of dates from 1980 to 2079. If the year field is 79, then the year is interpreted as 2079. If the year field is 00, then the year is interpreted as 2000.

For more information, see the *Working With Cross-Century Dates* in the *Developing Reporting Applications* manual.

StyleSheet Transformation

WebFOCUS supports StyleSheet transformation. This means that when you create a report using the advanced features of Report Assistant or Report Painter, you can manipulate your report using the OLAP Control Panel without losing customizations (such as conditionally-styled data visualization graphs).

When you change the number of columns in a report by adding or deleting dimensions, by pivoting dimensions, or by adding or removing measures in the OLAP Control Panel, the relative position of a column in a report changes. Similarly, a drill down dimension can become a drill across dimension.

The styling options of the original report are preserved when you run the report from the OLAP Control Panel. The preservation occurs regardless of any data manipulation you perform.

Visualizing Trends in OLAP-enabled Reports

To make your 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 use the OLAP Control Panel to specify those measures for which you want to apply data visualization. See Chapter 9, *Visualizing Trends in Reports* for details.

Troubleshooting OLAP-enabled Reports

This topic describes common problems that you might encounter when working with OLAP-enabled reports.

The report is not OLAP-enabled. Ensure that Run with OLAP in the Properties window for the report is selected.

If the Run with OLAP property is selected, ensure that the metadata for the report uses the WITHIN attribute to define one or more hierarchical dimensions.

The report displays the OLAP button, but the OLAP Control Panel does not open. Ensure that your Web browser supports the WebFOCUS Product. To access the WebFOCUS Product, you can use the following Web browsers:

- Microsoft® Internet Explorer 4.01 Version 4.72 and higher.
- WebFOCUS (Windows version) provides the Desktop Viewer for displaying OLAP reports.

The OLAP Control Panel does not display dimensions. Ensure that the metadata for the report uses the WITHIN attribute to create one or more hierarchical dimensions.

You cannot drill-down or roll up a dimension. Ensure that the metadata for the report uses the WITHIN attribute to create one or more hierarchical dimensions.

You cannot include additional measures in the report. You cannot use the OLAP Control Panel to include measures that are not included in the original report request.

Tip:

- You can specify NOPRINT in the report procedure to make measures available but not visible in the original report. Deselect the Visible check box in the Field Options dialog box accessible from the Fields tab of Report Assistant, thereby including the measure as a NOPRINT field in the report procedure. Then, the measure does not display when you first run the report, but you can select to include the measure and run the report again.
- To print all fields in a report you must specify each field. The PRINT * command (which prints the entire contents) is not recognized by OLAP.

The FOC3250 message displays: OLAP and On-demand Paging are mutually exclusive. OLAP and On-demand Paging cannot be enabled at the same time. Either deselect Run with OLAP in the Report Properties window or deselect the On-demand Paging check box in the Report Assistant Options tab.

When you click the OLAP button in a graph, the OLAP Control Panel does not open. OLAP currently is not implemented for GRAPH requests. Deselect Run with OLAP in the Report Properties window.

If you use Print *, an error occurs.

If you create a fex that uses Print *, and you then OLAP-enable and run the fex (selecting *Save output as PDF file* from the OCP), an error is returned. OLAP does not support Print *; it prints the entire contents.

CHAPTER 13

Creating Knowledge Map Reports

Topics:

- Knowledge Mapping Requirements
- Using a Knowledge Map Report
- Developing a Knowledge Map Report (An Overview)
- Specifying a Source Report
- Identifying Target Reports
- Specifying Criteria in Target Reports
- Specifying Navigation for a Source Report
- Using the Mapping Tool
- Century Corp: A Sample Knowledge Map Report
- Glossary of Knowledge Mapping Terms

Knowledge Mapping allows you to create a report that employs the ultimate in dynamic reporting and BI analysis. Reports created with Knowledge Mapping employ functionality such as dynamic pop-up menus, drag and drop capabilities, and intelligent drill downs.

A Knowledge Map report allows you to determine the drill down reports for every value in the report. Each value in a Knowledge Map report is a hot field, or "drag value". A drag value can be dragged to a variable, a field, or a URL.

Using a Knowledge Map report provides the user access to cross-context data analysis and minimizes the number of clicks to obtain desired information. The ability to drop a field or variable on any valid URL allows a truly dynamic return of information.

Knowledge Mapping Requirements

Building a Knowledge Map report requires the use of a Java Servlet as part of your WebFOCUS installation and configuration. For more information on configuring Servlets, see ReportCaster documentation.

Knowledge Mapping requires the following components:

- WebFOCUS Reporting Server
- WebFOCUS CGI/ISAPI/Servlet
- Web server
- Servlet Engine (if Web server does not support Servlets)
- Managed Reporting environment (MRE) or User Administration Services. For more information about User Administration Services, see ReportCaster documentation.
- WebFOCUS Developer Studio 4.3.6
- Internet Explorer Version 5.5 (or higher)

Using a Knowledge Map Report

A Knowledge Map report offers the user a variety of reporting options once it is created. The user can access target reports by either selecting a drill down option or dropping a source value on a target in the Knowledge Map.

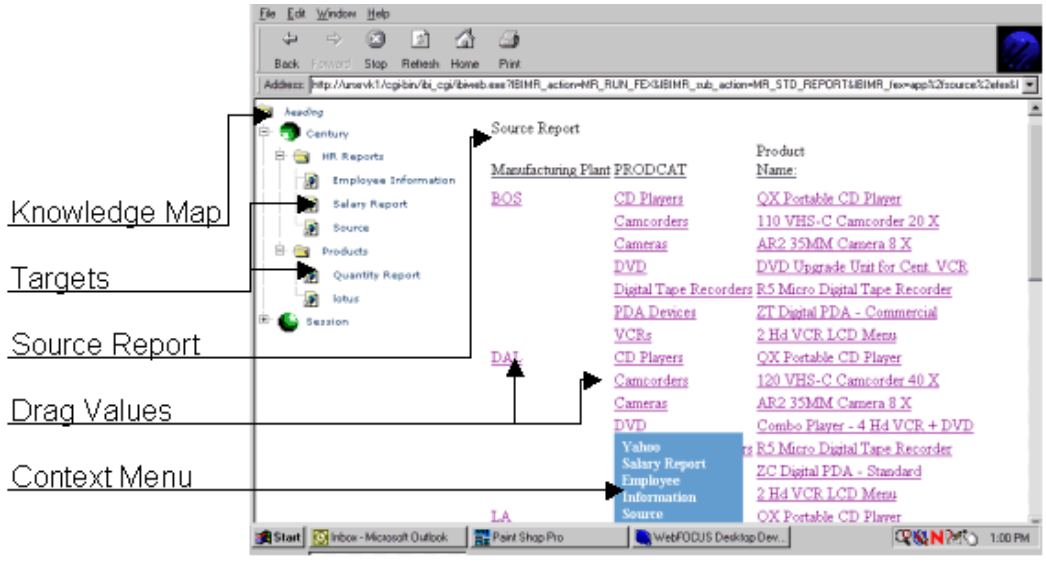
Any report that has Knowledge Mapping drill down capabilities is called a source report. All fields in the source report are “hot” and are what we call “drag values”. These fields can be dragged to a target. When the user’s cursor hovers over each field, a context menu containing drill down options also appears.

The targets are defined using the Mapping tool and are also displayed in the tree structure on the left hand side of the screen, called the Knowledge Map.

For more information on the terminology associated with the Mapping tool, see *Glossary of Knowledge Mapping Terms* on page 13-26.

Components of a Knowledge Map Report

A source report includes the following components: the actual report data, the Knowledge Map, and a context menu.



Utilizing a Knowledge Map Report's Capabilities

Dragging a source value on top of a target passes the dragged value to the target. The target graphically illustrates whether or not it can accept the Dragged Value. This is determined by the behavior of the mouse pointer when the user hovers over a target in the Knowledge Map while dragging. The mouse pointer will turn to an arrow with a plus sign if the target can accept the Dragged Value. If a target is unable to accept the Dragged Value, a circle with a line through it will display while hovering over the target.

In the Knowledge Map report pictured below, the source value DVD is the drag value. Dragging the DVD value to the Quantity Report target passes both the DVD and DAL values to the target.

When you drop the DVD value on the Quantity Report target, the resulting target report displays information based on the Dallas and DVD values.

Developing a Knowledge Map Report (An Overview)

To create an effective Knowledge Map report, you must have a well-designed plan for the flow of information. In order to make your source report as effective a basis as possible for your Knowledge Map, decisions about what information will be relevant to your user should be made before creating your mapping file. Execute the following steps in order to successfully build a Knowledge Map report:

1. Plan the design of the source report.
2. Identify existing procedures as target reports. The more targets you specify, the greater the analytical flexibility given to your user.
3. Define the criteria for each amper variable in the target report.
4. Specify display and navigation information for each target.

Step 1: Planning the Design of a Source Report

Before you create your Knowledge Map report, you will need to come up with a design for your report. Considerations about your user, your data sources, and the goals of your report will have to be weighed before you proceed.

The initial report containing Knowledge Mapping data is your source report. All fields in the source report are hot fields and contain the potential for cross-context drill down.

Your source report will display the actual data in the report in addition to displaying a Knowledge Map and context menus. For this reason, the source report should contain the most central information to your user. A report can be specified as both a target report and a source report, allowing you to build a network of Knowledge Map reports that drill down from one source report to the next.

The Knowledge Map contains all the targets available for your report. Targets can be either target reports or target URLs. Context menus that appear for a given source value when the user hovers on that field contain targets valid for that value as well.

Step 2: Identifying Target Reports and Target URLS

Any report or URL can be used as a target for your source report. Reports that are already in your Domain structure can be identified as targets in the Properties dialog box by checking Enable Knowledge Mapping. They will then appear in the Knowledge Map when you run your source report.

A target in the Knowledge Map can have two types of behavior or functionality. A target can accept a dropped value, or a target can be a clickable object.

In other words, a target can have a URL assigned to it, and the user could click on that target at any time to execute the URL. In addition, the target can be set to accept any number of values dragged from the source report. You can specify the behavior of your targets in the Mapping Tool.

For more information, see *Identifying Target Reports* on page 13-8 and *How to Set an Existing Procedure as a Target Report* on page 13-8.

Step 3: Specifying Criteria in Target Reports

The Drill Input Parameters tab displays the amper variables contained in the selected target report. The Drill Input Parameters tab allows you to specify the criteria for each parameter. The parameter criterion specifies the values that the target report will accept from the source report.

You can specify a value for one, two or all parameters. If you specify criteria for more than one parameter, the value passed from the source report must meet all criteria. You can choose not to specify any parameters, which means that the value passed from the source report does not have to meet any criteria.

For more information, see *How to Specify Criteria in a Target Report* on page 13-9 and *Specifying Criteria in Target Reports* on page 13-9.

Step 4: Specifying Display and Navigation Information in a Map

Once you have selected your source and target reports and specified the criteria for parameters in the target reports you can specify navigation information for your reports.

You can specify click URLs for target objects in the Knowledge Map. For more information, see *Specifying Navigation for a Source Report* on page 13-10, and *Specifying Navigation Information in Century Corp Sample* on page 13-22.

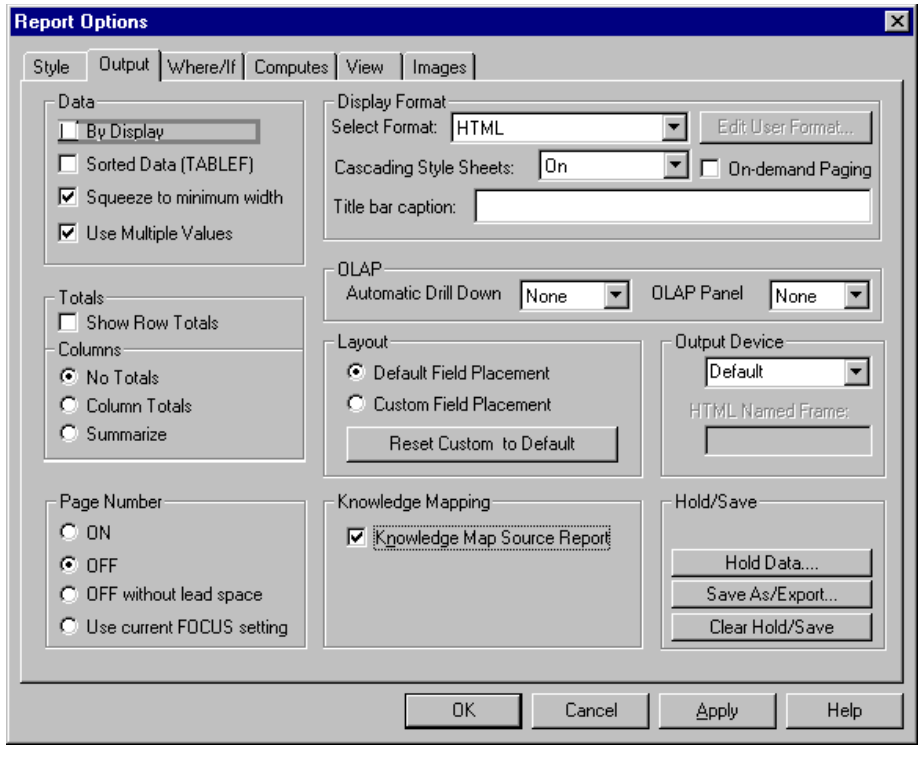
Specifying a Source Report

To identify a report as a source report, you must complete two actions. You must specify that the report should Run with Knowledge Mapping in the MRE Properties box, and enable Knowledge Mapping through the Report Painter.

Procedure How to Identify a Report as a Source Report

Complete the following steps to identify a report as a source report:

1. Open the Managed Reporting environment from the Developer Studio Application Explorer.
2. Select the report you wish to specify as your source report.
3. Right-click the report and select *Properties* from the pop-up menu. The Properties dialog box opens.
4. Select the *Run with Knowledge Mapping* check box and click *OK*. This identifies your report as a source report. Now you must enable the source report in the Report Painter.
5. Open the report in the Report Painter. From the *Report* menu, select *Output*. The Report Options dialog box opens.
6. In the Knowledge Mapping section of the Output tab, check the *Knowledge Map Source Report* check box. The report is now enabled to run as a source report.



Note: If you prefer to manually enable your report instead of using the report painter, you can add the code MAPPING=ON in the stylesheet section of your source report.

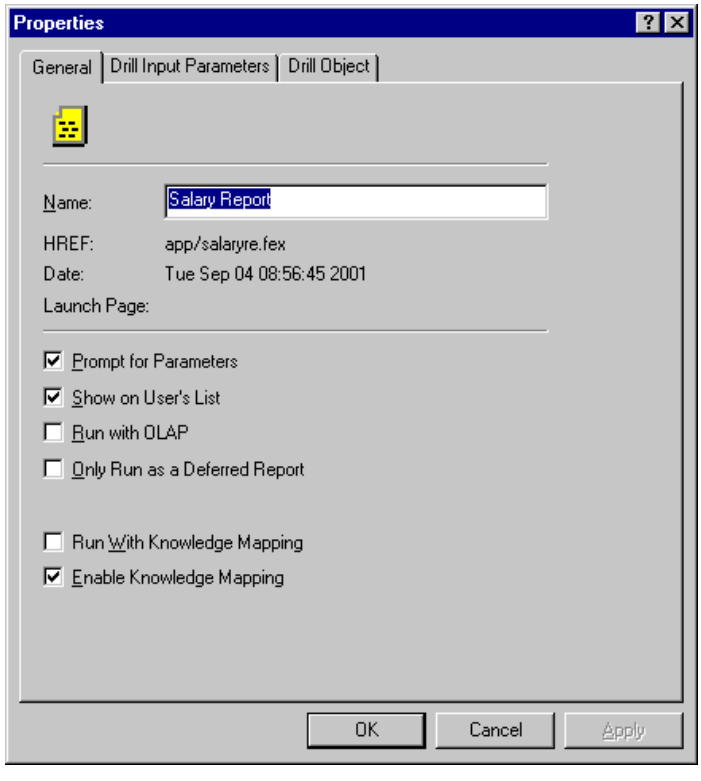
Identifying Target Reports

A target report is a report that is able to accept a specified Clicked Value. The properties and behavior of a target report are set using the Mapping Tool. A reference to the target report (labeled with a Target Display Name) is placed in the Knowledge Map and any source value can be passed by dragging and dropping the value in the Knowledge Map or by drilling down to the context menu.

Within your existing Domain structure, you can identify relevant reports as target reports.

Procedure How to Set an Existing Procedure as a Target Report

To set a target report, perform the following steps:



1. Right-click the report you wish to set as a target report.
2. Select *Properties* from the drop down menu.
3. In the Properties dialog box, select Enable Knowledge Mapping. The Drill Input Parameters and the Drill Object tabs become active.
4. Click *OK*.

Specifying Criteria in Target Reports

When you identify reports that contain amper variables as target reports, you can specify the criteria for those variables in the Drill Input Parameters tab in the Mapping tool.

When you specify criteria in the Mapping tool, you can limit which values the target will accept from the source report. This type of target, called a Dynamic target, appears on the context menu only if the criteria specified in the Mapping File for that source value are met. If the criteria are not met, the target will not display on the context menu. This helps eliminate the possibility of users running erroneous requests.

If you do not specify criteria for a parameter in a target, the target will not be a Dynamic target, and will always display on the menu since there are no criteria to be met.

Procedure **How to Specify Criteria in a Target Report**

In the Drill Input Parameters tab of the Mapping tool, complete the following steps:

1. Select the amper variable for which you wish to specify parameter criteria.
2. Click the *Browse...* button to the right of the File input box. Select a Master File from the Master File List dialog box and click *OK*.
3. Click the *Browse...* button to the right of the Field input box. Select a field from the Field List dialog box and click *OK*.

   Note: You must first specify a Master File in order to select from a list of fields.
4. If you wish to specify a format for your parameter, click the *Browse...* button to the right of the Format input box. Specify format type, width, and edit options in the Format dialog box.
5. You can also determine whether you want your parameter to be an optional parameter, if you want the parameter to be a dragged value, and how you want the data to be submitted (raw, formatted display, script defined).

For more information on using the Drill Input Parameters dialog box, see *Drill Input Parameters Tab in Mapping Tool* on page 13-11.

Specifying Navigation for a Source Report

The pop-up menu that appears when a user hovers over any value in a source report is the context menu. This menu displays a list of targets to which the user can drill. The targets that display on this menu can be dynamic (appears only if certain criteria are met) or static (always appear on the context menu regardless if criteria are met). This behavior can be set in the Mapping tool.

When a user drags and drops a value, every field to the left of the dragged value is passed to the target. For example, if you drag a value from the product column in a report that displays products by category and location, the category and location values will be passed to the target report along with the product value.

Note: If you have specified a Drill Down in the Report Painter for the source report, the Drill Down will appear as the first item in the context menu.

Using the Mapping Tool

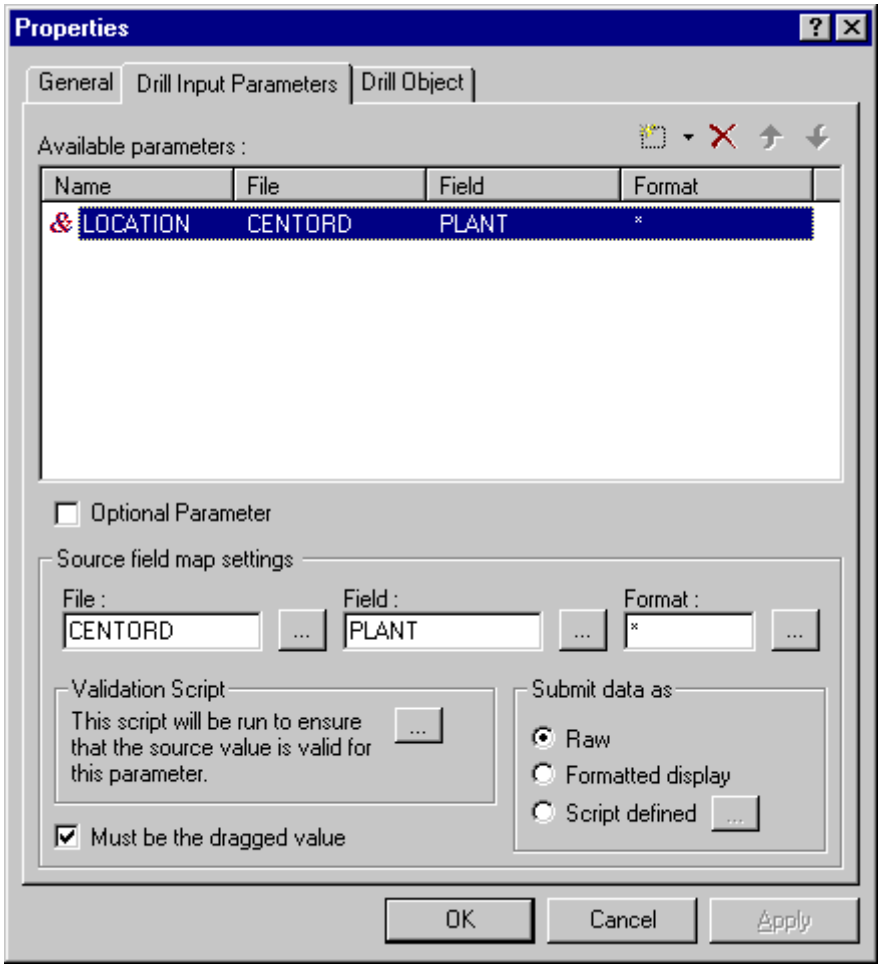
A Knowledge Map report is created using the Mapping tool, which is situated inside the Properties dialog box. The Mapping tool is used to control all aspects of the drill downs.

Procedure How to Access the Mapping Tool

To access the Mapping tool from the Windows based Managed Reporting environment, complete the following steps:

1. Right-click the report you wish to set as a Knowledge Map report.
2. Select *Properties* from the drop down menu.
3. In the Properties dialog box, select *Enable Knowledge Mapping*. The Drill Input Parameters and the Drill Object tabs become active. All Mapping tool tasks can be completed in these two tabs.

Reference Drill Input Parameters Tab in Mapping Tool



The Drill Input Parameters tab includes the following options:

Available Parameters

This box lists the following parameters:

- Amper variables contained in the target report.
- User-defined parameters.

Optional Parameter

If checked, the value associated with the selected variable or user parameter is not necessary for the target report to run.

Source field map settings

- File: Allows you to specify a Master File description. The value passed from the source report must be a field contained in the specified Master File.
- Field: Allows you to specify a fieldname contained in the Master File. The value passed from the source report must be referenced by the fieldname specified.
- Format: Allows you to specify a field format (A10, D12.4, for example). The value passed from the source report must be the same format as the format specified in this parameter.

Validation Script

Allows you to code a JavaScript or VBScript function that provides another level of validation for a value being passed to the target report. You can specify a validation script by clicking the Browse... button.

Submit Data As

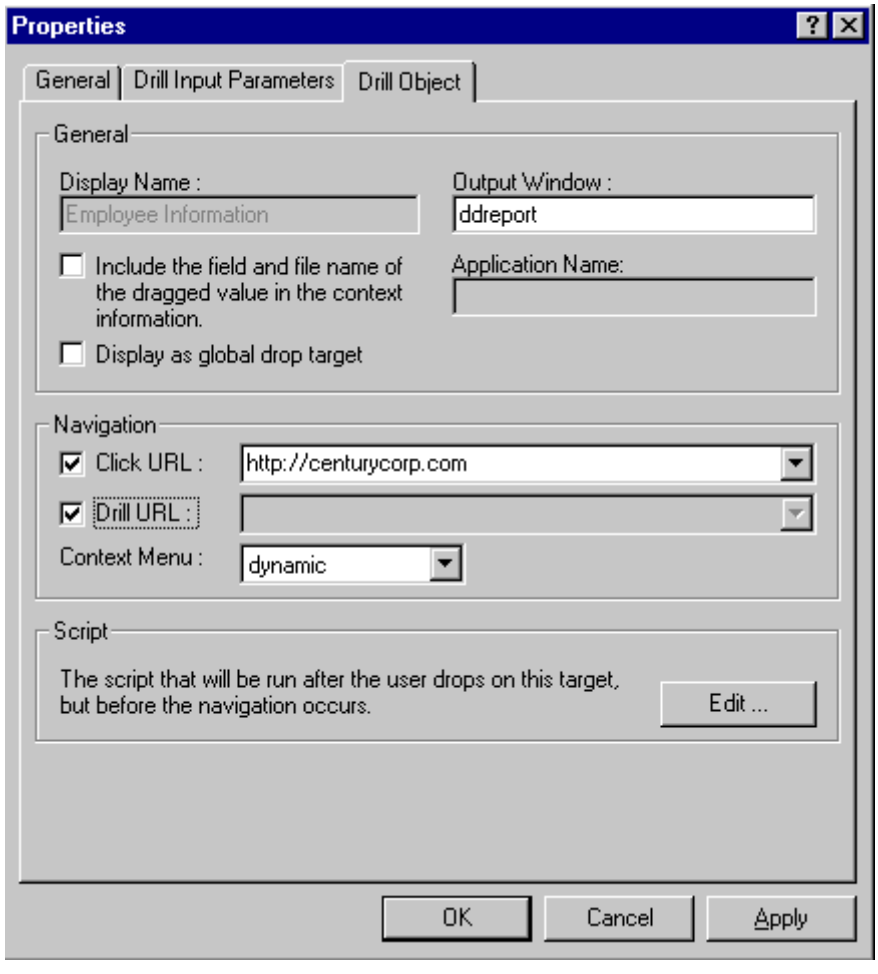
This box contains three radio buttons:

- Raw: The value passed to the target report will be stripped of all formatting options (for example, C – comma inclusion, M – floating dollar sign).
- Formatted display: The value passed to the target report will retain any formatting options.
- Script defined: Allows you to code a JavaScript or a VBscript function to determine formatting options. You can specify a script by clicking the Browse... button.

Must be the dragged value

If checked, only the value in the source report that is associated with the highlighted variable can be dragged from the source report to the target report.

Reference Drill Object Tab in the Mapping Tool



The Drill Object Tab contains the following elements:

Display Name

Displays the name of the target report.

Output Window

Lists the name of the window that displays the output for the target. The default name is ddreport, which causes the report to display in a frame to the right of the tree. This value can be changed to an existing frame name, or you can specify an HTML frameset (for example, _BLANK, _TOP, etc.)

Include the field and file name...

When checked, the Master File name and the fieldname are passed to the target report along with the drag value.

Display as global drop target

When checked, the target report is displayed at the top of the Knowledge Map hierarchy.

Click URL

Allows you to assign a static URL to a target in the Knowledge map. This action occurs when the user clicks on the actual target in the Knowledge Map and does not refer to Drill Behavior. Click URL is optional and does not have to be set.

Drill URL

The Drill URL is the predetermined URL that is used to execute the target report. It cannot be changed and is grayed out in the Mapping Tool.

Context Menu

Allows you to specify whether the target report will appear on context menu dynamically or statically.

Dynamic: If selected, the target report will appear in the context menu only in columns where the column value matches the criteria for the target report.

Always: If selected, the target report will always appear in the context menu regardless of the source value being passed.

Script

Allows you to specify a script that runs after the user drops a value on the target report.

Century Corp: A Sample Knowledge Map Report

Suppose you are a developer working for an electronics manufacturing company called Century Corporation. The CEO of Century Corp wants a report that shows both employee and product information for all the manufacturing plants across the country. A Knowledge Map report would allow users to access information about employees and products from a single source report with the click of a mouse.

The Century Corp sample report, organized as a set of examples, illustrates how to plan a Knowledge Map report so that your user can access specific salary information, employee information, and product information by utilizing a source report's Knowledge Mapping capabilities.

This sample is based on four sample Standard Reports: Century, Employee Information, Salary Report, and Quantity Report.

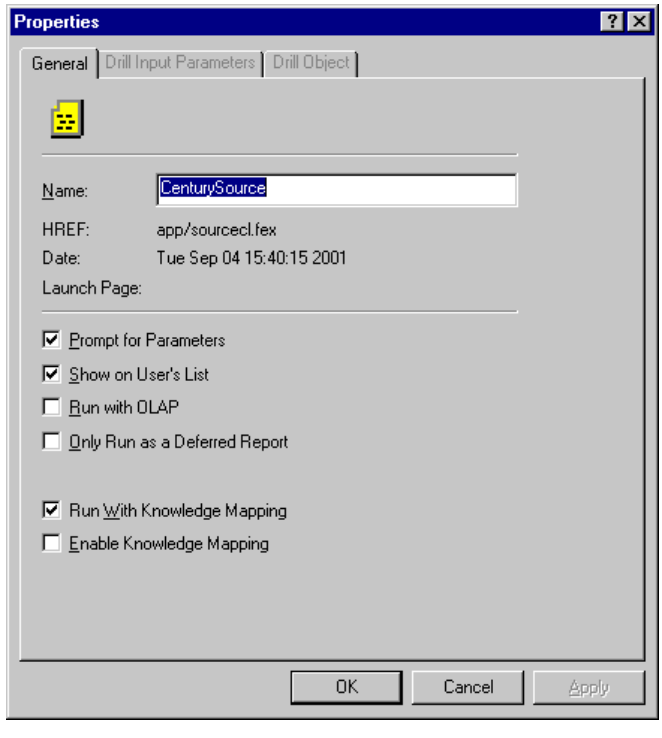
Example Specifying Your Century Corp Source Report

The source report for the Century Corp Knowledge Map report should be a report that includes values that pertain to both products and employees.

Suppose you have a Standard Report, called Century, which contains the Plant, Product Category, and Product fields. Choosing this report as a source report allows your user to select values from these fields to launch target reports. Your user will be able to use values from the Plant column as drop values to access employee information, and to use Product Category and Product columns to access product information.

The following steps illustrate how to specify Century as a source report:

1. Open the Managed Reporting environment from the Developer Studio Application Explorer.
2. Select the Century report from the Standard Reports folder in the Century Corporation domain.
3. Right-click the Century report and select *Properties* from the pop-up menu. The Properties dialog box opens.
4. You need to be able to easily identify which of your reports is the source report. For this reason, rename Century as CenturySource in the *Name* field.



5. Select the *Run with Knowledge Mapping* check box. This identifies CenturySource as a source report.
6. Click *OK*. Now you will need to enable the Knowledge Mapping feature.
7. Open the report in the Report Painter. From the Report menu, select *Output*. The Report Options dialog box opens.
8. In the Knowledge Mapping section of the Output tab, check the Enable box. The report is now enabled to run as a source report.

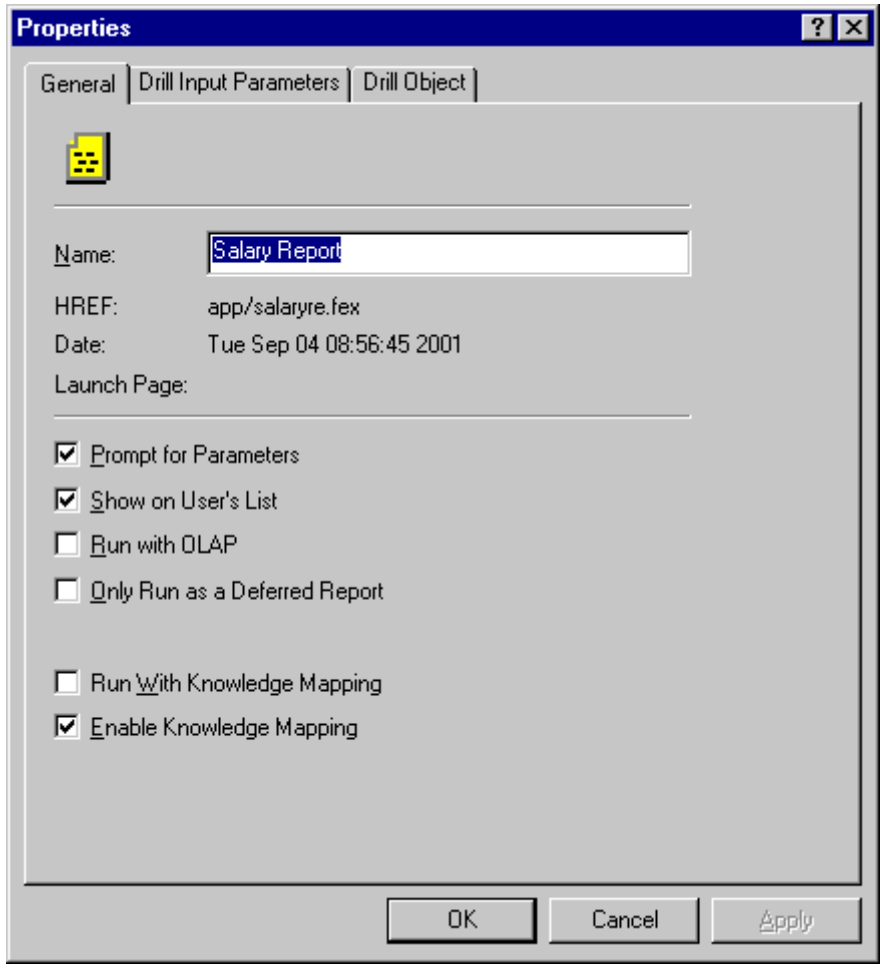
Example Specifying Target Reports in the Century Corp Sample

After you have selected your source report, you will want to select target reports that are able to accept values from the source report. Suppose you have a Standard Report, called Salary Report, which contains Position, Salary, and Plant fields. This report will accept values from the source report, and contains the information you want to call from the source.

The following steps illustrate how to specify Salary Report as a target report based on the Century Corp. example:

1. Open the Managed Reporting environment from the Developer Studio Application Explorer.
2. Select Salary Report from the Standard Reports folder in the Century Corporation domain.
3. Right-click Salary Report and select *Properties* from the pop-up menu. The Properties dialog box opens.
4. Select the Enable Knowledge Mapping check box. This identifies Salary Report as a target report. The Mapping tool, which consists of the Drill Output Parameters and the Drill Object tabs, becomes active. You can specify all drill down behaviors in the Mapping tool.

5. Once you have specified the criteria for your target report, click *OK*.



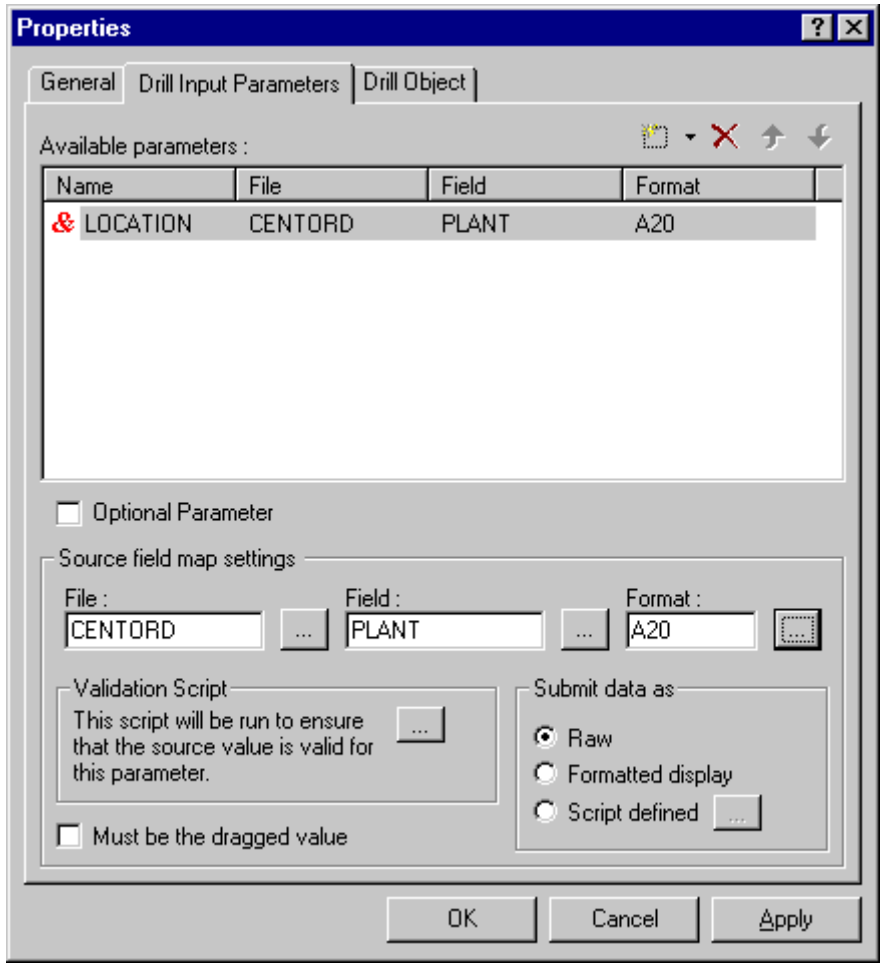
For more information on specifying parameters in the Century Corp sample report, see *Specifying Criteria in a Target Report* on page 13-18. For information on specifying navigation information, see *Specifying Navigation Information in Century Corp Sample* on page 13-22.

Example Specifying Criteria in a Target Report

The following steps illustrate how to specify criteria for the Salary Report based on the Century Corp example:

1. In the Standard Reports folder, right-click Salary Report and select *Properties*. Select the Drill Input Properties tab. This dialog box lists the amper variables contained in the target report. The amper variable &LOCATION is displayed in the Available parameters list.
2. Select &LOCATION, then click the *Browse...* button to the right of the File input box. Because the source report contains fields from the CENTORD Master File, select this Master File from the Master File List dialog box.
3. Select the *Browse...* button to the right of the Field input box. In the Master File List dialog box, select PLANT. You have now indicated that the only value that &LOCATION can accept is a value for the PLANT field contained in the CENTORD Master File.

4. Select the *Browse...* button to the right of the Format input box. The default format displays in the Format dialog box. Because PLANT is an alphanumeric field, the default format of A20 is an appropriate format. Click *OK*.

