10 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:

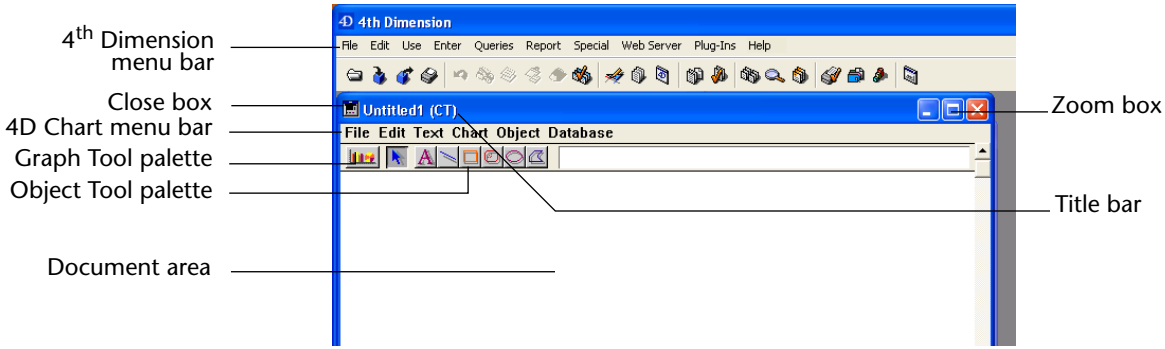
- Using 4D Chart in a plug-in window
- Using 4D Chart in a 4th Dimension form

- 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.

Opening 4D Chart in a Plug-in Window

The 4D Chart command appears automatically as an item in the **Plug-ins** menu. If you have installed additional plug-ins that can be accessed in their own windows, they appear in the same menu.

▶ To open 4D Chart in its own window:

1 **In the User environment, choose 4D Chart from the Plug-ins menu.**

A new 4D Chart document opens in its own window.

You can open additional 4D Chart windows by choosing 4D Chart again from the **Plug-ins** 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 in the appropriate window.

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

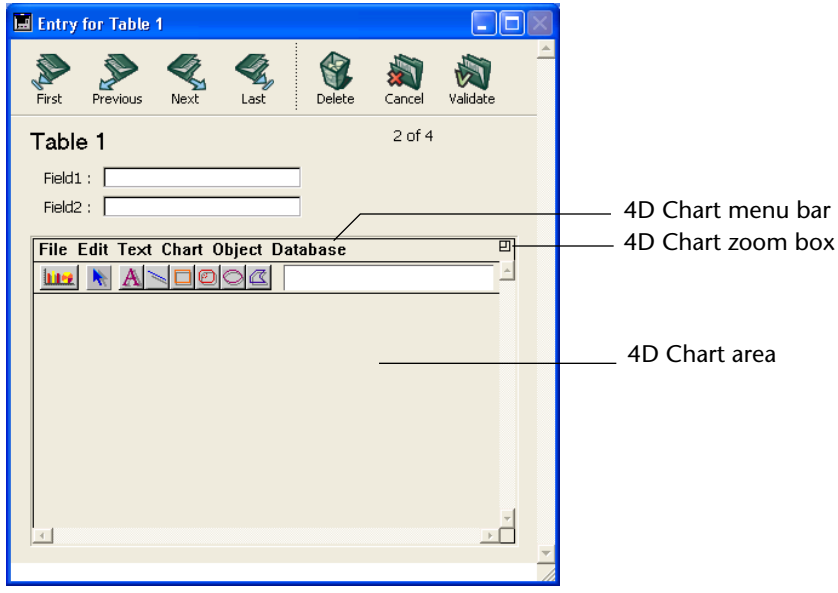
When you save a document, its title bar displays the document name, plus the suffix "(CT)", which distinguishes 4D Chart documents from documents created by other plug-ins.

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 on an input form and save a chart with each record in the table.

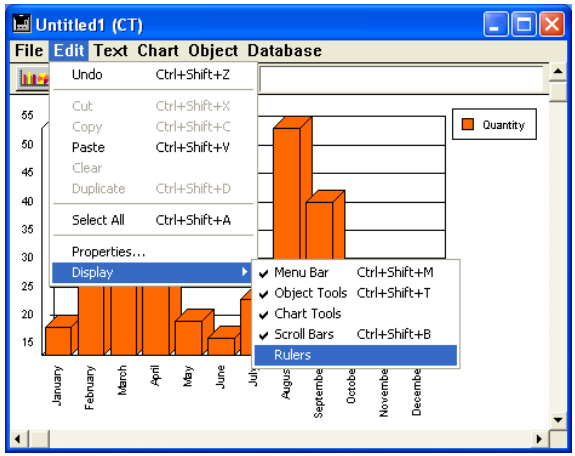
For more information about inserting a plug-in area into a form, refer to the *4th Dimension Design Reference* manual.

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.



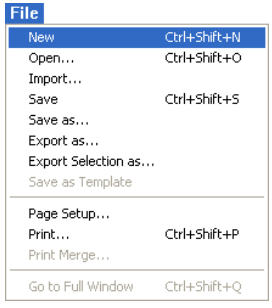
Note If you have hidden the 4D Chart menu bar, you can display it by pressing **Ctrl-Shift-M** on Windows or **Command-Shift-M** on Macintosh.

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.



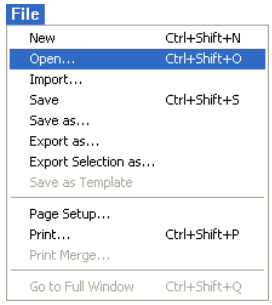
An empty document appears in which you can create a new graph.

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 chart. This point is covered in the paragraph "Importing a PICT document in a 4D Chart window," page 219.

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

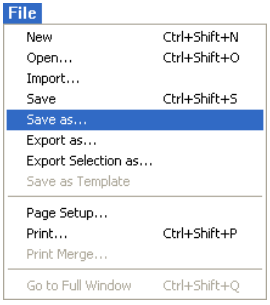
You can also save a selection of objects, for instance a graph, as a PICT document (Macintosh format). In this case, the document saved is a picture that can no longer be modified. This point is covered in the paragraph "Exporting a 4D Chart document in PICT form," page 220.

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.

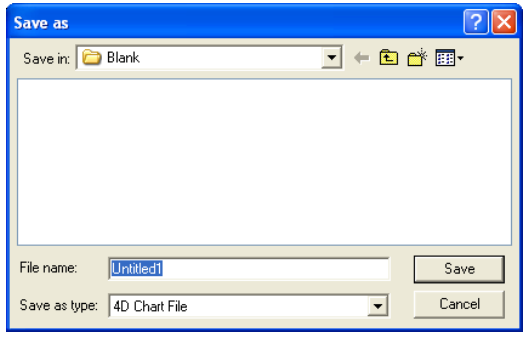
If you save a 4D Chart document as a file, when you reload the file, the document appears exactly as it was when you saved it. To update the information in any graphs in the document, you must use the **Update** menu item in the **Chart** menu, which is described in more detail in the section "Updating the Data in a Graph from the Database" on page 241.



► 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 on 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 chart 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 section "Updating the Data in a Graph from the Database" on page 241.

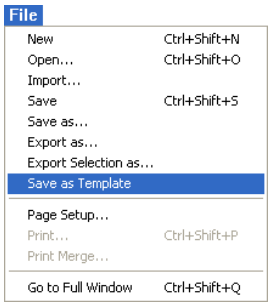
Saving a 4D Chart Document as a Template

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 create templates for 4D Chart only 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 are 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.

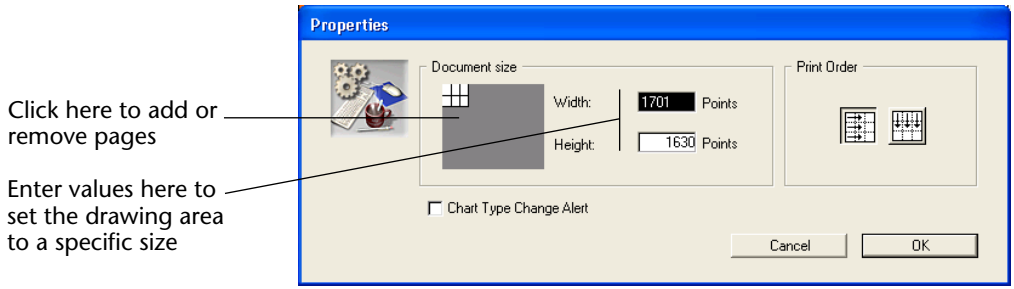
Setting the Document Size

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 Properties dialog box appears. The default document size is one page.



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.

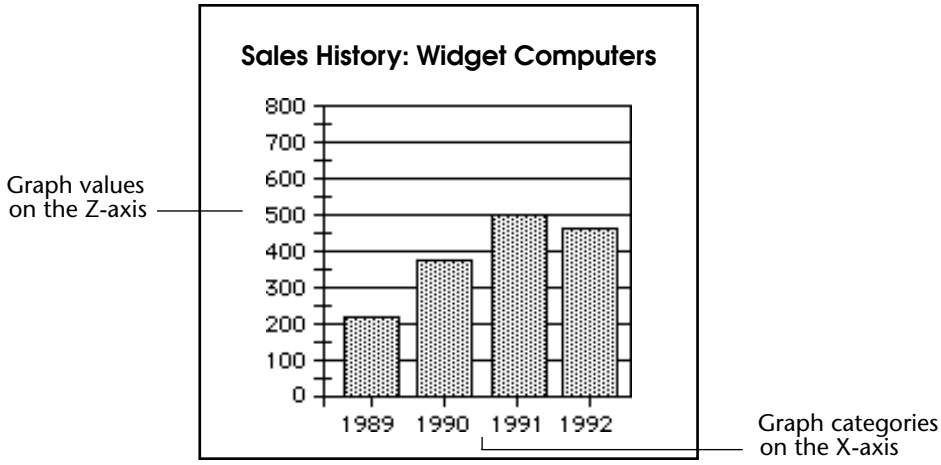
Don't be afraid to experiment with different graph types. Once you have created a graph, you can easily convert it to another graph type. Creating graphs and changing their types are discussed in section "Creating a Graph" on page 234.

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:

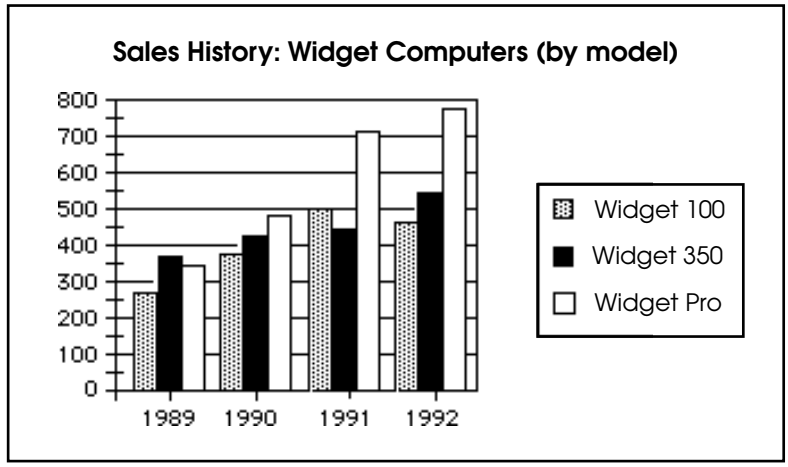


The X-axis is also called the *Category axis*. The X-axis displays the categories into which the information is divided. For instance, if you are graphing the number of computers sold per year, you would place the years on the X-axis.

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 break 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.

