4th Dimension

User Reference
Windows®/Mac OS®

4th Dimension®
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4th Dimension User Reference
Mac OS® and Windows® Versions

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Preface

4th Dimension is a powerful relational database for the Macintosh and Windows platforms. As an integrated database environment, 4th Dimension offers a complete solution for your Web publishing and database needs.

About the Manuals

The manuals described below provide a guide to the features of both 4th Dimension and 4D Server. The only exception is the *4D Server Reference*, which describes features exclusive to 4D Server.

4th Dimension QuickStart leads you through example lessons where you create and use a 4th Dimension database. These examples provide hands-on experience that helps you become familiar with the concepts and features of 4th Dimension and 4D Server.

The *User Reference* provides a description of the User environment — the environment in which you use databases and forms to enter and manipulate data.

The *Design Reference* is a guide to the Design environment and provides detailed descriptions of the operations that you can perform in this environment. You should use it in conjunction with the other volumes in your documentation package.

The *Language Reference* is a guide to using the 4th Dimension language as well as the Web Server. Use this manual to learn how to customize a database by incorporating 4th Dimension commands and functions.

The *4D Server Reference* is a guide to installing 4D Server and managing multi-user databases with 4D Server.

Supplemental manuals are also available. These manuals are particularly in reference to utility programs packaged with 4th Dimension and 4D Server (4D Chart Language, 4D Tools, etc.).

About This Manual

This manual serves as a reference to 4th Dimension's User environment and provides detailed descriptions of the operations that you can perform in this environment. It should be used in conjunction with the other manuals in the 4th Dimension package.

To use this manual effectively, you should first work through the exercises in *4th Dimension QuickStart* and start to create your own database, referring to the *4th Dimension Design Reference* when you need to review a process or explanation.

You can then proceed to enter and manipulate data in your database, referring to this manual when you need to review a process.

Windows/Mac OS Versions

This manual details use of 4th Dimension both on the Mac OS and Windows platforms. Although the concepts and functionality of both versions of 4th Dimension are nearly identical, the manual addresses any differences where necessary. Such differences include the graphical user interface and keyboard commands.

This manual contains graphics illustrating the Windows environment. If there is a substantial difference in the appearance of the Mac OS version of a window or dialog box, it is also presented.

Right-Click and Control+click under Mac OS

Certain functions are activated (for instance, the display of contextual menus) by carrying out a **right-click**, i.e. a click with the right button of the mouse, under both Windows and Mac OS.
Under Mac OS, the same result can be obtained by using a **Control+click** combination. This alternative is necessary when you are using a single-button mouse.

Chapter Descriptions

This manual is divided into the following chapters and appendices.

- Chapter 1, "Introduction to the User Environment" introduces you to some basic User environment concepts such as the current selection, using tables and forms, and processes. It also describes some basic operations, such as entering a password-protected database, and provides an overview of the User environment menus.
- Chapter 2, "Managing Structure and Data Files" provides an overview of 4th Dimension desktop files.
- Chapter 3, "Data Entry" describes how to use input and output forms and how to access forms from different tables.
- Chapter 4, "Selecting Records" explains how to create a selection of records using the commands in the **Records** menu and how to use the various search methods to select a specific record or group of records.
- Chapter 5, "Working with Records" explains how to add, modify, and delete records. It also describes how to use the Formula editor to automatically update records based on a formula (for instance, adding two days to the vacation balance in each employee's record).
- Chapter 6, "Sorting Records" describes how to place a selection of records in order by sorting them based on the values in one or more fields.
- Chapter 7, "Modifying User Forms" describes how to adapt certain forms to the specific needs of users.
- Chapter 8, "Form Reports" explains how to print reports that use forms created in the Design environment.
- Chapter 9, "Quick Reports" explains how to use the Quick Report editor to print data in a columnar report. The chapter describes how to design the report using fields from your database as columns in the report and how to enhance the report by dividing data into sorted groups and performing summary calculations for each group.
- Chapter 10, "Labels" explains how to use the Label Wizard to design and print labels.
- Chapter 11, "Graphs" explains how to create, modify and print various types of graphs using 4D Chart. It also describes how to add a variety of objects to your graphs, and how to add dynamic references to field values or to 4th Dimension expressions.

- Chapter 12, "Executing Methods" provides instructions on how to execute a project method in the User environment and how to start a new process for the method or run it on the server computer as a stored procedure.
- Chapter 13, "Backup and Restoring of the Database" explains how to set up and schedule backups, as well as how to ensure data integrity using the log file and the automatic restore parameters.
- Chapter 14, "Importing and Exporting Data" explains how to import and export records via files or ODBC data sources.
- Chapter 15, "Web Server" provides an overview of 4th Dimension's capabilities as a Web server and explains how to start and stop a Web service from the User environment.

Conventions

All the manuals in your documentation package, including this one, use certain conventions to help you understand the material.

The following explanatory notes are used:

Note Text emphasized like this provides annotations and shortcuts that will help you use 4th Dimension more productively.

4D Server Throughout the manual, 4th Dimension and 4D Server/4D Client are referred to simply as 4th Dimension. Differences between the operation of the two products are explained in 4D Server notes, which provide information about using 4D Server/4D Client. This information is provided only when the operation of 4D Server/4D Client differs from that of 4th Dimension.

Notes like this alert you to important pieces of information and situations where data might be lost.

In addition, all table names are shown in brackets in the text to help distinguish them from the names of fields, forms, and other items. For instance, the Employees table is written as the [Employees] table.

Using Hypertext

You can take advantage of the hypertext buttons that have been added to this manual. All hypertext buttons are printed in blue text. A hypertext button looks like this: “For information on using 4th Dimension as a Web server, see Chapter 15, “Web Server”.

You can click a hypertext button to read additional information about the topic. You can then use the Adobe Acrobat **Go Back** button to retrace your steps.

9 Quick Reports

Introduction

One of the most important tasks in data management is report generation. The Quick Report editor is one of two tools made available by 4th Dimension for the purpose of designing reports. You use the Quick Report editor to create ad-hoc reports in the User environment. The other tool is the Form editor, which you can use to design reports in the Design environment (which can be altered subsequently in User or Custom Menus mode). You should use an output form to design reports that require complex designs or programmatic processing.

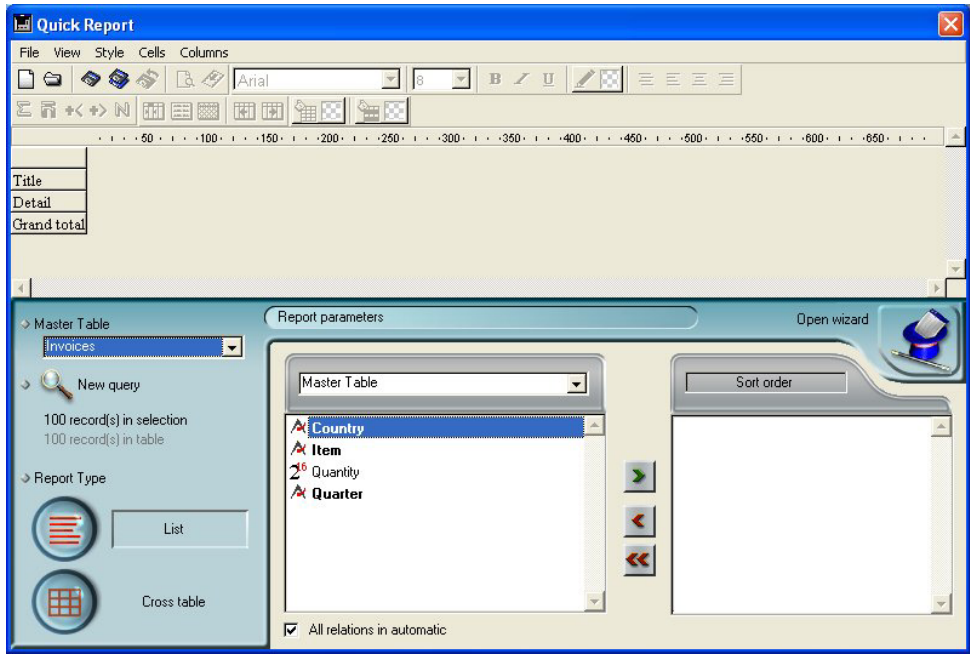
Using the Quick Report editor, you can:

- Produce lists of records.
- Create break areas.
- Produce cross-table reports.
- Compute summary calculations.
- Modify fonts and styles in the report.
- Define borders and background colors on a cell basis.
- Save and open quick report designs to disk.
- Select different output types such as HTML or text file, 4D View or 4D Chart area, printing or saving to disk.

The Quick Report editor produces reports from the current selection of records. Before generating a report, set the current selection of records that you want to include in your report.

Overview of the Editor

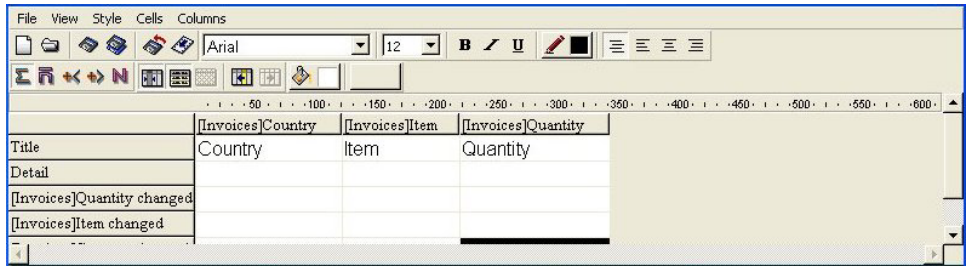
In the user environment, the Quick Report editor appears as follows:



It consists of two main areas:

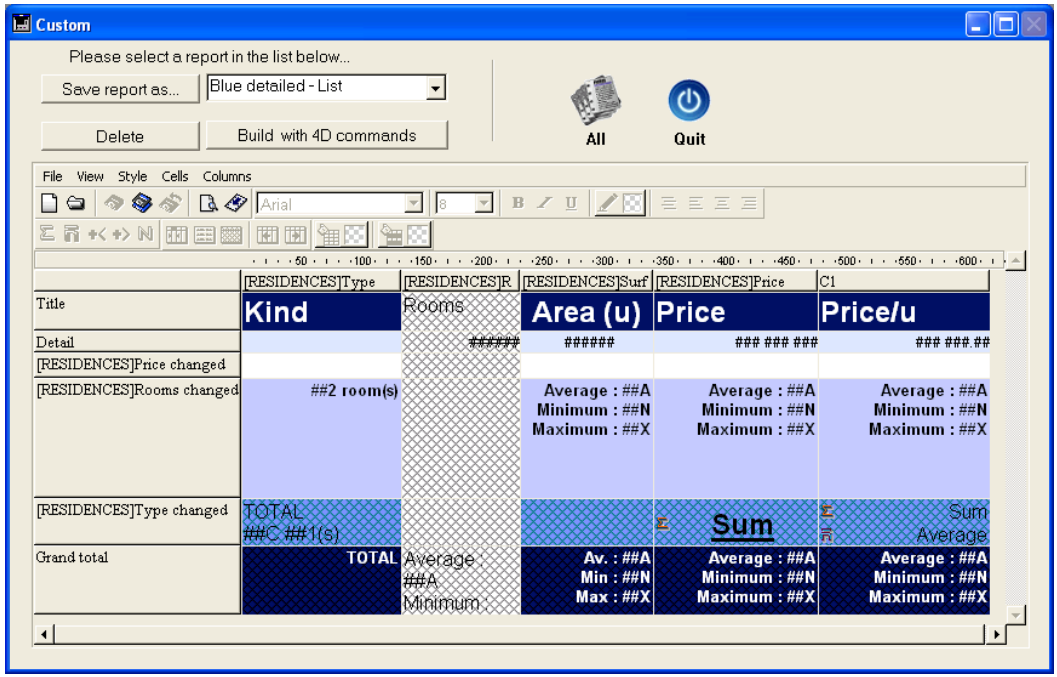
- The Quick Report data area that is used to specify the type of report to be built and the data to be integrated; it also can be used to access the Quick Report Wizard:

- The actual Quick Report area:



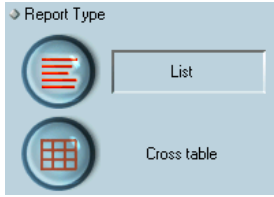
This shows the area as it appears when a Quick Report area is inserted in a form. This is where actual column and row contents are created, where sort orders are defined, etc. Also, this area includes various toolbars, its own menu bar and contextual menus.

For example, this area could be placed in a form as depicted below:



List Mode and Cross-table Mode

In the Quick Report editor there are two operation modes available which generate two specific types of reports: **List** and **Cross table**.



- **List mode**
  This is the default mode. In this mode, reports would typically display records as a list with break levels where sums would be performed. The following is a typical List quick report.

First Name	Last Name	Department Name	Salary
Biff	Davis	Accounting	43780
Smeldorf	Garbando		19610
Alan	Hull		41460
Bryan	Pfaff		26440
Shirley	Ransome		36040
Marlys	Wilson		36500
		Sum for Department : Accounting	203830
Kathy	Forbes	Engineering	18840
Dennis	Hanson		40520
Mary	Smith		55000
Andy	Venable		43520
Lance	Wolfram		27300
		Sum for Department : Engineering	185180

- **Cross-table mode**
  This mode allows you to display your report as a two-dimensional table. This is useful when you want to display data from a data source broken down into categories that are actually a function of two other data sources.

For example, a cross-table form would let you display in a table how many of each product type was sold in each quarter. The following is a typical Cross-table Quick Report.

	AV Preamplifier	Power module	Remote control	Line Total
Q1	34	29	39	102 10526316
Q4	48	64	21	133 66666667
Q3	49	68	40	157 48148148
Q2	64	74	47	185 66666667
Grand total	195 5.90909090909 1	235 5.875 1	147 5.4444444444 1	577 5.77 1

Quick Report Basics

This section describes basic operations used when working with the Quick Report editor to design a report.

Creating a New Quick Report

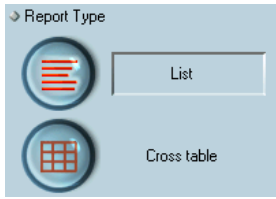
By default, the Quick Report editor lets you create reports in the User environment.
It is also possible to create reports from the Custom Menus mode, in particular by inserting a Quick Report area into a form.

► To design a quick report:

1 **Choose Quick Report... from the Tools menu or click on the corresponding button in the toolbar.**

4th Dimension displays the Quick Report editor. If a previous report has been defined, it appears in the window. To erase the contents of the window, choose **New** from the **File** menu or click the New icon in the standard toolbar of the editor to begin a new Quick Report design.

2 **Choose the type of report to be generated by clicking on either the List or Cross table button, located at the bottom left corner of the Quick Report editor:**



The List type is generally selected by default. The Quick Report area is modified according to the type selected.

Loading and Saving a Quick Report Design

You can save a quick report design as a file that you can open from the Quick Report editor. The quick report design includes all of your specifications for the report, but not the data. By saving report designs, you can maintain a library of quick report designs that you can use according to your needs.

Note If you do not save your design, it is displayed the next time you open the Quick Report editor but only during the same work-session.

Saving a Quick Report Design

► To save a quick report design:

1 **Choose Save as from the File menu.**
OR
Click the Save as icon in the file management toolbar **.**
4th Dimension displays a create-file dialog box in which you can name the quick report design.

Note Quick report files in 4th Dimension for Windows are denoted by the file extension .4QR.

2 **Enter a filename for the quick report and click OK.**
4th Dimension saves the report as a file that you can open with the Quick Report editor. You can save the file on your hard disk. If you modify the parameters of the report subsequently and want to save them again, you just need to choose the **Save** command in the **File** menu.

The new file will replace the previous one on the disk, without the standard save file dialog box appearing.

Loading a Quick Report Design

When the Quick Report editor is open, you can load a saved design and use it to print a new report. You can use the same quick report design repeatedly to print different selections of records.

► To load a report design:

1. **Choose Open from the File menu.**
   OR
   Click the Open icon in the file management toolbar **.**
   4th Dimension displays an open-file dialog box displaying a list of available quick report designs.
2. **Double-click a filename or select a filename from the list and click OK.**

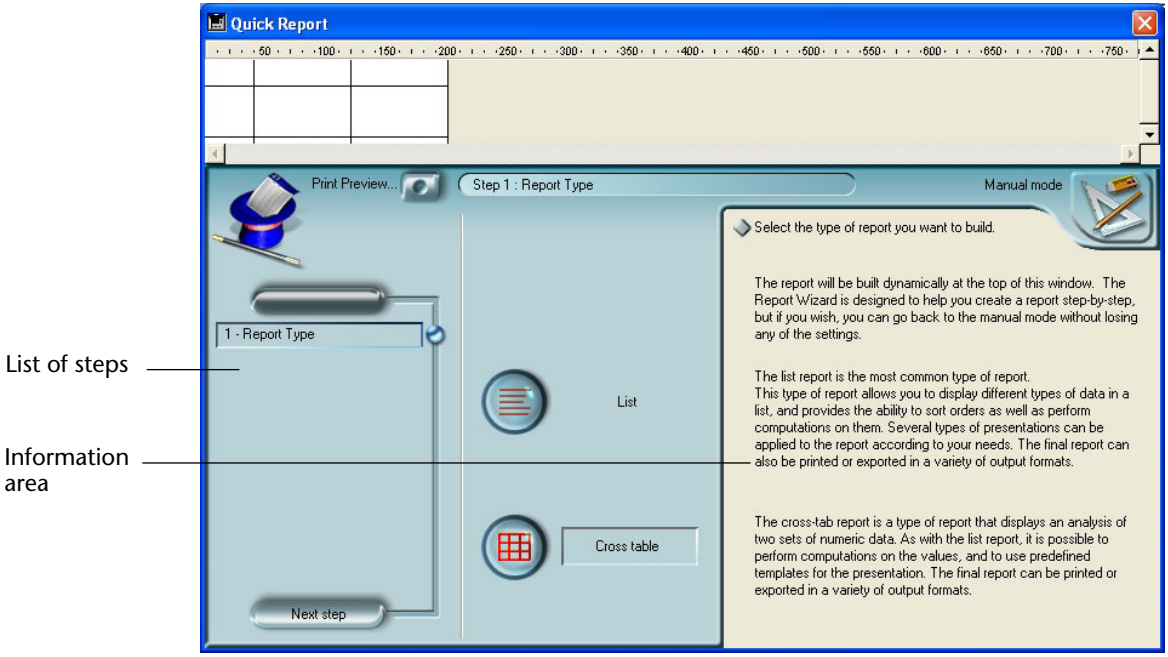
   4th Dimension replaces the current design with the design you opened.

The Quick Report Wizard

When creating a manual Quick report in User mode, you can use the Wizard to guide you through the creation of the report.

To start the wizard, click the **Open wizard** button in the Quick Report editor:

The pages of the wizard then replace the data area in the window of the Quick Report editor:



The construction of the report is then carried out through detailed steps with comments appearing in the right-hand part of the window. To create a Quick Report using the wizard, follow the instructions displayed on the screen.

When you have finished constructing the report, the wizard offers you the possibility of generating the corresponding 4D code. For more information about this, refer to the"Generating 4D code" paragraph on page 205.

To exit the wizard, click on the button to return to Manual mode:

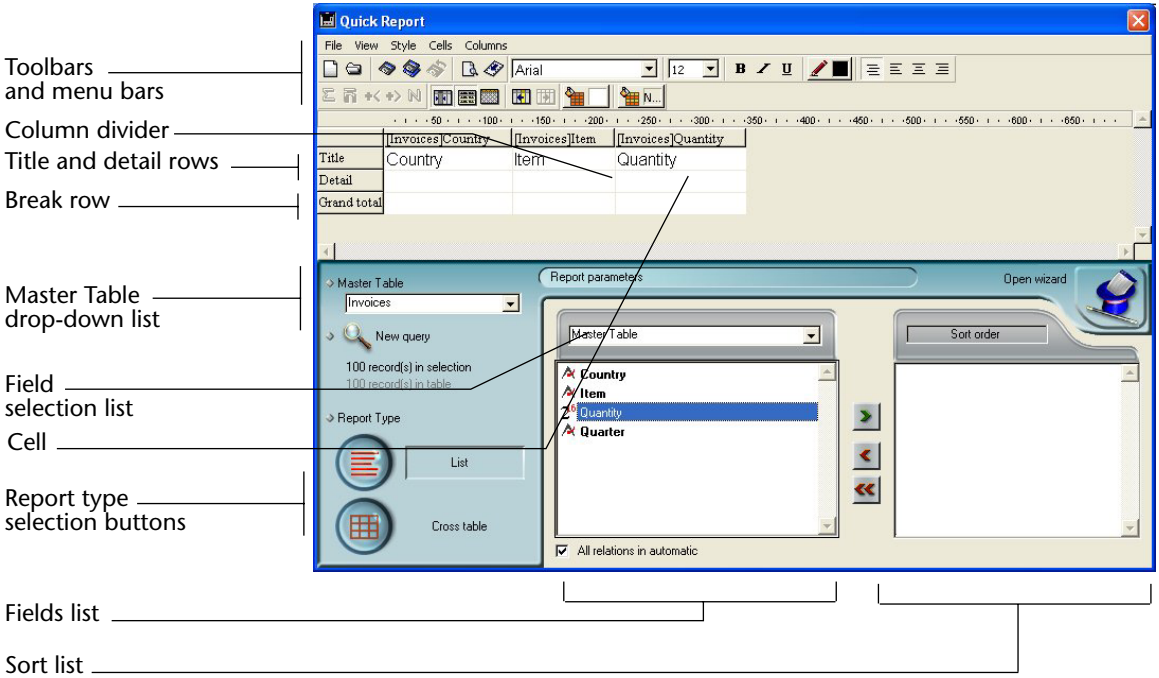
Using the Quick Report Editor

Interface

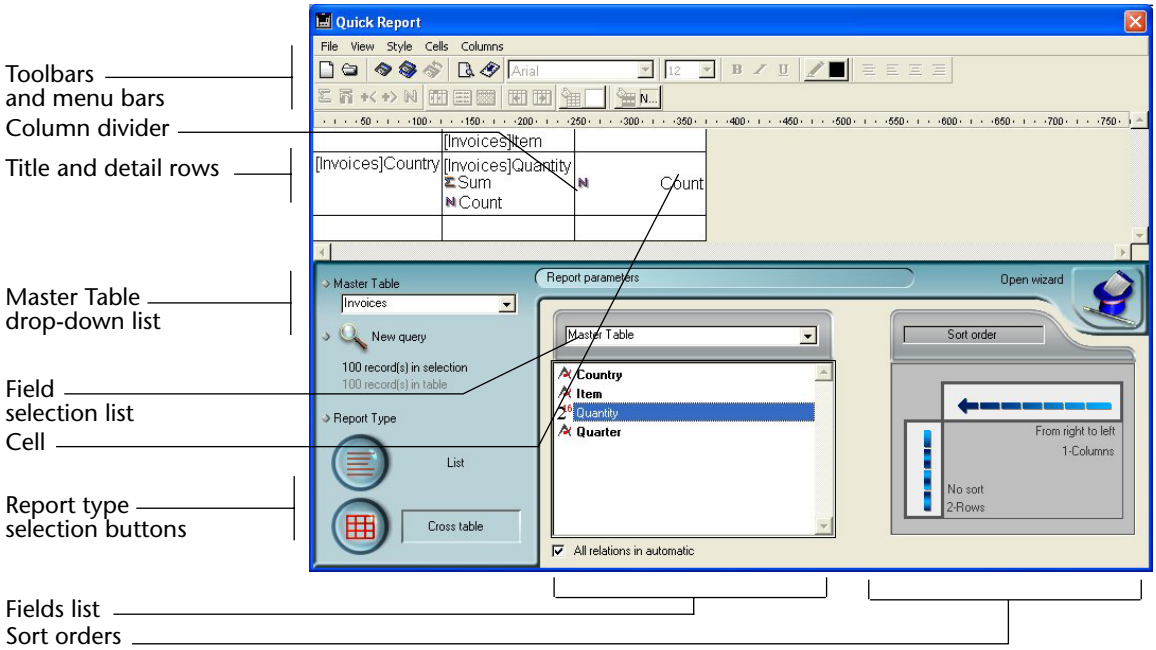
When you create a quick report, you can specify the following:

- Columns that display fields or formulas, either from the current table or from related tables,
- Sort levels and order (list mode),
- Summary calculations,
- Display format,
- Text for labels,
- Formats for numeric and Boolean data,
- Font, font size, style, and justification for labels, summary calculations, and data,
- Background colors on a cell column or row basis,
- Borders,
- Page headers and footers.

List mode:



Cross-table mode:



The Quick Report editor contains the following elements:

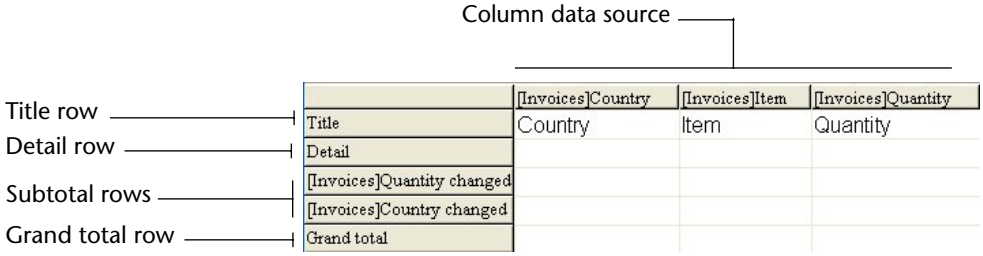
- **Master Table drop-down list**: This menu is used to specify the master table that will be used as a basis for generating the report. The fields of this table are displayed in the Fields list and the related fields will be displayed in relation to this table.
- **Fields list**: This list lets you select the fields to be inserted into the report by double-clicking or by drag and drop. It displays either the list of fields found in the master table, the hierarchical list of tables and related fields, or the hierarchical list of all the tables and fields of the database. You choose the type of display in the Field selection list located just above the area.
  Indexed fields appear in bold. You can also display and select the fields of related tables.

Note Only tables and fields which are not hidden appear in the Fields list of the Quick Report editor. For information about hiding tables and fields, refer to the *4th Dimension Design Reference* manual.

- **All relations in automatic**: This option is used to specify the way in which the Quick Report editor will make use of the relations between the different tables of the database.
  On principle, the editor can only use automatic relations. By default, the option is not checked and only automatic relations can be used by the editor.
  If the **All relations in automatic** option is checked, the Quick Report editor considers the manual relations of the database as automatic relations and will thus enable access to all the data related to the database.

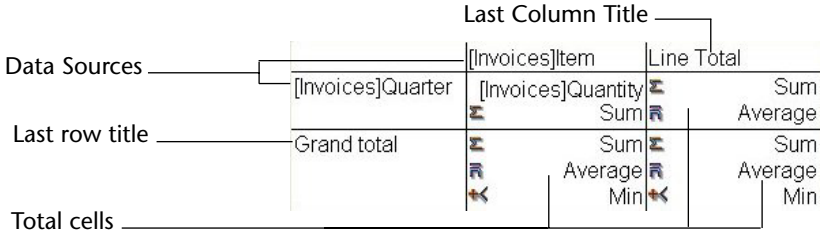
Note to developers
• The **All relations in automatic** option causes all the relations to pass into automatic for the current process, even after the Quick Report editor has been closed. If you want to make sure that all the relations will be manual after using the Quick Report editor, execute the statement AUTOMATIC RELATIONS(False;False) .
• When the editor is called using the QR REPORT command, this option does not appear in order to allow the developer to manage the status of relations directly.

- **Column dividers**: These lines indicate the boundaries between columns of the report. They can be moved manually in order to enlarge or reduce the size of each column. Manual resizing deselects the **Automatic Width** option if it has been activated for the column concerned.
- **Cells**: A cell is the intersection of a row and a column.
- **Scroll bars**: You use the scroll bars to view parts of the quick report design that extend beyond the area of the quick report form.
- **Sort list/Sort order display area**:
  - In List mode, this list displays the fields of the report on which the sort will be carried out, as well as the sort order and whether it will be ascending or descending. Each field inserted into this list causes a sub-total row to be added in the Quick Report area.
  - In Cross-table mode, this area displays the sort order for each data source.
- **Quick Report area**: This area lets you build your report by inserting fields using drag and drop, double-clicking or via the contextual menu; you can also adjust the width of the columns added, or delete breaks or formulas, define the colors and borders of cells, etc.



- **Title row**: This row displays the names of fields or formulas that have been inserted into the report. It is repeated for each page of the report. The Quick Report editor inserts field names by default, but you can modify the contents.
- **Detail row**: This row contains information drawn from each record and is repeated in the report for each record. You can associate a display format with it, depending on the type of data represented.
- **Subtotal rows**: These rows display intermediate calculations as well as the wording that is associated with them. A row is created for each sort order.

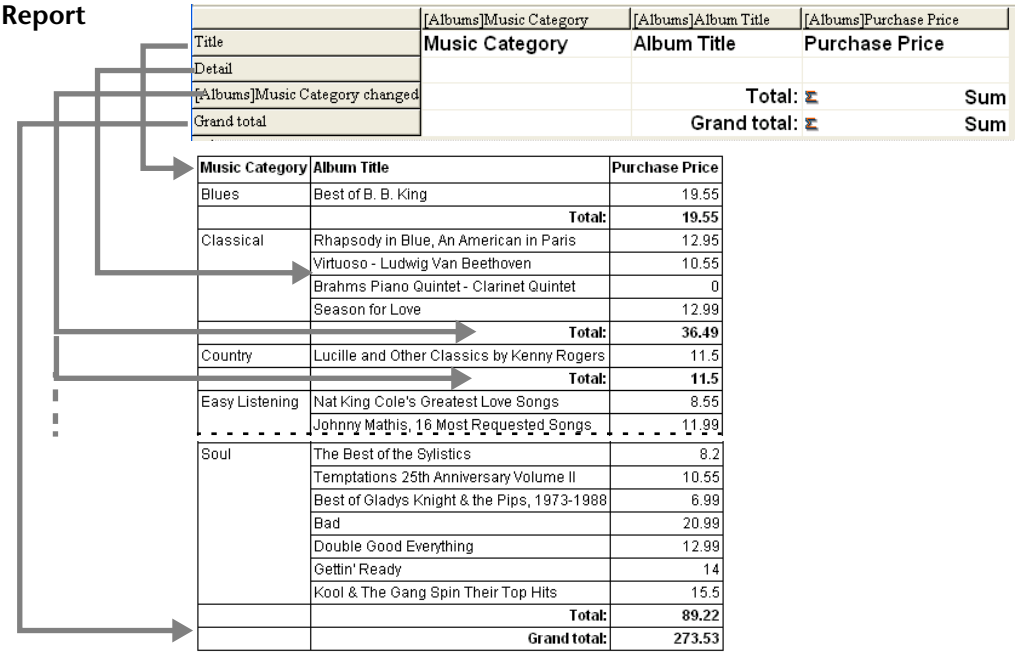
- **Column data sources**: These titles indicate the source of the data for each column.



- **Data Sources**: These two cells will house fields that will be used for the two categories of the array. The center cell can also accept fields sources and calculations at the same time.
- **Total cells**: These cells are designed to house calculations on the column's contents.
- **Title cells**: These cells house the titles for the last column or the last row. Their contents can be modified.