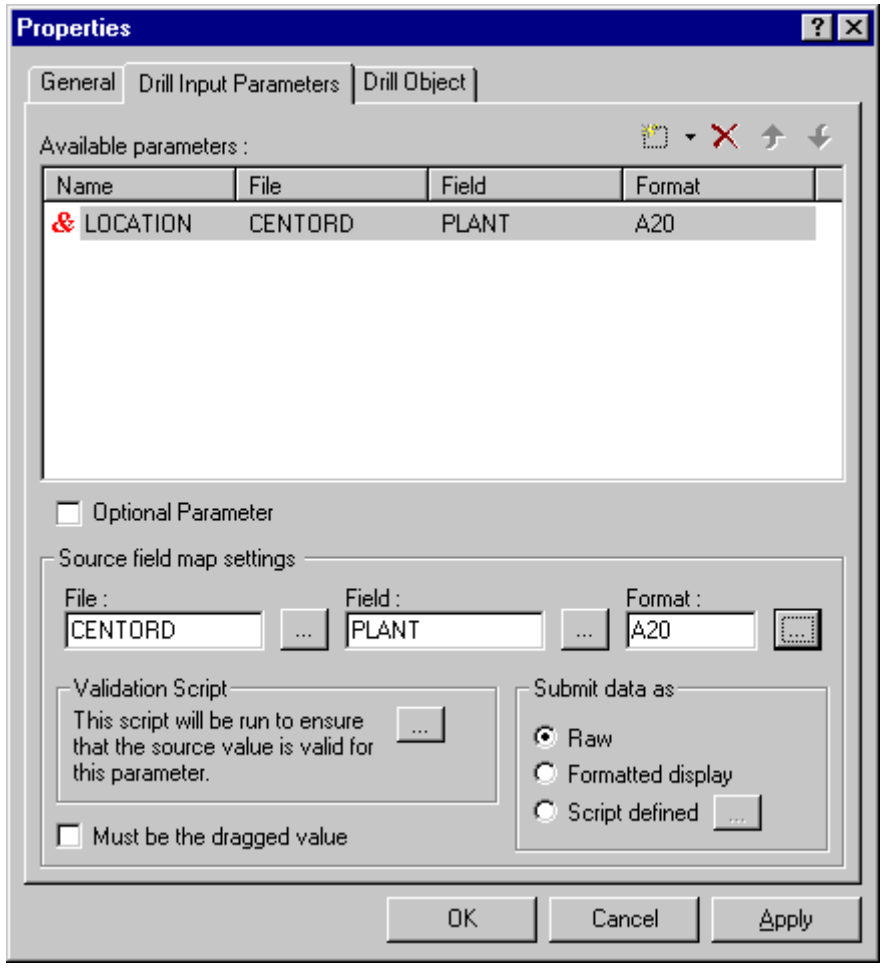


Example Specifying a Target URL in the Century Corp. Sample

You can create a clickable object in the Knowledge Map that cannot be used as a drill object. The following steps illustrate how to create a target URL that links to the Information Builders Web site:

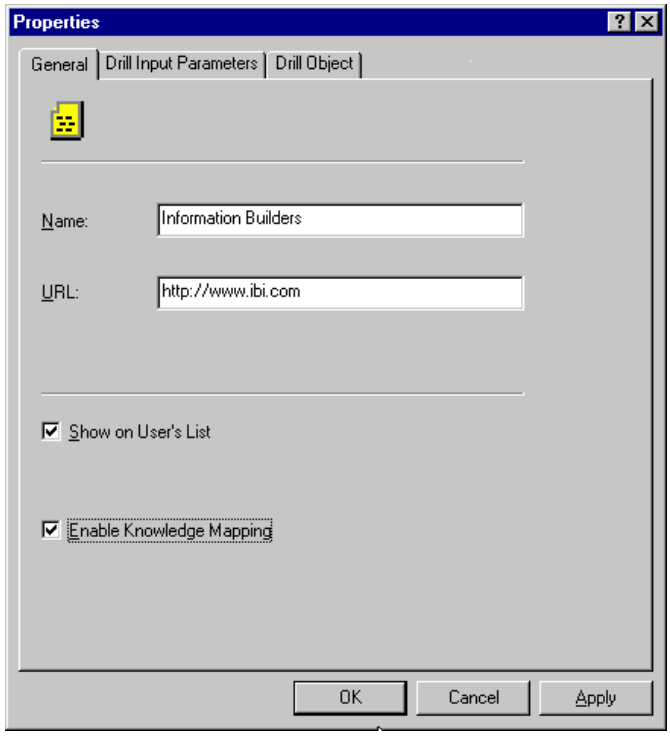
1. Open the Managed Reporting environment from the Developer Studio Application Explorer.
2. Right-click the Products folder in the Standard Reports folder in the Century Corporation domain.
3. From the pop-up menu, select *New. Standard Report*; then select *URL*. The new Standard Report URL dialog box displays.
4. In the Name field, enter Information Builders. In the URL field, enter http://www.ibi.com.
5. Click *OK*. The URL will appear in the Products folder as Information Builders.
6. Right-click on the Information Builders report and select *Properties* from the pop-up menu.

7. Check the Enable Knowledge Mapping check box. The URL is now designated a target URL and will appear on the Knowledge Map tree when you run the source report.



Example Specifying Navigation Information in Century Corp Sample

You can determine navigation information for a target report in the Drill Object tab of the Mapping tool. In this example, the Employee Information report is selected.



1. Determine whether the field and file names should be included with the dragged source value. Because the Employee Information report provides information based on the value selected from the PLANT column, it is not necessary to select this option.
2. Determine whether you want to display the report as a global drop variable. A global drop variable is situated at the highest level in the Knowledge Map. This option is useful if a target report is stored many levels deep in the Managed Reporting Repository. Because the Employee Information report is not buried within several folders in the Managed Reporting Repository, it is not necessary to select this option.
3. Specify a Click URL for the target report. In this example, specify the corporation's internal website when the Employee Information target is clicked by typing http://centurycorp.com in the Click URL input box.
4. Leave the context menu set to dynamic, so the Employee Information report will appear on the context menu only when the selected column in the source report fulfills the criteria for the target parameters.

Example Running the Century Corp. Knowledge Map Report

To run a Knowledge Map report, simply run the source report.

The following steps illustrate how to run the Century Corp. sample report:

1. Open the Managed Reporting environment from the Developer Studio Application Explorer.
2. Select CenturySource from the Human Resources Standard Reports group in the Century Corporation domain.
3. Right-click CenturySource and select *Run* from the pop-up menu.

The Century Corp. Knowledge Map report appears in your browser. The source report data and the Knowledge Map are displayed. The graphic below shows the CenturySource report with PDA Devices selected as a drop value.

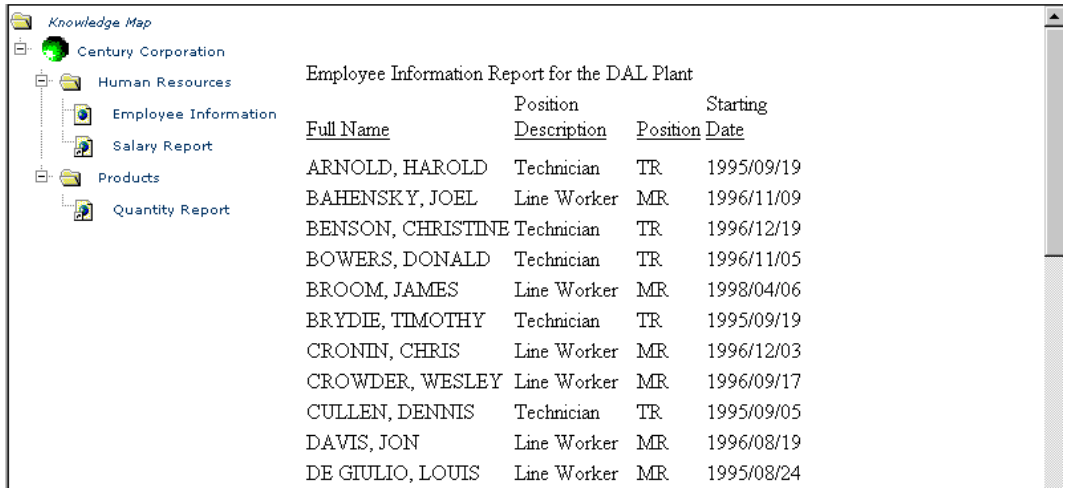
Example Running a Target Report from a Knowledge Map Report

In order to generate a target report, you can either drop a source value on a target or select an option from the context menu that appears when you hover on a source value.

The following steps illustrate how to generate a Target report by dragging a source value onto a target:

1. In the source report, click the Camcorder value to select it as a drag value. Continue to hold the mouse button down.
2. Drag your cursor to the Employee Information target in the Knowledge Map. Release the mouse button.

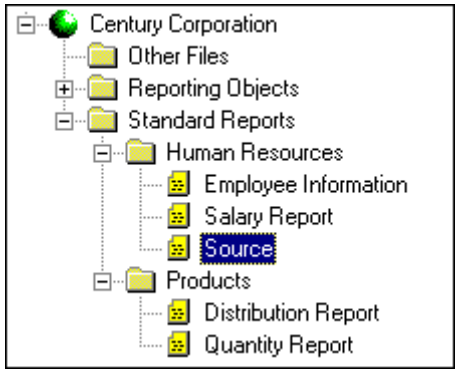
Dragging and dropping the camcorder value onto the Employee Information target in the Knowledge Map passes the DAL value and the camcorder value, then executes the Employee Information report. The following graphic illustrates the resulting target report containing employee information for the Dallas plant.



Full Name	Position Description	Position	Starting Date
ARNOLD, HAROLD	Technician	TR	1995/09/19
BAHENSKY, JOEL	Line Worker	MR	1996/11/09
BENSON, CHRISTINE	Technician	TR	1996/12/19
BOWERS, DONALD	Technician	TR	1996/11/05
BROOM, JAMES	Line Worker	MR	1998/04/06
BRYDIE, TIMOTHY	Technician	TR	1995/09/19
CRONIN, CHRIS	Line Worker	MR	1996/12/03
CROWDER, WESLEY	Line Worker	MR	1996/09/17
CULLEN, DENNIS	Technician	TR	1995/09/05
DAVIS, JON	Line Worker	MR	1996/08/19
DE GIULIO, LOUIS	Line Worker	MR	1995/08/24

Creating a Knowledge Map from the Managed Reporting Repository

Your Knowledge Map is created directly from the reports that exist in the same domain as your source report. Suppose the Century Corporation domain in the Managed Reporting environment (as accessed through Developer Studio) contains the following reports.



When you run the source report, the Knowledge Map appears as the following tree. The Knowledge Map uses the same structure as the Managed Reporting repository.

You will notice that the Distribution Report does not appear on the Knowledge Map. This is because the Enable Knowledge Mapping check box was not selected in the Mapping tool, so the Distribution Report was not selected as a target report. Only reports that have been enabled for Knowledge Mapping in the Mapping tool will appear on the tree.

Note: The reports that appear in the Knowledge Map are also affected by security. Only target reports that a user has access to through MRE User Admin will display.

Glossary of Knowledge Mapping Terms

This glossary includes definitions and helpful information about terms related to Knowledge Mapping.

Terms	Definitions
click URL	A static URL that is assigned to a target in the Knowledge Mapping tree. This action occurs when the user clicks on the actual target in the tree.
clicked value	A selected value in a source report. Clicked value is a generic term that may refer to a drag value or a drill value.
context menu	The pop-up menu that appears when a user hovers over any value in a source report. This menu displays a list of targets to which the user can drill down.
drag value	A value in the source report that has been selected for dragging by the user.
dragging	The act of clicking on a value in a source report and, while holding the mouse button down, moving the clicked value to a target.
drill behavior	The properties of a target that are set in the Mapping File. A Drill Down can be set to accept only certain fields from certain data sources, only the Clicked Value, etc. Furthermore, Scripting can be used to define the Drill Behavior as well. Drill Behavior pertains only to the Drill URL.
drilling down	The act of passing values to a target by dragging and dropping or clicking a target on the context menu.
drill URL	A URL that executes a target report.
drill value	A value in a source report over which the mouse is currently hovering. The resulting context menu displays the appropriate targets for that drill value as defined in the Mapping File.
drop	The act of releasing the mouse button (after dragging) on top of a target for the purpose of passing the drag value to a target.
dynamic target	A target that appears on the context menu only if the criteria specified in the Mapping File for that source value is met.

Terms	**Definitions**
ghost value	Any field that is higher than (to the left of) the clicked value in the hierarchical structure of the source report. Ghost values can be visible or invisible fields in the report and are always passed in the Drill Down.
hovering	The act of placing the mouse pointer over a value in a source report or over any target.
Knowledge Map	The tree structure that appears with a source report and lists all targets available to the report.
Mapping File	The XML document that controls every aspect of drill behavior. The source report and all target reports are linked to the Mapping File, which is automatically generated the first time a report is specified as a source report or target report. The Mapping File will display in 'Other Files' within the domain.
Mapping tool	The GUI tool used to build and define the Mapping File. The Mapping File is generated automatically, and the Mapping Tool is used to define drill behaviors.
source report	The initial Knowledge Map report. A source report will always include the following components: the actual report data, the Knowledge Map and a context menu.
target	Any target report or target URL defined in the Mapping File. A target can accept a dropped value or be a clickable object.
target report	A report that is defined in the Mapping File and is able to accept a specified clicked value.
target URL	A URL that is defined in the Mapping File and can be used to execute web searches, run a report, or run an operation.

CHAPTER 14

Customizing Graphs With the Graph Editor

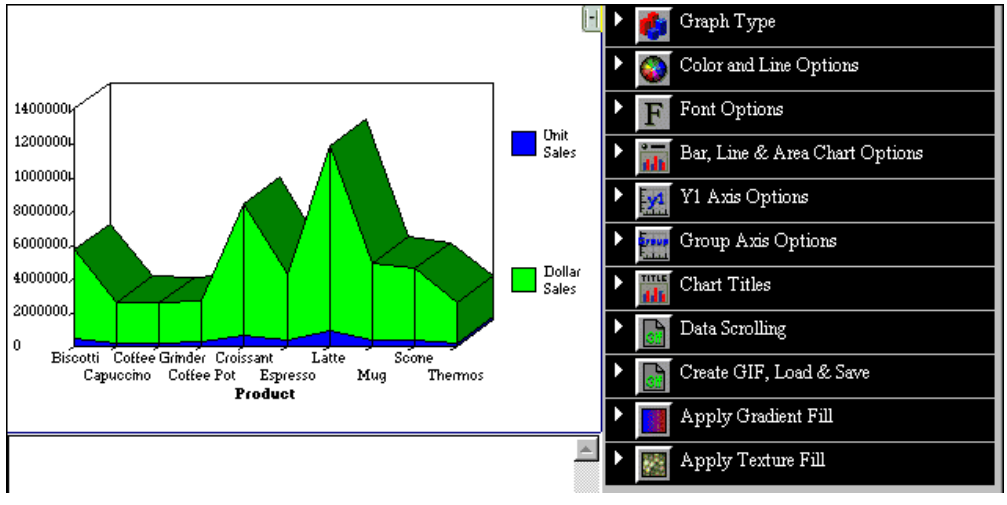
Topics:

- Choosing a Graph Type
- Applying Color and Line Options in Graphs
- Applying Font Options in Graphs
- Adding Chart Titles
- Creating and Loading GIF Files
- Applying Gradient Fill (All Graph Types)
- Applying Texture Fill (All Graph types)
- Zooming and Panning in Bar Graphs
- 3D Chart Options
- 3D Custom Viewing Options
- 3D Preset Viewing Options
- Bar, Line, and Area Chart Options
- Dual Y Options
- Group Axis Options
- Pie Chart Options
- Stock Chart Options
- X1 Axis Options
- Y1 Axis Options
- Y2 Axis Options

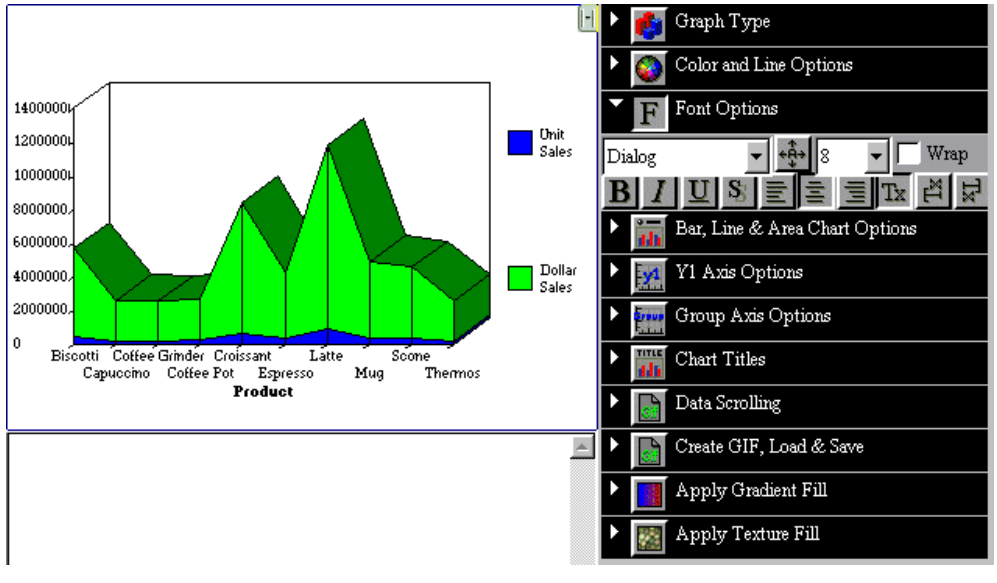
The Graph Editor is an interactive tool that allows you to modify a graph (either a basic graph or one to which you have applied a Look) without having to edit the underlying WebFOCUS code. With the Graph Editor you can redisplay data as a different graph type; change fonts, colors, and titles that appear in a graph; and save the graph as an image file. The Graph Editor applies and displays the changes you make to the graph, and edits the graph's underlying code.

Procedure How to Access and Use the Graph Editor

1. Click the *Edit...* button located on the Graph Assistant's Look tab.
2. The graph opens in the Graph Editor.
3. Click the small button at the top right of the graph pane to open the Graph Editor menu on the right, and a message/input box below the graph.



4. Click a menu button to expand the menu. When you select an item in the menu, a dialog box displays a list of parameters you can apply to the chart.



5. Make your modifications. Depending on your changes, the Graph Editor immediately applies the modifications to the graph or does so when you click the *Apply* button. You can continue to customize the graph to your exact specifications.

   Tip: Some menu selections may cause the dialog box to extend beyond the available display. Use the Up and Down arrow scroll bars to reposition the dialog box

6. Examine your modifications, then click the *Close* button or choose *Save* from the File menu to close the Graph Editor. The Save Query dialog box opens.
7. Select *Yes* to save your changes.

You are returned to the Graph Assistant Looks tab. When you close the Graph Assistant you can save your changes to a file.

Tip: If you wish to see the changes you have made to the WebFOCUS graph code, right-click the graph procedure in the Application window and select *Edit as Text*. Notice that the Java™ code generated by the Graph Editor has been inserted into WebFOCUS graph StyleSheet code.

Choosing a Graph Type

You can choose to redisplay your data as a different graph type. These graph types are contained in the following categories: 3D, bar, line, area, pie, scatter, stock (Hi-Lo), and a special category that includes polar, radar, and histogram charts. Each category offers multiple types of graphs, and appropriate customization options for that graph type.

Procedure How to Select a Graph Type

1. From the Graph Editor, select *Graph Type*. The Bar tab appears with a dialog box showing the tabs of the other supported graph types across the top of the box.

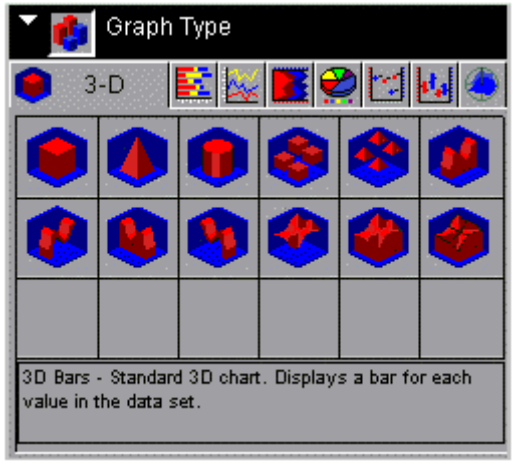
   Tip: When you move the mouse pointer over a chart in the list, the message area at the bottom of the dialog box describes the chart.

2. Click on the graph type you want to assign to the chart in the main window.

The chart is automatically updated to reflect the selected graph type. In addition, the Graph Editor menu changes to reflect the options that are available for the selected graph type.

Reference 3D Graphs

The 3-D icon tab displays the following dialog box:



When choosing among the twelve styles of 3-D charts, use the thumbnail as an approximation of how your 3-D graph will look. The descriptions below each style match your graph with its purpose.

From left to right and top to bottom, selections in this dialog include the following:

3D Bars (GraphType=0)

Standard 3D chart. Displays a bar for each value in the data set.

3D Pyramid (GraphType=1)

Pyramids are good for showing volume information, such as an amount of some item.

3D Octagon (GraphType=2)

Octagons drawn in 3D.

3D Floating Cubes (GraphType=4)

This 3D type is good for displaying data values that are close to each other. You can see under and around the cubes.

3D Floating Pyramids (GraphType=5)

Diamond-like pyramids float in air to trace out your data points.

3D Connected Series Area (GraphType=6)

Good for showing trend information along the series dimension.

3D Connected Series Ribbon (GraphType=7)

Good for showing trend information along the series dimension.

3D Connected Group Area (GraphType=9)

Good for showing trend information along the group dimension.

3D Connected Group Ribbon (GraphType=10)

Good for showing trend information along the group dimension.

3D Surface (GraphType=12)

Graphs all data points as a 3D surface, like a rolling wave.

3D Surface with Sides (GraphType=13)

Graphs all data points as a 3D surface with solid sides.

3D Honeycomb Surface (GraphType=14)

Graphs all data points as a 3D surface using a “honeycomb” effect.

Syntax

Graph Editor Syntax for 3D Charts

A selection in the 3D graphs dialog box adds the GraphType property to the code that describes the chart

```
setGraphType ( value );
```

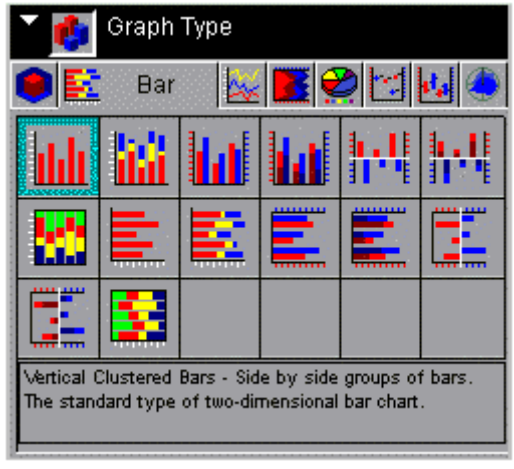
where:

value

Is a number in the range 0-2, 4-7, 9-10, 12-14.

Reference Bar Graphs

The Bar tab displays the following dialog box:



When choosing among the fourteen styles of bar charts, use the thumbnail as an approximation of how your bar graph will look. The descriptions below each style match your graph with its purpose.

From left to right and top to bottom, selections in this dialog include the following:

Vertical Clustered Bars (GraphType=17)

Side by side groups of bars. The standard type of two-dimensional bar chart.

Vertical Stacked Bars (GraphType=18)

Stacked groups of bars. Each stack is comprised of all series in this group, added up to get a total. The axis is the total value of the cumulative points.

Vertical Dual-Axis Clustered Bars (GraphType=19)

Also called a Dual-Y chart. Any series can be assigned to either of the two axes.

Vertical Dual-Axis Stacked Bars (GraphType=20)

Also called a Dual-Y stacked chart. Separate stacks will be created for the data on each of the two axes.

Vertical Bi-Polar Clustered Bars (GraphType=21)

A Dual-Y chart with the two axes physically split into separate sections, so that each can be seen independently of the other.

Vertical Bi-Polar Stacked Bars (GraphType=22)

A stacked Dual-Y chart with the two axes physically split into separate sections, so that each can be seen independently of the other.

Vertical Percent Bars (GraphType=23)

A bar version of a pie chart. Each group calculates the percent of the total required for each series. The axis goes from 0 to 100%.

Horizontal Clustered Bars (GraphType=24)

Side by side groups of bars. The standard type of two-dimensional bar chart.

Horizontal Stacked Bars (GraphType=25)

Stacked groups of bars. Each stack is comprised of all series in this group, added up to get a total. The axis is the total value of the cumulative points.

Horizontal Dual-Axis Clustered Bars (GraphType=26)

Also called a Dual-Y chart. Any series can be assigned to either of the two axes.

Horizontal Dual-Axis Stacked Bars (GraphType=27)

Also called a Dual-Y stacked chart. Separate stacks will be created for the data on each of the two axes.

Horizontal Bi-Polar Clustered Bars (GraphType=28)

A Dual-Y chart with the two axes physically split into separate sections, so that each can be seen independently of the other.

Horizontal Bi-Polar Stacked Bars (GraphType=29)

A stacked Dual-Y chart with the two axes physically split into separate sections, so that each can be seen independently of the other.

Horizontal Percent Bars (GraphType=30)

A bar version of a pie chart. Each group calculates the percent of the total required for each series. The axis goes from 0 to 100%.

Syntax

Graph Editor Syntax for Bar Charts

A selection in the Bar charts dialog box adds the GraphType property to the code that describes the chart

```
setGraphType ( value );
```

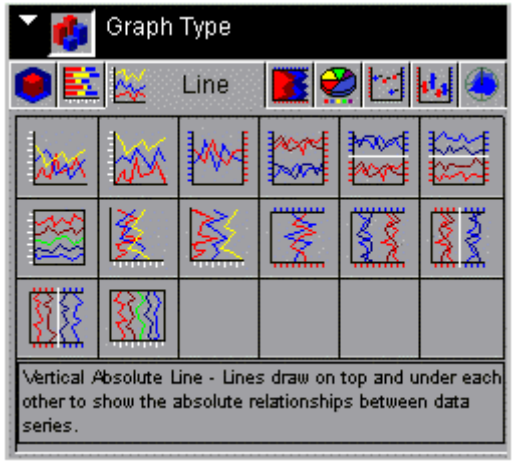
where:

value

Is a number in the range 17-30.

Reference Line Graphs

The Line tab displays the following dialog box:



When choosing among the fourteen styles of line charts, use the thumbnail as an approximation of how your line graph will look. The descriptions below each style match your graph with its purpose.

From left-to-right and top-to-bottom, selections in this dialog include the following:

Vertical Absolute Line (GraphType=41)

Lines drawn on top and under each other to show the absolute relationships between data series.

Vertical Stacked Line (GraphType=42)

Lines stacked on top of each other. The axis is the cumulative total of all the groups.

Vertical Dual-Axis Absolute Line (GraphType=43)

Also called a Dual-Y line chart. Any series can be assigned to either of the two axes.

Vertical Dual-Axis Stacked Line (GraphType=44)

Also called a Dual-Y stacked line chart. Separate stacks will be created for the data on each of the two axes.

Vertical Bi-Polar Absolute Line (GraphType=45)

A Dual-Y chart with the two axes physically split into separate sections, so that each can be seen independently of the other.

Vertical Bi-Polar Stacked Line (GraphType=46)

A stacked Dual-Y chart with the two axes physically split into separate sections, so that each can be seen independently of the other.

Vertical Percent Line (GraphType=47)

A line version of a pie chart. Each group calculates the percent of the total required for each series. The axis goes from 0 to 100%.

Horizontal Absolute Line (GraphType=48)

Lines drawn on top and under each other to show the absolute relationships between data series.

Horizontal Stacked Line (GraphType=49)

Lines stacked on top of each other. The axis is the cumulative total of all the groups.

Horizontal Dual-Axis Absolute Line (GraphType=50)

Also called a Dual-Y line chart. Any series can be assigned to either of the two axes.

Horizontal Dual-Axis Stacked Line (GraphType=51)

Also called a Dual-Y stacked line chart. Separate stacks will be created for the data on each of the two axes.

Horizontal Bi-Polar Absolute Line (GraphType=52)

A Dual-Y chart with the two axes physically split into separate sections, so that each can be seen independently of the other.

Horizontal Bi-Polar Stacked Line (GraphType=53)

A stacked Dual-Y chart with the two axes physically split into separate sections, so that each can be seen independently of the other.

Horizontal Percent Line (GraphType=54)

A line version of a pie chart. Each group calculates the percent of the total required for each series. The axis goes from 0 to 100%.

Syntax

Graph Editor Syntax for Line Graphs

A selection in the Line charts dialog box adds the GraphType property to the code that describes the chart

```
setGraphType ( value );
```

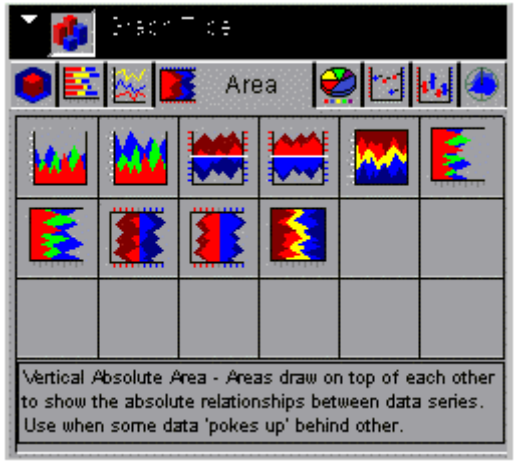
where:

value

Is a number in the range 41-54.

Reference Area Graphs

The Area tab displays the following dialog box:



When choosing among the ten styles of area charts, use the thumbnail as an approximation of how your area graph will look. The descriptions below each style match your graph with its purpose.

From left to right and top to bottom, selections in this dialog include the following:

Vertical Absolute Area (GraphType=31)

Areas drawn on top of each other to show the absolute relationships between data series. Use when some data “pokes up” behind other data.

Vertical Stacked Area (GraphType=32)

Areas stacked on top of each other. The axis is the cumulative total of all the groups.

Vertical Bi-Polar Absolute Area (GraphType=33)

A Dual-Y chart with the two axes physically split into separate sections, so that each can be seen independently of the other.

Vertical Bi-Polar Stacked Area (GraphType=34)

A stacked Dual-Y chart with the two axes physically split into separate sections, so that each can be seen independently of the other.

Vertical Percent Area (GraphType=35)

An area version of a pie chart. Each group calculates the percent of the total required for each series. The axis goes from 0 to 100%.

Horizontal Absolute Area (GraphType=36)

Areas drawn on top of each other to show the absolute relationships between data series. Use when some data “pokes up” behind other data.

Horizontal Stacked Area (GraphType=37)

Areas stacked on top of each other. The axis is the cumulative total of all the groups

Horizontal Bi-Polar Absolute Area (GraphType=38)

A Dual-Y chart with the two axes physically split into separate sections, so that each can be seen independently of the other.

Horizontal Bi-Polar Stacked Area (GraphType=39)

A stacked Dual-Y chart with the two axes physically split into separate sections, so that each can be seen independently of the other.

Horizontal Percent Area (GraphType=40)

An area version of a pie chart. Each group calculates the percent of the total required for each series. The axis goes from 0 to 100%.

Syntax

Graph Editor Syntax for Area Graphs

A selection in the Area charts dialog box adds the GraphType property to the code that describes the chart

```
setGraphType ( value );
```

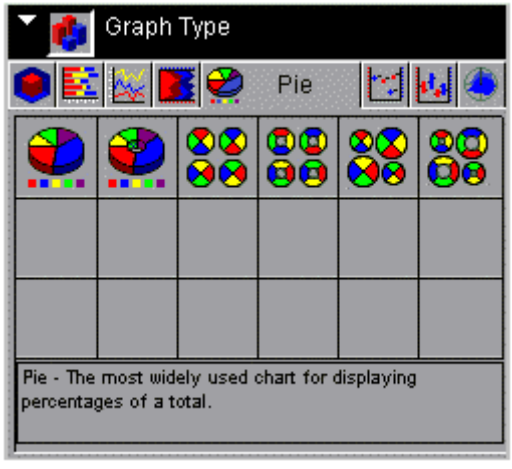
where:

value

Is a number in the range 31-40.

Reference Pie Charts

The *Pie* tab displays the following dialog box:



When choosing among the six styles of pie charts, use the thumbnail as an approximation of how your pie graph will look. The descriptions below each style match your graph with its purpose.

From left to right and top to bottom, selections in this dialog include the following:

Pie (GraphType=55)

The most widely used chart for displaying percentages of a total.

Ring Pie (GraphType=56)

A ring variant of a pie chart. The total of all slices is placed in the center.

Multi Pie (GraphType=57)

A separate pie is drawn for each group in the data set. A pie variation on Percent Bars.

Multi Ring Pie (GraphType=58)

A separate ring pie is drawn for each group in the data set.

Multi Proportional Pie (GraphType=59)

Each pie is sized in proportion to its total across the entire data set.

Multi Proportional Ring Pie (GraphType=60)

Each ring pie is sized in proportion to its total across the entire data set.

Syntax Graph Editor Syntax for Pie Charts

A selection in the Pie charts dialog box adds the GraphType property to the code that describes the chart

```
setGraphType ( value );
```

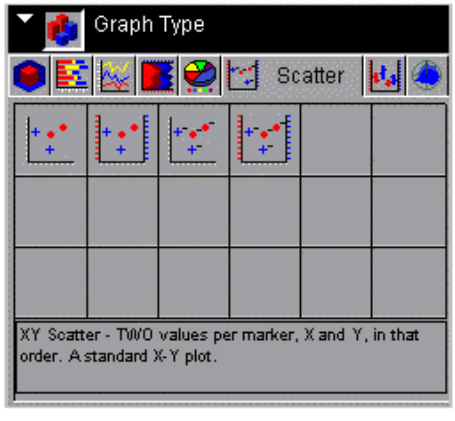
where:

value

Is a number in the range 55-60.

Reference Scatter Charts

The Scatter tab displays the following dialog box:



When choosing among the four styles of scatter charts, use the thumbnail as an approximation of how your scatter graph will look. The descriptions below each style match your graph with its purpose.

From left-to-right and top-to-bottom, selections in this dialog include the following:

XY Scatter (GraphType=61)

Two values per marker, X and Y, in that order. A standard X-Y plot.

XY Scatter Dual-Axis (GraphType=62)

Dual-Y scatter chart. Two values per marker, X and Y, in that order.

XY Scatter with Labels (GraphType=63)

Three values per maker, X, Y, and text label, in that order. Each XY point is discreetly labeled.

XY Scatter with Labels Dual-Axis (GraphType=64)

A Dual-Y scatter chart with labeled markers. Requires three values per marker, X, Y, and text label, in that order.

Syntax Graph Editor Syntax for Scatter Charts

A selection in the Scatter charts dialog box adds the GraphType property to the code that describes the chart

```
setGraphType ( value );
```

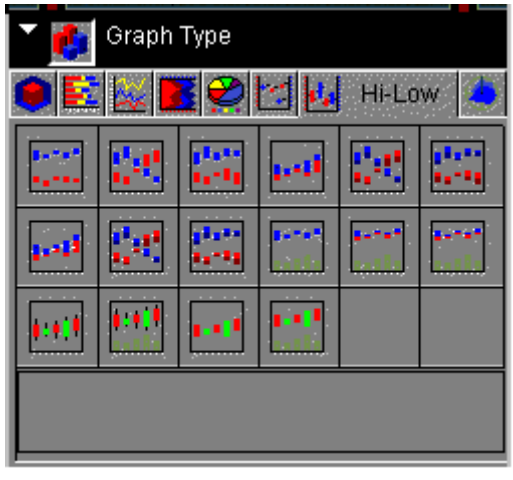
where:

value

Is a number in the range 61-64.

Reference Stock (Hi-Lo) Charts

The *Hi-Lo* tab displays the following dialog box:



When choosing among the sixteen styles of stock charts, use the thumbnail as an approximation of how your stock graph will look. The descriptions below each style match your graph with its purpose.

From left to right and top to bottom, selections in this dialog include the following:

Stock Hi-Lo (GraphType=73)

Requires two values per maker, High and Low, in that order. A standard financial equity chart.

Stock Hi-Lo Dual-Axis (GraphType=74)

Dual-Y Hi-Lo chart. Two values per marker: High and Low.

Stock Hi-Lo Bi-Polar (GraphType=75)

Dual-Y chart with the axis split into separate sections. Two values per marker: High and Low.

Stock Hi-Lo Close (GraphType=76)

Three values per marker, High, Low and Close, in that order. A standard financial equity chart.

Stock Hi-Lo Close Dual-Axis (GraphType=77)

Dual-Y version of Hi-Lo-Close chart. Requires three values per marker: High, Low, and Close.

Stock Hi-Lo Close Bi-Polar (GraphType=78)

Dual-Y chart with the axis split into separate sections. Three values per marker: High, Low, and Close.

Stock Hi-Lo Open-Close (GraphType=79)

Four values per marker: Open, High, Low, and Close. A standard financial equity chart.

Stock Hi-Lo Open-Close Dual-Axis (GraphType=80)

Dual-Y version of Open-Hi-Lo-Close chart. Four values per marker: Open, High, Low, and Close. A standard financial equity chart.

Stock Hi-Lo Open-Close Bi-Polar (GraphType=81)

Dual-Y chart with two axes split into separate sections. Four values per marker: Open, High, Low, and Close.

Stock Hi-Lo with Volume (GraphType=82)

Displays stock performance along with volume. Requires three values per marker: High, Low, and Volume.

Stock Hi-Lo Close with Volume (GraphType=88)

Displays stock performance along with volume. Requires four values per marker: High, Low, Close, and Volume.

Stock Hi-Lo Open-Close with Volume (GraphType=83)

Displays stock performance along with volume. Requires five values per marker: Open, High, Low, Close, and Volume.

Open-Hi-Lo-Close Candle Stock Chart (GraphType=70)

Requires four values per marker: Open, High, Low, and Close, in that order.

Open-Hi-Lo-Close Candle Stock Chart with Volume (GraphType=71)

Requires five values per marker: Open, High, Low, Close and Volume.