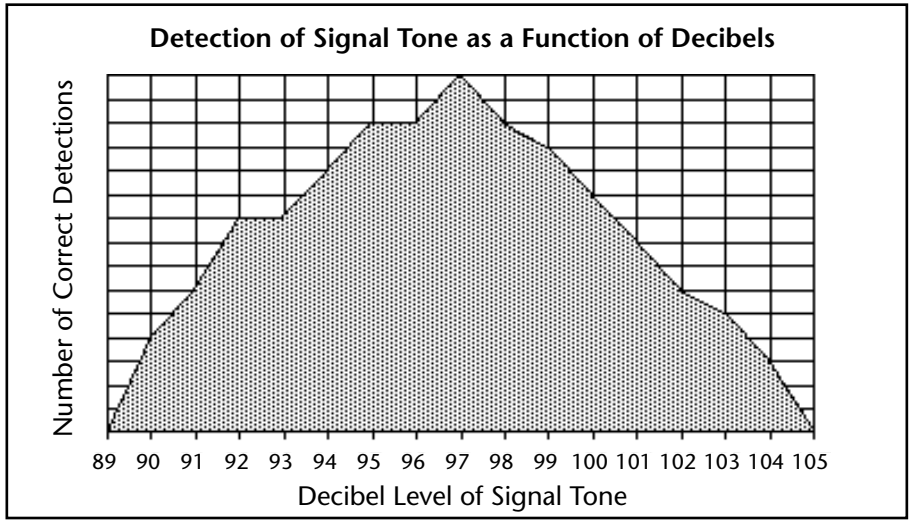
However, suppose you want to compare the sales volumes from 1989 to 1992 for three models of computers. In this case, each computer model becomes a distinct series on the graph. All series share the same categories (in this case, the years 1989 through 1992), but have their own values.



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 section "Choosing a Three-dimensional Graph Type" on page 229.

Area Graphs

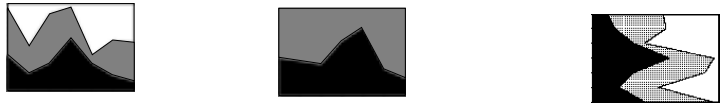
Area graphs are commonly used to show the magnitude of values over time, but can show values over any continuous category.



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.

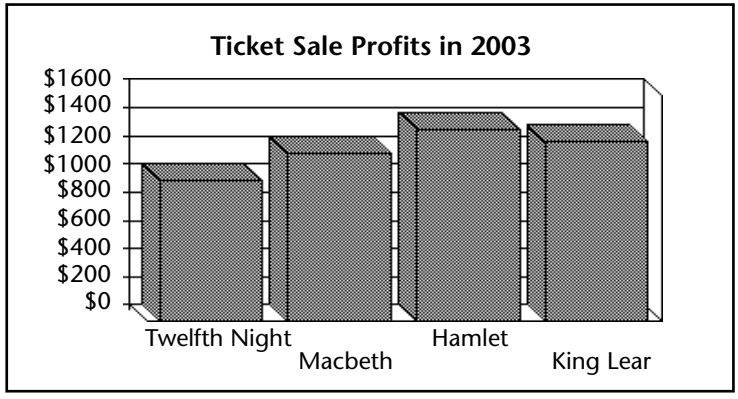


Stacked | Stacked, proportional | Horizontal

Column Graphs

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

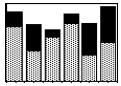
The following column graph uses the Depth feature, which makes each column look three-dimensional.



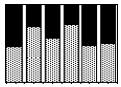
Note The Depth feature is discussed in more detail in the section "Modifying Depth in a Two-dimensional Graph" on page 264.

Options

The following options are available for Column graphs:



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

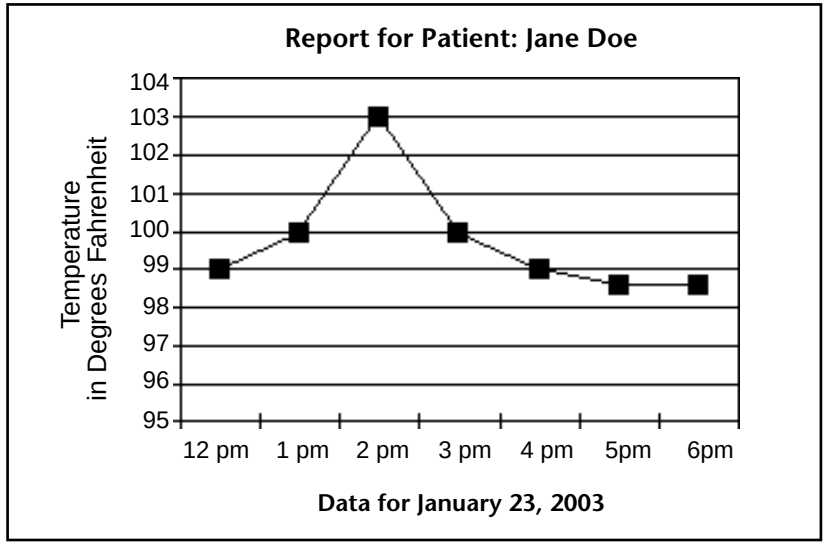


- **Stacked, proportional** When graphing multiple, stacked series, show the series as proportions of a 100% whole.

- **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.

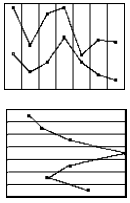
Line and/or Scatter Graphs

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:

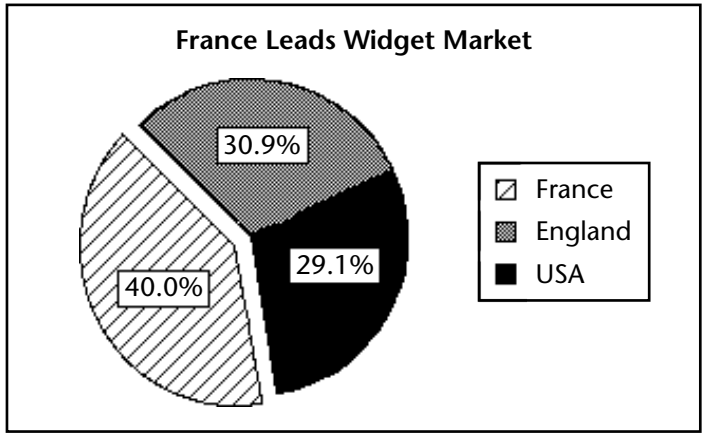


- **Stacked** When graphing multiple series, stack the lines for the series in each category.
- **Horizontal** Make the X-axis the vertical axis and the Z-axis the horizontal axis.
- **Displaying lines and/or points**
  You can:
  - **Show Points** Each value appears as a dot in the graph.
  - **Show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

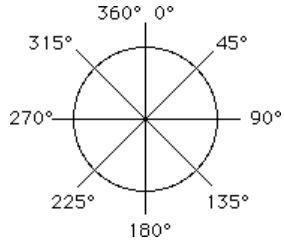
Each pie chart can have only one series. Categories are displayed in the legend.



Options

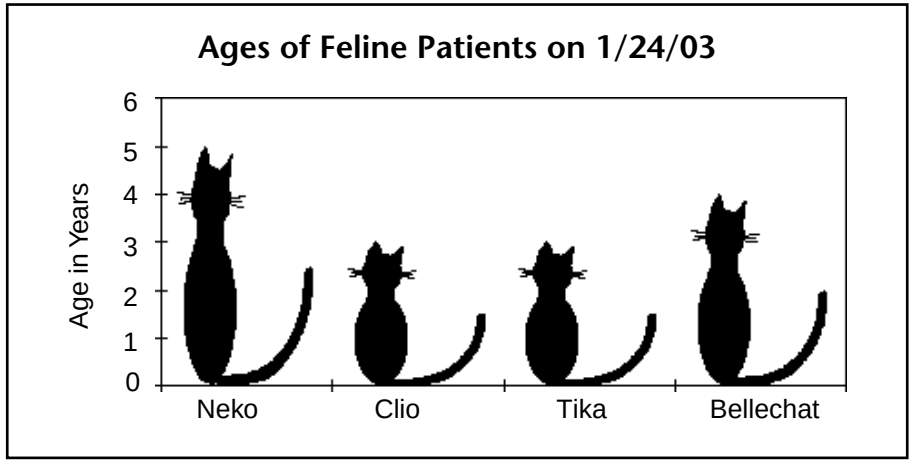
The following option is available for pie charts:

- **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.



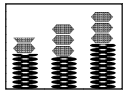
Picture Graphs

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

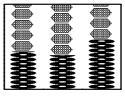


Options

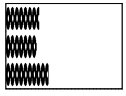
The following options are available for Picture graphs in 4D Chart:



- **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 section "Adding Pictures to a Picture Chart" on page 273.

2D XY Graphs (Scatterplots

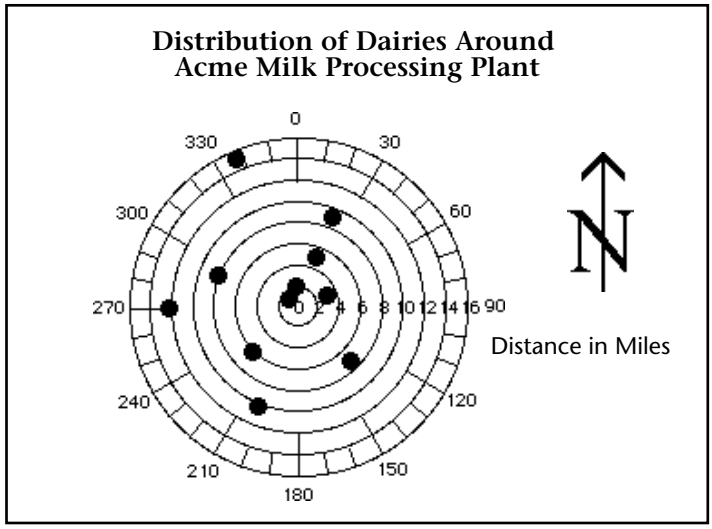
Each data point in a scatterplot represents a pair of values. The X-axis is also a value axis.

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 shapes** 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 to view 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** (MacOS), 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.

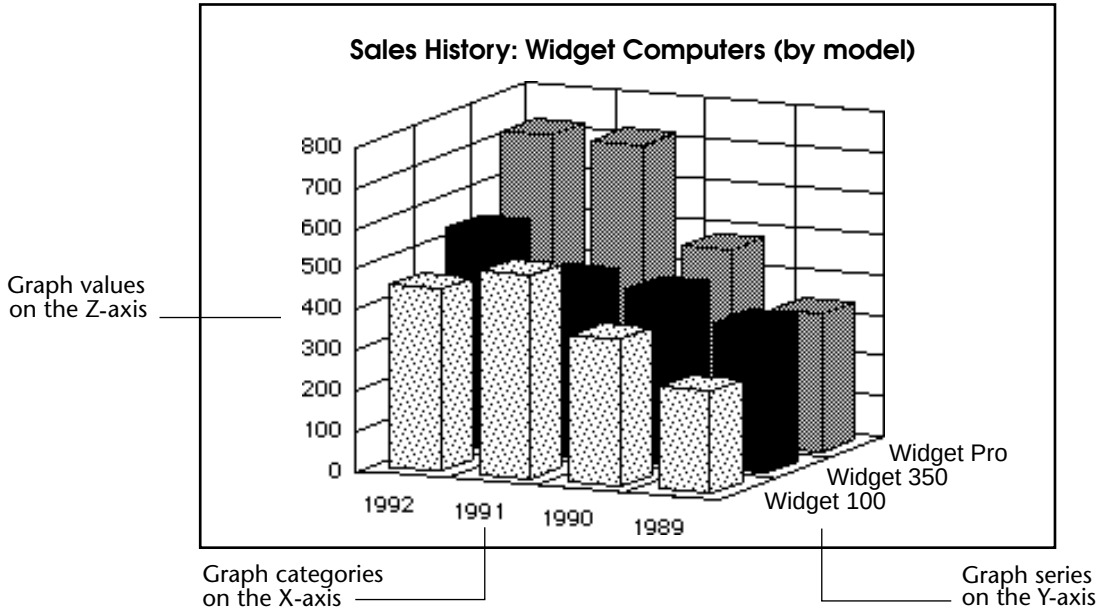
Each data point on a polar chart is plotted using one Z-axis field to specify the angle in degrees and a second Z-axis field to specify the distance from the center.