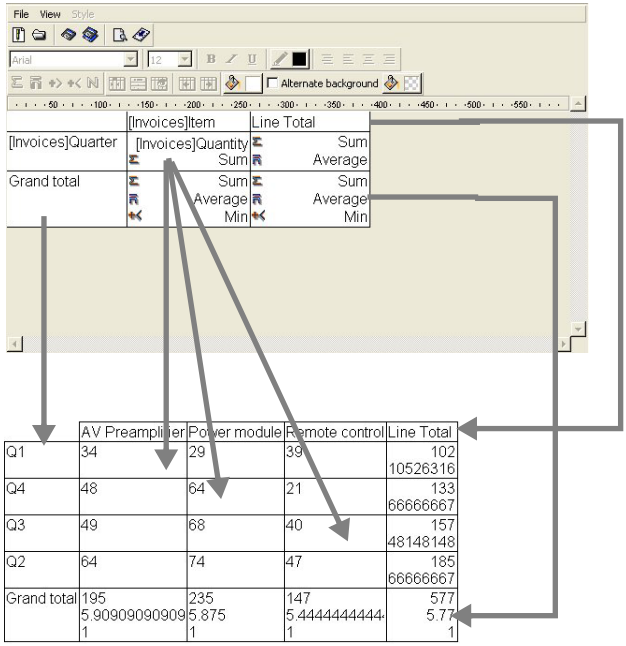
The following figures shows completed quick report designs and the relationship between the specifications in the design and the printed output:

List Report



Music Category	Album Title	Purchase Price
Blues	Best of B. B. King	19.55
	Total:	**19.55**
Classical	Rhapsody in Blue, An American in Paris	12.95
	Virtuoso - Ludwig Van Beethoven	10.55
	Brahms Piano Quintet - Clarinet Quintet	0
	Season for Love	12.99
	Total:	**36.49**
Country	Lucille and Other Classics by Kenny Rogers	11.5
	Total:	**11.5**
Easy Listening	Nat King Cole's Greatest Love Songs	8.55
	Johnny Mathis, 16 Most Requested Songs	11.99
Soul	The Best of the Sylistics	8.2
	Temptations 25th Anniversary Volume II	10.55
	Best of Gladys Knight & the Pips, 1973-1988	6.99
	Bad	20.99
	Double Good Everything	12.99
	Gettin' Ready	14
	Kool & The Gang Spin Their Top Hits	15.5
	Total:	**89.22**
	Grand total:	**273.53**

Cross-table report



Contextual Menus

The Quick Report editor has contextual menus that make it easy to access certain row, column, and cell operations. Instead of making menu selections or working with the Cell or Column properties areas, you can perform certain operations by displaying a Quick Report contextual menu.

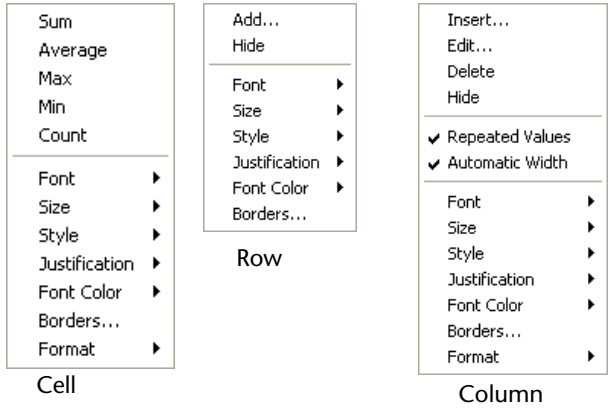
There are separate contextual menus for row, column, and cell operations.

► To use a contextual menu:

1 **Click with the right mouse button on a cell, a row title, or a column heading.**

A contextual menu appears. The commands in the contextual menu depend on where your pointer is (i.e., a row label, column heading, or cell). Also, menu commands that are inappropriate for the particular row, column, or cell are disabled.

2 Choose the desired menu command:



As with any contextual menu, this menu's contents vary depending on which cell type is highlighted. Items available break down into five main types:

- Font attributes,
- Display formats,
- Standard calculations,
- Column or row management items, and
- Cell borders.

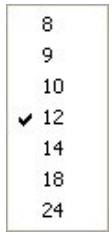
Font Attributes

These items appear in the contextual menu when a cell, column or row is selected. Selecting a font attribute will apply it to the current selection (cell, row or column). The Font attribute items appear as follows:

- **Font**
  Selecting this item displays the list of fonts installed on your machine from which you can select the font that will be applied to the items selected in the report area.

  Once an item in the list is selected, a check mark is displayed next to it.

- **Size**
  Selecting this item displays the list of font sizes from which you can select the font size that will be applied to the items selected in the report area.

  Once an item in the list is selected, a check mark is displayed next to it.

- **Style**
  Selecting this item displays the font styles (Plain, Bold, Italic, and Underline) from which you can select the font style that will be applied to the items selected in the report area.

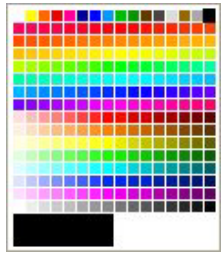
  Once an item in the list is selected, a check mark is displayed next to it.

- **Justification**
  Selecting this item displays the list of justification attributes (Default, Left justified, Centered and Right justified).

Note Default is the default justification for this data type (left for numbers or, otherwise, right).

Once an item in the list is selected, a check mark is displayed next to it.

- **Font color**
  Selecting this item displays a palette of colors.

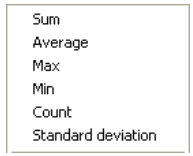


Display Formats

These items appear in the contextual menu when either a cell or a column is highlighted. From the menu, you can select one of the 4D default formats that match the data type of the column. Once selected, the format applies to the entire column, regardless of whether the current selection is a cell or a column.

Summary Calculations

These commands appear in the contextual menu when the current highlighted cell belongs to either the Grand total row or to a Subtotal row.



Selecting an item will insert the corresponding calculation in the highlighted cell (see the "Adding Summary Calculations" paragraph on page 189). Once an item in the list is selected for a cell, a check mark is placed next to it. It is possible to select several calculations successively.

Column and Row Management Items

There are several items that are dedicated to column or row management:

- **Hide**
  Selecting this item hides the current column or row. Once it is hidden, a check mark is displayed next to the item, and the row or column is crossed out.

- **Add...**
  This item is displayed when a row is highlighted or nothing is highlighted. Selecting this item displays the formula editor to allow you to define the data source for a new column. Once this is done, the new column is added to the right of the right-most existing column.

- **Insert...**
  This item is displayed only when a column is highlighted in list mode. Selecting this item displays the formula editor to allow you to define the data source for a new column. Once this is done, the new column is added to the left of the current highlighted column.

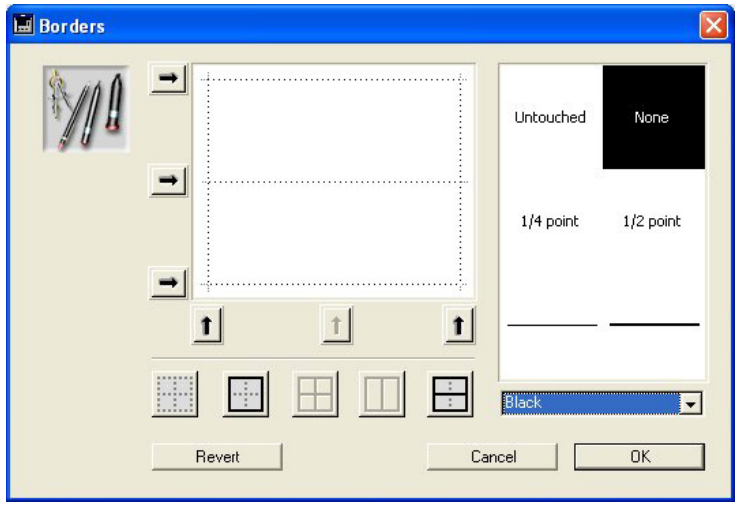
- **Delete**
  This item is displayed only when a column is highlighted in list mode. Selecting this item deletes the current highlighted column.

- **Edit...**
  This item is displayed only when a column is highlighted in list mode or when a cell is highlighted in cross-table mode. Selecting this item displays the formula editor to allow you to edit the data source for the current column (list mode) or for the current cell (cross-table mode).

- **Automatic Width**
  This item is displayed only when a column is highlighted in list mode, or when any cell is highlighted in cross-table mode. You can use this item to select or deselect the automatic width. When Automatic Width is selected, 4D will try to match the column size to the data so that the data fits on one line.

Borders

These items appear in the contextual menu when a cell, column or row is selected. Selecting Borders... displays the Borders dialog box:



For more information about this dialog box, refer to the "Setting Borders" paragraph on page 180.

Once defined, the border format is applied to the current selection (cell, row or column).

Selecting Rows, Columns, and Cells

When designing a List quick report, you need to select rows, columns, and cells in the quick report form. A cell is the intersection of a row and a column.

► To select a row:

■ **Click on the Title, Detail, Subtotal, or Grand total cells in the row label area.**

► To select a column:

■ **Click the Header row of a column.**

► To select a cell:

■ **Click the cell.**

Adding and Modifying Text

You can add or modify text in the quick report form to label parts of the report. For example, if you requested summary calculations, you can label them by adding text to other cells in the Subtotal and Grand total rows.

You can add and modify text as follows:

- Edit the text that 4th Dimension automatically adds to the Title row of the report,
- Insert text in empty cells of the Subtotal and Totals rows,
- Insert the value of a Subtotal field in the Subtotal rows,
- Specify the font, font size, justification, and style for any text that appears in the report.

Adding Text

► To add text in a report cell:

1 **Click twice on an empty cell in the quick report form.**

A text insertion point appears in the cell.

If you are entering a label for a summary calculation, select a cell in the same row as the cell containing the calculation icons. You cannot enter text into the same cell that contains summary calculations.

2 **Type the text in the cell.**

Modifying Text

► To modify text in a cell:

1 **Double-click in a cell to get an insertion point and drag across the text in the cell you want to modify.**

4th Dimension highlights the selected text.

2 **Type the new text in the cell.**

Adding Columns

In List mode, you create columns by dragging field names from the Fields list into the quick report area. If you want to add a field from a related table, expand the foreign key field in the hierarchical list of fields to display the fields in the related tables (if you have selected **Related Tables** or **All Tables** in the drop-down menu located just above the list).
You can add fields from related tables, provided that the relationship is automatic. If you want to be able to use manual relations, check the **All relations in automatic** option: in this case, the editor changes all the relations of the database to automatic (see the "Interface" paragraph on page 159).

Note You cannot add or edit a column in cross-table mode, since the report comes with all the columns needed.

► To add a field:

■ **Drag the name of a field to the right of existing columns in the Quick Report area and release the mouse button.**

OR
Double-click on the name of a field in the Fields list.

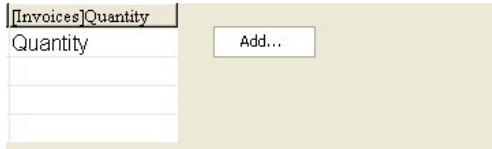
Note If you drag and drop a field onto an existing column, it will be replaced by the new column.

4th Dimension creates a column for the field and places the field name in both the column header and the cell in the Header row.

By default, 4th Dimension prints the field names as column heads at the top of each page in the quick report.

► To add a column using a menu command:

1 **Select the Add... command in the Columns menu of the editor.**
OR
Right-click over an unused area of the Quick Report area, then select the Add... command.



The standard 4th Dimension formula editor is displayed, allowing you to specify the data source of the new column (field or formula).

Inserting Columns

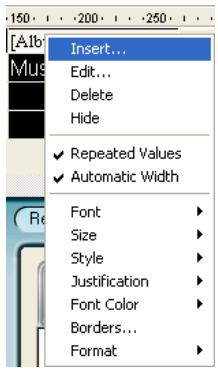
In List mode, you can insert an empty column into a quick report. After you insert the column, you can assign a field or a formula to it.

► To insert a column:

1 **Select a column.**

2 **Choose Insert... from the Columns menu.**

OR
Right-click to display the Quick Report contextual menu and choose Insert.



The standard 4th Dimension formula editor is displayed, allowing you to specify the data source of the new column (field or formula).

Deleting Columns

In List mode, as you specify fields for your quick report, you may want to remove some columns to place them elsewhere. Or, you might want to delete the column from the report.

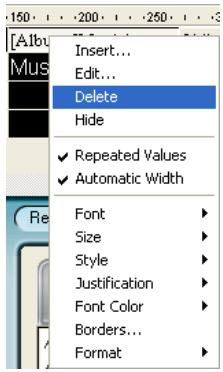
► To delete a column using the Quick Report menu bar.

1 **Select the column you want to delete.**

2 **Choose Delete from the Columns menu.**

OR

Right-click on the header of the column to be deleted, then select the Delete command from the contextual menu.



4th Dimension removes the selected column of the report.

Replacing Columns

In List mode, you can replace a column in the quick report by dragging another field over it. You can also replace a field with a formula and vice versa.

► To replace a column by a field:

1 **Drag a field from the Fields list to the column you want to replace.**
The replacement is instantaneous. If the previous field was designated as the sort level, the field that replaces it will also be substituted in the sort order list.

► To replace a column using the formula editor:

1 **Select the column you want to replace and choose Edit... from the Columns menu.**
OR
Right-click on the header of the column to be replaced, then select the Edit... command in the contextual menu.
The standard Formula editor of 4th Dimension appears, allowing you to designate the new data source of the column (field or formula).

When you print the quick report, 4th Dimension will print the results of the formula for each record that appears in the Detail row. See the "Associating Formulas with a Quick Report" section on page 175 for information about adding a formula to a quick report.

Sizing Columns

By default, the Quick Report editor sizes columns automatically, as reflected in the **Automatic Width** button. It sizes each column based on the maximum length of data displayed in the column and any labels typed into the column. The Quick Report editor sizes the columns when the report is printed.
This operation is enabled for a column when the **Automatic Width** attribute has been associated with it. You can set and view the activation of this option in the **Columns** menu, in the contextual menu of the columns or using the corresponding button in the Columns toolbar:

To view the widths of each column, preview the report on the screen. See the "Generating a Quick Report" section on page 200 for more information about previewing the report.

Because selecting the **Automatic Width** button or contextual menu item changes the width of a column based on the maximum width of data in the records being printed, selecting different records can change the size of the columns.

You can resize a column manually, which automatically causes the deselection of the **Automatic Width** option (where applicable).
When a column is set manually, text in the column wraps within the specified area.

► To manually resize a column:

1 **Select the column you want to resize.**

2 **Move the pointer over the column divider in the quick report to change the pointer into a column width cursor ↔.**

3 **Drag the column divider to the left or right to resize the column.**

Moving Columns

In List mode, as you specify fields for your quick report, you may want to move some columns to place them elsewhere.

► To move a column using the Quick Report toolbar:

1 **Select the column you want to move.**

2 **Click the move icon to move it to the right or to the left:**

OR

3 **Select Move right or Move left from the Columns menu to move the column as desired.**

4th Dimension moves the selected column.

Associating Formulas with a Quick Report

You can add a formula to a column in a quick report. For example, you can add a formula that computes employees' monthly salaries from an Annual Salary field.

► To associate a formula with a column:

1 **Insert an empty column**
OR
Click an existing column and choose Edit... from the Columns menu.
OR
Double-click an existing column's header.
OR
Right-click on an existing column header to display the Quick Report contextual menu and choose Edit.

4th Dimension displays the Formula editor, which you can use to build a formula. If you selected an existing column, the formula you create will replace the previous contents of the column.

Note Make sure that the formula you create does not change the current selection. Changing the current selection will cause problems when you print the quick report since the report is based on the current selection. For information about commands and functions that change the current selection, refer to the *4th Dimension Language Reference*.

2 **Build the formula by selecting the fields, operators, commands and/or 4D methods, then enter the desired values in the editing area.**
OR
Click the Load... button to retrieve an existing formula from disk.

For more information about the formula editor, refer to the "Global Updates" paragraph on page 113.

If you click the **Load...** button, 4th Dimension displays an open-file dialog box and asks you to select a file. When you load a file, it replaces any formula that currently appears in the Formula editor. After you load a formula, you can modify it in the editing area.

To save the formula as a file that you can retrieve and use in another column or in another report, click the **Save...** button and enter a filename in the dialog box.

3 **Click OK to assign the formula to the column.**

4th Dimension adds a new label to the column that identifies it as a formula. You can relabel the column by typing a label into the header cell for that column. The formulas are labelled *C1* to *Cn*. These labels are the name of the variables containing the current value of the column. You can use these variables in other formulas.

Modifying the Graphic Attributes of a Report

You can modify the graphic appearance of a quick report. The Quick Report editor lets you set the following attributes:

- the character font, as well as its size, justification, style and color,
- the background color of the cells,
- the cell borders.

In addition, 4th Dimension provides a set of predefined report templates that you can modify as desired.

Note Appearance specifications are only taken into account for the "Printer" and "HTML File" output destinations (colors only). With other types of output, the formatting of reports must be carried out after the report is generated, using the receiving applications (4D View, 4D Chart or a text editor). For more information about report destinations, refer to the "Generating a Quick Report" paragraph on page 200.

Specifying Character Font, Size, Justification, Style, and Color Attributes

While designing your quick report, you can specify different fonts, font sizes, justification, styles and colors. You can then apply these specifications to text, data, and summary calculations within rows, columns, or cells in the quick report.

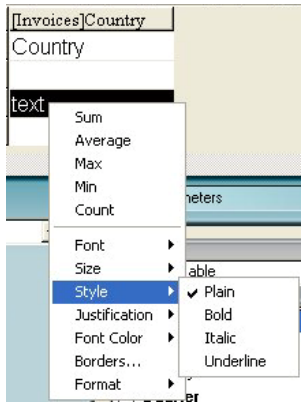
If you assign specifications to the Detail row of the report, you will not see the results until you preview or print the report.

You can specify font attributes using either the Quick Report menu commands or the Quick Report contextual menu.

► To specify a character font, font size, style, justification or color:

1 **Right-click on the row label, column header, or cell to which you want to apply the font attributes.**

A contextual menu appears.



2 **Use the Font, Size, Style, Justification or Font Color submenus to change the font attributes as desired.**
OR

1 **In the report, select the column, row or cell that you want to configure.**

2 **Choose a font in the drop-down font list and a size in the drop-down size list; then choose a style, justification and color in the Style toolbar:**

Note You can also assign a style and justification using the **Style** menu.

4th Dimension applies the parameters to the text, data or calculations included in the selected area.

Specifying the Background Color of Cells

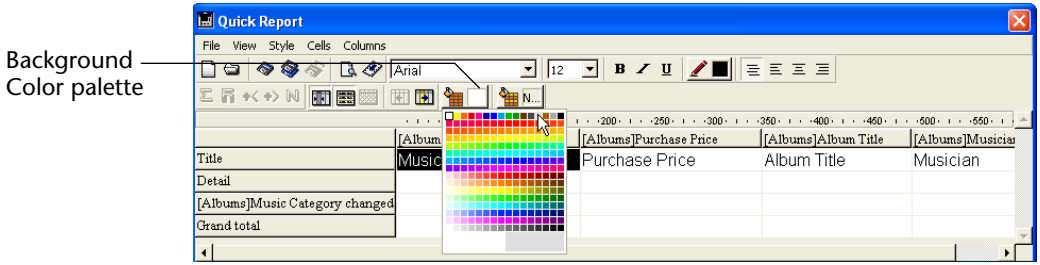
The Quick Report editor allows you to set a background color for each cell. You can set either a single color or two alternating colors, which provides better readability for tables.

It is possible to set background colors for both List and Cross-table reports.

Background colors are used with the “Print” and “HTML File” output destinations.

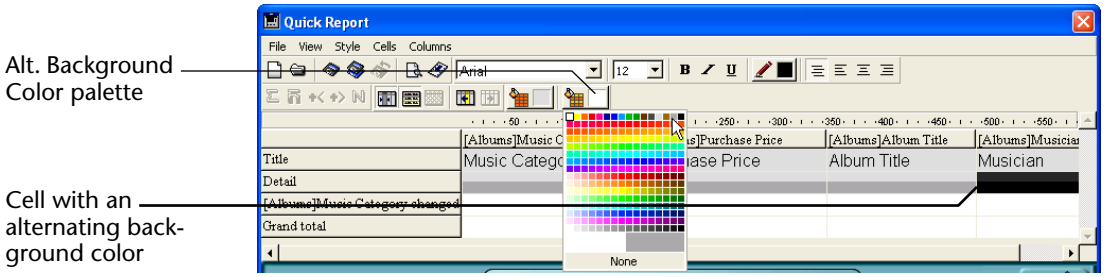
► To set a background color:

1 **Select a cell, column or row, then choose the main color in the "Background Color" palette of the toolbar:**



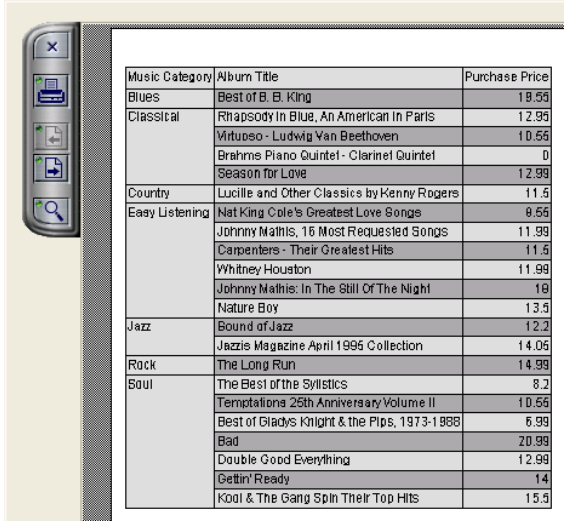
You can assign any color combination that you want to the rows, cells and columns.

2 **(Optional) If you want to use an alternating background color, choose it using the "Alt. Background Color" palette:**



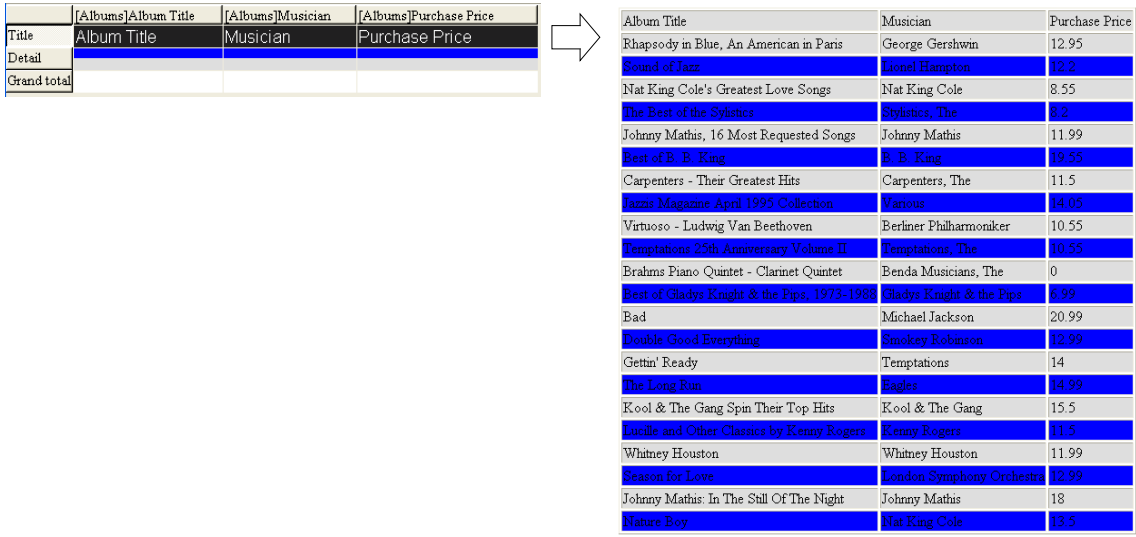
The cells which have been assigned two alternating background colors will display both of them in the Quick Report editor.

Here is an example of a generated report in List mode (preview) that has alternating background colors:



Music Category	Album Title	Purchase Price
Blues	Best of B. B. King	19.55
Classical	Rhapsody In Blue, An American In Paris	12.95
	Virtuoso - Ludwig Van Beethoven	10.55
	Brahms Piano Quintet - Clarinet Quintet	0
	Season for Love	12.99
Country	Lucille and Other Classics by Kenny Rogers	11.5
Easy Listening	Nat King Cole's Greatest Love Songs	8.55
	Johnny Mathis, 16 Most Requested Songs	11.99
	Carpenters - Their Greatest Hits	11.5
	Whitney Houston	11.99
	Johnny Mathis: In The Still Of The Night	18
	Nature Boy	13.5
Jazz	Bound of Jazz	12.2
	Jazzis Magazine April 1995 Collection	14.05
Rock	The Long Run	14.99
Soul	The Best of the Sylistics	8.2
	Temptations 25th Anniversary Volume II	10.55
	Best of Gladys Knight & the Pips, 1973-1988	6.99
	Bad	20.99
	Double Good Everything	12.99
	Gettin' Ready	14
	Kool & The Gang Spin Their Top Hits	15.5

Background colors are also taken into account in reports generated in HTML format:



	[Albums]Album Title	[Albums]Musician	[Albums]Purchase Price
Title	Album Title	Musician	Purchase Price
Detail			
Grand total			

Album Title	Musician	Purchase Price
Rhapsody in Blue, An American in Paris	George Gershwin	12.95
Sound of Jazz	Lionel Hampton	12.2
Nat King Cole's Greatest Love Songs	Nat King Cole	8.55
The Best of the Sylistics	Stylistics, The	8.2
Johnny Mathis, 16 Most Requested Songs	Johnny Mathis	11.99
Best of B. B. King	B. B. King	19.55
Carpenters - Their Greatest Hits	Carpenters, The	11.5
Jazzis Magazine April 1995 Collection	Various	14.05
Virtuoso - Ludwig Van Beethoven	Berliner Philharmoniker	10.55
Temptations 25th Anniversary Volume II	Temptations, The	10.55
Brahms Piano Quintet - Clarinet Quintet	Benda Musicians, The	0
Best of Gladys Knight & the Pips, 1973-1988	Gladys Knight & the Pips	6.99
Bad	Michael Jackson	20.99
Double Good Everything	Smokey Robinson	12.99
Gettin' Ready	Temptations	14
The Long Run	Eagles	14.99
Kool & The Gang Spin Their Top Hits	Kool & The Gang	15.5
Lucille and Other Classics by Kenny Rogers	Kenny Rogers	11.5
Whitney Houston	Whitney Houston	11.99
Season for Love	London Symphony Orchestra	12.99
Johnny Mathis: In The Still Of The Night	Johnny Mathis	18
Nature Boy	Nat King Cole	13.5

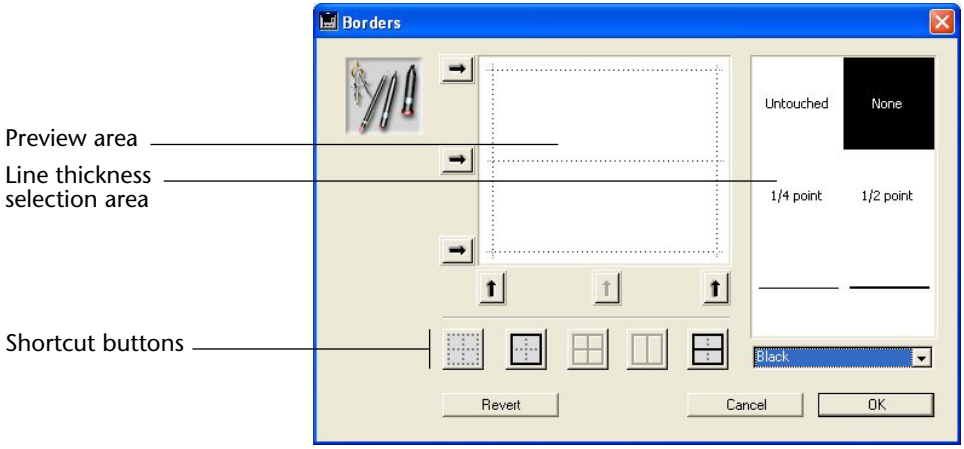
Setting Borders

You can set the borders for cells in both cross-table and list reports.

► To set the borders for a cell, a column or a row:

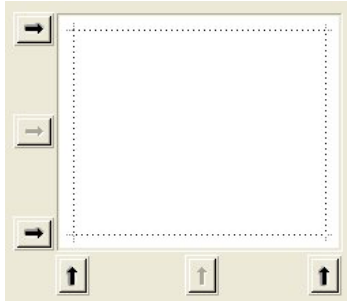
1 **Highlight a cell, column or row, and either select Borders... in the contextual menu or from the Style menu.**

The "Borders" dialog box is displayed:

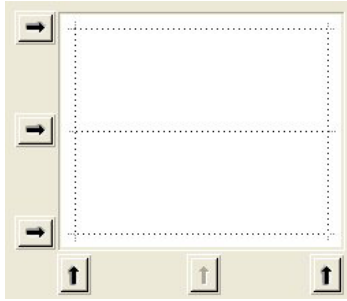


The preview area varies dynamically depending on the type of the selection: cell, column or row, but also whether a cell is in a list or cross-table type report. For example, the behavior of the center cell in a cross-table report is different from the behavior of a detail cell in a list report. The center cell is repeated both horizontally and vertically for a cross-table report, whereas the detail cell in a list report is going to be repeated only vertically. Also, other cells may not be repeated at all (titles, for instance).

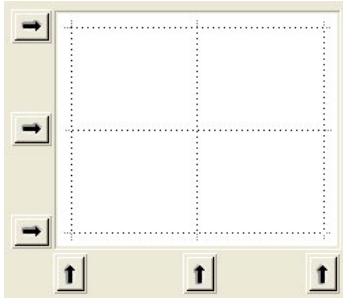
- If the selected cell is a title cell (which is not repeated), the outer lines represent the outer lines of the cell:



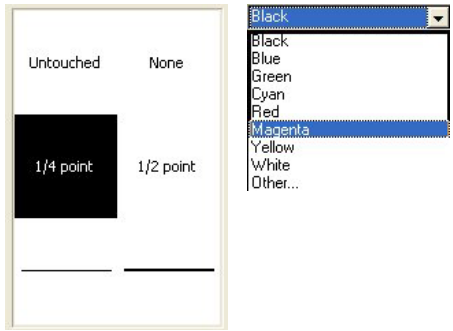
- If the selected cell is a detail cell in a List report (which is repeated vertically), the outer lines represent the outer lines of the cell repetition, and the inner horizontal line represents the border between two cells in the sequence:



- If the selected cell is the center cell in a cross-table report (which is therefore repeated both horizontally and vertically), the outer lines represent the outer lines of the repetition of cells, and the inner lines represent the borders between each cell generated from the center cell:



2 Select the line thickness and color to use:



You can use different colors for different borders.

3 **Select the borders using either the arrows or the shortcut buttons.**
You will notice that some shortcut buttons are disabled to match the type of the cell you are editing.

4 **Repeat steps 2 and 3 for each border to be configured.**

5 **Click OK to validate the changes.**
OR
Click Revert to revert to the original border settings.
OR
Click Cancel to discard the changes and close the dialog box.

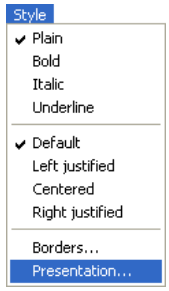
Using a Predefined Report Template

The Quick Report editor contains a set of predefined templates providing various graphic approaches for the production of printed or HTML reports. You can use all of the template as is or you can use it as a basis for constructing your own reports. A template can be applied at any time.

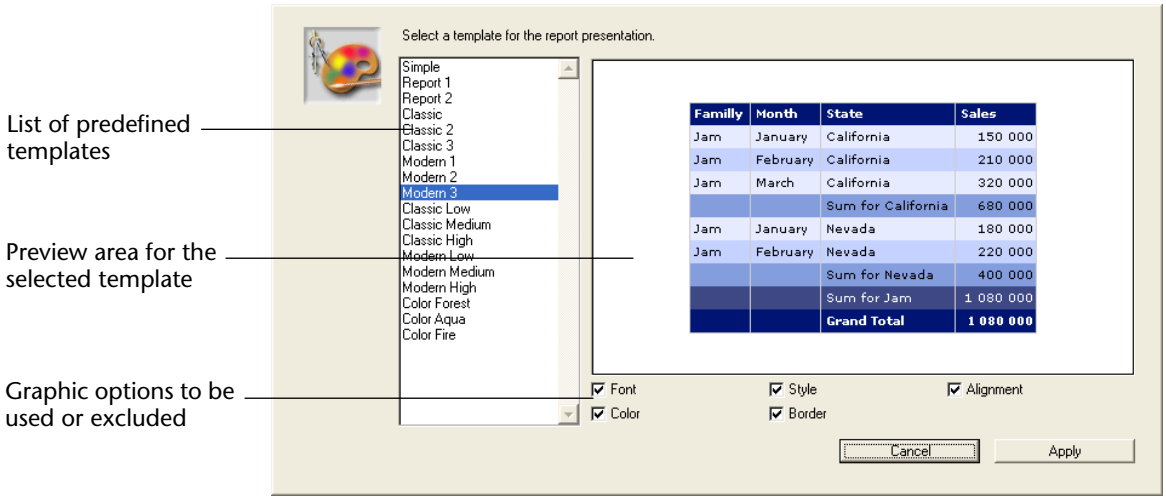
A report template combines a set of graphic characters: font, colors, style, borders and justification. You can use either all or part of the template characteristics.