Candle Stock Open-Close Chart (GraphType=72)

Two values per marker: Open and Close. A “candle” financial equity chart.

Candle Stock Open-Close Chart with Volume (GraphType=84)

Three values per marker: Open, Close, and Volume.

Syntax Graph Editor Syntax for Stock Charts

A selection in the Hi-Lo dialog box adds the GraphType property to the code that describes the chart

```
setGraphType ( value );
```

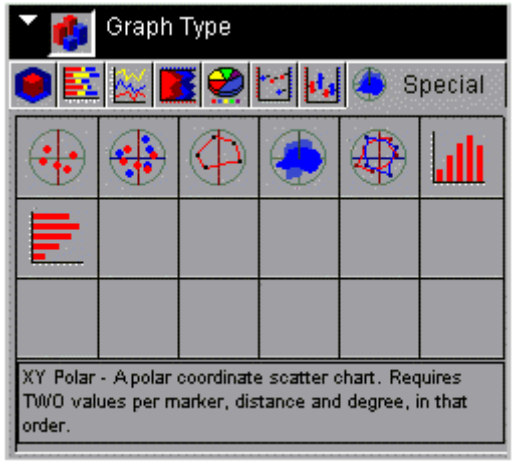
where:

value

Is a number in the range 70-84.

Reference Special Graph Types

The *Special* tab displays the following dialog box:



When choosing among the seven styles of special charts, use the thumbnail as an approximation of how your special graph will look. The descriptions below each style match your graph with its purpose.

From left to right and top to bottom, selections in this dialog include the following:

XY Polar (GraphType=65)

A polar coordinate scatter chart. Requires two values per marker in the following order: X (degree) and Y (distance from the center).

XY Polar Dual-Axis (GraphType=66)

A Dual-Y polar coordinate scatter chart. Requires two values per marker in the following order: X (degree) and Y (distance from the center).

Radar Line (GraphType=67)

A circular line chart. Excellent for cyclical data, such as hourly or monthly figures.

Radar Area (GraphType=68)

A circular area chart. Excellent for comparisons or cyclical data sets.

Radar Line Dual-Axis (GraphType=69)

A Dual-Y variation on Radar Line. Excellent for two sets of cyclical data.

Vertical Histogram (GraphType=85)

Standard histogram. Groups all of the data together and assigns it to “buckets” based on value. There are no series or groups in this chart type.

Horizontal Histogram (GraphType=86)

Groups all of the data together and assigns it to “buckets” based on value. There are no series or groups in this chart type.

Syntax Graph Editor Syntax for Special Charts

A selection in the Special charts dialog box adds the GraphType property to the code that describes the chart

```
setGraphType ( value );
```

where:

value

Is a number in the range 65-69, 85-86.

Applying Color and Line Options in Graphs

You can modify the color and line widths of objects in your graphs. The Color and Line Setting dialog box includes different tabs depending on the object in the chart that is selected. For example, in a bar chart you can change the color of each bar, or in a line graph you can change the color and width of the line representing the data.

When an object with an interior is selected (that is, riser or chart frame), you can choose:

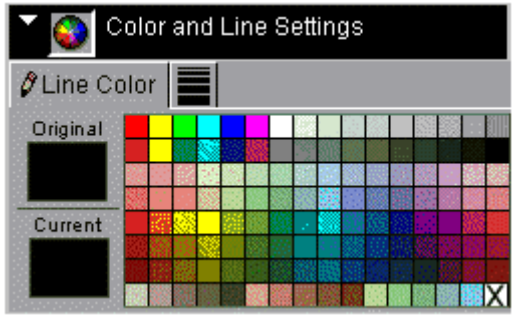
- The fill color of objects.
- The line color of objects.

When a line object is selected in a chart, you can change:

- The color of objects.
- The line width.

Procedure How to Select Color and Line Settings

1. From the Graph Editor, select *Color and Line Options*. The following dialog box displays:



2. To change the color of any object in the chart, select an object, then select a color from the grid. The change is applied immediately.
3. To change the width of a line object, use the Line Width slider bar on the Line tab to adjust the width. A value of zero selects a line width of one pixel. Values greater than zero specify the relative width of the line in pixels depending on the applet size. Click the *Apply* button to assign the width to the line.

Syntax Methods for Color Settings

Selections in the associated dialog box add the following method to the code that describes this graph.

If a line object is selected:

```
setBorderColor ( aGetObjectIDMethod(), new Color ( value, value, value
));
```

If an object with an interior is selected:

```
setFillColor ( aGetObjectIDMethod(),new Color(value,value,value));
```

For example:

```
setFillColor( getCubeFloor(),new Color(192,192,192));
```

Note: The aGetObjectIDMethod() is not a Graph Editor method. It is a notation convention used in this document to indicate one of the Perspective for Java methods that returns an object ID. The Editor chooses the appropriate method based on the object that is selected in the chart. For example, the getO1Label() method is used if the O1 Axis Label is selected in the chart.

Syntax Method for Line Width

Selections in the associated dialog box add a setLineWidth() method to the code that describes this graph:

```
setLineWidth ( aGetObjectIDMethod(),value);
```

For example:

```
setLineWidth ( getY1ZeroLine(), 2 );
```

Note: The aGetObjectIDMethod() is not a Graph Editor method. It is a notation convention used in this document to indicate one of the Perspective for Java methods that returns an object ID. The Editor chooses the appropriate method based on the object that is selected in the chart. For example, the getO1Label() method is used if the O1 Axis Label is selected in the chart.

Applying Font Options in Graphs

You can modify any text that appears with a graph, including axis titles, legends, values, and other chart titles. From this tab you can select a new font and font size, choose font styles, align text, and rotate text so that it better fits the graph.

Procedure How to Change Fonts

1. From the Graph Editor, select *Font Settings*. The following dialog box opens:

2. Select the font name, size, format of text objects, and enable/disable text autofitting.

   Text items in a graph include: Chart Title, Subtitle, Footnote, Axis Labels, and Legend Text. The following instructions describe the features in the dialog box from left to right starting at the top.

   Select items in the Font Settings box to change the format of the selected text object:

   - Toggle the Auto-Fit button to auto-fit the text object.
   - Use the drop-down list box to select a font size.
   - Check the Wrap box to enable or disable the wrapping of selected text objects.

     When this box is not checked, the selected text object must be displayed on one line.

     When this box is checked, the text can be displayed on multiple lines.
   - Toggle the Bold, Italic, Underline, and Shadow buttons for these effects.
   - Toggle the Left Justify, Center and Right Justify buttons for these effects.
   - Toggle the first Text button to display the text object horizontally.
   - Toggle the second Text button to rotate the text object right 90 degrees.
   - Toggle the third Text button to rotate text object left 90 degrees.

Syntax Properties and Methods for Applying Fonts

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Font Name	`setFontName ( aGetObjectIDMethod(), true | false );` Example: `setFontName ( getO1Label(), "Courier" );`
Autofit	`setAutofit ( aGetObjectIDMethod(), true | false );` Example: `setAutofit ( getO1Label(), false );`
Font Size	`setFontSizeVC ( aGetObjectIDMethod(), value );` Example: `setFontSizeVC ( getO1Label(), 1410 );`
Wrap	`setTextWrap ( aGetObjectIDMethod(), true | false );` Example: `setTextWrap ( getO1Label(), true );`
Font Style	`setFontStyle ( aGetObjectIDMethod(), value );` Example: `setFontStyle( getO1Label(), 7 );`
Shadow	`setShadowDisplay (aGetObjectIDMethod(), true|false );` Example: `setShadowDisplay ( getO1Label(), true );`
Horizontal Justification	`setTextJustHoriz ( aGetObjectIDMethod(), value );` Example: `setTextJustHoriz(getO1Label(),2);`
Text Rotation	`setTextRotation ( aGetObjectIDMethod(), value );` Example: `setTextRotation ( getO1Label(), 1 );`

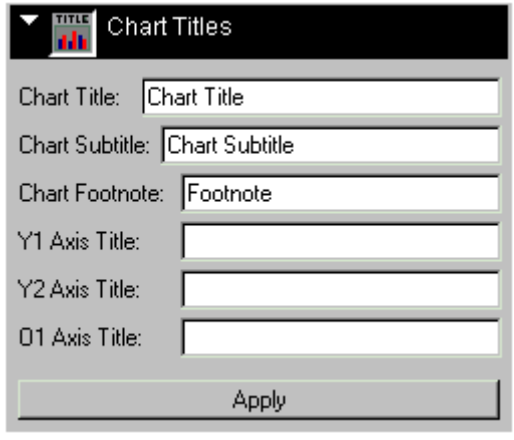
Note: The aGetObjectIDMethod() is not a Graph Editor method. It is a notation convention used in this document to indicate one of the methods that returns an object ID. The Editor chooses the appropriate method based on the object that is selected in the chart. For example, the getO1Label() method is used if the O1 Axis Label is selected in the chart.

Adding Chart Titles

You can add and edit the titles displayed with a chart or graph. The tab lets you edit the following titles: chart title, chart subtitle, chart footnote, and axis titles.

Procedure **How to Define Chart Titles**

1. From the Graph Editor, select *Chart Titles*. The following dialog box opens:



2. Enter a title string in each field where you want to define title text. You can define the chart title, subtitle, footnote, and axis title strings. The number of axis titles (O1, O2, X1, Y2, and Y2) will be different depending on the Graph Type.
3. Select the *Apply* button to display the title strings in the chart.

Syntax Properties and Methods for Chart Titles

The selections in this dialog add the following methods to the code that defines this chart:

Editor Field	Method
Chart Title	`setTextString (getTitle(),"Title String");`
Chart Subtitle	`setTextString (getSubtitle(),"Subtitle String ");`
Chart Footnote	`setTextString (getFootnote (),"Footnote String ");`
O1 Axis Title	`setTextString (getO1AxisTitle(),"O1 Axis Title");`
O2 Axis Title (where applicable)	`setTextString (getO2AxisTitle(),"O2 Axis Title");`
X1 Axis Title (where applicable)	`setTextString (getX1AxisTitle(),"X1 Axis Title");`
Y1 Axis Title	`setTextString (getY1AxisTitle(),"Y1 Axis Title");`
Y2 Axis Title	`setTextString (getY2AxisTitle(),"Y2 Axis Title");`

Note: If the default display attribute of a chart title is false, the setDisplay() method will also be added to the code to enable the display of the defined title object.

Example:

```
setDisplay(getO2Title(),true);
```

If you clear a title string, the setDisplay method will be added to the code to disable display of the cleared text object.

Example:

```
setDisplay(getO2Title(), false);
```

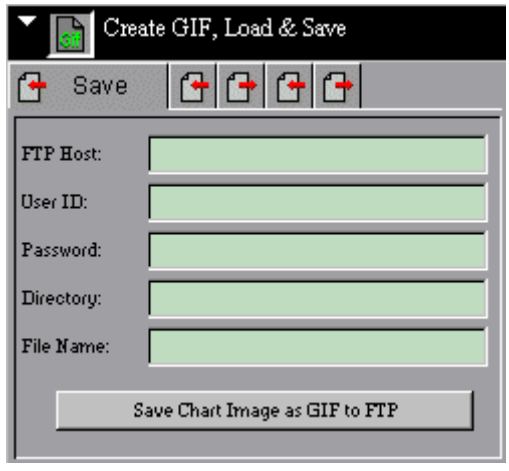
Creating and Loading GIF Files

From this tab you can:

- Save your current graph as a GIF image file.
- Load a saved graph image file.

Procedure How to Save a Graph as a GIF File (Graph Editor)

1. From the Graph Editor, select *Create GIF, Load & Save* to upload the file to a Web (FTP) site from which it can be downloaded. The following dialog box opens:



2. Use the Save and Load tabs at the top of this dialog box to select *one* of the following options:
   - Save Chart Image as GIF to FTP
   - Save Chart as Text to FTP
   - Load Chart Text From FTP
   - Save Chart Image as GIF to File
   - Load Chart Text from File

   The bar at the bottom of the dialog displays your selection.
3. Specify the location (FTP Host, User ID, Password, Directory, and File Name) from which a GIF file is to be loaded or where you want to save the currently displayed chart as a GIF file.
4. Click the bar with your Save or Load selection at the bottom of the dialog box to save or load the GIF image chart.

Syntax Methods for Saving and Loading GIF Files

Selections in the associated dialog box(es) add the following methods to the code that defines this chart:

Editor Field	Method
Save Chart Image as GIF to File	`sendGIFToFTP ( FTP Host, User ID, Password, Directory, File Name );`

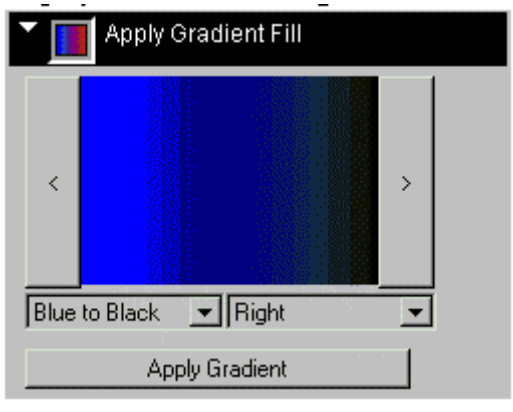
Editor Field	Method
Save Chart as Text To File	`sendChartToFTP ( FTP Host, User ID, Password, Directory, File Name );`
Load Chart Text From File	`getChartFromFTP ( FTP Host, User ID, Password, Directory, File Name );`

Applying Gradient Fill (All Graph Types)

You can apply a color gradient pattern and direction to any object or text in a graph.

Procedure How to Apply Gradient Fill

1. From the Graph Editor, select *Apply Gradient Fill* to apply a gradient to an area object in a chart. The following dialog box displays:



2. Select a gradient fill pattern (for example, Blue to Black, Blue Tube, Red Tube) and direction (Right, Left, Down, Up, etc.).
3. Select an object in the chart.
4. Select the *Apply Gradient* button to apply the gradient fill to the object in the graph. Gradients can be applied to any object in the chart (including text objects).

Syntax Properties and Methods for Applying Gradient Fill

The selections in this dialog add the following properties and methods to the code that defines this chart:

```
setFillType(aGetObjectIDMethod (), 2);
setGradientDirection(aGetObjectIDMethod (), value);
setGradientNumPins(aGetObjectIDMethod (), value);
```

```
setGradientPinLeftColor(aGetObjectIDMethod (),new
Color(value,value,value), value);
```

```
setGradientPinLeftColor(aGetObjectIDMethod (),new
Color(value,value,value), value);
```

```
setGradientPinPosition(aGetObjectIDMethod (),value,value);
```

```
setGradientPinPosition(aGetObjectIDMethod (),value,value);
```

```
setGradientPinRightColor(aGetObjectIDMethod (),new Color (value, value,
value), value);
```

```
setGradientPinRightColor(aGetObjectIDMethod (), new  Color (value, value,
value), value);
```

Note: The aGetObjectIDMethod() is not a Perspective for Java method. It is a notation convention used in this document to indicate one of the Perspective for Java methods that returns an object ID. The Editor chooses the appropriate method based on the object that is selected in the chart. For example, the getO1Label() method is used if the O1 Axis Label is selected in the chart.

Example Applying Properties for Gradient Fill

As an example, the following methods select the background object in the chart and assign the "Sunset" gradient to the object in the Radial, Center, Top direction:

```
setFillType(getBackgrnd(),2);
```

```
setGradientDirection(getBackgrnd(),10);
```

```
setGradientNumPins(getBackgrnd(),2);
```

```
setGradientPinLeftColor(getBackgrnd(),new Color(255,0,0),1);
```

```
setGradientPinLeftColor(getBackgrnd(),new Color(0,0,255),0);
```

```
setGradientPinPosition(getBackgrnd(),1.0,1);
```

```
setGradientPinPosition(getBackgrnd(),0.0,0);
```

```
setGradientPinRightColor(getBackgrnd(),new Color(255,0,0),1);
```

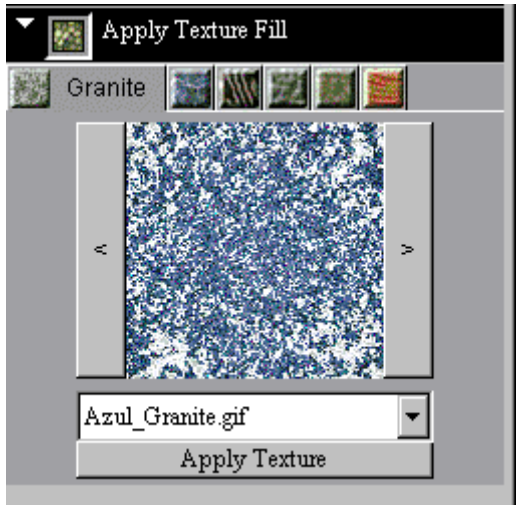
```
setGradientPinRightColor(getBackgrnd(),new Color(0,0,255),0);
```

Applying Texture Fill (All Graph types)

You can apply a texture pattern to any object or text in a graph.

Procedure How to Apply Texture Fill

1. From the Graph Editor, select *Apply Texture Fill* to apply a texture to an area object in a chart. The dialog box displays as follows:



2. Select a texture fill pattern.
3. Select an object in the chart.
4. Select the *Apply Texture* button to apply the texture to the object in the graph. Textures can be applied to any object in the chart (including text objects).

Syntax Properties and Methods for Applying Texture Fill

The selections in the associated dialog box add the following methods to the code that defines this chart:

```
setFillType (getSeries (#), 3 );
setTextureDisplayMode(getSeries(#),0);
setTextureURL( getSeries(#), "file:/drive:/directory/FileName.GIF");
```

Example Applying Methods for Texture Fill

As an example, the following methods assign the Hard_Rock_Green.GIF texture file to series one in the chart:

```
setFillType (getSeries (1), 3 );
setTextureDisplayMode(getSeries(1),0);
setTextureURL(getSeries(1),"file:/C:/3dg/Editor/tiles/
Hard_Rock_Green.GIF");
```

Zooming and Panning in Bar Graphs

When you invoke the Graph Editor, you can zoom in and out in a bar graph and pan across areas of the displayed data. These features are particularly useful when you have several data elements closely spaced together.

Procedure How to Zoom

1. Select *Turn Zoom On* from the File menu. You can now enlarge an area of the graph to enhance your view.
2. Click anywhere in a chart (graph), then hold the mouse button down and draw a box around the area where you want to zoom in. The outlined region automatically increases in size to fit the screen.

   Note: You cannot perform other types of edits in this mode. For example, to change the font, first select *Turn Zoom Off*. Similarly, you cannot drill-down from graphs that are saved in a zoomed state.
3. If you wish, you can save the chart in its zoomed state when you exit the Editor and update the graph procedure (FOCEXEC).

   Note: To return the graph to its original state, select *Turn Zoom Off* from the File menu or double-click anywhere in the graph.

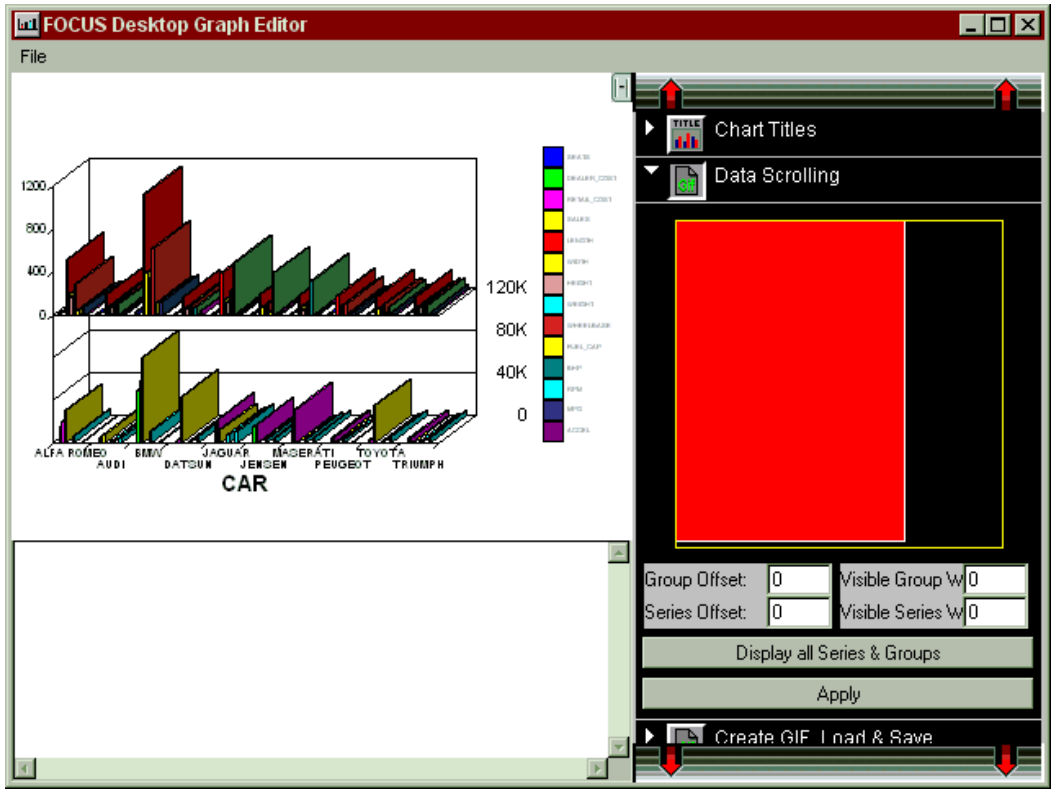
Procedure How to Pan Across Groups of Data in a Zoomed Graph

1. In a zoomed graph, select *Data Scrolling* from the Graph menu.
2. You can now either:
   - Drag the solid column that represents the zoomed data to view other data (other columns are highlighted in red as you pan).

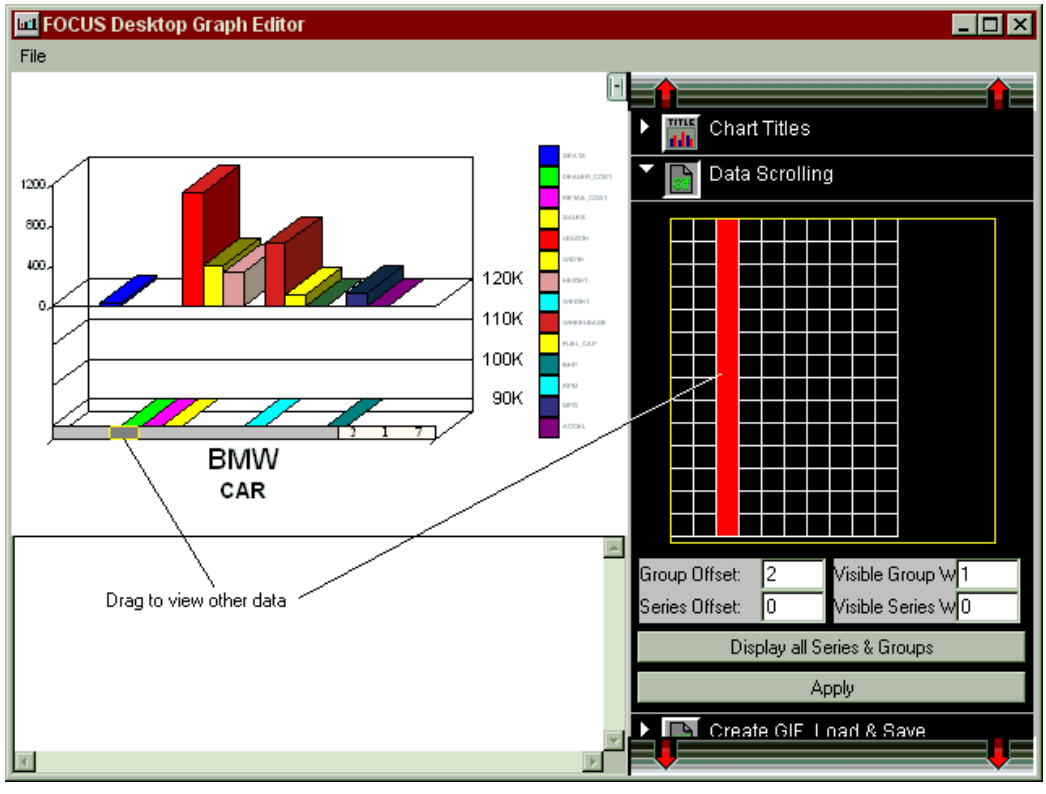
     or
   - Click subsequent sections of the thin highlighted bar (“handle”) at the bottom of the graph. The zoomed data changes as you click each section.

Example Zooming and Panning

The following illustration shows a graph in its normal state (indicated by the solid rectangle under the Data Scrolling menu). In the graph, each data group (bar) represents one car.


FOCUS Desktop Graph Editor
File
1200
800
400
0
120K
80K
40K
0
ALFA ROMEO
AUDI
BMW
DATSUN
JAGUAR
JENSEN
MASERATI
PEUGEOT
TOYOTA
TRIUMPH
CAR
Chart Titles
Data Scrolling
Group Offset:
0
Visible Group W
0
Series Offset:
0
Visible Series W
0
Display all Series & Groups
Apply
Create GIF, Load & Save

The next graph shows an enlarged area after zooming in on the bar for BMW. Notice that the large solid rectangle in the right panel now displays as a grid with only one solid column.



To pan across groups of data, with the graph in the zoomed state and *Data Scrolling* selected from the Graph menu, drag the solid column that represents the zoomed data to pan across all of your data.

or

Click the thin shaded bar at the bottom of the graph to view other areas of your graph in a zoomed state. Note that this method of panning is available when subsequently running the graph, provided that it was saved in its zoomed state.

3D Chart Options

This option is included in the Graph Editor menu when a 3D graph is selected in the Graph Type menu. 3D Chart Options enable you to define:

Procedure How to Set Square Markers, Autoshading, and Light Source (3D)

1. Select the *General tab* from 3D Chart Options.
2. Select the following parameters from the dialog box:

   Force Risers to Square Dimensions

   This selection enables and disables square risers. If selected (☑), this property forces the aspect ratio of 3D risers to be perfectly square regardless of the dimensions of the cube. When this field is not selected, risers will be drawn using the riser width and the aspect ratio of the cube. You can use the RiserWidth property to set the width of risers. For ribbons and floating graph types, you can use the Riser3DThicknessY property to set the height of the risers. The default value is not selected.

   Autoshading

   This selection enables and disables automatic shading of risers and the 3D cube. When this field is selected (☑), light source settings are used to automatically shade the faces of a 3D graph, simulating a cast light beam. If this field is not selected, all sides of 3D risers or the 3D cube are the same color. It is not possible to color each face separately. The default value is selected (☑).

   Light PositionX/Y/Z

   When Autoshading is selected (☑), use the Light Position sliders to change the shading of the 3D cube. These selections set the cube light source for the X-, Y-, and Z-coordinate (unit space). The default values are: Light Position X=0, Light Position Y=40, Light Position Z = 100.

3. Select the *Apply* button to add these parameters to the chart.

Syntax Properties and Methods for Square Dimensions, Autoshading, Light Source

Selections in the associated dialog box(es) add the following properties to the code that define this chart:

Editor Field	Property/Method
Force Risers to Square Dimensions	`setCubeSquareRisers ( true / false );`
Autoshading	`setAutoshading ( true / false );`
LightPositionX/Y/Z	`setCubeLightSourceX/Y/Z ( value );`

Procedure How to Define Scaling Parameters (3D)

1. Select the *Combo tab* from 3D Chart Options.
2. Select the properties that you want to apply to the chart's numeric axis:

   Always Include Zero on Scale

   Selects whether or not the Y1 axis must include a zero value. If the Log Scale field is selected, or the Max Value or Min Value is greater than zero, this field will be grayed-out. It is not valid when the logarithmic scale is used or Min and Max Values are greater than zero. The default value is not selected.

   Use Manual Setting for Maximum

   Selects manual and automatic calculation of the maximum scale value on the Y1 axis in the chart. If this field is selected (☑), enter the maximum allowable scale value on the Y1 axis in the Max Value field. The default value is not selected (let the charting engine automatically calculate the maximum value on the Y1 Axis).

   Max Value

   When the Use Manual Setting for Maximum field is selected (☑), use this field to specify the maximum allowable scale value on the Y1 axis. The default value is 70.0.

   Use Manual Setting for Minimum

   Selects manual or automatic calculation of the minimum scale value on the Y1 axis in the chart. If this field is selected (☑), enter the minimum allowable scale value on the Y1 axis in the Min Value field. The default value is not selected (let the charting engine automatically calculate the minimum value on the Y1 Axis).

   Min Value

   When the Use Manual Setting for Minimum field is selected (☑), use this field to specify the minimum allowable scale value on the Y1 axis. The default value is 0.0.

   Log Scale

   Selects logarithmic or linear scale for the numeric Y1-axis. When the scale range is set to automatic, any data items with Y1 values less than or equal to zero are graphed as null for log scale. If a manual scale range is specified to include negative values (Min Value is less than or equal to zero), the request for log scale is ignored. The default value is linear scale (this field is not selected).

   Draw from Zero Line

   In applications where the data range can include negative numbers, this field determines whether the risers will be drawn pointing up and down from a zero line or whether all risers will draw straight up from the “bottom” of the graph. The default value is draw from a zero line (this field is selected).
3. Select the *Apply* button to add these selections to the chart.

Syntax Properties and Methods for 3D Scaling

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Always Include Zero on Scale	`setScaleMustIncludeZero(getY1Axis(),true / false);`
Use Manual setting for Maximum	`setScaleMaxAuto( getY1Axis(), true / false );`
Max Value	`setScaleMax( getY1Axis(), value );`
Use Manual setting for Minimum	`setScaleMinAuto( getY1Axis(), true / false );`
Min Value	`setScaleMin( getY1Axis(), value );`
Log Scale	`setLogScale(getY1Axis(), true / false );`
Draw From Zero Line	`setScaleFromZero( true / false );`

Procedure How to Define 3D Y1 Axis Labels

1. Select the *Extrude tab* from 3D Chart Options.
2. Use the check boxes to enable or disable the display of all numeric axis labels, the minimum value, or the maximum axis label. When axis labels are displayed with Show Axis Labels, select the format of label values in the Format field.

   Show Axis Labels

   Enables and disables the display of labels on the Y1 axis in the chart. The default value is enabled (axis labels are displayed). Use the Format field to define the format of numeric labels. The location of Y1 labels can be controlled by the setY1AxisSide() property (that is, setY1AxisSide(2) will display Y1 axis scale on both sides of the cube).

   Format

   When Show Axis Labels is selected (☑), select the drop-down list box in this field to select a label format: General, 0%, 0.0%, $0, $0.00, etc. The default value is General.

   Hide Minimum Value

   When Show Axis Labels is selected (☑), this field can be used to include or exclude the minimum value on the Y1 Axis. The default value is not selected (include the minimum label).

Hide Maximum Value

When Show Axis Labels is selected (☑), this field can be used to include or exclude the maximum value on the Y1 Axis. The default value is not selected (include the maximum label).

3. Select the *Apply* button to add these selections to the chart.

Syntax

Properties and Methods for 3D Y1 Axis Labels

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Show Axis Labels	`setDisplay ( getY1Label(), true / false);`
Format	`setTextFormatPreset ( getY1Label(), value );`
Hide Minimum Value	`setExcludeMinLabel ( getY1Label(), true / false );`
Hide Maximum Value	`setExcludeMaxLabel ( getY1Label(), true / false );`

Procedure

How to Define 3D Group Axis Labels

1. Select the *Options tab* for Group Axis labels from 3D Chart Options.
2. Use the check boxes to enable or disable the display of all group labels, the first group label, and/or the last group label.

   Show Group Axis Labels

   Enables and disables the display of labels on the O1 axis in the chart. The default value is enabled (axis labels are displayed).

   Hide First Group Label

   When Show Group Axis Labels is selected (☑), this field can be used to include or exclude the first label on the O1 Axis. The default value is not selected (include the first label).

   Hide Last Group Label

   When Show Group Axis Labels is selected (☑),this field can be used to include or exclude the last label on the O1 Axis. The default value is not selected (include the last label).

3. Select the *Apply* button to add these selections to the chart.

Syntax Properties and Methods for 3D Group Axis Settings

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Show Group Axis Labels	`setDisplay ( getO1Label(), true / false );`
Hide First Group Label	`setExcludeMinLabel ( getO1Label(), true / false );`
Hide Last Group Label	`setExcludeMaxLabel ( getO1Label(), true / false );`

Procedure How to Define 3D Series Axis Settings

1. Select the *Options tab* for Series Axis labels from 3D Chart Options.
2. Use the check boxes to enable or disable the display all series labels, the first series label, and/or the last series label.

   Show Series Axis Labels

   Enables and disables the display of labels on the O2 axis in the chart. The default value is enabled (axis labels are displayed).

   Hide First Series Label

   When Show Series Axis Labels is selected (☑), this field can be used to include or exclude the first label on the O2 Axis. The default value is not selected (include the first label).

   Hide Last Series Label

   When Show Group Series Labels is selected (☑), this field can be used to include or exclude the last label on the O2 Axis. The default value is not selected (include the last label).
3. Select the *Apply* button to add these selections to the chart.

Syntax Properties and Methods for 3D Series Axis Settings

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Show Series Axis Labels	`setDisplay ( getO2Label(), true / false );`

Editor Field	Property/Method
Hide First Series Label	`setExcludeMinLabel ( getO2Label(), true / false );`
Hide Last Series Label	`setExcludeMaxLabel ( getO2Label(), true / false );`

3D Custom Viewing Options

This option is included in the Graph Editor menu when a 3D graph is selected in the Graph Type menu. 3D Custom Viewing options enable you to:

- Rotate cubes.
- Pan 3D cubes.
- Define 3D cube walls.
- Zoom in 3D cubes.
- Pan 2D cubes.
- Set the cube field of view.

Procedure How to Rotate 3D Cubes

1. Select the *Rotate tab* from 3D Custom View.
2. Position the mouse pointer over an arrow in the dialog box and hold down the primary mouse button to rotate the 3D cube in the direction of the arrow.

   Note: Click *Clear Frame* if you wish to remove the frame that appears as you position the graph. This cancels the rotation and leaves the graph unmoved.
3. Select the *Apply* button to add these selections to the chart.

Syntax Properties and Methods for Rotating 3D Cubes

Selections in the Rotate dialog box add the following properties and methods to the code that defines this chart:

```
setCubeRotationMatrix ( value, value, value, value, ...)
```

Procedure How to Pan 3D Cubes

1. Select the *3D Pan tab* from 3D Custom View.
2. Position the mouse pointer over an arrow in the dialog and hold down the primary mouse button to pan the 3D cube in the direction of the arrow.

   ←→

   Use the left arrow and right arrow to move the 3D cube in the X-direction (in virtual coordinates). Each mouse click moves the cube left or right 100 units in virtual coordinates. Hold the primary mouse button down to move the cube continuously in the X-direction.

   ↑↓

   Use the up-arrow and down-arrow to move the 3D cube in the Y-direction (in virtual coordinates). Each mouse click moves the cube up or down 100 units in virtual coordinates. Hold the primary mouse button down to move the cube continuously in the Y-direction.

   Front-Arrow/Back-Arrow

   Use the front-arrow and back-arrow to move the 3D cube in the Z-direction. Each mouse click moves the cube forward or backward 100 units in 2D virtual coordinates. Hold the primary mouse button down to move the cube continuously in the Z-direction.
3. Select the *Apply* button to add these selections to the chart.

Syntax Properties and Methods for Panning 3D Cubes

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
←→	`setCubeTranslationX ( value );`
↑↓	`setCubeTranslationY ( value );`
Front/Back Arrow	`setCubeTranslationZ ( value );`

Procedure How to Define 3D Cube Walls

1. Select the *Walls* tab from 3D Custom View.
2. Position the mouse pointer over an arrow in the dialog and hold down the primary mouse button to adjust the thickness and size of walls in the 3D cube in the direction of the arrow.

   Upper-Left Corner of Cube Wall ↑↓

   Use these arrows to increase or decrease the thickness of the cube left wall in the X-direction.

   Center of Cube Wall ↑↓

   Use these arrows to increase or decrease the size of the cube in the Y-direction.

   Upper-Right Corner of Cube Wall ↑↓

   Use these arrows to increase or decrease the thickness of the cube right wall in the Z-direction.

   Left Center of Cube ↑↓

   Use these arrows to increase or decrease the size of the cube in the Z-direction.

   Right Center of Cube ↑↓

   Use these arrows to increase or decrease the size of the cube in the X-direction.

   Bottom of Cube ↑↓

   Use these arrows to change the thickness of the floor.
3. Select the *Apply* button to add these selections to the chart.

Syntax Properties and Methods for Defining 3D Cube Walls

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Top Left Corner of Cube Wall (↔)	`setCubeWallThickX ( value );`
Top Center of Cube Wall (↔)	`setCubeSizeY ( value );`
Top Right Corner of Cube Wall (↔)	`setCubeWallThickZ ( value );`
Center Left of Cube Wall (↔)	`setCubeSizeZ ( value );`
Center Right of Cube Wall (↔)	`setCubeSizeX ( value );`
Bottom of Cube (↔)	`setCubeWallThickY ( value );`

Procedure How to Zoom in 3D Cubes

1. Select the *Zoom* tab from 3D Custom View.
2. Position the mouse pointer over an arrow in the dialog and hold down the primary mouse button to zoom the 3D cube in the direction of the arrow.

   ↗

   Use the up-arrow to set the cube zoom factor to negative values. Values less than one make the cube smaller, values greater than one make the cube larger. The cube becomes smaller within the chart frame.

   ↙

   Use the down arrow to set the cube zoom factor to positive values. The cube becomes larger within the chart frame.
3. Select the *Apply* button to add these selections to the chart.

Syntax Properties and Methods for Zooming in 3D Cubes

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
↗	`setCubeZoomFactor ( value );`
↙	`setCubeZoomFactor ( value );`

Procedure How to Use 2D Virtual Coordinates to Pan 3D Graphs

1. Select the *2D Pan* tab from 3D Custom View.
2. Position the mouse pointer over an arrow in the dialog and hold down the primary mouse button to pan the 3D cube in the direction of the arrow.