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 break 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.

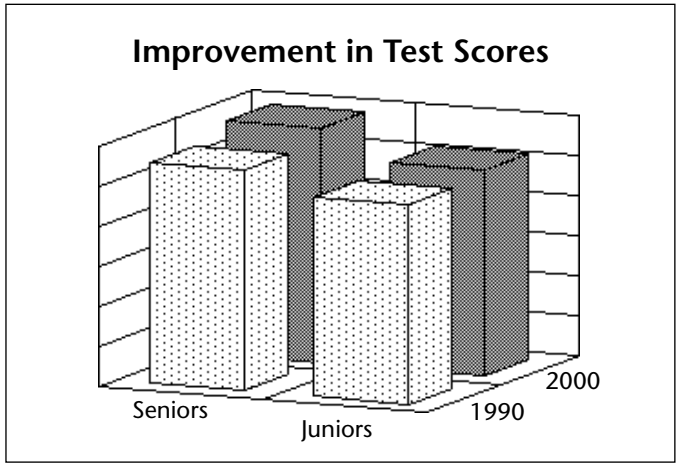
In a two-dimensional graph, the series remain on the X-axis. The columns representing each series are distinguished by their patterns. In a three-dimensional graph, the series are displayed on their own axis. Each series still has its own pattern, but now the series are also separated from each other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

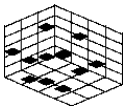
3D Column Graphs

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



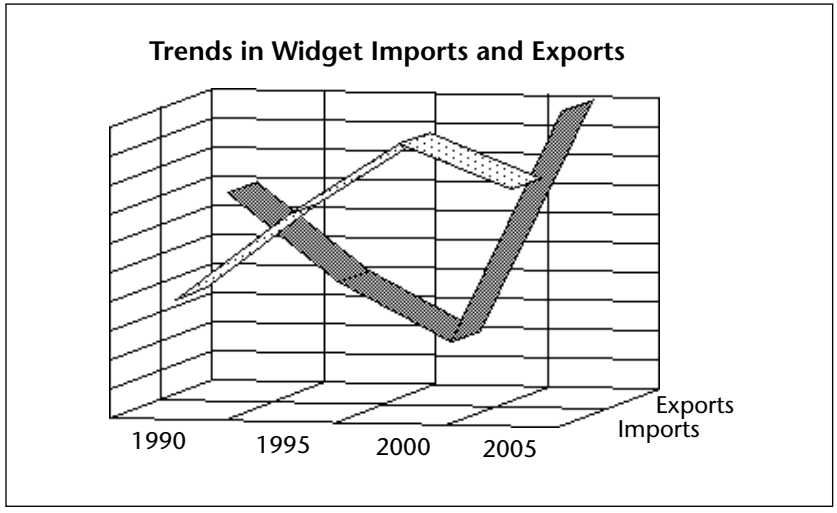
Options
The following options are available for 3D Column graphs:

- **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.

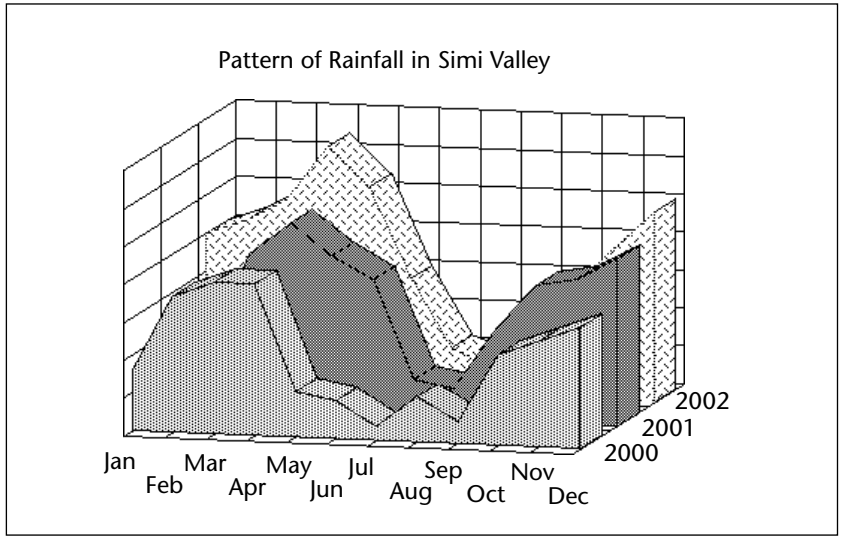


Option
The following option is available for 3D Line graphs:

- **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

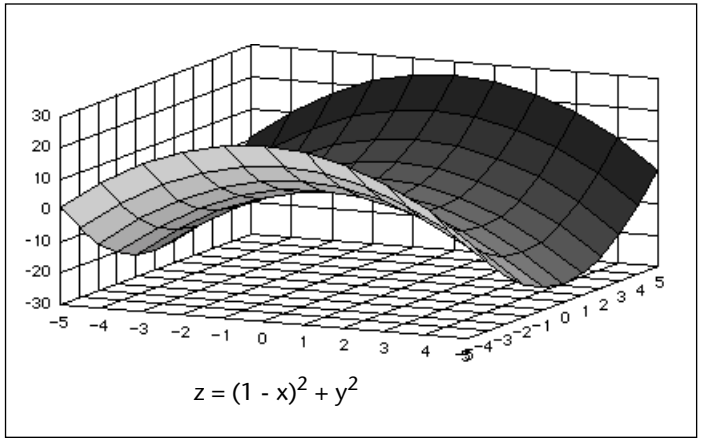
The following option is available for 3D Area graphs:

- **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.

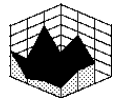
The following graph was created using a mathematical formula.



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

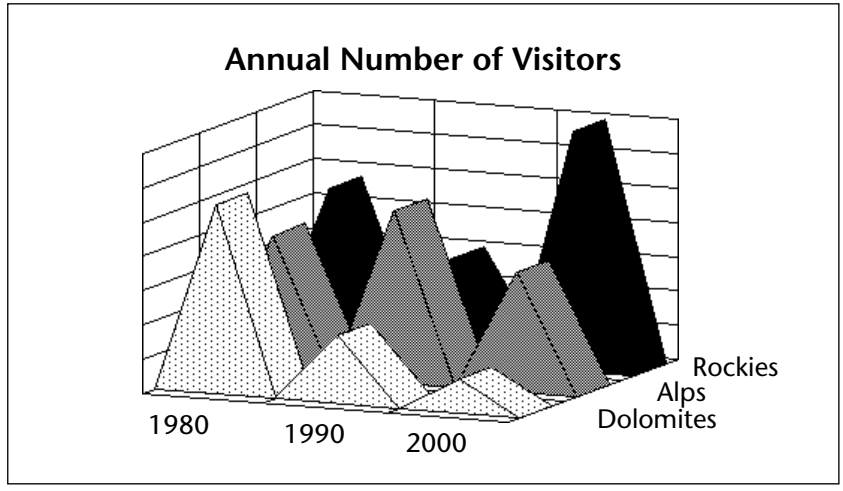
- **Tops only** Show only the top side of the surface, not the sides. This option is used in the previous example graph.

Here is an example of a surface graph with sides.

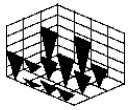


3D Triangle Graphs

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.



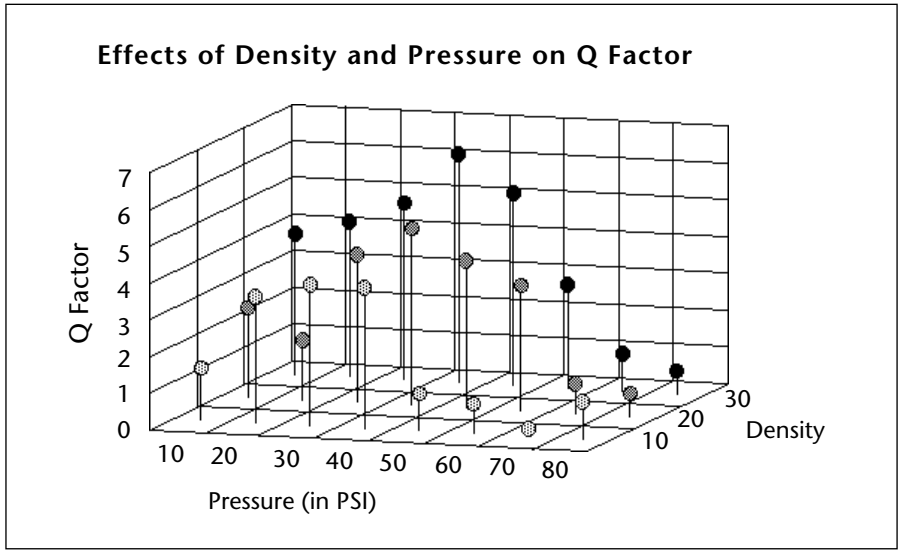
Options
The following options are available for 3D Triangle graphs:



- **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.

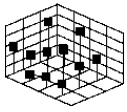
3D Spike Graphs

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 axes.

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*.

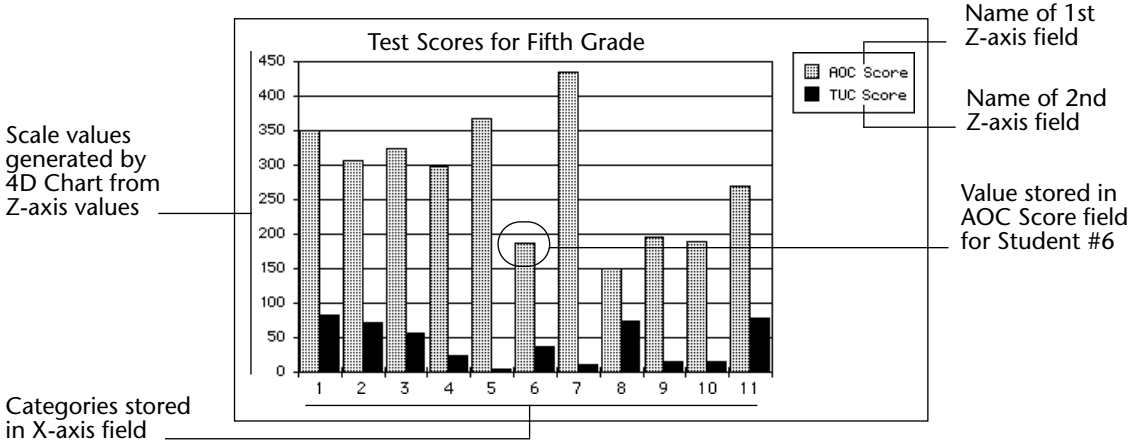
For more information about adding a 4D Chart area to a form, see the *4th Dimension Design Reference*.