► To use a predefined template:

1 **Choose the Presentation... command in the Style menu.**



The template selection dialog box appears:



2 **In the list of predefined templates, click on the one that you want to use.**

You can preview each template in the right-hand area of the dialog box. Choose the template that best corresponds to your needs, keeping in mind that you can always modify your report subsequently.

3 **If you do not want to use all the graphic options set by the template, you can uncheck each option that you do not want to be taken into account.**

By default, all the options are selected. If, for example, you uncheck the “Border” option, the borders defined by the template will not be applied to your report.

Note Only the “Color” option will be taken into account for reports whose output destination is an HTML file.

4 **Click on Apply.**

The selected characteristics are immediately applied to your report. If any graphic attributes were set previously, they will be replaced.

Keep in mind that certain characteristics will be only visible once the report has been generated.

Sorting Records

An important feature of the Quick Report editor is the ability to sort the records in your report. You sort records for two reasons:

- To view records in a particular order,
- To create groups of records and subtotal areas in the report for the purpose of reporting summary calculations for groups.

Specifying a Sort Order for a List Report

You can specify a sort order at any time; simply drag and drop a column into the Sort order list.
For example, if you wanted to sort the records of salespeople by the Sales Region field, you would drag and drop the Sales Region column into the Sort order area.

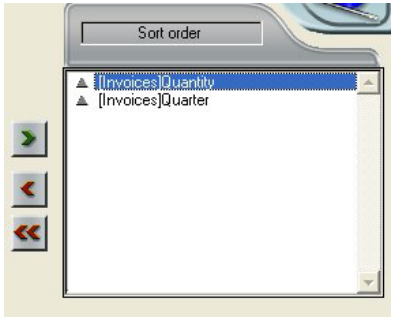
You can also sort based on a formula by selecting the column that contains the formula and placing it in the Sort order list. See the "Associating Formulas with a Quick Report" section on page 175 for more information about adding formulas to quick reports.

You can sort a report on several levels. The order in which the fields and formulas appear in the Sort order list indicates the sort level.

► To specify the sort order using the field list:

1 **Drag the Field you want to set as the sort level from the Fields list to the Sort order list.**
OR
Highlight the field from the Field lists and click on the field insertion button:

The field is then added to the Sort order list.

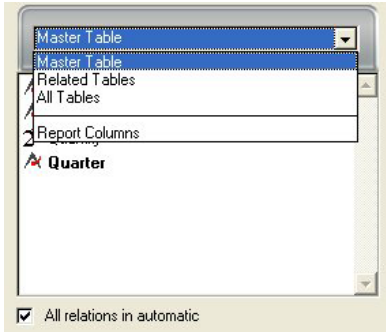


By default, sorts are carried out in increasing order (A -> Z). You can reverse the direction of the sort by clicking on the triangle next to the field in the Sort order list.

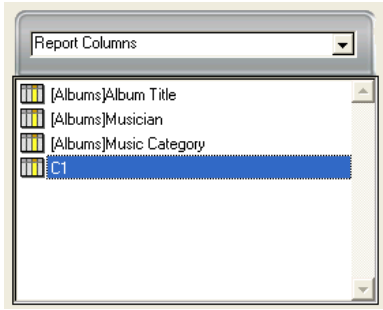
Note If the sorted field has not already been inserted into a report column, an additional column is automatically created in the Quick Report area.

► To specify a sort for a column (field or formula):

1 Select Report Columns from the table selection drop-down list.

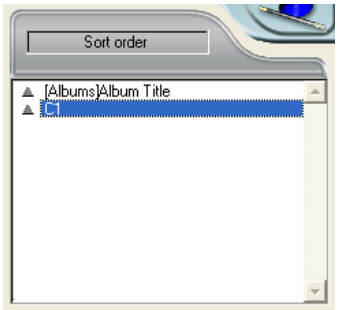


The list then displays the headers of the columns present in the report:



2 Drag the column that you want to set as the sort level and drop it in the "Sort order" list.
OR
Highlight the field from the Field lists and click on the field insertion button:

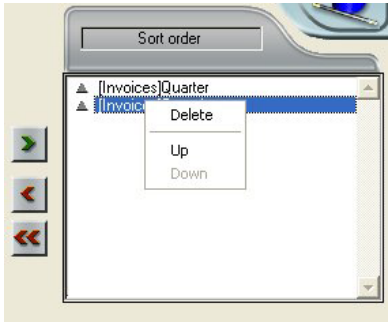
4th Dimension then displays the name of the column in the Sort order list:



Changing the Sort Level

► To change the level of a sort:

1 **Right-click on the field in the Sort order list in order to display the contextual menu:**



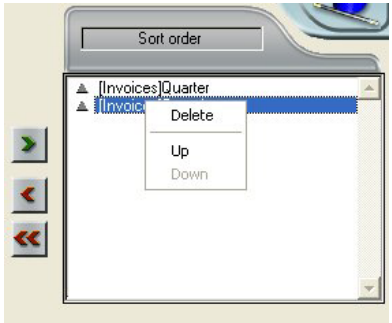
2 **Select Up or Down to move the field up or down (respectively) in the sort levels.**

Deleting a Field or Formula from the Sort List

You can delete any field or formula from the Sort list.

► To remove a field or formula from the Sort order:

1 **Select the field or formula to be deleted in the sort list and display the contextual menu using a right-click:**



2 **Select Delete.**

The level is then removed.
Note that the associated column is not removed from the report. On the other hand, the associated subtotal row disappears.

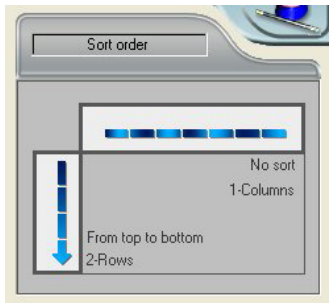
Sorting the Cross-Table Values

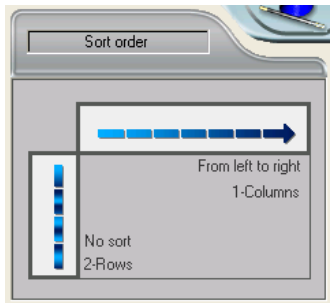
In a Cross-table report, the only values that can be sorted are the horizontal and vertical data sources (the two data sources that are used as categories in the final table).

► To sort the categories in a cross-table report:

1 **Click the sort indicators in the Sort order area.**

An arrow indicates the sort order specified:





To modify or delete the sort order of a data source, click on it again. The different possible reports appear successively.

When no arrow is displayed, no sort order is selected. In this case, values will be displayed in the order they appear in the selection.

Subtotal Levels

In a quick report, you set break levels to separate or "break" records into groups according to values in one or more sort fields. A break area is printed at each break level. You can print summary calculations in the break area. The summary calculations — sum, average, minimum, maximum, count and standard deviation — are calculated for each group of records.

Break levels are determined by the sort levels and Break rows. For example, if you sort records by Sales Region, 4th Dimension inserts a break between each group of records that have the same sales region. These rows are automatically inserted when a sort is defined.

After you add a subtotal row to the quick report, you can request summary calculations on each break. For example, you can insert a summary calculation in a subtotal row to display subtotals for sales from each state in a marketing region. Refer to the "Adding Summary Calculations" section on page 189 for more information about adding summary calculations to Subtotal and Total rows.

Subtotal rows

	[Invoices]Country	[Invoices]Item	[Invoices]Quantity
Title	Country	Item	Quantity
Detail			
[Invoices]Quantity changed			
[Invoices]Country changed			
Grand total			

The label of a subtotal row indicates which change in value triggers the break.

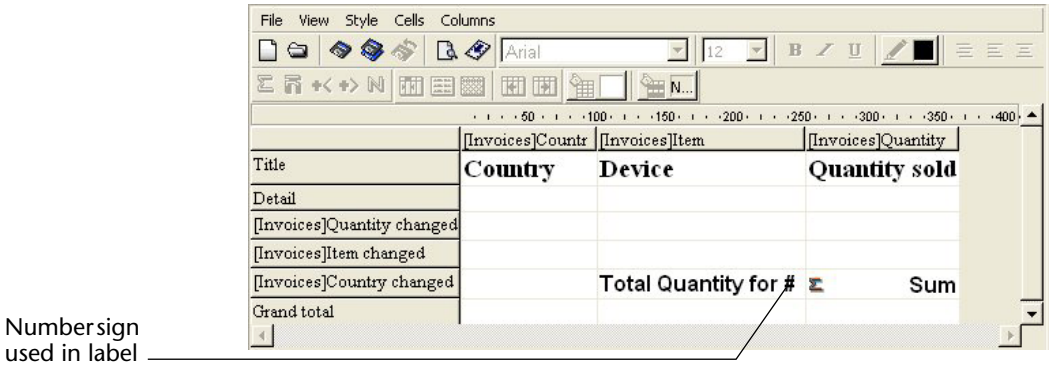
Using the Values of Break Fields in Labels

You can improve the appearance and clarity of your reports by labeling each Subtotal row using the value of the Break field.

To request that the value of a Break field be printed in a label placed in the Break area, use the number sign (#) in the label. For example, the text "Total salaries for # department" will insert the department name (in this case, the value of the Department field) in place of the number sign when the report is printed.

The number sign does not need to be placed in the same column as the Break field. It will display the value of the Break field in any cell in the Subtotal row.

The following figure illustrates the use of the number sign in a label in the Subtotal row:



Adding Summary Calculations

You can add summary calculations on the contents of fields and formulas to each Subtotal row and to the Totals row. In a cross-table report, calculations can be inserted in the center row.

The calculation buttons in the toolbars of the Quick Report editor identify the summary calculation options available for quick reports.

The following summary calculations are available.

- **Sum**: Totals the values in the report or break.

- **Average**: Calculates the average of the values in the report or break.

- **Minimum**: Displays the lowest value in the report or break.

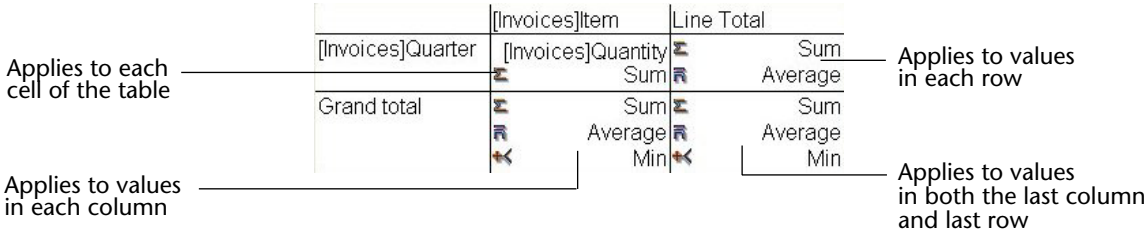
- **Maximum**: Displays the highest value in the report or break.

- **Count**: Calculates the number of records in the report or break.

- **Standard deviation**: Displays the square root of the variance of the report or break (the variance is a dispersion value around the average).

These options also appear in the Quick Report contextual menu for cells in the Subtotal and Total rows or, for a cross-table report, in the total cells and the center cell.

- List Reports
  When you place a summary calculation in the Totals row, the calculation is done for all records in the report. If you place the summary calculation in a subtotal row, separate calculations are done for the records in each break.
- Cross-table reports
  Summary calculations will apply as follows

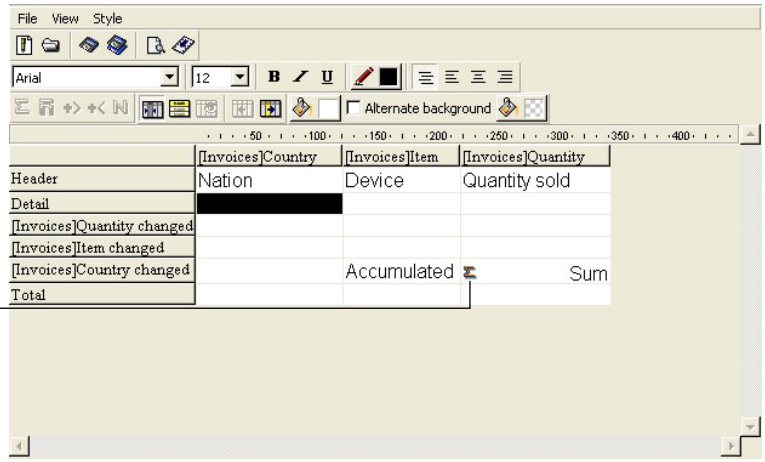


► To add a summary calculation:

1 **Select a cell where you want to insert the summary calculation.**
The Sum, Minimum, Maximum, and Average calculations work only on a numeric field or formula.

2 **Click as many summary calculation buttons as you like.**
OR
From the contextual menu, choose the desired summary calculations.

4th Dimension displays a calculation icon in the selected cell for each type of summary calculation you request. The following figure shows a Sum calculation icon in a Subtotal row:



If you add more than one summary calculation to a cell, 4th Dimension stacks the calculation icons on top of each other.

Using Calculations and Column Values in Labels

You can insert summary calculations using the following codes.

- **##S** will be replaced by the **sum** in the sub-total or total row.
- **##A** will be replaced by the **average**.
- **##C** will be replaced by the **count**.
- **##X** will be replaced by the **max**.
- **##N** will be replaced by the **min**.
- **##D** will be replaced by the **standard deviation**.
- **##xx**, where *xx* is a column number. This will be replaced by that column's value, using its formatting. If this column does not exist, then it will not be replaced

These codes can be useful when you want to mix labels and data in a cell.

Displaying Repeated Values for Break Columns

In a report with subtotals, the columns which are used to group records so that summary calculations can be done are called *Break columns*. In the report shown below, the Department field is a Break column since the records in the report are grouped by department.

When a report like this is printed, the values for the Break column are printed only once per break. In other words, a department name is printed only for the first record in the group and is not repeated until the department changes.

First Name	Last Name	Department Name	Salary
Biff	Davis	Accounting	43780
Smeldorf	Garbando		19610
Alan	Hull		41460
Bryan	Pfaff		26440
Shirley	Ransome		36040
Marlys	Wilson		36500
		Sum for Department : Accounting	203830
Kathy	Forbes	Engineering	18840
Dennis	Hanson		40520
Mary	Smith		55000
Andy	Venable		43520
Lance	Wolfram		27300
		Sum for Department : Engineering	185180

Non-repeating break values

In some cases, you may want to repeat the values for the Break columns so that they appear for every record in the Break area. You do so by selecting the **Repeated Values** column property. This can be done either by clicking the **Repeated Values** button in the toolbars , by choosing the **Repeated Values** menu command in the Quick Reports contextual menu for that column, or by selecting Repeated Values from the Columns menu.

► To display repeated values for fields in a column:

1 **Select the column by clicking the header row for that column and choosing the Repeated Values command in the Columns menu or clicking the Repeated Values button in the "Columns" toolbar.**
OR
From the contextual menu for that column, choose Repeated Values.

The following figure shows the previous report after the **Repeated Values** check box has been checked for the Department Name column.

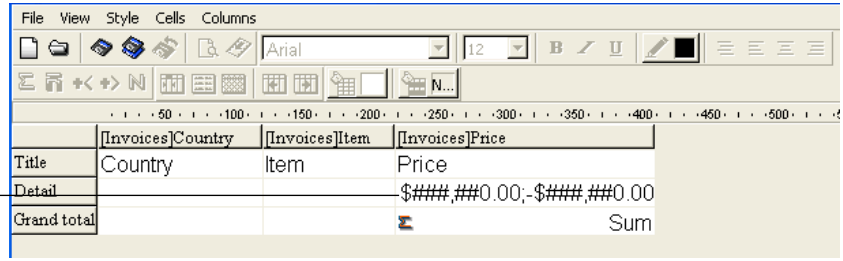
First Name	Last Name	Department Name	Salary
Biff	Davis	Accounting	43780
Smeldorf	Garbando	Accounting	19610
Alan	Hull	Accounting	41460
Bryan	Pfaff	Accounting	26440
Shirley	Ransome	Accounting	36040
Marlys	Wilson	Accounting	36500
		Sum for Department : Accounting	203830
Kathy	Forbes	Engineering	18840
Dennis	Hanson	Engineering	40520
Mary	Smith	Engineering	55000
Andy	Venable	Engineering	43520
Lance	Wolfram	Engineering	27300
		Sum for Department : Engineering	185180

Break values (repeated)

Setting Display Formats

You can specify display formats for columns that contain numeric (integer, longint, real), alphanumeric (alpha), date, time and picture data.

For example, if you are displaying prices in a column, you can add a numeric format to the Detail cell for the Price field. The $###,##0.00;-$###,##0.00 format places a dollar sign ($) to the left of the number and can display dollar amounts from -$999,999.99 to $999,999.99:



Numeric format

If your report includes Alpha fields such as a telephone number or Social Security number, you can use an Alpha format. If your report displays dates, times or pictures, you can also assign display formats to them.

4th Dimension provides different default display formats. However, you can create your own display styles for numeric and alphanumeric formats. For more information about this point, refer to the *4th Dimension Design Reference* manual.

Assigning the Display Format

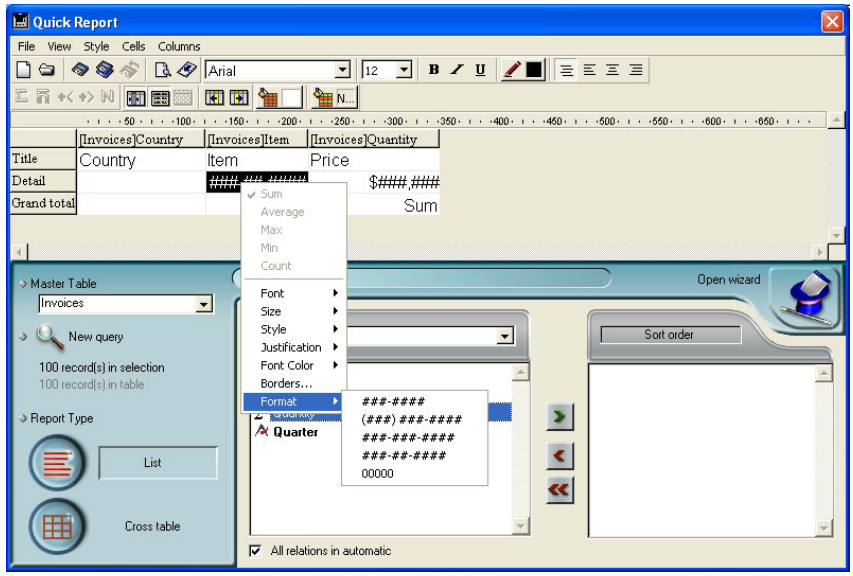
You can associate a display format with a cell by selecting it in the contextual menu or by entering it directly in the cell.

► To assign a display format to a numeric, alpha, date, time or picture field:

1 **Right-click on a cell of the column with which you want to associate a style.**

The contextual menu of the editor appears.

2 **Select the desired display format from the Format submenu:**



The contents of the submenu vary according to the type of data contained in the column: numeric, alphanumeric, date, time or picture. If the report column contains data that cannot be formatted, the Format command does not appear in the contextual menu.

Note For more information about display formats, refer to the *Design Reference* manual of 4th Dimension.

The format is entered in the Detail cell. If you have also requested summary calculations for the column, the format specified in the Detail cell will automatically be applied to the summary calculations. The only exception is the “Count” calculation which is always displayed as an integer and does not accept any formatting symbols such as the dollar sign.

You can also enter the formats to be applied manually by clicking twice in the cell and entering the elements of the format using the keyboard.

Different formats can be applied to different columns in the report.

Hiding and Showing Rows and Columns

4th Dimension lets you hide rows or columns in a quick report in List mode. If desired, you can show a hidden column or row.

Hiding rows is useful when you want the report to include only summary calculations. For example, hide the Detail row if you want to display only the summary calculations that appear in the Totals and Subtotal rows. You can also use this feature to hide a Subtotal row or the Totals row.

You can hide a column if you need to use the column as a sort column, but do not want the report to display it.

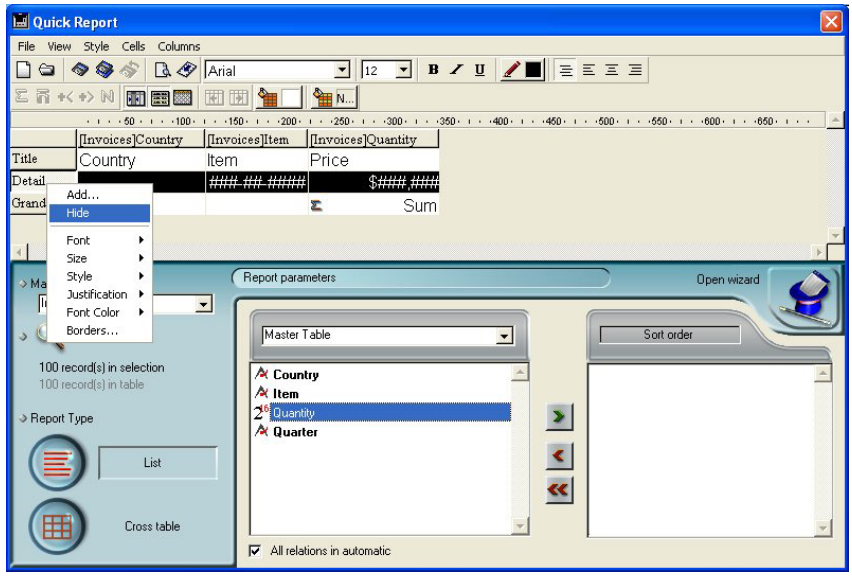
You can hide/display a row or column using either the Quick Report contextual menu, the Columns menu or the “Columns” toolbar.

Note You cannot hide a row or column in a cross-table report.

► To hide a row or column:

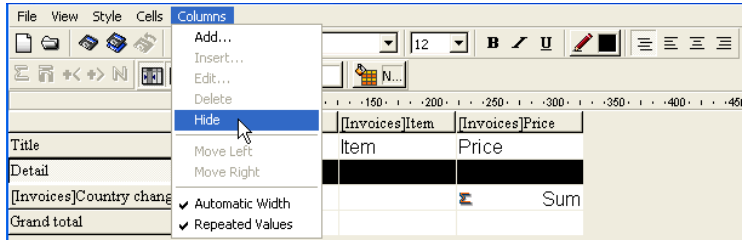
1 **Select the row or column you want to hide by clicking on its header.**

2 **Right-click on the header of the row or column to be hidden, then choose Hide in the contextual menu:**



OR

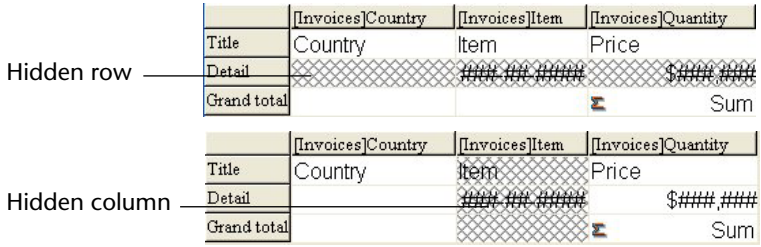
Choose the Hide command in the Columns menu of the Quick Report editor.



OR

Click on the button of the "Columns" toolbar.

4th Dimension displays the column in gray to remind you that the row will not appear when you print or preview the quick report.



Showing a Hidden Row or Column

When a row or column is hidden, a check mark (√) is displayed next to the **Hide** menu command in the **Columns** or contextual menu. In addition, the corresponding button of the "Columns" toolbar is pressed in.

You can display a hidden row or column by choosing **Hide** again from either the **Columns** or contextual menu, or by pressing the corresponding button in the "Columns" toolbar again. When you do so, the row or column is displayed normally in the Quick Report area.

Adding Page Headers and Footers

Before printing a quick report, you can add page headers and footers. You specify page headers and footers in the Headers and Footers dialog box. Use this dialog box to do the following:

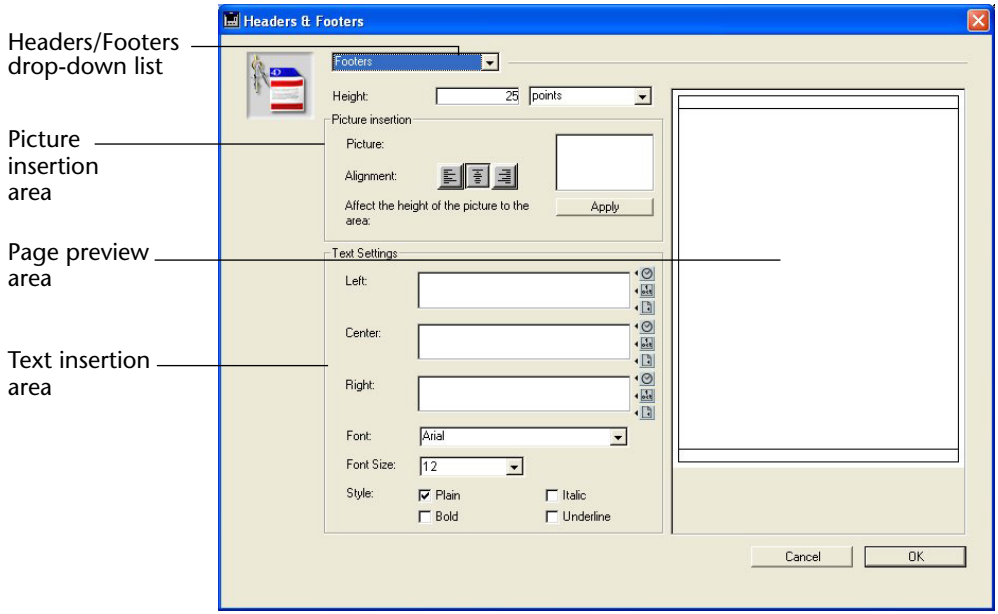
- Add page header and footer text or pictures,
- Specify the size of the page header and footer areas,
- Use separate text for left, center and right parts of the header and footer,
- Specify fonts, font sizes, and font styles for page header and footer text,
- Insert codes that add page numbers and the date and time to your reports.

You can only specify page headers and footers when printing to a printer. However, once they are defined, they are kept with the report, even if the destination is modified. See the "Generating a Quick Report" section on page 200 for more information about alternate output destinations.

► To add page headers and footers:

1 Choose Header and Footer... from the File menu.

The Headers and Footers dialog box appears.



Note The preview area takes the print format configuration into account.

The Headers and Footers dialog box lets you specify both headers and footers using the same screen. Use the Headers/Footers drop-down list to indicate the one you currently want to define.

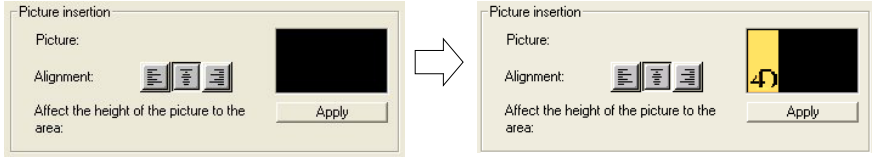
2 Choose Headers or Footers from the selection menu.

3 Enter the header or footer height in the Height area.

When you first enter the dialog box, the header and footer heights are set to 25 points each. You can not only change these values, but can change the measurement scale to enter values in inches or centimeters as well.

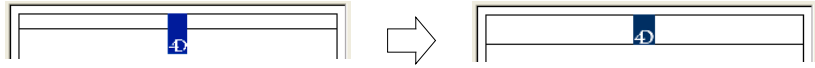
As you enter the header and footer height, the lines on the page preview area change to indicate the size of the header and footer as they will appear in the printed report.

4 **If you want to use a picture, paste it in the picture area (using standard copy-paste commands):**

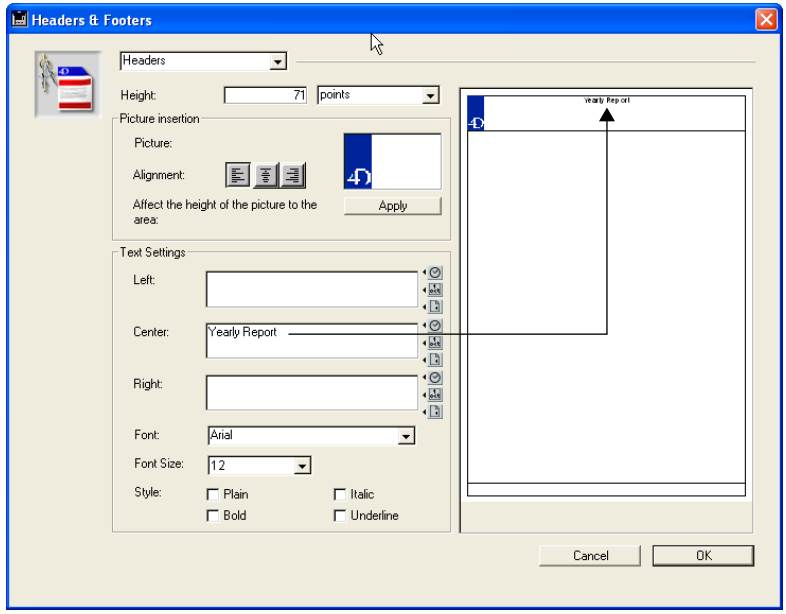


5 **Select its alignment by clicking on the alignment icons:**

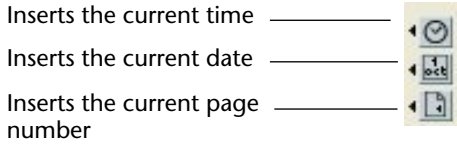
6 **If you want the height of the picture to become the height of the header/footer, click the Apply button:**



7 **Select an entry area and type the header or footer text.**



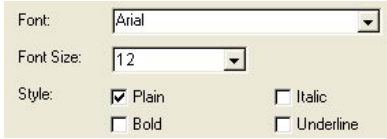
To the right of each entry area, there are three buttons that let you enter variables into the entry area.



You can insert the current page number, time of execution, or date of execution.

You can also use the code for the variables directly: #H for the time, #D for the date and #P for the page number.

8 **Assign the font attributes for the header/footer.**



9 **Click OK to validate the changes.**

Generating a Quick Report

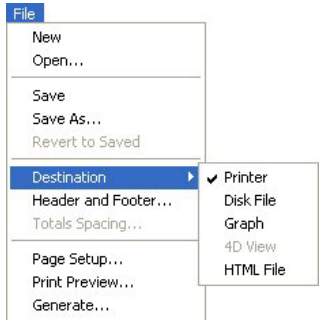
After you have completed your report design, you can "print" the quick report. You can print a quick report to a variety of output types:

- On the standard printer selected,
- To disk, in a Text file,
- To a graph,
- To a 4D View document,
- To an HTML document.

► To select an output destination:

- **Choose Destination from the File menu.**

The Destination submenu contains five items.



Printer

This option uses the printer you have chosen in your current print settings. If you are printing to a printer, you can preview the report before printing it.

► To print to a printer:

1 **In the File menu, choose Printer from the Destination submenu.**

This option is selected by default.

2 **If necessary, select Page Setup from the File menu and specify your print parameters.**

Note This command is only available when the **Printer** destination is selected.

3 **If you want to preview your report, select Print Preview... in the File menu.**

Note This command is only available when the **Printer** destination is selected.

The print preview dialog box appears, containing the report that you have defined with the current data of the database.

4 **Select Generate... in the File menu.**

5 **Choose the settings that are appropriate for your report and click the OK button.**

Disk File

This option sends your quick report to a disk file that you can open and modify with other applications, including text editors and spreadsheets. This option exports the records in the quick report to a text file.

When you use this option, 4th Dimension automatically uses the column headings as the first "record" that is exported.