   ←→

   Use the left-arrow and right-arrow to move the 3D cube in the X-direction (in 2D virtual coordinates). Each mouse click moves the cube left or right 100 units in virtual coordinates. Hold the primary mouse button down to move the cube continuously in the X-direction.

   ↑↓

   Use the up-arrow and down-arrow to move the 3D cube in the Y-direction (in 2D virtual coordinates). Each mouse click moves the cube up or down 100 units in virtual coordinates. Hold the primary mouse button down to move the cube continuously in the Y-direction.
3. Select the *Apply* button to add these selections to the chart.

Syntax Properties and Methods for Using 2D Virtual Coordinates to Pan 3D Graphs

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
←→	`setCubePanX ( value );`
↑↓	`setCubePanY ( value );`

Procedure How to Set the Cube's Field of View

1. Select the *FOV* tab from 3D Custom View.
2. Position the mouse pointer over a cube in the dialog and hold down the primary mouse button to change the cube focus factor.

   Front Cube

   Hold down the primary mouse button on the front cube to make the 3D cube smaller within the chart frame.

   Back Cube

   Hold down the primary mouse button on the back cube to make the 3D cube larger within the chart frame.
3. Select the *Apply* button to add these selections to the chart.

Syntax Properties and Methods for Field of View

Selections in the associated dialog box add the following properties and methods to the code that defines this chart:

```
setCubeFocusFactor( value );
```

3D Preset Viewing Options

The 3D Preset Views option is included in the Graph Editor menu when a 3D graph is selected in the Graph Type menu.

You can select one of the preset views from the dialog box. It will automatically be applied to the graph.

Syntax Properties and Methods for Preset Viewing Angles

Selections in the associated dialog box add the following property to the code that defines the chart

```
set3DViewingAnglePreset ( value );
```

where:

value

Is a number in the range 0 through 15.

Bar, Line, and Area Chart Options

This option is included in the Graph Editor menu when a bar, line, or area graph is selected in the Graph Type menu. Bar, Line & Area Chart Options enable you to:

Draw from zero line and data text displays.

- Define riser types (bar, line, area) for each series.
- Apply a 3D effect to the graph.
- Define the look of bar risers.
- Select marker types and sizes.

Procedure How to Define General Bar, Line, and Area Settings

1. Select the *General* tab from Bar, Line & Area Chart Options.
2. Select from the following options:

   Draw from Zero Line

   Enables and disables drawing of risers from zero. In applications where the data range can include negative numbers, this field determines whether the risers will be drawn pointing up and down from a zero line or whether all risers will draw straight up from the "bottom" of the graph. The default is for this field to be selected.

   Show Data Values

   Enables and disables the display of data values next to risers or markers in a chart. The default value is disabled.

   When the Show Data Values check box is selected (☑), use the Position and Distance slider bars to define where the data values are displayed.

   Position

   When the Show Data Values field is selected (☑), this field sets an angle from center-point that all data text is drawn from. The default value is 90 degrees.

   Distance

   When the Show Data Values field is selected (☑), this field sets the radius that a data text value will be drawn out from the center of a chart riser. The default value is 20.

3. Select the *Apply* button to add these selections to the chart.

Syntax Properties and Methods for General Bar, Line, and Area Options

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Draw from Zero Line	`setScaleFromZero ( true | false );`
Show Data Values	`setDisplay (getDataText(), true | false );`
Position	`setDataTextAngle ( value );`
Distance	`setDataTextRadius ( value );`

Procedure How to Define Bar, Line, Area Combo Settings

1. Select the *Combo* tab from Bar, Line & Area Chart Options.
2. Select a riser in the chart in the editor window. Then choose one of the selections in this dialog to assign a riser type (bar, line, area, or default for chart type) to the series.
3. Select the *Apply* button to add these selections to the chart.

Syntax Properties and Methods for Bar, Line, Area Combo Settings

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Bar	`setSeriesType ( getSeries(#), 1);`
Line	`setSeriesType ( getSeries(#), 2);`
Area	`setSeriesType ( getSeries(#), 3 );`
Default for Graph type	`setSeriesType ( getSeries(#), 0 );`

Procedure How to Define Bar, Line, Area Extrude Settings

1. Select the *Extrude* tab from Bar, Line & Area Chart Options.
2. Use 3D Extrusion Effect enables and disables the application of a 3D effect on a 2D chart. When this check box is selected (☑), use the Direction, Thickness, and Line Thickness slider bars to define the depth angle and thickness of the 3D extrusion effect.

   Use 3D Extrusion

   Determines whether or not a 3D effect is applied to this 2D graph. When it is selected (☑), use the Direction and Thickness fields to specify how much 3D effect is applied to the chart frame and risers. The default value is selected (☑).

   Direction

   When the Use 3D Extrusion field is selected (☑), this field sets the angle of a line from the front of the chart frame to the back (in degrees). The default value is 45.

   Thickness

   When the Use 3D Extrusion field is selected (☑), this field sets how far out the extruded frame will be extended. Small values produce a very narrow chart, larger values produce a thicker chart. The default value is 25.

   Line Thickness

   When the Use 3D Extrusion field is selected (☑) for a vertical or horizontal line chart or a combo chart with lines, this field defines the width of the "fake 3D" lines in the chart. It is expressed as a value in the range 1 to 100. A value of 1 produces very thin lines, a value of 100 produces very thick 3D ribbons. The default value is 30.
3. Select the *Apply* button to add these selections to the chart.

Syntax Properties and Methods for Bar, Line, Area Extrude Settings

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Use 3D Extrusion (not selected)	`setDepthRadius( 0 );`
Direction	`setDepthAngle ( value );`
Thickness	`setDepthRadius ( value );`
Line Thickness	`setDataLineThickness ( value );`

Procedure How to Define Bar, Line and Area Options 1

1. Select the *Options* tab from Bar, Line & Area Chart Options.
2. The Show as Pictograph check box enables and disables the display of bar risers as a pictograph. Enable Bar Resizing… enables and disables the user's ability to resize bars in a chart with the CTRL/primary mouse button. Use the Width and Spacing slider bars to define the width of bar risers and the spacing between them.

   Show as Pictograph

   Enables and disables the display of bars as pictographs in a flat 2D chart. The default value is disabled. Note that the "Use 3D Extrusion" field in the Extrude Settings dialog must be disabled in order to use this feature.

   Enable Bar Resizing with CTRL+Resize

   Enables and disables resize bar mode. When it is enabled (☑), the user interface will allow resizing of bars. The user can change the size of bars by using the control key and mouse to stretch or reduce the size of the bars. This action will also change the internal data value assigned to the bar. If data callbacks are being used to provide data input to the chart, any resize operation will be reset to the value provided by the data call back. The default value is selected (the user can resize bars).

   Width

   Controls the width of bars in a graph. The riser width is expressed as a percentage of the space available for each group of bars. When this field is set to 100, all bars touch each other and there is no space in between them. When this field is set to zero, the bars are displayed as thin lines with no space detectable. The default value is 75.

   Spacing

   For bar graphs only, sets the spacing between bars within a group (clusters) in a side-by-side bar graph. A larger number creates more space between bars within a group. When this field is set to zero, there is no space between the bars within a group and all bars within the group will touch each other. When this field is set to 100, the bars within a group are as far apart as possible. The default value is zero.
3. Select the *Apply* button to add these selections to the chart.

Syntax Properties and Methods for Bar, Line, Area Options 1

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Show as Pictograph	`setDisplayBarAsPictograph ( true / false );`
Enable Bar Resizing with CTRL+Resize	`setResizeBarMode ( true / false);`
Width	`setRiserWidth ( value );`
Spacing	`setRiserBarGroupSpacing ( value );`

Procedure How to Define Bar, Line, Area Options 2

1. Select the *Options* tab from Bar, Line & Area Chart Options.
2. For line charts, the Show Marker check box enables and disables the display of markers. When this check box is selected, the Marker Shape and Marker Size fields define the shape and size of the markers. Use Marker Shapes on Legends enables and disables the use of the selected marker shapes in the legend area of the chart. Show Lines enables/disables the display of connecting lines in a line chart.

   Show Marker

   Enables and disables the display of markers in a 2D chart. Use this field to turn off markers in a Line Chart when you only want to see the lines themselves and not the markers. The default value is selected (markers are displayed). Note that the Thickness field in the Extrude dialog must be set to zero in order for this selection to be properly applied to the chart.

   Marker Shape

   When Show Marker is selected (☑) for a line chart, use this field to select a marker shape for each series in the chart. Click on a series in the chart and then select a marker shape in this dialog.

   Marker Size

   When Show Marker is selected (☑) for a line chart, use this field to select the size of markers. The default value is 30.

   Use Marker Shapes on Legends

   Enables and disables the use of the series shapes selected in the Marker Shape field in the legend area of the chart.

   Show Lines

   Enables and disables the display of connecting markers in a line chart. When this field is not selected in a line chart, the result will be a “floating marker” effect with only markers and no connecting lines.
3. Select the *Apply* button to add these selections to the chart.

Syntax **Properties and Methods for Bar, Line, Area Chart Options**

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Show Marker	`setMarkerDisplay ( true / false );`
Marker Shape	`setMarkerShape ( getSeries(#), value );`
Marker Size	`setMarkerSize ( getSeries(#), value );`
Use Marker Shapes on Legends	`setUseSeriesShapes ( true / false );`
Show Lines	`setConnectLineMarkers ( true / false);`

Dual Y Options

This option is included in the Graph Editor menu when a dual-axis chart is selected for certain graph types including bar, line, and hi-lo.

Procedure **How to Define Dual Y Settings**

1. Select a dual-axis chart.
2. Select from the following options in the dialog box.

   Y1 Axis/Y2 Axis

   In dual axis charts, these fields can be used to specify which series appears on each numeric (Y1 and Y2) axis in the chart. Select one or more series in the Y2 Axis list box and select the << button to move these series to the Y1 axis in the chart. Select one or more series in the Y1 Axis list box and select the >> button to move these series to the Y2 Axis in the chart. You can also double click on a series to move it from one axis to the other.

   Split Position

   Sets the position within the chart frame where the Dual-Y split position will be created. The default value of 50 is exactly in the middle. A lower number will move the split position closer to the bottom of the chart; a higher value will move it closer to the top of the chart.

   Dual Axis Line/Plane

   This field enables and disables the display of a line that separates the two halves of a dual axis chart. When the default value is selected (☑), the dual-axis split line is displayed.

3. Select the *Apply* button to add these selections to the chart.

Syntax Properties and Methods for Dual Y Settings

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Y1 Axis	`setAxisAssignment ( getSeries(#), 0 );`
Y2 Axis	`setAxisAssignment ( getSeries(#), 1 );`
Split Position	`setDualAxisSplitPosition ( value );`
Dual Axis Line/Plane	`setDisplay ( getFrameSeparator(), true / false);`

Group Axis Options

This option is included in the Graph Editor menu when a bar, line, area, or stock chart is selected in the Graph Type menu.

The Group Axis Options enable you to:

- Define where the group axis is imaged.
- Enable and disable group axis label displays.
- Select group axis grid lines.

Procedure How to Define the Location of the Group Axis

1. Select the *General* tab from Group Axis Options.
2. Select the location where you want the group axis label to appear in the chart.

   Bottom Side of Chart

   Select this field (☑) if you want the primary ordinal (O1) axis to be imaged at the bottom of a vertical chart or on the left side of a horizontal chart. This is the default value.

   Top Side of Chart

   Select this field (☑) if you want the primary ordinal (O1) axis to be imaged at the top of a vertical chart or the right side of a horizontal chart.

   Both Sides of Chart

   Select this field (☑) if you want the primary ordinal (O1) axis to be imaged at the top and bottom of a vertical chart or left and right sides of a horizontal chart.
3. Select the *Apply* button to add these selections to the chart.

Syntax Properties and Methods for Group Axis General Settings

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Bottom Side of Chart	`setAxisSide (getO1Axis(), 0);`
Top Side of Chart	`setAxisSide (getO1Axis(), 1);`
Both Sides of Chart	`setAxisSide (getO1Axis(), 2);`

Procedure How to Define Group Axis Labels

1. Select the *Labels* tab from Group Axis Options.
2. Use the check boxes to enable/disable the display of group axis labels.

   Show Axis Labels

   Enables and disables the display of primary ordinal (O1) axis labels. The default value is enabled (group/O1 axis labels are displayed). When this box is checked the setting in the general tab determines where the labels are displayed (left, right, both).

   Hide First Label

   When Show Axis Labels is selected (☑), this field enables and disables the display of the first group label on the primary ordinal (O1) axis. The default value is disabled (the first group label is displayed).

   Hide Last Label

   When Show Axis Labels is selected (☑), this field enables and disables the display of the last group label on the primary ordinal (O1) axis. The default value is disabled (the last group label is displayed).
3. Select the *Apply* button to add these selections to the chart.

Syntax Properties and Methods for Group Axis Labels

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Show Axis Labels	`setDisplay ( getO1Label(), true / false);`
Hide First Label	`setExcludeMinLabel ( getO1Label(), true / false );`
Hide Last Label	`setExcludeMaxLabel ( getO1Label(), true / false );`

Procedure How to Define Group Axis Grids

1. Select the *Grids* tab from Group Axis Options.
2. Use the check boxes in this dialog to enable or disable the display of major and minor grid lines. When either check box is selected, use the Style field to select a major and minor grid line format.

   Show Major Grid Lines

   Enables and disables the display of major grid lines for the primary ordinal (O1) axis. The default value is enabled (☑).

   Style

   When Show Major Grid Lines is selected (☑), use this field to select the style of the major grid lines: Regular Grids, Grids and Ticks, Inner Ticks, Outer Ticks, or Spanning Ticks. The default value is Regular Grids.

   Show Minor Grid Lines

   Enables and disables the display of minor grid lines for the primary ordinal (O1) axis. The default value is disabled (minor grid lines are not displayed).
3. Select the *Apply* button to add these selections to the chart.

Syntax Properties and Methods for Group Axis Grids

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Show Major Grid Lines	`setDisplay ( getO1MajorGrid(), true / false );`
Style	`setGridStyle ( getO1MajorGrid(), value );`
Show Minor Grid Lines	`setDisplay ( getO1MinorGrid(), true / false );`
Style	`setGridStyle ( getO1MinorGrid(), value );`

Pie Chart Options

This option is included in the Graph Editor menu when a pie chart is selected in the Graph Type menu.

Pie Chart options enable you to:

- Select feeler and label displays and delete slices.
- Select the pie tilt, rotation, and depth.
- Select ring pie formats.
- Select the number of pies in a multiple pie chart.

Procedure How to Define Pie Chart Slices

1. Select the *General* tab from Pie Chart Options.
2. Use the radio buttons to enable or disable the display of feelers and text labels. Select the format of labels in the Format field. Select a slice in the pie chart in the editor window and select the Delete Selected Slices check box to remove the selected slice from the chart. The Restore All Slices check box will restore any deleted slices.

   Show Feeler and Text Labels

   Select this field (☑) if you want to display feeler lines and text labels in a pie chart. This is the default value for all pie chart types.

   Show Labels on Slices

   Select this field (☑) if you want to display text labels only on slices in the pie chart. Feeler lines will not be drawn.

   Show Labels Next to Slices

   Select this field (☑) if you want to display text labels only next to slices in the pie chart. Feeler lines will not be drawn.

   No Feelers or Labels

   Select this field (☑) if you do not want to display feeler lines or text labels in the pie chart.

   Format

   When Show Feeler and Text Labels, Show Labels on Slices, or Show Labels Next to Slices is selected (☑), use the field to specify the format of text labels that are displayed: General, 0%, 0.0%, $0, $0.00, etc. The default value is 0%.

   Delete Selected Slices

   Select a slice in a pie chart, and select this field (☑) to delete the slice from the chart. If a multiple pie chart type is selected, all slices for the respective series will be deleted.

   Restore All Slices

   When the Delete Selected Slices field has been used to delete one or more slices from a pie chart, this field will restore all of the deleted slices.
3. Select the *Apply* button to add these selections to the chart.

Syntax Properties and Methods for Pie Chart Slices

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Show Feeler and Text Labels	`setPieFeelerTextDisplay (1);`
Show Labels on Slices	`setPieFeelerTextDisplay (3);`
Show Labels Next to Slices	`setPieFeelerTextDisplay (2);`
No Feelers or Labels	`setPieFeelerTextDisplay (0);`
Format	`setTextFormatPreset ( getPieSliceLabel(), value );`
Delete Selected Slices	`setPieSliceDelete ( getSeries(#), true / false );`
Restore all Slices	`Not Stored`

Procedure How to Define Pie Chart Settings for Tilt, Rotation, and Depth

1. Select the *Look* tab from Pie Chart Options.
2. Use the slider bars in this dialog to adjust the tilt, rotation and depth of the chart.

   Pie Tilt

   Tilts a pie chart a specified number of degrees. The default value is 15.

   Pie Rotation

   Rotates a pie chart a specified number of degrees. The default value is zero.

   Pie Depth

   Specifies the depth of the piecrust in a pie chart. The default value is 30.

   Detach Slice

   Slides the selected slice out of the pie.

   Delete Selected Slices

   Select a slice in a pie chart, and select this field (☑) to delete the slice from the chart. If a multiple pie chart type is selected, all slices for the respective series will be deleted.

Restore All Slices

When the Delete Selected Slices field has been used to delete one or more slices from a pie chart, this field will restore all of the deleted slices.

3. Select the *Apply* button to add these selections to the chart.

Syntax Properties and Methods for Tilt, Rotation, and Depth

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Pie Tilt	`setPieTilt ( value );`
Pie Rotation	`setPieRotate ( value);`
Pie Depth	`setPieDepth ( value );`

Procedure How to Define Pie Chart Ring Settings

1. Select the *Ring* tab from Pie Chart Options.
2. You must have previously selected a ring pie chart type in the Graph Type Menu. Use the slider bar to adjust the size of the ring in a ring pie chart. Use the check box to enable/disable the display of a total value in the center of the ring in a pie chart. When this check box is selected, use the Format field to select the format of the total value.

   Pie Ring Hole Size

   This field determines the relative size of the ring (inner circle) in a ring pie. The default value is 55.

   Show Pie Ring Total

   This field enables and disables the display of a total value in the center of a pie ring chart. The default value is enabled (☑).

   Format

   When Show Pie Ring Total is selected (☑), use the field to specify the format of total value: General, 0%, 0.0%, $0, $0.00, etc. The default value is General.

3. Select the *Apply* button to add these selections to the chart.

Syntax Properties and Methods for Pie Chart Ring Settings

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Pie Ring Hole Size	`setPieRingSize ( value );`
Show Pie Ring Total	`setDisplay ( getPieRingLabel(), true / false);`
Format	`setTextFormatPreset ( getPieRingLabel(), value );`

Procedure How to Define Multiple Pie Charts

1. Select the *Multi* tab from Pie Chart Options.
2. You must have previously selected a multi-pie chart type in the Graph Type menu. Use the slider bar in this dialog to select the number of pies per row in a multi-pie chart.
3. Select the *Apply* button to add these selections to the chart.

Syntax Properties and Methods for Multiple Pie Charts

Selections in this dialog add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Pies Per Row	`setPiesPerRow ( value );`

Stock Chart Options

This option is included in the Graph Editor menu when a stock (hi-lo) chart is selected in the Graph Types menu.

The Stock Chart Options enable you to:

- Enable and disable moving average line and data files and define the format and location of data values.
- Enable and disable the 52-week high and low line display.
- Enable and disable Open/Close tick marks and define the width and length.

Procedure How to Control the Display of Moving Average Lines and Data Values

1. Select the *General* tab from Stock Chart Options.
2. Use the check boxes in this dialog to enable or disable the display of a moving average line and data values in the stock chart. When Show Data Values is selected, use the Position and Distance slider bars to define the location of data values. The Bar Width slider bar can be used to adjust the width of risers in the chart.

   Show Moving Average Line

   Enables and disables the display of a moving average line in the stock chart. The default value is disabled.

   Show Data Values

   Enables and disables the display of High values only. If the chart does not have a high value, no data value is displayed. The default value is disabled.

   Position

   When the Show Data Values field is selected (☑), this field sets an angle from center-point that all data text is drawn from. The default value is 90 degrees.

   Distance

   When the Show Data Values field is selected, this field sets the radius that a data text value will be drawn out from the center of a chart riser. The default value is 20.

   Bar Width

   Allows you to set the width of the bars displayed in a stock chart. Drag the slider with the mouse, or enter a number from 1 to 100 to select a percentage of the maximum bar width.
3. Select the *Apply* button to add these selections to the chart.

Syntax Properties and Methods for Displaying Moving Average Lines and Data Values

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Show Moving Average Line	`setDisplay(getStockMALine(), true / false);`
Show Data Values	`setDisplay(getDataText(), true / false);`
Position	`setDataTextAngle ( value );`
Distance	`setDataTextRadius ( value );`
Bar Width	`setRiserWidtrh ( value );`

Procedure How to Define Stock Chart 52-Week Settings

1. Select the *52-Week* tab from Stock Chart Options.
2. Use the check boxes to enable or disable the display of a 52-Week High and/or Low Line in the stock chart. When enabled for display, enter a 52-Week High and/or Low value in the fields below.

   Show 52-Week High Line

   Enables and disables the display of a 52-week high line in a stock chart. The default value is disabled.

   Value

   When Show 52-Week High Line is selected (☑), use this field to define a 52-week high value. The default value is 40.0.

   Show 52-Week Low Line

   Enables and disables the display of a 52-week low line in a stock chart. The default value is disabled.

   Value

   When Show 52-Week Low Line is selected (☑), use this field to define a 52-week low value. The default value is 10.0.
3. Select the *Apply* button to add these selections to the chart.

Syntax Properties and Methods for Stock Chart 52-Week Settings

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Show 52-Week High Line	`setDisplay(getStock52WeekHighLine(), true / false);`
Value	`setStock52WeekHighValue ( value );`
Show 52-Week Low Line	`set Display(getStock52WeekLowLine(), true / false );`
Value	`setStock52WeekLowValue ( value );`

Procedure How to Define Stock Chart Tick Settings

1. Select the *Ticks* tab from the Stock Chart Settings menu.
2. Select from the following options:

   Split Riser at Close Value

   Enables and disables the display of split risers at the stock close value. The default value is enabled.

   Thickness

   Sets the thickness of tick marks in a stock chart. The default value is 2 pixels. If close and/or open values are not available, the tick mark(s) will not be displayed.

   Note: The thickness of tick marks can also be controlled by selecting the tick mark object, and using the Color and Line Options dialog box.

   Length

   Sets the length of tick marks in a stock chart. The default value is 50. If close and/or open values are not available, the tick mark(s) will not be displayed.
3. Select the *Apply* button to add these selections to the chart.

Syntax Properties and Methods for Stock Chart Tick Settings

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Split Riser at Close Value	`setDisplay(getStockLowerRiser(), true | false );`
Thickness	`setLineWidth(getStockCloseTick(), value );`
Length	`setStockTickLength ( value );`

X1 Axis Options

This option is included in the Graph Editor menu for graph types that have an X-axis (for example, XY scatter charts, polar charts, and histograms).

The X1 Axis Options enable you to define:

- Location, format, and display of the X1 axis.
- Automatic/Manual and Minimum/Maximum scaling.
- Display and format of X1 axis labels.
- Automatic/Manual and Minimum/Maximum grids.

Procedure How to Define the Location and Format of the X1 Axis

1. Select the *General* tab from X1 Axis Options.
2. Select the location in the chart where you want the axis imaged. Descending Axis draws the axis labels in ascending or descending order. The Axis Line and Zero Line check boxes enable and disable display of the axis base line and zero line.

   Left Side of Chart

   Select this field (☑) if you want the X1 numeric axis to be imaged at the left side of a horizontal chart or on the bottom side of a vertical chart. This is the default value.

   Right Side of Chart

   Select this field (☑) if you want the X1 numeric axis to be imaged at the right of a horizontal chart or the top of a vertical.

   Both Sides of Chart

   Select this field (☑) if you want the X1 numeric axis to be imaged at the top and bottom of a vertical chart or left and right sides of a horizontal chart.

   Descending

   Selects descending or ascending values on the X1 numeric. The default value is ascending (this field is not selected). For example, assume the values 0, 10, 20, … 70 are displayed from left to right across the bottom of an XY Scatter chart. If this field is selected and applied to the chart, these values would be displayed from right-to-left across the bottom of the chart (70, 60, 50...0).

   Axis Line

   Enables and disables the display of the X1 axis base line. The default value is enabled (☑).

   Zero Line

   Enables and disables the display of a zero line on the X1 axis. The default value is disabled (this field is not selected).
3. Select the *Apply* button to add these selections to the chart.

Syntax Properties and Methods for Location and Format of the X1 Axis

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Left Side of Chart	`setAxisSide ( getX1Axis(), 0 );`
Right Side of Chart	`setAxisSide ( getX1Axis(), 1 );`
Both Sides of Chart	`setAxisSide ( getX1Axis(), 2 );`
Descending Axis	`setAxisDescending ( getX1Axis(), true / false );`
Axis Line	`setDisplay ( getX1AxisLine(), true / false);`
Zero Line	`setDisplay ( getX1ZeroLine(), true / false );`

Procedure How to Define X1 Axis Scale Settings

1. Select the *Scale* tab from X1 Axis Options.
2. Use the check boxes to enable or disable Always include Zero, log scale, and manual maximum and minimum scaling. When manual maximum and/or minimum scaling is enabled, enter values in the Max Value and/or Min Value fields.

   Always Include Zero on Scale

   Selects whether or not the X1 axis must include a zero value. If the Log Scale field is selected or the Max Value or Min Value is greater than zero, this will be grayed-out. It is not valid when the logarithmic scale is used or Min and Max Values are greater than zero. The default value is not selected (a zero is not required on the X1 axis).

   Log Scale

   Selects logarithmic or linear scale for the numeric X1-axis. When the scale range is set to automatic, any data items with X1 values less than or equal to zero are graphed as null for log scale. If a manual scale range is specified to include negative values (Min Value is less than or equal to zero), the request for log scale is ignored. The default value is linear scale (this field is not selected).

   Use Manual Setting for Maximum

   Selects manual or automatic calculation of the maximum scale value on the X1 axis in the chart. If this field is selected (☑), enter the maximum allowable scale value on the X1 axis in the Max Value field. The default value is not selected (let the charting engine automatically calculate the maximum value on the X1 Axis).

Max Value

When Manual Setting for Maximum field is selected (☑), use this field to specify the maximum allowable scale value on the X1 axis. The default value is 70.0.

Use Manual Setting for Minimum

Selects manual or automatic calculation of the minimum scale value on the X1 axis in the chart. If this field is selected (☑), enter the minimum allowable scale value on the X1 axis in the Min Value field. The default value is not selected (let the charting engine automatically calculate the minimum value on the X1 Axis).

Min Value

When the Use Manual Setting for Minimum field is selected (☑), use this field to specify the minimum allowable scale value on the X1 axis. The default value is 0.0.

3. Select the *Apply* button to add these selections to the chart.

Syntax

Properties and Methods for X1 Axis Scale Settings

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart.

Editor Field	Property/Method
Always Include Zero on Scale	`setScaleMustIncludeZero (getX1Axis(), true / false );`
Log Scale	`setLogScale ( getX1Axis(), true / false );`
Use Manual setting for Maximum	`setScaleMaxAuto ( getX1Axis(), true / false );`
Max Value	`setScaleMax ( getX1Axis(), value);`
Use Manual setting for Minimum	`setScaleMinAuto ( getX1Axis(), true / false );`
Min Value	`setScaleMin ( getX1Axis(), value);`

Procedure How to Define X1 Axis Labels

1. Select the *Labels* tab from X1 Axis Options.
2. Use the check boxes to enable or disable the display of all axis labels, the minimum axis label, or the maximum axis label. When Show Axis Labels is selected, select a label format in the Format field.

   Show Axis Labels

   Enables and disables the display of labels on the X1 axis in the chart. The default value is enabled (axis labels are displayed). Use the Format field to define the format of numeric labels. When this box is checked, the setting in the general tab determines where the labels are displayed (left, right, both).

   Format

   When Show Axis Labels is selected (☑), select the drop-down list box in this field to select a label format: General, 0%, 0.0%, $0, $0.00, etc. The default value is General.

   Hide Minimum Value

   When Show Axis Labels is selected (☑), this field can be used to include/exclude the minimum value on the X1 Axis. The default value is not selected (include the minimum label).

   Hide Maximum Value

   When Show Axis Labels is selected (☑), this field can be used to include/exclude the maximum value on the X1 Axis. The default value is not selected (include the maximum label).
3. Select the *Apply* button to add these selections to the chart.

Syntax Properties and Methods for X1 Axis Labels

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Show Axis Labels	`setDisplay ( getX1Label(), true / false );`
Format	`setTextFormatPreset ( getX1Label(), value );`
Hide Minimum Value	`setExcludeMinLabel ( getX1Label(), true / false );`
Hide Maximum Value	`setExcludeMaxLabel ( getX1Label(), true / false );`

Procedure How to Define X1 Axis Grids

1. Select the *Grids* tab from the X1 Axis Options.
2. Use the check boxes in this dialog to enable or disable the display of major and minor grid lines. When either check box is selected, use the Style field to select the format of major and minor grid lines. The Automatic Grids radio buttons enable or disable automatic calculation of the number of major and minor grid lines. When these radio buttons are not selected, select a number of major or minor grid lines in the Manual Intervals fields.

Show Major Grid Lines

Enables and disables the display of major grid lines for the X1 axis. The default value is enabled (☑).

Style

When Show Major Grid Lines is selected (☑), use this field to select the style of the major grid lines: Regular Grids, Grids and Ticks, Inner Ticks, Outer Ticks, or Spanning Ticks. The default value is Regular Grids.

Automatic Grids

Enables and disables automatic calculation of the number of major grid lines on the X1-axis. The default value is enabled (the number of major grid lines on the X1-axis is automatically calculated). When this field is not selected, specify the number grid steps in the Manual Intervals field.

Manual Intervals

When Automatic Grids is not selected (☑), use this field to set the number of major grid lines/steps that will be imaged on the X1-axis. For example, grid steps 1, 6, 11, 16 …51 will be imaged if the range of values in the chart is 1…51 and this field is set to 5. If this field is set to 10, grid steps 1, 11, 21, 31…51 would be displayed. Do not use a negative value or a value that results in greater than 50 grid lines.

Show Minor Grid Lines

Enables and disables the display of minor grid lines for the X1 axis. The default value is disabled (minor grid lines are not displayed on the X1-axis).

Style

When Show Minor Grid Lines is selected (☑), use this field to select the style of the minor grid lines: Regular Grids, Grids and Ticks, Inner Ticks, Outer Ticks, or Spanning Ticks. The default value is Regular Grids.

Automatic Grids

Enables and disables automatic calculation of the number of minor grid lines on the X1-axis. The default value is enabled (the number of minor grid lines on the X1-axis is automatically calculated). When this field is not selected, specify the number grid steps in the Manual Intervals field.

Manual Intervals

When Automatic Grids is not selected, use this field to set the number of minor grid lines/steps that will be imaged on the X1-axis. Do not use a negative value or a value that results in greater than 50 grid lines.

3. Select the *Apply* button to add these selections to the chart.

Syntax

Properties and Methods for X1 Axis Grids

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Show Major Grid Lines	`setDisplay ( getX1MajorGrid(), true / false );`
Style	`setGridStyle ( getX1MajorGrid(), value );`
Automatic Grids	`setGridStepAuto ( getX1MajorGrid(), true / false );`
Manual Intervals	`setGridStep ( getX1MajorGrid(), value );`
Show Minor Grid Lines	`setDisplay ( getX1MinorGrid(), true / false );`
Style	`setGridStyle ( getX1MinorGrid(), value );`
Automatic Grids	`setGridStepAuto ( getX1MinorGrid(), true / false );`
Manual Intervals	`setGridStep ( getX1MinorGrid(), value );`

Y1 Axis Options

This option is included in the Graph Editor menu for all graph types except pie graphs.

The Y1 Axis Options enable you to define:

- Location, format, and display of the Y1 Axis.
- Automatic/Manual and Minimum/Maximum scaling.
- Display and format of Y1 Axis labels.
- Automatic/Manual and Minimum/Maximum grids.

Procedure How to Define the Location and Format of the Y1 Axis

1. Select the *General* tab from Y1 Axis Options.
2. Select the location in the chart where you want the axis imaged. Descending Axis draws the axis labels in ascending or descending order. The Axis Line and Zero Line check boxes enable and disable display of the axis base line and zero line.

   Left Side of Chart

   Select this field (☑) if you want the Y1 numeric axis to be imaged at the left side of a vertical chart or on the bottom side of a horizontal chart. This is the default value.

   Right Side of Chart

   Select this field (☑) if you want the Y1 numeric axis to be imaged at the right of a vertical chart or the top of a horizontal chart.

   Both Sides of Chart

   Select this field (☑) if you want the Y1 numeric axis to be imaged at the left and right sides of a vertical chart or bottom and top of a horizontal chart.

   Descending

   Selects descending or ascending values on the Y1 numeric. The default value is ascending (this field is not selected). For example, assume the values 0, 10, 20 … 70 are displayed from bottom-to-top on the left side of a standard 2D bar chart. If this field is selected and applied to the chart, these values would be displayed from top to bottom and the risers are also imaged from the top of the chart rather than the bottom.

   Axis Line

   Enables and disables the display of the Y1 axis base line. The default value is enabled (☑).

Zero Line

Enables and disables the display of a zero line on the Y1 axis. The default value is disabled (this field is not selected).

3. Select the *Apply* button to add these selections to the chart.

Syntax Properties and Methods for the Location and Format of Y1 Axis

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Left Side of Chart	`setAxisSide ( getY1Axis(), 0 );`
Right Side of Chart	`setAxisSide ( getY1Axis(), 1 );`
Both Sides of Chart	`setAxisSide ( getY1Axis(), 2 );`
Descending Axis	`setAxisDescending ( getY1Axis(), true / false );`
Axis Line	`setDisplay ( getY1AxisLine(), true / false);`
Zero Line	`setDisplay ( getY1ZeroLine(), true / false );`

Procedure How to Define Y1 Axis Scale Settings

1. Select the *Scale* tab from Y1 Axis Options.
2. Use the check boxes to enable or disable Always include Zero, log scale, and manual maximum and minimum scaling. When manual maximum and/or minimum scaling is enabled, enter values in the Max Value and/or Min Value fields.

Always Include Zero on Scale

This field selects whether or not the Y1 axis must include a zero value. If the Log Scale field is selected or the Max Value or Min Value is greater than zero, this will be grayed-out. It is not valid when the logarithmic scale is used or Min and Max Values are greater than zero. The default value is not selected.

Log Scale

This field selects logarithmic or linear scale for the numeric Y1-axis. When the scale range is set to automatic, any data items with Y1 values less than or equal to zero are graphed as null for log scale. If a manual scale range is specified to include negative values (Min Value is less than or equal to zero), the request for log scale is ignored. The default value is linear scale (this field is not selected).

Use Manual Setting for Maximum

This field selects manual/automatic calculation of the maximum scale value on the Y1 axis in the chart. If this field is selected (☑), enter the maximum allowable scale value on the Y1 axis in the Max Value field. The default value is not selected (let the charting engine automatically calculate the maximum value on the Y1 Axis).

Max Value

When the Use Manual Setting for Maximum field is selected (☑), use this field to specify the maximum allowable scale value on the Y1 axis. The default value is 70.0.

Use Manual Setting for Minimum

This field selects manual or automatic calculation of the minimum scale value on the Y1 axis in the chart. If this field is selected (☑), enter the minimum allowable scale value on the Y1 axis in the Min Value field. The default value is not selected (let the charting engine automatically calculate the minimum value on the Y1 Axis).

Min Value

When the Use Manual Setting for Minimum field is selected (☑), use this field to specify the minimum allowable scale value on the Y1 axis. The default value is 0.0.

3. Select the *Apply* button to add these selections to the chart.

Syntax

Properties and Methods for Y1 Axis Scale Settings

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Always Include Zero	`setScaleMustIncludeZero (getY1Axis(), true / false );`
Log Scale	`setLogScale ( getY1Axis(), true / false );`
Use Manual setting for Maximum	`setScaleMaxAuto ( getY1Axis(), true / false );`
Max Value	`setScaleMax ( getY1Axis(), value);`
Use Manual setting for Minimum	`setScaleMinAuto ( getY1Axis(), true | false );`
Min Value	`setScaleMin ( getY1Axis(), value);`

Procedure How to Define Y1 Axis Labels

1. Select the *Labels* tab from Y1 Axis Options.
2. Use the check boxes to enable or disable the display of all axis labels, the minimum axis label, or the maximum axis label. When Show Axis Labels is selected, select a label format in the Format field.

   Show Axis Labels

   Enables and disables the display of labels on the Y1 axis in the chart. The default value is enabled (axis labels are displayed). Use the Format field to define the format of numeric labels. When this box is checked the setting in the general tab determines where the labels are displayed (left, right, both).

   Format

   When Show Axis Labels is selected, select the drop-down list box in this field to select a label format: General, 0%, 0.0%, $0, $0.00, etc. The default value is General.

   Hide Minimum Value

   When Show Axis Labels is selected (☑), this field can be used to include/exclude the minimum value on the Y1 Axis. The default value is not selected (include the minimum label).

   Hide Maximum Value

   When Show Axis Labels is selected (☑), this field can be used to include/exclude the maximum value on the Y1 Axis. The default value is not selected (include the maximum label).
3. Select the *Apply* button to add these selections to the chart.

Syntax Properties and Methods for Y1 Axis Labels

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Show Axis Labels	`setDisplay ( getY1Label(), true | false );`
Format	`setTextFormatPreset ( getY1Label(), value );`
Hide Minimum Value	`setExcludeMinLabel ( getY1Label(), true | false );`
Hide Maximum Value	`setExcludeMaxLabel ( getY1Label(), true | false );`

Procedure How to Define Y1 Axis Grids

1. Select the *Grids* tab from Y1 Axis Options.
2. Use the check boxes in this dialog to enable or disable the display of major and minor grid lines. When either check box is selected, use the Style field to select the format of major and minor grid lines. Use the Automatic Grids radio buttons to enable or disable automatic calculation of the number of major and minor grid lines. When these radio buttons are not selected, select a number of major or minor grid lines in the Manual Intervals fields.

