

# ActiveX User's Guide

## First Impression<sup>TM</sup>

High performance software for charting data

For Microsoft<sup>®</sup> Visual Basic<sup>TM</sup>, Visual C++<sup>TM</sup>, and Other Languages

Version 6.0

Tidestone Technologies, Inc.<sup>TM</sup>

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Published by  
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## P R E F A C E

# Welcome To First Impression

First Impression is a powerful, customizable business charting ActiveX component. Its more than 35 unique chart types include two-dimensional and three-dimensional options. The component's extensive programming interface offers an unparalleled degree of charting and graphical control, allowing complete customization by the developer.

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**Note** First Impression can be used by itself in applications or with Tidestone's spreadsheet product, Formula One ActiveX. Tidestone's Java spreadsheet application, Formula One for Java, is a separate product and is not intended for use with First Impression ActiveX.

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## New Features in First Impression 6.0

- **Apartment Threading Model Support.** Developers who use First Impression in Internet-related applications can benefit from First Impression's new ability to handle multiple data streams.
- **Multiple Y Axes.** First Impression now allows users to define more than one Y axis on a chart, allowing them to compare two or more dissimilar things. For example, a user could show the performance of a stocks over a week's time on one axis and the volume of trading for that same time period on another axis. For information on how to create multiple Y axes, see "Formatting Charts with Multiple Y Axes" on page 209.
- **Date/Time Axes.** First Impression now supports date/time axes on bar, line, area, step, hi-lo, hi-lo-close, open hi-lo-close, and Gantt charts. (Previous versions of First Impression supported only date axes, not date/time axes.) Now users can create charts with axes that automatically show intervals as small as milliseconds. For information on how to create a chart with a date/time axis, see "Formatting Charts with Computed Date/Time Axes" on page 208.
- **Tested in Visual Studio 6.0.** First Impression has been tested in the Visual Basic 6.0 and Visual C++ 6.0 portions of Visual Studio 6.0.

## Other Features of First Impression

- **Support for All Major Chart Types.** First Impression includes 2D, 3D, and stacked permutations of bar, line, area, and step charts. It also includes XY, polar, radar, Gantt, hi-lo, pie, doughnut, elevation, 3D XYZ and 3D scatter charts.
- **Interactive Chart Formatting.** First Impression allows you to use simple point and click techniques to easily change chart types, text styles, fill patterns, marker styles, as well as 3D rotation, perspective, lighting, and much more.
- **Plot Multi-Dimensional Data.** First Impression easily interprets and charts complex data with multiple levels of labels.
- **True 3D.** First Impression offers true 3D representations of chart elements, including the use of projected text. It also provides exceptional control of lighting on 3D chart elements.
- **Chart Designer.** First Impression provides an advanced chart design interface for design-time or run-time design needs. The Chart Designer is presented to you in an organizational tree format. Users can select a chart item and view the design pages available for that item. Common design pages display when multiple chart items are selected.
- **JPEG Support.** First Impression allows charts to be exported as JPEG graphics files. JPEG graphics files can also be imported and used for backdrops and pictographs.
- **Complex Bound Control.** First Impression is a complex bound control. First Impression can be bound to a database via the Microsoft Remote Data Control or the Data Control.
- **Ease of Use.** First Impression has many features that make it one of the easiest chart controls to use, including the complete documentation available through online help and endless flexibility for customizing the control.

## Installation

The Installer Program can be used to install both trial and working versions of any component.

You are prompted for a valid serial number during installation. If you enter a valid serial number, Formula One successfully installs as a working developer version.

The product is installed as a trial (demo) version if you do one of the following:

- press ENTER at the serial number prompt
- unsuccessfully attempt to enter a valid serial number three times

After the third attempt, the product installs as a trial version.

The trial version of a product is **NON-REDISTRIBUTABLE** component and will expire after 15 days. You cannot deploy applications with this version. The trial version displays the About Box every 30 minutes reminding you that you are working with an evaluation version of the product. If you wish to continue evaluating the product after the 15-day trial, contact Tidestone.

## Installing the Product

The Setup program creates new directories and copies product files to your hard disk.

➤ **To install a Tidestone ActiveX control on your hard disk:**

1. Insert the CD-ROM in your drive.
2. Locate and double-click SETUP.EXE in the First Impression folder.
3. Follow the Setup program directions.

## What Does The Installation Program Do?

The Installer performs the following tasks during the installation process:

- Allows you to identify the components you want to install, select a directory to hold the program files, and specify a folder in which to place the program on your desktop.
- Copies the files to your hard disk.
- Updates system files in your Windows system directory or the location of your choice.
- Records your serial number. During the installation process, you enter the product serial number provided on the installation media and product registration card. The serial number is recorded and displayed in your product's About Box. You are required to provide your serial number to receive technical support and upgrade pricing on future product releases.
- Registers the ActiveX control with the Windows Registration Database. This makes the control visible and available to your development environment.

## After Installation

Once you install the product, you can determine if you have a full version of the product or a trial version by displaying the About Box. This can be done by executing the **AboutBox** method in code. Text in the About Box tells you whether you are using an evaluation copy.

After you successfully install a full version on your system, you can distribute that ActiveX control to your end-users without worrying that the About Box might display on their system every 30 minutes. If you have any concerns as to which version you are deploying, check the About Box.

## If You Experience Installation Problems

If you experience problems installing this product, please read the file INSTPROB.DOC located in the First Impression folder. This file contains suggestions for fixing the most common installation problems. If problems persist, contact Tidestone Technical Support for further assistance.

## Technical Support

The Tidestone technical support staff can help you with any problem you encounter installing or using First Impression. You can contact Tidestone in any of the following ways:

- **On the World Wide Web.** For best service, send your technical support requests to the Tidestone Case Tracking System, accessible from the Tidestone website. Point your browser at [www.tidestone.com/support/tsmain.htm](http://www.tidestone.com/support/tsmain.htm).
- **By telephone.** You can contact our technical support staff at (913) 851-2200 on weekdays between 9:00 a.m. and 4:00 p.m., central time.
- **By fax.** You can contact us by fax at (913) 851-1390.
- **By mail.** Address your correspondence to:

Tidestone Technical Support Department  
12980 Metcalf, Suite 300  
Overland Park, KS 66213

- **In Europe,** contact:

Tidestone Europe  
Lenexa House  
11 Eldon Way  
Paddock Wood, Kent  
England TN12 6BE  
**Tel:** +44 1892 834343  
**Fax:** +44 1892 835843

# Documentation Conventions

Throughout this documentation, typographic conventions are used to define elements and references to First Impression items.

Recognizing these conventions will assist your comprehension of this documentation.

Convention example	Description
<b>AxisSelected, AllowSelections, Select,</b> <b>➤ To install First Impression:</b>	Names of events, properties, and methods, are in proper case and bold font.  A series of numbered instructions are preceded by an introductory line. The introductory line begins with an arrowhead.
1.Type a:\setup.	Numbered instructions provide step-by-step directions for performing tasks. The instructions should be performed in the order they are presented. In numbered steps, items you are to enter are shown in Letter Gothic font.
<i>chart plot</i>	In general sections, italic text is used for the first occurrence of a new term.
<i>thicknessratio</i>	In reference sections, italic text indicates variable or argument information you must supply.
[axis_id]	In reference sections, italic text surrounded by square brackets indicates optional arguments.
{TRUE FALSE}	In reference sections, text surrounded by braces indicates you must make a choice among the items inside the braces. Choices are separated by vertical bars.
VtChart1.AllowDithering	Letter Gothic font is used for all code examples.
TTFI6.OCX	File names are presented in upper case text.
VtChart1.RowCount 'number of rows	In code examples, an apostrophe precedes a comment.

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# Getting Started

## Basic Concepts

First Impression is a Custom Control (ActiveX control). It can be accessed directly by Microsoft's Visual Basic, Visual C++, and other environments that support ActiveX control containers.

- In design mode, randomly generated data is provided to allow you to design a default format for the chart control. You can override this data by inserting specific values in the data grid.
- In run mode, data can be assigned to the data grid associated with the chart. This data is charted using the default format you created during design time. You can also allow additional formatting of the chart during run time.
- The chart format can be modified from code or from the built-in user interface.
- Charts can be saved with a form or in a separate file.
- Any formatting changes you make to a chart using the First Impression interface are only saved if you are in design mode. Changes made through the interface in run mode are not saved with the chart.

## Adding the ActiveX Control to Your Application

The process for adding an ActiveX control to your application varies slightly from one development environment to another. In most cases it consists of:

- Adding the ActiveX control to your project.
- Selecting the control's tool from the toolbar and drawing the control on a form or in a window.

This chapter provides basic information to help you begin with First Impression. Consult your development environment documentation for specific steps for adding a control to your application.

## ActiveX Development

This version of First Impression is designed for developers creating 32-bit ActiveX applications in Visual Basic 5.0 or 6.0, Visual C++ 5.0 or 6.0, PowerBuilder 5.0 or 6.0, or other environments that support ActiveX containers.

First Impression provides an ActiveX control (TTFI6.OCX) for use in developing 32-bit applications.

This document shows code examples in Visual Basic because of Visual Basic's wide acceptance and ease of use.

## Getting Started in Visual Basic

The following sections highlight procedures required to use First Impression as an ActiveX control with Visual Basic 5.0 and 6.0.

### Adding the Component to Your Visual Basic Project

➤ **To insert the component into your Visual Basic 5.0 or 6.0 project:**

1. Choose Project > Components OR press CTRL T from the keyboard OR right-click the component palette and choose Components from the context menu.

The Components dialog box appears.

2. Select the Tidestone First Impression Chart component from the list of available components.
3. If the Tidestone First Impression Chart component is not visible in the component list, click BROWSE to add the component.
4. Click OK.

The Visual Basic form is returned, and the First Impression component appears in the Component palette.

5. Double-click the Tidestone First Impression icon in the component palette to drop it on your form.

You can easily set specific properties for the First Impression component, either programmatically or through the First Impression component properties dialog box.



## Setting Properties in Visual Basic

➤ **To set properties for a component programmatically:**

1. Select the component in your project for which you want to set properties.
2. Press F4 to display the properties window.
3. Modify the property settings as needed.

➤ **To set properties for a component via the component properties pages:**

1. Select the component.
2. Click the right mouse button and choose Properties from the context menu. If you want to access from the Properties window, click the button for Custom properties. The component property pages are displayed.
3. Within this dialog box, you may set general chart features such as application and table name; determine what editing features will be available to end users; and set the appearance features of the chart.

For advanced chart design, use the Chart Designer.

## Using First Impression as a Data-Bound Control

After you drop the First Impression component on the form, you must hook it to a Data Control to bind it to a database.

If you want to connect to an external or remote database with First Impression, you must use the Remote Data Control and provide connection information for your ODBC data source using the DataSource Administrator in the Windows Control Panel. For more information, see the Remote Data Control topic in your Visual Basic online help.

➤ **To hook First Impression to a Data Control:**

1. From the components palette, double-click the Data Control to drop it on your form.
2. From the components palette, double-click the First Impression control to drop it on your form.
3. Click to select the First Impression Component on the form.
4. Press F4 to access the property list.
5. Click the button to the right of the DataSource property to select the name of the Data Control that you placed on the form. Typically, the name is Data1 and it is located in the Name property of the Data Control.
6. Select the Data Control on the form and press F4 to access the property list.

7. Click the button to the right of the Database Name property and browse for the database file.
8. Click the button to the right of the Connect property to display the list of available database types.
9. Select the database type for which you want to connect.
10. Click the button to the right of the RecordSource property to select the table name from your database.

The First Impression component is now bound to your database.

► **To hook First Impression to a Remote Data Control**

1. From the components palette, double-click the Microsoft Remote Data Control to drop it on your form.
2. From the components palette, double-click the First Impression control to drop it on your form.
3. With the First Impression control still selected, press F4 to access the property list.
4. Click the button to the right of the DataSource property to select the name of the Remote Data Control that you placed on the form. Typically, the name is MSRDC1 and it is located in the Caption property of the MSRDC.
5. Select the MSRDC on the form and right-click to display the context menu.
6. From the context menu, choose Properties.
7. The Property Pages for the MSRDC appear. Select the General tab, if necessary.
8. Click the button to the right of the DataSource field in the General tab and select the name of your database from the combo box.
9. In the SQL text box of the General tab, you can enter an SQL command to query the database. For example, to issue an SQL command to retrieve all the records from the database table, type the following:

```
Select * from Table1
```

where *Table1* is the name of the table in the database for which you want to retrieve data.

10. Click OK to dismiss the Property Pages.
11. With the Remote Data Control still selected, press F4 to access the property list.

12. The SQL property displays the SQL command that you previously entered.
13. Click the button to the right of the Database Name property and browse for the name of your database from the combo box.

The First Impression component is now bound to your database.

## Getting Started in Visual C++

Before using First Impression with Visual C++, you should read the Microsoft Visual C++ documentation and online help.

The following section highlights procedures required to use First Impression as an ActiveX control with the Microsoft Visual C++ 5.0 and 6.0 environments.

---

**Important** Visual C++ does not read constants from the ActiveX control. The file TTFICNST.H, distributed with First Impression, should be included wherever you use constants in your code.

---

## Creating a Dialog, CFormView, or CView-Based Application

➤ **To create a Dialog, CFormView, or CView-Based ActiveX control application in Visual C++ 5.0 or 6.0:**

1. Start Visual C++.
2. Choose File > New to display the New dialog box.
3. Select Projects tab.
4. Browse to locate the desired directory path.
5. Type a name for your project in the Name text box. This creates a sub-directory of that name in the current path.
6. From the Type list, select MFC AppWizard(exe) to create a project based on the MFC library.
7. Click OK.

The MFC AppWizard - Step 1 dialog box appears.

- To create a Dialog-based application, select the Dialog radio button and click NEXT. Refer to “Dialog-Based Applications” on page 20 for the remaining steps.
- To create a CFormView-based application, select the “Single Document” or “Multiple Documents” radio button. Refer to “CFormView-Based Applications” on page 20 for the remaining steps.

- To create a CView-based application, select the “Single Document” or “Multiple Documents” radio button. Refer to “CView-Based Applications” on page 20 for the remaining steps.

## Dialog-Based Applications

To create a dialog box-based application, be sure to complete the steps in “Creating a Dialog, CFormView, or CView-Based Application” on page 19 before continuing with the following steps:

➤ **To create a dialog-based application in Visual C++ 5.0 or 6.0:**

1. Click the FINISH button to accept the default options. Visual C++ builds your project.

The New Project Information dialog box appears.

2. Click OK.

## CFormView-Based Applications

To create a CFormView-based application, be sure to complete the steps in “Creating a Dialog, CFormView, or CView-Based Application” on page 19 before continuing with the following steps:

➤ **To create a CFormView-based application in Visual C++ 5.0 or 6.0:**

1. Click NEXT until you get to the dialog box in step 6.
2. In the Step 6 dialog box, select the class view name from the class list at the top of the dialog box.

CView appears in the Base Class list.

3. In the Base Class list, change CView to CFormView.
4. Click FINISH for Visual C++ to build your project.

## CView-Based Applications

To create a CView-based application, be sure to complete the steps in “Creating a Dialog, CFormView, or CView-Based Application” on page 19 before continuing with the following steps:

➤ **To create a CView-based application in Visual C++ 5.0 or 6.0:**

1. Click FINISH to accept the default options. Visual C++ builds your project.

The New Project Information dialog box appears.

2. Click OK.

## Adding the First Impression Component to Your Project

➤ **To add a First Impression component to your project in Visual C++ 5.0 or 6.0:**

1. Choose Project > Add To Project > Components and Controls to display the Components and Controls Gallery dialog box.
2. Select the Registered ActiveX Controls folder.
3. If the First Impression Chart Control icon is not visible in the list, then the control was not registered properly and you may need to install or try to register it from the ActiveX Control Text Container, which is available in the Tools menu of Visual C++.
4. Select the control from the Component list and click Insert. Click OK.

The Confirm Classes dialog box appears.

5. Click OK to confirm and exit the dialog box.
6. Click Close to exit the Component Gallery.

The Chart Control appears in the Control palette.

When Visual C++ adds components to your project, it creates CPP and H source files defining the class, properties, and methods for the control. It is a good idea to review these files to understand what they contain. Methods and properties are not accessed the same in C++ as they are in many other languages like Visual Basic. When these files are generated, Visual C++ creates both a Get and Set function for most methods and properties.