► To generate the report in a Text file:

1 **In the File menu, choose Disk File from the Destination submenu.**

2 **Choose Generate... from the File menu.**

4th Dimension displays a standard create-file dialog box and asks you to enter a filename.

3 **Enter a filename and click OK.**

4th Dimension displays a dialog box that keeps you informed of the progress of the operation.

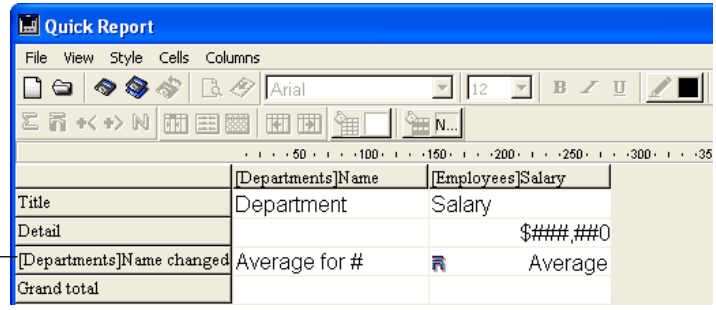
After the report is printed to a file, 4th Dimension returns you to the Quick Report editor. Remember to change the output device if you want to resume sending a quick report to a standard printer.

Print to Graph

This option directs the report to 4D Chart, 4th Dimension's plug-in for plotting data. When you choose the Graph item in the Destination submenu, your report is presented as a graph rather than in table form. Your graph can then be printed using 4D Chart.

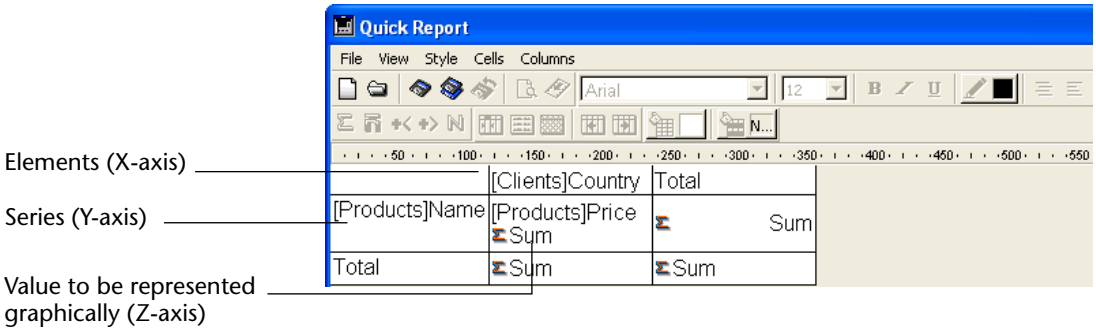
- In **list mode**, 4D Chart uses only the summary calculations and labels in the Subtotal row. It uses the leftmost non-numeric column for the Categories axis (the horizontal axis). To use the Graph feature, your report should:
  - Include from one to five numeric fields or formulas. These columns will be assigned to the values axis in the graph.
  - Use one type of summary calculation per numeric field.

For example, if you want to graph the average salary by department, you should create a quick report with two columns, Department Name and Salary as well as a Subtotal row consisting of the Average summary calculation for Salary:



Value to be represented graphically

- In **cross-table mode**, 4D Chart uses two data sources and the value cell. The last row and column are ignored.
  For example, if you want to show the amount of sales per country for a set of products, you can define the following report:

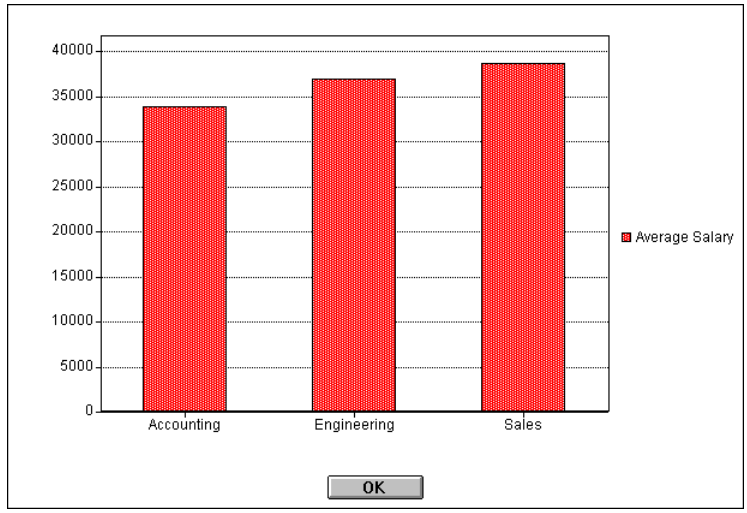


► To print to a graph:

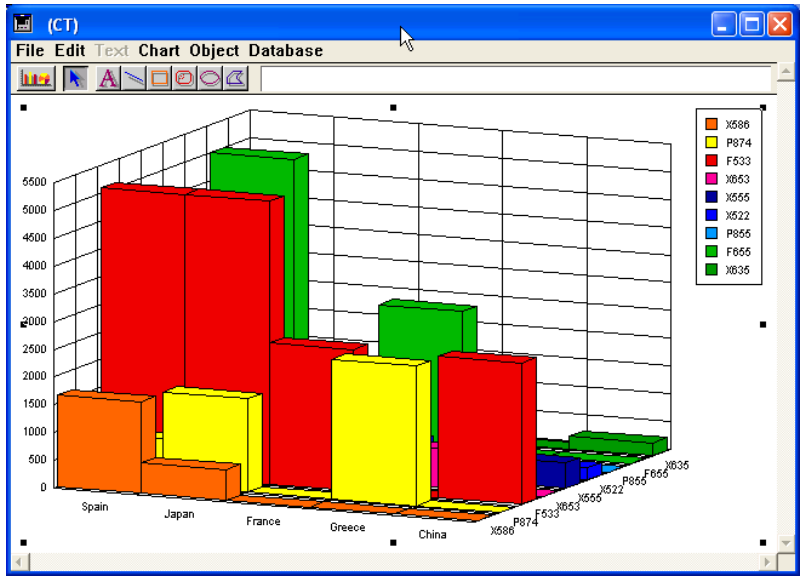
1 **In the File menu, choose Graph from the Destination submenu.**

2 **Choose Generate... from the File menu.**

- For list reports, 4th Dimension graphs your data as a 2D column graph.



- For cross-table reports, 4th Dimension graphs the data as a 3D column graph:



You can use 4D Chart to select another graph type or print the graph.

Printing to a 4D View Document

This option directs the report to 4D View, 4th Dimension's plug-in for displaying data. When you choose the 4D View item in the Destination submenu, your report is presented as a 4D View window rather than in table form. 4D View uses all the data in the report.

Note The **4D View** destination is only available if this plug-in is installed in your 4th Dimension environment, and if you have the appropriate licenses.

► To generate a report in a 4D View document:

1. **In the File menu, choose 4D View from the Destination submenu.**
2. **Choose Generate... from the File menu.**
   4th Dimension creates a 4D View window containing the data. You can modify its contents, print it or save it using the 4D View menu commands.

Printing to an HTML Document

This option sends your quick report to an HTML file. When you choose this option, it uses the default HTML template unless it was changed programmatically.

When you use this option, 4th Dimension automatically uses the column headings as the first "record" that is exported.

► To print to an HTML file:

1 **In the File menu, choose HTML File from the Destination submenu.**

2 **Choose Generate... from the File menu.**

4th Dimension displays a standard create-file dialog box and asks you to enter a filename.

3 **Enter a filename and click OK.**

4th Dimension displays a dialog box that keeps you informed of the progress of the operation.

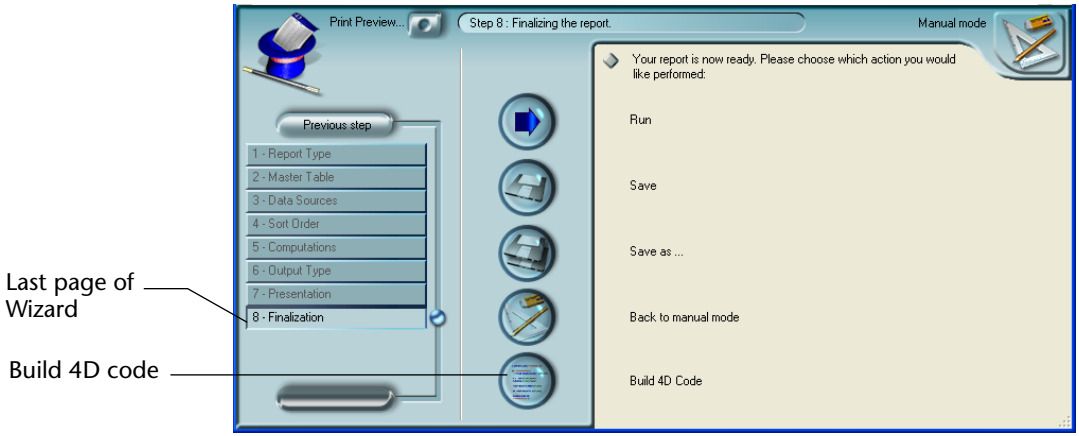
After the report is printed to an HTML file, 4th Dimension returns you to the Quick Report editor. Remember to change the output device if you want to resume sending a quick report to a standard printer.

Generating 4D code

The Quick Report editor allows you to automatically generate the 4th Dimension code corresponding to a defined report and paste it in the Clipboard. This function allows manual building of quick report outlines that can be customized using 4th Dimension language.

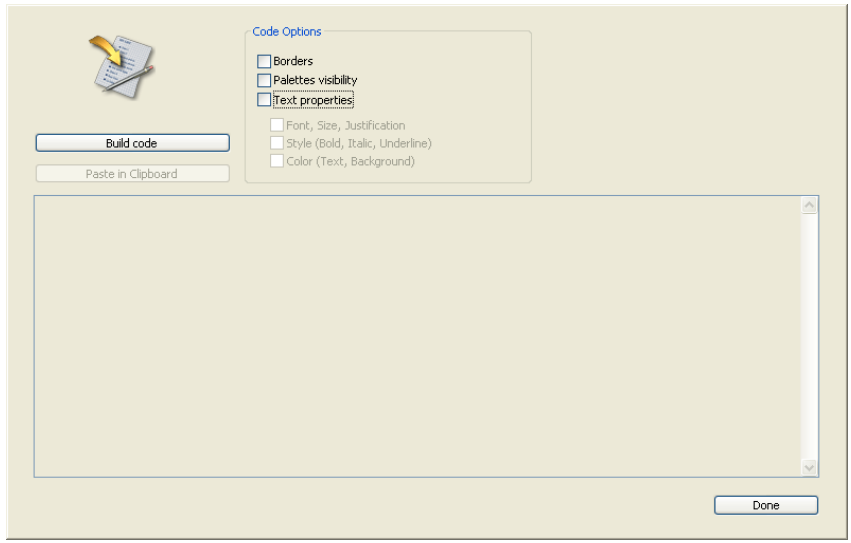
This feature is only available in User mode.

The button for code generation is located on the last page of the Quick Report Wizard:



Even if you built the quick report manually, you can use this feature by displaying the “Finalization” step of the wizard.

When you click on this button, a dialog box appears that allows you to set the parameters related to code generation:

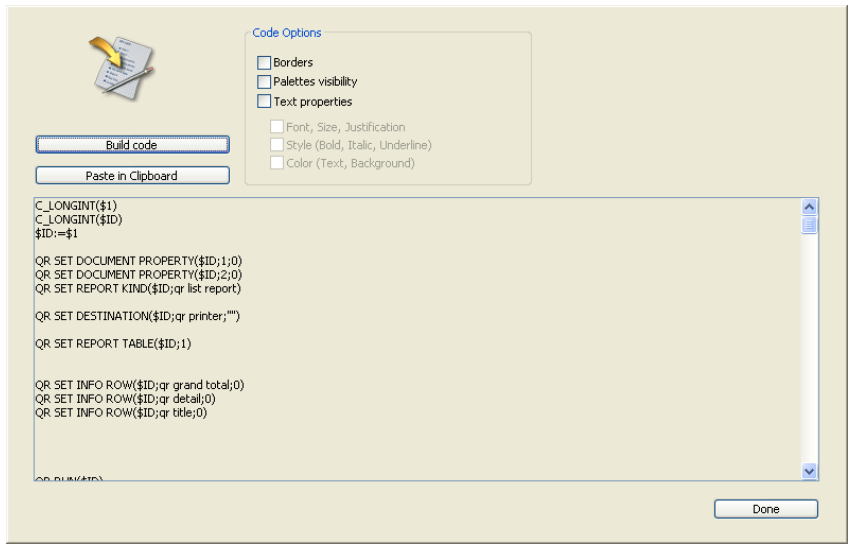


The following options are available:

- **Borders**: Check this option to specify that you want to include the cell border properties in the generated 4D code.

- **Palettes visibility**: Check this option to specify that you want to include the current palettes display status (Standard, Styles, Columns...) in the generated 4D code.
  It is advisable to deselect this option if the code is intended for use in an offscreen area.
- **Text properties**: Use this option to specify that you want to include the font style definition of the report (font, style, etc.) in the 4D code. If this option is not checked, the three following options have no effect.
  - **Font, Size, Justification**: When this option is checked, the generated 4D code includes information regarding font, font size and font justification in the quick report template.
  - **Style (Bold, Italic, Underline)**: When this option is checked, the generated 4D code includes information regarding text styles in the quick report template.
  - **Color (Text, Background)**: When this option is checked, the generated 4D code includes information regarding the text colors in the quick report template.

  Once you have defined the options, click on the **Build code** button to generate the 4D code; the code is then displayed in the Preview area of the dialog box:



You can modify the code options and click again on the **Build code** button in order to update the preview area.

If you are satisfied with the code generated, click on the **Paste in Clipboard** button, then click on the **Close** button to close the dialog box.

You can then paste the code in a method or a text file using the standard shortcut **Ctrl+V** (Windows) or **Command+V** (Mac OS), or the **Paste** command in the **Edit** menu.

11 Graphs

4th Dimension allows you to create a wide variety of two- and three-dimensional plots without having to export the data to a graphics package. You can create graphs from the data in your database or from data that has been copied to the Clipboard from another application. You can graph data directly from fields or you can graph the results of calculations on data. You create graphs in 4th Dimension using the built-in 4D Chart plug-in.

Because graphing capability is fully integrated into 4th Dimension, you can graph data in your database and update your graphs when the information in the database changes. You can print your graphs or copy them to the Clipboard and paste them into other applications.

Finally, 4D Chart adds over 100 commands to the 4th Dimension language which enable you to control tasks that you normally perform manually. For example, you can use 4D Chart commands to create new graphs, modify graph features, open and save documents, and execute any 4D Chart menu command. For information on these commands, please refer to the *4D Chart Language Reference* manual.

Managing 4D Chart Documents and Windows

4D Chart documents can be created in plug-in areas on forms or in separate plug-in windows. This section explains how to create, open, and save 4D Chart documents in both types of areas.

This section explains the basics of managing 4D Chart documents, including:

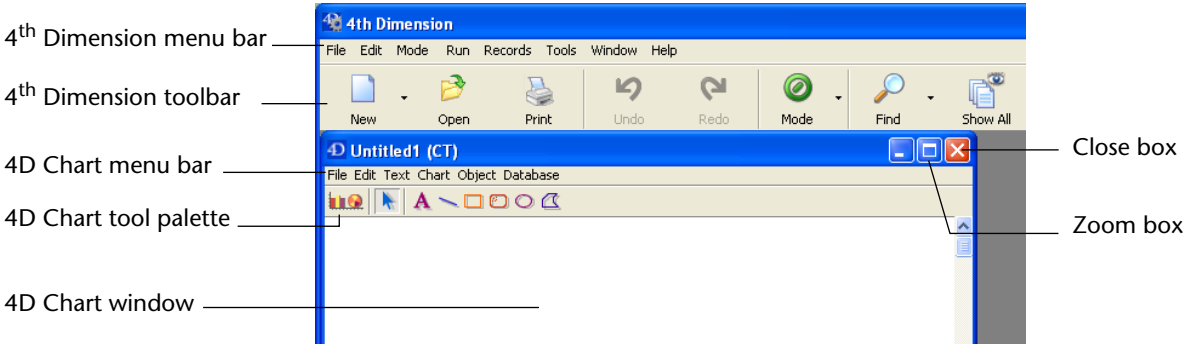
- Using 4D Chart in a plug-in window
- Using 4D Chart in a 4th Dimension form

- Hiding and showing 4D Chart features
- Creating a new document
- Opening an existing document
- Saving a document
- Setting the document size.

Using 4D Chart in a Plug-in Window

You can use 4D Chart in its own window. When used in its own window, 4D Chart operates as if it were a separate application.

When you open 4D Chart in a plug-in window, the window has its own menu bar. 4th Dimension's menu bar remains at the top of the screen.



When you expand the window to full screen size by clicking the window's zoom box, 4th Dimension's menu bar remains at the top of the screen and 4D Chart's menu bar remains within the 4D Chart window.

To generate and modify a graph in an external 4D Chart window, you have two possibilities:

- Call the Chart Wizard directly from the User mode of 4th Dimension. After it has been set up, the graph is displayed in a new external window,
- Open a blank 4D Chart window then use the menus and functions of the plug-in to create your graph.

Opening an External Window Displaying the Graph Directly

When you create a graph from the User mode of 4th Dimension, an external window is automatically opened to display it.

► To create an external window displaying the graph directly:

1. **Make sure that the current selection contains the records that you want to represent graphically.**
2. **Choose Charts... from the Tools menu of 4th Dimension or click on the corresponding icon in the 4th Dimension toolbar.**

   The Chart Wizard appears. The use of this wizard is described in the "Creating a Graph" paragraph on page 254.
3. **Set the parameters of your graph and click on OK.**

   An external 4D Chart window is created to display the graph.

Opening a Blank 4D Chart External Window

You work with external windows in the User mode of 4th Dimension.

► To open 4D Chart in an external window:

1. **In the User environment, choose 4D Chart from the Tools menu.**

   A new 4D Chart document opens in an external window.

   You can open additional 4D Chart windows by choosing 4D Chart again from the **Tools** menu. Opening several 4D Chart documents at the same time allows you to compare documents, copy and paste between documents, and move from one document to another simply by clicking on the appropriate window.

   The titles of all 4D Chart windows appear at the bottom of the Window menu. You can bring any document to the front by choosing it from this menu.

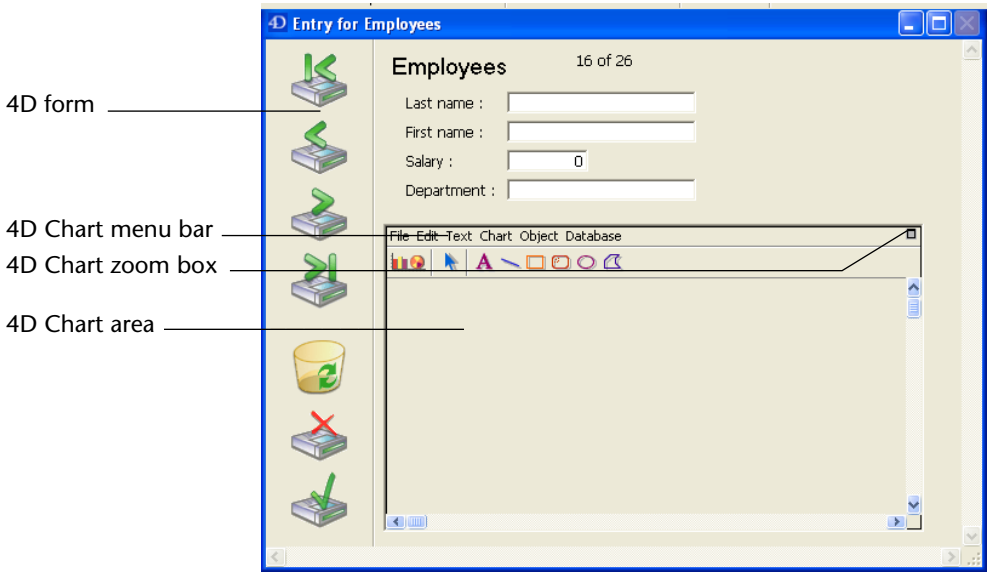
   When you save a document, its title bar displays the document name, plus the suffix "(CT)", which distinguishes 4D Chart documents from documents created by other plug-ins.

   You can close a plug-in window at any time by clicking the window's control-menu box (on Windows) or the close box (on Macintosh).

Using 4D Chart in a Form

You can place a 4D Chart area in any form. When you use 4D Chart in an input form, you can display a graph for each record in the table. You can also use a 4D Chart area in an output form.

When 4D Chart is used in a form, the 4D Chart menu bar appears at the top of the 4D Chart area. You can choose menu commands from either the 4th Dimension menu bar or the 4D Chart menu bar.



► To expand a 4D Chart area:

1 **Choose Go to Full Window from the 4D Chart File menu.**
OR
Click the 4D Chart area's zoom box.

The document expands to fill the entire screen, and 4D Chart's menu bar temporarily replaces 4th Dimension's menu bar.

The expanded window has a size box and close box.

When the document window is expanded, the **Go to Full Window** menu item in the File menu changes to **Return to Form**.

► To reduce the window and return to the form:

1 **Choose Return to Form from the File menu.**
OR
Click the close box.

Creating a 4D Chart Area in a Form

You can add a chart area in an input form and save a graph with each record in the table.

For more information about inserting a plug-in area into a form, refer to the *4th Dimension Design Reference* manual.

Hiding and Displaying 4D Chart Features

You can choose to hide or display several of 4D Chart's features, including:

- The 4D Chart menu bar
- The Object Tool palette
- The Chart Tool palette
- Scroll bars
- Rulers.

Use the **Display** submenu of the **Edit** menu of the plug-in area to hide or display these items. Items that are checked in the Display submenu are displayed in 4D Chart.

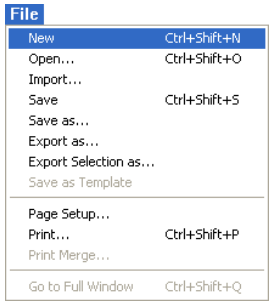
Note If you have hidden the 4D Chart menu bar, you can display it by pressing **Ctrl-Shift-M** on Windows or **Command-Shift-M** on Macintosh.

Creating a New 4D Chart Document

You can create a new, blank 4D Chart document at any time. The new document replaces the current document. If you have made changes to the current document, you will be prompted to save them before opening a new document.

► To create a new document:

1 **Choose New from the 4D Chart File menu.**



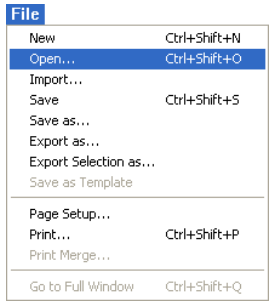
An empty document appears in which you can create a new graph.

Opening a 4D Chart Document

You can open any previously saved 4D Chart document in a 4D Chart area. The newly opened document replaces any current document.

► To open a 4D Chart document:

1 **Choose Open from the 4D Chart File menu.**



A standard open-file dialog box appears.

2 **Select a document.**

3 **Click Open.**

The document opens in the current 4D Chart window.

Note You can also open a PICT file in your graph. This point is covered in the "Importing a PICT Document in a 4D Chart Window" paragraph on page 239.

Saving a 4D Chart Document

You can save the contents of a 4D Chart document regardless of whether the document was created in a plug-in window or in a form. 4D Chart offers several ways to save documents:

- As a file
- As part of a record
- As a template for a 4D Chart area.

You can also save a selection of objects, for instance a graph, as a PICT document (Macintosh format). In this case, the document saved is a picture that can no longer be modified. This point is covered in the "Exporting a 4D Chart Document in PICT Form" paragraph on page 239.

Saving a 4D Chart Document as a File

Any document that you create using 4D Chart can be saved as a separate document for use in another place — either in the same database, in another database that uses 4D Chart, or in an entirely different application. You use the standard **Save** and **Save As** menu items in the 4D Chart **File** menu to save and update individual documents.

Documents you save can be opened with the **Open** menu item in the 4D Chart **File** menu. It makes no difference whether a document is created in a plug-in window or in a form; a document can be saved and opened in either place.

If you save a 4D Chart document as a file, when you reload the file, the document appears exactly as it was when you saved it. To update the information in any graphs in the document, you must use the **Update** menu item in the **Chart** menu, which is described in more detail in the "Updating the Data in a Graph from the Database" section on page 262.

► To save a 4D Chart document:

1 **Choose Save As from the 4D Chart File menu.**

Notice that you choose **Save As** from the 4D Chart **File** menu, not the 4th Dimension **File** menu. 4D Chart displays a save-file dialog box.

2 **Enter a filename for the document.**

3 **Click Save.**

4D Chart saves the document with the filename you entered.

Saving a 4D Chart Document as Part of a Record

If you have created a 4D Chart area in a form and want its contents to be saved with each record, you need to create a BLOB or Picture field in the table to which the form belongs in order to store the contents of the area. The contents of the area are then saved automatically with each record when it is validated.

For more information about creating 4D Chart areas on forms, refer to the *4th Dimension Design Reference* manual.

► To save a 4D Chart document as part of a record:

1 **Add a BLOB or Picture field to the table whose form contains the 4D Chart area.**

For more information about creating a field, refer to the *4th Dimension Design Reference* manual.

2 **Give the field the same name as the external area that you have created on the form and add an underline (_) to it.**

For example, if your external area is named MyArea, the field must be named MyArea_.
Each graph is thus saved as a part of the record.

If you save a 4D Chart document as part of a record, when you reload the record, the document appears exactly as it was when you saved it. To update the information in any graphs in the document, you must use the **Update** menu item, which is described in more detail in the "Updating the Data in a Graph from the Database" section on page 262.

Saving a 4D Chart Document as a Template

If you have inserted a 4D Chart area into a form, you can create a standard document that is the same for every record by saving the document as a template. You can only create templates for 4D Chart on forms.

When you save a document as a template, the template is used for every new record that is opened in the form.

Each document starts with the same template, but any unique modifications you make to it are saved with the record. There can be only one template for each 4D Chart area on a form.

If there is a graph in the document that is saved as a template, the graph is updated automatically for each record, if possible. 4D Chart can update a graph only if it was created from data stored in records in the database.

► To save a document as a template:

1 **Choose Save as Template from the 4D Chart File menu.**

4D Chart saves the document with a special filename. The filename is the name of the 4D Chart area on the form, plus an underscore.

For example, an area named "Document" will have a template file named "Document_".

Because 4D Chart automatically names the file and places it in the database directory; no save-file dialog box is displayed.

4D Server By default, 4D Chart templates are read from and saved to the client machines. You can use the 4D Chart language to specify that templates be read from and saved to the server machine.

If you make changes to the document and want to incorporate those changes in the template, choose **Save as Template** again.

You can create a template for a 4D Chart area without using the **Save as Template** menu item simply by saving the document with a filename that is the same as the name of the 4D Chart area, plus an underscore, and placing the file in the database directory. This feature allows you, for example, to create a document in one database and use it as a template in another database. You can also create a document in one document area and use it as a template in another document area.

You can temporarily disable the use of a particular template file by changing the template filename or moving the file out of the database directory.

Importing a PICT Document in a 4D Chart Window

You can open documents of the PICT type in a 4D Chart window. These documents can come from different sources (export of a 4D Chart graph in PICT form, design software, etc.). The imported document behaves like a simple object; you cannot modify its attributes.

► To import a PICT document:

1 **Choose the Import... command in the File menu of 4D Chart.**

A standard open file dialog box appears.

2 **Select the PICT file you want to open (*.PCT extension under Windows) and click Open.**

If the imported file is valid, its contents are displayed in the 4D Chart window.

Exporting a 4D Chart Document in PICT Form

You can export a 4D Chart document or a selection of objects in it as a PICT file. In both cases, the objects do not keep their unique 4D Chart properties; the exported document is a static picture of the objects in the 4D Chart area or in the external window. You can import it as a PICT in 4D Chart or any other application that opens PICT files.

► To export a 4D Chart document in PICT form:

1 **Choose the Export as... command in the File menu of 4D Chart.**

2 **Select a name and location for your file in the standard dialog box then click Save.**

► To export a selection of 4D Chart objects in PICT form:

1 **Select the object(s) that you want to export in PICT form.**

2 **Choose the Export Selection as... command in the File menu of 4D Chart.**

A standard save file dialog box appears.

3 **Select a name and location for the file and click Save.**

Whether you export a 4D Chart document or a selection of objects, a PICT file (*.PCT extension under Windows) is created on the disk.

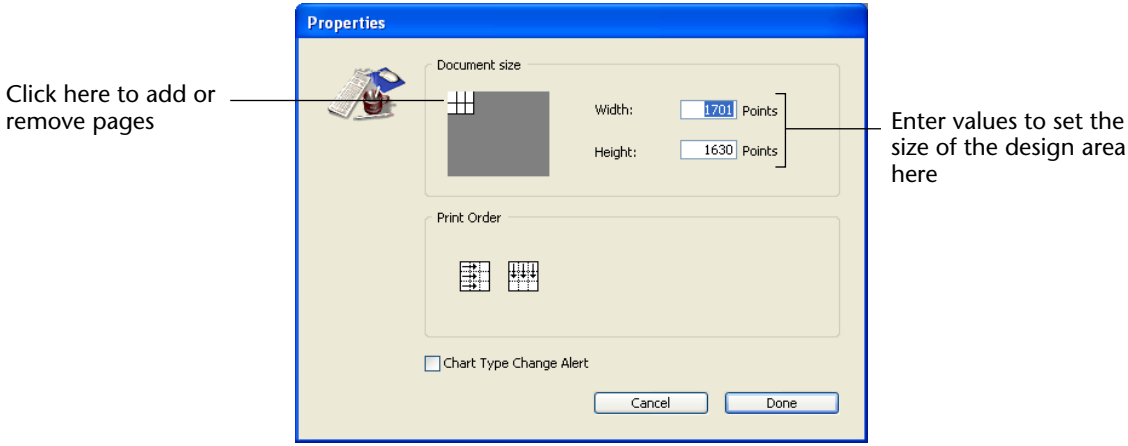
Setting the Document Size

You can change the document size by changing the number of pages in the document or by specifying a new document size in points. The maximum drawing size is 3500 x 3500 points. You can add pages to the right of the first page, below it, or both.

► To change the document size:

1 **Choose Properties from the 4D Chart Edit menu.**

The following dialog box appears.



The document size is indicated by the point values to the right of the model document area and by the white rectangles in the model document area.

2 **Click in the Document size area to adjust the number of pages in the drawing.**
OR
Enter the exact size of the document (in points) in the Width and Height text areas.

Choosing a Graph Type

4D Chart allows you to create two-dimensional and three-dimensional graphs from within your database. Once you decide what data you want to graph, you should think about what type of graph will best display that data.

The nature of the data that you are graphing will help indicate the type of graph you should choose. For example, a line graph is best suited for showing how values (such as “number of units sold”) change over time.

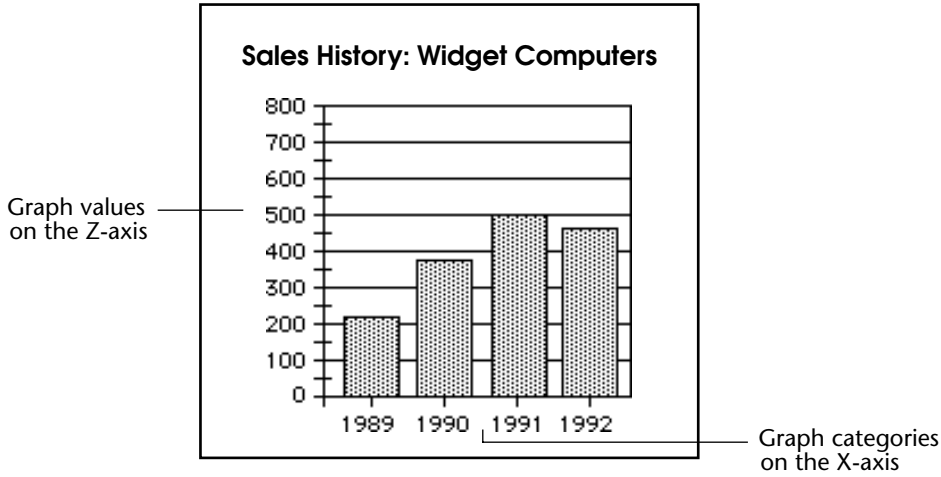
Don’t be afraid to experiment with different graph types. Once you have created a graph, you can easily convert it to another graph type. Creating graphs and changing their types are discussed in the “Creating a Graph” section on page 254.