Show Major Grid Lines

Enables and disables the display of the major grid lines for the Y1 axis. The default value is enabled (☑).

Style

When Show Major Grid Lines is selected (☑), use this field to select the style of the major grid lines: Regular Grids, Grids and Ticks, Inner Ticks, Outer Ticks, or Spanning Ticks. The default value is Regular Grids.

Automatic Grids

Enables and disables automatic calculation of the number of major grid lines on the Y1-axis. The default value is enabled (the number of major grid lines is automatically calculated).

Manual Intervals

When Automatic Grids is not selected (☑), use this field to set the number of major grid lines/steps that will be imaged on the Y1-axis. For example, grid steps 1, 6, 11, 16, …51 will be imaged if the range of values in the chart is 1…51 and this property is set to 5. If this property is set to 10, grid steps 1, 11, 21, 31…51 would be displayed. Do not use a negative value or a value that results in greater than 50 grid lines.

Show Minor Grid Lines

Enables and disables the display of the minor grid lines for the Y1 axis. The default value is disabled (minor grid lines are not displayed on the Y1-axis).

Style

When Show Minor Grid Lines is selected (☑), use this field to select the style of the minor grid lines: Regular Grids, Grids and Ticks, Inner Ticks, Outer Ticks, or Spanning Ticks. The default value is Regular Grids.

Automatic Grids

Enables and disables automatic calculation of the number of minor grid lines on the Y1-axis. The default value is enabled (the number of minor grid lines is automatically calculated).

Manual Intervals

When Automatic Grids is not selected, use this field to set the number of minor grid lines/steps that will be imaged on the Y1-axis. Do not use a negative value or a value that results in greater than 50 grid lines.

3. Select the *Apply* button to add these selections to the chart.

Syntax

Properties and Methods for Y1 Axis Grids

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Show Major Grid Lines	`setDisplay ( getY1MajorGrid(), true | false );`
Style	`setGridStyle ( getY1MajorGrid(), value );`
Automatic Grids	`setGridStepAuto ( getY1MajorGrid(), true | false );`
Manual Intervals	`setGridStep ( getY1MajorGrid(), value );`
Show Minor Grid Lines	`setDisplay ( getY1MinorGrid(), true | false );`
Style	`setGridStyle ( getY1MinorGrid(), value );`
Automatic Grids	`setGridStepAuto ( getY1MinorGrid(), true | false );`
Manual Intervals	`setGridStep ( getY1MinorGrid(), value );`

Y2 Axis Options

This option is included in the Graph Editor menu for all dual-axis graph types.

The Y2 Axis Options enable you to define:

- Location, format, and display of the Y2 Axis.
- Automatic/Manual and Minimum/Maximum scaling.
- Display and Format of Y2 Axis labels.
- Automatic/Manual and Minimum/Maximum grids.

Procedure How to Define the Location and Format of the Y2 Axis

1. Select the *General* tab from Y2 Axis Options.
2. Select the location in the chart where you want the axis imaged. Descending Axis draws the axis labels in ascending or descending order. The Axis Line and Zero Line check boxes enable or disable display of the axis base line and zero line.

   Left Side of Chart

   Select this field (☑) if you want the Y2 numeric axis to be imaged at the left side of a vertical chart or on the bottom side of a horizontal chart.

   Right Side of Chart

   Select this field (☑) if you want the Y2 numeric axis to be imaged at the right of a vertical chart or the top of a horizontal chart. This is the default value.

   Both Sides of Chart

   Select this field (☑) if you want the Y2 numeric axis to be imaged at the left and right sides of a vertical chart or top and bottom of a horizontal chart.

   Descending

   This field is used to select descending or ascending values on the Y2 numeric. The default value is ascending (this field is not selected).

   Axis Line

   Enables and disables the display of the Y2 axis base line. The default value is enabled (this field is selected).

   Zero Line

   Enables and disables the display of a zero line on the Y2 axis. The default value is disabled (this field is not selected).
3. Select the *Apply* button to add these selections to the chart.

Syntax Properties and Methods the Location and Format of the Y2 Axis

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Left Side of Chart	`setAxisSide ( getY2Axis(), 0 );`
Right Side of Chart	`setAxisSide ( getY2Axis(), 1 );`
Both Sides of Chart	`setAxisSide ( getY2Axis(), 2 );`
Descending Axis	`setAxisDescending ( getY2Axis(), true | false );`
Axis Line	`setDisplay ( getY2AxisLine(), true | false);`
Zero Line	`setDisplay ( getY2ZeroLine(), true | false );`

Procedure How to Define Y2 Axis Scale Settings

1. Select the *Scale* tab from Y2 Axis Options.
2. Use the check boxes to enable or disable Always include Zero, log scale, and manual maximum and minimum scaling. When manual maximum and/or minimum scaling is enabled, enter values in the Max Value and/or Min Value fields.

   Always Include Zero on Scale

   Selects whether or not the Y2 axis must include a zero value. If the Log Scale field is selected or the Max Value or Min Value is greater than zero, this will be grayed-out. It is not valid when the logarithmic scale is used or Min and Max Values are greater than zero. The default value is not selected.

   Log Scale

   Selects logarithmic or linear scale for the numeric Y2-axis. When the scale range is set to automatic, any data items with Y2 values less than or equal to zero are graphed as null for log scale. If a manual scale range is specified to include negative values (Min Value is less than or equal to zero), the request for log scale is ignored. The default value is linear scale (this field is not selected).

   Use Manual Setting for Maximum

   Selects manual or automatic calculation of the maximum scale value on the Y2 axis in the chart. If this field is selected (☑), enter the maximum allowable scale value on the Y2 axis in the Max Value field. The default value is not selected (let the charting engine automatically calculate the maximum value on the Y2 Axis).

Max Value

When the Use Manual Setting for Maximum field is selected (☑), use this field to specify the maximum allowable scale value on the Y2 axis. The default value is 70.0.

Use Manual Setting for Minimum

Selects manual or automatic calculation of the minimum scale value on the Y2 axis in the chart. If this field is selected (☑), enter the minimum allowable scale value on the Y2 axis in the Min Value field. The default value is not selected (let the charting engine automatically calculate the minimum value on the Y2 Axis).

Min Value

When the Use Manual Setting for Minimum field is selected (☑), use this field to specify the minimum allowable scale value on the Y2 axis. The default value is 0.0.

3. Select the *Apply* button to add these selections to the chart.

Syntax

Properties and Methods for Y2 Axis Scale Settings

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Always Include Zero	`setScaleMustIncludeZero (getY2Axis(), true | false );`
Log Scale	`setLogScale ( getY2Axis(), true | false );`
Use Manual setting for Maximum	`setScaleMaxAuto ( getY2Axis(), true | false );`
Max Value	`setScaleMax ( getY2Axis(), value);`
Use Manual setting for Minimum	`setScaleMinAuto ( getY2Axis(), true | false );`
Min Value	`setScaleMin ( getY2Axis(), value);`

Procedure How to Define Y2 Axis Labels

1. Select the *Labels* tab from Y2 Axis Options.
2. Use the check boxes to enable or disable the display of all axis labels, the minimum axis label, or the maximum axis label. When Show Axis Labels is selected, select a label format in the Format field.

   Show Axis Labels

   Enables and disables the display of labels on the Y2 axis in the chart. The default value is enabled (axis labels are displayed). Use the Format field to define the format of numeric labels. When this box is checked the setting in the general tab determines where the labels are displayed (left, right, both).

   Format

   When Show Axis Labels is selected (☑), select the drop-down list box in this field to select a label format: General, 0%, 0.0%, $0, $0.00, etc. The default value is General.

   Hide Minimum Value

   When Show Axis Labels is selected (☑), this field can be used to include or exclude the minimum value on the Y2 Axis. The default value is not selected (the minimum label is included).

   Hide Maximum Value

   When Show Axis Labels is selected (☑), this field can be used to include or exclude the maximum value on the Y2 Axis. The default value is not selected (the maximum label is included).
3. Select the *Apply* button to add these selections to the chart.

Syntax Properties and Methods for Y2 Axis Labels

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Show Axis Labels	`setDisplay ( getY2Label(), true | false );`
Format	`setTextFormatPreset ( getY2Label(), value );`
Hide Minimum Value	`setExcludeMinLabel ( getY2Label(), true | false );`
Hide Maximum Value	`setExcludeMaxLabel ( getY2Label(), true | false );`

Procedure How to Define Y2 Axis Grids

1. Select the *Grids* tab from Y2 Axis Options.
2. Use the check boxes in this dialog to enable or disable the display of major and minor grid lines. When either check box is selected, use the Style field to select the format of major and minor grid lines. The Automatic Grids radios button enable/disable automatic calculation of the number of major and minor grid lines. When these radio buttons are not selected, select a number of major or minor grid lines in the Manual Intervals fields.

Show Major Grid Lines

Enables and disables the display of the major grid lines for the Y2 axis. The default value is enabled (☑).

Style

When Show Major Grid Lines is selected (☑), use this field to select the style of the major grid lines: Regular Grids, Grids and Ticks, Inner Ticks, Outer Ticks, or Spanning Ticks. The default value is Regular Grids.

Automatic Grids

Enables and disables automatic calculation of the number of major grid lines on the Y2-axis.

Manual Intervals

When Automatic Grids is not selected (☑), use this field to set the number of major grid lines/steps that will be imaged on the Y2-axis. For example, grid steps 1, 6, 11, 16, ...51 will be imaged if the range of values in the chart is 1…51 and this property is set to 5. If this property is set to 10, grid steps 1, 11, 21, 31…51 would be displayed. Do not use a negative value or a value that results in greater than 50 grid lines.

Show Minor Grid Lines

Enables and disables the display of the minor grid lines for the Y2 axis. The default value is disabled.

Style

When Show Minor Grid Lines is selected (☑), use this field to select the style of the minor grid lines: Regular Grids, Grids and Ticks, Inner Ticks, Outer Ticks, or Spanning Ticks. The default value is Regular Grids.

Automatic Grids

Enables and disables automatic calculation of the number of minor grid lines on the Y2-axis

Manual Intervals

When Automatic Grids is not selected (☑), use this field to set the number of minor grid lines/steps that will be imaged on the Y2-axis. Do not use a negative value or a value that results in greater than 50 grid lines.

3. Select the *Apply* button to add these selections to the chart.

Syntax

Properties and Methods for Y2 Axis Grids

Selections in the associated dialog box(es) add the following properties and methods to the code that defines this chart:

Editor Field	Property/Method
Show Major Grid Lines	`setDisplay ( getY2MajorGrid(), true | false );`
Style	`setGridStyle ( getY2MajorGrid(), value );`
Automatic Grids	`setGridStepAuto ( getY2MajorGrid(), true | false );`
Manual Intervals	`setGridStep ( getY2MajorGrid(), value );`
Show Minor Grid Lines	`setDisplay ( getY2MinorGrid(), true | false );`
Style	`setGridStyle ( getY2MinorGrid(), value );`
Automatic Grids	`setGridStepAuto ( getY2MinorGrid(), true | false );`
Manual Intervals	`setGridStep ( getY2MinorGrid(), value );`

CHAPTER 15

Using Two-Way Email

Topics:

- Two-Way Email User Steps
- Subscribing for the First Time
- Replying to the Confirmation Message
- Receiving Your Templates for the First Time
- Requesting a Report
- Updating Your Subscription Information
- Responding to an Alert

Two-Way Email enables mobile business professionals to request and receive WebFOCUS reports through e-mail, using a handheld device, laptop, or desktop. From any location, at any time, users have access to their company's enterprise data.

To request a report, a user simply replies to and sends an e-mail that contains a Two-Way Email template. A template is the means by which a request is made and parameter values are supplied if required. A Managed Reporting Administrator or Domain Administrator creates and maintains templates for a user.

This topic explains the steps that a user performs to enable the Two-Way Email capability. It also describes what a template looks like, and how to use one to request a report. Finally, it addresses alert response for those sites that have licensed and installed both ReportCaster and Two-Way Email.

Two-Way Email User Steps

As a user, you perform five simple steps that enable Two-Way Email:

1. Subscribe to Two-Way Email by accessing and supplying information on an HTML subscription page, using your browser. See *Subscribing for the First Time* on page 15-2.

   You can also ask your Managed Reporting Administrator to subscribe you from the Two-Way Email Administrator console.

   Reply to the confirmation message sent by Two-Way Email. This message acknowledges your subscription request and validates your Reply-To e-mail address. See *Replying to the Confirmation Message* on page 15-6.

2. Receive and store your Two-Way Email templates in your inbox, or in a folder on your e-mail program. The Managed Reporting Administrator or Domain Administrator creates these templates for your use. Each template is associated with a Managed Reporting Standard Report of interest to you. See *Receiving Your Templates for the First Time* on page 15-6.

3. Request a report simply by selecting, replying to, and sending a template. See *Requesting a Report* on page 15-7.

4. Update your subscription information if it changes. See *Updating Your Subscription Information* on page 15-11.

Subscribing for the First Time

Two-Way Email provides a subscription page accessed from a Web browser. You can display the subscription page on your desktop, laptop, or any handheld device that supports the Web.

Use the subscription page to independently subscribe to Two-Way Email for the first time.

On the subscription page, you must supply a valid MRE user ID and password. You must also supply a WebFOCUS Reporting Server user ID and password, unless they are stored for you on the server. If you do not know the required security information, ask your Managed Reporting Administrator for it.

After you subscribe, you receive a confirmation message through e-mail. Once you reply to it, Two-Way Email sends you all the templates you are authorized to use.

Procedure How to Subscribe for the First Time

1. Your site has a Web address for the Two-Way Email subscription page. Ask your Managed Reporting Administrator for the address if you do not know it.

2. From your browser, access the subscription page by entering the Web address. An example is

   `http://server_name/ibi_html/mobile/twoway.htm`

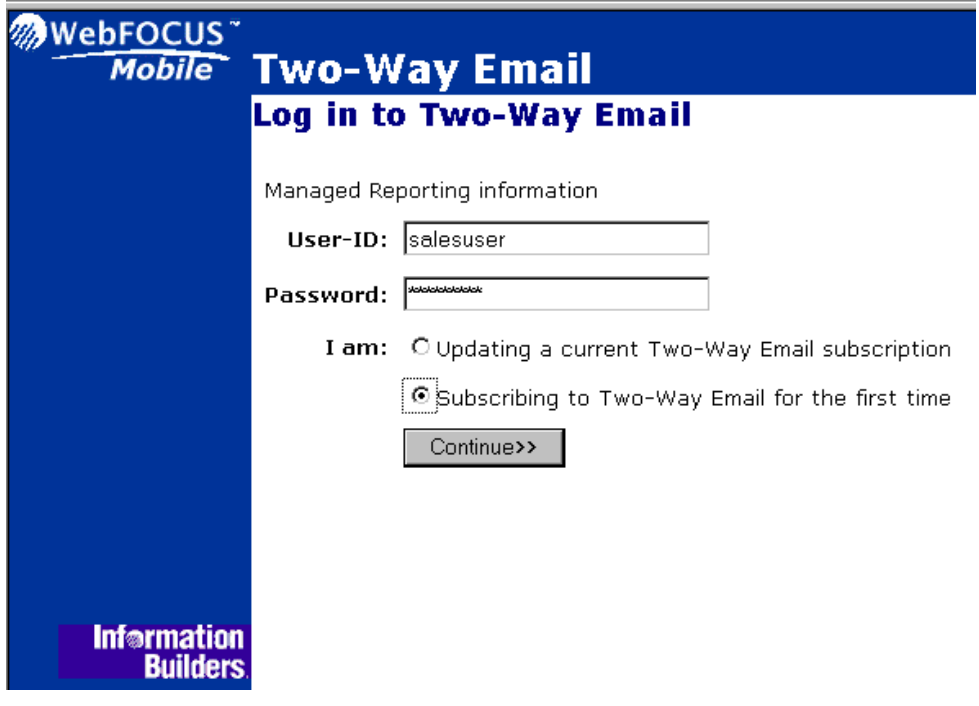
   where:

   server_name

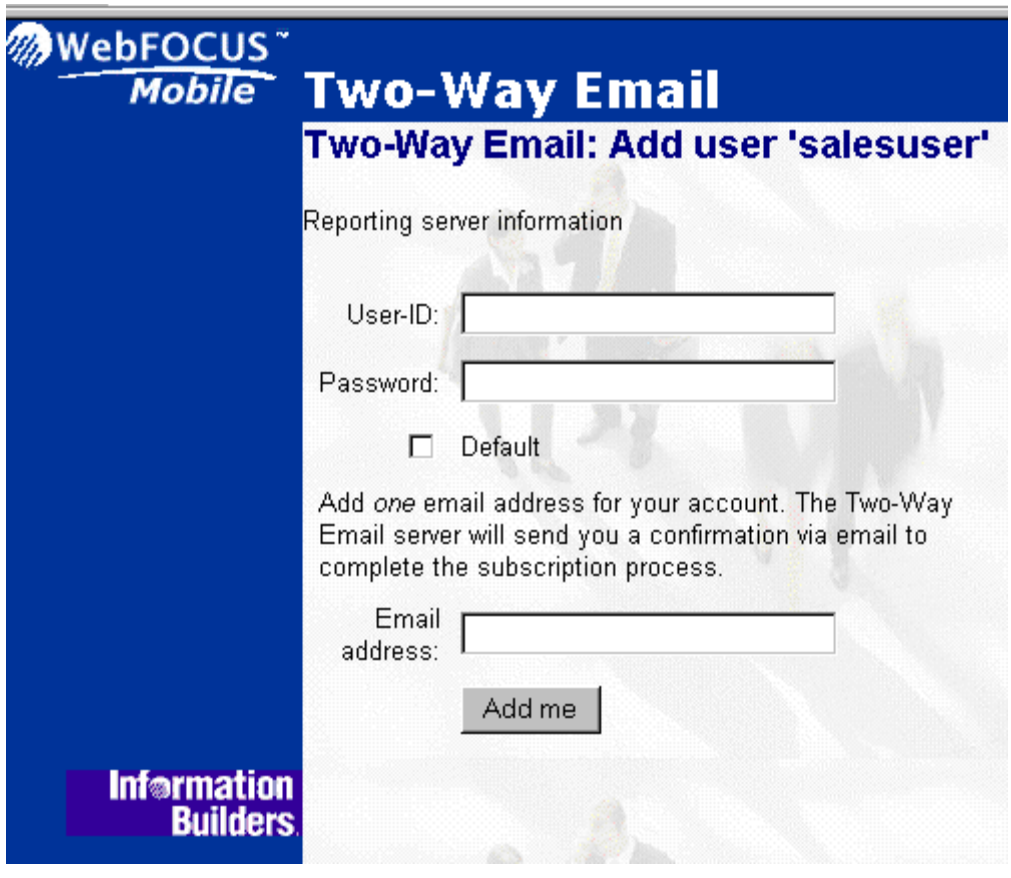
   Is the name of the Web server.

   Enter your MRE user ID and password as assigned by the Managed Reporting Administrator.

   Click the *Subscribing to Two-Way Email for the first time* radio button, as shown on the following window:



3. Click *Continue*. A window similar to the following opens:



4. If applicable at your site, select the check box labeled *Default* to use the WebFOCUS Reporting Server user ID and password stored for you on that server. Otherwise, enter your security credentials for the WebFOCUS Reporting Server.

5. Enter your e-mail address. Two-Way Email will use this address to send you Two-Way Email templates and WebFOCUS reports when you request them. Use the following syntax

   name@domain

   where:

   name

   Is your e-mail user name.

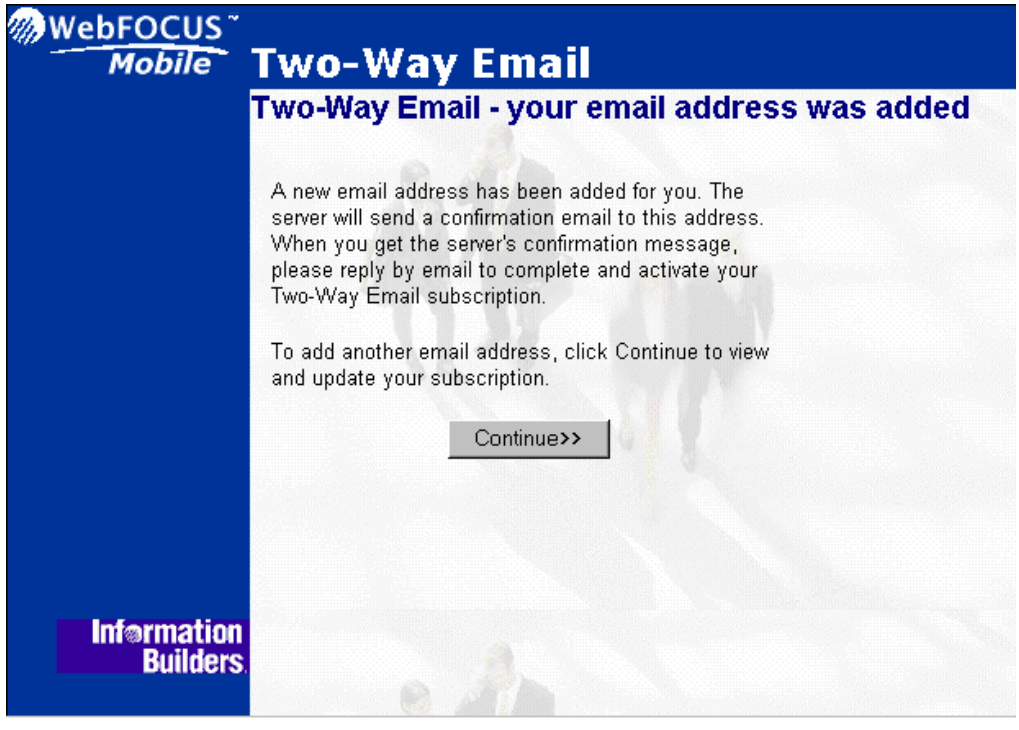
   domain

   Is the domain name.

Note: You must include the character @.

6. Click *Add me* to add your new subscription.

A message informs you that Two-Way Email added your address to the data source:



7. You have the opportunity to add another e-mail address to your subscription information, or to view the information already supplied. Just click *Continue*.

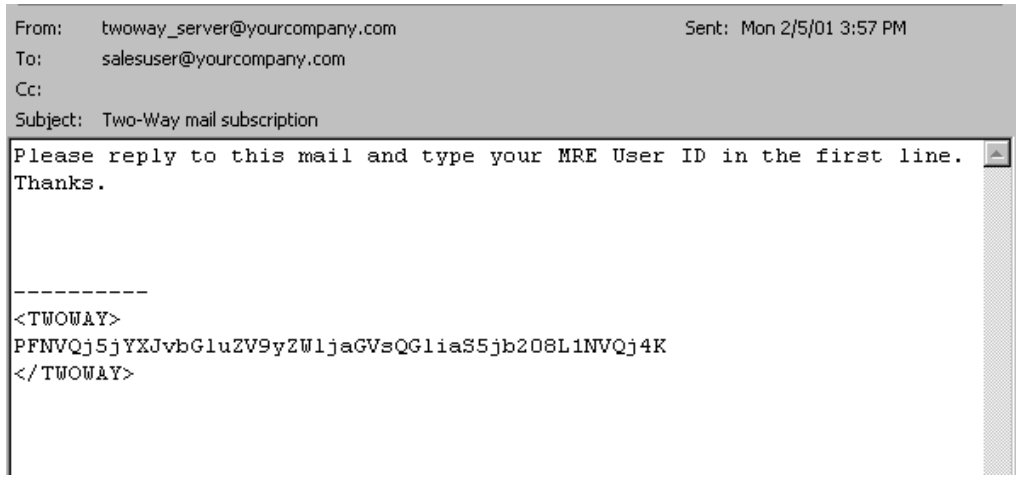
Close the Two-Way Email window when you are done.

Replying to the Confirmation Message

After receiving your subscription request and validating your security credentials, Two-Way Email sends you a confirmation message through e-mail. It acknowledges your request and makes sure it has your correct e-mail address by using it to send the message.

Procedure **How to Reply to the Confirmation Message**

1. Check your mailbox for e-mail from Two-Way Email. When it is delivered, open it. A window similar to the following opens:



   As prompted, reply to the e-mail. Type your MRE user ID on the first line of the reply.

   If your device or program has an option to include the body of the e-mail (for example, Reply with Text or Include Original Text), select it. This option ensures that the content of the template is included in the reply. Two-Way Email requires the content to correctly process the reply.

2. Click or tap *Send* to send your reply to Two-Way Email.

Receiving Your Templates for the First Time

After you subscribe for the first time and reply to the confirmation message, Two-Way Email sends you all the templates you are authorized to use for your reporting needs.

Check your mailbox for their delivery. When they arrive, store them in your inbox, or in a folder on your e-mail program.

Requesting a Report

Once you receive and store your templates, you can request a WebFOCUS report. A template is the means by which you request a report and supply parameter values if required.

A Two-Way Email template contains information about the associated report. It may also prompt you for one or more parameter values that define the scope of the report. If a template prompts you for a value, you must supply one; otherwise, the report will not run.

A report template may request an update to a data source rather than a report.

The following is a sample template that requests a report:

```
Enter a product category on line 1 of your reply.

Valid product categories are Coffee, Food, Gifts.

----------

<TWOWAY>

YXBwL3RvdGFscmV0LnR4dCwjdGVsbG1ldGVzdHNuLHByb2dyYW1tL3By

b2dyYW1tLmh0bSwwLjE4OTQ5NTI3NDE0NjIxMDky

</TWOWAY>
```

The tags <TWOWAY> and </TWOWAY> delimit an encrypted Extensible Markup Language (XML) stream describing the report to run, including its associated Domain. Two-Way Email needs this information to retrieve the report code from the Managed Reporting Repository, and route it to the WebFOCUS Reporting Server for execution.

The prompt at the top of the sample template instructs you to supply a parameter value on line 1 of your reply. In this case, you must enter the name of a product category that exists in the data source, such as Coffee, Food, or Gifts. If you enter Coffee, the report will contain only data that applies to that category.

Procedure How to Request a Report

1. Double-click or tap the e-mail that contains the template for the desired report.
2. The subject of the e-mail typically identifies or describes the report.
3. Click or tap *Reply*.

   If your device or program has an option to include the body of the e-mail (for example, Reply with Text or Include Original Text), select it. This option ensures that the content of the template is included in the reply. Two-Way Email requires the content to correctly process the reply.
4. If the report requires a parameter value, type it on the first line of the reply. Type multiple values on successive lines, each on a line by itself.
5. To accept the default value of a parameter, type a period (.) on the applicable line in your reply. This action ensures that Two-Way Email will read the value properly.
6. The e-mail may indicate valid values from which you can choose. If it does not and you are not sure how to respond, ask your Managed Reporting Administrator or Domain Administrator.
7. Click *Send* or tap *Done*.

Two-Way Email will return the requested report to you.

Example Requesting a Report With a Parameter

Suppose you want a report that shows the number of units sold, and the total dollar amount of sales, for a particular product category. The report is associated with a Two-Way Email template called Sales Report for User-supplied Category : TW. It requires a parameter value for the product category of interest.

A Managed Reporting Administrator or Domain Administrator can create the Standard Report and template for you, as described in Chapter 8, *Two-Way Email Administration* in the *Managed Reporting Development and Administration Developer Studio Edition* documentation.

1. Double-click or tap the e-mail called *Sales Report for User-supplied Category : TW*.

   The template prompts you for the product category and shows the possible values:

   ```
   Enter a product category on line 1 of your reply.

   Valid product categories are Coffee, Food, Gifts.
   ```

2. Click or tap *Reply*.

   If your device or program has an option to include the body of the e-mail (for example, Reply with Text or Include Original Text), select it. This option ensures that the content of the template is included in the reply. Two-Way Email requires the content to correctly process the reply.

3. Enter *Food* on line 1 as the parameter value.

4. Click or tap *Send*.

   Two-Way Email sends the report to you:

   ```
   PAGE    1

   Category     Unit Sales   Dollar Sales

   --------     ----------   ------------

   Food            1384845       17229333
   ```

Example Accepting the Default Value of a Parameter

Suppose you want a report that shows the number of units budgeted, and the number of units sold, for a particular product category and store code. The report is associated with a Two-Way Email template called Budgeted Units by Category and Store Code : TW.

For the product category, you can supply a value or accept the default. For the store code, you must accept the value provided by the Administrator.

A Managed Reporting Administrator or Domain Administrator can create the Standard Report and template for you, as described in the *Managed Reporting Development and Administration Developer Studio Edition* documentation.

1. Double-click or tap the e-mail called *Budgeted Units by Category and Store Code : TW*.

   The template prompts you as follows:

   ```
   Enter a product category on line 1 of your reply.

   Valid product categories are Coffee, Food, Gifts.

   You can accept the default, which is Gifts.

   To accept the default, enter a period (.) on line 1 of your reply.
   ```

   It also informs you that the only allowed store code value is R1019.

2. Click or tap *Reply*.

   If your device or program has an option to include the body of the e-mail (for example, Reply with Text or Include Original Text), select it. This option ensures that the content of the template is included in the reply. Two-Way Email requires the content to correctly process the reply.

3. You want to accept the default, Gifts. As instructed, enter a period on line 1 of your reply.

4. Click or tap *Send*.

   Two-Way Email sends the report to you:

   ```
   PAGE     1

   Category    Store ID  Budget Units  Unit Sales

   --------    --------  ------------  ----------

   Gifts       R1019            79552       78869
   ```

Updating Your Subscription Information

Use the subscription update page to do the following:

Add a new e-mail address.

- Delete an existing e-mail address.
- Refresh your Two-Way Email templates (that is, have them resent to you).
- Update your WebFOCUS Reporting Server security credentials.

Procedure How to Access the Subscription Update Page

1. From your browser, access the subscription page by entering the Web address that applies to your site. An example is

   `http://server_name/ibi_html/mobile/twoway.htm`

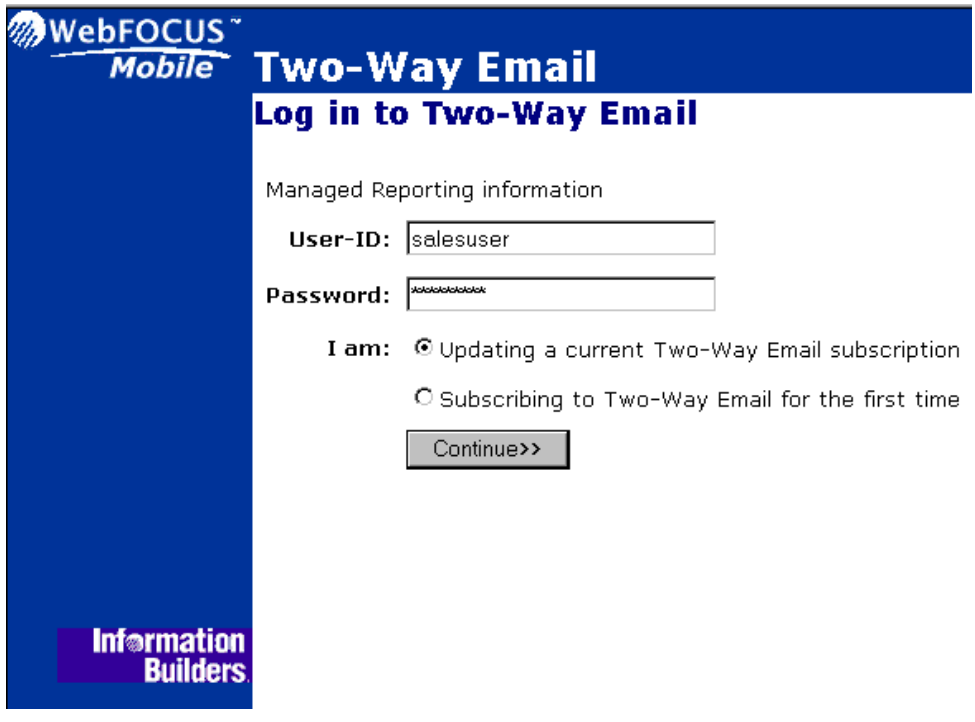
   where:

   server_name

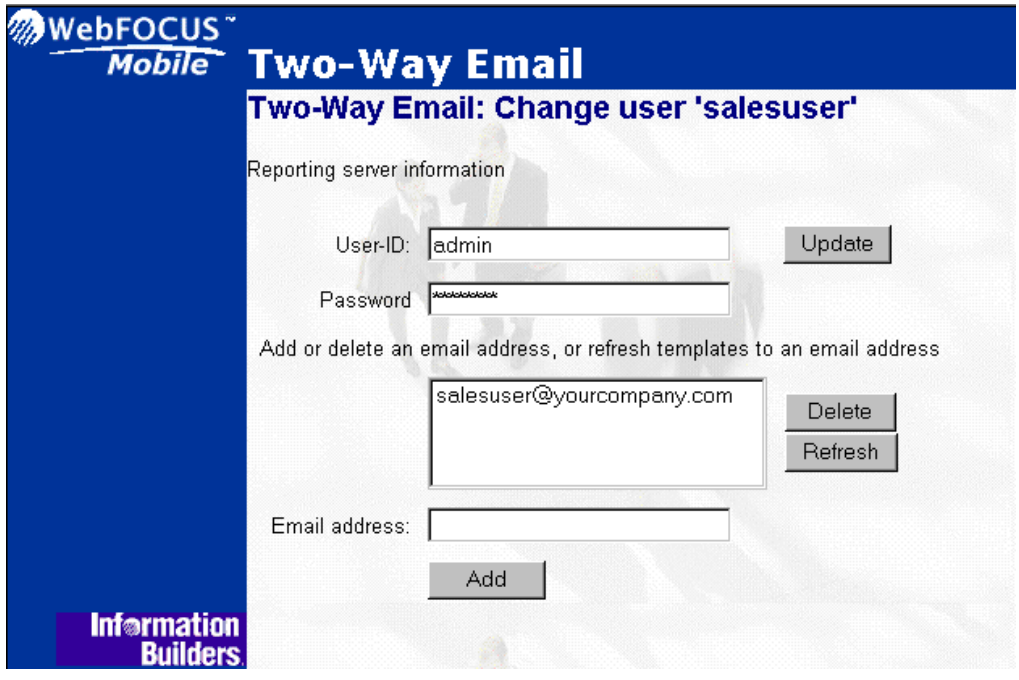
   Is the name of the Web server.

2. Enter your MRE user ID and password as assigned by the Managed Reporting Administrator.

3. Click *Updating a current Two-Way Email subscription*, as shown on the following window:



4. Click *Continue*. The next window allows you to perform update tasks, as described in the procedures that follow.

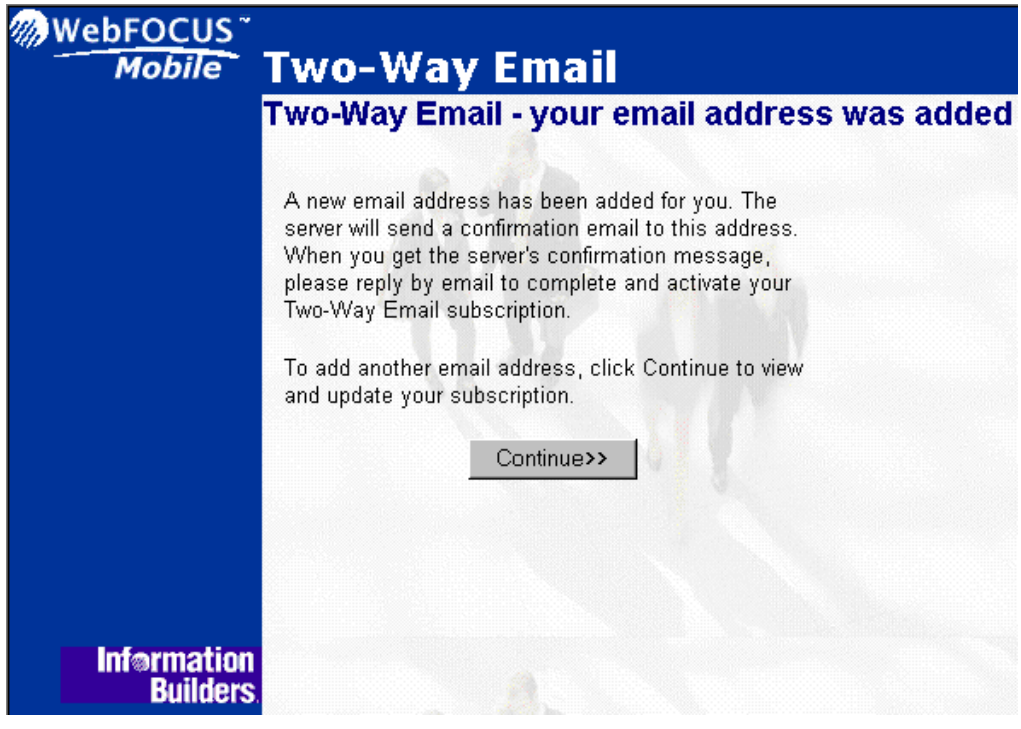


Adding a New E-mail Address

You can add a new e-mail address to the Two-Way Email data source. It will be associated with your subscription information.

Procedure How to Add a New E-mail Address

1. In the Email address field, type the new address.
2. Click *Add*. The following window opens:



3. Click *Continue* to return to the subscription update page to perform other tasks or review what you have done. Close the window when you are finished.