## Adding the Component to Your Dialog or CFormView

➤ **To add the component to your dialog or CFormView:**

1. In the Resource Editor, display the dialog box for which you want to place First Impression.
2. Click the First Impression component in the Editor's Control palette.
3. Draw the component on the dialog box.
4. Size and place the component using the handles around the control.
5. Click the right mouse button to display the context menu. You can view and modify the design-time properties using the context menu.

## Assigning Member Variables

After you add the chart control to the dialog box, you must assign a member variable to the control to gain access to the methods and properties at runtime.

➤ **To assign member variables (for CForm or Dialog-based Applications):**

1. Choose View > ClassWizard.
2. Select the Member Variables tab.
3. Select the Chart Control in the Control ID window and click the Add Variable button.

The Add Member Variable dialog box appears.

4. Type the member variable name (e.g., something like `m_chart`) and click OK to accept the default variable category and type.

The MFC ClassWizard dialog box displays the variable in the Control ID window.

5. Click OK in the MFC ClassWizard dialog box to return to your project.

## Adding the First Impression Component to Your CView

➤ **To add the First Impression component to your CView:**

1. In the file list, display the header file for the view ( `<projname>view.h` ).
2. At the top of the file, include each of the First Impression control header files that were created when you added First Impression to your project:

```
#include "vcchart.h"
```

3. In the Attributes section, as a public member, add the following to create member variables for each of the controls in your view:

```
CVcChart m_chart;
```

4. Now through the file list, display the C++ source file for the view ( `<projname>view.cpp` ).
5. Start the ClassWizard, and make sure the view class is selected as the Class Name.
6. Select the View object in the Object Id list.

7. Select the “Create” message in the Messages list. Click Add Function.

The Create handler initially presents the following code:

```
return CWnd::Create(lpszClassName, lpszWindowName, dwStyle, rect,
    pParentWnd, nID, pContext);
```

Change this to the following:

```
if (CWnd::Create(lpszClassName, lpszWindowName, dwStyle, rect,
    pParentWnd, nID, pContext) == 0)
    return FALSE;
if (m_chart.Create("First Impression Chart", dwStyle, rect, this,
    1000) == 0)
    return FALSE;
return TRUE;
```

8. Start the ClassWizard, and select view class as the Class Name.
9. Select the View object in the Object Id list.
10. Select the WM\_SIZE message in the Messages list.
11. Click Add Function to create the OnSize handler function for this message.
12. Add the following code to the handler:

```
// TODO: Add your message handler code here
if (m_chart) {
    m_chart.MoveWindow(0, 0, cx, cy);
}
```

## Working With Top-Level Properties and Methods in Visual C++

TTCHART.H defines a number of properties and methods that affect the chart control. Methods are simply called as declared. However, each property has a Get and a Set method. For example, the **TitleText** property mentioned in the First Impression online documentation can be set with the **SetTitleText** method, and read with the **GetTitleText** method.

## Accessing First Impression Sub-Objects

The First Impression chart object contains several sub-objects, such as the plot, the title, the footnote, etc. You can access each of these sub-objects via wrapper classes provided by Visual C++. To use the sub-objects, a project must contain the wrapper classes for those sub-objects. Wrapper classes are generated when you add the chart control to the project.

An object's sub-objects are accessed via a **Get** method, which returns a pointer to an OLE IDispatch object. This pointer is used to construct the sub-object. For example, the code below accesses the Plot, Axis, and AxisScale sub-objects:

```
VARIANT Index;
VariantInit (&Index);

Index.vt = VT_12;
Index.iVal = 1;

//sets the minimum y-axis scale to -10
//sets the maximum y-axis scale to 200
CVcPlot plot;
plot = m_chart.GetPlot();
CVcAxis yaxis;
yaxis = plot.GetAxis(1, Index);
CVcValueScale yvscale;
yvscale = yaxis.GetValueScale();

yvscale.SetAuto(FALSE)
yvscale.SetMinimum(-10.0);
yvscale.SetMaximum(200.0);
```

## Handling Events in Your Dialog or CFormView

### ► To assign message handlers:

1. Start ClassWizard.
2. In the Message Map tab, in the Class Name list, select the Dialog or CFormView class that was created.
3. In the Messages list, select the desired message to handle and click the Add Function button to add a handler. For this example, select the “Click” event and click the Add Function button to add the handler.
4. Click the Edit Code button to edit the new function.
5. Add the following code in the function:

```
MessageBox ("Click Event","You clicked on the document");
```

6. Run the program and when the document is clicked, the message “You clicked on the document” is displayed.



## Handling Events in Your CView

In the view header, declare the First Impression event handlers to be used, in the section with all the other AFX messages. In the view source file, implement the event handlers, and define the `EVENTSINK_MAP` for the chart. An easy way to get boilerplate for these declarations and definitions is to create a `CFormView` project with the same name as the `CView` project and use ClassWizard to generate the event procedures. Then copy them into the `CView` project.

## Setting Properties of a Control on a Dialog or a CFormView

You can easily set specific properties for each of the controls you include in your project.

➤ **To set properties for a control on a dialog or a CFormView:**

1. Right-click the control in your project for which you want to set properties, and choose Properties from the context menu.

The Control Properties dialog box appears.

2. Select the appropriate tab for the property settings you want to modify. Properties are grouped together in categories, such as paragraphs, fonts, and pages.
3. Modify the property settings as needed. For more information on each property, see “First Impression Properties, Events, and Methods” in the First Impression online documentation.
4. Once you set the properties for the active control, close the Control Properties dialog box to return to your project.
5. Repeat steps 1 through 4 for each control.

## Setting Properties of a Control on a CView

Since a control on a `CView` is created dynamically at runtime, you must call chart methods to make any changes to its initial properties. Make these calls in the Create handler for the `CView`.

## Handling Printing and Previewing

From ClassWizard, add an `OnPrint` override to the view. Use the First Impression **Draw** method to send the chart to the printer `hDC`. If previewing, you must convert the chart coordinates to screen units using the **CPreviewDC** method.

## Serializing the Chart Control

Using the **ReadFromFile** and **WriteToFile** methods, you can read and write chart controls to a file. Alternatively, you can load and save the First Impression OLE control via its **IPersistStorage** interface.

## Connecting to a Database With Visual C++

➤ **To set up the ODBC connection:**

1. In the Windows Control Panel, double-click the ODBC icon.

The Data Sources window appears.

2. Select the appropriate database driver (e.g. Microsoft Access \*.mdb) from the list.
3. Click the Setup button.

The ODBC Setup window appears.

4. Click the Select Button.

The Select Database window appears.

5. In the DataBase Name list, select the database you want to use.
6. In the DataSource Name text box, type a name for the data source.
7. In the Description text box, type any description for the data source.
8. Click OK to return to the Setup window.
9. Click OK to exit the Control Panel and close any open windows.

## Adding the Remote Data Control to Your Project

➤ **To add the Remote Data Control to your project:**

1. Choose Project > Add to Project > Components and Controls.

The Component Gallery dialog box appears.

2. Select the Registered ActiveX Controls folder.
3. Choose the Microsoft Remote Data Control icon.
4. Click Insert, then click OK.
5. Click OK to confirm classes.

The Remote Data Control appears in your controls palette.

6. Select the Remote Data Control from the palette, and draw it on your form.
7. Right-click the Remote Data Control and select Properties.

The Properties dialog box appears.

8. Select the Control tab.
9. Click the combo box to display and select the DataSource (e.g. the DataSource name set up during the ODBC Setup process).
10. Type the following command in the SQL text box:

```
Select * from tablename
```

where *tablename* should be the name of the table in the database.

11. Close the dialog box.

## Getting Started in PowerBuilder

The First Impression control can be used as an ActiveX control with several Windows-based development environments. This section highlights the basic procedures required to begin using First Impression as an ActiveX control with the PowerBuilder environment. For detailed information, consult your PowerBuilder documentation.

## Providing Data to the First Impression Control

The sample program directory installed with your First Impression control contains sample programs for learning the three techniques for providing data to the First Impression control. This section contains tutorial instructions for those three techniques.

- **OLE 2 Presentation Method.** This technique involves the use of PowerBuilder's OLE 2 Presentation Style. The First Impression control is inserted into the DataWindow and data is provided via the DataWindow Object. Refer to "OLE 2 Presentation Method" on page 28 for tutorial instructions.
- **Uniform Data Transfer Method.** This technique simply places the First Impression control in the Application window. Data is then copied to the clipboard where First Impression can access the data via the Uniform Data Transfer method. Refer to "Creating a Uniform Data Transfer Method" on page 32 for tutorial instructions.
- **Standalone Chart Method.** This technique focuses on using First Impression as a standalone chart without any database connectivity. Refer to "Using First Impression as a Standalone Chart in PowerBuilder" on page 36 for tutorial instructions.

## OLE 2 Presentation Method

The following section describes the OLE 2 Presentation technique.

### Database Preparation

Prior to creating an application in PowerBuilder which accesses a database, you must ensure that you have correctly configured your environment. The following steps outline some preliminary measures to take before working with databases in PowerBuilder.

➤ **To configure the ODBC:**

1. Click the Configure ODBC button.
2. Select the appropriate database driver from the list.
3. Click the CREATE button.

The ODBC Database Driver Setup dialog box appears.

4. Depending on the database driver that is selected, the exact setup instructions might vary. Please refer to the PowerBuilder interface for instructions on how to locate your database file. In general, the ODBC Database Driver Setup dialog prompts you for the following information:

**Data Source Name.** A string that identifies this data source configuration in ODBC.INI.

**Description.** An optional long description of a data source name.

**Database.** An identification for the database file.

5. If you must access a SELECT button or a BROWSE button to locate your database file, select the database file and click OK to return to the ODBC window.
6. Click OK to confirm the Setup dialog box information.
7. Click CLOSE.

➤ **To set the database profile:**

1. Click the DB Profile button.

The DB Profile Painter window appears.

2. Select the database file you indicated in the section that starts with “To configure the ODBC:” on page 28.
3. If the database does not appear, click the NEW button.
4. Enter a long description of the data source name.

5. Choose ODBC in the DBMS field.
6. From the SQL Data Sources window, select the database file indicated in the section that starts with “To configure the ODBC:” on page 28.
7. Click OK to exit the New Database window.
8. Click OK to exit the DB Profile window.

## Creating an Application via an Application Template

➤ **To create an application via a PowerBuilder generated application template:**

1. Click the APPLICATION button to open a new application.
2. Click the NEW button.

The Select New Application Library dialog box appears.

3. Type a file name in the text box.
4. Click the SAVE button.

The Save Application dialog box appears.

5. Type an Application name and click OK.

A Message box appears asking whether you want PowerBuilder to generate an Application Template.

6. Click the YES button.
7. Click the WINDOW button to open a new window.

The Select Window dialog box appears.

8. Select w\_genapp\_sheet from the list and click OK.

## Adding the ActiveX Control to the PowerBuilder DataWindow

➤ **To add the ActiveX control to the PowerBuilder datawindow:**

1. Click the DATAWINDOW button to display the Select DataWindow dialog box.
2. Click the NEW button to display the New DataWindow dialog box.
3. Select QuickSelect as the DataSource.
4. Select OLE 2.0 as the presentation style.

5. Click OK, and then the QuickSelect dialog box appears.
6. Select the appropriate table for your database from the list.
7. Select one or more columns from the table, or click the ADD ALL button.
8. Click OK, and then the Insert Object dialog box appears.
9. Select the Insert Control tab.
10. Select the Tidestone First Impression Chart control from the list of Control Types.
11. If the control is not registered, you must click the REGISTER NEW button to register it.
12. Click OK, and then the First Impression context menu appears.
13. Click elsewhere on the form to dismiss the First Impression menu.
14. The First Impression control appears in your DataWindow, and the Ole Object dialog appears.
15. Click the Data tab, if necessary.
16. Drag and drop any key Source data to Target data in the appropriate order for assignment. By dragging this information to the Target data window, you are linking the database columns to the First Impression chart.
17. Click OK.
18. Right-click the DataWindow and choose Properties.
19. Select the General tab and enter the name of DataWindow Object in the Name text box.
20. Click the PREVIEW button to preview the DataWindow object and retrieve data from the database to display in First Impression.
21. Close the DataWindow and indicate Yes to save the changes.
22. Type a name for your DataWindow object and click OK.
23. Choose File > Close to close the DataWindow.
24. Click Yes when the DataWindow prompts you whether to save changes.

## Connecting the DataWindow Object

➤ **To connect the DataWindow object:**

1. Select Controls > DataWindow.
2. Drag and drop a DataWindow on the form. Resize as necessary.
3. Right-click the DataWindow and choose Properties from the context menu.

The DataWindow dialog box appears.

4. Assign a name to your DataWindow in the text box or use the default name.
5. Browse to select the name of the DataWindow object created in the section titled “Adding the ActiveX Control to the PowerBuilder DataWindow” on page 29.

The DataWindow control is now bound to the DataWindow object and acts as an interface to the database.

6. Click OK to accept the values and exit back to the DataWindow dialog box.
7. Click OK to dismiss the DataWindow dialog box.

## Creating a Transaction Object for the Application Open Event

➤ **To create a transaction object for the application open event:**

1. Right-click the mouse on the form.
2. Choose Script from the context menu.
3. From the Select Event list, select the Open Event for the form.
4. Append the following script to the Open Event script:

```
transaction DBTrans
DBTrans = Create transaction
DBTrans.DBMS = 'ODBC'
connect;
dw_1.settransobject (SQLCA)
dw_1.retrieve()
```

dw\_1 represents the DataWindow object; supply the name of your DataWindow object as created in the section titled “Connecting the DataWindow Object” on page 31.

5. Click the Close box on the Script window.

6. Save the script when prompted.
7. Run your application.

## Creating a Uniform Data Transfer Method

The following provides information about creating a Uniform Data Transfer method.

### Creating a New Application Window

➤ **To create a new application window:**

1. Click the APPLICATION button to create a new application.
2. Click the NEW button.

The Select Application Library dialog box appears.

3. Type a file name in the text box.
4. Click the SAVE button.

The Save Application dialog box appears.

5. Type an Application name and click OK.

A message box appears that asks whether you would like PowerBuilder to generate an Application Template.

6. Click the NO button.

### Modifying the Application Open Event

➤ **To modify the application open event:**

1. Click the SCRIPT button on the PowerBar.
2. From the default Select Event list, select the Open Event.
3. Modify the Open Event script to populate the SQL object and create a start-up application window.



#### 4. The Open Event script should read as follows:

```

/* Populate sqlca from current PB.INI settings */
sqlca.DBMS = ProfileString ("pb.ini","database","dbms","")
sqlca.database = ProfileString ("pb.ini","database","database","")
sqlca.userid = ProfileString ("pb.ini","database","userid","")
sqlca.dbpass = ProfileString ("pb.ini","database","dbpass","")
sqlca.logid = ProfileString ("pb.ini","database","logid","")
sqlca.logpass = ProfileString ("pb.ini","database",
    "LogPassWord","")
sqlca.servername = ProfileString
    ("pb.ini","database","servername","")
sqlca.dbparm = ProfileString ("pb.ini","database","dbparm","")
/* Uncomment the following for actual DB connection */
connect;
    if sqlca.sqlcode <> 0 then
        MessageBox ("Cannot Connect to Database", sqlca.sqlerrtext)
        return
    end if
    Open (w_ttimpres_demo) // This should be the application window
                           name that you want to place the control in and want to
                           be the startup application window. (eg. W_test_demo) If
                           it does not exist, you will need to create one.

```

## Placing the Control in the Application Window

### ► To place the control in the application window:

1. Click the window to display the window painter.
2. Choose Controls > OLE to insert an OLE Control.

The Insert Object window appears.

3. Select the Insert Control tab.
4. From the Control Type list, choose the Tidestone First Impression Chart control and click OK.
5. Click the form to draw the First Impression control in the window.

You might need to size First Impression to the project window size, or reset the size in the properties window before you can view First Impression.

## Creating the DataWindow Object

### ► To create the DataWindow object:

1. Click the DATAWINDOW button.
2. Click the NEW button.

3. Select OLE 2.0 and click OK.
4. Select the appropriate table for your database from the list.
5. Select one or more columns from the table, or click the ADD ALL button. (The field columns must be numeric.)
6. Click OK.