Creating a Graph From Data in the Database

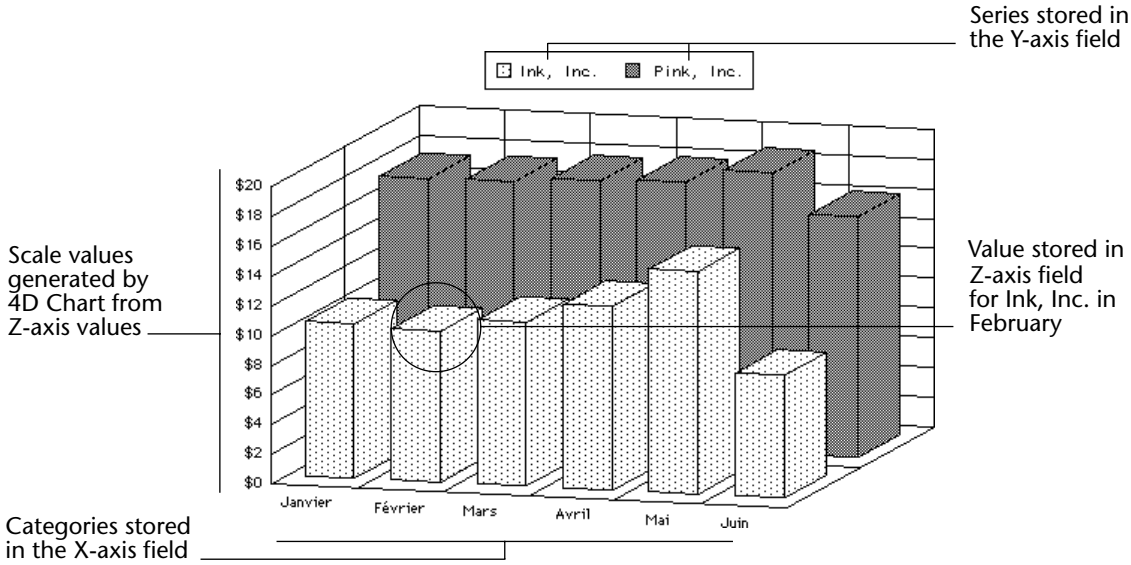
For a two-dimensional graph, you specify a field for the horizontal axis (X-axis) and one or more fields or formulas for the vertical axis (referred to in 4D Chart as the Z-axis).

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.

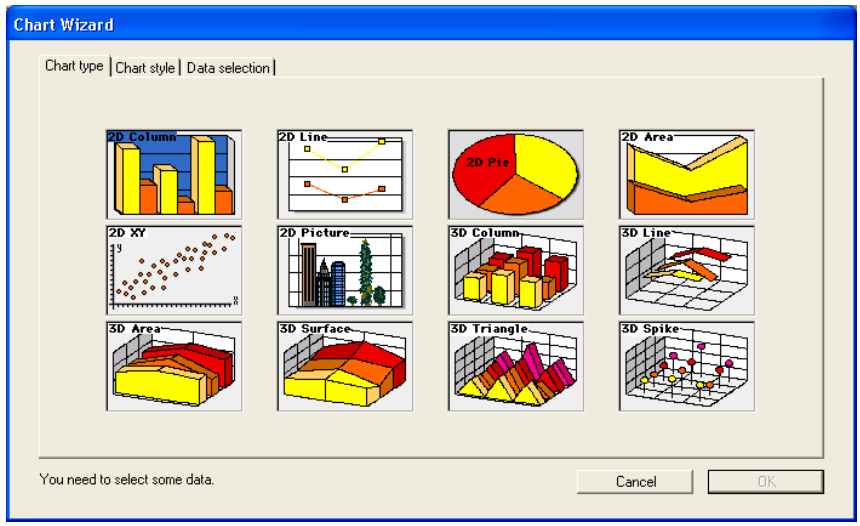


► To create a graph from data stored in the database:

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 **Click the Graph icon in the Chart Tool palette.**
OR
Choose New Chart from the Chart menu.

The Chart Wizard appears.



The Chart Wizard has three pages:

- **Chart Type** displays the 12 chart types supported by 4D Chart and lets you choose a graph type.
- **Chart Style** displays the variations on the type of graph that you selected in the Chart Type page. The Chart Style page 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. You do not need to choose a chart style.

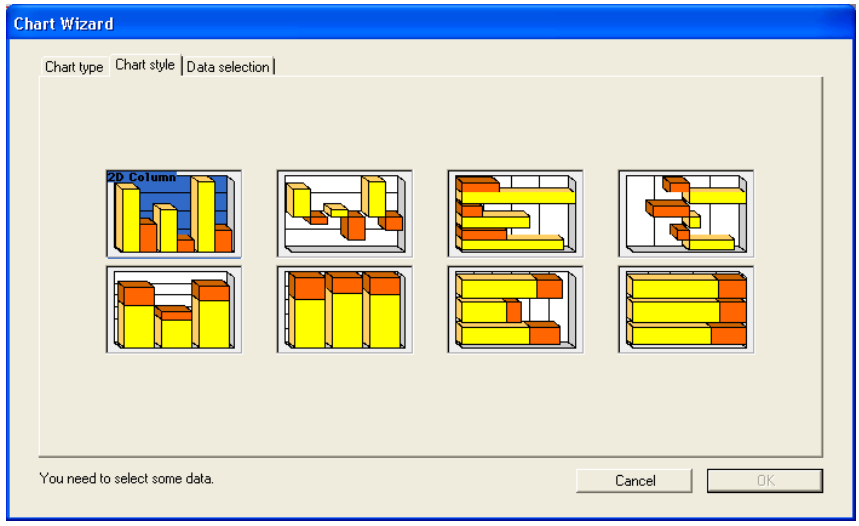
Note If you are creating a graph in a 4D Chart area in an input form, the current table is not listed in the Tables list because you cannot graph data from the current table.

3 Click a chart type.

When you click on a chart type, the Chart Style and Data Selection pages change to match the requirements of the selected type. For complete information on the types of charts available in 4D Chart, see "Choosing a Graph Type" on page 221.

4 **Click the Chart Style tab (Optional).**

The styles for the selected chart type appear. The following illustration shows the styles available for the 2D Column chart type.



5 **Click the desired chart style.**

6 **Click the Data Selection tab.**

The Data Selection page appears, displaying the appropriate options for the selected chart type.

2D graph

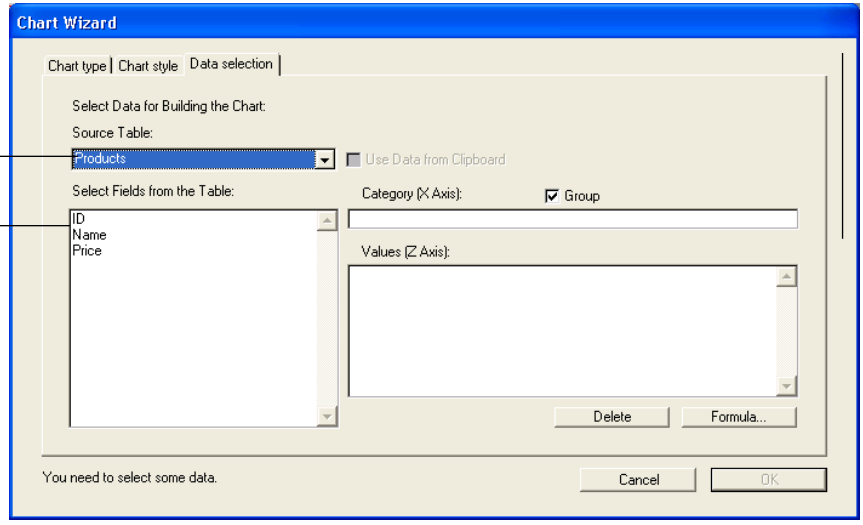
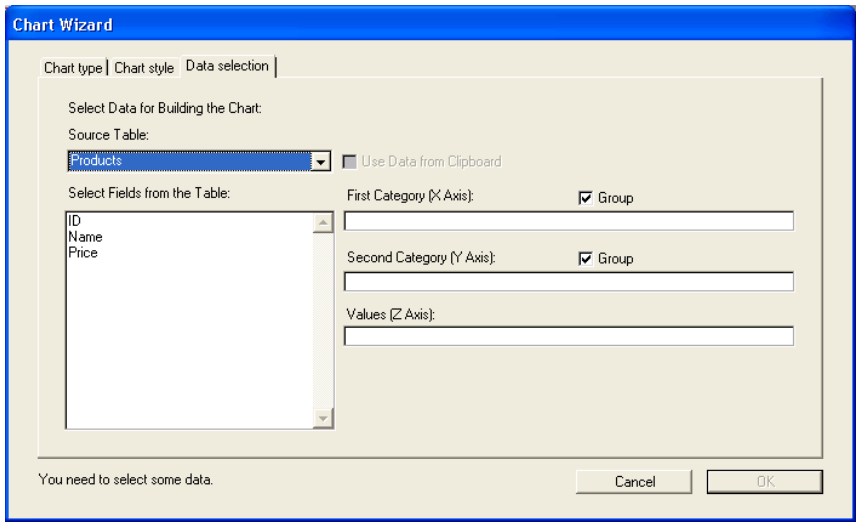


Table drop-down list

Fields list

3D graph



7 Choose the desired table from the Table drop-down list.

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

8 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 to field to 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 10.

9 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.

10 **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).
The name of the field or the formula appears in the Z-axis (Values) box. For instructions on creating a formula, see the section "Adding a Formula" on page 246.

11 **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 section "Grouping Non-unique Categories and Series" on page 245.

12 **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 section "Grouping Non-unique Categories and Series" on page 245.

13 **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

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 section "Choosing a Graph Type" on page 221.

- 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.

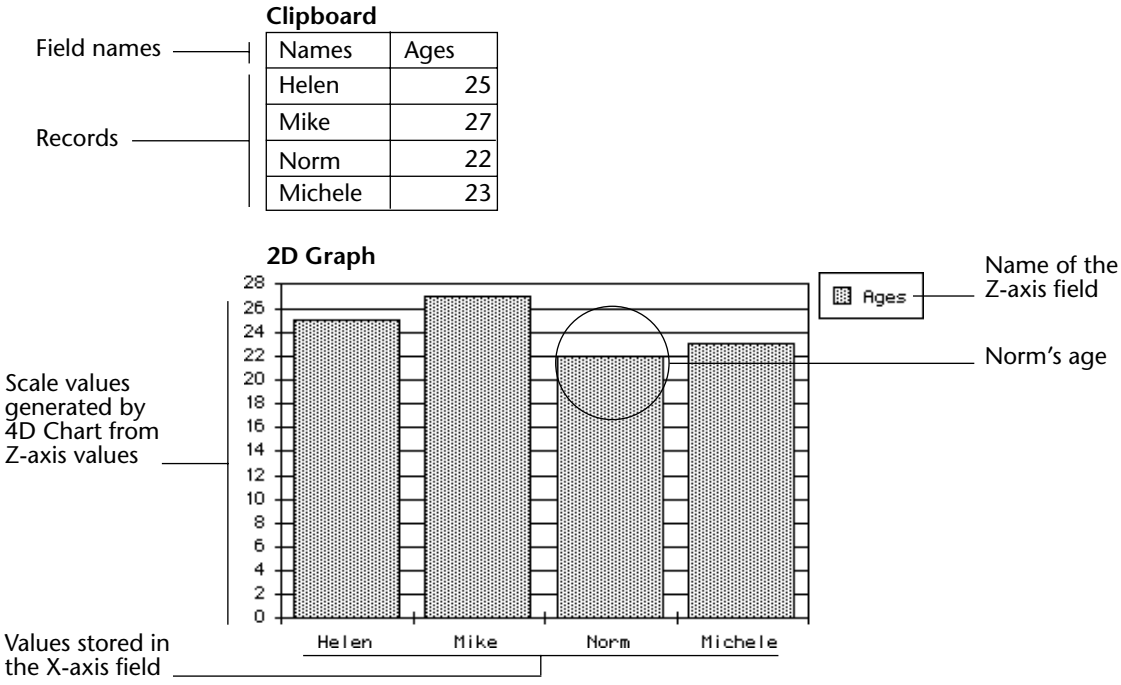
The first row of data is used as the field names. Each column contains the data for one field.

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.