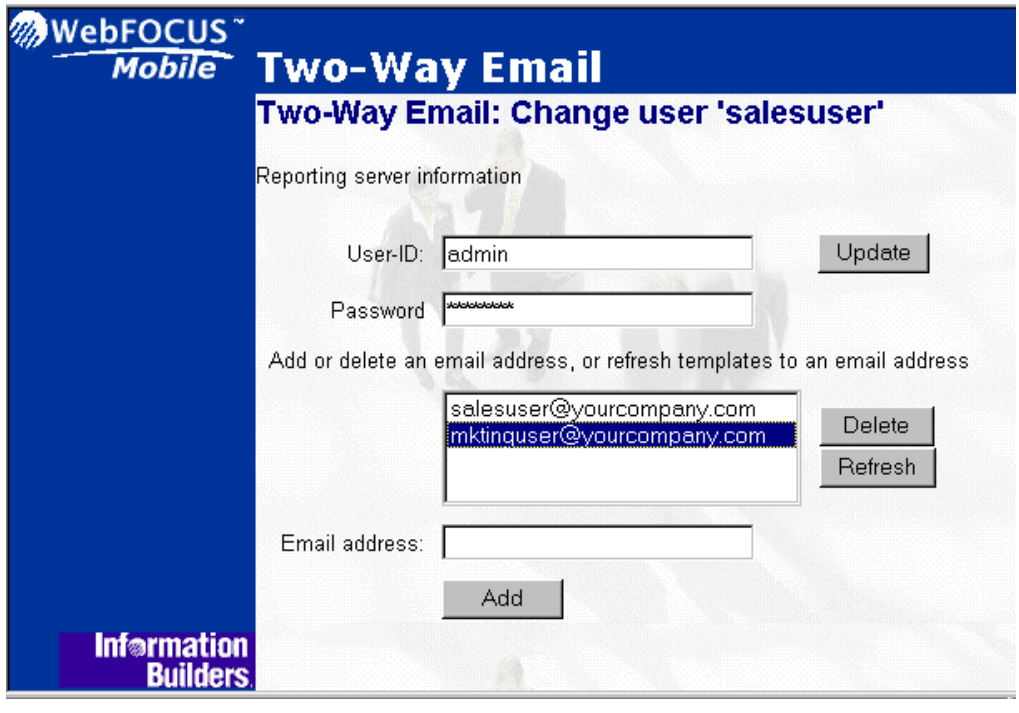
Two-Way Email sends a confirmation message to the new e-mail address. Once you reply to the message, the address is activated, and Two-Way Email sends the templates you are authorized to use.

Deleting an Existing E-mail Address

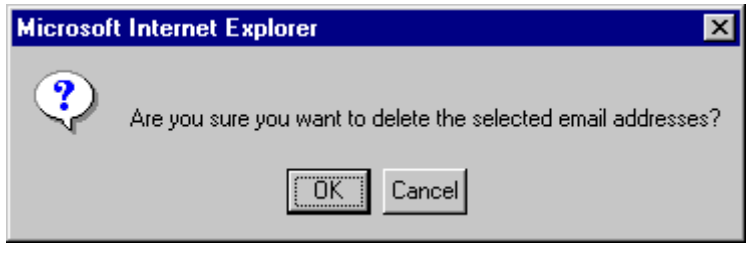
You can delete an existing e-mail address from the Two-Way Email data source.

Procedure How to Delete an Existing E-mail Address

1. In the list of current addresses, select the one you want to remove, as shown on the following window:



2. Click *Delete*. You are asked if you are sure you want to delete the address:

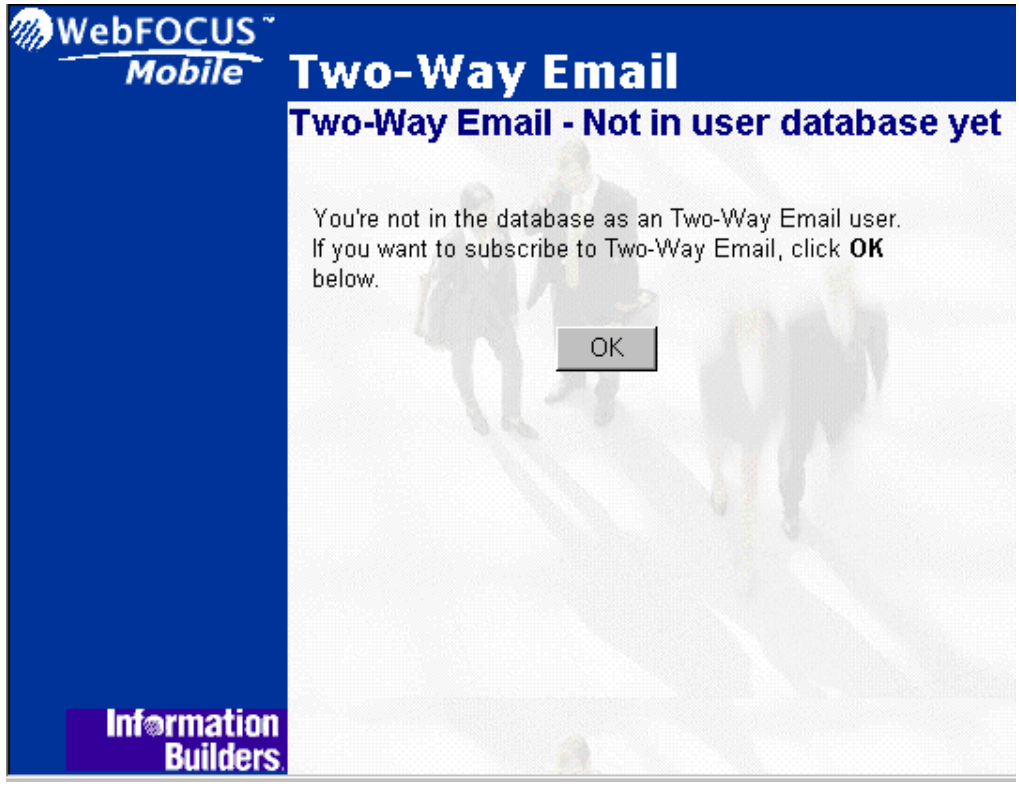


3. Click *OK* to remove the address from the data source.

   Click *Cancel* to discontinue the procedure and return to the previous window.

4. If you attempt to delete the only e-mail address associated with your subscription, the entire subscription (user account) will be cancelled. You are asked if you are sure you want to proceed with that action.

   Click *OK* to delete your subscription, or click *Cancel* to discontinue the procedure. If you click *OK*, Two-Way Email informs you that you are not in its user data source:



Refreshing Your Templates

Request copies of all your templates if you accidentally delete one, or if the Managed Reporting Administrator or Domain Administrator creates or modifies a template for you.

Procedure How to Refresh Your Templates

1. From the list of current addresses, select the address to send the templates to.
2. Click *Refresh*. A message informs you that fresh copies of your templates will be sent to the address specified.

Updating Your WebFOCUS Reporting Server Security Credentials

If your user ID and password for the WebFOCUS Reporting Server change, you must update them.

Procedure **How to Update Your Security Credentials**

1. Enter your new WebFOCUS Reporting Server user ID and password in the appropriate fields.
2. Click *Update*. A message informs you that your user ID and password have been updated.

Responding to an Alert

Two-Way Email alert response is available only at sites that have licensed and installed both ReportCaster and Two-Way Email. For more information about ReportCaster, see the ReportCaster documentation.

A Managed Reporting Administrator or Domain Administrator can attach a Two-Way Email template to a ReportCaster Alert. As a user, you are alerted when certain pre-defined data conditions are met. You can use the attached Two-Way Email template to respond to the alert, to request a report for more detail, to redistribute a report or parts of it to other interested people, or to take other timely action.

Example **Responding to an Alert**

A Managed Reporting Administrator or Domain Administrator can create the sample alert and template for you, as described in the *Managed Reporting Development and Administration Developer Studio Edition* documentation.

You are alerted when the total dollar sales for coffee for store code R1019 exceed $1,000,000. The alert takes the form of a report showing the exact amount of dollar sales.

Attached to the report is a template, prompting you for another store code of interest, for comparison purposes. You will respond to the alert by supplying a store code value and sending the template. Your response generates a second report, showing the dollar sales for coffee for the supplied store code. You can then compare the two reports.

1. Periodically check your inbox for an alert from Two-Way Email, named Coffee Sales Alert. When it is delivered, open it and view the report. A template will be attached to it:

```
PAGE    1

Category     Store ID   Dollar Sales
--------     --------   ------------
Coffee       R1019           1393610

Enter a store code on line 1 of your reply.

Valid store codes are R1088, R1109, R1250.

----------

[TWOWAY]

YXBwL3RvdGFscmV0LnR4dCwjdGVsbG1ldGVzdHNuLHByb2dyYW1tL3By

b2dyYW1tLmh0bSwwLjE4OTQ5NTI3NDE0NjIxMDky

[/TWOWAY]
```

   Notice that the template prompts you for a store code.

2. Click or tap *Reply*.

   If your device or program has an option to include the body of the e-mail (for example, Reply with Text or Include Original Text), select it. This option ensures that the content of the template is included in the reply. Two-Way Email requires the content to correctly process the reply.

3. Enter the store code you are interested in.

4. Click or tap *Send*.

   Two-Way Email sends the comparison report to you. For example, if you requested information on store code R1088, you receive the following:

```
PAGE    1

Category     Store ID   Dollar Sales
--------     --------   ------------
Coffee       R1088           1375040
```

CHAPTER 16

Using PDA Sync

Topics:

- PDA Sync Requirements
- Subscribing to a Channel
- Viewing Standard Reports on Your PDA
- Viewing Deferred Reports on Your PDA

If you are using a Pocket PC or Palm OS® Personal Digital Assistant (PDA) and your Managed Reporting Administrator has made the WebFOCUS PDA Sync feature available to you, you can receive WebFOCUS Managed Reporting-based Standard Reports and Deferred Reports on your PDA. Only HTML reports, text reports, and GIF-based graphs are supported by AvantGo, which enables you to view content on your PDA.

PDA Sync Requirements

To receive Standard Reports on your PDA, your Managed Reporting Administrator must already have performed the following functions:

- Enabled a Standard Report for PDA Sync.
- Created an AvantGo channel from the current Managed Reporting Repository.
- Authorized you to use PDA Sync.

If you need more detailed information about Managed Reporting Administrator functions, see the *Managed Reporting Development and Administration Developer Studio Edition* documentation. For more information about AvantGo, see the *WebFOCUS Technology Guide*.

Subscribing to a Channel

WebFOCUS Standard Reports are enabled for sync through a publish and subscribe approach. Once a channel is published by the Managed Reporting Administrator, you must subscribe to that channel in order to receive any data.

You automatically receive a subscription created by your Managed Reporting Administrator when you sync your PDA.

For more information about synchronization, see the AvantGo documentation and the documentation for your PDA.

Viewing Standard Reports on Your PDA

After you synchronize your PDA (with HotSync or PC ActiveSync), you are ready to view WebFOCUS Standard Reports.

Procedure How to View WebFOCUS Standard Reports on your PDA

After synchronizing your PDA, perform the following steps:

1. Select the *Applications* icon.

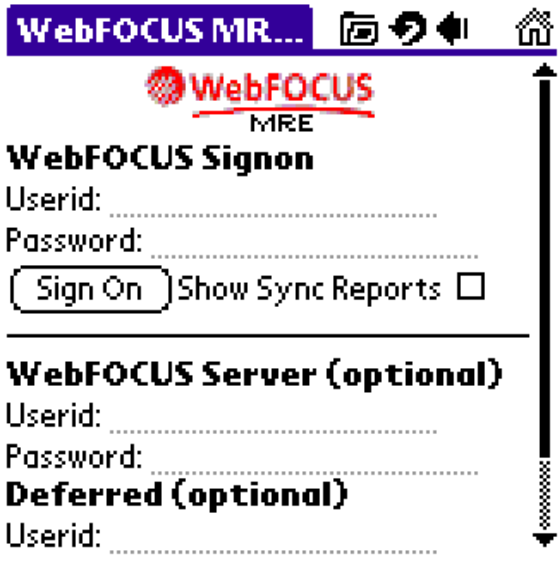
   The Applications window opens:

2. Select *AvantGo*.

The AvantGo channels window opens:

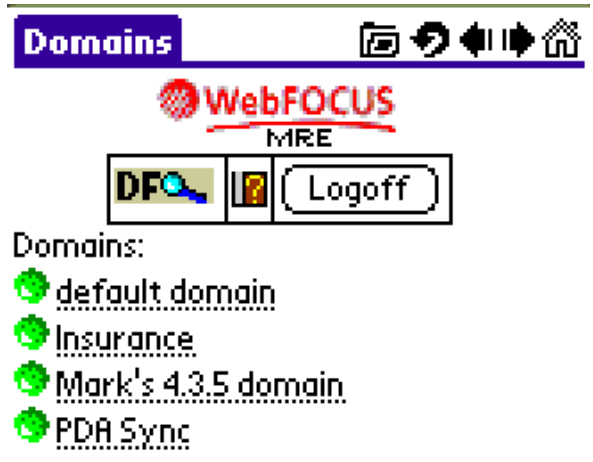
3. Select the channel you wish to navigate (for example, *PDA Sync*).

The WebFOCUS login page opens:



4. Enter your Managed Reporting security credentials on the login page and click *Sign On*.

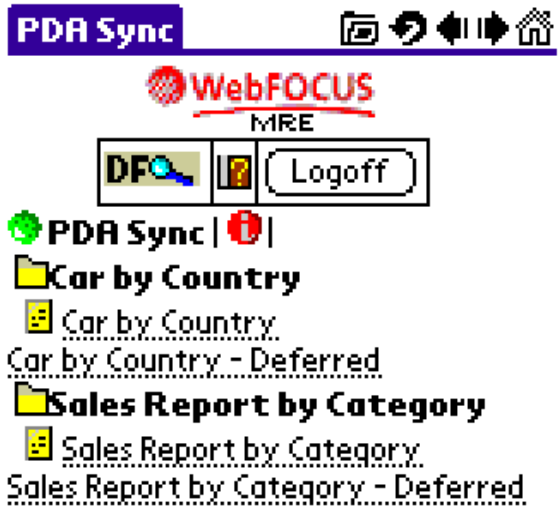
The Domains window opens:



Note: You only need to enter your security credentials the first time you sync your PDA. Every time thereafter, a persistent cookie is held on the AvantGo Enterprise Server on behalf of your registered device. The cookie holds your Managed Reporting login information.

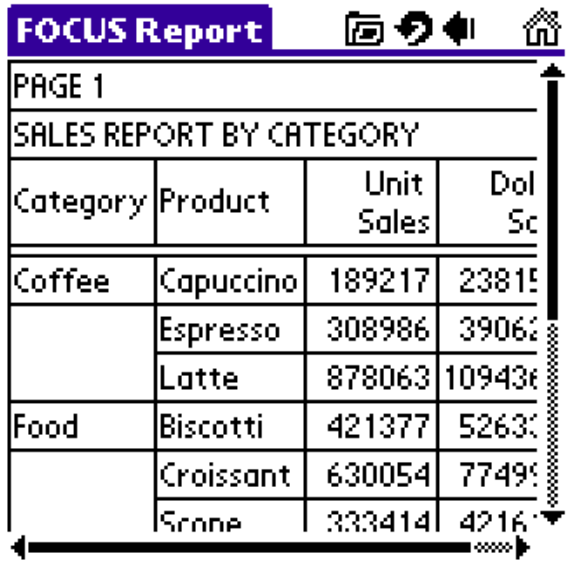
5. Select the Domain you wish to navigate (for example, *PDA Sync*).

   The report folders within that Domain display:



6. Select the report you want to view (for example, *Sales Report by Category*).

7. The Sales Report by Category report opens:



Note: Due to space limitations, the entire report does not display on the screen. You can view the rest of the report by using the navigation arrows located at the side and bottom of the screen.

8. To return to the previous menu options, select the back arrow located on the top right toolbar.

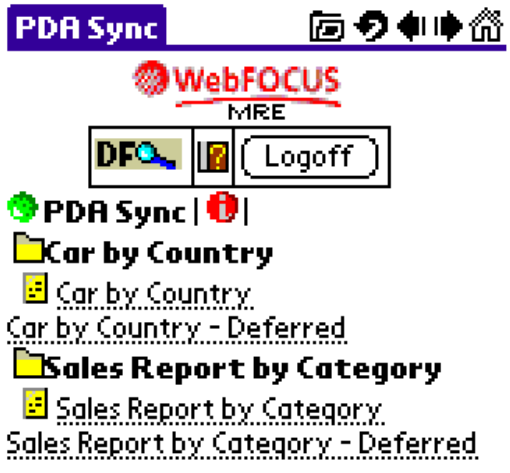
Viewing Deferred Reports on Your PDA

Your Managed Reporting Administrator can also flag WebFOCUS Deferred Reports for PDA Sync. To view Deferred Reports on your PDA you need to access AvantGo, as described in the first four steps of the previous procedure, *How to View WebFOCUS Standard Reports on your PDA* on page 16-3.

Procedure How to View Deferred Reports on Your PDA

1. Select the domain you wish to navigate from the domain's window.

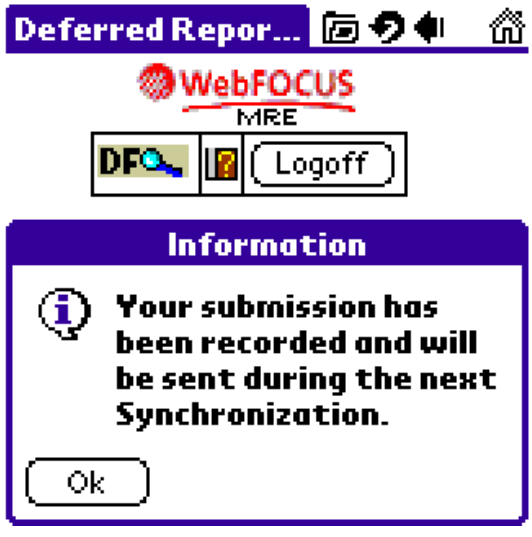
   The report folder within that domain appears:



2. Select the Deferred Report (for example, *Sales Report by Category - Deferred*).

   The following window appears:

3. Select *Defer* to submit the request. The following window opens:



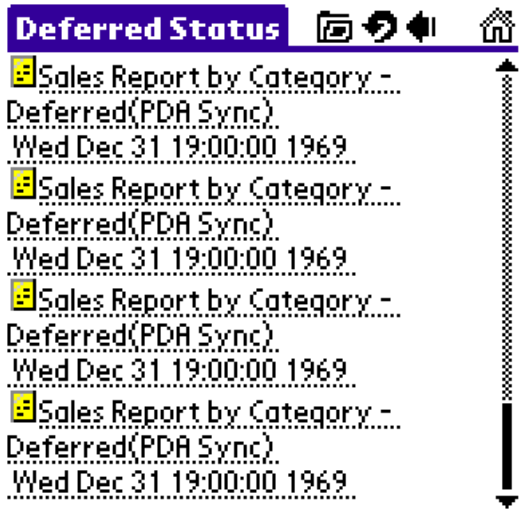
4. Click *OK*. The following window opens:

5. Sync your reports and then return to AvantGo.

   Note: For more information about synchronization, see the AvantGo documentation and the documentation for your PDA.

6. Select the Deferred Reports icon to see a listing of all Completed and Queued Deferred Reports.

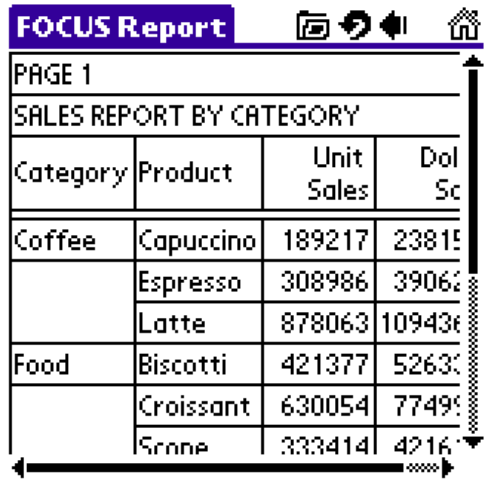
   The Deferred Status window opens:



   Note: In this example, the Sales Report by Category - Deferred report displays four times, since it was synchronized four times.

7. Select the report you want to view (for example, Sales Report by Category - Deferred).

   The report opens:



APPENDIX A

Assigning Field Formats

Topics:

- Types of Formats
- Numeric Formats
- Alphanumeric Format
- Date Format
- Text Field Format
- Character-based Large Object (CLOB) Format
- Assigning Field Formats With Graphical Tools

The field format describes how you want a field to be formatted when WebFOCUS displays it in reports. You must assign the field a format based on the values it will hold.

The field format specifies:

- The field's data type, which indicates whether the field contains alphanumeric, numeric, or date values.
- The field length, which determines the maximum number of positions an alphanumeric or numeric field can contain.
- Display options that affect how numeric and date values appear in reports, such as date formatting, floating dollar signs, and zero suppression.

Types of Formats

You can specify several types of formats:

- **Numeric.** There are four numeric formats:
  - **Integer.** Whole numbers, using 4 bytes of storage and a maximum number of 9 positions. Numbers after the decimal are truncated.
  - **Decimal (Floating-Point Double-Precision).** Used for whole numbers or fractions, using 8 bytes of storage and a maximum number of 16 positions. This type of field automatically inserts a comma after every third significant digit.
  - **Floating-Point Single-Precision.** Whole number or fractions, using 4 bytes of storage and a maximum number of 9 positions.
  - **Packed.** Whole numbers or fractions, using 8 bytes of storage and a maximum number of 33 positions. This type of field will automatically round any number with more than the specified number of decimal places to the number of decimal places in the format. Recommended for monetary values.
  - **Alphanumeric.** Assign the Alphanumeric format to values composed of any combination of alphabetic, numeric, or special characters, up to 256 characters in length.
- **Date.** Assign the Date format to define date components such as year, quarter, month, day, and day of week; to sort by date; to do date comparisons and arithmetic with dates; and to automatically validate dates in transactions. (Note that for some uses, such as assigning a date value using the DECODE function, you may wish to instead use alphanumeric, integer, or packed-decimal fields with date display options which provide partial date functionality.)
- **Text.** Assign text format to display text fields between 1 and 256 characters.
- **Character-based Large Object (CLOB).** Assign CLOB format to display CLOB fields (257 characters or more in length) as text fields.

For additional information about field formats see *Describing Data With WebFOCUS Language*.

Numeric Formats

The four types of numeric formats are integer, decimal (floating-point double-precision), floating-point single-precision, and packed decimal. You can perform numeric calculations on values in numeric fields.

For all numeric fields, you can select display options to indicate how you want the field to appear in reports. For details see *Numeric Display Options* on page A-7.

Integer Format

You can use integer format for whole numbers—that is, any value composed of the digits zero to eleven, without a decimal point. (For larger values, consider decimal or packed format.)

You can also use integer fields with date display options to provide limited date support. This use of integer fields is described in the *Alphanumeric and Numeric Formats With Date Display Options* on page A-23.

Tip: If the value contains decimal places, the system:

1. Truncates the decimal portion.
2. Stores the truncated value.

Syntax **How to Specify an Integer Format**

`I`*`n`*

where:

`n`

Is the maximum number of digits, up to eleven digits. The default length is 5.

Display options are described in *Numeric Display Options* on page A-7.

Example **Specifying an Integer Format**

Format	Display
`I6`	`4316`
`I2`	`22`
`I4`	`-617`

Decimal (Floating-Point Double-Precision Format)

You can use floating-point double-precision format for any number, including numbers with decimal positions—that is, for any value composed of the digits zero to twenty and an optional decimal point.

If the value contains more decimal places than the field format specifies, the system:

1. Stores as many decimal places as the field can hold (8 bytes).
2. Rounds to the specified number of decimal places only for display.

Note: A decimal field automatically inserts a comma (or a period if continental decimal notation is in effect) after every third significant digit when the value appears in a report.

Syntax How to Specify a Decimal (Floating-Point Double-Precision) Format

`Dt[.s]`

where:

t

Is the maximum number of characters to be displayed, up to a maximum of 20 including digits, a leading minus sign if the field will contain any negative values, and an optional decimal point if you want one to be displayed. The default length is 12.2.

s

Is the number of digits that will follow the decimal point. It can be up to 18 digits.

The compatible display options are described in *Numeric Display Options* on page A-7.

Example Specifying a Floating-Point Double-Precision Format

Format	Display
D8.2	3,187.54
D8	416

In the case of D8.2, the 8 represents the maximum number of places including the decimal point and decimal places. The 2 represents how many of these eight places are decimal places. The commas are automatically included in the display, and are not counted in the total.

Floating-Point Single-Precision Format

You can use floating-point single-precision format for any number, including numbers with decimal positions—that is, for any value composed of the digits 0 to 9, including an optional decimal point. This format is intended for use with smaller decimal numbers; unlike floating-point double-precision format, its length cannot exceed nine positions. For larger values, consider decimal format.

If the value contains more decimal places than the field format specifies, the system:

1. Stores as many decimal places as the field can hold (4 bytes).
2. Rounds the value to the specified number of decimal places only for display.

Syntax How to Specify a Floating-Point Single-Precision Format

`F`*`t`*`[.`*`s`*`]`

where:

t

Is the maximum number of characters to be displayed, up to a maximum of 9, including digits, a leading minus sign if the field will contain any negative values, and an optional decimal point if you want one to be displayed. The default length is 7.2.

s

Is the number of digits that will follow the decimal point.

The compatible display options are described in *Numeric Display Options* on page A-7.

Example Specifying a Floating-Point Single-Precision Format

Format	Display
`F5.1`	`614.2`
`F4`	`318`

Packed-Decimal Format

You can use packed-decimal format for any number, including decimal numbers—that is, for any value composed of the digits 0 to 9, including an optional decimal point. Packed decimal format is particularly useful with monetary values.

If the value contains more decimal places than the field format specifies, the system:

1. Rounds the number to the specified number of decimal places.
2. Stores the rounded value.

You can also use packed-decimal fields with date display options to provide limited date support. This use of packed-decimal fields is described in *Alphanumeric and Numeric Formats With Date Display Options* on page A-23.

Syntax How to Specify a Packed-Decimal Format

`Pm.n`

where:

m

Is the maximum number of characters to be displayed, up to a maximum of 33 positions (which include a position for the sign and decimal place). The default length is 12.2.

n

Is the number of digits that will follow the decimal point. It can be up to 31 digits.

The compatible display options are described in *Numeric Display Options* on page A-7.

Example Specifying a Packed-Decimal Format

Format	Display
`P9.3`	`4168.368`
`P7`	`617542`

Numeric Display Options

Display options may be used to edit numeric formats in various ways. Display options affect only how the data in the field is printed or appears on the screen. Display options do not affect how the data is stored in your file.

Edit Option	Meaning	Effect
`C`	Comma inclusion	Inserts a comma after every third significant digit, or a period instead of a comma if Continental Decimal Notation is in use.
`S`	Zero suppress	If the data value is zero, prints a blank in its place.
`B`	Bracket negative	Encloses negative numbers in parentheses.
`R`	Credit negative	Places CR after negative numbers.
`L`	Leading zeroes	Adds leading zeroes.
`M`	Floating dollar	Places a floating dollar sign to the left of the highest significant digit.
`N`	Non-floating dollar	Places a dollar sign to the left of the field.
`E`	Scientific notation	Displays only significant digits.
`YMD`	Year-Month-Day	Displays alphanumeric or integer data as a date in the form year/month/day.
`MDY`	Month-Day-Year	Displays alphanumeric or integer data as a date in the form month/day/year.
`DMY`	Day-Month-Year	Displays alphanumeric or integer data as a date in the form day/month/year.
`T`	Month translation	Displays the month as a three-character abbreviation.
`c`	Comma suppress	Suppresses the display of commas in numeric columns.
`%`	Percent	Displays a percent sign along with numeric data.

Reference Numeric Display Options Usage Notes

- Options may be specified in any order.
- Options M and N (floating and non-floating dollar sign) and data format D (floating-point double-precision) automatically invoke option C (comma).
- Options L and S cannot be used together.
- Option T (translate month) can be included anywhere in an alphanumeric or integer USAGE specification that includes the M (month) display option.
- Date display options (D, M, T, and Y), which cannot be used with floating-point fields, are described in *Alphanumeric and Numeric Formats With Date Display Options* on page A-23.
- Options c (comma suppress) and % (percent) are available only when the Decimal (D), Integer (I), Floating (F), or Packed (P) format is selected in the Format Types group box.
- Option c (comma suppress) may only be used with numeric format options that automatically invoke comma inclusion option C.

  Using this option with other numeric data types has no effect.
- Option % (percent) may be used only when the M (floating dollar sign), N (non-floating dollar sign), or E (scientific notation) edit options are not selected in the Edit Options group box. If you select the M, N, or E edit options, the percent edit option becomes disabled.

Example Using Numeric Display Options

The following table shows examples of the display options that are available for numeric fields.

Option	Format	Data	Display
Comma inclusion	I6C	41376	41,376
Zero suppression	D6S	0	
Bracket negatives	I6B	-64187	(64187)
Credit negative	I8R	-3167	3167 CR
Leading zeros	F4L	31	0031
Floating dollar	D7M	6148	$6,148
Non-floating dollar	D7N	5432	$ 5,432
Scientific notation	D12.5E	1234.5	0.123456D+04
Year/month/day	I6YMD I8YYMD	980421 19980421	98/04/21 1998/04/21
Month/day/year	I6MDY I8MDYY	042198 04211998	04/21/98 04/21/1998
Day/month/year	I6DMY I8DMYY	210498 21041998	21/04/98 21/04/1998
Month translation	I2MT	07	JUL
Comma suppress	D6c D7Mc D7Nc	41376 6148 6148	41376 $6148 $ 6148
Percent	I2% D7% F3.2%	21 6148 48	21% 6,148% 48.00%

Several display options can be combined, as shown:

Format	Data	Display
I5CB	-61874	(61,874)

Rounding

When a value with decimal places is assigned to a numeric field, if there are more decimal places in the value than are specified in the field's length description, FOCUS rounds the value to an acceptable size before either storing or displaying it. Integer fields (format I) and packed decimal fields (format P) are rounded before they are stored. Floating-point fields (format F and D) are stored as entered and rounded for display.

WebFOCUS handles the details of rounding in the following way for the following numeric formats:

- **Integer format.** When a value with decimal places is assigned to an integer field, the value is rounded before it is stored. If the value is assigned with a DEFINE or COMPUTE command, the decimal portion of the value is truncated before it is stored.
- **Packed-decimal format.** When a value is assigned to a packed-decimal field, and the value has more decimal places than the field's format specifies, the value is rounded before it is stored.
- **Floating-point double- and single-precision formats.** When a value is assigned to one of these fields, and the value has more decimal places than the field's format specifies, the full value is stored in the field (up to the limit of precision determined by the field's internal storage type). When this value is later displayed, however, it is rounded.

  Note: If the decimal portion of a floating-point value *as it is internally represented in hexadecimal floating-point notation* is repeating—that is, non-terminating—the repeating hexadecimal number is resolved as a non-repeating slightly lower number, and this lower number is stored as the field's value. In these situations, if in the original value of the digit to be rounded had been a five (which would be rounded up), in the stored lower value it would become a four (which is rounded down).

Example Rounding a Packed-Decimal Field With Two Decimal Places

Consider a packed-decimal field with two decimal places

```
FIELDNAME = PRESSURE, FORMAT = P8.2, $
```

to which you assign a value with *four* decimal places:

```
PRESSURE = 746.1289
```

The first extra digit—that is, the first one past the specified length of two decimal places—is 8. Since 8 is greater than or equal to 5, the value is rounded up, and becomes:

```
746.13
```

Example Rounding a Floating-Point Double-Precision Field With One Decimal Place

Consider a floating-point double-precision field with one decimal place

```
FIELDNAME = VELOCITY, FORMAT = D5.1, $
```

to which you assign a value with *two* decimal places:

```
VELOCITY = 1.15
```

This value is stored as a slightly smaller number due to the special circumstances of floating-point arithmetic, as previously described:

```
1.149999
```

While the original number, 1.15, would have been rounded upward to 1.2 (since the first extra digit was 5 or greater), the number as stored is slightly less than 1.15 (1.149999) and, as the first extra digit is now less than 5 (4 in this case), it is rounded down to 1.1. To summarize the process:

format:	`D5.1`
entered:	`1.15`
stored:	`1.149999`
rounded:	`1.1`
displayed:	`1.1`

Alphanumeric Format

You can use alphanumeric format for any value to be interpreted as a sequence of characters and composed of any combination of digits, letters, and other characters.

You can also use alphanumeric fields with date display options to provide limited date support. This use of alphanumeric fields is described in *Alphanumeric and Numeric Formats With Date Display Options* on page A-23.

You can concatenate alphanumeric values, but you cannot perform mathematical operations on an alphanumeric field, even if the field's value is composed of numeric characters.

Tip: WebFOCUS provides an EDIT function that enables you to perform numeric operations on an alphanumeric field. See the *Using Functions* manual for details.

Syntax How to Specify an Alphanumeric Format

```
An
```

where:

n

Is the maximum number of characters in the field, up to 256 characters. The default length is 20.

Tip: The standard numeric display options are not available for the alphanumeric data format.

However, alphanumeric data can be printed under the control of a pattern that is supplied at run time. For instance, if a product code is to be displayed in parts with each part separated by a "-", the following could be included at report time in a virtual field

```
PRODCODE/A11 = EDIT (xxxxx,'999-999-999') ;
```

where:

xxxxx

Is the existing field name, not the newly defined field name.

If the value is 716431014, PRODCODE will be displayed as 716-431-014.

Example Specifying an Alphanumeric Format

Format	Display
A115	The minutes of today's meeting were submitted...
A2	B3
A24	127-A429-BYQ-49

Date Format

Date format enables you to define a field as a date and manipulate the field's value and display that value in ways appropriate to a date. Using date format, you can:

Define date components such as year, quarter, month, day, and day of week, and extract them easily from date fields.

- Sort reports into date sequence, regardless of how the date is displayed.
- Do arithmetic with dates and compare dates without resorting to special date-handling functions.
- Refer to dates in a natural way, such as JAN 1 1995, without regard to display or editing formats.
- Automatically validate dates in transactions.

Date Format Display Options

The date format does not specify type or length; instead, it specifies date component options (D, W, M, Q, Y, and YY) and display options. These options are shown in the following chart.

Display Option	Meaning	Effect
`D`	Day	Prints a value from 1 to 31 for the day.
`M`	Month	Prints a value from 1 to 12 for the month.
`Y`	Year	Prints a two-digit year.
`YY`	Four-digit year	Prints a four-digit year.
`T`	Translate month or day	Prints a three-letter abbreviation for the month or day in uppercase, if M or D is included in the FORMAT specification. †
`t`	Translate month or day	Prints a three-letter abbreviation for the month or day, capitalizing only the first letter of the month or day, if M or D is included in the FORMAT specification.* †
`TR`	Translate month or day	Prints the full name of the month or day in uppercase, if M or D is included in the FORMAT specification. †

Display Option	Meaning	Effect
`tr`	Translate month or day	Prints the full name of the month or day, capitalizing only the first letter of the month or day, if M or D is included in the FORMAT specification.* †
`Q`	Quarter	Prints the quarter (1 - 4 if Q is specified by itself, or Q1 - Q4 if it is specified together with other date format items such as Y).
`W`	Day-of-Week	If it is included in a FORMAT specification with other date component options, prints a three-letter abbreviation of the day of the week in uppercase. If it is the only date component option in the FORMAT specification, it prints the number of the day of the week (1-7, Mon=1).†
`w`	Day-of-Week	Functions as uppercase W (described above), except that the first letter is uppercase and the following letters are lowercase. *†
`WR`	Day-of-Week	Functions the same as uppercase W (described above), except that the entire day name is printed instead of an abbreviation. *†
`wr`	Day-of-Week	Functions the same as lowercase w (described above), except that the entire day name is printed instead of an abbreviation. *†
`JUL`	Julian format	Prints date in Julian format.
`YYJUL`	Julian format	Prints a Julian format date in the format YYYYDDD. The 7-digit format displays the four-digit year and the number of days counting from January 1. For example, January 3, 2001 in Julian format is 2001003.

Note: When using these display options, be sure they are actually stored in the Master File as lowercase letters.

Reference Storage of Y, YY, M, and W Field Formats

The Y, YY, and M formats are not smart dates. Smart date formats YMD and YYMD are stored as an offset from the base date of 12/31/1900. Smart date formats YM, YQ, YYM, and YYQ are stored as an offset from the base date 01/1901. W formats are stored as integers with a display length of one, containing values 1-7 representing the days of the week. Y, YY, and M formats are stored as integers. Y and M have display lengths of two. YY has a display length of four. When using Y and YY field formats, keep in mind these two important points:

- The Y formats will not sort based on DEFCENT and YRTHRESH settings. A field with a format of Y will not equal a YY field, as this is not a displacement, but a 4-digit integer.
- It is possible to use DEFCENT and YRTHRESH to convert a field from Y to YY format.

Date Literals Interpretation Table

This table illustrates the behavior of WebFOCUS date formats. The columns indicate the number of input digits for a date format. The rows indicate the usage or format of the field. The intersection of row and column describes the result of input and format.

Date Format	1	2	3	4
YYMD	*	*	CC00/0m/dd	CC00/mm/dd
MDYY	*	*	*	*
DMYY	*	*	*	*
YMD	*	*	CC00/0m/dd	CC00/mm/dd
MDY	*	*	*	*
DMY	*	*	*	*
YYM	CC00/0m	CC00/mm	CC0y/mm	CCyy/mm
MYY	*	*	*	*
YM	CC00/0m	CC00/mm	CC0y/mm	CCyy/mm
MY	*	*	0m/CCyy	mm/CCyy
M	0m	mm	*	*
YYQ	CC00/q	CC0y/q	CCyy/q	0yyy/q
QYY	*	*	q/CCyy	*
YQ	CC00/q	CC0y/q	CCyy/q	0yyy/q

Date Format	1	2	3	4
QY	*	*	q/CCyy	*
Q	q	*	*	*
JUL	CC00/00d	CC00/0dd	CC00/ddd	CC0y/ddd
YY	000y	00yy	0yyy	yyyy
Y	0y	yy	*	*
D	0d	dd	*	*
W	w	*	*	*

Date Format	5	6	7	8
YYMD	CC0y/mm/dd	CCyy/mm/dd	0yyy/mm/dd	yyyy/mm/dd
MDYY	0m/dd/CCyy	mm/dd/CCyy	0m/dd/yyyy	mm/dd/yyyy
DMYY	0d/mm/CCyy	dd/mm/CCyy	0d/mm/yyyy	dd/mm/yyyy
YMD	CC0y/mm/dd	CCyy/mm/dd	0yyy/mm/dd	yyyy/mm/dd
MDY	0m/dd/CCyy	mm/dd/CCyy	0m/dd/yyyy	mm/dd/yyyy
DMY	0d/mm/CCyy	dd/mm/CCyy	0d/mm/yyyy	dd/mm/yyyy
YYM	0yyy/mm	yyyy/mm	*	*
MYY	0m/yyyy	mm/yyyy	*	*
YM	0yyy/mm	yyyy/mm	*	*
MY	0m/yyyy	mm/yyyy	*	*
M	*	*	*	*
YYQ	yyyy/q	*	*	*
QYY	q/yyyy	*	*	*

Date Format	5	6	7	8
YQ	yyyy/q	*	*	*
QY	q/yyyy	*	*	*
Q	*	*	*	*
JUL	CCyy/ddd	*	*	*
YY	*	*	*	*
Y	*	*	*	*
D	*	*	*	*
W	*	*	*	*

- CC stands for two century digits provided by DFC/YRT settings.
- * stands for error message FOC177 (invalid date constant).
- WebFOCUS reads date literals from right to left.