The Insert Object dialog box appears.

7. Select the Insert Control tab.
8. Select the Tidestone First Impression Chart control from the list of Control Types.
9. If the control is not registered, you must register the control by clicking the REGISTER NEW button.
10. Click OK.

The First Impression context menu appears.

11. Click elsewhere on the form to dismiss the First Impression menu.
12. The First Impression control appears in your DataWindow, and the Ole Object dialog box appears.
13. Click the Data tab, if necessary.
14. Drag and drop any key Source data to Target data in the appropriate order for assignment. By dragging this information to the Target data window, you are linking the database columns to the First Impression chart.
15. Click OK.
16. Click the PREVIEW button to preview the DataWindow object and retrieve data from the database to display in First Impression.
17. Close the DataWindow and indicate Yes to save the changes.
18. Type a name for your DataWindow object and click OK.
19. Choose File > Close to close the DataWindow.
20. Click Yes when the DataWindow prompts you whether to save changes.

## Connecting the Control

► **To connect the DataWindow object:**

1. Choose Controls > DataWindow.
2. Drag and drop a DataWindow on the form.
3. Right-click the mouse on the DataWindow Control and choose Properties from the context menu.

The DataWindow dialog box appears.

4. Assign a name to the DataWindow in the text box or use the default name.
5. Click the BROWSE button to select the name of the DataWindow object that you created in “Creating the DataWindow Object” on page 33.
6. Click OK.

The DataWindow control is now bound to the DataWindow object and acts as an interface to the database.

## The Constructor Event

When the Constructor Event fires, data is copied from the DataWindow Object to the clipboard where First Impression can access it via the Uniform Data Transfer method.

► **To use the constructor event:**

1. Right-click the First Impression control and choose Script.
2. From the default Event list, select the Constructor Event.
3. Type the following code:

```
int li_rc
string ls_data
dw_1.settransobject(sqlca)
li_rc = dw_1.retrieve()
if li_rc > 0 then
    ls_data = dw_1.describe("datawindow.data")
    ole_1.SetData(ClipFormatText!, ls_data)
    ole_1.object.refresh()
end if
```

4. Close the event window and confirm to save changes.

## Using First Impression as a Standalone Chart in PowerBuilder

You might want to use First Impression in PowerBuilder without the benefit of any database connectivity to supply data. You can either enter data in the First Impression Data Grid Editor yourself, or provide data to the chart through any number of copy methods.

➤ **To use First Impression as a standalone chart in PowerBuilder:**

1. Click the APPLICATION button to open a new application.
2. Click the NEW button to display the Select New Application Library dialog box.
3. Type a file name in the text box.
4. Click OK, and then the Save Application dialog box appears.
5. Type an Application name and click OK.

A Message box appears that asks if you want PowerBuilder to generate an Application Template.

6. Click the YES button.
7. Click the WINDOW button to open a new window.  
The Select Window dialog box appears.
8. Select w\_genapp\_sheet from the list and click OK.

## Placing First Impression in the Application Window

➤ **To place the First Impression control in the application window:**

1. Choose Controls > OLE to insert an OLE Control.  
The Insert Object window appears.
2. Select the Insert Control tab.
3. From the Control Type list, choose the Tidestone First Impression Chart control and click OK.
4. Click the form to draw the First Impression control in the window.

You can now use First Impression in the PowerBuilder environment.

## General Information

The following section describes general information about using First Impression with PowerBuilder.

### Calling Properties and Methods in PowerBuilder

The syntax to access an ActiveX property or method follows:

```
<Ole_Object>.object.<Ole Property or Method>
```

Property Example:

```
Ole_1.object.ShowGridlines (False)
```

Method Example:

```
Ole_1.object.SetSelection (1,1,5,5)
```

### Converting General Syntax into PowerBuilder Syntax

This section provides detailed descriptions of what each property and method does. It explains all the parameters and their settings. You can easily convert your property or method general syntax to PowerBuilder syntax if you follow these guidelines:

► **To convert syntax for PowerBuilder:**

1. Go to the script window where you want to call the property or method.
2. Choose Design > Browse Object...
3. In the Browser, choose the OLE tab.
4. In the Browser window, double click Ole Custom Controls.
5. Find the ActiveX control that you want to access.

Under the ActiveX control there is a list of Properties and Functions with the proper PowerBuilder syntax.

### Trapping Errors in PowerBuilder

The PowerBuilder ActiveX container has an event called ExternalException event. This event fires any time an ActiveX control throws an exception. In the ExternalException event, there are arguments that allow you to check to find out the details of the exception. For Example:

```
Script - externalexception for ole_1  
MessageBox ("Exception", description)
```

This displays the description text of the exception that is thrown.

## Handling Method Parameters Passed By Reference

To handle an ActiveX method with parameters that are passed by reference, you must place the keyword REF in front of the parameter.

The following example shows this with the First Impression **SaveFileDialog** method.

```
string pBuf  
int pFileType  
ole_1.object.SaveFileDialog ("Save File", REF pBuf, REF pFileType)
```

## Introducing Internet Application Development

First Impression can be used by containers for Internet and corporate Intranet application development.

The First Impression 6.0 ActiveX control has been digitally signed by Verisign Commercial Software Publishers CA and conforms to Internet guidelines for secure data.

The installer program provides a CAB file containing a redistributable version of the control for Internet application usage.

For specific information about how to use First Impression for Internet application development, consult the Tidestone website at <http://www.tidestone.com/internet>.

## Upgrading and Converting to First Impression 6.0

You should upgrade to First Impression 6.0 in order to take advantage of the new features in the 6.0 version: the apartment-model thread-safe feature, which ensures that your application will run smoothly on the Internet, and the new multiple Y axis and date/time axis features.

You may upgrade to First Impression 6.0 from First Impression 5.x. You may also convert charts from MSChart into First Impression 6.0.

For further information about upgrading from previous versions of First Impression, check the Tidestone website at [www.tidestone.com](http://www.tidestone.com).

## Upgrading from First Impression 5.x

You must convert charts designed using First Impression 5.x before they function properly in First Impression 6.0. The conversion process involves saving your existing 5.x charts as .vtc files, and then loading them into First Impression 6.0 in the same development session.

➤ **To convert your First Impression 5.x charts:**

1. Place First Impression 5.x and First Impression 6.0 in your component palette.
2. Open your 5.x project and display the chart on the form.
3. Right-click the chart, choose Save As from the context menu, and save the 5.x chart as a .vtc file.
4. Delete the 5.x chart from the form.
5. Read the saved chart file back into the form.
6. Right-click the chart and choose Load Chart from the context menu.
7. Re-save your project and the chart. You must recompile any executables using First Impression 6.0.

## Converting from MSChart

The following steps convert a Visual Basic 5 project containing instances of the Microsoft Chart Control (MSChart) to use the First Impression Chart Control (VtChart). You can only perform this migration on a machine with both chart controls installed.

You must rebuild any executables built from a project containing MSChart controls after conversion in order to take advantage of the full-featured VtChart control.

➤ **To convert a project from MSChart:**

1. In the VBP file for a project containing an MSChart control, locate the following line of code:

```
Object = {02B5E320-7292-11CF-93D5-0020AF99504A}#1.0#0; MSCHART.OCX
```

2. Replace the previous code with the following code:

```
Object = {2C724BE0-A87B-11D1-8027-00A0C903B2B1}#6.0#0; TTfi6.ocx
```

3. In each FRM file for a project containing an MSChart control, locate the following line of code:

```
Object = "{02B5E320-7292-11CF-93D5-0020AF99504A}#1.0#0";  
"MSCHART.OCX"
```

4. Replace the previous code with the following code:

```
Object = "{2C724BE0-A87B-11D1-8027-00A0C903B2B1}#6.0#0"; "TTfi6.ocx"
```

5. For each MSChart control on each form, locate the code in the FRM file that looks like the following:

```
Begin MSChartLib.MSChart SomeName
```

where *SomeName* is the instance name of that particular chart.

6. Replace the “MSChartLib.MSChart” with “VtChartLib.VtChart” wherever it appears. The instance name line should look like the following:

```
Begin VtChartLib6.VtChart SomeName
```

7. Load the project as usual. If the conversion was successful, load errors for the chart do not occur, and the MSChart controls on each form are replaced with full-featured VtChart controls.
8. If you followed the previous steps, and the load fails and leaves a LOG file similar to the following:

```
Line 21: Class VtChartLib.VtChart of control SomeName was not a  
        loaded control class.  
Line 24: The property name OleObjectBlob in SomeName is invalid.
```

...then you forgot or incorrectly implemented steps one and two.

If the load fails and leaves a LOG file similar to this:

```
Line 21: Class MSChartLib.MSChart of control SomeName was not a  
        loaded control class.  
Line 24: The property name OleObjectBlob in SomeName is invalid.
```

...then you forgot or incorrectly implemented steps five and six for one or more of your controls.



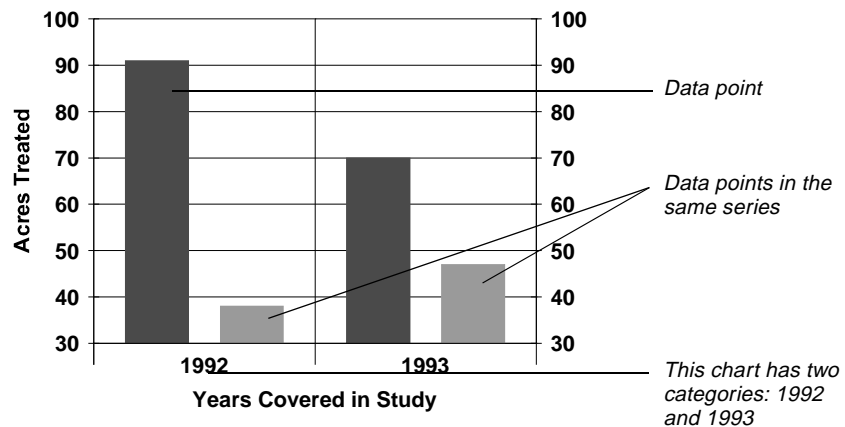
## CHAPTER 2

# Understanding Chart Basics

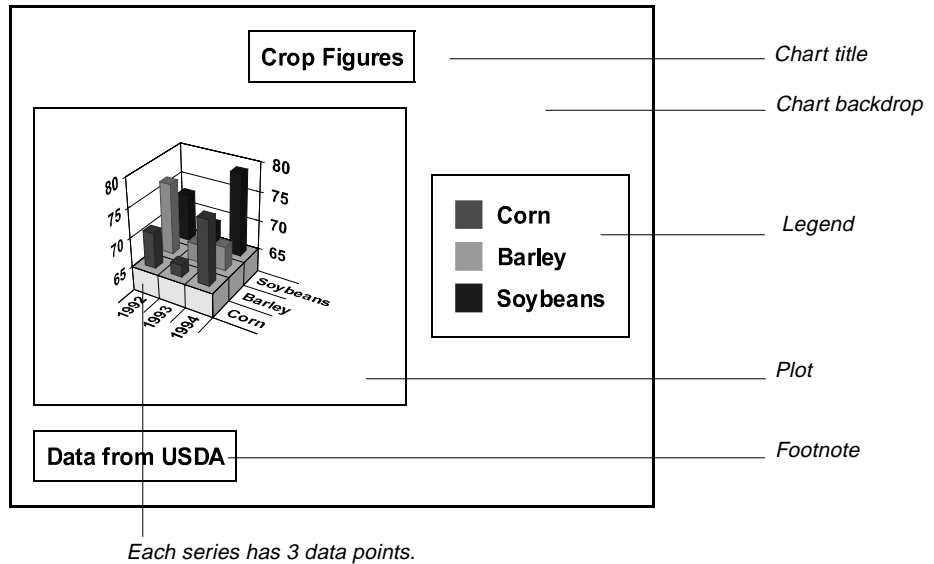
This chapter provides an overview of basic chart concepts and provides information about the different techniques that you can use to design, create, and modify charts.

## Understanding Chart Terminology

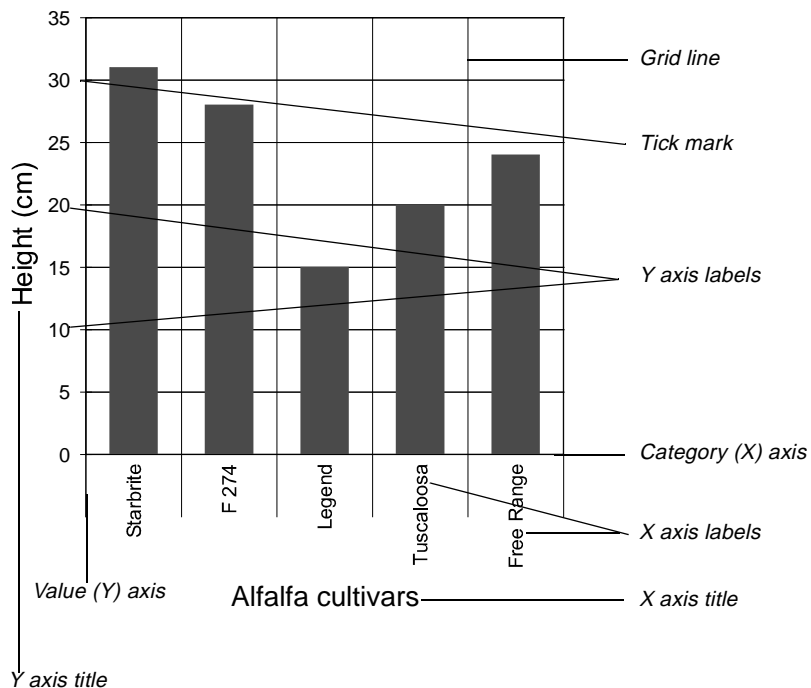
Charts provide a graphical representation of data. *Values* or *data points* are displayed in formats such as: bars, lines, markers, filled areas, bubbles, or pie slices. These data points are grouped into *series* that are identified with unique colors or patterns. In many chart types, one data point from each series is grouped together by *category* along an *axis*.



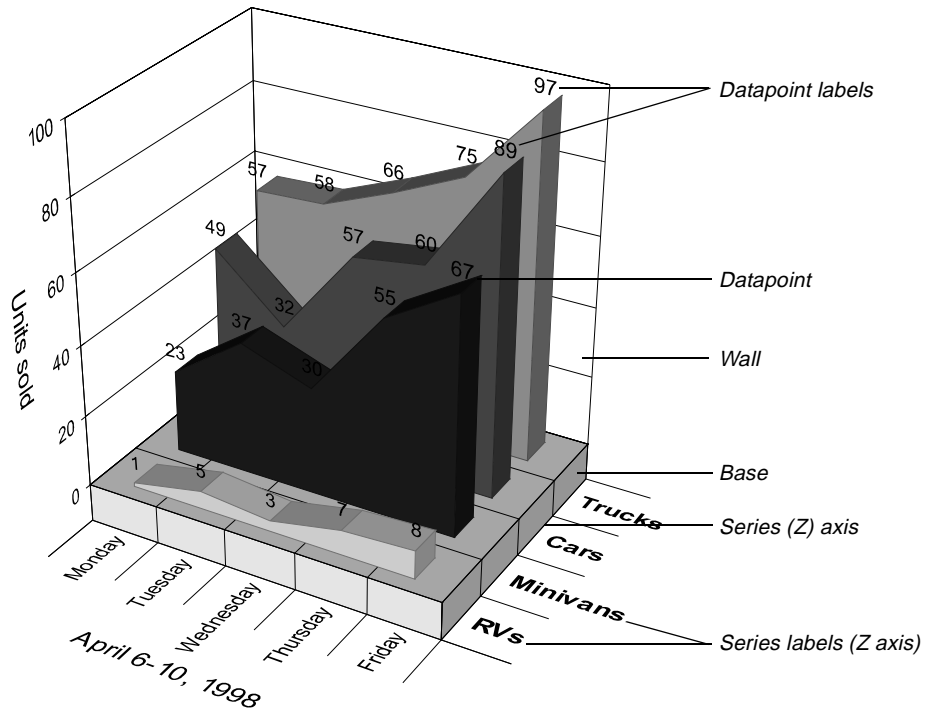
Charts can also have titles, backdrops, legends, plots, and footnotes. The following illustration identifies these common chart elements in their default positions.