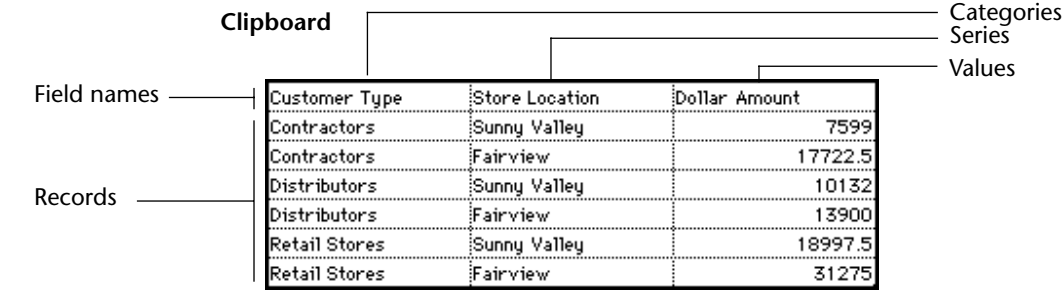
When you have prepared the data in your application, select the desired rows and columns and copy them to the Clipboard.

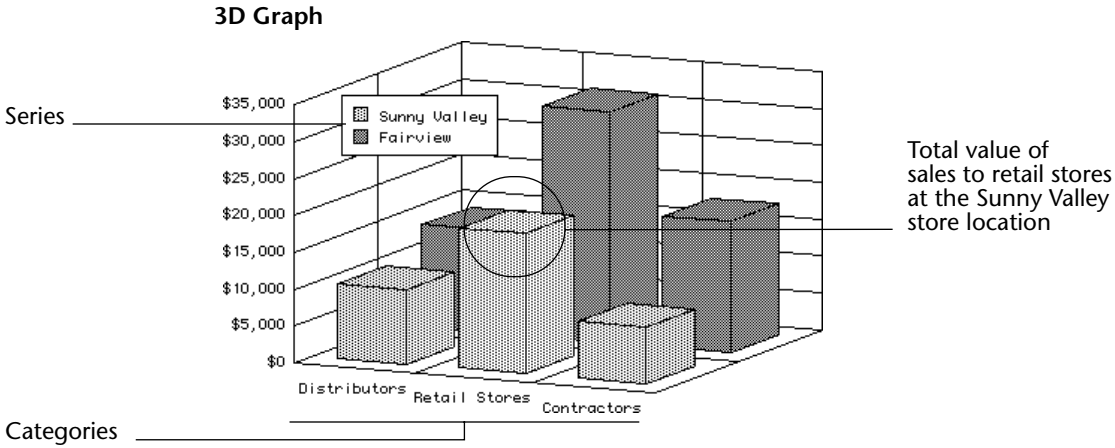
Creating the Graph from Data on the Clipboard

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.



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.



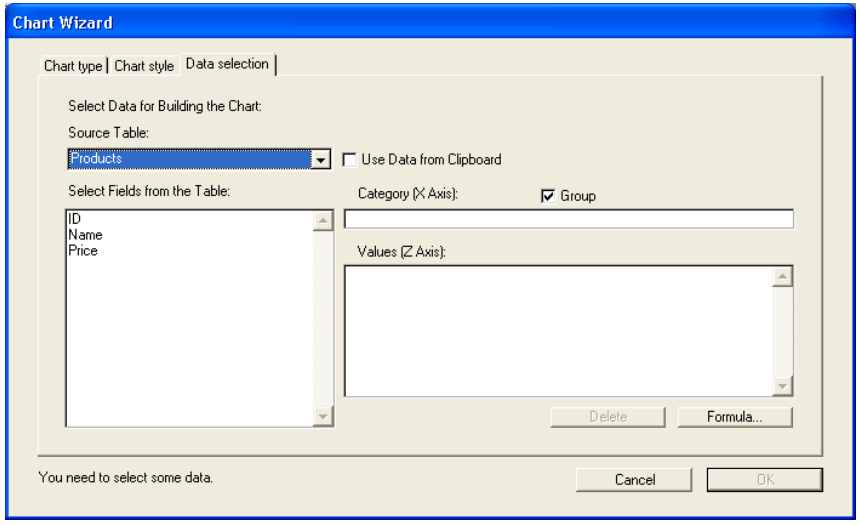


► To create a graph from data stored on the Clipboard:

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

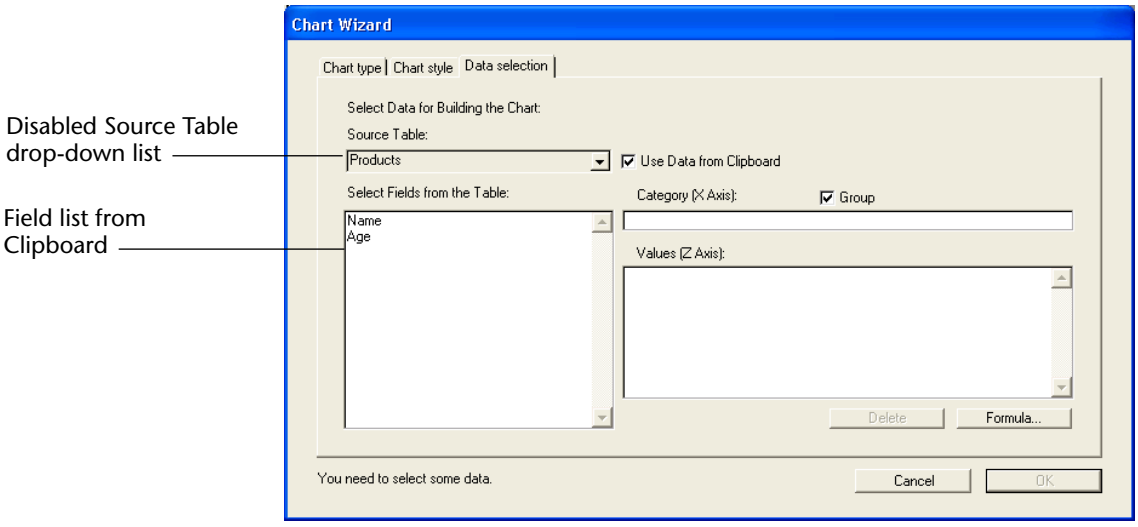
2 **Follow the instructions provided in steps 1 to 6 in the section** **"Creating a Graph From Data in the Database" on page 236.**

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, as shown below.



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 becomes 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 section "Grouping Non-unique Categories and Series" on page 245.

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

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

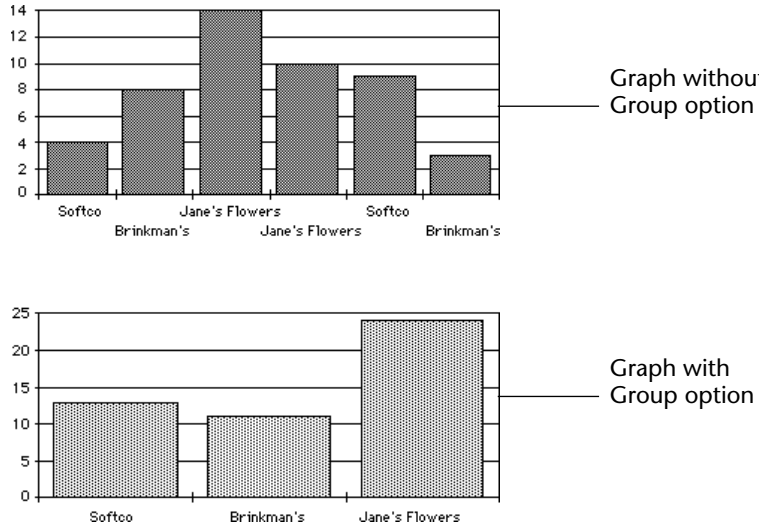
Grouping Non-unique Categories and Series

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:



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 valid 4th Dimension method 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 section "The Formula Editor" on page 113. 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

3 **Click OK.**

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

Changing the Graph Type

You can switch between graph 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 graph types to find the best way to present your data.

▶ To change the graph 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 **Choose another graph type from the Graph drop-down list in the Chart Tool palette.**
OR
Choose the Chart Type item in the Chart menu.
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 graph type. Both the Graph 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 graph type. For information on the graph types available in 4D Chart, see the section "Choosing a Graph Type" on page 221.

Setting the Graph 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 graph type is selected:

1 **Choose Properties from the 4D Chart Edit menu.**
The Properties dialog box appears.

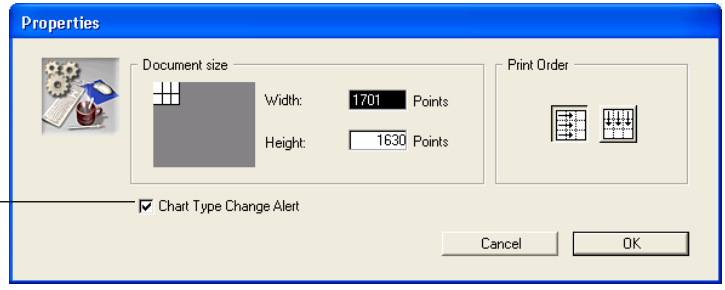


Chart type change alert check box

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 Graph Type

Each graph type has a particular set of options that you can change using the Options dialog box. By changing the graph 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 graph type, see section "Choosing a Graph Type" on page 221.

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 chart
- Change the graphic attributes of chart objects
- "Explode" a wedge from a pie chart
- Add a picture to a picture chart

Resizing a Graph

You can resize a graph by dragging its selection handles. Selection handles are the black squares that appear around the object when it is selected.

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

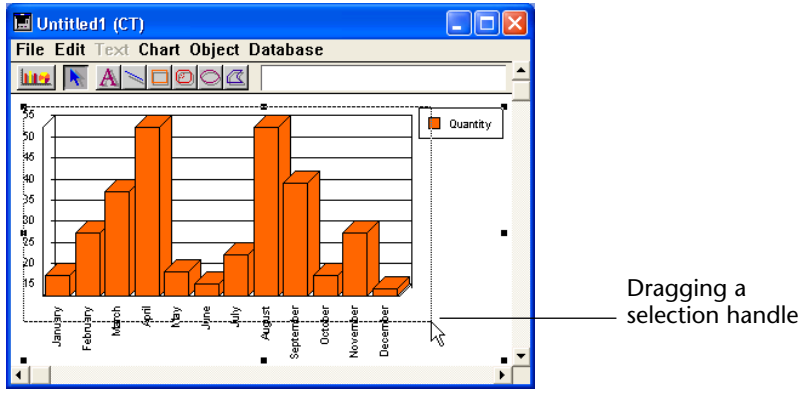
► To resize a graph:

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:

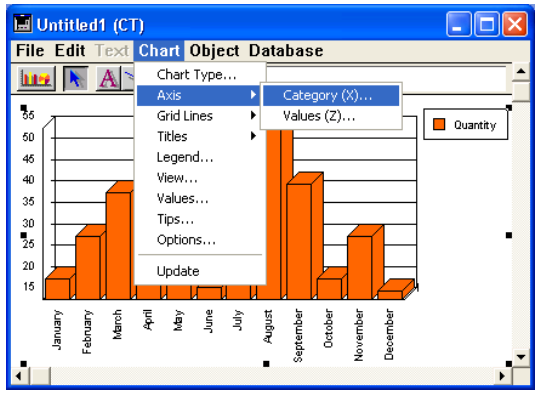
- Customizing the axis labels
- Customizing the tick marks
- Changing the scale of the Values axis
- Reversing the order of data points on an axis
- Positioning the origin
- Adding axis titles

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

Number of Axes	Axis Name	Axis
Three (3D Graph)	Category	X
	Series	Y
	Values	Z

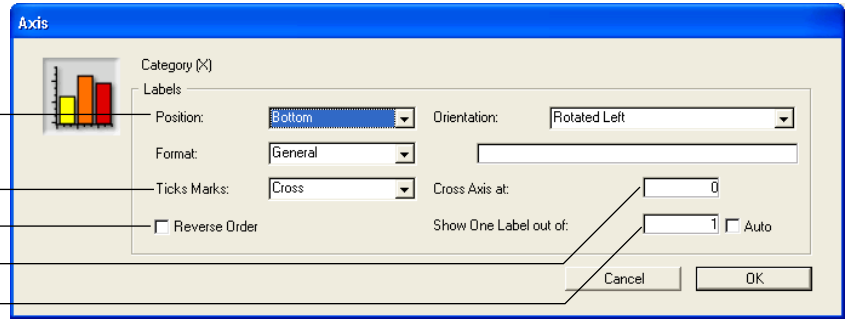
You can display the Axis dialog box for any axis by choosing the appropriate axis from the **Axis** submenu of the **Chart** menu.