Controlling the Date Separator

You can control the date separators when the date is displayed. In basic date format, such as YMD and MDYY, the date components are displayed separated by a slash character (/). The same is true for the year-month format. Year-quarter format is displayed with the year and quarter separated by a blank (for example, 94 Q3 or Q3 1994). The single component formats display just the single number or name.

The separating character can be changed to a period, a dash, or a blank, or can even be eliminated entirely. The following table shows the FORMAT specifications that can be used to change the separating character.

Format	Display
YMD	93/12/24
Y.M.D	93.12.24
Y-M	93-12
YBMBD	93 12 24 (The letter B signifies blank spaces.)
Y|M|D	931224 (The concatenation symbol "|" eliminates the separation character.)

Date Translation

Numeric months and days can be replaced by a translation, such as JAN, January, Wed, or Wednesday. The translated month or day can be abbreviated to three characters or spelled out completely. It can appear in either uppercase or lowercase. In addition, the day of the week can be appended to the beginning or end of the date. All of these options are independent of each other.

Translation	Display
`MT`	JAN
`Mt`	Jan
`MTR`	JANUARY
`Mtr`	January
`WR`	MONDAY
`wr`	Monday

Sample Date Formats

The following chart shows some sample USAGE and ACTUAL formats for data stored in a non-FOCUS data source. The Value column shows the actual data value, and the Display column shows how the data is displayed.

USAGE	ACTUAL	Value	Display
`wrMtrDYY`	`A6YMD`	990315	Monday, March 15, 1999
`YQ`	`A6YMD`	990315	99 Q1
`QYY`	`A6YMD`	990315	Q1 1999
`YMD`	`A6`	990315	99/03/15
`MDYY`	`A6YMD`	990315	03/15/1999

Note: The date attributes in the ACTUAL format specify the order in which the date is stored in the external file. If the ACTUAL format does not specify the order of the month, day, and year, it will be inferred from the USAGE format, as illustrated in row four.

Using Date Fields

A field formatted as a date is automatically validated when it is entered. It can be entered as a natural date literal (for example, JAN 12 1999) or as a numeric date literal (for example, 011299).

Natural date literals, by including spaces between date components and using abbreviations of month names, enable you to specify a date in a natural, easily understandable way. For example, April 25, 1999 can be specified as any of the following natural date literals:

```
APR 25 1999
25 APR 1999
1999 APR 25
```

Natural date literals can be used in all date computations and with the PROMPT, FREEFORM, and FIXFORM statements when updating a file. Examples are shown in the following chart.

In WHERE screening	`WHERE MYDATE IS 'APR 25 1999'`
In arithmetic expressions	`MYDATE - '1999 APR 25'`
In computational date comparisons	`IF MYDATE GT '25 APR 1999'`
In replies to MODIFY prompts	`MYDATE==> APR 25 1999`
In comma-delimited data	`...,MYDATE = APR 25 1999, ...`

Note that natural date literals cannot be used to enter dates using FIDEL.

The following chart describes the format of natural date literals.

Literal	**Format**
Year-month-day	Four-digit year, uppercase three-character abbreviation or uppercase full name of the month, and one or two digit day of the month (for example, 1999 APR 25 or APRIL 25 1999).
Year-month	Four-digit year and uppercase three-character abbreviation or full name of the month.
Year-quarter	Four-digit year, Q plus quarter number for quarter (for example, 1999 Q3).
Month	Uppercase three-character abbreviation or full name of the month.
Quarter	Q plus quarter number for quarter (for example, 1999 Q3).
Day of week	Three-character uppercase abbreviation, or full uppercase name of the day (for example, MON or MONDAY).

The date components of a natural date literal can be specified in any order, regardless of their order in the FORMAT specification of the target field. Date components are separated by one or more blanks.

For example, if a FORMAT specification for a date field is YM, a natural date literal written to that field can include the year and month in any order. MAY 1999 and 1990 APR would both be valid literals.

Numeric Date Literals

Numeric date literals differ from natural date literals in that they are simple strings of digits. The order of the date components in a numeric date literal must match the order of the date components in the corresponding FORMAT specification. In addition, the numeric date literal must include all of the date components included in the FORMAT specification. For example, if the FORMAT specification is DMY, then April 25 1999 must be represented as:

```
250499
```

Numeric date literals can be used in all date computations and all methods of file updating.

Date Fields in Arithmetic Expressions

The general rule for manipulating date fields in arithmetic expressions is that date fields in the same expression must specify the same date components. The date components can be specified in any order, and display options are ignored. Valid date components are Y or YY, Q, M, W, and D.

Note that arithmetic expressions assigned to quarters, months, or days of the week are computed modulo 4, 12, and 7, respectively, so that anomalies like fifth quarters and thirteenth months are avoided.

For example, if NEWQUARTER and THISQUARTER both have FORMAT specifications of Q, and the value of THISQUARTER is 2, then the following statement

```
NEWQUARTER = THISQUARTER + 3
```

gives NEWQUARTER a value of 1 (that is, the remainder of 5 divided by 4).

Converting Date Fields

You can also convert date fields. Two types of conversions are possible: format conversion and date component conversion. In format conversion, the value of a date format field can be assigned to an alphanumeric or integer field that uses date display options (see the following section); the reverse conversion is also possible.

In date component conversion, a field whose format specifies one set of date components can be assigned to another field specifying different date components. For example, the value of REPORTDATE (DMY) can be assigned to ORDERDATE (Y); in this case, the year is being extracted from REPORTDATE. If REPORTDATE is Apr 27 89, ORDERDATE is 89. You can also assign the value of ORDERDATE to REPORTDATE; if the value of ORDERDATE is 89, the value of REPORTDATE would be Jan 1 89. In this case, REPORTDATE is given values for the missing date components.

Syntax How to Convert Date Fields

The general formula for converting date fields is

```
field1/format = field2;
```

where:

field1

Is a date format field, or an alphanumeric or integer format field using date display options.

format

Is the FORMAT (or USAGE) specification of *field1* (the target field).

field2

Is a date format field, or an alphanumeric or integer format field using date display options. The format types (alpha, integer, or date) and the date components (YY, Y, Q, M, W, D) of *field1* and *field2* do not need to match.

How Date Fields Are Represented Internally

WebFOCUS represents date fields internally as four-byte binary integers indicating the elapsed time since the date format base date. For each field, the unit of elapsed time is that field's smallest date component.

For example, if the format specification of REPORTDATE is MDY, then elapsed time is measured in days, and internally the field contains the number of days elapsed between the entered date and the base date. If you entered the numeric literal for February 13, 1964 (that is, 021364), and then printed the field in a report, 02/13/64 would be displayed. If you used it in the equation

```
NEWDATE = 'FEB 28 1964' - REPORTDATE ;
DAYS/D = NEWDATE ;
```

then the value of DAYS would be 15. However, the internal representation of REPORTDATE would be a four-byte binary integer representing the number of days between December 31, 1900 and February 13, 1964.

Just as the unit of elapsed time is based on a field's smallest date component, so too is the base date. For example, for a YQ field, elapsed time is measured in quarters and the base date is the first quarter of 1901. For a YM field, elapsed time is measured in months and the base date is the first month of 1901.

Date Format Support

Date format fields are used in special ways with the following WebFOCUS facilities:

- **FIDEL.** Natural date literals cannot be used to enter data via FIDEL.
- **Dialogue Manager.** Amper variables can function as date fields if they are set to natural date literals. For example:

  ```
  -SET &NOW = 'APR 25 1960' ;
  -SET &LATER = '1990 25 APR' ;
  -SET &DELAY = &LATER - &NOW ;
  ```

  In this case, the value of &DELAY is the difference between the two dates, measured in days: 10,957.
- **Extract files.** Date fields in SAVB and unformatted HOLD files are stored as four-byte binary integers representing the time difference between the field's face value and the standard FOCUS base date. Date fields in save files and formatted hold files (for example, FORMAT WP) are stored in internal format, without any display options.
- **Graph.** Date fields are not supported as sort fields in ACROSS and BY phrases.
- **Financial Modeling Language (FML).** Date fields are not supported within the RECAP statement.

Alphanumeric and Numeric Formats With Date Display Options

In addition to the standard date format, you can also represent a date by using an alphanumeric, integer, or packed-decimal field with date display options (D, M, Y, and T). Note, however, that this does not offer the full date support that is provided by the standard date format.

Alphanumeric and integer fields used with date display options have some date functionality when used with special date functions. See the *Using Functions* manual for details.

When representing dates as alphanumeric or integer fields with date display options, you can specify the year, month, and day. If all three of these elements are present, then the date has six digits (or eight if the year is presented as four digits) and the format can be:

Format	Display
I6MDY	04/21/98
I6YMD	98/04/21
P6DMY	21/04/98
I8DMYY	21/04/1998

A month's number (1 to 12) can be translated to the corresponding month name by adding the letter T to the format, immediately after the M. For instance:

Format	Data	Display
`I6MTDY`	05/21/98	MAY 21 98
`I4MTY`	0698	JUN 98
`I2MT`	07	JUL

If the date has only the month element, a format of I2MT will display the value 4 as APR, for example. This is particularly useful in reports where columns or rows are sorted by month. They will then appear in correct calendar order; for example, JAN, FEB, MAR, because the sorting is based on the numerical, not alphabetical, values. (Note that without the T display option, I2M would be interpreted as an integer with a floating dollar sign.)

Text Field Format

You can apply text format to a field in a relational or FOCUS data source, if the length of the field is between 1 and 256 characters.

Due to its free form and automatic wrap characteristics, this format provides flexibility for displaying characters in a field when values are unknown. To display characters with defined values, see *Alphanumeric Format* on page A-11.

Note: Text format is not currently supported in Financial Modeling Language (FML) reports.

Syntax **How to Specify a Text Field Format**

`FIELD = fieldname, ALIAS = aliasname, FORMAT = TXnn[F],$`

where:

`fieldname`

Is the name you assign the text field.

`aliasname`

Is an alternate name for the field name.

`nn`

Is the output display length in TABLE for the text field. The display length may be between 1 and 256 characters.

`F`

Is used to format the text field for redisplay when TED is called using ON MATCH or ON NOMATCH. When F is specified, the text field is formatted as TX80, and is displayed. When F is not specified, the field is redisplayed exactly as entered.

All letters, digits and special characters can be stored with this format.

Example Specifying a Text Field Format Display

The text field in the *courses* file is specified as:

```
FIELD = DESCRIPTION, ALIAS = CDESC, USAGE = TX50,$
```

The following are some sample text field formats.

Format	Display
TX50	This course provides the DP professional with the skills needed to create, maintain, and report from FOCUS databases.
TX35	This course provides the DP professional with the skills needed to create, maintain, and report from FOCUS databases.

The standard edit options are not available for the text field format.

Character-based Large Object (CLOB) Format

When accessing data from a relational data source, you can display CLOB fields with the CLOB format. CLOB fields in a relational data source are fields that contain more than 256 characters. These fields may be composed of any combination of alphabetic, numeric, or special characters. WebFOCUS automatically converts these fields to the FOCUS Text (TX) field format in the Master File.

If you define a field's format as CLOB in a Master File and include that field in a report, your report will display the CLOB field as a long text field (TX) of more than 256 characters in your report output. CLOB is supported for temporary fields, as well as fields in a data source.

CLOB format is not currently supported in Financial Modeling Language (FML) reports.

Assigning Field Formats With Graphical Tools

Developer Studio provides graphical tools that you can use to assign field formats to fields in a data source, to temporary fields, and to subtotal calculations:

- Assign formats to real and temporary fields in a Master File using the Master File Editor's General Tab (Field level). For details see *Creating Master Files* in *Describing Data With Graphical Tools*.
- Assign field formats to temporary fields defined outside of a Master File using the Format dialog box, which you can access from the Define and Compute tools.
- Assign field formats to subtotal calculations using the Format dialog box, which you access from the Report Painter's Recap dialog box.
- Change the formats of fields in a report using the Format dialog, which you can access from the Report Painter.
- Assign field formats to Recap output in financial reports using a variation on the Format dialog box, which you access from the Financial Report Painter. For details see *Creating Reports With Financial Report Painter*.

Reference

Assigning Field Formats in Master Files (Master File Editor)

When a field is selected in the left (Master File) frame, the General tab has the following fields/options:

Field Name

Enter a unique name (1-66 characters) in uppercase characters. The first character must be a letter. Do not use embedded blanks or special characters if you wish to include the field in a calculation. This is a required entry.

Field Alias

Enter a brief alternate name that you can use in requests as a synonym for the field name to minimize typing. (Length and format rules apply to aliases.) This is an optional entry.

If you create a report, the field name appears as a column heading unless you have specified an alternate title for the field. Aliases cannot be uses as column titles.

Field Property

Choose one of the following, to be used in conjunction with Field Reference:

PARENT_OF

Identifies this field as the parent of the referenced field in a hierarchy. This attribute can be specified on every field. Therefore, multiple hierarchies can be defined in one Master File. However, an individual field can have only one parent. If multiple fields have PARENT_OF attributes for the same hierarchy field, the first parent found by traversing the structure in top-down, left-to-right order is used as the parent.

CAPTION

Signifies that this field contains a descriptive caption that can be displayed in place of the hierarchy field values in a report. For example, if the employee ID is the hierarchy field, the last name may be the descriptive text to be displayed in place of the ID.

A caption can be specified for every field, but an individual field can have only one caption. If multiple fields have CAPTION attributes for the same hierarchy field, the first parent found by traversing the structure in top-down, left-to-right order will be used as the caption.

You can assign either PARENT_OF or CAPTION to a field in the data source or to a virtual field defined in the Master File.

Field Refererence

If PARENT is the field property, the reference is the child field in the hierarchy to say which field this is the parent of.

If CAPTION is the field property, the reference is the child field in the hierarchy to show which field to apply the caption to.

Format

The field Format option is a required entry. It enables you to assign a format to the field based on the values the field will hold. The options are: Alphanumeric, Numeric (Floating Point, Integer, Decimal, Packed), Date/Time, Text, and CLOB. For details see specific topics on each format type.

The input fields in the window adjust based on the format you select:

- Length is a required entry. The pane adjusts appropriately to indicate the maximum number of positions an alphanumeric or numeric field can contain.
- For fields with Numeric formats, you can assign display options that determine how the field will be displayed in reports.
- For fields with a Date format, you assign display options that determine how the field will be displayed in reports. You can also assign century values to the date field.

Index (standard B-tree)

Specify that you wish to index the values of a field to enhance data retrieval performance. Not available for virtual fields.

Allow Missing Data check box

Select this option to request a missing value for the field when it is read from the data source.

Not supported for virtual fields.

Expression box

For virtual fields only, type the syntax for the expression in the Expression input box.

The *Assist button* provides an alternative way to create expressions.

Assist button

For virtual fields only, click the *Assist* button to create an expression using the Define Expression dialog box.

The expression will display in the Expression box.

Reference Assigning Field Formats for Reporting (Format Dialog Box)

You can access the Format dialog box by clicking the *Format* button in the Compute, Define, and Recap dialog boxes to define field formats for temporary fields and subtotal calculations.

You can also access the Format dialog box from the shortcut or Properties menu for a selected field in the Report Painter window to change a field's format.

The Format dialog box has the following fields/options:

Format Types

Specifies the format of the current field: alphanumeric, CLOB, numeric, date, text, or dynamic.

Date

Launches the Date Format dialog box, where you can assign date formats, century options, and apply date and time display options. For more information, see *Applying Date Format Display Edit Options* on page A-30.

Length

Specifies the length, in characters, of a field. Enter a number in the Length box, or click the arrow buttons to specify a number.

Note: For numeric fields, include the decimal place in the length.

Decimal

Specifies the number of decimal places, to the right of the decimal point, in a Decimal, Packed Decimal, or Floating Point field.

Edit Options

Add display options to numeric or date fields format to control how the field will be appear on reports. For details see *Date Format Display Options* on page A-13.

Tip: For date fields, you can select basic edit options from the Format dialog box. However, there are a number of supplementary display options that are available, but not on this list.

With Field

When checked, displays the real fields from the specified Master File. You can then select the real field that will be associated with the temporary field.

Note: The Financial Report Painter provides a variation on the Format dialog box. The FML Format dialog box identifies the field type, field length, and display options that will be used for the Recap output. The field type can be alphanumeric, numeric, or date. For details see Chapter 10, *Creating Reports With Financial Report Painter*.

Reference Applying Date Format Display Edit Options

Access the Date Formats dialog box by clicking the *Date* button in the Format dialog box.

Date

Assign a date format to values that represent a date or date component.

Enable Edit Options

Check this box to enable Date, Month, and Actual Date edit options.

Edit Options

Scroll the Date, Month, and Actual Date lists to select format options.

The Actual Date drop-down list displays the date format based on the current selections in the Month and Day drop-down lists.

You can also choose a date format from the Actual Date drop-down list directly. The options in the Date, Month, and Day drop-down lists change according to the selections you make in the Actual Date drop-down list.

Century

Assign the two-digit century value option to control the century values of a field.

Base

Assign the two-digit base year option to control the century values of a field.

Time Options

Assign a time format to values that represent a time or time component. This is only enabled when the original date format (as described in a Master File) has a time component.

You can also insert the current date into an object area in the Report Painter window. For more information, see Chapter 3, *Creating Reports With the Report Painter*.

Procedure How to Change the Display of the Date Format

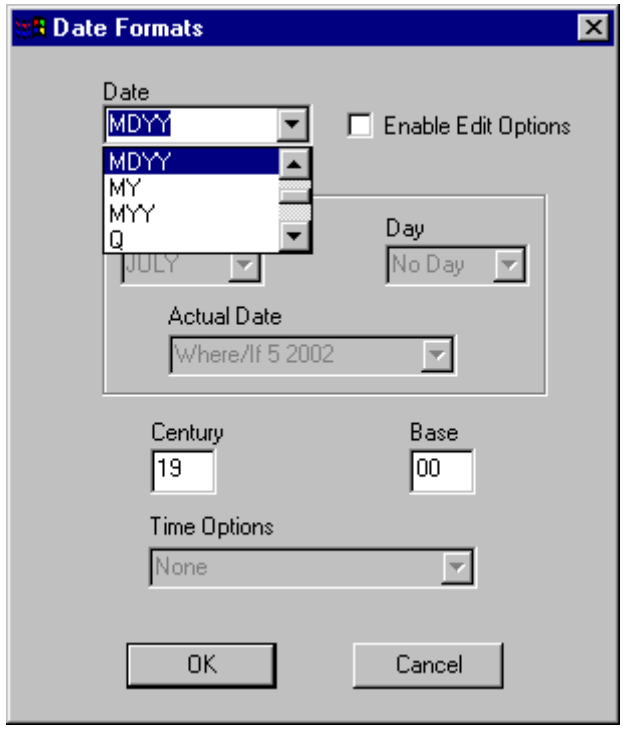
1. Select the date field in the Report Painter window that you want to change.
2. Right-click and select *Format* from the shortcut menu.

   or

   Choose *Format* from the Properties menu.

   The Format dialog box opens.
3. Click the *Date* button on the Format dialog box.

   The Date Formats dialog box opens.
4. Scroll the Date list to select a date format.



5. Click *OK*.

Procedure How to Enable Edit Options in the Date Formats Dialog Box

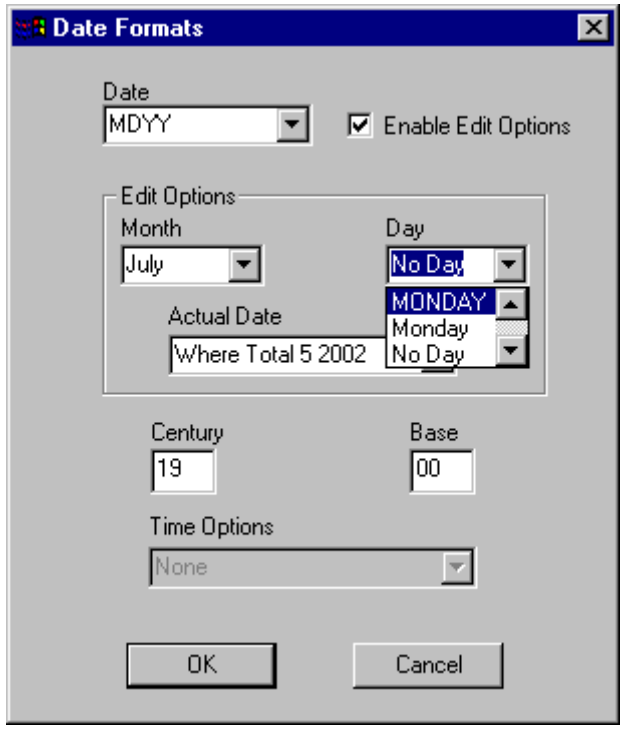
1. Select the date field in the Report Painter window that you want to change.
2. Right-click and select *Format* from the shortcut menu.

   or

   Choose *Format* from the Properties menu.

   The Format dialog box opens.
3. Click the *Date* button on the Format dialog box.

   The Date Formats dialog box opens.
4. Click the *Enable Edit Options* check box.
5. Scroll the Month, Day, and Actual Date lists and select the one(s) you wish to change.



6. Click *OK*.

Note that the availability of the formats depend on the date format type selected. If you select the YM date format, the Format dialog box only shows Month Edit options. If you select the YMD format, the Format dialog box shows the Date and Month edit options.

Procedure How to Change the Time Display

You have the option of changing the time display when you use a date field that contains a time component in the Master File.

1. Select the date time field in the Report Painter window that you want to change.
2. Right-click and select *Format* from the shortcut menu.

   or

   Choose *Format* from the Properties menu.

   The Format dialog box opens.
3. Click the *Date* button on the Format dialog box.

   The Date Formats dialog box opens.
4. Scroll the Time Options list select the one(s) you wish to change.
5. Click *OK*.

APPENDIX B

Writing Expressions

Topics:

- WebFOCUS Operations That Use Expressions
- Types of Expressions You Can Write
- Writing Numeric Expressions
- Writing Date Expressions
- Writing Alphanumeric Expressions
- Writing Logical Expressions
- Writing Conditional Expressions
- Writing Expressions With Graphical Tools
- Creating Expressions for Subtotal Calculations

An expression enables you to combine fields, constants, and operators in an operation that produces a single value. You can use an expression in a variety of WebFOCUS commands to assign that value to a temporary field or an amper (&) variable, or use it in screening. In addition, you can use expressions, functions, and subroutines as building blocks for more complex expressions.

When you write an expression, you can specify the operation yourself, or you can use one of the many functions and subroutines provided with WebFOCUS for performing specific calculations or data manipulations. WebFOCUS offers a rich set of functions and subroutines that operate on one or more arguments and return a single value as a result. Functions and subroutines provide a convenient way to perform certain calculations and manipulations. To use a function or a subroutine, you simply call it. See the *Using Functions* manual for more information.

WebFOCUS Operations That Use Expressions

You can use an expression in various WebFOCUS commands. An expression may not exceed 40 lines and must end with a semicolon, except in WHERE and WHEN criteria, where the semicolon is optional.

You can use expressions in the following WebFOCUS operations:

- Creating temporary fields, where an expression can be used to assign a value to a field. This field can be in the Master File, or in a field created with the Define tool or Computes tab, or with corresponding syntax.
  - COMPUTE command in a report request:

    ```
    COMPUTE field[/format] = expression;
    ```

  - DEFINE command preceding a report request:

    ```
    DEFINE FILE filename
       field[/format] = expression;
          .
          .
          .
       field[/format] = expression;
       END
    ```

  - DEFINE command in a Master File:

    ```
    DEFINE field[/format] = expression;$
    ```

- Defining record selection criteria and criteria that control the display of headings and footings, where an expression can define the conditions for evaluation.

  ```
  {WHERE|IF}logicalexpression[;]
  ```

  ```
  WHEN logicalexpression[;]
  ```

- Assigning values to variables using two Dialogue Manager commands. The -IF command controls branching, and the -SET command populates amper variables.

  ```
  -IF logicalexpression [THEN] GOTO label [ELSE GOTO label];
  ```

  ```
  -SET &variable = expression;
  ```

- Creating RECAP calculations:
  - In the Financial Modeling Language (FML):

    ```
    RECAP field [{n}] [/format] = expression;
    ```

  - In tabular report requests:

    ```
    {ON/BY} fieldname1 RECAP fieldname2 [/format] = expression;
    ```

  You can also use expressions to validate entries and updates in data maintenance procedures. See your WebFOCUS Maintain documentation for details.

Reference Usage Notes: Assigning Field Formats in Expressions

When you use an expression to assign a value to a field, be sure to assign a field format that is consistent with the value returned by the expression. For example, if you use an alphanumeric expression to concatenate the first name and last name into a value for the field FULL_NAME, make sure you assign that field an alphanumeric format with sufficient length to accommodate the concatenated name, as in the following example:

```
FULL_NAME/A25 = FIRST_NAME|LAST_NAME ;
```

Types of Expressions You Can Write

There are five types of expressions:

- **Numeric.** A numeric expression returns a numeric value. Use numeric expressions to perform calculations that use numeric constants or 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 = CURR_SAL * 0.05 ;
  ```

  For details, see *Writing Numeric Expressions* on page B-4.

- **Date.** A date expression returns a date or an integer that represents the number of days, months, quarters, or years between two dates. Use date expressions to perform numeric calculations that involve 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:

  ```
  DEFINE DELIVERY/MDY = SHIPDATE + 5 ;
  ```

  For details, see *Writing Date Expressions* on page B-6.

- **Alphanumeric.** An alphanumeric expression returns a character string. Use alphanumeric expressions to manipulate alphanumeric constants or fields. For example, you can write an expression to extract the first initial from an alphanumeric field:

  ```
  DEFINE FIRST_INIT/A1 = EDIT (FIRST_NAME, '9$$$$$$$$$') ;
  ```

  For details, see *Writing Alphanumeric Expressions* on page B-12.

- **Logical.** A logical expression returns TRUE or FALSE. Use logical expressions to determine whether a relationship between two values is true. For details, see *Writing Logical Expressions* on page B-14.

- **Conditional.** A conditional expression (IF … THEN … ELSE) returns a numeric or alphanumeric value. Use conditional expressions to assign values based on the result of logical expressions. For details, see *Writing Conditional Expressions* on page B-16.

Writing Numeric Expressions

A numeric expression performs a numeric calculation that uses numeric constants, fields, operators, functions, or subroutines 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:

- A numeric constant. For example:

  ```
  COMPUTE COUNT/I2 = 1 ;
  ```

- Two numeric constants or fields joined by a numeric operator. For example:

  ```
  COMPUTE BONUS = CURR_SAL * 0.05 ;
  ```

  For a list of numeric operators, see *Operators Used in Numeric Expressions* on page B-5.

- A numeric function or subroutine. For example:

  ```
  COMPUTE LONGEST_SIDE = MAX (WIDTH, HEIGHT, DEPTH) ;
  ```

- Two or more numeric expressions joined by a numeric operator. For example:

  ```
  COMPUTE PROFIT = (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 WebFOCUS performs numeric operations, see *Order of Evaluation* on page B-5.

WebFOCUS converts all numeric values to double-precision floating-point format before use in calculations, and then converts the result to the specified field format. In some cases, the conversion may result in a rounding difference.

If a number is too large (greater than 10^{75}) or too small (less than 10^{-75}), WebFOCUS issues an OVERFLOW or UNDERFLOW warning and displays asterisks for the field value.

For related information, see *Numeric Formats* on page A-3 in Appendix A, *Assigning Field Formats*.

Reference Operators Used in Numeric Expressions

Numeric expressions operate on numeric constants or fields and return a numeric value. You can use the following operators in a numeric expression:

Operator	Description
+	Adds values.
-	Subtracts values.
*	Multiplies values.
/	Divides values. If you attempt to divide by 0, WebFOCUS sets the value of the expression to 0.
**	Raises a value to the specified power.

For additional information see *Order of Evaluation* on page B-5.

Order of Evaluation

WebFOCUS performs numeric operations in the following order:

1. Parentheses.
2. Exponentiation.
3. Division and multiplication.
4. Addition and subtraction.

Example How Order of Evaluation Affects Results

The order of evaluation can affect the result of the expression. For example, the expression

```
COMPUTE PROFIT = RETAIL_PRICE - UNIT_COST * UNIT_SOLD ;
```

gives an incorrect result because UNIT_SOLD is first multiplied by UNIT_COST, and then the result is subtracted from RETAIL_PRICE.

You can change the order of evaluation by enclosing expressions in parentheses. An expression in parentheses is evaluated before any other expression. Using parentheses, the correct syntax for the preceding example is:

```
COMPUTE PROFIT = (RETIAL_PRICE - UNIT_COST) * UNIT_SOLD ;
```

The parentheses change the order of evaluation. They also may be used to improve readability.

Writing Date Expressions

A date expression performs numeric calculations that involve dates. A date expression returns a date or an integer that represents the number of days, months, quarters, or years between two dates.

A date expression can consist of:

- A date constant enclosed in quotation marks. For example:

  ```
  COMPUTE STARTDATE/MDYY = 'FEB 28 1999' ;
  ```

- A calculation that uses numeric operators, date functions, or date subroutines to return a date. For example:

  ```
  DEFINE DELIVERY/MDY = SHIPDATE + 5 ;
  ```

- A calculation that uses numeric operators, date functions, or date subroutines to return an integer that represents the number of days, months, quarters, or years between two dates. For example:

  ```
  COMPUTE TURNAROUND/I4 = MDY (ORDERDATE, SHIPDATE) ;
  ```

Field Formats for Date Values

WebFOCUS enables you to work with dates in one of two ways:

- **In date format.** WebFOCUS treats the value as an integer that represents the number of days between the date value and the base date. WebFOCUS has two base dates for smart date formats. Format YMD fields have a base date of 12/31/1900. Format YM, YQ fields have a base date of 1/1901. When displaying the value, WebFOCUS converts the number to the corresponding date in the format specified for the field either in the Master File or in the command that uses an expression to assign a value to the field. These are referred to as smart date formatted fields.

- **In integer, packed, or alphanumeric format with date edit options.** WebFOCUS treats the value as an integer, a packed-decimal, or an alphanumeric string. When displaying the value, WebFOCUS formats it as a date. These are referred to as old date formatted fields.

The following chart shows the base date for each supported date format:

Format	**Base Date**
YMD and YYMD	1900/12/31
YM and YYM	1901/01
YQ and YYQ	1901/Q1
JUL and YYJUL	00/365 and 1900/365 respectively

The following table illustrates how the field format affects storage and display:

	Date Format (For example: MDYY)		**Integer, Packed, 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 and subroutines. Calculations on dates in integer, packed, or alphanumeric format require the use of date functions and subroutines; numeric operators would return an error message or an incorrect result.

To illustrate this point, consider the following example, which calculates how many days it takes for your shipping department to fill an order by subtracting the date on which an item is ordered, ORDERDATE, from the date on which it is shipped, SHIPDATE:

```
COMPUTE TURNAROUND/I4 = SHIPDATE - ORDERDATE ;
```

An item ordered on October 31, 1996 and shipped on November 1, 1996 should result in a difference of 1 day. The following table shows how the field format affects the result:

	Value in Date Format	**Value in Numeric Format**
SHIPDATE = March 1, 1999	35854	03011999
ORDERDATE = February 28, 1999	35853	02281999
TURNAROUND	1	730000

To obtain the correct result using fields in integer, packed, or alphanumeric format, you can use a date function, MDY, which returns the difference between two dates in the form month-day-year. Using the MDY function, you can calculate TURNAROUND as follows:

```
COMPUTE TURNAROUND/I4 = MDY (ORDERDATE, SHIPDATE) ;
```

WebFOCUS provides a rich set of functions and subroutines that enable you to manipulate dates in integer, packed-decimal, or alphanumeric format. For more information on date functions, see the *Using Functions* manual.

Cross-Century Dates in Temporary Fields

WebFOCUS allows century processing against temporary fields created by DEFINE and COMPUTE statements. A DEFINE can also be coded in a Master File, and century processing attributes can also be applied in this context. At the virtual field level, two Master File parameters (DEFCENT and YRTHRESH) provide a means of interpreting the century if the first two digits of the year (YYyy) are not provided elsewhere. If the first two digits are provided, they are simply accepted and validated.

Virtual field-level use of these parameters overrides and takes precedence over any application-, file-, or field-level setting, but just for the virtual field in which they are used. This means that applications that have situations outside the application norm can still have global control and use of century processing.

For a complete discussion of cross-century data processing, see *Working With Cross-Century Dates* in *Developing Reporting Applications*.

Syntax How to Define Temporary Fields With Cross-Century Dates

The syntax for COMPUTE and DEFINE is

```
field/format [{DEFCENT|DFC}  cc  {YRTHRESH|YRT} yy] [MISSING...] = exp;
```

where:

field

Is the name of the virtual field being created.

format

Is a date data type for the virtual field being created.

cc

Is the default century value to be applied.

yy

Is the threshold value used for application of the century value.

exp

Is the logic, routine, or constant being evaluated for the virtual field.

Note:

- When DEFCENT is used in combination with YRTHRESH, it establishes a 100-year window. Any two-digit year that falls within that span has the century digits calculated as DFC. Any two-digit year outside that span has the century digits calculated as DFC+1.
- The Default Century and Year Threshold values are applied to the final result of the right-hand side of an expression. Settings that individual fields within an expression may have are ignored. Thus, complex expressions in which this is not the desired behavior should use the technology to convert the fields on-the-fly to virtual Smart Date fields and then perform computation using the Smart Date versions of the fields.

The DEFCENT and YRTHRESH parameters may be abbreviated to DFC and YRT, respectively.

Selecting the Format of the Result Field

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 you give to the field determines how the result is displayed.

Consider the following commands. The first command calculates how many days it takes for your shipping department to fill an order by subtracting the date on which an item is ordered, ORDERDATE, from the date on which it is shipped, SHIPDATE. The second command calculates a delivery date by adding 5 days to the date on which the order is shipped, SHIPDATE.

```
COMPUTE TURNAROUND/I4 = SHIPDATE - ORDERDATE ;
DEFINE DELIVERY/MDY = SHIPDATE + 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 fields in date format, you must enclose it in single quotation marks ('); otherwise, WebFOCUS interprets it as the number of days between the constant and the base date (December 31, 1900 or January 1, 1901). The following example shows how to initialize STARTDATE with the date constant 02/28/99:

```
COMPUTE STARTDATE/MDY = '022899' ;
```

The following example calculates the number of days elapsed since January 1, 1999:

```
DEFINE YEARTODATE/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 in date format from a field. The following example shows how you can extract a month from SHIPDATE, which has the format MDY:

```
DEFINE SHIPMONTH/M = SHIPDATE ;
```

If SHIPDATE has the value February 29, 1999, the above expression returns the value 2 for SHIPMONTH.

Calculations on date components automatically produce a valid value for the desired component. For example, if the current value of SHIPMONTH is 2, the following expression

```
COMPUTE ADDTHREE/M = SHIPMONTH + 3 ;
```

correctly returns the value 5. 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).

You cannot write an expression that extracts days, months, or quarters from a date that did not have these components. For example, you cannot extract a month from a date in YY format, which represents only the number of years.