The following illustration identifies the elements in a typical 2D chart.



The following illustration identifies the elements in a typical 3D chart.



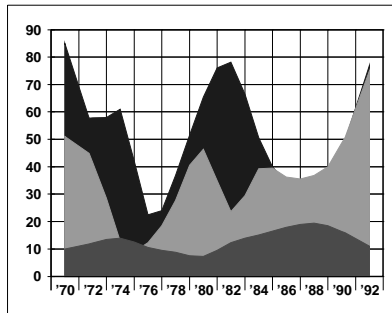
# Chart Types

This section describes each chart type supported by First Impression. The illustrations and general information about the various 2D and 3D chart types might help you determine which chart type best suits your data.

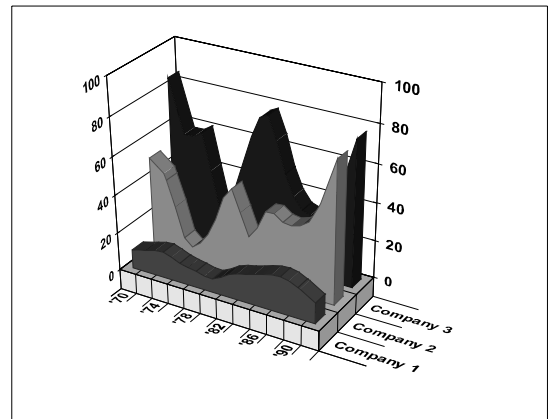
## Area Charts

Use area charts to emphasize the relative importance of values over a period of time. An area chart focuses on the magnitude of change rather than the rate of change.

Each filled area on the chart represents a series and is identified by a different color or pattern. Values are plotted on the vertical (Y) axis and categories are plotted on the horizontal (X) axis. You can also chart one or more series against the secondary Y axis instead of the primary axis if you want to compare different but related things on the same chart..



2D area chart

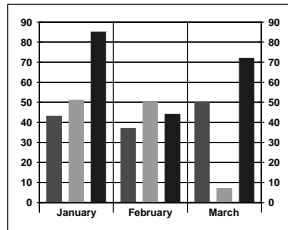


3D area chart

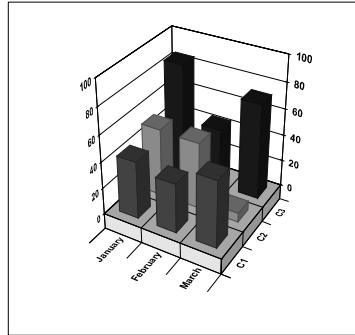
## Bar Charts

Use bar charts to compare one item to another, or to compare a number of items over a period of time. These charts are particularly effective at showing large changes from one category to another.

Each 2D or 3D bar represents a value in the data grid. Bars representing a series are located at the same position in each category and have the same color and pattern.



2D bar chart

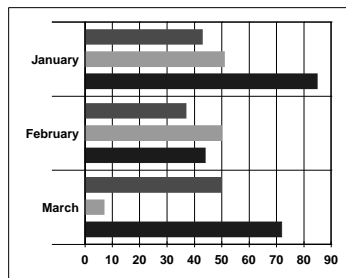


3D bar chart

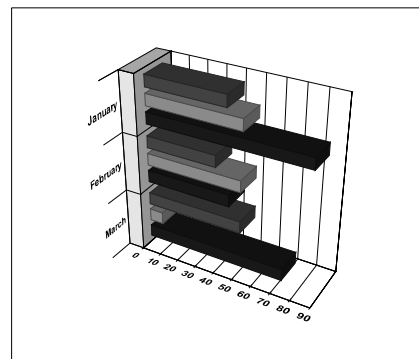
In 2D bar charts, values are grouped on the vertical (Y) axis, and bars are grouped by category along the horizontal (X) axis. On 3D bar charts, values are plotted on the vertical (Y) axis, categories are grouped along the horizontal (X) axis, and the depth (Z) axis shows series.

## Horizontal Bars

Horizontal bars are similar to standard bar charts except that the categories are organized on a vertical (X) axis and the values are plotted on a horizontal (Y) axis.



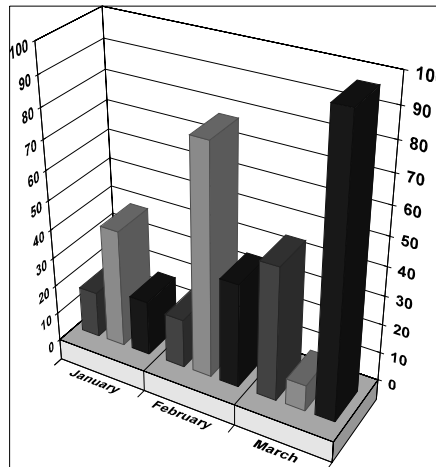
2D horizontal bar chart



3D horizontal bar chart

## Clustered Bars

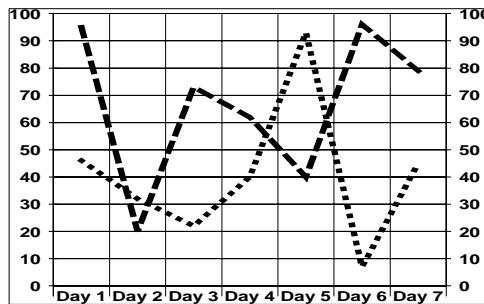
Series and data points in a clustered bar chart are displayed as they are in a 2D bar chart; however, the chart and all the chart elements are displayed in 3D.



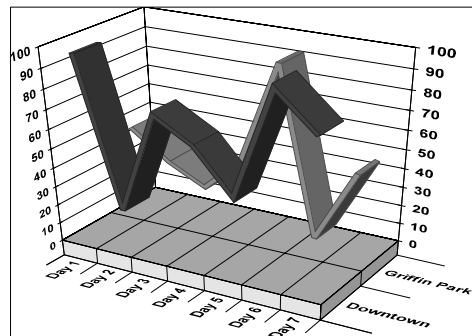
*Clustered bar chart*

## Line Charts

Use line charts to show trends or changes in data over a period of time. These charts emphasize time flow and rate of change rather than amount of change.



*2D line chart*

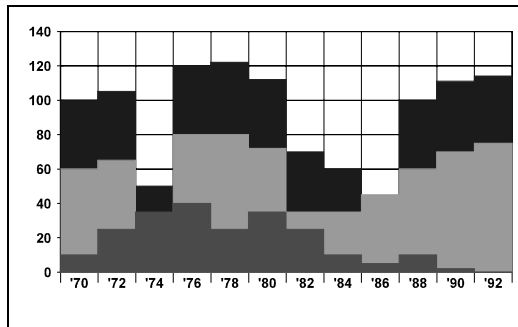


*3D line chart*

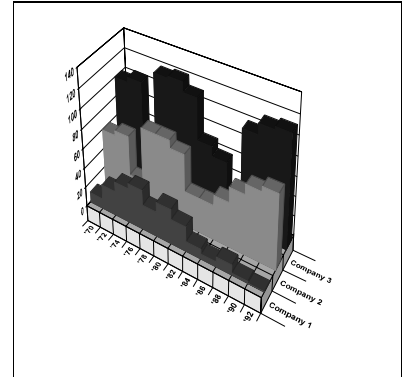
In 2D line charts, values are plotted along the vertical (Y) axis and categories are displayed on the horizontal (X) axis. In 3D charts, values are plotted on the vertical (Y) axis, categories are grouped along the horizontal (X) axis, and the depth (Z) axis shows series.

## Step Charts

Use step charts to compare items that do not show trends. Step charts display distinct points along the value (Y) axis, with vertical lines showing the difference between each point. The horizontal (X) axis shows categories.



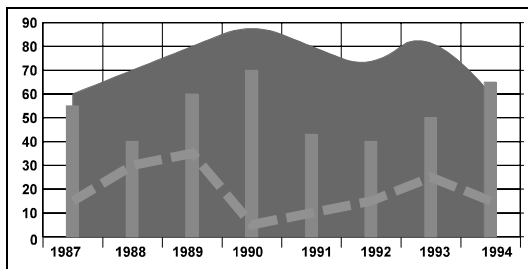
2D step chart



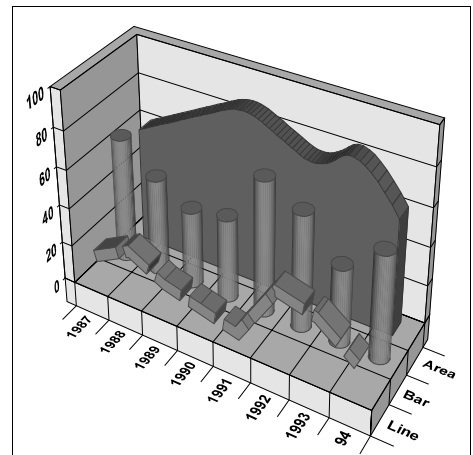
3D step chart

## Combination Charts

Use combination charts to visually highlight the differences between multiple series of data. A different method can be used to draw each data series.



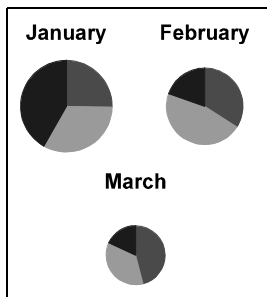
2D combo chart



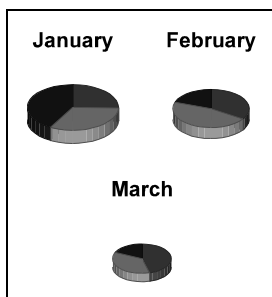
3D combo chart

## Pie and Doughnut Charts

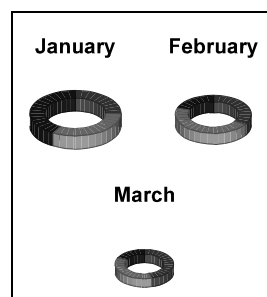
Use pie or doughnut charts to show the relationship of parts to the whole. Each pie or doughnut represents a category. Each slice of the pie or doughnut represents a value in that category. You can separate or “explode” slices in a chart by clicking a slice and dragging it away from the rest of the pie or doughnut.



*2D pie chart*



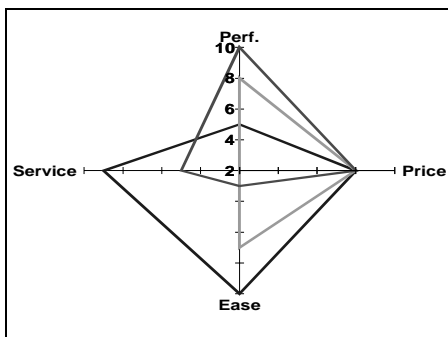
*3D pie chart*



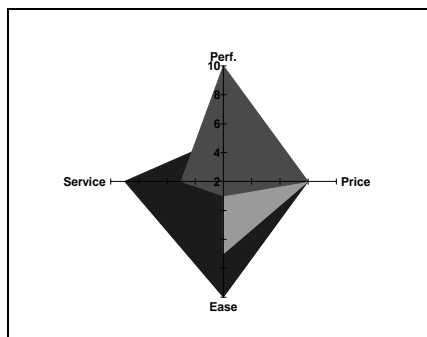
*Doughnut chart*

## Radar Charts

Use radar charts to show changes or frequencies of each series relative to a center point and to one another. Lines connect all the data markers in the same series. You can choose to fill the lines, thereby creating a radar area chart.



*Radar line chart*



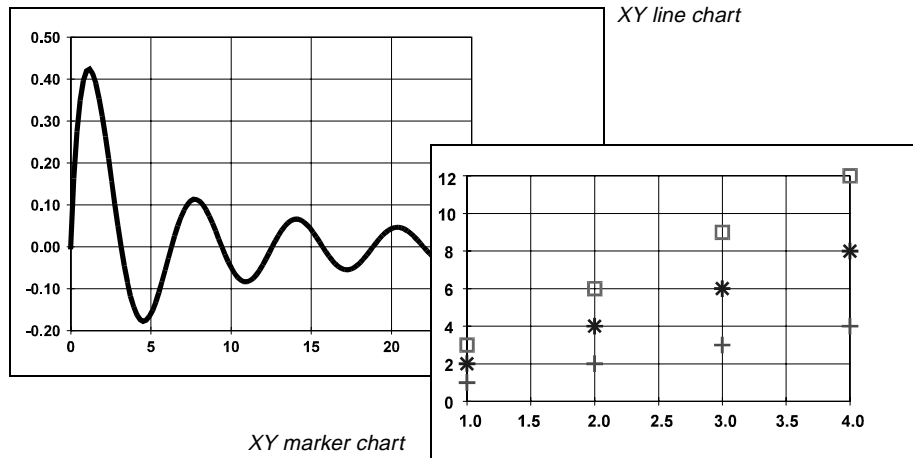
*Radar area chart*



## XY Charts

Use XY charts to plot two groups of numbers as one series of XY coordinates.

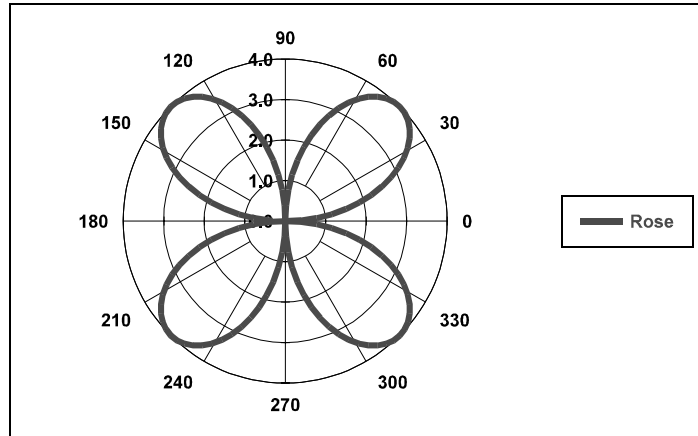
Each series on the chart requires two columns of data in the data grid. The first column holds the X coordinate and the second column the Y coordinate. The column label on the first column in each series is used to identify the series in the legend. Additionally, any formatting applied to the first column is used to display the series on the chart. Any formatting applied to the second column is ignored. You can use markers or lines or both to draw the XY points.



## Polar Charts

Use polar charts to show cyclical trends.

The polar chart requires two columns in the data grid for each chart series: the first column holds the distance from the center of the chart (the radius), and the second column contains the angle on the perimeter of the chart. The column label on the first column in each series identifies the series in the legend. Additionally, any formatting applied to the first column is used to display the series on the chart. Any formatting applied to the second column is ignored.



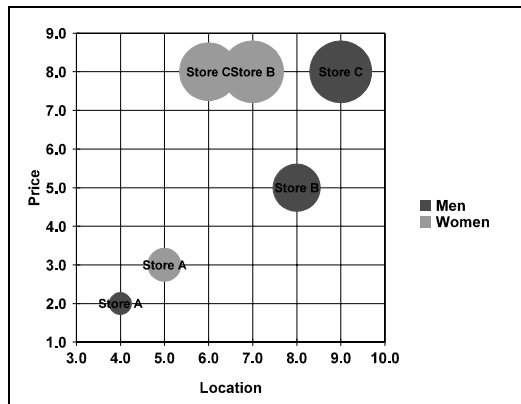
*Polar chart*

## Bubble Charts

Use bubble charts to show a visual comparison using three coordinates.

Each bubble requires three columns of data in the data grid. The first column holds the X coordinate, the second the Y coordinate, and the third the bubble size. All the coordinates in a bubble chart measure values; therefore, the vertical (Y) axis and the horizontal (X) axis both show values.

The column label on the first column in each series identifies the series in the legend. Additionally, any formatting applied to the first column is used to display the series on the chart. Any formatting applied to the second and third columns is ignored.

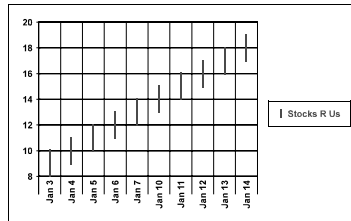


*Bubble chart*

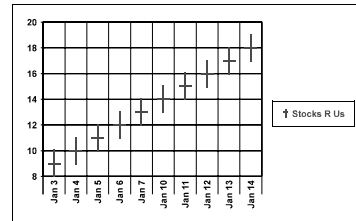
## Hi-Lo Charts

Hi-lo charts are most commonly used to show stock market information. However, these chart types can also be used for scientific data such as indicating changes in readings over a period of time. The vertical (Y) axis shows values and the horizontal (X) axis shows categories or dates.