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.

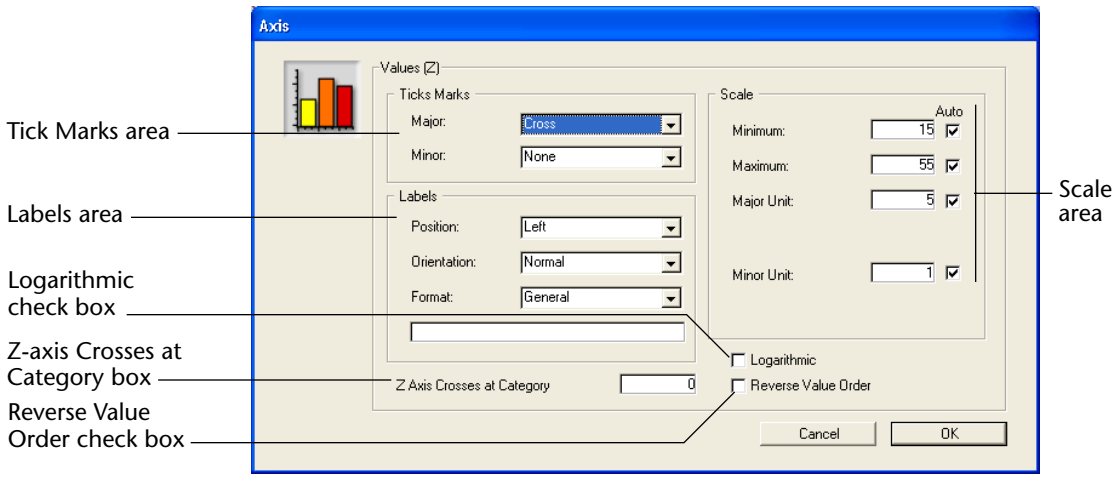
This section presents the dialog boxes that you use to customize the axes of your graph. It then provides details about each of the options.

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	L a b e l	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 (—ı—)
- Outside (—ı)

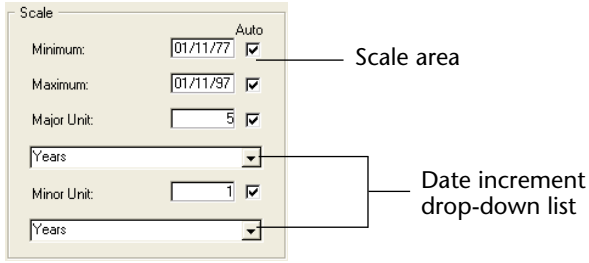
Changing the Values Axis Scale

You can change the minimum and maximum values shown on the Values axis. You can also change the major and minor units of the axis.

If dates are being graphed, you can specify whether the major and minor units are measured in days, weeks, months, or years.

In addition, you can specify that the graph use the default value for any of these items. To use the default value, simply check the check box located to the left of the desired option.

In the following graphic, the default minimum and maximum values and the user-specified major and minor units are used.



- **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. You can reverse the order of data only 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" text box.**
   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 Cross at Category" text box.**
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 chart). 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.

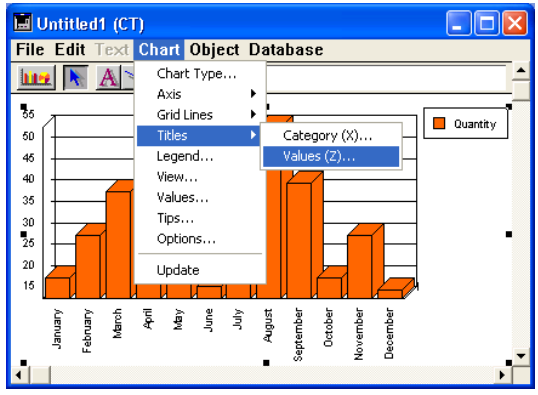
3 **Click OK to close the dialog box.**

Adding Axis Titles

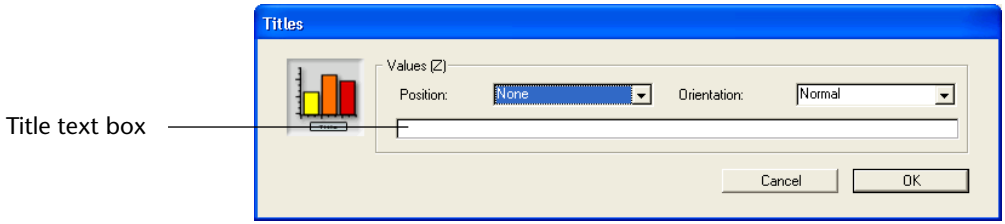
You can add a title for each axis. Usually, the titles describe the data graphed on the axis.

► 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.**

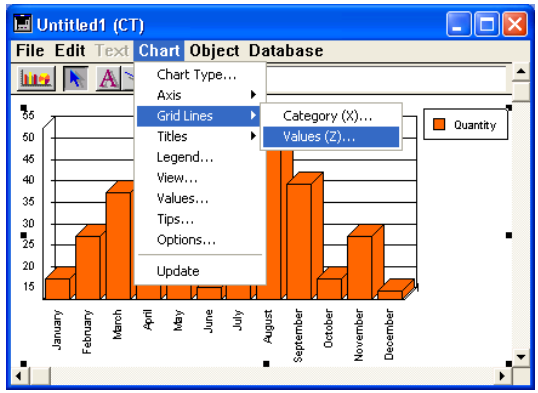
Showing and Hiding Grid Lines

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

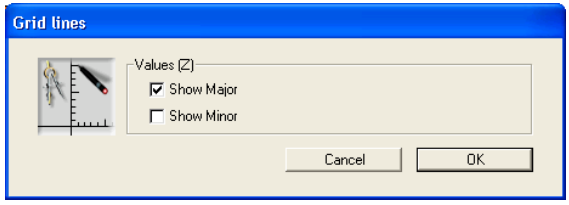
The major and minor increments are set in the Axis dialog box for the Values axis.

► 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.



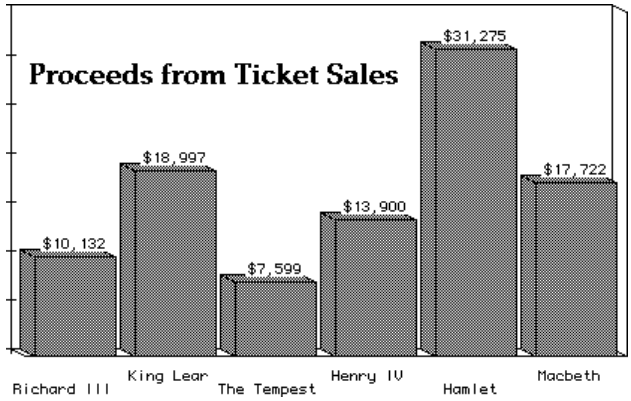
2 **Click the desired check boxes and click OK.**

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.



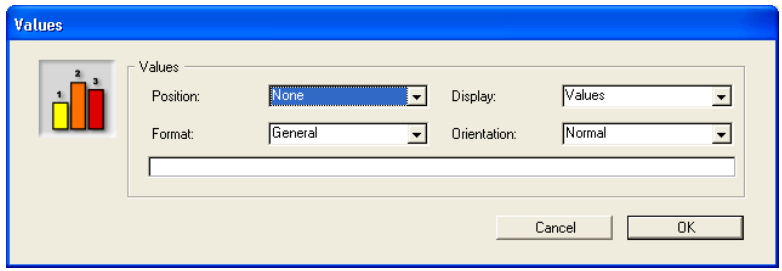
You can select the location at which the values, percentages, or category labels should appear, their orientation, and their format.

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

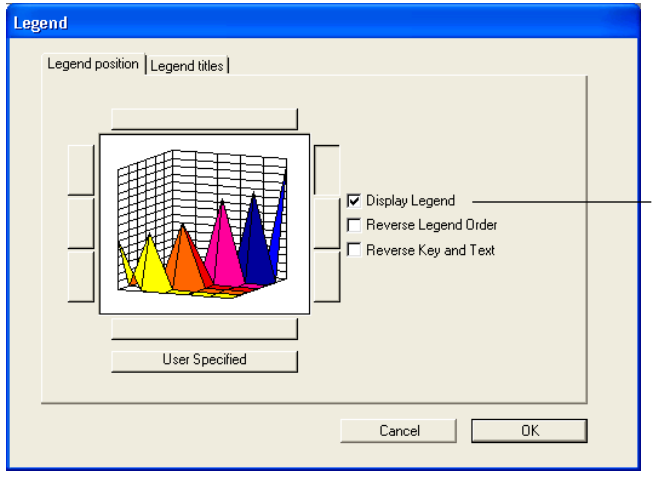
4D Chart automatically creates a legend for you when it generates the graph. By default, the legend is based on value labels. You can customize the legend's location, order, and text.

Displaying and Hiding the Legend

To display or hide the legend for the selected chart:

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 chart 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 chart object.

Positioning the Legend

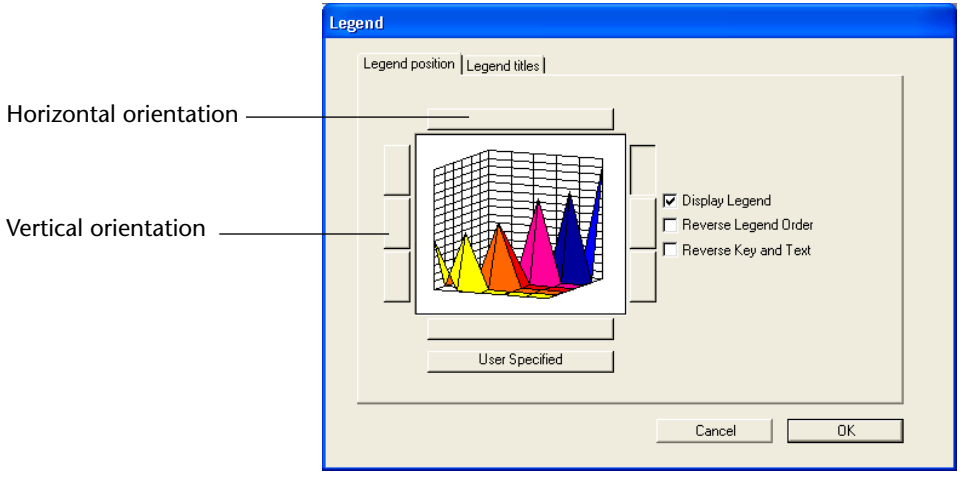
The legend is part of the chart object. You can position the legend using the eight built-in legend locations, or you can move it using the mouse. You can move the legend anywhere in the document, including placing it inside the graph itself.