Combining Fields With Different Components in an Expression

When using fields in date format, you can combine fields with a different order of components within the same expression. For example, consider the following two fields: 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 ;
```

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. For example, consider the field DATE_SOLD, which contains the date on which an item is sold, in YYMD format. You can write an expression that adds 7 days to DATE_SOLD to determine the last date on which the item can be returned, and then assign the result to a field with DMY format, as in the following COMPUTE command:

```
COMPUTE RETURN_BY/DMY = DATE_SOLD + 7 ;
```

You cannot, however, write an expression that combines dates in date format with dates in integer, packed, or alphanumeric format.

Writing Alphanumeric Expressions

An alphanumeric expression manipulates alphanumeric constants, fields, concatenation operators, functions, or subroutines to return an alphanumeric value. When you use an alphanumeric expression to assign a value to a field, you must give that field an alphanumeric format.

An alphanumeric expression can consist of:

- An alphanumeric constant (character string) enclosed in single quotation marks. For example:

  ```
  COMPUTE STATE = 'NY' ;
  ```

- Two or more alphanumeric fields or constants joined by the concatenation operator. For example:

  ```
  DEFINE TITLE/A19 = 'DR. '|LAST_NAME ;
  ```

- An alphanumeric function or subroutine. For example:

  ```
  DEFINE INITIAL/A1 = EDIT (FIRST_NAME, '9$$$$$$$$$$') ;
  ```

For related information, see Appendix A, *Assigning Field Formats*.

Reference

Concatenation Operators Used in Alphanumeric Expressions

Alphanumeric expressions operate on alphanumeric constants and fields and return an alphanumeric value. You can use the following operators in an alphanumeric expression:

Operator	Description
|	Concatenates two values, retaining any trailing blanks after the first one.
||	Concatenates two values, suppressing any trailing blanks after the first one.

Example Concatenating Character Strings

You can write an expression to concatenate two or more alphanumeric constants or fields into a single character string. The following example shows how to use the EDIT function to extract the first initial from a first name, and then use both strong (||) and weak (|) concatenation to produce the last name, followed by a comma, followed by the first initial, followed by a period:

```
FIRST_INIT/A1 = EDIT (FIRST_NAME, '9$$$$$$$$$$');
NAME/A19 = LAST_NAME ||(', '|FIRST_INIT|'.');
```

Suppose that FIRST_NAME has the value Chris and LAST_NAME has the value Edwards. The above request evaluates the expressions as follows:

1. The EDIT function extracts the initial C from FIRST_NAME.
2. The expression in parentheses is evaluated. It returns the value:

   ```
   , C.
   ```

3. LAST_NAME is concatenated to the string derived in Step 2 to produce:

   ```
   Edwards, C.
   ```

   Note that while LAST_NAME has the format A15, strong concatenation suppresses the trailing blanks. The resulting field is still alpha 10 long.

Using Quotation Marks Within Quote-Delimited Literal Strings

Under certain conditions, WebFOCUS allows users to use quote-delimited strings containing embedded quotation marks. WebFOCUS treats two contiguous quotes within a quote-delimited string as a single literal quote.

WebFOCUS supports quote delimited strings in the following:

- IF and WHERE criteria containing multiple quotes.
- WHERE criteria containing *field* {IS, IS-NOT, IN, IN FILE or NOT IN FILE}.
- EDIT.
- WHEN *field* EQ *embedded quote in a literal*.
- DEFINE commands.
- DEFINE commands in Master Files.
- DBA expressions in Master Files (for example, VALUE = IF *field* EQ *embedded quotes in literal*).
- ACCEPT=, DESCRIPTION=, TITLE= in Master Files.
- AS.
- DECODE.

Example Using Quote-Delimited Literal Strings

For example, if a report request contains the following command

```
IF AIRPORT EQ 'O''HARE'
```

WebFOCUS will interpret the literal string ‘O’’HARE and look for a data source value of O’HARE.

Writing Logical Expressions

A logical expression determines whether a particular condition is true. There are two kinds of logical expressions: relational and Boolean. The entities you want to compare determine the kind of expression you use:

- A relational expression returns TRUE or FALSE based on a comparison of two individual values (either fields 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.

Reference Operators Used in Logical Expressions

Logical expressions operate on numeric and alphanumeric values and expressions and return the values True or False. You can use the following operators in a logical expression:

Operator	Description
LT	Returns the value TRUE if the value on the left is less than 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.
GE	Returns the value TRUE if the value on the left is greater than or equal to the value on the right.
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.

Operator	Description
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.

Syntax

Relational Expressions

You can use the following relational operators in an expression:

```
value    {EQ|NE}    value
value    {GE|GT}    value
value    {LE|LT}  value
```

```
alphanumeric value {CONTAINS|OMITS} alphanumeric value
```

You must enclose alphanumeric literals with embedded blanks in single quotation marks (').

Syntax

Boolean Expressions

You can use the following Boolean operators in an expression:

```
(relational expression) {AND|OR} (relational expression)
NOT (logical expression)
```

Note that you must enclose expressions in parentheses.

Writing Conditional Expressions

A conditional expression assigns a value based on the result of a logical expression. The assigned value can be numeric or alphanumeric. A conditional expression takes the following form:

`IF` *`expression1`* `THEN` *`expression2`* `[ELSE` *`expression3`*`]`

Note:

- 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, although the expression following IF may not be an IF … THEN … ELSE expression (for example, IF … IF …). If the expression following THEN is itself a conditional expression, it must be enclosed in parentheses, but after ELSE, this is not necessary.
- Conditional expressions can have up to 16 IF phrases.
- The keyword ELSE, followed by an expression, is optional. If you do not specify an ELSE condition, however, and the IF condition is not met, the value is taken from the last true condition.

Reference

Operators Used in Conditional Expressions

Conditional expressions operate on numeric, alphanumeric, and Boolean values and assign the result based on a conditional test. You can use the following operators in a conditional expression:

Operator	Description
IF	Establishes a conditional test.
THEN	Specifies the action to perform if the result of a conditional test is TRUE.
ELSE	Specifies the action to perform if the result of a conditional test is FALSE.

Example Supplying Values With Conditional Expressions

This example calculates the values of a virtual field (BLANK_NAME) using a conditional expression; the following report evaluates the expression and displays the values of the virtual field accordingly.

```
BANK_NAME/A20 = IF BANK_NAME EQ ' ' THEN 'NONE'
ELSE BANK_NAME;
```

```
PAGE     1

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
```

Example Defining True or False Conditions

You can define a virtual field with a “true” condition and then refer to it as TRUE or FALSE in your report request.

For example, the report below evaluates a virtual field called MYTEST using the following expression:

```
MYTEST=(CURR_SAL GE 11000) OR (DEPARTMENT EQ 'MIS');
```

The report request then evaluates the condition set for MYTEST and displays the fields CURR_SAL and DEPARTMENT (sorted by EMP_ID) only if MYTEST is true.

```
PAGE     1

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: TRUE and FALSE conditions are valid only in the IF phrase.

Writing Expressions With Graphical Tools

A variety of graphical tools are available to help you write expressions for WebFOCUS operations that accept them. As you build expressions using these tools, WebFOCUS creates the corresponding syntax. For simple expressions, the tools will guide your choices. However, if you wish to write more complex expressions it is important to understand how WebFOCUS processes this information. For details see *Types of Expressions You Can Write* on page B-3.

You can use graphical tools to create expressions that:

- Define temporary fields in Master Files and reports (Defines and Computes).
- Perform data selection.
- Control conditional display of subheading and subfootings.
- Use subtotal values in calculations.
- Perform calculations on data in the rows of a financial report to produce new rows.

Creating Expressions for Temporary Fields

When you create a temporary field for a report (with the Define tool or the Report Options Computes tab) or in a Master File (with the Master File Editor), you must specify how to derive the new field's value by writing an expression.

For additional information see *Creating Temporary Fields* and *Creating Master Files* in *Describing Data With Graphical Tools*.

Procedure How to Specify a Field in an Expression With the Define Tool

In the Define tool window, double-click the desired field in the Fields window.

The field name is added to the expression box.

Note: The format of the field you specify in an expression must be consistent with the format of the temporary field you are creating. For example, if you are creating an alphanumeric temporary field, the fields you use in the expression must also be alphanumeric

Procedure How to Use a Function in an Expression With the Define Tool

In the Define tool window:

1. Click the *Functions* tab.

   The Functions window opens. For a list of functions, see the *Using Functions* manual.

2. Double-click the desired function.

   The function and placeholders for its arguments are added to the expression.

3. Highlight an argument.
4. Enter the value you wish to substitute for that argument.
5. Repeat steps 3 and 4 for each argument.

Procedure How to Specify a Field in an Expression With the Computes Tab

In the Report Options Computes tab, click the Fields... button and double-click the desired field.

The field name is added to the expression box.

Note: The format of the field you specify in an expression must be consistent with the format of the temporary field you are creating. For example, if you are creating an alphanumeric temporary field, the fields you use in the expression must also be alphanumeric.

Procedure How to Use a Function in an Expression With the Computes Tab

1. In the Report Options Computes tab, click the Functions... button and double-click the desired function.
2. The function and placeholders for its arguments are added to the expression. For details on functions, see the *Using Functions* manual.
3. Highlight an argument.
4. Enter the value you wish to substitute for that argument.
5. Repeat steps 2 and 3 for each argument.

Reference Master File Editor: Define Expression Dialog Box

The Define Expression dialog box is used to create expressions for virtual fields in a Master File. The dialog box displays a list of available data source fields, functions, and logical and mathematical operators you can use to build an expression.

Expression box

Location for typing an expression. You can add data source fields from the Fields tab, functions from the Functions tab, and numbers and operators from the calculator as you type.

Calculator

Provides numbers and operators that you can use to create expressions.

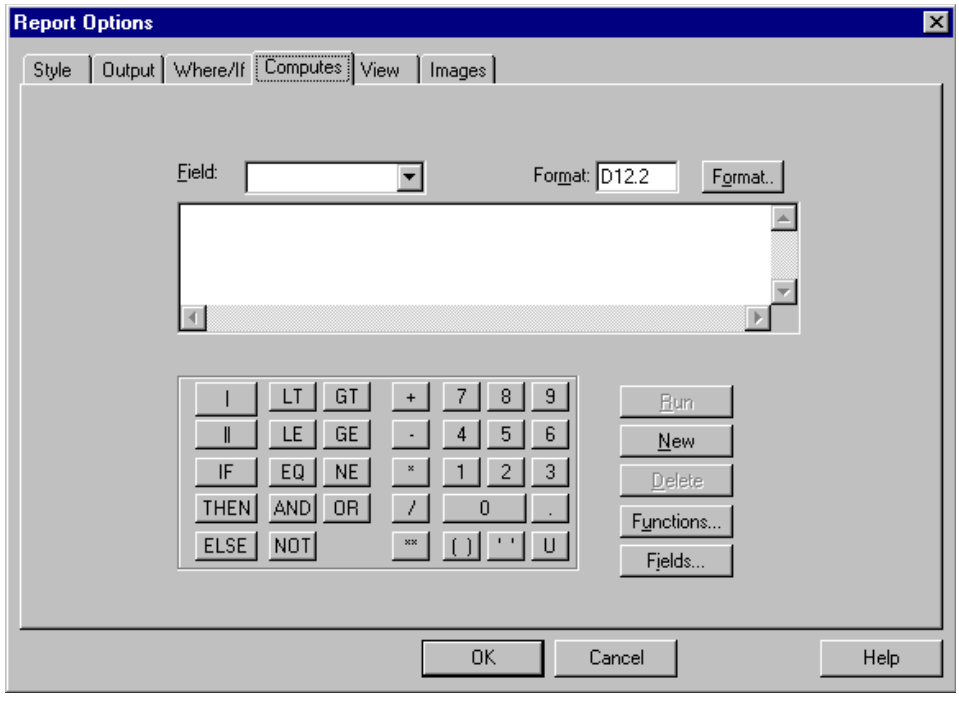
Fields tab

Lists the data source fields that you can use in creating an expression.

Functions tab

A function is a program that returns a value. This tab lists the built-in functions that you can use to derive the value of a temporary field.

Reference Report Options Computes Tab



The Compute tab includes the following fields and options for creating expressions.

Field box

Displays the name of the calculated value. Assign a field name to the value you wish to calculate.

When editing a calculated value, click the down arrow on the Field combo box, and select the field you wish to edit. When you select a field, the corresponding information appears in the Format box, and the expression box. You can edit the information, eliminate the field, or run it.

Format box

Displays the field type, field length, and display options. The field type can be alphanumeric, numeric, or date.

Format button

Opens the Format dialog box, where you can assign format information to the calculated value: format type (alphanumeric, numeric, date, text); length; decimal places (for numeric fields); edit options (for numeric and date fields), and other date information. For details about the Format dialog box, see Appendix A, *Assigning Field Formats*.

Expression box

Displays the expression used to evaluate the field.

Type the expression, or use the Fields list, Calculator, and Functions list to help you create the expression.

Calculator

Provides numbers and operators that you can use to create numeric, alphanumeric, and conditional expressions. Click the desired number or operator to add it to the expression box.

To enclose a value in parentheses, click the ( ) key in the calculator. Parentheses affect the order in which the specified operations are performed. For information on when to use parentheses, see *Order of Evaluation* on page B-5.

To enclose a value in single quotation marks, click the ' ' key in the calculator. Use single quotation marks to enclose alphanumeric and date literals.

To convert entries in the expression box to uppercase, click the U key in the calculator. Note that field names are case sensitive.

Functions button

Opens the Functions window, which lists all available built-in functions. (A function is a program that returns a value.)

Double-click the desired function to add it to the expression box. Then, in the expression box, highlight each argument and substitute the value or field name you wish to use. For details see the *Using Functions* manual.

Fields button

Opens the Fields window, which lists all the fields in the data source. To adjust the information that you see in the Fields list window (for example, to display field formats and aliases, along with the field name), right-click in the window and select display options from the pop-up menu.

New button

Clears the entry box, including the Field combo box and the corresponding expression. It also returns the format to the default value D12.2, and places the cursor in the Field combo box so you can begin to create a new field.

OK button

Checks the syntax for your calculated value and displays a warning message; you cannot exit until the errors are fixed. When the syntax is correct and you click OK, the Compute tab closes. You can continue building your report.

Reference Define Dialog Box

The Define tool has the following fields/options:

Field box

Displays the name of the temporary field.

When creating a field, type the name you wish to assign.

When editing a field, click the down arrow on the Field combo box, and select the field you wish to edit. The drop-down list shows all virtual fields for the current data source. When you select a field, the corresponding information appears in the Format box, and the expression box. You can edit the information, eliminate the field, or run it.

Add radio button

When selected, it indicates that the current temporary field definitions should be added to the list of temporary fields previously defined for the same data source.

If this button is not selected, the current set of temporary fields replaces those previously defined for the same data source.

This action marks all definitions created during the current use of the Define tool to be added to other virtual fields defined for the same data source during earlier use of the tool.

Note: You can define and execute several virtual fields during a single use of the Define tool. However, unless you select Add, running the current list will erase other virtual fields created outside of the Master File for the same data source. Virtual fields created in the Master File remain in effect.

Clear radio button

When selected, it clears any current temporary field definitions you previously added to the list of temporary fields.

Format button

Opens the Format dialog box, where you assign a format to the temporary field. For details about format options, see Appendix A, *Assigning Field Formats*.

Format box

Displays the field type, field length, and display options. The field type can be alphanumeric, numeric, or date. See Appendix A, *Assigning Field Formats*.

Expression box

Displays the expression used to evaluate the field.

Type the expression or use the Fields list, calculator, and functions list to help you create the expression.

Calculator

Provides numbers and operators that you can use to create numeric, alphanumeric, Boolean, and conditional expressions.

Click the desired number or operator to add it to the expression box.

To enclose a value in parentheses, click the *( )* key in the calculator. Parentheses affect the order in which the specified operations are performed. For information on when to use parentheses, see *Order of Evaluation* on page B-5.

- To enclose a value in single quotation marks, click the ' ' key in the calculator. Use single quotation marks to enclose alphanumeric and date literals.
- To convert entries in the expression box to uppercase, click the *U* key in the calculator. Note that field names are case sensitive.

Close button

Closes the Define tool.

Run button

Executes the current list of virtual fields, adding them to the Fields window. This action makes the current list of virtual fields available for subsequent use.

You must explicitly run virtual fields in order for them to be available for use.

Note: If you did not select the Add checkbox, running the current list will erase other virtual fields created outside of the Master File for the same data source. Virtual fields created in the Master File remain in effect.

New button

Clears the tool's entry fields, including the Field combo box and the corresponding expression. It also returns the format to the default value D12.2, and places the cursor in the Field combo box so you can begin to create a new field.

Delete button

Deletes the temporary field identified in the Field box. The field is no longer available.

Defined Fields tab

Lists the names of the temporary fields already associated in the Master File.

Fields List tab

Lists the fields defined in the Master File. To adjust the information that you see in the Fields list window (for example, to display field formats and aliases, along with the field name), right-click in the window and select display options from the pop-up menu.

Functions tab

Lists available built-in functions. (A function is a program that returns a value.)

Double-click the desired function to add it to the expression box. Then, in the expression box, highlight each argument and substitute the value or field name you wish to use. For details see the *Using Functions* manual.

Creating Data Selection and Conditional Expressions

To create a report based on a subset of the records in a data source, you must specify record selection criteria in the form of an expression. You can also control when subheadings and subfootings appear in reports based on conditions you supply in the form of an expression.

There are a number dialog boxes and tools designed to help you do this. These include the Where/If tab for record selection, the When dialog box for defining display criteria for subheadings/subfootings, and the Expression Builder, which can be used for both of these operations.

Reference

Report Options Where/If Tab

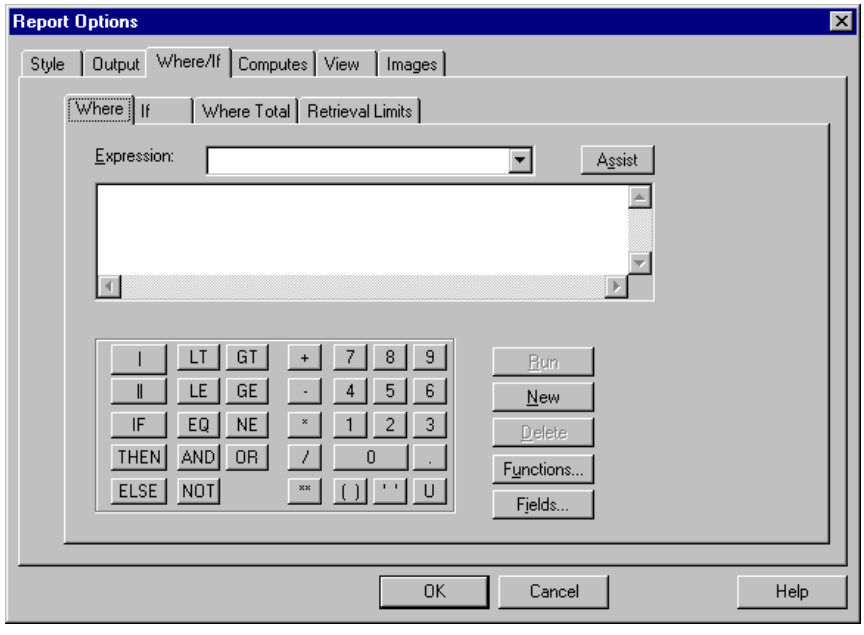
You can apply three types of record selection: Where, If, and Where Total.

- **Where** enables you to display only those field values that meet your needs.
- **If** enables you to perform Boolean tests (TRUE/FALSE) as well as the same tests you can perform with Where.
- **Where Total** enables you to select records based on the aggregate value of a field—for example, on the sum of a field's values, or on the average of a field's values.

With the exception of the operators on the calculator, the options on the Where, If, and Where Total tabs are identical.

For related information, see Chapter 3, *Creating Reports With the Report Painter*.

Where tab



Expression

Displays all previously defined selection criteria expressions attached to the report.

Assist

Opens the Expression Builder, a tool designed to assist you in building expressions for record selection. For details, see *Using the Expression Builder* on page B-29.

Calculator

Provides numbers and operators that you can use to create numeric, alphanumeric, and conditional expressions.

Click the desired number or operator to add it to the expression box.

To enclose a value in parentheses, click the **( )** key in the calculator. Parentheses affect the order in which FOCUS performs the specified operations. For information on when to use parentheses, *Order of Evaluation* on page B-5.

To enclose a value in single quotation marks, click the **' '** key in the calculator. Use single quotation marks to enclose alphanumeric and date literals.

To convert entries in the expression box to uppercase, click the **U** key in the calculator. Note that field names are case sensitive.

New

Saves the current expression, then clears the tab so that a user can create another expression.

Functions button

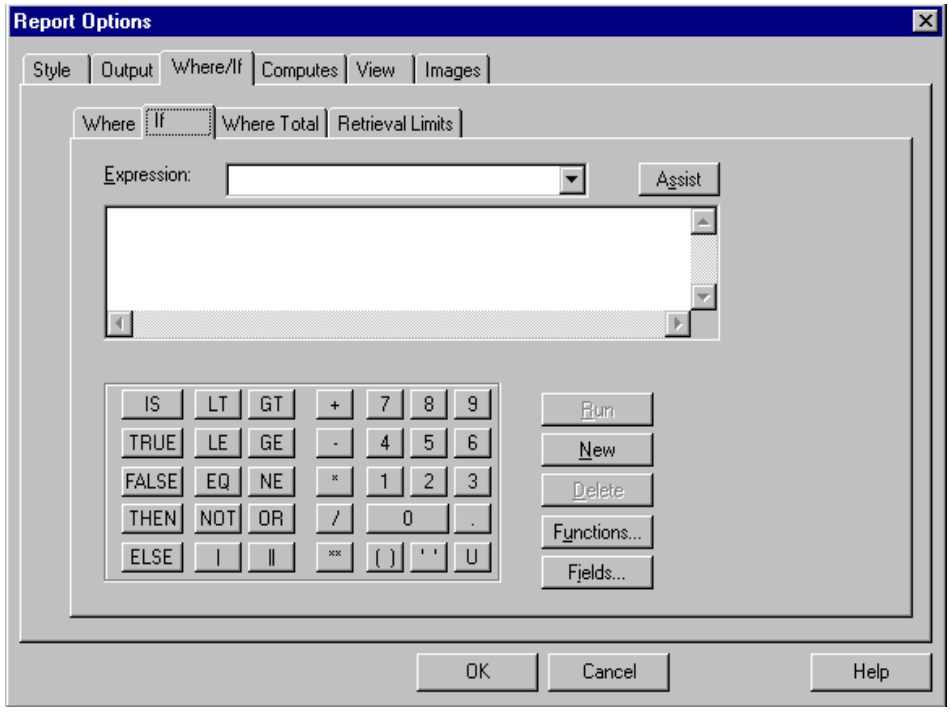
Opens the Functions window, which lists all available built-in functions. (A function is a program that returns a value.)

Double-click the desired function to add it to the expression box. Then, in the expression box, highlight each argument and substitute the value or field name you wish to use. For details see the *Using Functions* manual.

Fields button

Opens the Fields window, which lists all the fields in the data source. Select the fields that you want to use in an expression.

If tab



Calculator

Provides numbers and operators that you can use to create numeric, alphanumeric, and conditional expressions. In addition, the If tab calculator includes TRUE/FALSE operators that you can use in constructing Boolean tests, and an IS operator.

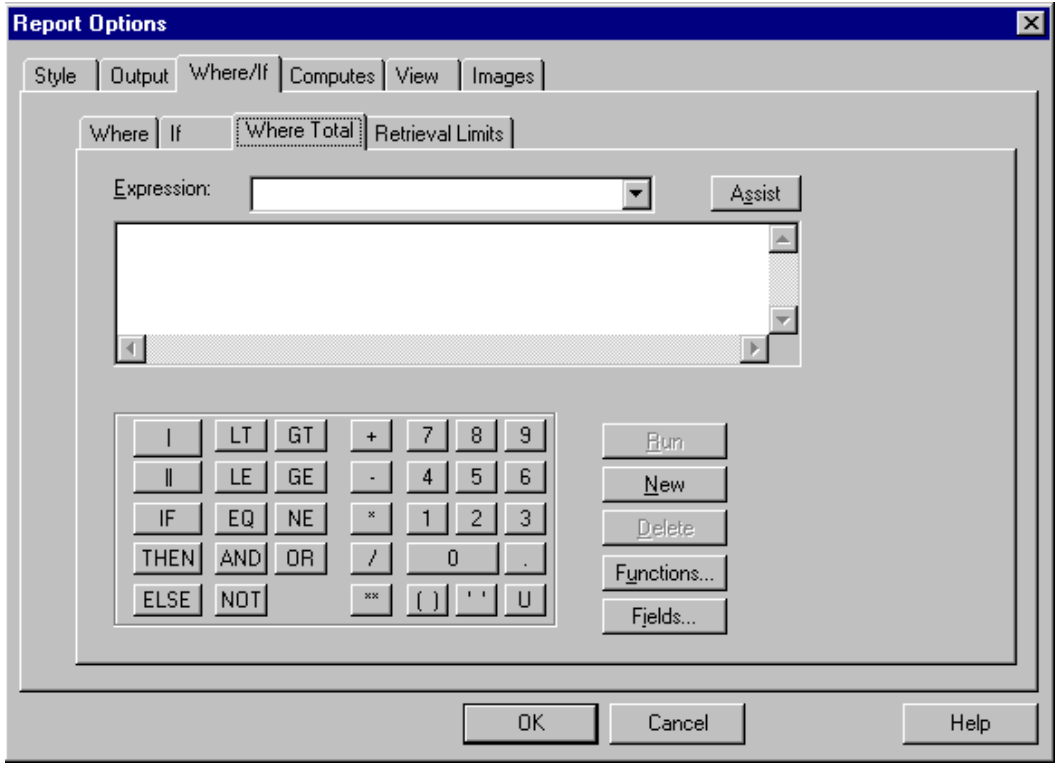
Click the desired number or operator to add it to the expression box.

To enclose a value in parentheses, click the **( )** key in the calculator. Parentheses affect the order in which the specified operations are performed. For information on when to use parentheses, see *Order of Evaluation* on page B-5.

To enclose a value in single quotation marks, click the **' '** key in the calculator. Use single quotation marks to enclose alphanumeric and date literals.

To convert entries in the expression box to uppercase, click the **U** key in the calculator. Note that field names are case sensitive.

Where Total tab



This tab includes the same options as the Where tab, but selects records after all data has been retrieved and processed.

Reference When Dialog Box

You can use this dialog box to define conditions for displaying report subheadings and subfootings.

The dialog box has the following fields/options:

Expression

Displays all previously defined selection criteria expressions attached to the report.

Assist

Assists you in building expressions for record selection. For more information see *Using the Expression Builder* on page B-29.

Operators

Lists operators you can use to create expressions that calculate the value of the field to which you are applying When tests.

Fields

Lists the fields that you can use in your expression.

Functions

Lists functions that you can use to calculate the value of a field in an expression (a function is a program that returns a value). See the *Using Functions* manual for details.

Using the Expression Builder

The Expression Builder enables you to create expressions quickly by selecting fields, relations, operators, and values from lists. You can base selection criteria on a specified value, a variable value, or a field value.

You can access the Expression Builder from the Report Assistant and Graph Assistant Selection tabs, and from the Report Painter's Report Options Where/If tab and When dialog boxes.

Reference Expression Builder Dialog Box

The Expression Builder dialog box has the following fields/options:

Field

Displays a list of all of the fields in the data source. Double-click a field to add it to the Column to filter column.

And/Or

Displays the keyword used in the expression listed in the Expression list box. You must select more than one field to activate this option.

Logical Relation

Displays a list of possible relations between the selected data source field and the value, parameter, or other field that WebFOCUS will compare it to. Select a relation to activate the Compare Type column.

Compare Type

Indicates the nature of the comparison you wish to make to the field selected in the field section.

Value

Double-click the Compare Value column to launch the Edit Multiple Values dialog box. Click the *View Data* button to select a value or multiple values to compare the selected field to a literal value.

For more information about editing multiple values, see Chapter 3, *Creating Reports With the Report Painter*.

Field

Click the down arrow in the Compare Value column to select another field in the data source to compare it to the the selected field.

Parameter

Double-click the Compare Value column to launch the Variable Editor and Add Accept Values dialog boxes. They enable you to create variable fields and define lists of acceptable values.

For more information about the Variable Editor and Add Accept Values dialog boxes, see Chapter 3, *Creating Reports With the Report Painter*.

Compare Value

Specifies the literal value, parameter, or other field to which the selected field is compared.

The choices available here are dependent on the selection you make in the Compare Type column.

See the procedures in this topic for details.

Note: You can add opening and closing parentheses after you select other criteria for your expression. To add opening parentheses, click the down arrow in the column to the right of the And/Or column. To add closing parentheses, click the down arrow in the columnt to the right of the Compare Value column.

Procedure How to Display Records Based on Specified Values

In the Expression Builder dialog box:

1. Select a field name from the fields window.
2. Click the down arrow in the Logical Relation list box to select a relation.
3. In the Compare Type column, select *Value*.
4. Double-click the Compare Value column. The Edit Multiple Values dialog box opens.
5. Click the *View Data* button and select a value from the list.
6. Double-click the value or click *Add* to add the value to the list.

   Note: Repeat this process to add other values to the list.
7. Enter a message that will prompt the user to select a value. This is an optional entry.
8. Click *OK*.

The values are shown in the Compare Value column.

Procedure How to Display Records Based on a Variable Value

In the Expression Builder dialog box:

1. Select a field name from the fields window.
2. Click the down arrow in the Logical Relation list box to select a relation.
3. In the Compare Type column, select *Parameter*.
4. Double-click the Compare Value column. The Variable Editor dialog box opens.
5. In the Name input box, type a name for the variable. This name will appear as the Column title if the field is added to the report.
6. Enter a message that will prompt the user to select a value. This is an optional entry.
7. Click the *And* or *Or* radio button in the Multi-Select area to add values for fields you want to include in your list of valid values.
8. Click the *Add* button. The Add Accept Value dialog box opens.
9. Click the *Value* radio button, then select the same field you chose in step 2.
10. Click the *Range* radio button to multi-select the other values you want to include in your list.

    The values are shown in the Accept List.

    Tip: Repeat this process for each selection criterion you want to include in a parameterized report created from the Report Layout Painter tool.
11. Click *OK*.

Procedure How to Display Records Based on Field Values

In the Expression Builder dialog box:

1. Select a field name from the fields window.
2. Click the down arrow in the Logical Relation list box to select a relation.
3. In the Compare Type column, select *Field*.
4. Click the down arrow in the Compare Value column to select a field name from the list.
5. Click *OK*.

Procedure How to Select Multiple Values and Fields

In the Expression Builder dialog box, you can select multiple values or fields to be used for record selection criteria by selecting options in the And/Or column. The And/Or column is acivated after you have entered criteria for at least one expression.

1. Select a field name from the fields window.
2. Click the down arrow in the And/Or column. Select one of the following:

   And

   To start a new expression that will be combined with the previous expression by the keyword AND.

   Or

   To start a new expression that will be combined with the previous expression by the keyword OR.
3. Select remaining criteria from the other columns in the Expression Builder to complete the expression.
4. Click *OK*.

Note: When the keyword AND is used, FOCUS only selects data that meet both conditions. When the keyword OR is used, FOCUS selects data that meet either condition.

Creating Expressions for Subtotal Calculations

The Report Painter provides a Recap option that enables you to use subtotal values in calculations. To accomplish this task you must define the calculation in an expression. The result is displayed on the report; new values appear each time the specified sort field value changes. For details on the Recap option see Chapter 3, *Creating Reports With the Report Painter*.

Reference Recap Dialog Box (Report Painter)

The Recap dialog box has the following field/options that you can use to create an expression:

Field

Is the field you wish to calculate based on the subtotal created by the expression you write. This result (not the subtotal value) appears on the report.

Format

Displays the field type, length and display options format of the selected field. For a Recap, the format must be numeric. The default is D12.2. You can type a new format into this box or apply a new format from the Format dialog box. See Chapter 2, *Creating Reports With Financial Report Painter*.

Format button

Opens the Format dialog box.

Calculator

Use the calculator to compose an expression that WebFOCUS will evaluate. The calculator contains numbers, plus the operators you need to create expressions.

Functions...

Opens the Functions window, which lists all available built-in functions. For details see *Using Functions*.

Fields...

Displays a window containing a list of available fields. To adjust the information that you see in the Fields list window (for example, to display field formats and aliases, along with the field name), right-click in the window and select display options from the pop-up menu.

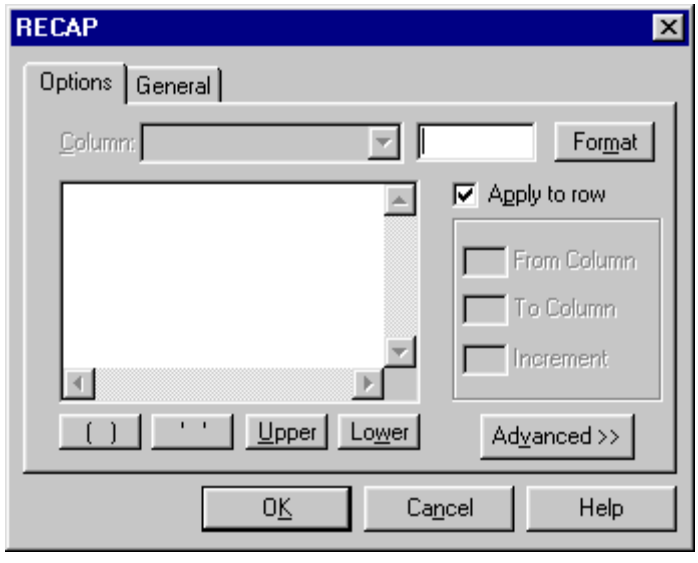
Creating RECAP Expressions for Financial Modeling

To initiate a Recap operation you must supply the title and format of the field that receives the result of the calculation and an expression that defines the calculation you wish to perform. In the Financial Report Painter, you can type an expression directly into the Recap dialog box or use a tabbed dialog box to formulate your expression.

Reference RECAP Dialog Box (Financial Report Painter)

Options Tab

Several options in this dialog box enable you to specify the column or columns to which you want to apply a Recap formula:



Column

Identifies a single column that will contain the Recap formula; this is also the column in which the Recap output will be displayed on the report. You can choose the column from the drop-down list.

Apply to row

Indicates that the same Recap formula is to be used for all columns in the row. (The Columns box is disabled when you select Apply to row.)

From Column/To Column/Increment

Define a range of columns to which the Recap formula is to be applied:

From Column/To Column

Identifies the first and last columns in a range.

Increment to

Indicates an interval of columns in the range that should have the Recap formula applied. For example, a value of 2 will apply the formula to every other column.

Format box

Identifies the field type, field length, and display options that will be used for the Recap output. The field type can be alphanumeric, numeric, or date.

Format button

Opens the Format dialog box, which is designed to help you choose the format for your Recap output.

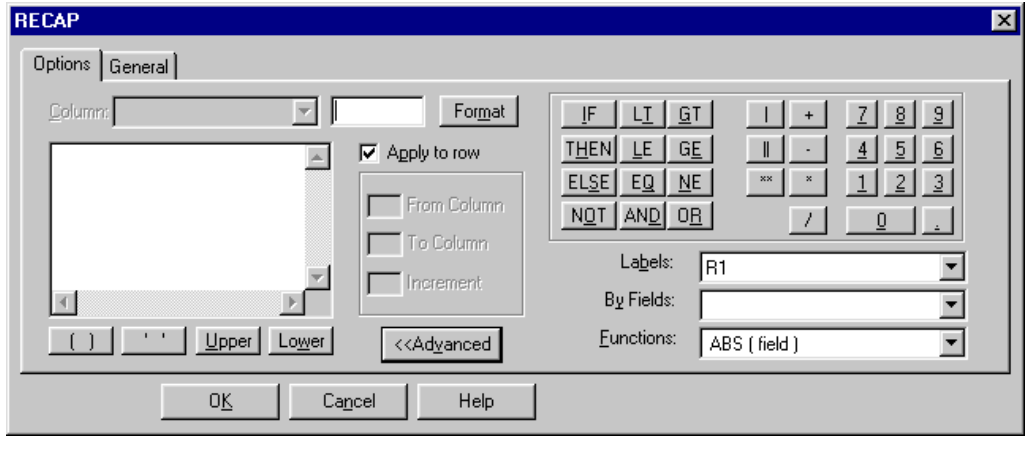
Expression box

Displays the expression used to generate the Recap output.

Type the expression, or click the *Advanced* button to expand the Options tab, exposing features that will help you create the expression.

Advanced button

Expands the Options tab to make it easy to add functions, numbers, operators, labels, and sort fields to your expression. Your selections are reflected in the Expression box.



Calculator

Provides numbers and operators that you can use to create numeric, alphanumeric, Boolean, and conditional expressions. Click the desired number or operator to add it to the formula in the Expression box.

Four additional buttons below the Expression box enable you to:

- Enclose a value in parentheses. Click the *( )* button to add parenthesis.
- Parentheses affect the order in which WebFOCUS performs the specified operations. For information on when to use parentheses, see *Order of Evaluation* on page B-5.
- Enclose alphanumeric or date literals in single quotation marks. Click the ' ' button to add quotation marks.

- Convert entries in the expression box to upper or lowercase. Click the *Upper* or *Lower* button to specify case. Note that field names are case sensitive.

Labels

Lists the labels (default or explicitly defined) that you can use in your expression. Select the labels from the drop-down list that you want to add. Your selection is added to the formula.

By Fields

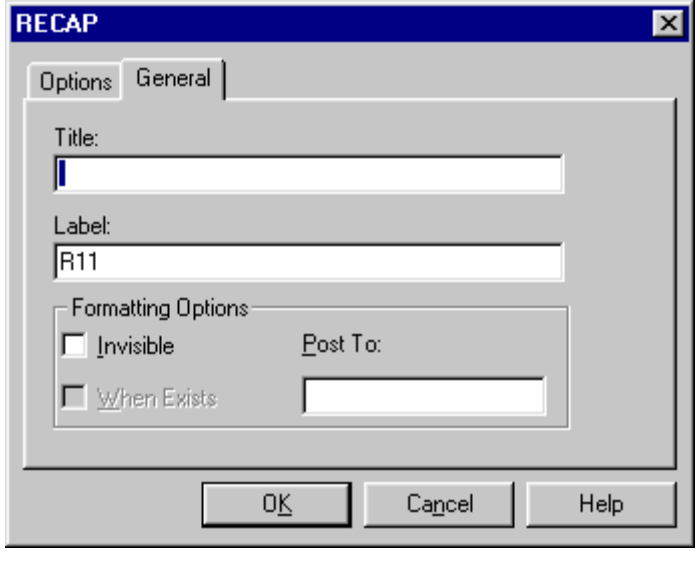
Lists the vertical sort (BY) fields that you can use in your expression. Select the fields from the drop-down list that you want to add. Your selection is added to the formula.

Functions

Lists all available built-in functions that you can add to your expression. (A function is a program that returns a value.)

Select a function from the drop-down list. Then, in the Expression box, highlight each argument and substitute the value or field name you wish to use by typing or by selecting items from other drop-down lists. For details see *Using Functions*.

General Tab



Title

Enables you to specify a title for the Recap calculation; this title will appear on the report.

Label

Lists the default FML label for the Recap row. You can replace the default row identification label with an explicit row label that you want to reference on the left hand side of an FML expression. You can think of this label as a calculated field or as a variable that holds the result of the Recap calculation. It can also be used as part of the expression in subsequent Recap formulas.

Formatting Options

Invisible

Creates a Recap expression for use in a calculation, but does not display its results on the report.

Post to

Posts the output of a Recap line to a work file. This line can then be used as though it was provided in a TAG line. For details see Chapter 2, *Creating Reports With Financial Report Painter*.

Tip: You can also apply these formatting options from the Properties bar.

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