This section discusses the types of two- and three-dimensional graphs that you can create using 4D Chart. The features of each type of graph are described, along with the type of data that the graph is best suited to show.

Choosing a Two-dimensional Graph Type

This section briefly describes the parts of a two-dimensional graph and then presents each two-dimensional graph type.

The following diagram shows a two-dimensional (two-axis) graph:

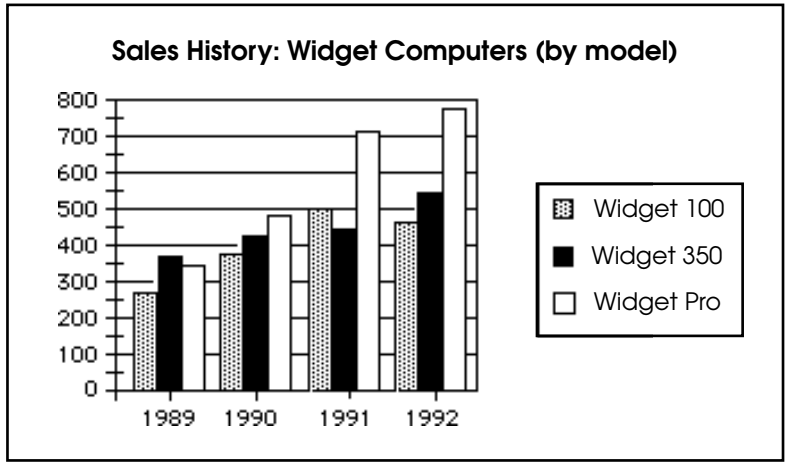


The X-axis is also called the *Category axis*. The X-axis displays the categories into which the information is divided. For instance, if you are graphing the number of computers sold per year, you would place the years on the X-axis.

The Z-axis is also called the *Values axis*. You use the Z-axis to display the values calculated for each category. In the computer sales example, the Z-axis would contain the values for the numbers of computers sold per year. For instance, if there were 500 computers sold in 1991, the Z-axis value corresponding to the X-axis category "1991" would be 500.

Another concept in graphing is the *data series* (or simply, *series*). Each category is composed of one or more series that further breaks down the information displayed in the graph. In this example, there was only one series, "computers sold." Therefore, the series is not represented by a separate field or formula.

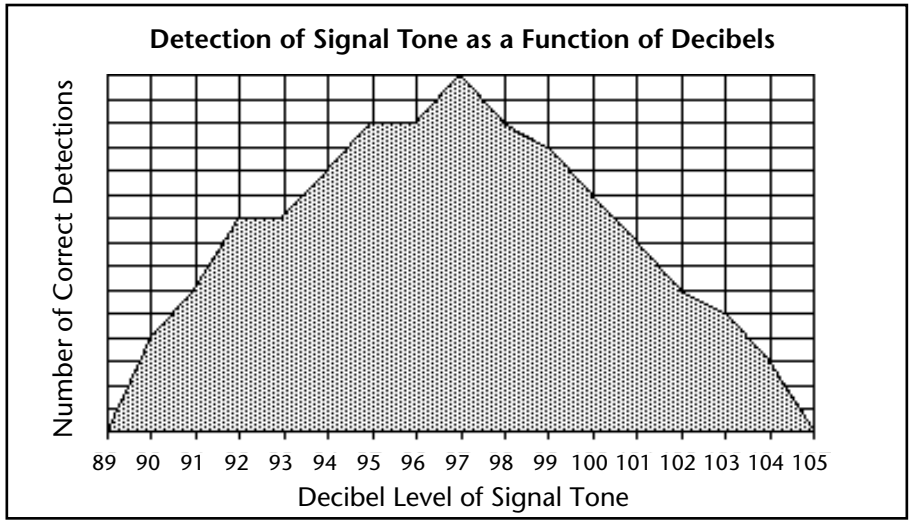
However, suppose you want to compare the sales volumes from 1989 to 1992 for three models of computers. In this case, each computer model becomes a distinct series on the graph. All series share the same categories (in this case, the years 1989 through 1992), but have their own values.



Another way to graph this data would be to create a three-dimensional graph of the data. This type of graph is discussed in the "Choosing a Three-dimensional Graph Type" section on page 249.

Area Graphs

Area graphs are commonly used to show the magnitude of values over time, but can show values over any continuous category.



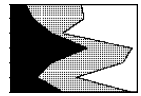
The categories on the X-axis should be continuous, such as times or temperatures. Discrete categories, such as salespeople or products, are better suited to column graphs.

Options
The following options are available for Area graphs:

- **Stacked**: When graphing multiple series, stack the areas for the series.
- **Stacked, proportional**: When graphing multiple, stacked series, show the series as proportions of a 100% whole.
- **Horizontal**: Make the X-axis the vertical axis and the Z-axis the horizontal axis.

Stacked

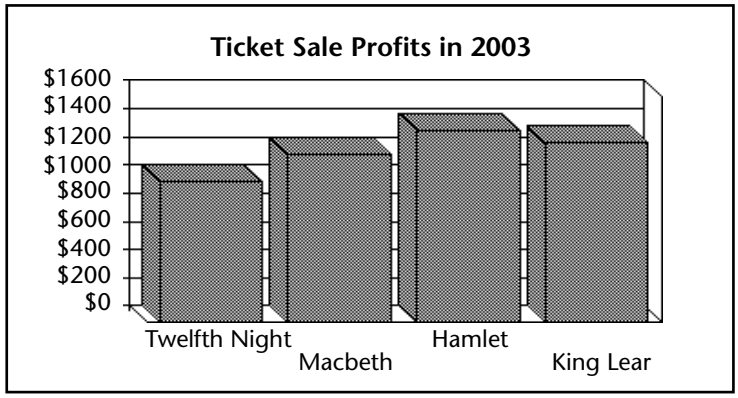
Stacked, proportional


Horizontal

Column Graphs

Column and bar graphs are the most frequently used graph types for business data. They are usually used to compare one item to another, or one or more items over a period of time.

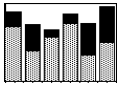
The following column graph uses the Depth feature, which makes each column look three-dimensional.



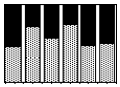
Note The Depth feature is discussed in more detail in the "Modifying Depth in a Two-dimensional Graph" section on page 284.

Options

The following options are available for Column graphs:



- **Stacked**: When graphing multiple series, stack the columns for the series in each category.



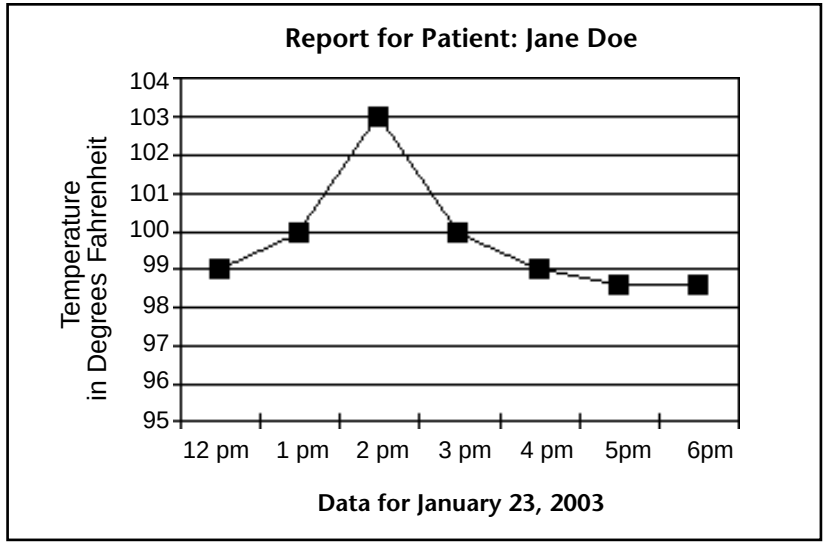
- **Stacked, proportional**: When graphing multiple, stacked series, show the series as proportions of a 100% whole.

- **Horizontal**: Make the X-axis the vertical axis and the Z-axis the horizontal axis. This option creates a bar graph. Bar graphs show the categories on the vertical axis, with the values expressed by the length of the bars. Bar graphs are often a useful alternative to column graphs, especially when the category labels are long.
- **Overlap**: When graphing multiple series, use this option to specify the percentage by which the series columns within each category overlap each other.
- **Gap Width**: Use this option to specify the spacial gap between the columns from one category to the next. The larger the gap, the narrower the columns for each category.

Line and/or Scatter Graphs

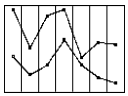
Line graphs are often used to show the rate of change of values over time. Scatter graphs can show relationships and trends in your data.

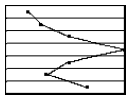
Such graphs are most often used when there are a large number of different values of the X-axis field, as in a scientific study.



The values on the X-axis should be continuous or ordered, such as times or temperatures. Discrete categories or categories that do not have an order — such as salespeople or products — are better suited to column graphs.

Options
The following options are available for Line and/or Scatter graphs:



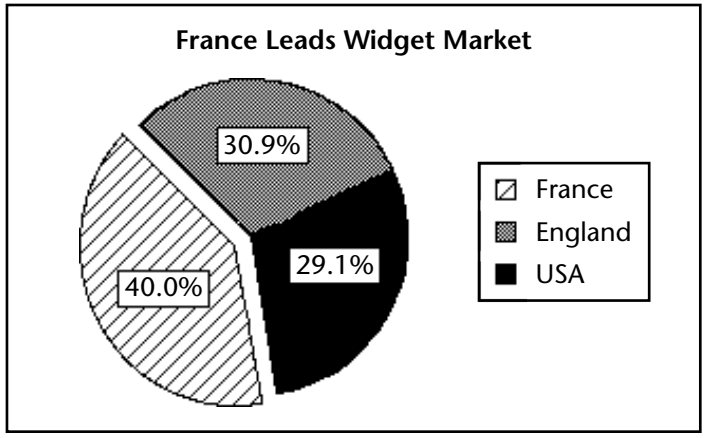


- **Stacked**: When graphing multiple series, stack the lines for the series in each category.
- **Horizontal**: Make the X-axis the vertical axis and the Z-axis the horizontal axis.
- **Displaying lines and/or points**
  You can:
  - **Show Points**: Each value appears as a dot in the graph.
  - **Show Lines**: Only lines appear in the graph.
  - **Show Both**: Lines and Points appear in the graph.

Pie Charts

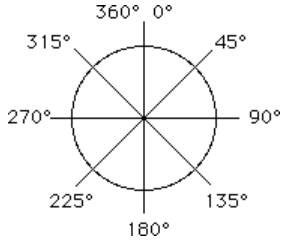
Pie charts show data as a percentage of a whole. Your data does not need to be expressed as percentages; 4D Chart automatically converts the data into percentages when it creates the pie chart.

Each pie chart can have only one series. Categories are displayed in the legend.



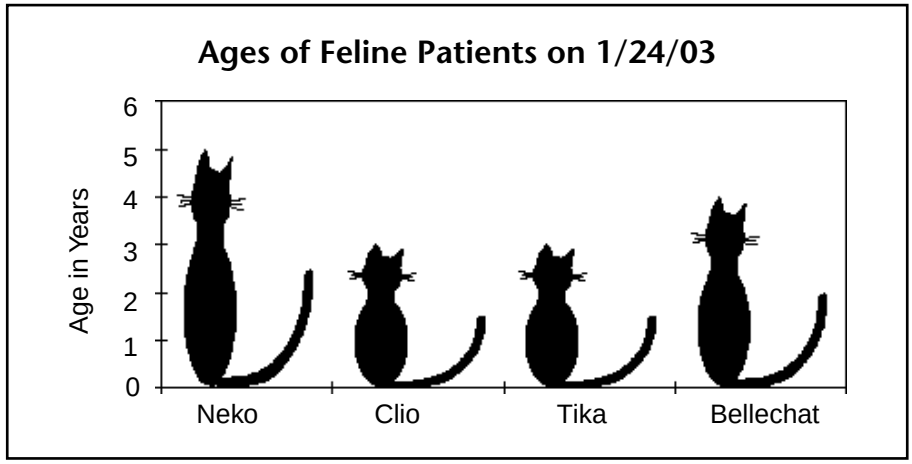
Options
The following option is available for pie charts:

- **Start Angle**: Use this option to specify the rotation of the chart. The specified angle determines the placement of the first edge of the first category in the chart.



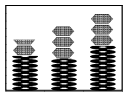
Picture Graphs

Picture graphs are similar to column graphs, except that you can substitute a picture for the column.

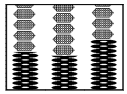


Options

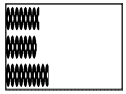
The following options are available for Picture graphs in 4D Chart:



- **Stacked**: When graphing multiple series, stack the pictures for the series in each category.



- **Stacked, proportional**: When graphing multiple, stacked series, show the series as proportions of a 100% whole.



- **Horizontal**: Make the X-axis the vertical axis and the Z-axis the horizontal axis. This option creates a bar picture graph.
- **Overlap**: When graphing multiple series, use this option to specify the percentage by which the series within each category overlap.
- **Gap Width**: Use this option to specify the spacial gap between the picture columns from one category to the next. The larger the gap, the narrower the picture columns.

Additional options for aligning and adjusting the pictures are discussed in the "Adding Pictures to a Picture Chart" section on page 291.

2D XY Graphs (Scatterplots)

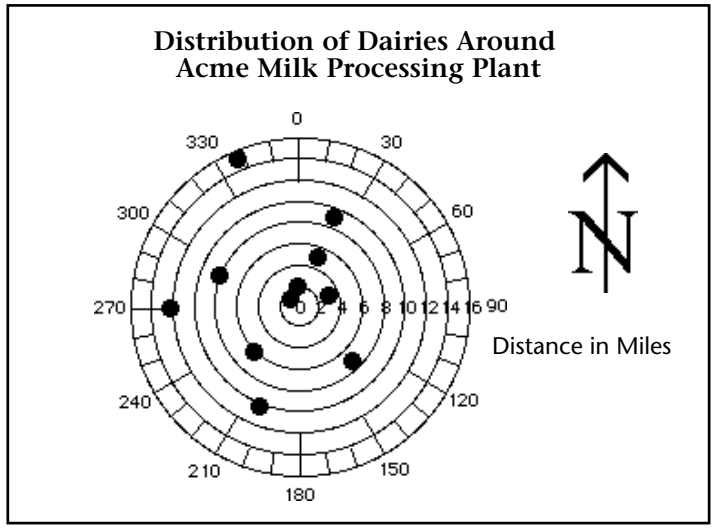
Each data point in a scatterplot represents a pair of values. The X-axis is also a value axis.

When the 2D XY type is selected, the option Category is replaced with Values (X) in the Chart>Axis, Chart>Grid Lines and Chart>Titles menus.

Options
The following options are available for 2D XY graphs in 4D Chart:

- **Plots shape**: You can display None, Circles, Squares, or Star plots.
- **Lines appearance**: You can display None, Straight, or Arrows lines.
- **Show Regression Line** (y = ax+b): Allows viewing the predictive relation between the X- and Y-axis values (if appropriate).
  There is one regression line for each series of points. Using **Ctrl+click** (Windows) or **Command+click** (Mac OS), you can select the points associated with the regression line.
- **2D XY variant: Polar charts**
  Polar charts are used to show the distribution of data around a central point. In a polar chart, each point is plotted in terms of degrees from the zero point and distance from the center.

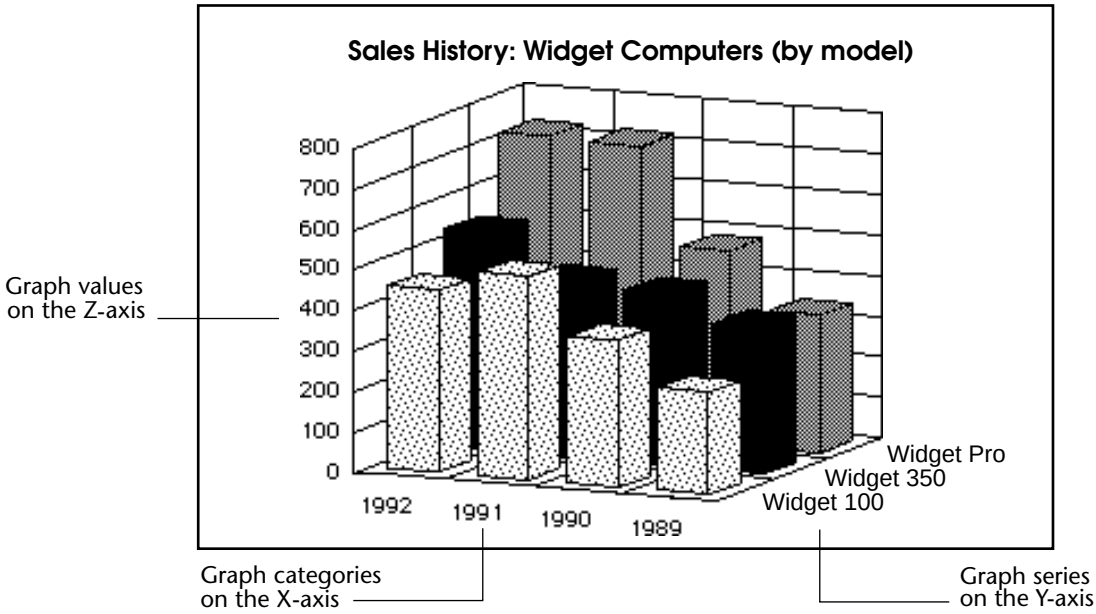
  Each data point on a polar chart is plotted using one Z-axis field to specify the angle in degrees and a second Z-axis field to specify the distance from the center.



Choosing a Three-dimensional Graph Type

This section briefly describes the parts of a three-dimensional graph and then presents each three-dimensional graph type.

The following diagram shows a three-dimensional (three-axis) graph:



As with a two-dimensional graph, the X-axis (or Category axis) displays the categories into which the information is divided. For instance, if you are graphing the number of computers sold per year, you would place the years on the X-axis.

In a three-dimensional graph, the Y-axis is also called the Series axis. Each category is composed of one or more series that further breaks down the information for each value of the X-axis field. Each data point in the graph is the intersection of one category and one series. In the example illustrated above, each computer model is a series.

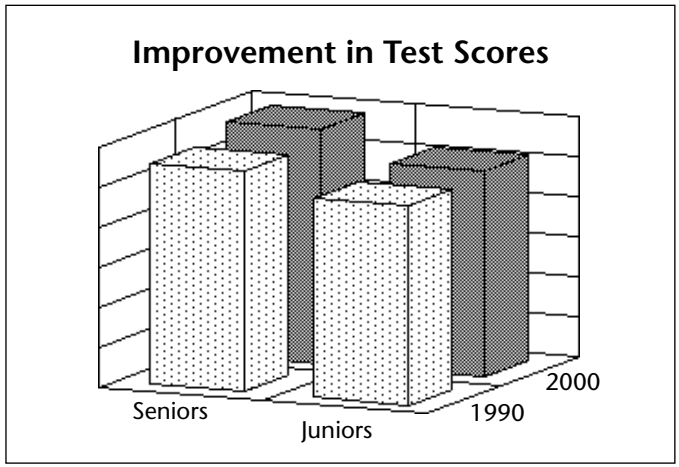
In a two-dimensional graph, the series remain on the X-axis. The columns representing each series are distinguished by their patterns. In a three-dimensional graph, the series are displayed on their own axis. Each series still has its own pattern, but now the series are also separated from each other in space.

The Z-axis displays the values calculated for each combination of category and series.

In the computer sales example, the Z-axis would contain the values for the numbers of each type of computer sold per year. For instance, if there were 725 Widget Pro computers sold in 1991, the Z-axis value corresponding to the X-axis category “1991” and the Y-axis series “Widget Pro” would be 725.

3D Column Graphs

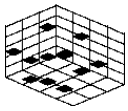
3D Column graphs, like 2D Column graphs, compare one item to another, or one or more items over a period of time.



Options

The following options are available for 3D Column graphs:

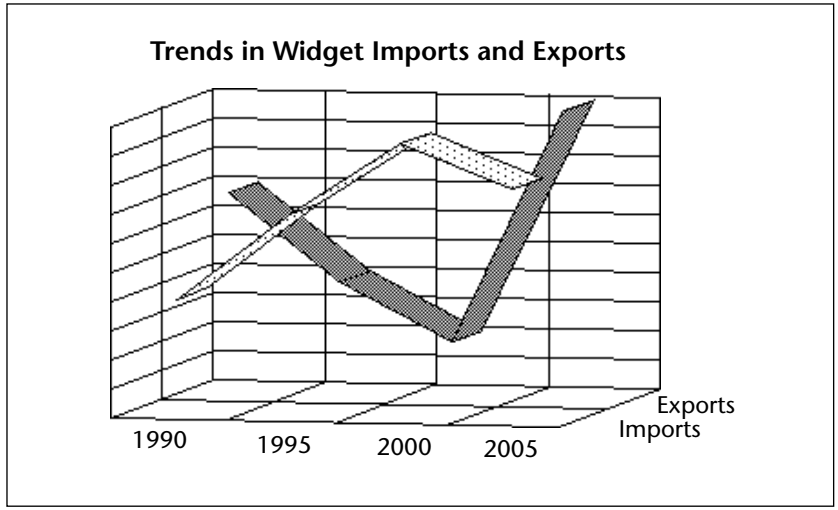
- **Category Gap/Width**: The gap between or width of the categories in the graph. The larger the category gap, the smaller the category width.



- **Series Gap/Width**: The gap between or width of the series in the graph. The larger the series gap, the smaller the series width.
- **Tops only**: Show only the top side of each column.

3D Line Graphs

3D Line graphs show trends in your data. They should be used for continuous categories, such as time.



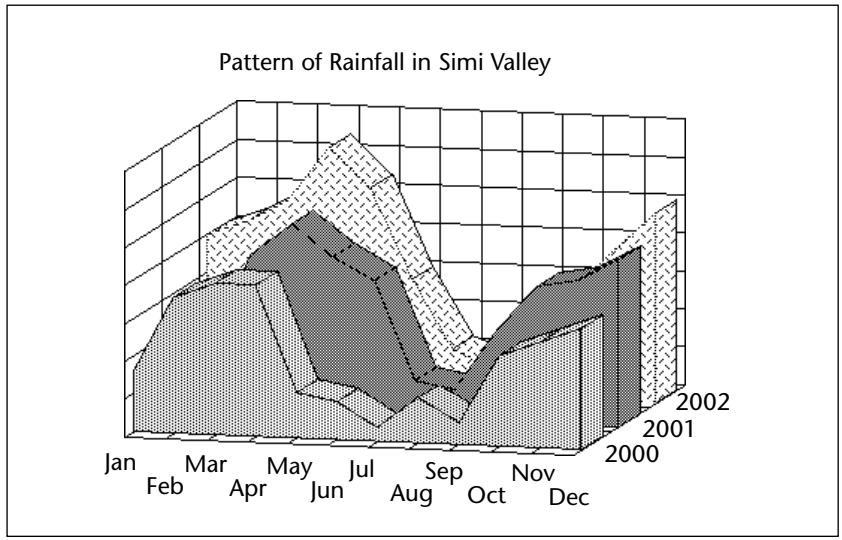
Option

The following option is available for 3D Line graphs:

- **Series Gap/Width**: The gap between or width of the series in the graph. The larger the series gap, the smaller the series width.

3D Area Graphs

3D Area graphs emphasize the volume or size of the series over a continuous category, such as time.



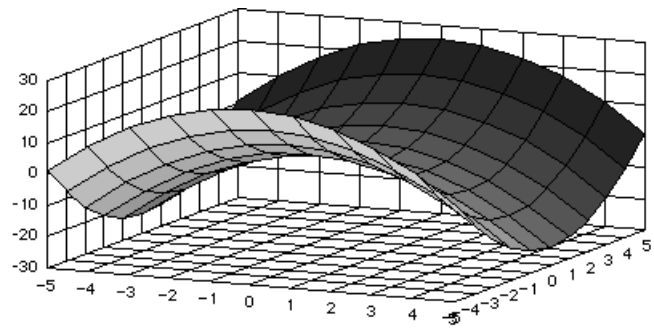
Option
The following option is available for 3D Area graphs:

- **Series Gap/Width**: The gap between or width of the series in the graph. The larger the series gap, the smaller the series width.

3D Surface Graphs

Surface graphs show three-dimensional data where the Z-axis value varies depending on the X- and Y-axis values. Surface graphs are commonly used to graph the results of mathematical formulas.

The following graph was created using a mathematical formula:

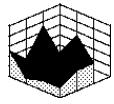


$z = (1 - x)^2 + y^2$

Option
The following option is available for 3D Surface graphs:

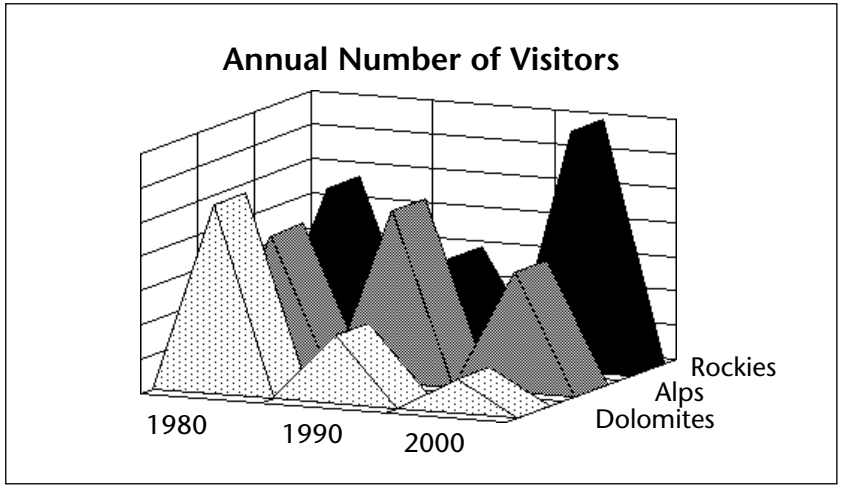
- **Tops only**: Show only the top side of the surface, not the sides. This option is used in the previous example graph.

Here is an example of a surface graph with sides:



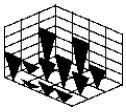
3D Triangle Graphs

3D Triangle graphs compare one item to another, or one or more items over a period of time. 3D Triangle graphs are an alternative to 3D Column graphs.



Options

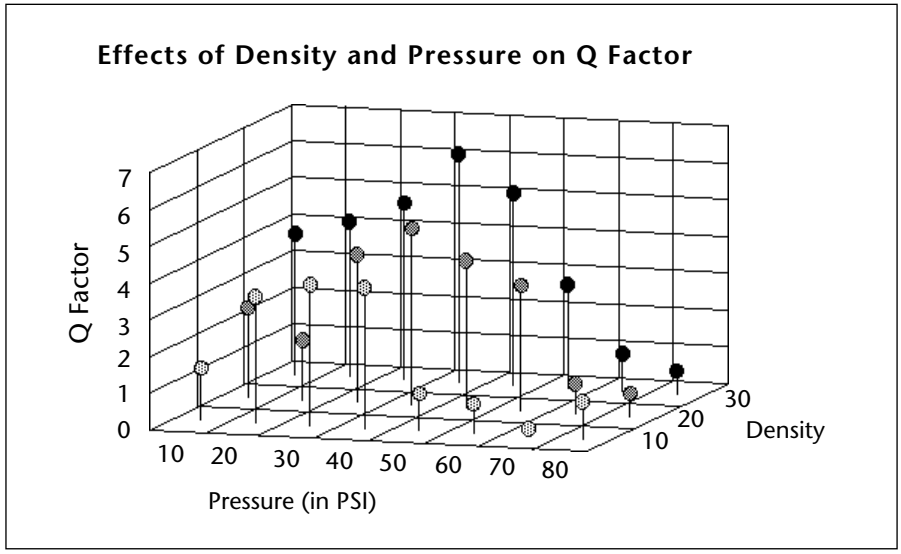
The following options are available for 3D Triangle graphs:



- **Series Gap/Width**: The gap between or width of the series in the graph. The larger the series gap, the smaller the series width.
- **Flipped**: The triangles appear flipped vertically.
- **Plot Zero Values**: If this option is not selected, zero values will be omitted from the graph.

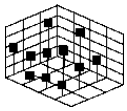
3D Spike Graphs

3D Spike graphs show the intersection of three values. Each data point is connected to the Category plane with a drop line.



Option

The following option is available for 3D Spike graphs:



- **Oval/Square Heads**: Use this option to specify whether the spike heads are oval or square.

Creating a Graph

This section includes the basic steps for creating a graph. After reading this section, you will be able to:

- Create a two-dimensional or three-dimensional graph from data stored in the database or copied to the Clipboard
- Update a graph created from data in the database
- Change a graph's type
- Change the options specific to each graph type.

4D Chart allows you to create two-dimensional and three-dimensional graphs based on the data in fields in your database. You can graph the values in the fields themselves, or you can graph the values that result from formulas that use the fields.

Whatever the case, when you create a graph, you select the data that you want to graph on each axis. For each axis, there are certain restrictions on the data types that can be graphed. If a data type cannot be graphed on a certain axis, fields of that type cannot be selected in the Chart Wizard. The following table provides information on the types of data that can be assigned to the Categories or Series axis and the Values axis.

Data Type	Category or Series Axis?	Values Axis?	Compatible Types on Values Axis
Alphanumeric	Yes	No	-------
Text	Yes	No	-------
Real	Yes	Yes	Integer, Long integer
Integer	Yes	Yes	Real, Long integer
Long integer	Yes	Yes	Real, Integer
Date	Yes	Yes	-------
Time	Yes	No	-------
Boolean	Yes	No	-------
Picture	No	No	-------
Blob	No	No	-------

Creating a Selection of Records to Graph

Before you begin the process of creating a graph, you must create a selection of records to graph.

4D Chart can operate in its own window or in 4D Chart areas on forms. The following sections explain how to generate the selection of records to be graphed, depending on the 4D Chart location.

Creating a Selection of Records in a Plug-in Window

4D Chart graphs the records in the current selection. Before you create a graph in a plug-in window, select the records you want to graph.

4D Chart will not create a graph unless there is at least one record in the current selection of the table whose data you want to graph.

Creating a Selection of Records in an Input Form

A 4D Chart area in an input form can be used to graph data in other tables.

The table whose records you want to graph must have at least one record in its current selection. If the table that contains the form is automatically related to the table you wish to graph, the current record in the input form determines the selection of records in the related table.

Because you have a record loaded in an input form, you should avoid creating graphs from data in the current table. If you want to graph data from the same table as the input form, you must use PUSH RECORD and POP RECORD or create a new process with the New process function. For more information, see the descriptions of these commands in the *4th Dimension Language Reference* manual.

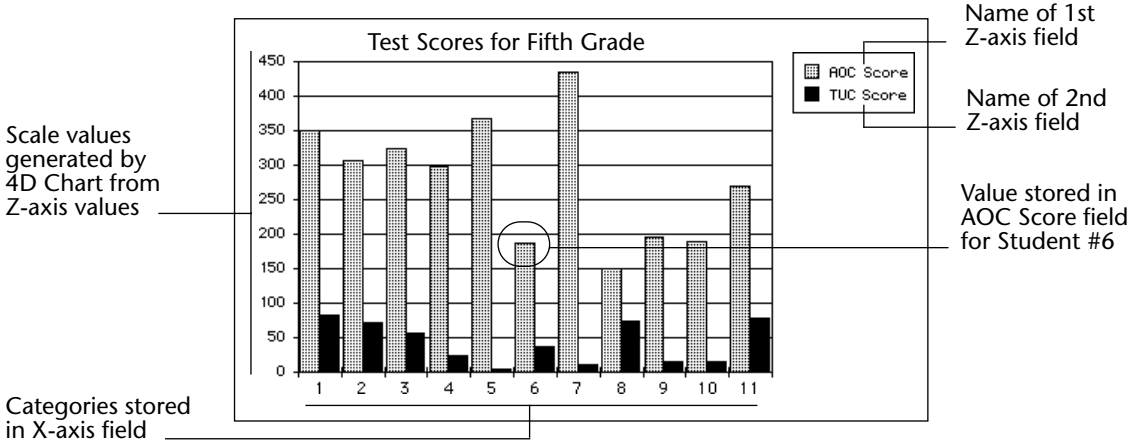
For more information about adding a 4D Chart area to a form, see the *4th Dimension Design Reference* manual.