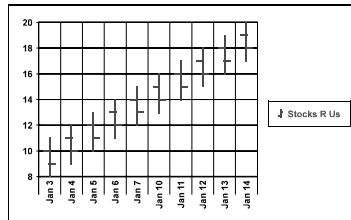
First Impression supports three variations of the basic hi-lo charts. They are: hi-lo-close, with the close marker crossing the data point or extending to the right of the data point; open-hi-lo-close; and open-hi-lo-close bar.



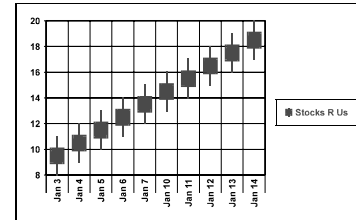
*Hi-lo chart*



*Hi-lo-close chart*



*Open-hi-lo-close chart*



*Open-hi-lo-close bar chart*

The data in the data grid must be organized appropriately for each variation of the hi-lo chart.

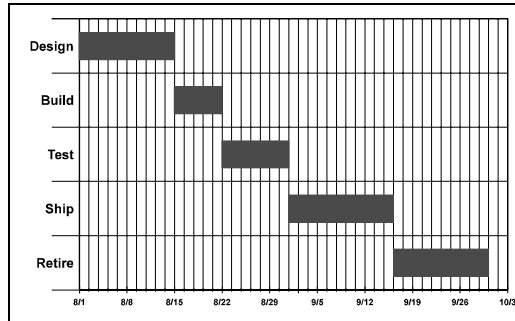
- A hi-lo chart requires two columns of data: the first column is used for the high point and the second is used for the low point.
- A hi-lo-close chart requires three columns of data: the first column is used for the high point, the second for the low point, and the third for the closing point.
- An open-hi-lo-close or a open-hi-lo-close bar chart (sometimes called candle stick charts) requires four columns of data: the first column is used for the open point, the second for the high point, the third for the low point, and the fourth for the closing point.

The column label on the first column in each series identifies the series in the legend. Additionally, any formatting applied to the first series is used to display the series on the chart. Any formatting applied to the remaining series is ignored.

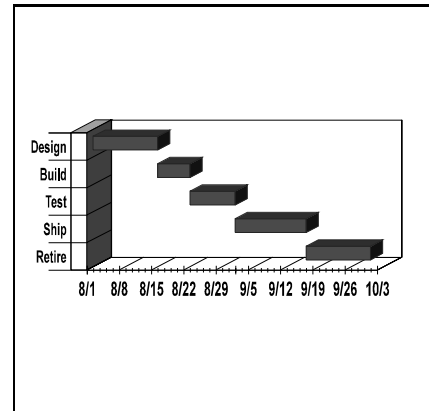
## Gantt Charts

Use Gantt charts to display a range of bars that indicate the relative time required for various activities within a project. The horizontal axis (Y) shows dates and the vertical axis (x) shows categories.

This chart type requires two columns of data. The first column holds the start date, and the second column holds the duration.



2D Gantt chart



3D Gantt chart

## Elevation Charts

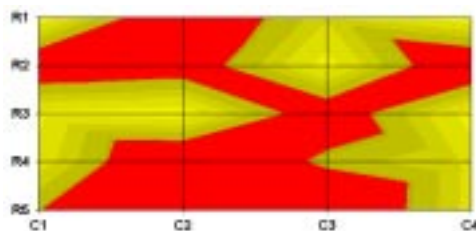
Elevation charts are commonly used to display topographic data. There are two types of elevation charts: contour charts and 3D surface charts.

Elevation charts do not have series data. The data grid requires at least two columns and two rows of data in order to draw a surface or contour chart. If the data grid is missing data, a value of zero is supplied.

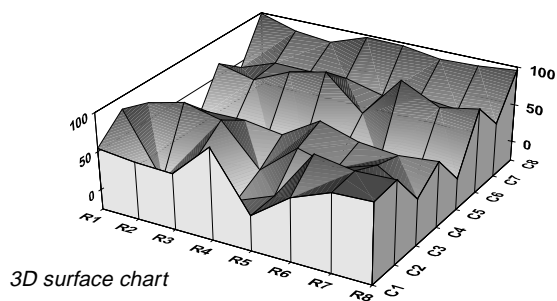
A contour chart is drawn as a two-dimensional area. Changes in the data plotted on this chart are demonstrated through variations in color known as contours. Contours are drawn on the chart as either colored bands or lines. Contour bands can be represented on the chart in dramatic contrast or as a subtle transition in hue known as gradient. Contour charts do not have a value axis; the variation in color is represented in the legend instead.

A surface chart is drawn as a rectangular grid with a surface base or floor. The value axis is drawn perpendicular to the chart base, giving the chart its three-dimensional quality. Data variations are plotted on this chart at raised elevations from the surface. The data points themselves are plotted on grid intersections at the corresponding value axis elevation, thus giving the chart depth.

Contours can be applied to surface charts to display additional information. These variations in color bands or lines are projected on the chart's three-dimensional surface and can demonstrate a separate collection of data, independent of elevation.



*2D contour chart*

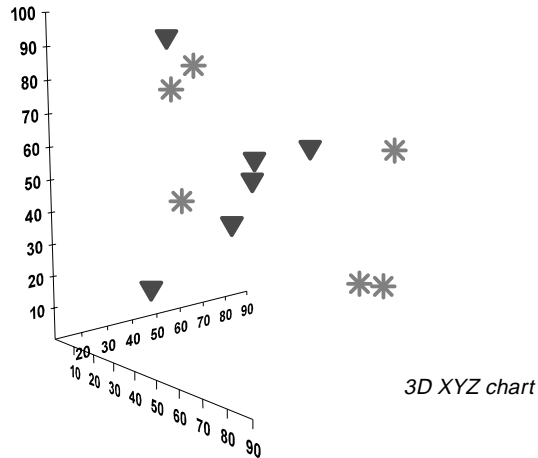


*3D surface chart*

## 3D XYZ Charts

This chart shows variation and relationships over three sets of values plotted on a three-dimensional grid. Each data point represents the intersection of the X,Y and Z axes.

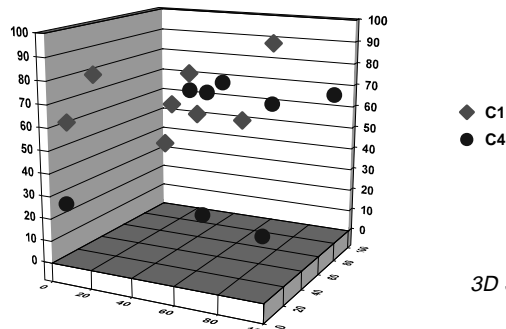
Each series on the chart requires three columns of data in the data grid. The first column holds the X coordinates, the second column holds the Y coordinates and the third column holds the Z coordinates.



## 3D Scatter Charts

This chart is drawn as a three-dimensional grid with a base and walls. It plots data points created by the intersection of three different coordinate values.

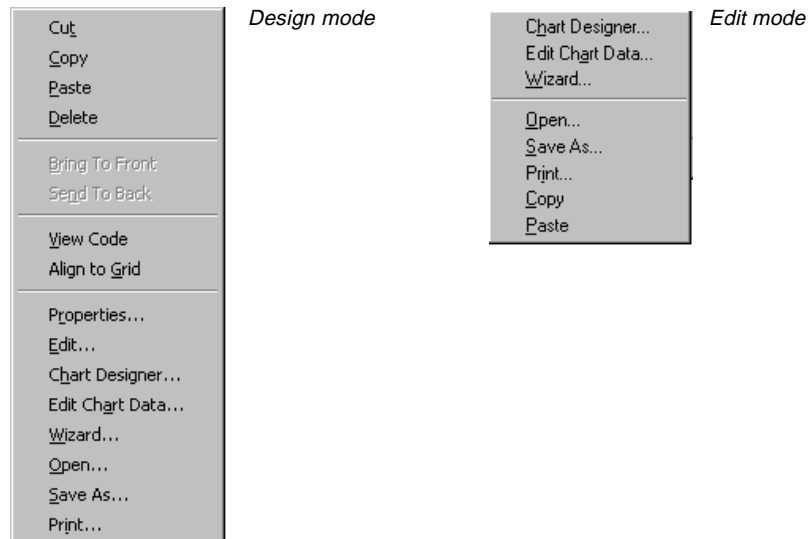
Each of the three values that make up a point corresponds to a particular axis in a 3D grid. Each series on the chart requires three columns of data in the data grid. The first column holds the X coordinates, the second column holds the Y coordinates and the third column holds the Z coordinates.



## Using the Context Menu

Click the right mouse button anywhere within a First Impression chart to display the context menu. Once the menu appears, use the left mouse button to select a menu item. Clicking on menu items followed by three periods displays a set of property pages or a dialog box.

When the application is in edit mode, the context menu provides a subset of the menu items that are displayed when the application is in design mode. The following illustration shows examples of the context menu in edit mode and in design mode.



The following table includes a description of each menu item on the context menu.

Item	Description
Cut	Cuts the current chart and places a copy of it on the clipboard in Windows Metafile (.wmf) format.
Copy	Places a copy of the current chart on the clipboard in Windows Metafile (.wmf) format.
Paste	Takes a graphic in Windows Bitmap (.bmp), Windows Metafile (.wmf) format, or Joint Photographic Experts Group format (.jpg) from the clipboard and places it in the selected element's backdrop or fill.
Delete	Removes the current chart.
Bring to Front	Places the selected objects in front of other objects.
Send to Back	Places the selected objects behind other objects.
View Code	Allows you to view the code for the selected object.



Item	Description
Align to Grid	Aligns the top left of the selected objects on your form to the closest grid. The objects are not resized.
Properties	Displays Property Pages that allow you to format your chart.
Edit	Accesses edit mode.
Chart Designer	Displays the Chart Designer.
Edit Chart Data	Modifies the data, rows, columns, and labels in the data grid.
Wizard	Guides you through the chart design process.
Print	Displays the Print dialog box.
Save As	Saves the current file as a chart file (.vtc), a bitmap (.bmp), a metafile (.wmf), or a Joint Photographic Experts Group (.jpg) file.
Open	Loads an existing chart file into the current chart control. The chart you load replaces the chart already in the control.

## Selecting Chart Elements in Edit Mode

You can click the left mouse button on a chart element to select it when First Impression is in edit mode.

### ► To start edit mode:

1. Right-click the chart control on the form.
2. Choose Edit from the context menu.

You are now able to select chart elements. The following table provides information about selecting each chart element.

To select...	Click...	Effect
Chart	In the chart, but not on a specific chart element.	Selection handles appear around the chart.
Chart title	Anywhere in the title area.	Selection handles appear around the title. You can resize or reposition it.
Footnote	Anywhere in the footnote area.	Selection handles appear around the footnote. You can resize or reposition it.
Legend	In the legend, but not the legend keys.	Selection handles appear around the legend. You can resize or reposition it.
Series	On an element in an unselected series, or on the legend key identifying the series.	Selection handles appear on all the elements of chart series. Handle also appears on legend key.
Series Label	Anywhere in the series label.	Selection handles appear around the label. You can reposition it.

To select...	Click...	Effect
Plot	In the plot, but not on a specific chart element.	Selection handles appear around the chart plot. You can resize or reposition it.
Axis	On the axis text, axis line, or axis ticks.	Selection handles appear on the axis. You cannot manually resize the axis.
Axis title	Anywhere in the axis title area.	Selection handles appear around the axis title.
Chart grid	On any grid line.	Selection handles appear around the grid.
2D wall and 3D wall or base	Any part of the base or wall other than a grid line.	Selection handles appear around the wall in a 2D chart, and the base and wall in a 3D chart.
Data point	Click on a data point in a selected series, or on a data point in the same series as another selected data point.	Selection handles appear on the single data point only.
Data point label	Anywhere in the data point label.	Selection handles appear around the data point label. You can reposition it.

## Using the Data Grid Editor

You can easily modify the data in the data grid using the Data Grid Editor. Refer to Chapter 4, “Using the Data Grid Editor” for more information about editing data and data grid requirements of various chart types.

### ► To access the Data Grid Editor:

1. Right-click the chart control on the form to display the context menu.
2. Choose Edit Chart Data... from the menu.

Once the Data Grid Editor is displayed, you can easily modify the data in the data grid without setting property values.

## Using the Chart Wizard

The Chart Wizard provides you with another way to design charts. It guides you through the process required to create a new First Impression chart or modify an existing chart for use with your application. Using the Chart Wizard, you can quickly accomplish many design tasks that would otherwise take much longer to complete.

➤ **To access the Chart Wizard:**

1. Right-click the chart control on the form.
2. Select Wizard from the context menu.

The Chart Wizard displays. Refer to Chapter 5, “Using the Chart Wizard” for more information about creating and modifying charts using the Chart Wizard.

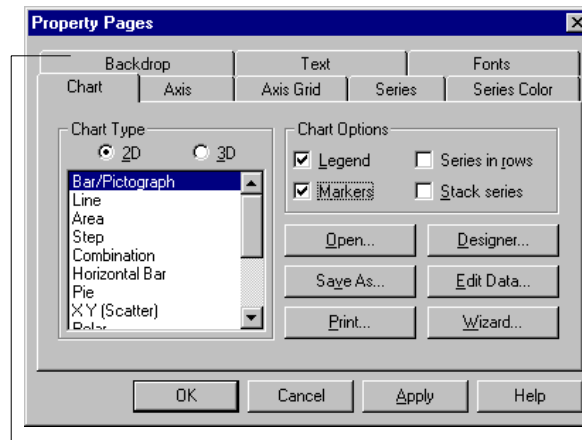
## Changing Properties

Once a chart is placed in the container, you can access the property pages through the context menu if the ActiveX container supports it. Not all the containers behave in the same manner. In Visual Basic, you access the context menu by right-clicking the chart control.

➤ **To display the chart properties:**

1. Right-click the chart control on the form.
2. Choose Properties from the context menu.

The chart property pages display, as shown in the following illustration.



Select the tabs to set properties for the chart.

You can format chart attributes using property pages in a similar manner as in the Chart Designer. Refer to the chapters throughout this book to learn more about formatting chart attributes.

## Applying Properties Using Visual Basic

When using OLE property pages, the ActiveX container controls when properties are applied to the chart. In Visual Basic, when you set a property for a chart that property is applied to the chart either when you move to another tab in the property page dialog, or when you click the Apply button. All the tab changes are applied when the OK button is clicked to exit the dialog.

## Using the Chart Designer

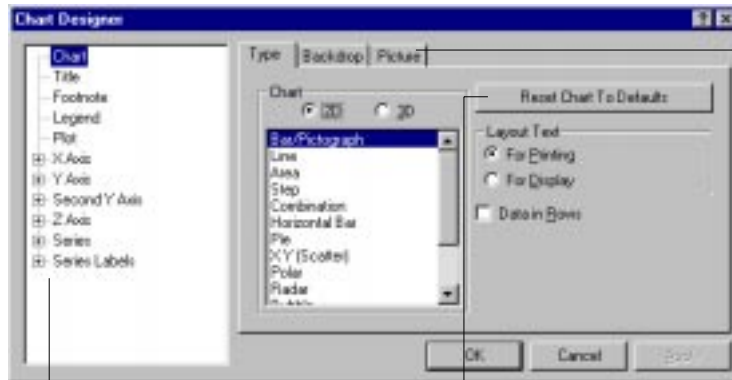
After you place a chart in a container, you can use the Chart Designer. The Chart Designer allows you to select multiple and common chart elements and set properties interactively and simultaneously for the elements. However, the Chart Designer does more than just allow you to interactively design your chart. The Designer's tree-view outline allows you to select multiple and common chart parts and set properties for all the selected parts at once.

## Accessing the Chart Designer

Once your chart is placed in the container, you can access the Chart Designer in two ways:

➤ **To display the Chart Designer when in design mode:**

1. Right-click the chart control on the form and choose Chart Designer from the context menu. The following illustration shows the Chart Designer.