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.**

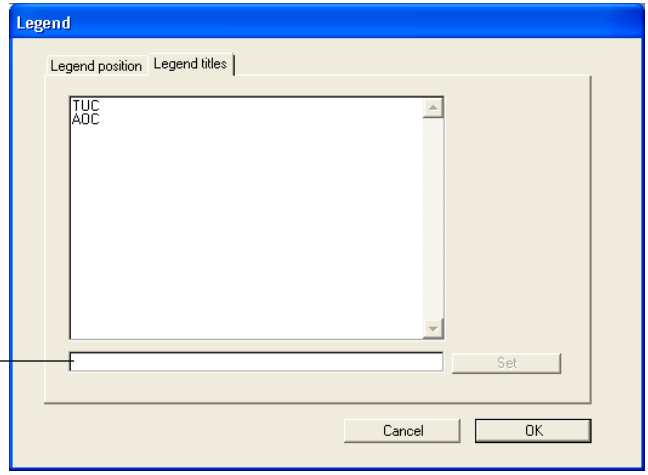
Customizing the Legend Text

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 change to take effect.

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

7 **Click OK.**

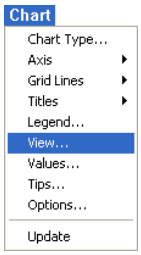
The Edit Legend dialog box closes. If you are displaying the legend, you will see your changes in the legend text.

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.

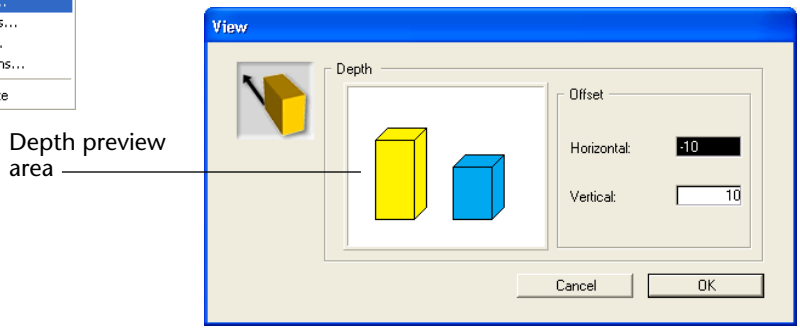
► To modify or remove the depth illusion in a two-dimensional graph:



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.



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 three-dimensional illusion axis.

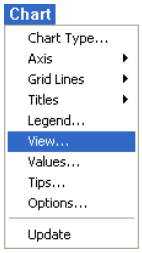
When you press **Tab** or click outside a text box, the value you have entered is reflected in the Depth preview area.

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.

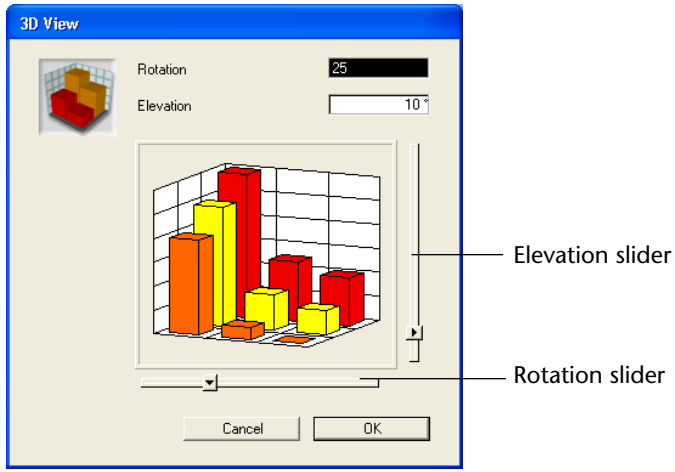


► To change the perspective from which a three-dimensional graph is viewed:

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 change 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.

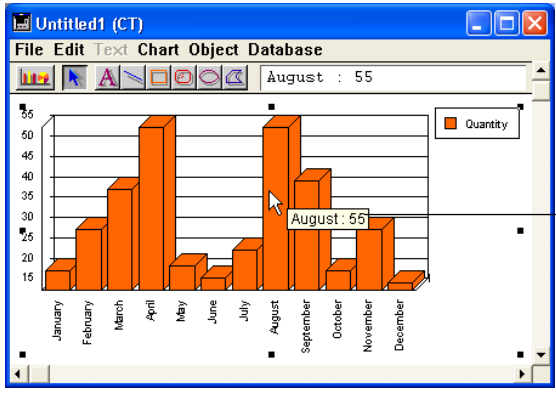
The model graph reflects the change you have made.

4 **Click OK.**

Your graph is redrawn from the new perspective.

Customize Tips in Charts

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:

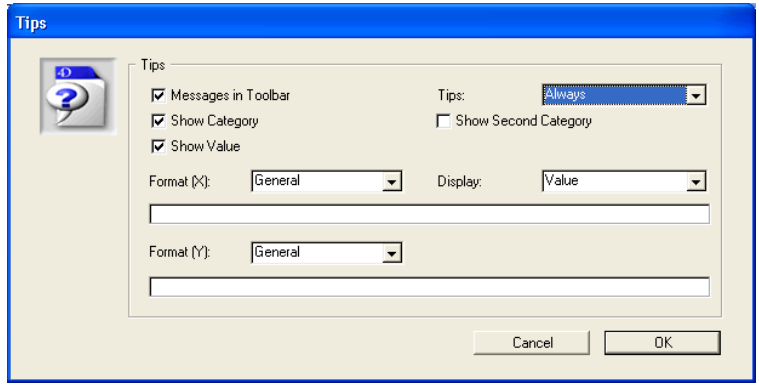
Type of Graph	Tips
2D Column	Values and percentages
2D Line	None
2D Pie	Values and percentages
2D Area	None
2D XY	Values only
2D Picture	Values and percentages
2D Polar	Values only
3D Column	Values only
3D Line	None
3D Area	None
3D Surface	None
3D Triangle	Values only
3D Spike	Values only

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.

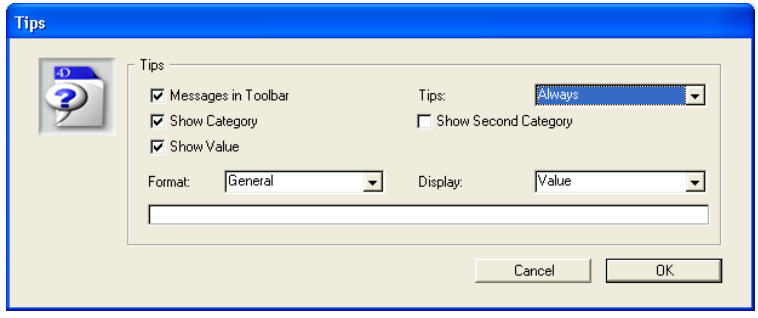
Tip attributes are accessed manually in the Tips dialog box (from the **Tips** item in the **Chart** menu) or programmatically using the commands CT GET TIPS ATTRIBUTES and CT SET TIPS ATTRIBUTES.

The Tips dialog boxes differ for XY and non-XY graphs.

- XY Graph:



- Non-XY Graph:



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**.

Selecting the **Messages in Toolbar** option displays the tips in the toolbar. If this check box is not selected, the tip will be displayed in an independent message box only. The default is to display the tips in the toolbar.

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

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.

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.

Changing the Attributes of Chart Objects

This section describes how to select individual chart 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 chart text objects (such as axis labels and titles).

► To select an individual chart object:

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

  The following chart 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

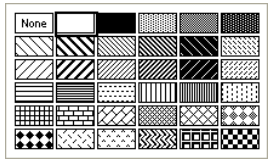
- The legend
- Values displayed for the series.

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:

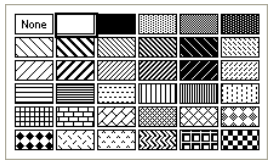
- **Fill Pattern** The pattern displayed inside the border of an object. All objects except lines have fill patterns.



- **Fill Color** The color displayed inside the border of an object.

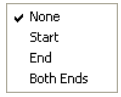
Note The number of colors displayed depends on the number of colors that your monitor supports.

- **Line Pattern** The pattern of a line or border. The default line pattern is solid.



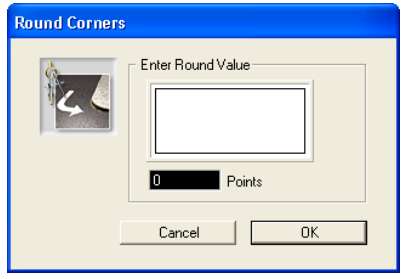
- **Line Color** The color of a line or border. The default line color is black. The color palette used for Fill Color is also used for Line Color.
- **Line Width** The width of a line or border measured in points. The default line width is 0.25 points (also called a hairline).

- **Arrowhead** If the selected object is a line, the **Arrowhead** menu item is enabled. The Arrowhead submenu has the following items.

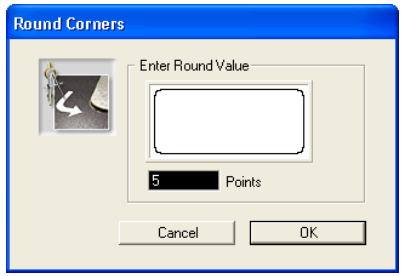


You can choose to add an arrowhead to either or both ends of the line.

- **Round Corners** 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:



Changing Text Attributes

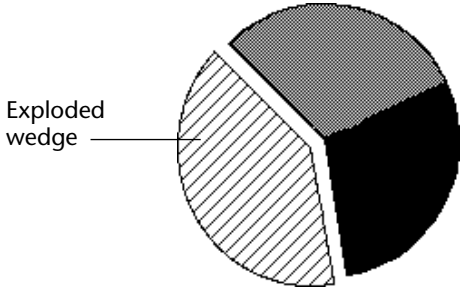
Text attributes apply only to axis labels, axis titles, legend text, and series values. Each of the following text attributes can be changed in the **Text** menu:

- **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 section "Adding Text" on page 278.

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 picture column for the desired series.**

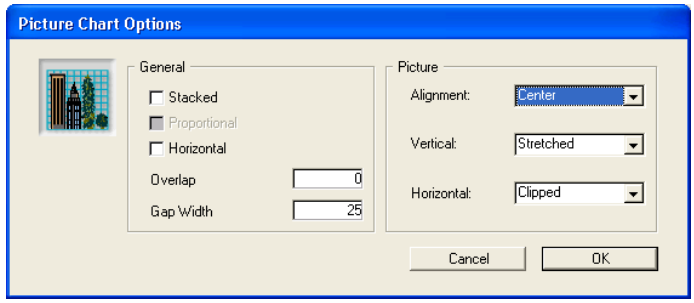
3 **Choose Paste from the 4th Dimension or 4D Chart Edit menu.**
The picture is pasted into each column for the series.

You can repeat this process for each series.

Adjusting the Pictures Within the Columns

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 section "Choosing a Graph Type" on page 221, 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.

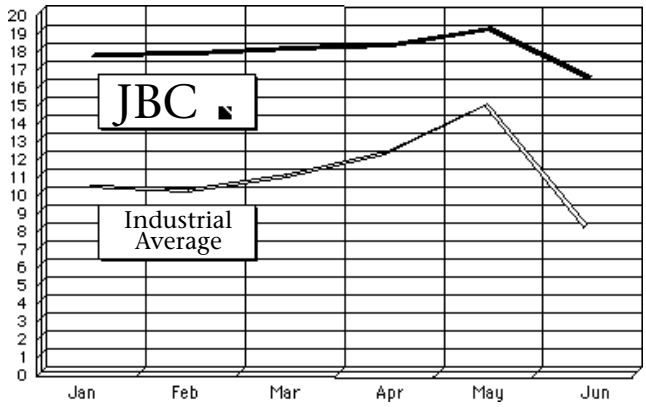
Option	Description
Clipped	If the picture is too tall or too wide to be displayed in its entirety, it is truncated at the edges of the column. The proportions of the picture remain unchanged.
Stretched	The picture is stretched or shrunk so that its dimensions match those of the column.
Stacked	If the 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.

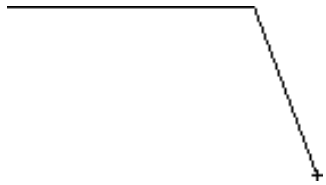
1 Hold down the mouse button in the document area and drag the mouse to draw the object.