Creating a Graph from Data in the Database

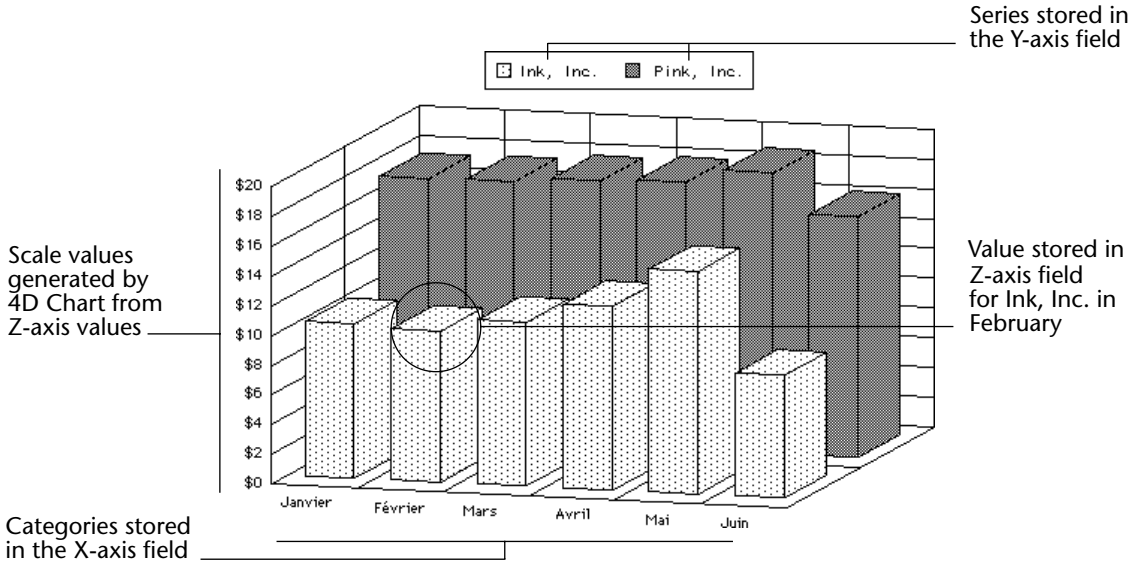
For a two-dimensional graph, you specify a field for the horizontal axis (X-axis) and one or more fields or formulas for the vertical axis (referred to in 4D Chart as the Z-axis).

For a three-dimensional graph, you will specify one field (or formula) each for the X-, Y-, and Z-axes.

The following example graph shows how 4D Chart uses the information in the database to create a 2D graph. The graph plots the scores on two tests for each of 11 students. The X-axis field is Student ID, and the Z-axis fields are AOC Score and TUC Score.



The following example graph shows how 4D Chart uses the information in the database to create a graph. The graph shows the average monthly stock value for two companies. The X-, Y-, and Z-axis fields are, respectively: Month, Company Name, and Average Price.



► To create a graph from data stored in the database:

1 **Make sure that no graph is currently selected in the 4D Chart area.**

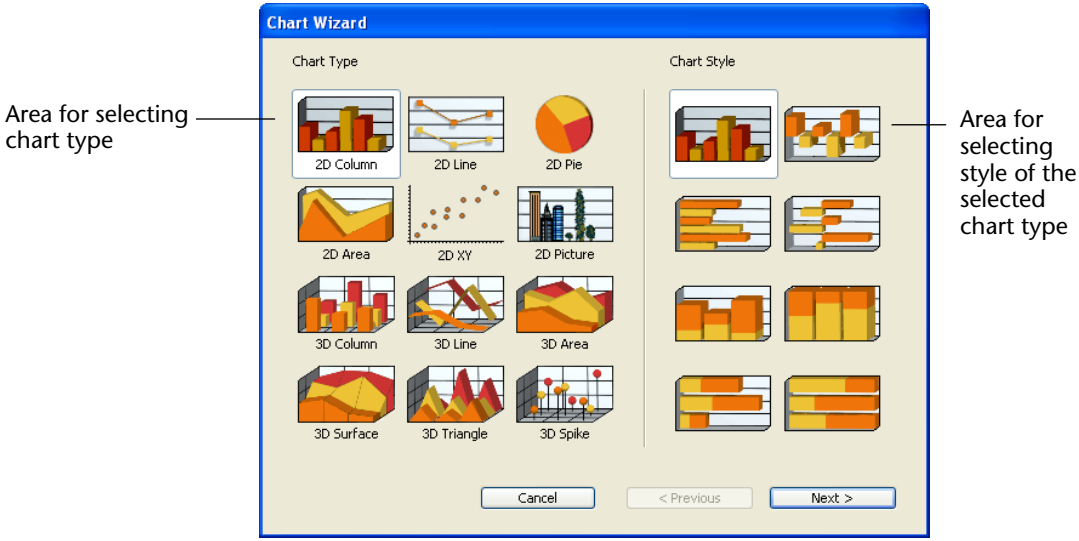
To deselect a selected graph, click anywhere in the 4D Chart area outside the graph.

2 **Choose the Charts... command in the Tools menu of 4th Dimension or click the Chart icon** **in the 4th Dimension toolbar.**

OR

If you are in a 4D Chart area, choose New Chart from the Chart menu or click the chart creation icon **in the 4D Chart tool palette.**

The Chart Wizard appears.



You can choose between 12 types of charts. Types 1-6 are two-dimensional and 7-12 are three-dimensional. By default, the first chart type is selected.

The Chart Wizard has two pages:

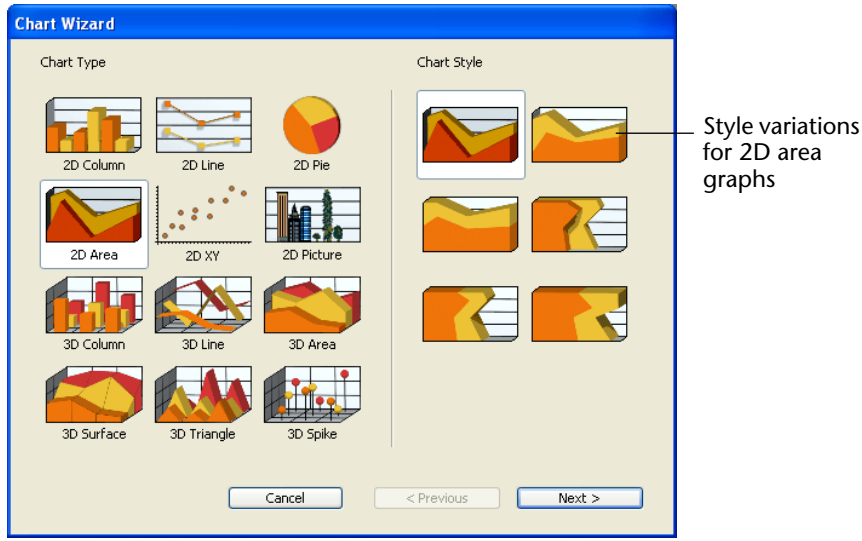
- **Chart Type/Chart Style**: Displays the 12 chart types and the variations on the type of graph that you selected in the Chart Type section. The Chart Style section changes depending on your choice of chart type.
- **Data Selection**: Lets you select the table that contains the data you wish to graph and a field list. Use the Data Selection page to assign fields or formulas to the graph axes. The Data Selection page changes depending on the graph type you chose.

You must choose a chart type and use the Data Selection page to assign appropriate fields or formulas to each axis that the chart type requires.

3 **Click a chart type.**

When you click on a chart type, the Chart Style section and Data Selection page change to match the requirements of the selected type. For complete information on the types of charts available in 4D Chart, see the "Choosing a Graph Type" section on page 241.

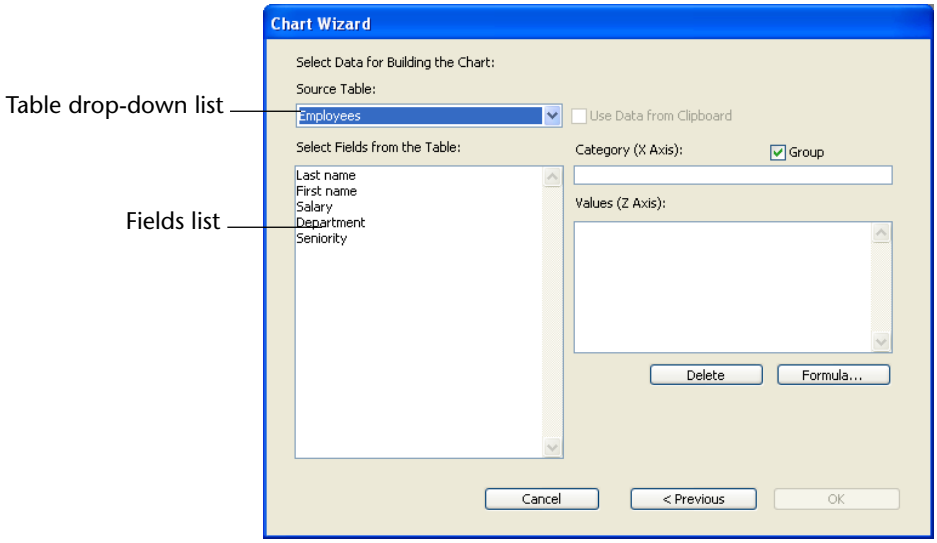
4 Click on a chart style (Optional).



Note Some chart types allow for only one style.

5 Click the Next > button.

The Data Selection page appears, displaying the appropriate options for the selected chart type. The names of database tables are placed in the "Source Table" drop-down list and the field names of the selected table are displayed in the "Select Fields from the Table" area.



Note If you are creating a graph in a 4D Chart area in an input form, the current table is not listed in the Tables list because you cannot graph data from the current table.

6 **Choose the desired table from the Source Table drop-down list.**

The Fields list changes to show the fields from the selected table.

Note Picture, subtable and BLOB fields cannot be included in a graphic representation.

7 **Drag the field that you want to assign to the Category axis to the Category box or double-click the field.**

Note If you make a mistake when choosing the X-axis field, replace the field by dragging the desired field to the Category box.

- If you want to create a three-dimensional graph, you must fill the "Second Category (Y-axis)" area. Go to the following step.
- If you want to create a two-dimensional graph, you only need to fill the "Values (Z-axis)" area. Go to step 9.

8 **If you are creating a 3D graph, drag the Series field to the Y-axis (Second Category) box or double-click the field.**

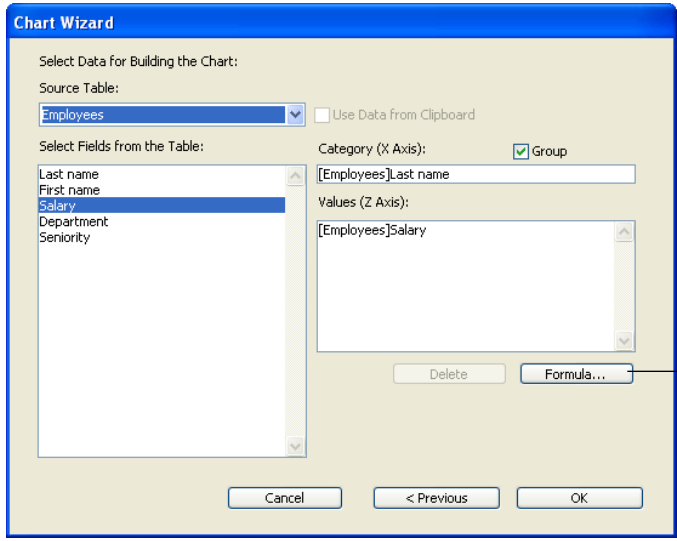
The name of the field appears in the Y-axis box.

Note If you make a mistake when choosing the Y-axis field, replace it by dragging the correct field to the Second Category box.

9 **Drag the field containing the values to be graphed to the Values (Z-axis) box or double-click the field[1].**
OR
Click the Formula button (2D graphs only).

1. With 2D graphs, you can add more than one field or formula to the Z-axis. Each field or formula becomes a series. For more information, please refer to the "Choosing a Graph Type" section on page 241.

The name of the field or the formula appears in the Z-axis (Values) box. For instructions on creating a formula, see the "Adding a Formula" section on page 267.



Button for adding a formula (2D graphs)

For two-dimensional graphs, you can add an unlimited number of fields and/or formulas on the Z-axis (Values). Each item placed in the **Values (Z-axis)** area becomes a series. For more information on series, refer to the "Choosing a Graph Type" paragraph on page 241.

Notes

- For three-dimensional graphs, to modify the field placed in the Z-axis area, you just need to drag and drop the name of another field onto the area.
- For two-dimensional graphs, you can delete a series, i.e., a field or formula placed in the Z-axis area: just select the series then click on the **Delete** button or press **Backspace**.

10 If you want to have the Z-axis values summed for each X-axis category, click the Group check box.

This option is used when the X-axis categories are not unique and you want each category to appear only once, with the values for each instance summed. For more information about this option, see the "Grouping Non-unique Categories and Series" section on page 266.

11 **If you want to have the Z-axis values summed for each Y-axis series, click the Group check box (3D graphs only).**

This option is used when the Y-axis series are not unique and you want each series to appear only once, with the values for each instance summed. For more information about this option, see the "Grouping Non-unique Categories and Series" section on page 266.

12 **When you have finished designing your graph, click OK.**

4D Chart creates the graph and displays it in the 4D Chart area.

Updating the Data in a Graph from the Database

When you create a graph from data stored in the database, the data in the graph is static. Although the data in the database may change, the data in the graph remains the same until you update it.

You can tell 4D Chart to update a graph by choosing **Update** from the **Chart** menu. When you choose Update, 4D Chart regenerates the selected graph using the data in the current selection for the table whose fields you are graphing.

You will want to update a graph in the following situations:

- When you want to include more records in the selection
- When you want to include fewer records in the selection
- When you want to include different records in the selection
- When the data in the selection has been modified.

When you use **Update**, 4D Chart recreates the graph using the new current selection and the settings you chose for the original graph.

Note The **Update** menu item is available only for graphs created from data in the database.

Creating a Graph from Data on the Clipboard

You can graph data from any application if it is correctly formatted and then copied to the Clipboard. This section describes how to format data in order to use it in a graph, and how to create a 4D Chart graph from this information.

Formatting Data and Copying it to the Clipboard

You can graph data that is formatted in the Tab-Tab-Return (TTR) format. If you copy cells from any spreadsheet application, they will be in TTR format. You can also use data from a word-processing application if it is formatted with tabs between the fields and carriage returns between the records.

Following are examples of correctly formatted data:

TTR data (word-processing)

Names ⇥ Ages ↵
Helen ⇥ 25 ↵
Todd ⇥ 27 ↵
Norm ⇥ 22 ↵
Michele ⇥ 23 ↵

Spreadsheet data

Names	Ages
Helen	25
Todd	27
Norm	22
Michele	23

Note The ⇥ and ↵ symbols represent the invisible symbols used by many word-processing applications to indicate tabs and carriage returns, respectively.

The first row of data is used as the field names. Each column contains the data for one field.

Note If you want to use dates copied to the Clipboard, the dates must be in the same format as the System-level date format.

When you have prepared the data in your application, select the desired rows and columns and copy them to the Clipboard.

Creating the Graph from Data on the Clipboard

For a two-dimensional graph, you will specify a field for the X-axis and one or more fields or formulas for the Z-axis. The following illustration shows how 4D Chart interprets the information from the Clipboard.

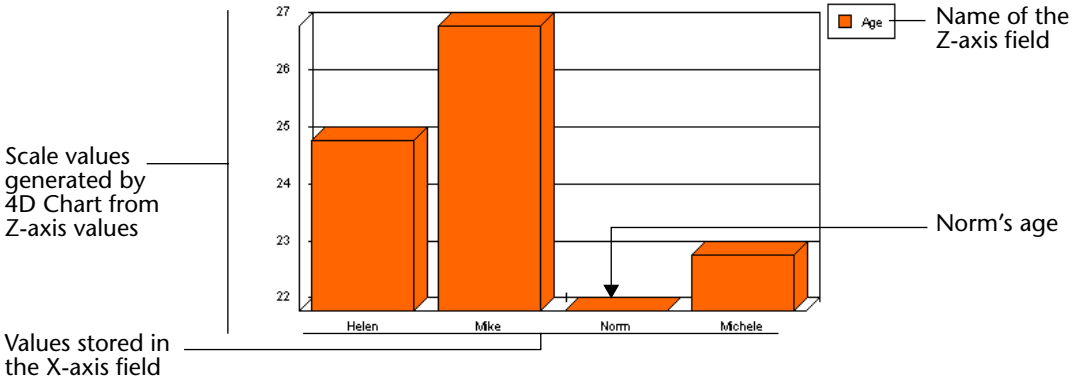
Clipboard

Field names

Records

Names	Ages
Helen	25
Mike	27
Norm	22
Michele	23

2D Graph



For a three-dimensional graph, you specify one field each for the X-, Y-, and Z-axes. The following illustration shows the spreadsheet data used for the example graph. The information details the total sales by two different stores to three types of customers.

Clipboard

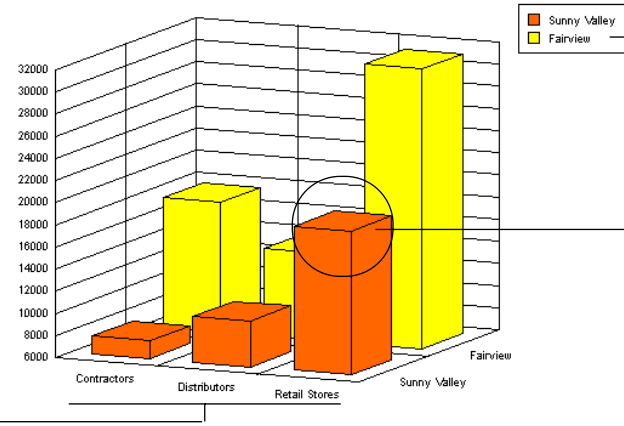
Categories
Series
Values

Field names

Records

Customer Type	Store Location	Dollar Amount
Contractors	Sunny Valley	7599
Contractors	Fairview	17722.5
Distributors	Sunny Valley	10132
Distributors	Fairview	13900
Retail Stores	Sunny Valley	18997.5
Retail Stores	Fairview	31275

3D Graph



Series

Total value of sales to retail stores at the Sunny Valley store location

Categories

► To create a graph from data stored on the Clipboard:

1 **Copy the data to be graphed to the Clipboard, using the format described in this section.**

2 **Follow the instructions provided in steps 1 to 5 in the "Creating a Graph from Data in the Database" section on page 256.**

The Data Selection page appears, configured for the selected chart type.

3 **Click the Use Data From Clipboard check box.**

Clicking Use Data From Clipboard disables the Source Table drop-down list and populates the Fields list with the field names from the Clipboard.

4 **Assign fields to the axes by dragging to the appropriate areas or by double-clicking the fields.**

When all areas have been assigned fields, the **OK** button is enabled.

Note With 2D graphs, you can add as many fields and formulas to the Z-axis as you like. However, be sure to choose only numeric fields. Do not mix date fields and formulas with number fields and formulas. Each item in the Z-axis (Values) box is plotted in the graph.

5 **If you want to have the Z-axis values summed for each X-axis category, click the Group check box.**

This option is used when the X-axis categories are not unique and you want each category to appear only once, with the values for each instance summed. For more information about this option, see the "Grouping Non-unique Categories and Series" section on page 266.

6 **When you have finished designing your graph, click OK.**

4D Chart creates your graph and displays it in the 4D Chart area.

Updating Graph Data from the Database

When you create a graph using the contents of the database, the data it contains are static. Even when the contents of the database change, the data of the graph can only be modified by an update.

► To update a 4D Chart graph:

1 **Choose the Update command in the Chart menu of 4D Chart.**

This way 4D Chart regenerates the selected graph using the data found in the current selection of the table whose fields are being graphed.

You should update a graph in the following cases:

- To add records to the selection,
- To remove records from the selection,
- To put different records in the selection,
- When the data of the selection has been modified.

When you use the update, the graph remains the same with all the previously chosen options, but with a new selection of data.

Note The **Update** menu command is only enabled for graphs created using the contents of the database.

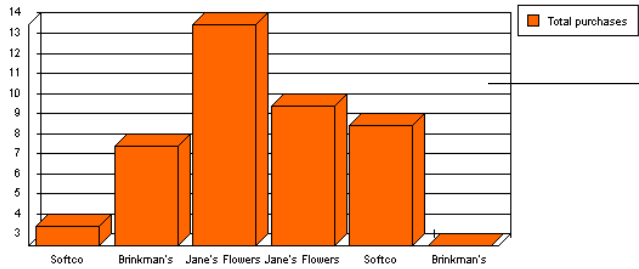
Grouping Non-unique Categories and Series

Some categories or series may appear more than once in your data. For instance, suppose that you want to graph the total purchases made by each of your customers. Each customer may have made several purchases.

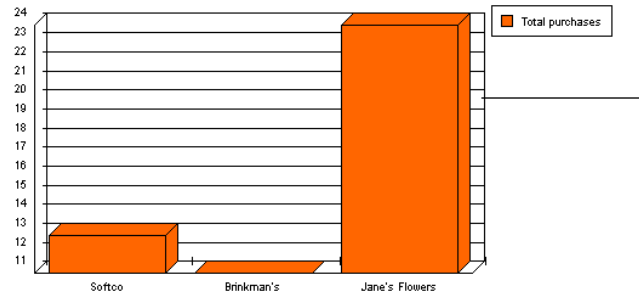
When you create a two-dimensional graph, you can choose to sum the values for non-unique categories, so that each category appears only once on the graph. When you create a three-dimensional graph, you can choose to sum the values for non-unique categories, non-unique series, or both.

To create the graph described in the example above, you might graph from the [Invoices] table, using [Invoices]Customer for the X-axis categories and [Invoices]SalesTotal for the Z-axis values. Because some customers may have more than one invoice, you would want 4D Chart to sum the values in the [Invoices]SalesTotal field so that there would be only one value (the total) for each customer.

The illustrations below show the same basic graph with and without the Group option:



Graph without Group option



Graph with Group option

To group data on the Category or Series axis, check the corresponding **Group** check box in the Data Selection page of the Chart Wizard.

Adding a Formula

You can graph values that are not represented in your data but are obtained by performing calculations on the data or on other values in your database. For example, you can graph your profits by graphing the results of a formula that subtracts your unit cost from your retail price.

You can refer to any function or valid 4th Dimension method "allowed" in the formula editor and graph the result on the Values axis. The method must return a value to 4D Chart. If the categories are grouped, 4D Chart sums the values returned.

If there are fields or other formulas also being graphed on the Values axis, the data types of all the values must be compatible. For instance, if you are graphing a Date field and a formula on the Values axis, the formula must return a date.

Formulas are available only for two-dimensional graphs.

► To use a formula to calculate values for a graph:

1 **When you are ready to specify the Values field in the Data Selection page, click the Formula button.**

The 4D Formula dialog box appears.

2 **Type the formula.**

For more information about the Formula editor dialog box, please refer to "Formula Editor" section on page 115. Following are some examples of formulas:

Formula	Syntax
Month of (Current date)	4D function (4D function)
Day of ([Invoices]Invoice date)	4D function (field)
Sin (vX)	4D function (variable)
NumVisits	Method that returns a value in $0 This method must have been "allowed" in the Formula editor using the SET ALLOWED METHODS command

3 **Click OK.**

4 **When you have finished designing the graph, click OK in the Chart Wizard to create the graph.**

Changing the Chart Type

You can switch between chart types at any time. You can change from one two-dimensional graph type to another, or from one three-dimensional graph type to another. When creating a graph, feel free to experiment with chart types to find the best way to present your data.

► To change the chart type:

1 **Make sure that the graph is selected.**

You select a graph by clicking it. When a graph is selected, selection handles appear around it.

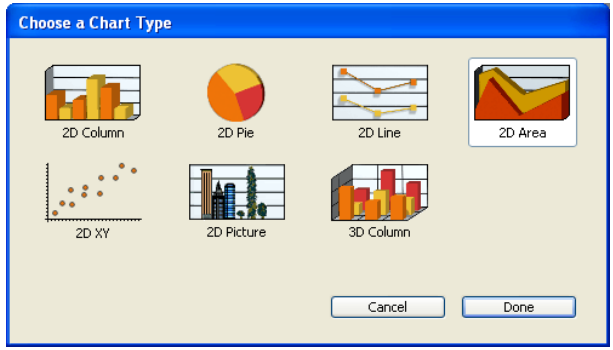
2 **Click the Chart button in the 4D Chart Tool palette.**

A pop-up menu appears, which lets you select another type of chart. This menu does not allow a preview of the chart types.

OR

Choose the Chart Type item in the Chart menu of 4D Chart.

The "Choose a Chart Type" window is then displayed.



You can select another chart type and click **OK**.

The graph is redrawn using the new chart type. Both the Chart drop-down list and the Choose a Chart Type window display only the chart types that are appropriate for the selection of data. You cannot, for example, plot 3D data using a 2D chart type. For information on the graph types available in 4D Chart, see the "Choosing a Graph Type" section on page 241.

Setting the Chart Type Change Alert

You can have 4D Chart display an alert dialog box when the user attempts to change the type of a graph. The user then has the option to cancel or continue with the change.

► To display an alert dialog box when a new chart type is selected:

1 **Choose Properties from the 4D Chart Edit menu.**

The Properties dialog box appears.

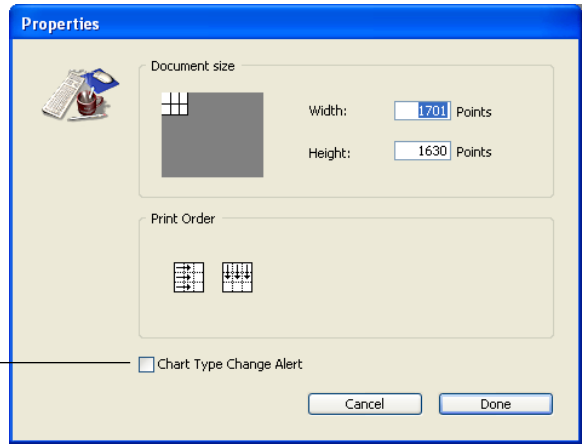


Chart type change alert check box

2 **Check or uncheck the Chart Type Change Alert check box.**

3 **Click OK to close the Properties dialog box.**

Changing the Options for a Chart Type

Each chart type has a particular set of options that you can change using the Options dialog box. By changing the chart options, you can, for example, change a column graph to a bar graph, or show the series in an area graph as proportions of a whole.

► To open the Options dialog box for a graph:

■ **Double-click the graph.**
OR
Select the graph and choose Options from the Chart menu.

For more information about the options for each chart type, see the "Choosing a Graph Type" section on page 241.

Modifying Graph Features

This section explains how to modify graph features. After reading this section, you will know how to:

- Resize a graph
- Customize graph axes
- Show and hide grid lines
- Display the series values
- Customize legends
- Add depth to a two-dimensional graph
- Change the perspective of a three-dimensional graph
- Customize the tips of a graph
- Change the graphic attributes of graph objects
- "Explode" a wedge from a pie chart
- Add a picture to a picture chart.

Resizing a Graph

When you create a graph, its initial size corresponds to the size of the window in which it is created.
If the graph is created using the **Tools>Chart...** menu command of 4th Dimension, its size corresponds to the default size of a 4D Chart external window .
If the graph is created from a 4D Chart window, its size corresponds to that of the window.

You can resize a graph in two ways:

- By resizing the window in which it is displayed.
A graph is "unified" with the window where it was created as long as its own dimensions have not been modified using the selection handles (see below).
- By directly resizing the graph in the window using the selection handles (black squares that appear around the object when it is selected). Once you have done so, the graph is no longer "unified" with the window (see above).

You can resize the height and width at the same time, maintaining the sizing proportion between the two.

► To resize a graph:

1 **Select the graph.**

2 **Hold down the mouse button on a selection handle and drag it up, down, or diagonally.**

If you drag a corner, the height and width change. If you drag a side, either the height or the width changes.

To resize the object so that the height and width retain the same proportion to each other, hold down the **Shift** key while you are resizing.

3 **Release the mouse button when you have finished.**

The graph is resized.

Customizing the Axes

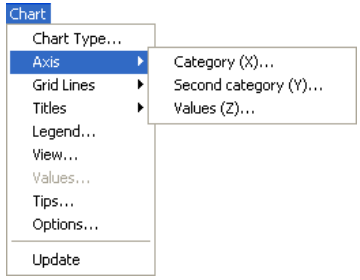
You can customize many aspects of each axis of a graph. This section contains information about:

- Customizing the axis labels
- Customizing the tick marks
- Changing the scale of the Values axis
- Reversing the order of data points on an axis
- Positioning the origin
- Adding axis titles.z

The following table explains the axes available in two-dimensional (2D) and three-dimensional (3D) graphs:

Number of Axes	Axis Name	Axis
Two (2D Graph)	Category	X
	Series	N/A
	Values	Z
Three (3D Graph)	Category	X
	Series	Y
	Values	Z

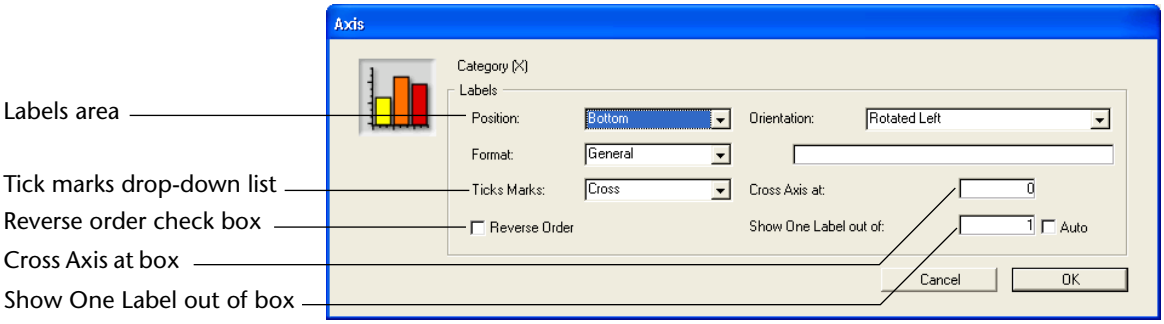
You can display the Axis dialog box for any axis by choosing the appropriate axis from the **Axis** submenu of the **Chart** menu.



Using the Axis dialog box, you can change the location of the axis labels, tick marks, and origin. You can also change the scale used for the Values axis and reverse the order of the items graphed on each axis.