*The tabs that are displayed depend upon your selection in the tree view. If you select different chart elements simultaneously, the tabs that are common to all the selected elements are displayed.*

*The Chart Designer provides a tree view that allows you to interactively design a chart.*

*Click this button to reset any chart modifications back to the default settings.*

2. When your changes are complete, click OK or Apply to redraw the chart to reflect the changes.

You can also quickly edit individual chart elements if you access the Chart Designer from edit mode. For example, if you want to edit the value scale of the Y Axis on a chart, you could display the Chart Designer with the Y Axis already highlighted in the Chart Designer tree view, and the current settings displayed in the Value Scale tab.

Use the following procedure to quickly edit chart elements.

► **To display the Chart Designer from edit mode:**

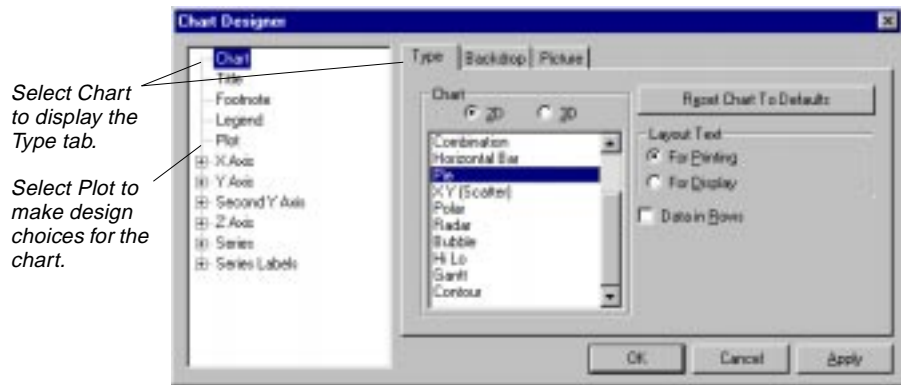
1. Right-click the chart control on the form.
2. Choose Edit from the context menu.
3. Double-click the chart element that you want to edit.
4. The Chart Designer is displayed showing all the tabs that apply to the chart element.
5. Make your desired changes, and click OK or Apply to redraw the chart to reflect the modifications.

## Selecting Chart Elements From the Tree View

The Chart Designer provides an organizational tree view for selecting chart elements and making property changes. The key to working in the Chart Designer is understanding how to select individual and multiple chart elements, and how your changes affect those selected elements. This section of the documentation demonstrates how to select the appropriate chart element and how to make desired changes.

## Selecting the Chart and Plot

The Type tab, which is available when you select Chart from the Chart Designer tree view, allows you to declare the type of chart you wish to design. However, you make most of your design decisions for charts when you select Plot from the Chart Designer tree view. The following illustration describes how to declare a chart type and set design options.



## Selecting Chart Title, Footnote, and Legend

The title, footnote, and legend chart elements share four common tabs, so it makes sense to set common attributes for all these chart elements simultaneously. An example of setting a common attribute would be to set an identical font style and size for the chart title, footnote, and legend. The following illustration shows how to select the chart elements discussed in this section.

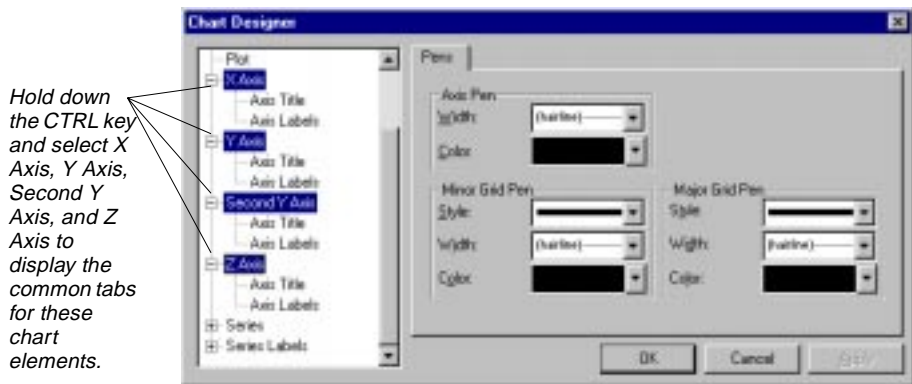


## Selecting Axes

In the Chart Designer tree view you can select a specific axis for a chart or you can select all the axes and set common attributes from the available tabs. Once the axis titles are selected, you can make design choices from the available tabs.

**Note** Not all the chart types contain all the axes. For example, 2D charts do not have a Z axis. In addition, depending on the type of data in your chart, your axis might be one of three possible scale types: Category, Value, or Date scale. For more information about the kind of axes your chart contains, see Chapter 8, “Formatting Axes.”

The following illustration shows how to select the axes.

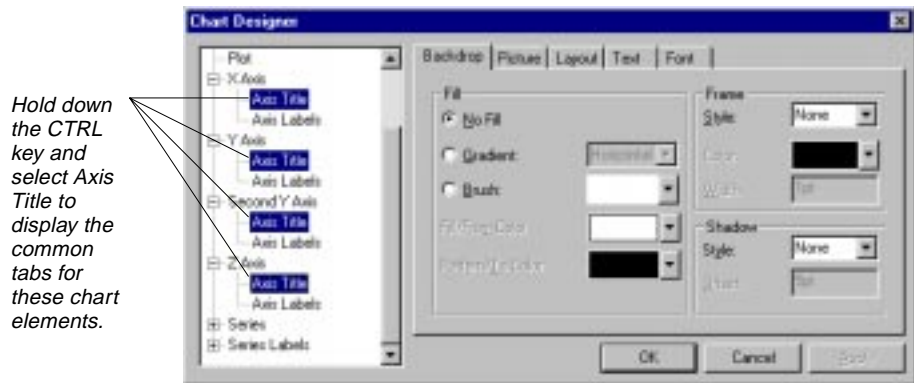


## Selecting Axis Titles

In the Chart Designer tree view, you can select a specific axis title for a chart or you can select all the axis titles and set common attributes from the available tabs. Once the axis titles are selected, you can make design choices from the available tabs.

**Note** The Axis Title Object in the First Impression API has a **Visible** Property that is not exposed in the Chart Designer. In order to actually place axis titles on your chart, you must edit or modify the default axis title text that exists in the Text tab, then click the Apply button.

The following illustration shows how to select the axes titles.



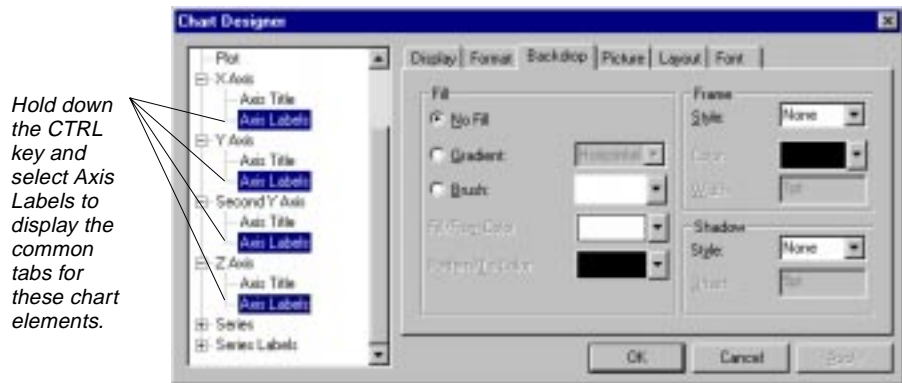


## Selecting Axis Labels

In the Chart Designer tree view, you can select a specific axis label for a chart or you can select all the axis labels and set common attributes from the available tabs.

**Note** Not all the chart types contain all the axes. For example, 2D charts do not have a Z axis. In addition, depending on the type of data in your chart, your axis might be one of three possible scale types: Category, Value, or Date scale. Category axes have text labels identifying the category or series in the chart. Value axes display numbers as values or percents. Date/time axes display a range of dates and/or times. For more information about the kind of axes your chart contains, see Chapter 8, “Formatting Axes.”

The following illustration shows how to select the axis labels.

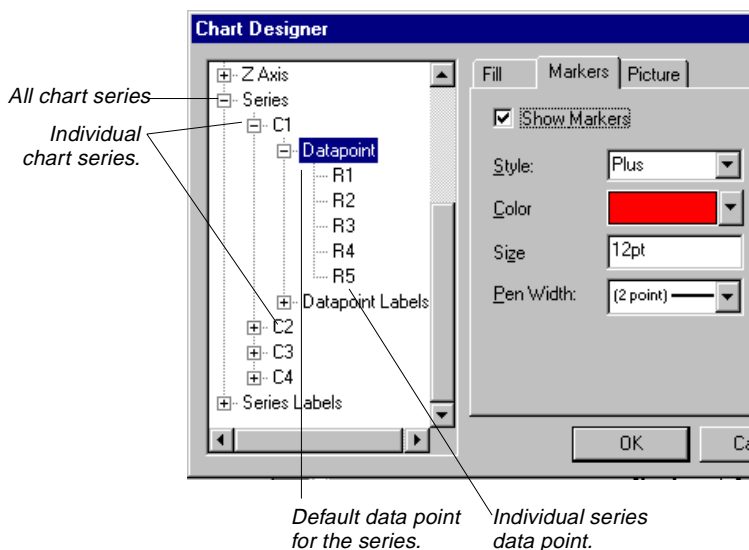


## Selecting Series and Data Points

In the Chart Designer tree view, you can select and format series data and data points in many ways. For example:

- To make changes to the attributes that all the series in the current chart have in common, select the Series level.
- To make changes to the attributes for a specific series, select an individual series (such as C1).
- To make default settings for all the data points in a series, select a default data point. Any data point that does not have any custom settings inherits the settings of the default data point.
- To make custom changes to a specific data point within a series, select an individual data point (such as R1).

The following illustration identifies the chart elements that are affected when you select a particular series or data point tree view level.

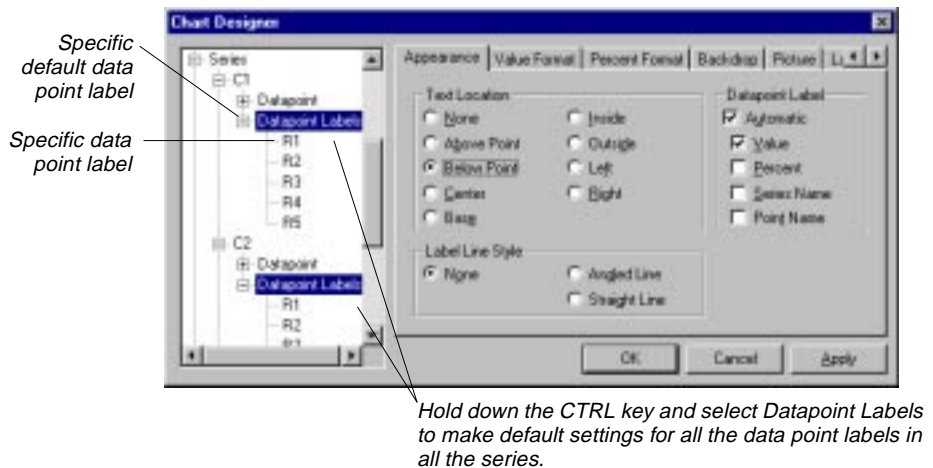


## Selecting Data Point Labels

In the Chart Designer tree view, you can select and format data point labels in many ways. For example:

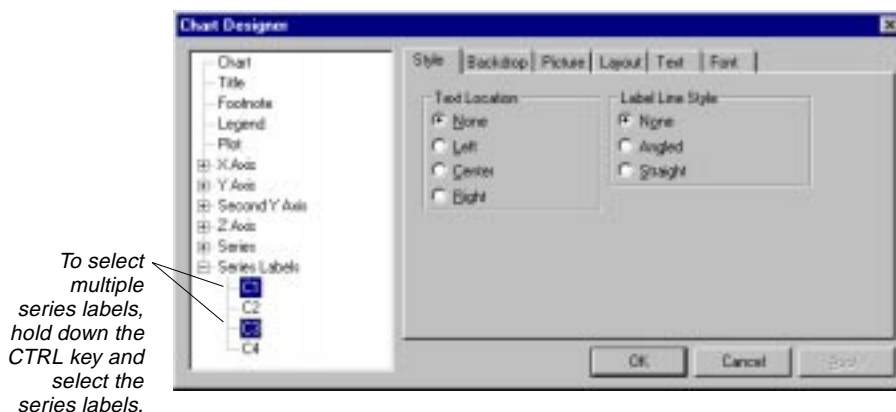
- To make custom changes to a specific data point label within a series, select an individual data point label (such as R1) for a specific series (such as C1).
- To make default settings for all the data point labels in a particular series, select a specific default data point label. Any data point that does not have any custom settings inherits the settings of the default data point label.
- To make default settings for all the data point labels in all the series, select all the default data point labels (Datapoint Labels) for each series. Any data point that does not have any custom settings inherits the settings of the default data point labels.
- To make custom changes to the selected data point labels for each series, select multiple data point labels (such as R1) for multiple series (such as C1 and C2).
- To make custom changes to all the selected data point labels, select all the data point labels (such as R1-R5) for all the series (such as C1-C4). It is important to note that this is considered a custom data point label, and would therefore, override any default data point label attributes.

The following illustration further explains how to select data point labels.



## Selecting Series Labels

In the Chart Designer tree view you can select a specific series label for a chart or you can select multiple series labels and set common attributes from the available tabs. Once you have selected the appropriate series labels, you can make the desired design choices from the tabs. The following illustration shows how to select multiple series labels.



## Finding No Common Pages

The No Common Pages tab appears when the Chart Designer is unable to display tabs for the selected chart elements in the tree view. This tab might appear for the following reasons:

- One or more of the selected chart elements do not share common tabs. For example, if you select unrelated chart elements such as footnote and series, the Chart Designer cannot display common tabs.
- The Chart Designer cannot display a single tab for the selected chart element. For example, Series Labels has no Chart Designer pages.
- The selected chart element does not apply to the current chart type. For example, if the current chart type does not have a secondary Y or Z axis, this tab displays when either axis is selected in the tree view.

If this tab appears, try making your selection again or limiting the number of chart parts you select.

## Using the Chart Designer to Apply Changes

When using the Chart Designer, you may select options on each tab displayed for the selected chart part. The options you select from all the tabs are applied to the chart when you click the Apply button or the OK button. Changes are not applied to the chart as you move from tab to tab. Only the Apply button, or the OK button affects the chart.

## CHAPTER 3

# Managing Charts

This chapter provides information about managing your charts. For example, it covers:

- Manually repositioning and resizing chart elements.
- Exporting charts.
- Loading saved charts.
- Deleting charts.
- Setting print options and print setup.
- Linking to a Formula One spreadsheet.

## Manually Repositioning and Resizing Chart Elements

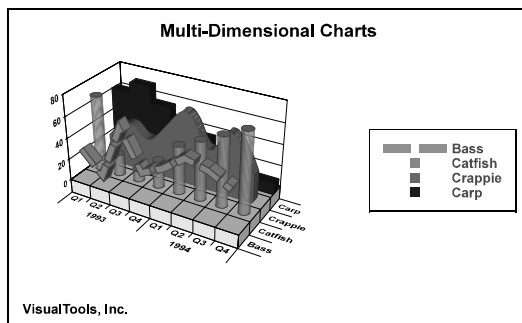
You can override the layout of chart elements by selecting and dragging elements on the screen or by specifying settings in the Chart Designer. When you manually reposition an element, it is no longer in automatic layout mode. First Impression no longer considers the element when allocating space for the remaining chart elements that use automatic layout.

➤ **To resize or reposition objects manually:**

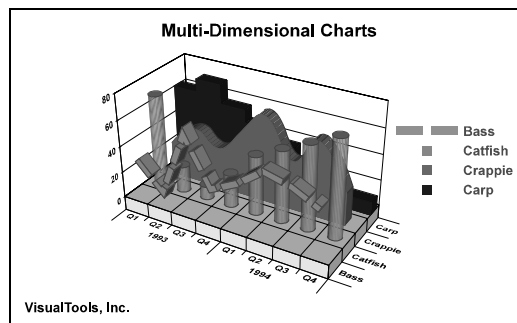
1. Select the title, footnote, plot, or legend.
2. When the object is surrounded by selection handles, drag it to a new location or resize it as desired.