2 Release the mouse button to finish drawing the object.

► To draw a polygon:

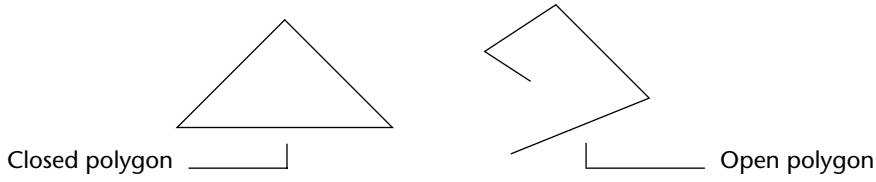
1 Click to anchor the first vertex.

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 (MacOS).
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
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.
- **Round Corners** The amount of rounding of the corner of a rounded rectangle. The default rounding is 1/4 inch.

Adding Text

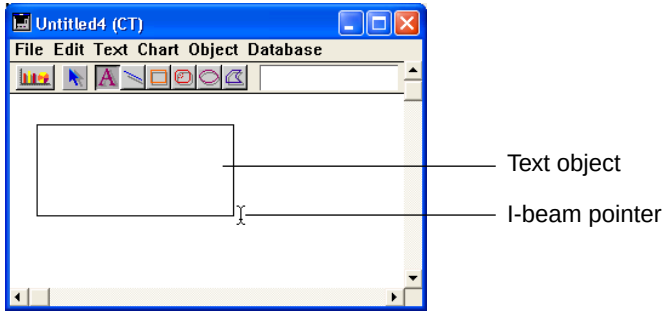
Most of the text that you want to add to a graph — such as axis labels, titles, legends — can be added using menu items in the **Chart** menu.

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:

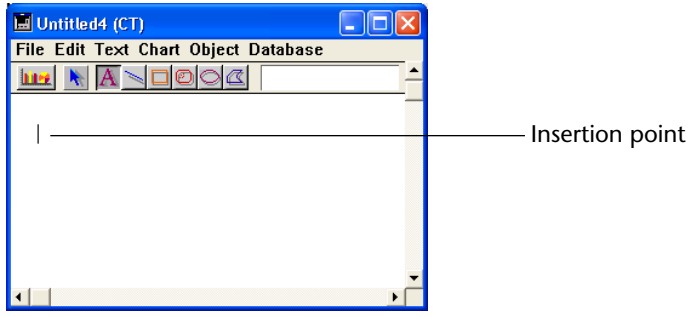
1 **Select the Text tool** .
The pointer changes to an I-beam .

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 chart 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 section "Inserting 4th Dimension Expressions" on page 283.

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.

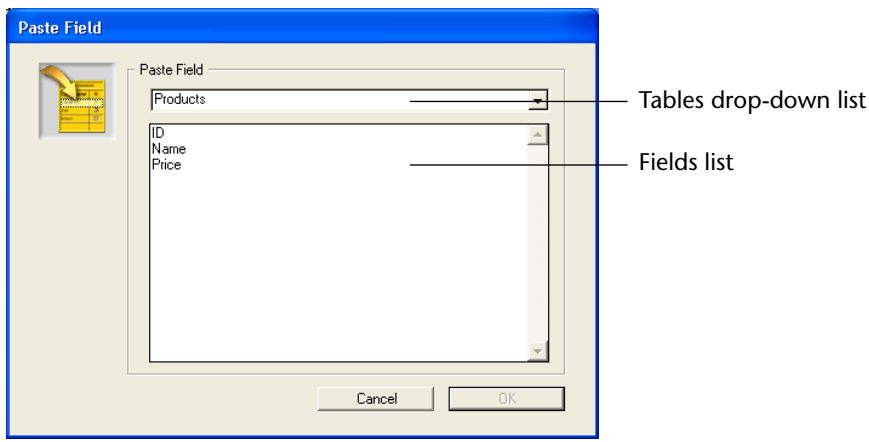
- **Using Field References in a 4D Chart Area on a Form**
  When you insert a field reference in a 4D Chart area on an input form, the value that is displayed when you choose **Show Values** from the **Database** menu is the field's value for the current record.

  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 section "Adding Text" on page 278.

2 **Position the I-beam pointer 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*.

▶ 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

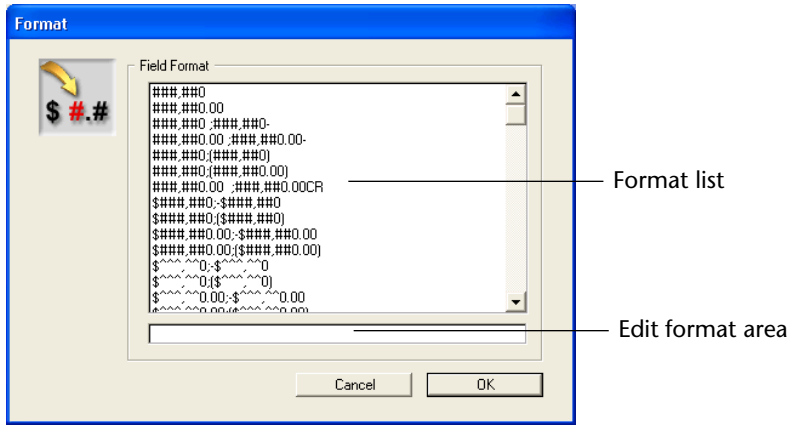
▶ To format a reference:

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.

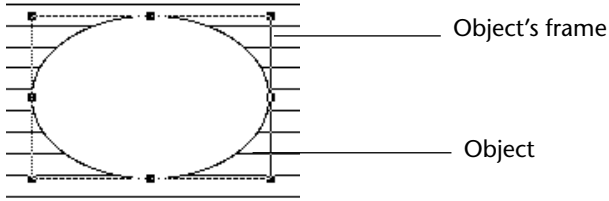
► To resize an object:

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.



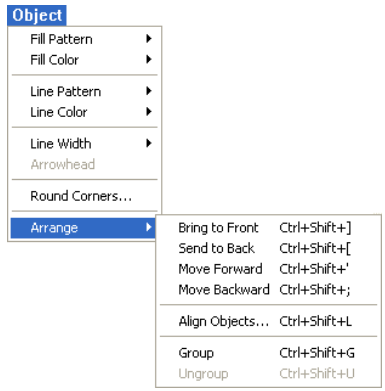
To resize the object so that the height and width retain the same proportion to each other, hold down the **Shift** key while you are resizing.

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:

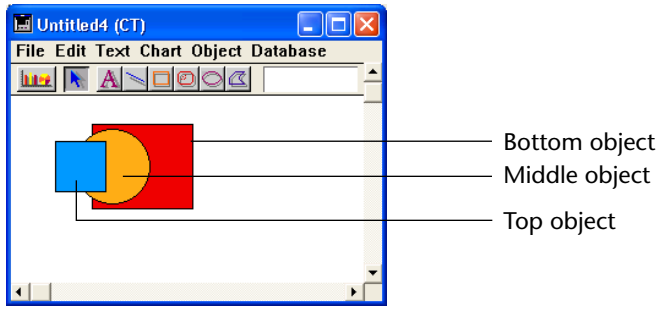
- Bringing an item to the front
- Sending an item to the back
- Moving an item forward one level
- Moving an item backward one level

- 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 sample screen 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.

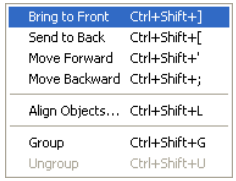
- **Moving an Object in Front of All Others** By moving an object in front of all others, you move it to the top layer.
- **Moving an Object Behind All Others** By moving an object behind all other objects, you move it to the bottom layer.
- **Moving One Object in Front of Another** Moving an object 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 on the Arrange submenu in the Object menu.**

The **Arrange** submenu is shown below.

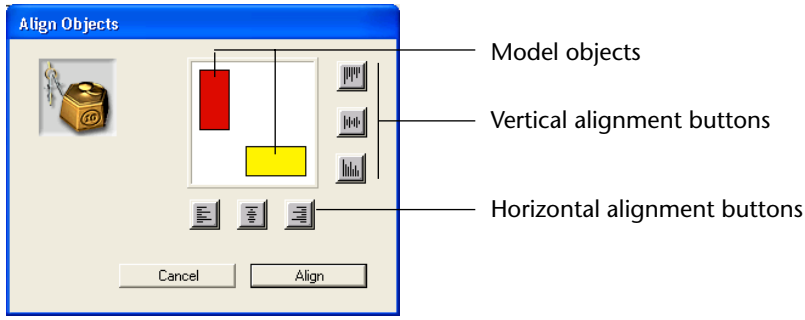


Aligning Objects

When you align objects to each other, you position them in relation to each other. Aligning objects to each other ensures that objects 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 to 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 to each other:

Icon	Meaning
	Align the left edges of selected objects.

Icon	Meaning
	Align the centers of select objects along a vertical axis.
	Align the right edges of selected objects.
	Align the top edges of selected objects.
	Align the centers of select 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.

You can make a single object from several selected objects by grouping them. Once you create a group, you can manipulate it the same way you would a single object.

▶ 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

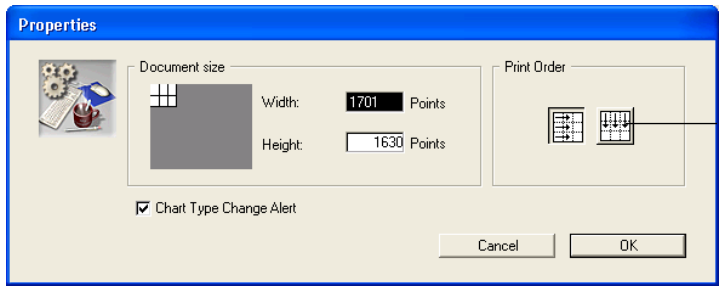
Setting the Print Order

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.**

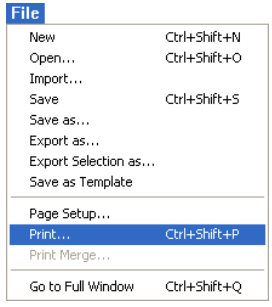
3 **Click OK.**

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.

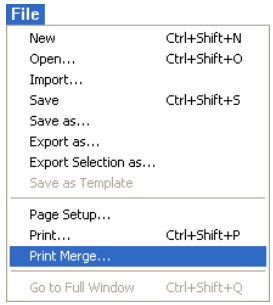
Print merges are most useful when performed from 4D Chart plug-in windows.

You can perform print merges only 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 section "Inserting Field References" on page 280.

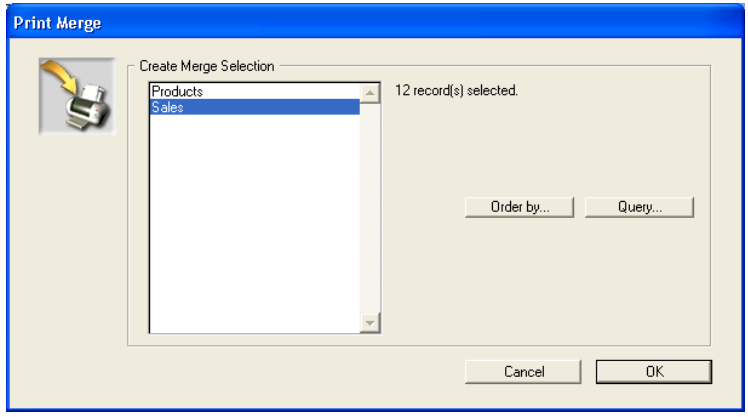
► To perform a print merge:

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 print the document only 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 do 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 section "Query Editor" 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 section "The Order By Editor" on page 123.

When you have selected the appropriate records, you can print the records.

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.