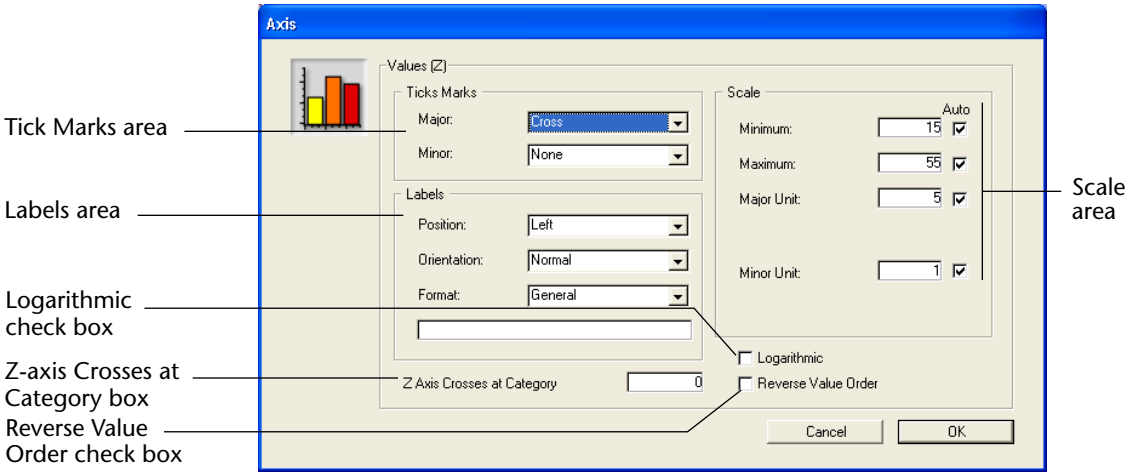
This section presents the dialog boxes that you use to customize the axes of your graph. It then provides details about each of the options.

The Category Axis dialog box enables you to customize the Category and Series axes:



Note The Tick Marks drop-down list, Reverse Order check box, and Cross Axis At text box are not available in the Category or Series Axis dialog box for three-dimensional graphs.

The following dialog box enables you to customize the Values axis:



Note Only the Labels and Scale areas are available in the Axis dialog box for three-dimensional graphs. The Date Increment drop-down lists are available only when dates are being graphed on the Values axis.

Customizing the Axis Labels

4D Chart automatically labels the axes when it generates a graph. You can change the position, orientation, and format of the labels, or you can decide not to display them with your graph.

- **Label Positions**
  You can choose one of the following label positions from the **Position** drop-down list:
  - None
  - Top
  - Bottom
  - Left
  - Right.

  Depending on the orientation of the axis, either Top and Bottom or Left and Right will be unavailable.

  When the position is None, the label does not appear on the graph.

- **Label Orientation**
  The following label orientations are available for each axis:

	Orientation					
	Normal	**Vertical**	**Rotated Left**	**Rotated Right**	**Staggered**	**Wrap**
Result	Label	Label	Label	Label	Label1 Label3 Label2	Lab el

- **Label Formats**
  You can change the way data in your labels is displayed by using display formats. For instance, you can use a display format to display dollar amounts using the dollar sign ($), commas, and decimals.

  The following table shows some examples of the effects of display formats:

Data in Default Format	Display Format	Data in Display Format
3400	$###,###.00	$3,400.00
3/4/99	Month Date, Year	March 4, 1999

  When you select one of the formats from the Format drop-down list, it is entered into the Format text box, located to the right of the drop-down list. If you want to use a custom format, you can enter it in that area.

  You can use one of 4th Dimension's built-in formats, edit a format, or create one of your own. For more information, see the *4th Dimension Design Reference* manual.

- **Labeling Data from Boolean Fields**
  If you create graphs using Boolean fields from the database, the default axis labels are "0" and "1", corresponding to FALSE and TRUE. You can label your graph more informatively by changing the label format.

  To create more meaningful labels for Boolean fields, change the label format to the following:

  TrueLabel;;FalseLabel

  For example, you might change the format to "Female;;Male" or "Experimental;;Control".

Reducing the Number of Labels

You can reduce the number of labels displayed on the X-axis or Y-axis of a graph. This feature is useful when you create graphs with a large number of categories (more than 100).

When this option is used, 4D Chart displays only one label per N labels on the selected axis. To use this option, enter a value between 2 and 255 in the "Show One Label out of" box. For example, if you enter 10, 4D Chart will display one label per 10 categories. The value 1 is the standard setting (all labels are displayed).

- **Auto**: If you check the **Auto** box, 4D Chart will calculate the appropriate number of labels to display, according to the amount of room.

Customizing the Tick Marks

Tick marks show the increments of the axes. You can choose among different styles of tick marks, or you can decide not to show the tick marks. You can customize this option for each axis in a two-dimensional graph.

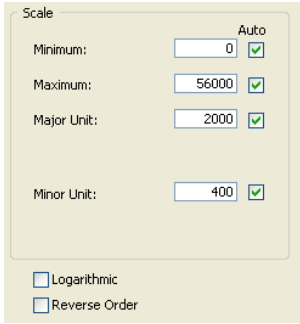
Note You cannot customize the tick marks for a three-dimensional graph.

The following tick mark styles are available:

- Cross (⊥)
- Inside (⊥)
- Outside (⊥).

Changing the Values Axis Scale

You can change the minimum and maximum values. By default, 4D Chart uses the minimum and maximum value of the set of data being graphed. You can change these values, for example, to start the Z-axis at zero.



You can also modify the major and minor units for tick marks. By default, 4D Chart calculates these parameters based on the number of values to be shown and the size of the graph. If the values are dates, you can specify whether the major and minor units are measured in days, weeks, months or years.

For each scale display option, there is an **Auto** option which lets you enable the default operation of 4D Chart.
If you want to use custom values, remember to uncheck the **Auto** option, otherwise your parameters will not be taken into account.

Note The major and minor unit grid lines can be either hidden or displayed (see the "Showing and Hiding Grid Lines" paragraph on page 278).

- **Using a Logarithmic Scale**
  You can change the scale from normal to logarithmic by checking the **Logarithmic** check box, located in the Values axis dialog box.

Reversing the Order of the Data

You can reverse the order of the data on an axis by checking the **Reverse Order** check box. This can only be done in a two-dimensional graph.

Positioning the Origin

You can change the position of the origin — the place where one axis crosses another — for each axis in a two-dimensional graph.

- **Changing the Origin of the Values (Y) Axis**
  The origin of the Z-axis is the value at which the Category (X) axis crosses the Z-axis. Usually, the origin is the minimum value on the graph or zero. Sometimes you will want to change the position of the origin.

► To change the origin of the Values axis:

1. **Choose Category (X) from the Axis submenu of the Chart menu.**
   The Category (X) dialog box appears.
2. **Enter a value in the "Cross Axis At" area.**
   The value you enter is the numerical value of the desired origin position.
3. **Click OK to close the dialog box.**

- **Changing the Origin of the Category (X) Axis**
  The origin of the X-axis is the category at which the Values axis crosses the X-axis. Usually, the origin is placed to the left of the first category. Sometimes you will want to move the origin.

► To change the origin of the Category (X) axis:

1 **Choose Values (Z) from the Axis submenu of the Chart menu.**

The Values (Z) dialog box appears.

2 **Enter a number in the "Z Axis Crosses at Category" area.**

The number you enter is the number of the category at which the origin should cross. The categories are numbered from left to right, (or from bottom to top in a horizontal graph). The Z-axis crosses to the left of the specified category.

To move the origin to the right of the last category on the graph, specify the number of categories plus 1.

If the specified number is higher than the number of categories plus 1, the value is ignored and the origin is reset to the left of the first category.

3 **Click OK to close the dialog box.**

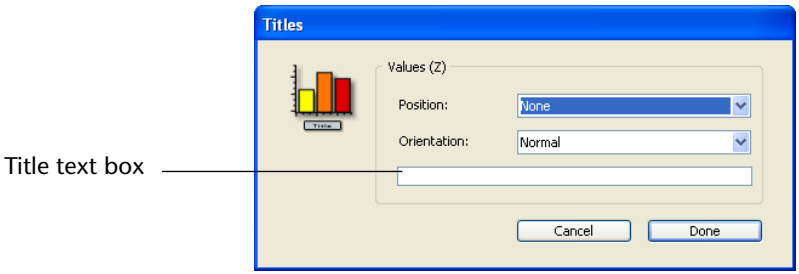
Adding Axis Titles

You can add a title for each axis. Usually, the titles describe the data graphed on the axis.

► To add a title to any axis:

1 **Choose the appropriate axis from the Titles submenu of the Chart menu.**

The Titles dialog box appears.



2 **Type the title into the "Title" text box.**

3 **Choose a position for the title from the "Position" drop-down list.**

This specifies the position of the title relative to the graph.

You can choose one of the following title positions:

- None
- Top
- Bottom
- Left
- Right.

The default position is None. When the position is None, the title does not appear on the graph.

Depending on the orientation of the axis, either Top and Bottom or Left and Right will be unavailable.

4 **Choose an orientation for the title from the "Orientation" drop-down list.**

The following orientations are available for each axis:

- Normal
- Vertical
- Rotated Left
- Rotated Right.

5 **Click OK.**

Showing and Hiding Grid Lines

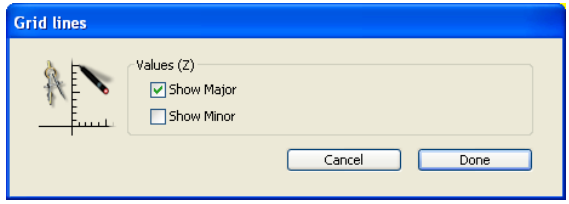
You can display grid lines for the major and minor increments of each axis. Grid lines can make a graph easier to read.

The major and minor increments are set in the Axis dialog box for the Values axis.

► To display the grid lines for any axis:

1 **Choose the appropriate axis from the Grid Lines submenu of the Chart menu**

The Grid Lines dialog box appears.



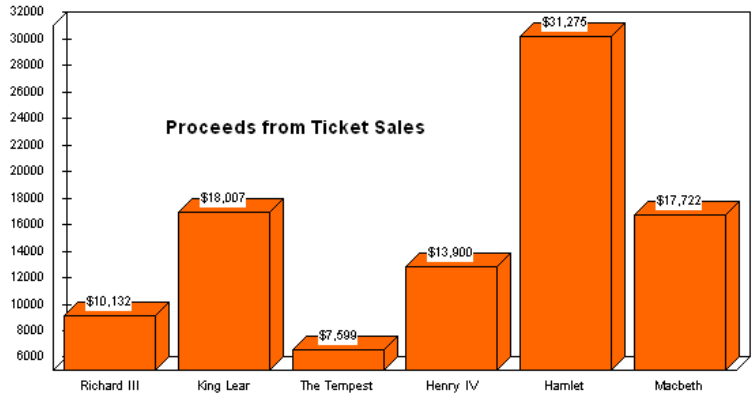
2 **Click the desired check boxes and click OK.**

Displaying the Series Values

You can display information for each series directly in the graph. You can display the following information:

- **Values**: The actual number or date, in Arabic numerals. You can show the values on the graph instead of using labels on the Values axis, or use them to supplement the axis labels.
- **Percentages**: The value of the data point divided by the sum of all the values in the category, as a percentage.
- **Categories**: The name of the category, identical to the axis label for the category.

The following graph shows the values at the tops of the columns:



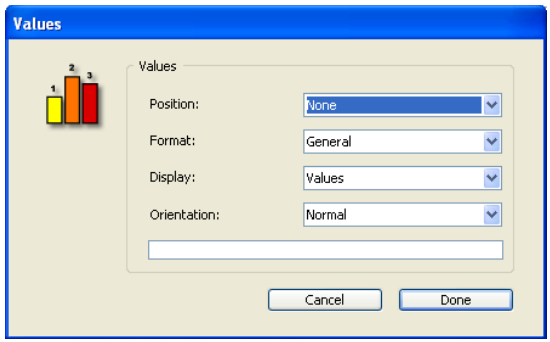
You can select the location at which the values, percentages, or category labels should appear, as well as their orientation and format.

This feature is not available for three-dimensional graphs.

► To display information about the data in a series:

1 **Choose Values from the Chart menu.**

The Values dialog box appears.



2 **Select the location at which the information should appear.**

You can select one of the following options from the **Position** drop-down list:

Pie Charts	All Other Graph Types
None	None
Inside	Outside Top
Outside	Outside Bottom
	Inside Top
	Inside Centered
	Inside Bottom
	At Axis

3 **Select the type of information you wish to display.**

You can select one of the following options from the Display drop-down list:

- Values
- Percentage
- Category
- Value & Percent
- Categories & Percent.

4 **If you wish, select a format from the "Format" drop-down list.**

You can change the way values are displayed by using display formats. For instance, you can use a display format to display dollar amounts using the dollar sign ($), commas, and decimals.

The following table shows some examples of the effects of display formats:

Data in Default Format	Display Format	Data in Display Format
3400	$###,##.00	$3,400.00
3/4/99	Month Date, Year	March 4, 1999

When you select one of the formats from the Format drop-down list, it is entered into the Format text box, located below the drop-down list.

You can use one of 4th Dimension's built-in formats, edit a format, or create one of your own. For more information, see the *4th Dimension Design Reference* manual.

5 **Select an orientation from the "Orientation" drop-down list.**

You can select one of the following options:

- Normal
- Vertical
- Rotated Left
- Rotated Right.

6 **When you are finished making your selections, click OK.**

Customizing the Legend

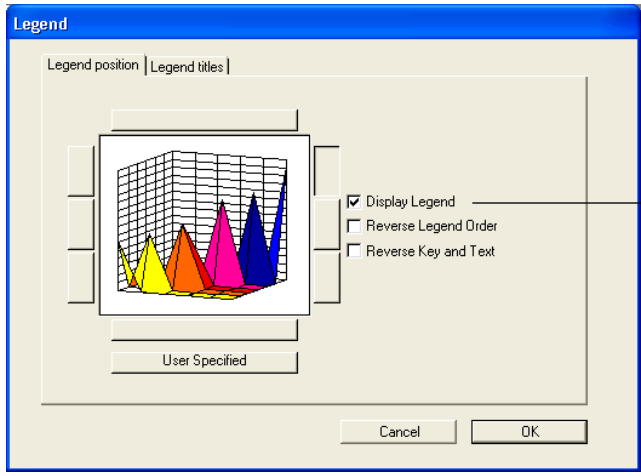
4D Chart automatically creates a legend for you when it generates the graph. By default, the legend is based on value labels. You can customize the legend's location, order, and text.

Displaying and Hiding the Legend

To display or hide the legend for the selected graph:

1 **Choose Legend from the Chart menu.**

The Legend dialog box appears.



2 **Click the Display Legend check box.**

If this check box is checked, the legend is displayed as part of the graph object. If this check box is unchecked, the legend is hidden.

3 **Click OK to close the dialog box.**

The next section explains how to position the legend in the graph object.

Positioning the Legend

The legend is part of the graph object. You can position the legend using the eight built-in legend locations, or you can move it using the mouse. You can move the legend anywhere in the document, including placing it inside the graph itself.

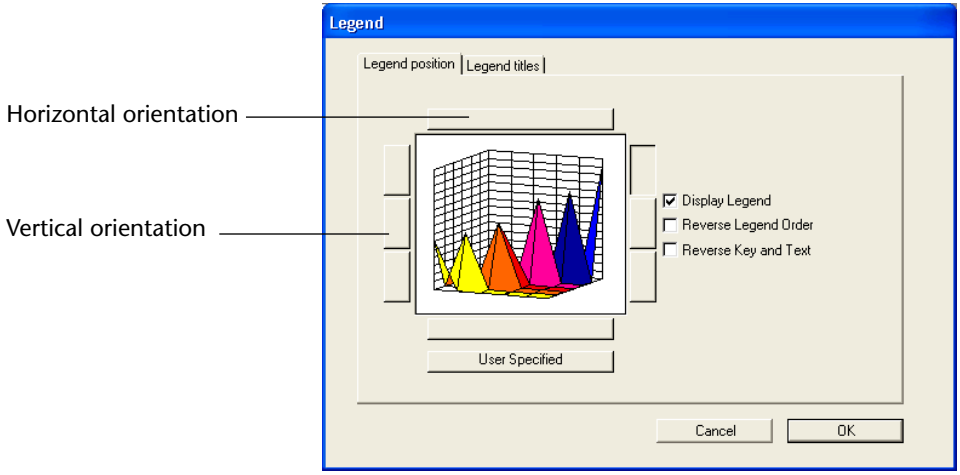
In addition, you can display the legend vertically or horizontally. In other words, the series in the legend can be placed left-to-right or top-to-bottom.

Positioning the Legend Using the Built-in Locations

To use the built-in locations for the legend:

1 **Choose Legend from the Chart menu.**

The Legend dialog box appears.



2 **Select a legend position by clicking one of the model legends in the Location area.**

The location you choose will determines whether the orientation is horizontal or vertical.

3 **Click OK to close the dialog box.**

Positioning the Legend with the Mouse

You can position the legend anywhere in the 4D Chart document by moving it with the mouse.

► To position the legend with the mouse:

1 **Hold down the Ctrl key (⌘ key on Macintosh) and click the legend to select it.**

2 **While continuing to hold down the Ctrl or ⌘ key, click and drag the legend to the desired location.**

3 **Release the mouse button and the Ctrl or ⌘ key.**

Maintaining the Legend Location

When you use the Legend dialog box, click the **User Specified** button to maintain the legend location. If you select one of the built-in locations, the **User Specified** option is automatically deselected.

Setting the Legend Order

You can reverse the order of the series in the legend. In addition, you can reverse the order of the legend key and legend text.

► To change these options:

1 **Choose Legend from the Chart menu.**

The Legend dialog box appears. The following options are available:

- **Reverse Legend Order**: Reverses the order of the series in the legend.
- **Reverse Key and Text**: If this check box is checked, the square containing the color or pattern code for each series is displayed after the series name.

2 **Check or uncheck the check boxes as desired.**

3 **Click OK to close the dialog box.**

Customizing the Legend Text

You can customize the text of any or all of the series in a legend.

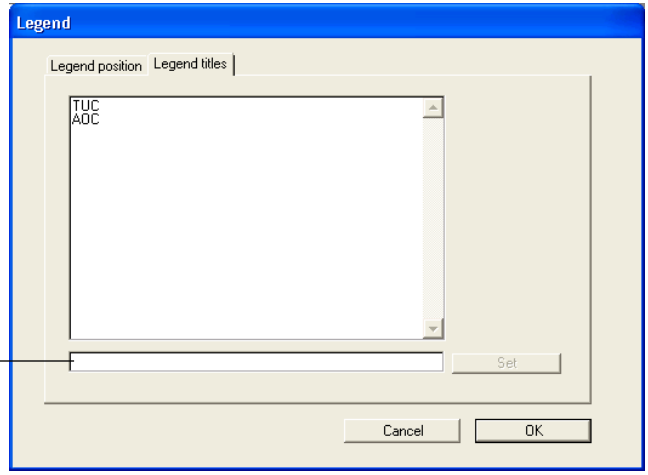
► To customize legend text:

1 **Choose Legend from the Chart menu.**

The Legend dialog box appears.

2 **Click the Legend Titles tab.**

The Legend Titles page appears.



The series labels for the legend are displayed in a list.

3 **Choose the series label to edit by clicking its name in the list.**

The series label is highlighted in the list and the text of the label appears in the Text Editing box.

4 **Edit the text in the Text Editing box.**

5 **Click the Set button.**

You must click **Set** in order for the changes to take effect.

6 **Repeat the previous steps until you have made all the changes you want.**

7 **Click OK.**

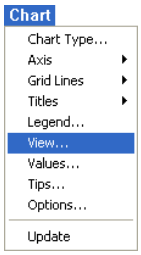
The Edit Legend dialog box closes. If you are displaying the legend, you will see your changes in the legend text.

Modifying Depth in a Two-dimensional Graph

A three-dimensional graph plots three fields or variables in three dimensions. However, you can add the appearance of a third dimension to a two-dimensional graph by adding "depth." The third dimension does not represent the values of any of the fields or formulas plotted in the graph.

By default, 4D Chart adds the illusion of depth to two-dimensional graphs. You can remove it to make the values in the graph easier to read, or modify the three-dimensional illusion.

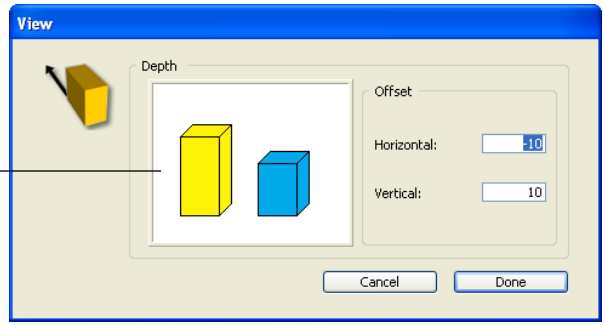
► To modify or remove the depth illusion in a two-dimensional graph:



1 **Choose View from the Chart menu.**

This menu item is enabled only when the currently selected object is a graph.

The Depth dialog box appears.



Depth preview area

2 **Modify the horizontal and vertical depth, measured in points, by typing values in the appropriate text boxes.**

To remove the depth illusion, enter zeros in both entry areas. You can also enter negative values to invert the axis of the three-dimensional illusion.

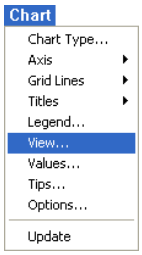
When you press **Tab** or click outside a text box, the value you have entered is reflected in the Depth preview area.

3 **Click OK.**

Your Depth specifications are applied to the graph.

Changing the Perspective of a Three-dimensional Graph

You can change the perspective from which a three-dimensional graph is viewed. You can change both the rotation and the elevation of a graph.

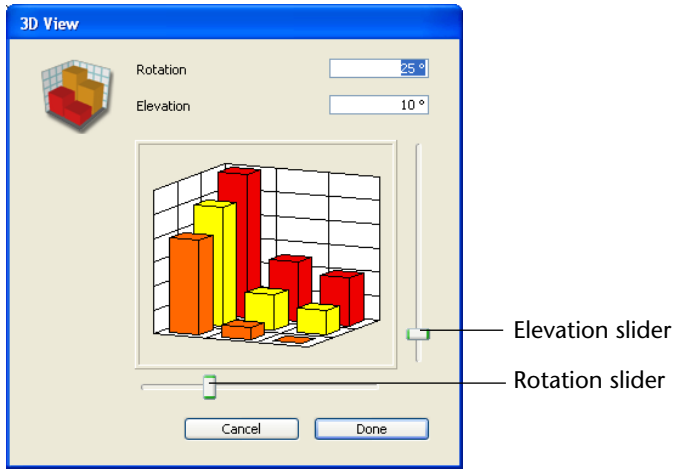


► To change the perspective from which a three-dimensional graph is viewed:

1 **Choose View from the Chart menu.**

The View menu item is enabled only when the currently selected object is a graph.

The 3D View dialog box appears.



2 **If you wish, you can change the rotation by entering a new value (from 0 to 90) in the Rotation text box or by moving the Rotation slider to the left or right.**

Rotation is the rotation of the graph around the Values axis.

The model graph reflects the changes you have made.

3 **If you wish, you can change the elevation by entering a new value (from 0 to 90) in the Elevation text box or by moving the Elevation slider up or down.**

Elevation is the rotation of the graph around a horizontal line perpendicular to the Values axis.

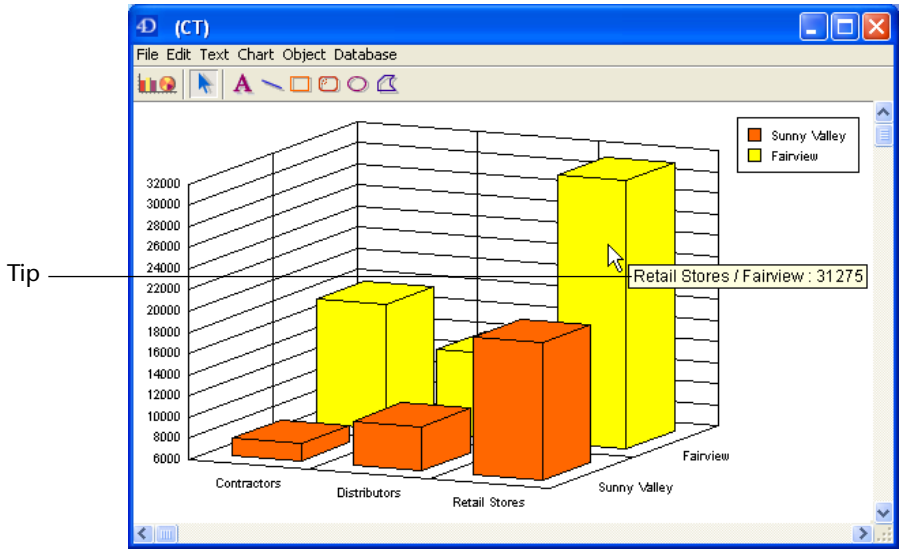
The model graph reflects the change you have made.

4 **Click OK.**

Your graph is redrawn from the new perspective.

Customize Tips in Graphs

Tips — information about a graph and its data — are available for both XY and non-XY graphs. The user can display tips from any position of the pointer in the graph.



Tips display the following types of information:

- Value (on which the pointer is located).
- Ratio between a value (on which the pointer is located) and the total of values in that category. This ratio is expressed as a percentage.
- Category.

The following table lists the graph types and the information that can be displayed in the associated tips:

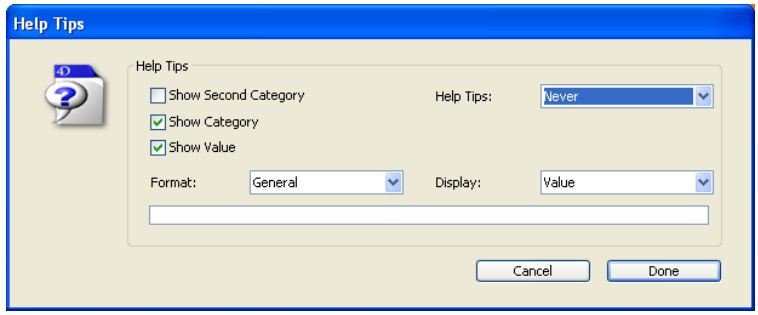
Type of Graph	Tips
2D Column	Values and percentages
2D Line	None
2D Pie	Values and percentages
2D Area	None
2D XY	Values only
2D Picture	Values and percentages
2D Polar	Values only
3D Column	Values only
3D Line	None
3D Area	None

Type of Graph	Tips
2D Column	Values and percentages
3D Surface	None
3D Triangle	Values only
3D Spike	Values only

The values in the tips are based on the data as displayed in the graph and thus may be approximations based on the screen resolution.

Tip attributes are accessed manually in the Tips dialog box (from the **Tips** item in the **Chart** menu) or programmatically using the CT GET TIPS ATTRIBUTES and CT SET TIPS ATTRIBUTES commands.

The Tips dialog box appears as follows:



Note In the case of XY type graphs, the dialog box contains a second **Format** drop-down list and an additional entry area for the Y-axis.

In the Tips dialog box, you can change the properties of the tips displayed for any graph.

The Tips list box enables you to select when to display tips. The choices are **Never**, **Always,** and **On Request**.

- If you select **Always**, tips appear when the user places the mouse cursor over part of the graph.
- If you select **Never**, tips are disabled.
- If you select **On Request**, tips will appear when the user places the mouse cursor over part of the graph while holding down the **Ctrl** (Windows) or **Command** (Mac OS) key.

By default, the **Never** option is selected.

Selecting the **Show Second Category** displays the value of the second Category axis in the tips. The default is to not show the second category. In the case of a 2D graph, selecting this option displays the field name of the Category axis value.

Selecting the **Show Category** option displays the value of the Category axis in the tips. The default is to display the Category axis value.

Selecting the **Show Value** option displays the value of the Values axis in the tips. The default is to display the Values axis value.

The **Format** list box enables you to select the display format for values displayed. The default is General. If the Format selected is General, the text box below the Format list box allows you to enter text for the Values axis. In the case of XY graphs, there are two Format list boxes and text boxes, to accommodate the X- and Y-Values axes.

The **Display** list box enables you to choose to display the category value, percentage (the ratio between the value on which the pointer is located and the total of values in that category), or both.

Changing the Attributes of Graph Objects

This section describes how to select individual graph objects (axis lines, grid lines, series elements, etc.) and change their graphic attributes, such as color, pattern, and line width. You can also change the font attributes of graph text objects (such as axis labels and titles).

► To select an individual graph object:

- **Hold down the Ctrl key (Windows) or Command key (Macintosh) and click the object.**

  The following graph objects can be selected:

  - Each series in a two-dimensional graph
  - Each of the three visible sides of a series in a 3D graph

Note To select all sides of a series in a three-dimensional graph at once, hold down the **Shift** and **Ctrl** keys (Windows) or **Command** key (Macintosh) and click an object in the series.

  - Each axis (includes the tick marks)
  - Axis labels for each axis
  - Major grid lines for each axis
  - Minor grid lines for each axis

- Titles for each axis
- The legend
- Values displayed for the series.

Changing Object Attributes

After you have selected an object, you can modify its graphic attributes using items in the **Object** menu.

Each of the following object attributes can be changed in the **Object** menu.

- **Fill Pattern:** The pattern displayed inside the border of an object. All objects except lines have fill patterns.
- **Fill Color**: The color displayed inside the border of an object.
- **Line Pattern**: The pattern of a line or border. The default line pattern is solid.
- **Line Color**: The color of a line or border. The default line color is black. The color palette used for Fill Color is also used for Line Color.
- **Line Width**: The width of a line or border measured in points. The default line width is 0.25 points (also called a hairline).

Changing Text Attributes

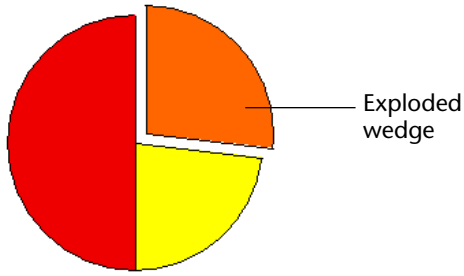
Text attributes apply only to axis labels, axis titles, legend text, and series values. Each of the following text attributes can be changed in the **Text** menu:

- **Font**: The typeface of the text.
- **Size**: Font size is measured in points.
- **Style**: Styles include plain, bold, and italic. The default style is plain.
- **Color**: The default color is black.

You cannot change the justification of graph text. You can only change the justification of text added with the Text tool. For more information about adding text with the Text tool, see the "Adding Text" section on page 297.

Exploding Wedges from a Pie Chart

You can "explode" a pie chart by pulling one or more wedges away from the center of the pie.



► To explode a wedge from a pie chart:

1. **Hold down the Ctrl key (Windows) or Command key (Macintosh) and click a wedge of the pie chart to select it.**

   Selection handles appear around the wedge.

2. **While holding down the Ctrl key (Command key on Macintosh), click and drag the wedge away from the center of the pie.**

3. **When the wedge is where you want it, release the mouse button and the Ctrl key (Command key on Macintosh).**

Adding Pictures to a Picture Chart

When you create a picture chart, the columns are filled with a default picture. You can add your own picture for each series by pasting it from the Clipboard.

► To paste a picture into the columns for a series:

1. **Make sure that the picture you want to paste into the column is on the Clipboard.**

2. **Hold down the Ctrl key (Windows) or Command key (Macintosh) and click a column of the desired series.**

   All the columns are then selected. By default, the picture for each series shows a building.

3. **Choose Paste from the 4th Dimension or 4D Chart Edit menu.**
   OR
   Press Ctrl+V under Windows or Command+V under Mac OS.

   The picture is pasted into each column for the series.

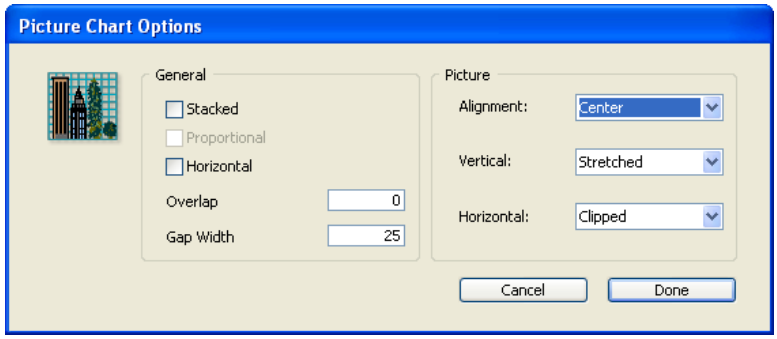
   You can repeat this process for each series.

Note To recover the standard picture, apply a different chart type then re-apply the 2D Picture type.

Adjusting the Pictures within the Columns of Picture Charts

To customize the proportions of the pictures within the series columns:

1 **Double-click the graph to display the Options dialog box for picture graphs.**
OR
Select the graph and choose Options from the Chart menu.
The Picture Chart Options dialog box appears.