What you are actually resizing is not the text or plot itself, but the bounding rectangle around the object. Based on the size you make the object, First Impression may have to resize or clip objects to fit the space.

The following illustration shows the results of resizing and repositioning chart elements.



Automatic Layout



Custom Layout

*The custom chart was given more impact by enlarging the plot and repositioning it higher in the chart. The border was also removed from the legend and it was repositioned slightly to better fit with the resized plot.*

---

**Note** To reposition or resize a chart element using the Chart Designer, select the Custom Location radio button in the Location tab for the chart element that you want to modify.

---

## Exporting Charts

There are two ways to export copies of a chart or chart element from First Impression: by copying it to the clipboard, or by saving it to a file.

### ➤ To copy a chart to the clipboard:

1. Click the right mouse button.

Selection handles appear.

2. Choose Copy from the resulting context menu.

A copy of the current chart or chart element is placed on the clipboard in Windows Metafile format. You can then view it in any application that supports the .wmf format.

### ➤ To save the chart to a file:

1. Use the right mouse button to display the context menu and choose Save As.

The Save As dialog box appears.

2. Enter a name and path for the file.
3. Select a file type from the Save File As Type list.

You can save the chart in the native First Impression format (.vtc), as a standard metafile (.wmf), as a Windows bitmap (.bmp), or as a Joint Photographic Experts Group (.jpg) file. By default, the Adobe placeable header information is included in the metafile.

4. To save the metafile without the Adobe Placeable header information, check Save metafile without size information.

Do not check this option if you intend to use this metafile in a Microsoft application such as Word or Excel. These applications expect size information to be included in metafiles.

5. To save the text on the chart as curves check Save Text As Curves.

You should check this option if you are using an unusual font that might not be present on other systems using the metafile. This option should also be used to properly display text if you are deforming the metafile by stretching it.

6. Click Save.

## Loading Saved Charts

You can open a chart that was saved in First Impression's native format into the current chart control. Any chart that currently exists in the control is discarded.

### ► To load a file:

1. Use the right mouse button to display the context menu and choose Open.

The Open dialog box appears. A list of all the .vtc files in the current directory is displayed.

2. Select the file you want to open.
3. Click OK.

## Deleting Charts

You can delete a chart using First Impression's context menu. However, you cannot delete individual chart elements.

### ► To delete a chart:

1. Click the chart using the right mouse button.
2. Choose Delete from the resulting context menu.

The chart is removed.

## Printing Charts

You can print a copy of the current chart. You can also set print and page layout settings.

➤ **To print a chart:**

1. Use the right mouse button to display the context menu and choose Print to display the Print dialog box.
2. Make any necessary settings and click Print.

Specific information about the settings that you can access from the Print dialog box is presented in the following discussion.

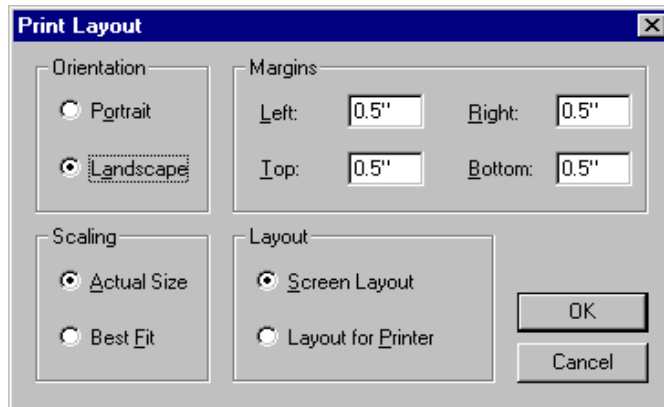
## Setting Print Options

The Print Layout dialog box allows you to specify print and page layout settings such as page margins and position, scaling, and orientation.

➤ **To access the Print Layout dialog box:**

1. Use the right mouse button to display the context menu and choose Print to display the Print dialog box.
2. Click the Layout button.

The following illustration shows the settings in the Print Layout dialog box.





➤ **To specify print settings:**

1. In the Orientation section of the Print Layout dialog box, select the Portrait radio button to specify a Portrait orientation. Alternatively, click the Landscape radio button to specify a Landscape orientation.
2. In the Scaling section of the Print Layout dialog box, select the Actual Size radio button to print the chart at the original size it was created. Alternatively, select the Best Fit radio button to scale the chart proportionally to fit the page.
3. In the Margins section of the Print Layout dialog box enter a value in inches or centimeters, depending on your Windows settings, to specify the left, top, right, and bottom margins of the page.
4. In the Layout section of the Print Layout dialog box, select the Screen Layout radio button to print the chart exactly as it appears on the screen. Select the Layout for Printer radio button to adjust the chart to best fit the page. Chart elements such as axis labels and data points are repositioned as they would be if you had resized the chart on the screen.
5. Click OK to accept the settings.

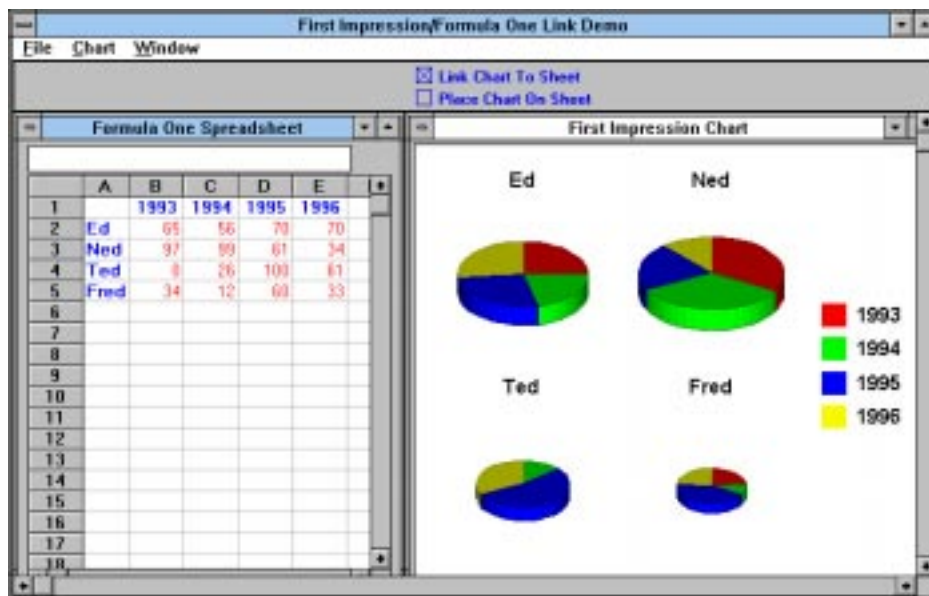
## Changing Printer Setup

If you click the Properties button located on the Print dialog box, you can set standard Windows settings for selecting the printer, page orientation, and paper size and source.

## Linking to a Formula One Spreadsheet

You can create a link between a First Impression chart control and a Formula One spreadsheet control. Once the link is activated, the data from the spreadsheet is imported into the data grid. As long as the link remains active, the spreadsheet notifies the chart control of any charted data changes. The chart automatically redraws to reflect the change. To organize your spreadsheet data appropriately, you must understand the data grid information presented in Chapter 4 and the data grid requirements of each chart type as outlined at the end of Chapter 4.

The following illustration shows a form containing a First Impression chart control and a Formula One spreadsheet control. To view the code behind this form, refer to the Formula One Link demo that is shipped with First Impression.



Notice that the data in the spreadsheet control must be organized in a manner that the chart's data grid can understand. In the case of the previous illustration, the first row of labels are used to identify each series in the legend. The first column of labels are used to identify each pie. Each column of data in the spreadsheet represents a different slice of the pie.

For additional information, run the data grid demo supplied with First Impression. This demo shows the minimum amount of data required for each chart type and shows how that data should be organized.

## Setting Up the Link

First Impression provides three properties to set up the link between the spreadsheet control and the chart control.

- Use the **SsLinkBook** property to identify the spreadsheet.
- Use the **SsLinkRange** property to identify the range within the spreadsheet control that contains the data you want to chart.
- Use the **SsLinkMode** property to specify whether or not the link is active and how First Impression interprets the spreadsheet data.

## Identifying the Spreadsheet

You must identify the Formula One spreadsheet you want to use as the data source for the chart. Identify the spreadsheet by table name and not the handle of the spreadsheet control. You can determine the table name using the Formula One **TableName** property.

## Specifying a Data Range

You must also identify the range within the spreadsheet that holds the data you want to chart. This range can be identified by name or coordinates, although the use of named ranges is recommended.

There are also a number of other rules that apply when specifying a data range:

- A defined name used as the source range for the link must contain absolute references, not relative references.
- The source range cannot contain external sheet references.
- First Impression does not interpret “backward” ranges. For example, enter the range \$A\$4:\$D\$19, not \$D\$19:\$A\$4.

## Controlling the Link Behavior

There are three different modes you can use to link to a spreadsheet control: off, on, and autoparse.

- **Off.** The link is not active. Any changes in the spreadsheet are not automatically updated in the chart.
- **On.** The link is active and changes in the spreadsheet are automatically displayed in the chart. In this mode, First Impression makes no attempt to determine if the data in the specified range is text labels or data. You must first identify how many levels of row and column labels, and how many rows and columns of data your data range contains. Enter these values in the **ColumnCount**, **RowCount**, **ColumnLabelCount**, and **RowLabelCount** properties to set the dimensions of the data grid. If these dimensions do not match the data in the spreadsheet range, you may get unexpected results.
- **AutoParse.** The link is active and changes in the spreadsheet are automatically displayed in the chart. In this mode, First Impression analyzes the data in the specified spreadsheet range and attempts to determine the number of levels of column and row labels. It also tries to determine how many data columns and data rows are in the specified range. First Impression then adjusts the settings of the **ColumnCount**, **RowCount**, **ColumnLabelCount**, and **RowLabelCount** properties to match the dimensions of the data imported from the spreadsheet.

---

**Note** AutoParse mode can be very useful when linking to simple ranges of data that are organized in exactly the way First Impression expects to find the data. However, using On mode and setting the data grid dimensions yourself is recommended in most cases that involve more complex data or unusual data arrangements. For example, if your data does not contain column labels, AutoParse may become confused and you may not get the chart you expect.

---

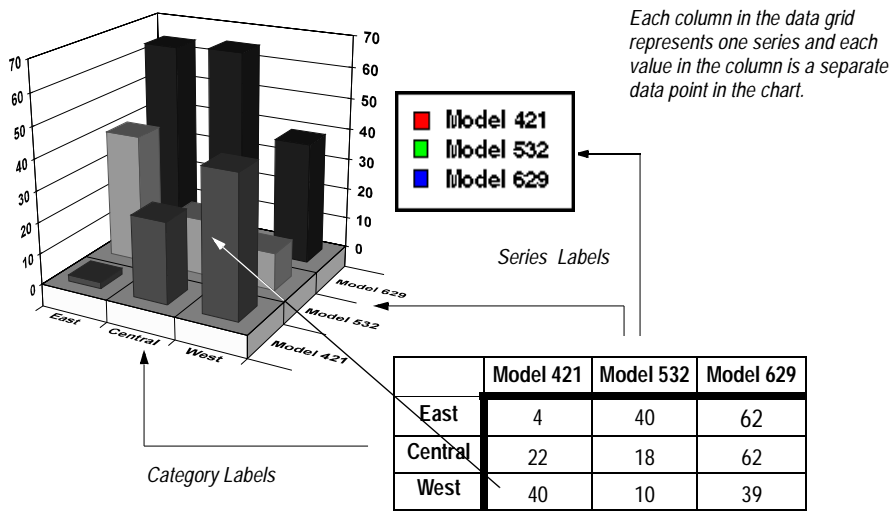
# Understanding Data Grids

Data grids hold text for series and category labels and charted values on charts. A data grid is comparable to an array or table containing chart information.

## Charting Grid Data

Each chart has a data grid associated with it. The data grid portrayed in the following illustration is a table that holds charted data. The data grid can also include labels used to identify series and categories on a chart. The person who designs your chart application fills the data grid with information by inserting data, or by importing data from a spreadsheet or array.

The following illustration shows the data grid and a chart, as well as the relationship between them.



In most cases, each column in the data grid translates to one series on the chart. However, First Impression supports a number of chart types that require two or more columns of data to chart a series. These chart types include XY, polar, bubble, hi-lo, and Gantt charts. Specific information about the data grid requirements of these chart types is included in the following discussion.

**Note** You might format a chart in an application designed for you by someone else. To use one of the chart types that requires more than one column of data for a series, you might need to have that person familiarize you with the structure of the chart data.

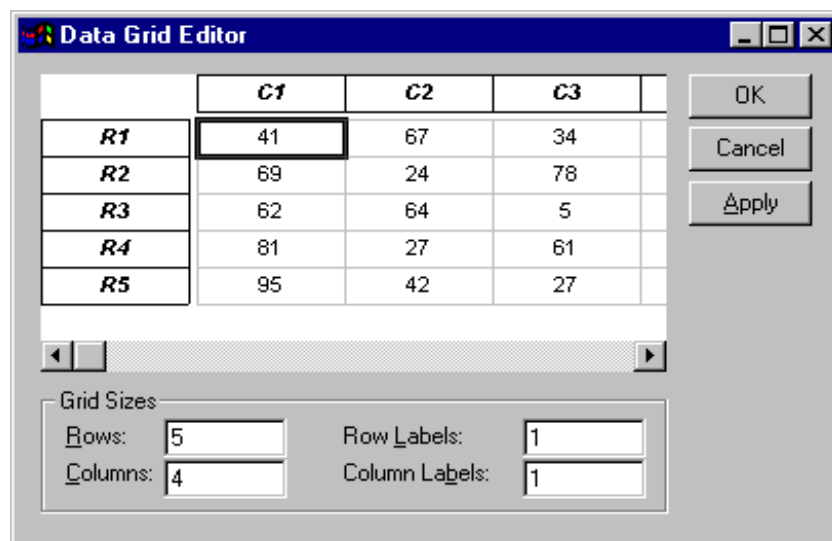
## Using the Data Grid Editor

You can easily modify the data in the data grid using the Data Grid Editor.

► **To access the Data Grid Editor:**

1. Right-click the chart control on the form to display the context menu.
2. Choose Edit Chart Data...

The Data Grid Editor displays as shown in the following illustration.



Since the data grid is initially filled with random data, you can start by resizing the data grid to agree with the size of the worksheet containing your data. To resize the grid, indicate the correct number of rows and columns for your worksheet in the Data Grid Editor. You can also specify the number of levels of labels for the rows and columns.

The following example describes how to resize the data grid.

➤ **To resize the data grid for eight rows and columns of data:**

1. Double-click the mouse cursor in the **Rows** text box of the Data Grid Editor to select the current row value.
2. Type the number 8.
3. Tab to the **Columns** text box and type the number 8.
4. Tab to exit the **Columns** text box.
5. Click the Apply button.

The data grid displays eight columns and eight rows. The additional column and row cells appear empty. Once you have resized the data grid to accommodate your worksheet data, you can modify the grid data.

➤ **To change the number of row labels and column labels:**

1. Double-click the mouse cursor in the **Row Labels** text box of the Data Grid Editor to select the current number of row labels.
2. Type the number of desired row labels.
3. Tab to the **Column Labels** text box and type the number of desired column labels.
4. Tab to exit the **Column Labels** text box.
5. Click the Apply button.

The data grid displays the modified number of column and row labels. Once you have changed the number of row and column labels, you are ready to modify the row and column labels.

➤ **To modify row and column labels in the grid:**

1. Use the mouse, tab key, or left, right, up, and down arrow keys to navigate to the desired row or column label cell. When a label cell is active, the cell location is highlighted in black.
2. Type the new label in the active cell.

The cell displays the new label and replaces the previous label when you exit the cell. You can exit the grid cell using the navigational keys or the Enter key.

➤ **To modify grid data:**

1. Use the mouse, tab key or left, right, up, and down arrow keys to navigate to the desired cell. When a cell is active, the cell location is highlighted by a thick black border.
2. Type the new data value in the active cell.

The cell displays the new value and replace the previous value when you exit the cell. You can exit the grid cell using the navigational keys or the Enter key.

➤ **To apply or cancel data grid changes to the chart:**

- Click the Apply button to apply grid changes to the chart and allow the Data Grid Editor to remain open.
- Click the OK button to apply grid changes to the chart and close the Data Grid Editor.
- Click the Cancel button to close the Data Grid Editor without applying the changes.