In addition to the chart options, which are discussed in the "Choosing a Graph Type" section on page 241, you will find the following options for aligning and adjusting the pictures:

- **Alignment**: This option specifies the horizontal alignment of the picture: center, left, or right.
- **Vertical**: This option specifies how the picture uses the vertical space of the column. The options are: clipped, stretched, and stacked. For more information about these options, see the table at the end of this section.
- **Horizontal**: This option specifies how the picture uses the horizontal space of the column. The options are: clipped, stretched, and stacked. For more information about these options, see the table at the end of this section.

The following table explains the Vertical and Horizontal options.

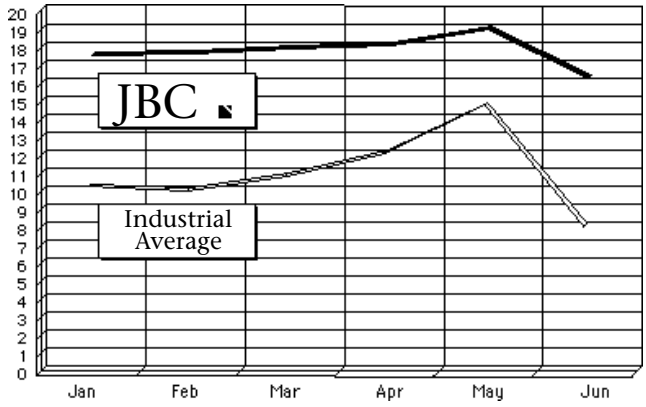
Option	Description
Clipped	If the picture is too tall or too wide to be displayed in its entirety, it is truncated at the edges of the column. The proportions of the picture remain unchanged.
Stretched	The picture is stretched or shrunk so that its dimensions match those of the column.
Stacked	If the picture is either too short or too narrow to fill the column, the picture is repeated until the column's height or width is reached. When the edge of the column is reached, the picture is truncated.

2 **Choose the desired options from the drop-down lists and click OK.**

Adding Objects and Text

With 4D Chart you can add a variety of objects to your documents, including lines, rectangles, ovals, polygons, and text. You can also add dynamic references to fields or to 4th Dimension expressions by inserting expressions in text objects.

The following graph uses objects and text to identify the series.



Topics covered in this section include:

- Drawing objects
- Modifying object attributes
- Adding text

- Modifying text attributes
- Adding a dynamic reference to a 4th Dimension field or expression
- Resizing objects
- Arranging objects in a document.

Drawing Graphic Objects

You can draw the following objects:

- Lines
- Rectangles
- Rounded rectangles
- Ovals
- Polygons .

Selecting a Drawing Tool

To draw an object, you must first select a tool from the Object Tool palette. You make a tool active for drawing when you select it.

The mouse pointer changes depending upon its use. If the Arrow tool is selected, then the pointer is an arrow . You use the Arrow tool to select menu items and objects.

When you select any of the graphic object tools, the pointer changes to a crosshair +. You use the crosshair to draw graphic objects.

Locking a Drawing Tool

When you select a tool, it is in effect only while you draw one object, after which the Arrow tool is selected. However, you can *lock* a tool so that you can continue to use it as long as you need it, by double-clicking it. When you lock a tool, it remains in use until you select another tool.

Drawing an Object

► To draw all objects except polygons:

1 **Select a tool in the 4D Chart toolbar.**

1 **Hold down the mouse button in the document area and drag the mouse to draw the object.**

2 **Release the mouse button to finish drawing the object.**

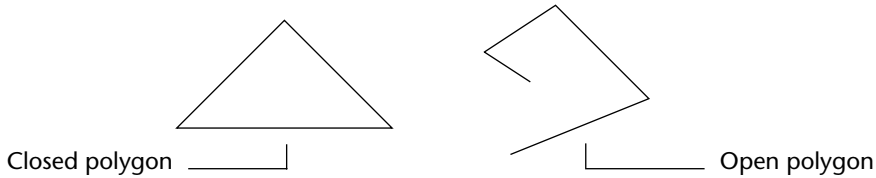
► To draw a polygon:

1 **Click to anchor the first vertex.**

2 **Drag the mouse to draw a side and then click to anchor the next vertex.**

3 **Continue anchoring vertices and drawing sides as necessary.**

4 **Close the polygon by clicking the first vertex to close the polygon, or by pressing Alt+Ctrl+Enter (Windows) or Option+Command+Enter (Mac OS).**
OR
Leave an open side to the polygon by double-clicking the mouse button to anchor the last vertex or by pressing Enter.



Constraining Graphic Objects As You Draw

By constraining graphic objects as you draw, you can control the drawing process — in particular, the height and width of objects. For example, a square is really just a constrained rectangle.

The following table lists the effects of constraining each object:

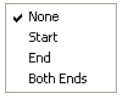
Object	Key	Constraint
Lines	Shift	Constrain line to 45° angles
Rectangles	Shift	Draw a square
	V (for *vertical*)	Constrain height
	H (for *horizontal*)	Constrain width
Rounded Rectangles	Shift	Draw a rounded square
	V	Constrain height
	H	Constrain width

Object	Key	Constraint
Ovals	Shift	Draw a circle
	V	Constrain height
	H	Constrain width
Polygons	Shift	Constrain sides to 45° angles

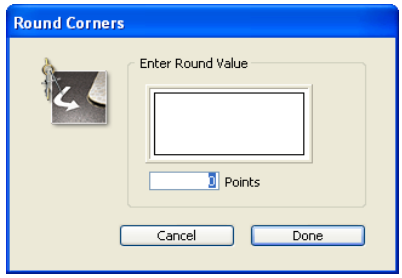
Changing Object Attributes

Each of the following object attributes can be changed using commands in the **Object** menu:

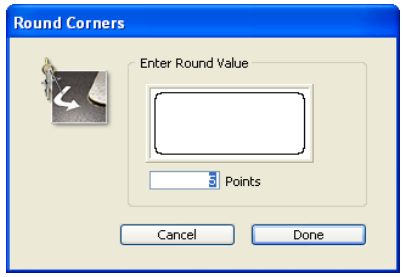
- **Fill Pattern**: The pattern displayed inside the border of an object. All objects except lines have fill patterns. The default fill pattern is solid white.
- **Fill Color**: The color displayed inside the border of an object. All objects except lines have fill color. The default fill color is black.
- **Line Pattern**: The pattern of a line or border. The default line pattern is solid.
- **Line Color**: The color of a line or border. The default line color is black.
- **Line Width**: The width of a line or border measured in points. The default line width is 0.25 points (also called a hairline).
- **Arrowhead**: The arrows that appear on one or both ends of a line; only lines have arrowheads. The default is to have no arrowheads. If the selected object is a line, the **Arrowhead** menu item is enabled. The Arrowhead submenu has the following items.



- **Round Corners**: The amount of rounding of the corner of a rounded rectangle. The default rounding is 1/4 inch. If the selected object is a rectangle that you created with a rectangle tool, the **Round Corners** menu item is enabled. When you choose **Round Corners**, the following dialog box appears:



When you enter a value in the entry area, the preview area shows the effect of the value:



Adding Text

Most of the text that you want to add to a graph — such as axis labels, titles, legends — can be added using menu items in the **Chart** menu.

To add extra text to a graph, you must first create a text object and then enter the text. A text object is a container for text.

► To create a text object:

1 **Select the Text tool A.**

The pointer changes to an I-beam I.

2 **Hold down the mouse button and drag the mouse to create a rectangular text area.**

3 **Release the mouse button.**

You can also simply click in the window after you have selected the Text tool to create a text object of default size (three inches in width). The default height is determined by the font and font size you have selected.

4 **If you have not already done so, click inside the text object to insert the pointer.**

When you place the pointer in the text object, it becomes an insertion point | .

5 **Type your text.**

6 **When you have finished typing the text, select any other tool.**

Unlike other objects, text objects are not selected after you create them.

Once you have created a text object and added text, you can change the text by editing it — for example, copying, cutting, or pasting it. You can also change its attributes, such as its font, size, style, and justification. For more information about changing text attributes, refer to the next section, "Changing Text Attributes".

Changing Text Attributes

Text attributes are applied only to text inside a text object. Each of the following text attributes can be changed in the **Text** menu:

- **Font**: The typeface of the text.
- **Size**: Font size is measured in points. The default size is 12 point.
- **Style**: Styles include plain, bold, and italic. The default style is plain.
- **Color**: The default color is black.
- **Alignment**: Text can be left, right, or center aligned. The default alignment left.

Adding Dynamic References

Using field references and 4th Dimension expressions, you can create 4D Chart documents that incorporate information from your database. For example, you can use field information from the records to make graph titles. You can use 4th Dimension expressions to perform tasks such as computing numeric values or concatenating text information.

In this section, you will find information about the following topics:

- Inserting field values into a 4D Chart document,
- Inserting a 4th Dimension expression into a 4D Chart document,
- Displaying field and expression values,
- Formatting field and expression values,
- Changing a dynamic reference to static text.

Understanding Values and References

You can display the information from 4th Dimension as either *values* or *references*. A value is the actual information stored in a field or calculated from an expression. A reference is the name of the field or the text of the expression.

When expressions and fields are displayed as references, they are surrounded by the following symbols: « and ».

For example, a reference to the First Name field in the [Stationery Order] table would appear as:

«[Stationery Order]First Name»

4D Chart inserts these symbols when a field is inserted into a text object. When you insert any other type of reference, such as a 4th Dimension function or variable, you must indicate that it is a reference. 4D Chart will then add the « and » symbols to differentiate the reference from normal text. For more information on referencing expressions, see the "Inserting 4th Dimension Expressions" section on page 302.

When references are displayed as values, the « and » symbols do not appear; for example, a field value for First Name might be:

James

The field value appears as standard text.

Field references and 4th Dimension expressions always refer to the current record and are updated whenever the current record changes. If there is no current record, no value is displayed.

Inserting Field References

By inserting a field reference in a 4D Chart document, you add dynamic information to the document. As the field is updated, so is the value in 4D Chart. You can use fields from any table in the database, except subtables.

The field reference or value appears in a text object, except for references to picture fields. The text object containing a reference acts as any other text object; you can change its attributes, move it, and so on.

- **Using Field References in a Plug-in Window**
  When you insert a field reference in a 4D Chart plug-in window, the value that is displayed when you choose **Show Values** from the **Database** menu is the field's value for the current record. If no record is currently loaded there will be no value displayed in the 4D Chart plug-in window.

In order to show the value stored in a field for a particular record, make sure that the record is loaded — by displaying the record in an input form, for instance. If the current record changes, the value displayed in the field changes.

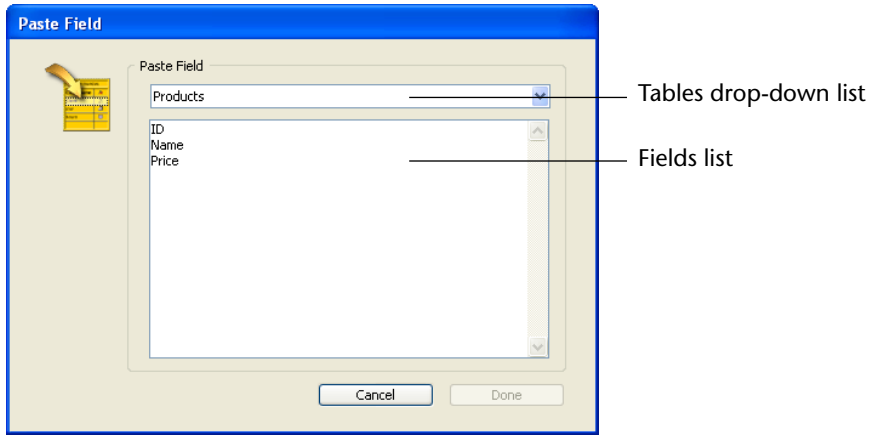
- **Using Field References in a 4D Chart Area on a Form**
  When you insert a field reference in a 4D Chart area on an input form, the value that is displayed when you choose **Show Values** from the **Database** menu is the field's value for the current record.

You can use the Paste Field dialog box to paste a field reference into a document.

► To paste a field reference into a 4D Chart document using the Paste Field dialog box:

1 **Click the mouse button where you want to insert the reference.**
If you click inside a text object, you cannot insert a Picture field.

2 **Choose Paste Field from the Database menu.**
The Paste Field dialog box appears. All tables in the database are listed in the Tables drop-down list. The fields for the selected table are displayed in the Fields list.



3 **Select the table from which you wish to paste a field reference from the Tables drop-down list.**
The fields in the selected table are displayed in the Fields list.

4 **Select the field you wish to paste from the Fields list and click OK.**
A reference to the field is pasted into the document in a text object.

You can select fields from a drop-down list containing all available tables and fields. You cannot paste references to Picture fields when you select a field from a drop-down list.

When you are working in a form, you can choose fields from a drop-down list that displays the fields in the current table, or from a drop-down list of fields for all tables in the database.

When you use 4D Chart in a plug-in window, the drop-down list always contains both tables and fields.

► To insert a field into a 4D Chart document using the Tables and Field pop-up menu:

1 **Create a text object where you want to paste the field.**

If you need information about creating text objects, see the "Adding Text" section on page 297.

2 **Position the I-beam pointer I over the text object.**

Make sure that the insertion point is in the text object.

3 **To choose a field from the same table as the form, hold down the Alt key (Windows) or Option key (Macintosh) as you press the mouse button.**

A pop-up menu of fields for the table in which you are working appears. If you are working in a plug-in window, the pop-up menu contains both tables and fields.

4 **To choose a field from another table, hold down the Shift and Alt (Windows) or Option (Macintosh) keys while you press the mouse button.**

If you are working in a plug-in window, you do not need to hold down the **Shift** key.

4D Chart displays a hierarchical pop-up menu of the tables in the database. Each table has a submenu containing its fields.

5 **Select a field.**

A reference to the selected field is pasted into a text object in the 4D Chart document at the insertion point location.

Inserting 4th Dimension Expressions

You can insert any valid 4th Dimension expression into a document. The expression can be a 4th Dimension variable, a 4th Dimension function, a plug-in function, or a method that returns a value.

With expressions you can use the power of 4th Dimension's language within 4D Chart documents. You can perform calculations, concatenate information from several fields, and so on.

The following table contains some examples of expressions:

Expression	Comment
vDate	A variable containing a date
Current date	A 4th Dimension function
Current date–vDate	A statement that performs a calculation
DateCalc	A method that returns a value

An expression is evaluated only when you perform one of the following actions:

- Open the document
- Choose **Show Values** from the **Database** menu
- Print the document.

For more information about expressions, refer to the *4th Dimension Language Reference* manual.

► To insert a 4th Dimension expression into a 4D Chart document:

1. **Create a text object where you want to place the expression.**
   Since the expression is created from text, you must first create the text object.
2. **Enter the expression text and then select it.**
3. **Choose Reference from the Database menu.**
   The text is now enclosed in the « and » symbols, which indicate that it is an expression:

   «Current date»
4. **When you have finished, select the Arrow tool.**
   To display the value of the reference, choose **Show Values** from the **Database** menu.

Displaying Values or References

When you display values, you show the actual values stored in referenced fields and the values calculated by referenced 4th Dimension expressions. For example, if the reference is «Current date », today's date is displayed.

► To display values:

■ **Choose Show Values from the Database menu.**

The value of each reference is displayed.

Note The values of all references are displayed, regardless of the selected reference.

► To display references:

■ **Choose Show References from the Database menu.**

The reference for each value is displayed.

Changing the Value in a Reference to Text

You can change the value in a dynamic reference into static text that will not be updated when the value changes.

For instance, you can use the 4th Dimension expression «Current date » to display the date you created a graph, and then change that date to a static text object. No matter what the current date is, the text object will always display the creation date of the graph.

Changing a value to text is called *unreferencing* the value, because the value no longer has a dynamic reference to the database. Once you have unreferenced a value, you cannot change it back to a reference.

► To change a value in a field reference or expression to text:

1 **Choose Show Values from the Database menu to display all values.**

2 **Select the text block containing the value you want to unreference.**

If the text block contains more than one field or expression, select only the value you want to change.

3 **Choose Unreference from the Database menu.**

The value becomes text.

Changing a Reference to Text

You can change a reference into text by unreferencing it. When you change a reference to text, you change the words of the reference, not the value to which the reference refers.

For instance, if you change the reference «Current date » to text, the text object displays the following:

Current date

When you choose **Show Values** from the **Database** menu, this text does not change, and the current date is not displayed, because the text no longer refers to a 4th Dimension expression.

You may want to edit a reference or permanently change it to standard text. If you want to edit a reference, you must unreference it, edit it, and then reference it again.

► To unreference a field reference or expression:

1 **Choose Show References from the Database menu to display all references.**

2 **Select the text block containing the reference you want to unreference.**

If the text block contains more than one field or expression, select only the reference you want to change.

3 **Choose Unreference from the Database menu.**

The « and » symbols are removed, and the reference becomes text.

Formatting References

You can use a display format for the value of any numeric, date, or time field, or expression in 4D Chart. For instance, you can use a display format to display dollar amounts using the dollar sign ($), commas, and decimals.

The following table shows some examples of display formats:

Data in Default Format	Display Format	Data in Display Format
3400	$###,##.00	$3,400.00
3/4/03	Month Date, Year	March 4, 2003

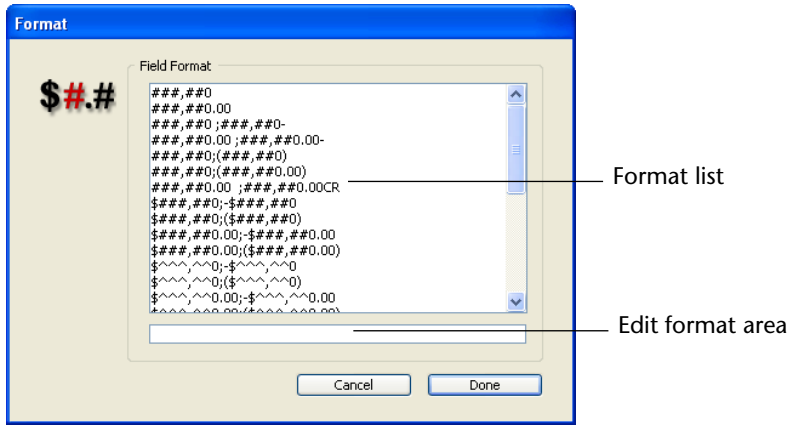
► To format a reference:

1 **Select the reference.**

Since the entire expression is a single value, you can select it by clicking it with the Text tool.

2 **Choose Format from the Database menu.**

The Field Format dialog box appears.



3 **Select an appropriate format from the list.**

The format appears in the text box below the list of formats.

If you want, you can edit a number format or enter a new number format in the Format text box. You cannot edit date or time formats.

For more information about display formats, refer to the *4th Dimension Design Reference* manual.

4 **Click OK.**

The format is listed after the reference. For instance:

«Current date; Abbr.: Month Day, Year»

When you choose **Show Values**, the value of the reference is displayed using the format.

Resizing Objects

You can make an object larger or smaller by resizing it. You can select one or more objects to resize. If you select more than one object, all selected objects are resized by the same amount.

You can resize the height and width at the same time, maintaining the sizing proportion between the two.

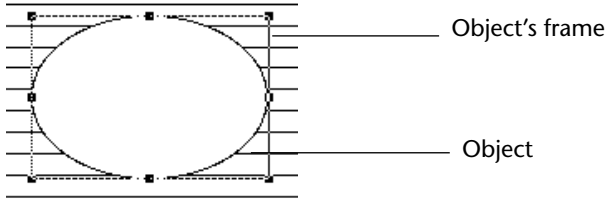
► To resize an object:

1 **Select the object.**

2 **Hold the mouse button down on a selection handle and drag it up, down, or diagonally to change the object's size.**

If you drag a corner, the height and width change. If you drag a side, either the height or the width changes.

To display the object's outline — rather than its rectangular frame — hold down the **Alt** key (**Option** key on Macintosh) while resizing.



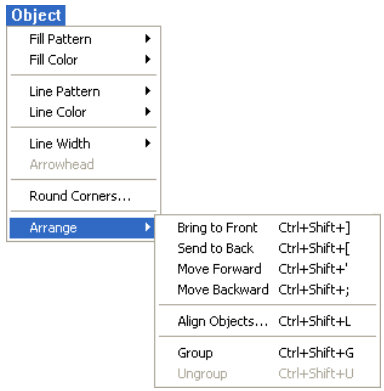
To resize the object so that the height and width retain the same proportion to each other, hold down the **Shift** key while you are resizing.

3 **Release the mouse button when you have finished.**

The object is resized.

Arranging Objects

When you have two or more objects in a 4D Chart document, you can use the items in the **Arrange** submenu of the **Object** menu to arrange them. The **Arrange** submenu is shown below.



You can choose from the following actions in the **Arrange** submenu:

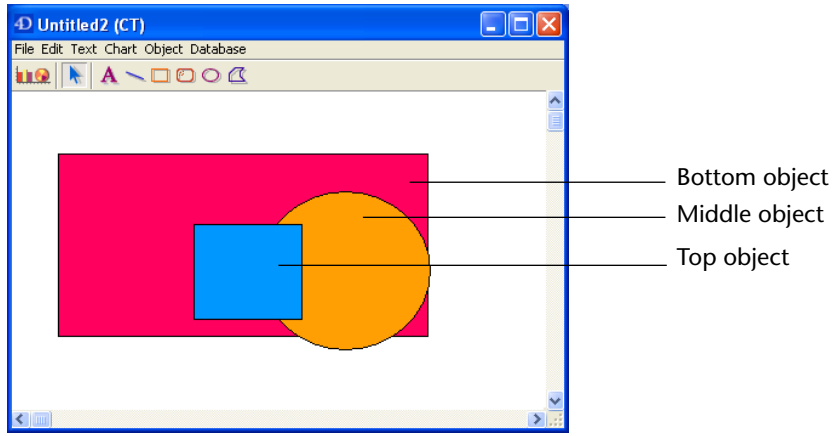
- Bringing an item to the front
- Sending an item to the back
- Moving an item forward one level
- Moving an item backward one level

- Aligning objects in relation to each other
- Grouping a set of objects
- Ungrouping a set of objects.

The following sections describe these actions in more detail.

Changing the Stacking Order

When you draw objects, they can partially or entirely overlap one another. The order in which objects are placed when they overlap one another is called the *stacking order*. The example below displays several objects and their stacking order:



As you work with objects, you may want to change the stacking order of objects; to do so, you can move one or more objects in front of or behind other objects.

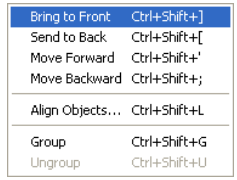
- **Moving an Object in Front of All Others**: By moving an object in front of all others, you move it to the top layer.
- **Moving an Object Behind All Others**: By moving an object behind all other objects, you move it to the bottom layer.
- **Moving One Object in Front of Another**: Moving an object in front of another object allows you to move the selected object one layer higher — that is, place it closer to the top layer.
- **Moving One Object Behind Another**: Moving an object behind another object allows you to move the selected object one layer lower — that is, place it closer to the bottom layer.

► To modify the stacking order:

1 **Use the arrow pointer to select an object.**

2 **Choose a command in the Arrange submenu of the Object menu.**

The **Arrange** submenu is shown below:

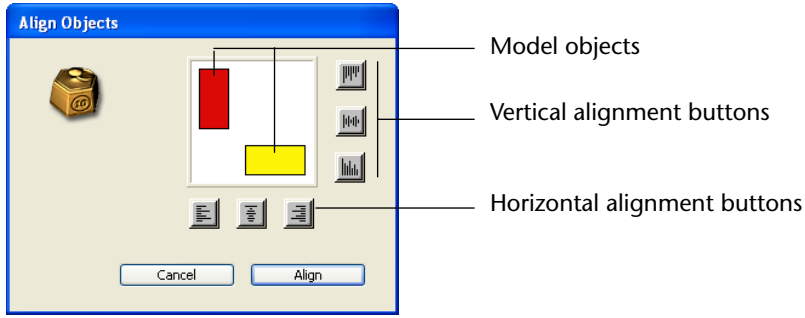


Aligning Objects

When you align objects, you position them in relation to each other. Aligning objects ensures that they are placed precisely in relation to each other. You can align objects both horizontally and vertically.

The object that is farthest in the selected alignment direction is the reference for object alignment. For example, if you want to align the left sides of several selected objects, the selected object that is furthest to the left remains fixed, and the other objects are aligned with it.

When you select **Align Objects** from the **Arrange** submenu, the Align Objects dialog box appears:



Use the following icons to align the selected objects with each other:

Icon	Meaning
	Align the left edges of selected objects.
	Align the centers of selected objects along a vertical axis.
	Align the right edges of selected objects.
	Align the top edges of selected objects.
	Align the centers of selected objects along a horizontal axis.
	Align the bottom edges of selected objects.

Select a maximum of one vertical and one horizontal alignment. The model objects move to indicate the effects of the alignment.

Note To deselect an icon, click it again.

► To align objects:

1 **Select the objects to be aligned.**
Shift-click to select several objects.

2 **Choose Align Objects from the Arrange submenu of the Objects menu.**
The Align Objects dialog box appears.

3 **Click the desired alignment icons and click the Align button.**

Grouping and Ungrouping Objects

By *grouping* objects, you can combine several objects into one. A grouped object acts like a single object when you manipulate or edit it. You can work with a grouped object as you would any other object; you can change its attributes, resize it, and so on.

When you group several objects, all attributes of the individual objects are retained. However, if you change any attribute of the group, that change affects all objects in the group. For example, if you select a new fill pattern for the group, it is applied to each object in the group.

Ungrouping an object breaks it into its component objects. When an object is ungrouped, each piece becomes a separate object again. Ungrouped objects retain any changes made to them while part of a group.

► To group objects:

1 **Select all objects to group.**

2 **Choose Group from the Arrange submenu of the Object menu.**
The objects become one object.

You can break a grouped object into its separate objects by ungrouping it.

► To ungroup objects:

1 **Select an object to ungroup.**

2 **Choose Ungroup from the Arrange submenu of the Object menu.**
The object is ungrouped and each object is selected.

Printing 4D Chart Documents

You can print any 4D Chart document. This section discusses printing 4D Chart documents in the following ways:

- As a single 4D Chart document
- As part of a 4th Dimension form
- As a part of a print merge, in which you print a 4D Chart document for each record in a selection of records.

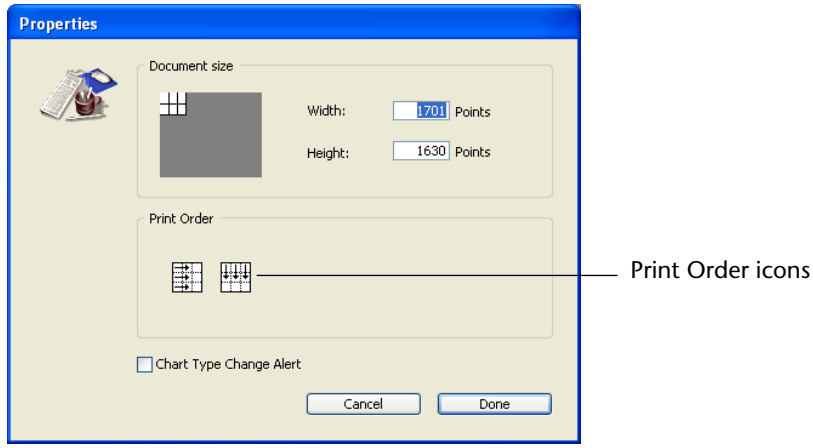
Setting the Print Order

The order in which a multi-page document is printed (either horizontally or vertically) is determined by the print order selected in the Properties dialog box. You can select printing by row , or printing by column . The print order affects only the order in which the document prints; it does not affect the page orientation. The default is to print pages by row.

► To set the order in which a multi-page document is printed:

1 **Choose Properties from the 4D Chart Edit menu.**

The Properties dialog box appears:



2 **Click the desired Print Order icon.**

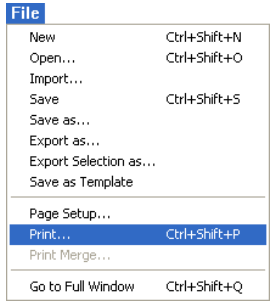
3 **Click OK.**

Printing the Document

You can print 4D Chart documents from a plug-in window or from a 4D Chart area in a form. If the document is more than one page in length, you can select the pages you want to print.

► To print a document:

1 **Choose Print from the 4D Chart File menu.**



The Print dialog box appears.

2 **Select options as necessary.**

3 **Click the Print button to begin printing.**

Printing a 4D Chart Area as Part of a Form

If a 4D Chart area is on a 4th Dimension form, you can print it with the record. In this case, you print from 4th Dimension, rather than from 4D Chart.

Before printing, be sure to select the records you want to print. For more information about selecting records in 4th Dimension, see Chapter 4, "Selecting Records," on page 81.

► To print a 4D Chart document as part of a record:

1. **Choose Print from the 4th Dimension File menu.**
   A dialog box appears so that you can choose the print form.
2. **Choose the print form.**
3. **Click OK.**
   The Page Setup dialog box appears.
4. **Select options from the Page Setup dialog box as necessary.**
5. **Click OK.**
   The Print dialog box appears.
6. **Select options as necessary.**
7. **Click the Print button when you want to begin printing.**
   The selected records are printed, including the 4D Chart documents.

Creating a Print Merge

You can perform a print merge of a 4D Chart document. Performing a print merge allows you to print a 4D Chart document for each record in a selection of records.

Note The values in any graphs in the document are not updated for each record.

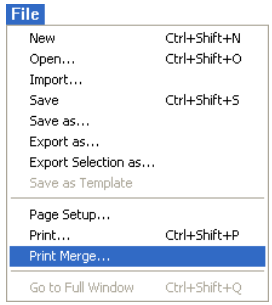
Print merges are most useful when performed from 4D Chart plug-in windows.

You can only perform print merges for documents that contain references to 4th Dimension fields. The value in a field reference is determined by the current record being printed. The advantage to performing a print merge is that you can print a document for an entire selection of records without having to load and print for each record separately.

Note For information on adding field references, see the "Inserting Field References" section on page 299.

► To perform a print merge:

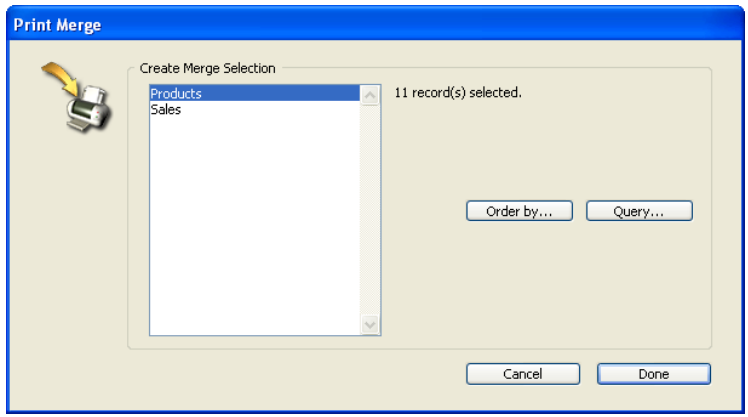
1 **Choose Print Merge from the 4D Chart File menu.**



The Create Merge Selection dialog box appears.

2 **Choose the table whose records should be included in the print merge.**

The dialog box displays the number of records currently selected for that table.



4D Chart will only print the document for the selected records.

3 **If you want to change the selection of records, click the Query button.**

The 4th Dimension Query editor appears. After you perform the query in the Query editor, you will return to the Create Merge Selection dialog box. For more information about the 4th Dimension Query editor, see the "Query Editor" section on page 90.

4 **If you want the selected records to be sorted, click the Order by button.**

The 4th Dimension Order By editor appears. After you sort the records, you will return to the Create Merge Selection dialog box. For more information about the Order By editor, see "The Order By Editor" section on page 125.

When you have selected the appropriate records, you can print them.

5 **Click OK in the Create Merge Selection dialog box.**

The Print dialog box appears.

6 **Select the appropriate options and click OK.**

4D Chart prints the document for each record in the selection.