## Using the Data Grid Editor Context Menu

The Data Grid Editor provides a context menu that allows you to:

- cut, copy, and paste data and labels between cells in the data grid.
- add or delete data grid rows and columns to and from the data grid.
- add or delete data grid row and column labels to and from the data grid.

The context menu displays if you right-click the grid in the Data Grid Editor. The menu items that are displayed vary depending on the selection in the Data Grid Editor, as described in the following illustration.



*The Add Row, Add Column, Delete Row, and Delete Column menu items display when you right-click a data grid cell.*



*The Add Row, Add Row Label, Delete Row, and Delete Row Label menu items display when you right-click a data grid row label.*



*The Add Column, Add Column Label, Delete Column, and Delete Column Label menu items display when you right-click a data grid column label.*

*The Cut, Copy, Paste, and Delete menu items display when you right-click a data grid cell or data grid label cell.*



## Cutting, Copying, Pasting, and Deleting Data

Using the context menu available from the Data Grid Editor, you can cut, copy, and paste data between cells and between labels in the data grid.

➤ **To cut data grid row text:**

1. Use the mouse or navigational keys to select the desired cell location.
2. When the cell is active, right-click to display the menu.
3. Select Cut from the menu to cut the text from the active cell.

➤ **To copy data grid row text:**

1. Use the mouse or navigational keys to select the desired cell location.
2. When the cell is active, right-click to display the menu.
3. Select Copy from the menu to copy the text in the active cell.

➤ **To paste data grid row text:**

1. Use the mouse or navigational keys to select the desired cell location.
2. When the cell is active, right-click to display the menu.
3. Select Paste from the menu to paste the text in the active cell.

➤ **To delete data grid row text:**

1. Use the mouse or navigational keys to select the desired cell location.
2. When the cell is active, right-click to display the menu.
3. Select Delete from the menu to delete the text from the active cell.

## Adding and Deleting Data Grid Rows and Columns

Using the context menu available from the Data Grid Editor, you can easily add or delete data grid rows and columns to and from the data grid.

➤ **To insert a data grid row:**

1. Use the mouse or navigational keys to select the desired cell location.
2. When the cell is active, right-click to display the menu.
3. Select Add Row > Before or Add Row >After from the menu to add the data grid row before (above) or after (below) the current row.

An entire data grid row is inserted at that point in the grid, adding the new row before or after the current row.

➤ **To insert a data grid column:**

1. Use the mouse or navigational keys to select the desired cell location.
2. When the cell is active, right-click to display the menu.
3. Select Add Column > Before or Add Column > After from the menu to add the data grid column before (to the left of) or after (to the right of) the current column.

An entire data grid column is inserted at that point in the grid, adding the new column before or after the current column.

➤ **To delete a data grid row:**

1. Use the mouse or navigational keys to select the desired cell location.
2. When the cell is active, right-click to display the menu.
3. Select Delete Row from the menu to delete the entire data grid row.

The entire data grid row is deleted at that point, moving the row below the current cell location up to the current position.

➤ **To delete a data grid column:**

1. Use the mouse or navigational keys to select the desired cell location.
2. When the cell is active, right-click to display the menu.
3. Select Delete Column from the menu to delete the entire data grid column.

The entire data grid column is deleted at that point, moving the column to the right of the current cell location left one position.

## **Adding and Deleting Data Grid Row and Column Labels**

You can use the context menu on the Data Grid Editor to add or delete data grid row and column labels to and from the data grid.

➤ **To insert a column of data grid row labels:**

1. Use the mouse or navigational keys to select the desired row label cell location. When a row label cell is active, it is highlighted in black.
2. Right-click the active row label cell to display the menu.
3. Select Add Row Label > Before or Add Row Label > After from the menu to add a column of row labels before (to the left of) or after (to the right of) the current row label cell.

The column of row labels is added before or after the current row label cell location.

➤ **To insert a row of data grid column labels:**

1. Use the mouse or navigational keys to select the desired column label cell location. When a column label cell is active, it is highlighted in black.
2. Right-click the active column label cell to display the menu.
3. Select **Add Column Label > Before** or **Add Column Label > After** from the menu to add a row of column labels before (above) or after (below) the current column label cell.

The row of column labels is added before or after the current column label cell location.

➤ **To delete a column of data grid row labels:**

1. Use the mouse or navigational keys to select the desired row label cell location. When a row label cell is active, it is highlighted in black.
2. Right-click the active row label cell to display the menu.
3. Select **Delete Row Label** from the menu.

The entire column of row labels is deleted at that point in the grid, moving the existing row labels left one position.

➤ **To delete a row of data grid column labels:**

1. Use the mouse or navigational keys to select the desired column label cell location. When a column label cell is active, it is highlighted in black.
2. Right-click the active column label cell to display the menu.
3. Select **Delete Column Label** from the menu.

A row of column labels is deleted at that point in the grid, moving the existing row labels up one position.

---

**Important** Inserting and deleting column and row **labels** always affects the entire row or column of labels. A single label cannot be inserted or deleted.

---

## Using Simple Data Grids

Most data can be simply arranged in series of rows and columns. In this format, each value in the chart can be identified by one column label and one row label. For example, in the following illustration, the value **4** can be identified by the row label **East** and column label **Model 421**.

	Model 421	Model 532	Model 629
East	4	40	62
Central	22	18	62
West	40	10	39

*The text in these column labels is used as series labels to identify the series in a chart legend.*

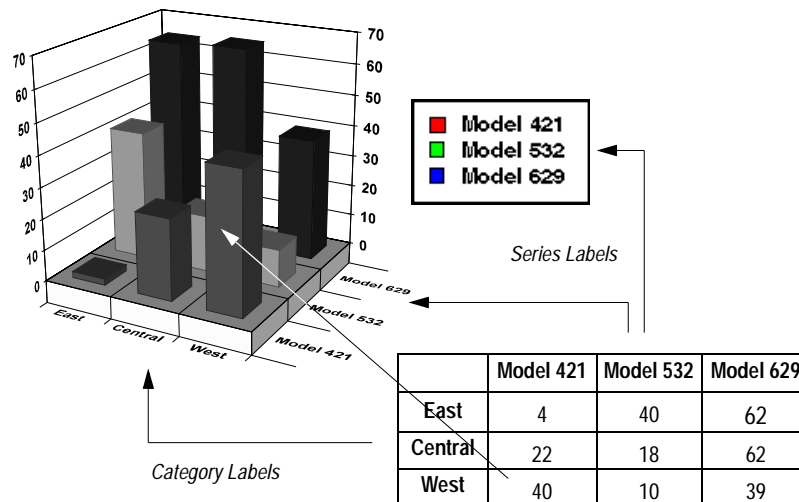
*Data grid rows are represented as data points within a chart series.*

*The text in these row labels is used as data point labels on the chart.*

*Data grid columns are represented as series on a chart.*

In general, data grid columns are represented as series on a chart, and data grid rows are represented as data points within a chart series. However, in First Impression, you can specify if you want data grid **rows** to contain chart series data.

The organization of information in the data grid varies for each chart type. Specific information about how the data grid should be organized for different chart types is presented at the end of this chapter. The following illustration shows a 3D bar chart based on this simple data grid.



# Using More Complex Data Grids

First Impression can also chart more complex data. In the simple data grid discussed previously, each value is identified by a column label and a row label. However, many times it is useful to view chart data that belongs to more than one category. You can accomplish this by adding levels of labels representing the new categories in the data grid.

The following illustration expands on the simple data grid discussed earlier in this chapter. One new level of column labels and one new level of row labels are added to the original data grid. In addition, three new rows of data have been added to the data grid.

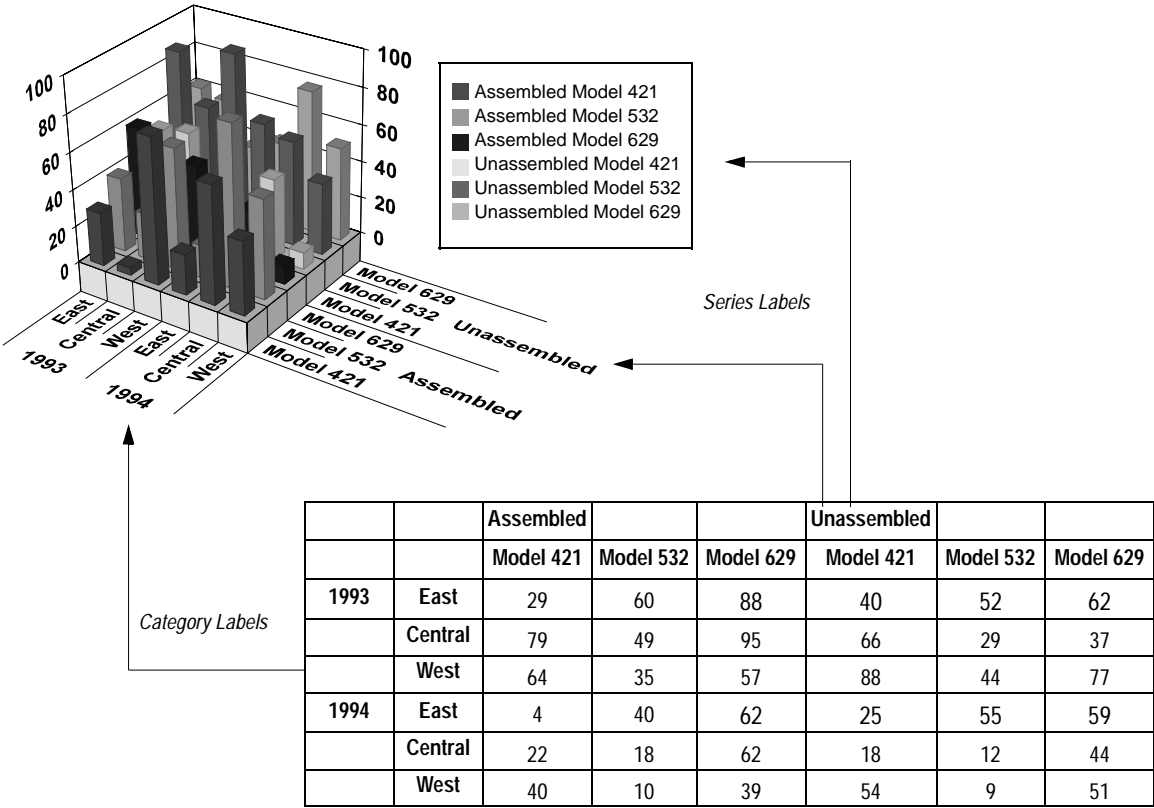
Notice that the value **4**, previously identified by the row label **East** and the column label **Model 421** can now be identified by the row labels **1994** and **East**, and by the column labels **Assembled** and **Model 421**. This provides more specific information about the data being charted.

*This new level of labels identifies the year the sale took place.*

		Assembled			Unassembled		
		Model 421	Model 532	Model 629	Model 421	Model 532	Model 629
1993	East	29	60	88	40	52	62
	Central	79	49	95	66	29	37
	West	64	35	57	88	44	77
1994	East	4	40	62	25	55	59
	Central	22	18	62	18	12	44
	West	40	10	39	54	9	51

*This new level of labels identifies whether the models were assembled before they were sold.*

Following is an illustration of a 3D bar chart created using this data grid.



## Identifying Data Grid Elements

There are two types of information stored in the data grid: data and labels. Columns of data are numbered from left to right, beginning with 1. Rows of data are numbered from top to bottom, beginning with 1.

		Assembled			Unassembled			
		Model 421	Model 532	Model 629	Model 421	Model 532	Model 629	
1993	East	29	60	88	40	52	62	Row 1
	Central	79	49	95	66	29	37	Row 2
	West	64	35	57	88	44	77	Row 3
1994	East	4	40	62	25	55	59	Row 4
	Central	22	18	62	18	12	44	Row 5
	West	40	10	39	54	9	51	Row 6
		Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	

**Note** For information about identifying columns in data grids used to draw more complex chart types, refer to the section titled “Data Grids for Special Chart Types” on page 95.

Column labels identify the data columns. They are numbered from left to right within each level. Multiple levels of column labels are numbered from bottom to top, beginning with 1. Row labels identify the data rows. They are numbered from top to bottom, beginning with 1. Multiple levels of row labels are numbered from right to left beginning with 1.

		Assembled			Unassembled			Level 2
		Model 421	Model 532	Model 629	Model 421	Model 532	Model 629	Level 1
1993	East	Label 1	Label 2	Label 3	Label 4	Label 5	Label 6	Column Labels
	Central							
	West							
1994	East							
	Central							
	West							
		Level 2	Level 1					Row Labels

# Using Multiple Level Labels

To accommodate the need for multiple levels of labels, First Impression must understand the relationship between labels at each level. The following illustration shows how First Impression interprets two levels of labels.

		1993				1994	
		Q1	Q2	Q3	Q4	Q1	Q2
US	Eastern Region	29	60	88	40	52	62
	Central Region	79	49	95	66	29	37
	Western Region	64	35	57	88	44	77
Europe	Northern Region	4	40	62	25	55	59
	Southern Region	22	18	62	18	12	44

*This data grid reflects the way most people arrange multiple levels of labels in a spreadsheet or table.*

		1993	1993	1993	1993	1994	1994
		Q1	Q2	Q3	Q4	Q1	Q2
US	Eastern Region	29	60	88	40	52	62
US	Central Region	79	49	95	66	29	37
US	Western Region	64	35	57	88	44	77
Europe	Northern Region	4	40	62	25	55	59
Europe	Southern Region	22	18	62	18	12	44

*This data grid illustrates how First Impression interprets those labels.*

In order to properly match lower and higher level labels, First Impression analyses the text in a label and compares it to the text in the next label. If the text is the same, or a null string, First Impression assumes the lower level label is still associated with the same higher level label. It continues associating lower level labels as long as it encounters the same text or a null string.



When it encounters a new string, it stops associating lower level labels with the old string and begins associating them with the new string. The following illustration shows an example of this process.

		1993	null string	null string	null string	1994	null string
		Q1	Q2	Q3	Q4	Q1	Q2
US	Eastern Region	29	60	88	40	52	62
null string	Central Region	79	49	95	66	29	37
null string	Western Region	64	35	57	88	44	77
Europe	Northern Region	4	40	62	25	55	59
null string	Southern Region	22	18	62	18	12	44

These null strings tell First Impression that the labels Q2, Q3, and Q4 are associated with 1993.

Once First Impression encounters the string 1994, it stops associating 1993 with columns and begins associating 1994 with any null strings it finds until the next string is encountered.

**Important** When comparing the contents of each column label, First Impression differentiates between null strings and a string of spaces. If it encounters a string of spaces, it assumes it is a new label. Information on how to ensure a column label contains a null string is provided in “Manipulating the Data Grid Using Properties” on page 90.

# Creating the Data Grid

The data grid is created when you draw the chart control on a form. First Impression uses the settings for the **RowCount**, **ColumnCount**, **RowLabelCount**, and **ColumnLabelCount** to determine the initial dimensions of the data grid. When it is first created, the data grid is filled with random data. You can use this random data to format your chart, or you can modify that data to represent specific data values.

## Manipulating the Data Grid Using Properties

First Impression provides a number of properties that allow you to resize the data grid, or modify a value, column label, or row label. Changing any of these properties causes the chart to redraw and reflect the changes in the data grid.

- Use the **ColumnCount** and **RowCount** properties to determine the number of data columns and data rows in the data grid. Rows and columns containing labels are not included in the **ColumnCount** and **RowCount**. If the new column or row count is greater or smaller than the current count, columns are added to or deleted from the right and rows are added to or deleted from the bottom of the data grid. Any data in the deleted columns or rows is lost.
- Use the **ColumnLabelCount** property to set the number of levels of column labels on the data grid. Use the **RowLabelCount** property to set the number of levels of row labels on the data grid. If the new count is greater than the current count, new levels of labels are added to the top or left side of the data grid. If the new count is smaller than the current count, levels of labels are deleted from the top or left side of the data grid. Any labels in deleted levels are lost.
- Use the **Column** and **Row** properties to identify a specific point in the data grid. Data columns are numbered from left to right beginning with 1. Rows in the data grid are numbered from top to bottom beginning with 1. Any labels in the data grid are not counted.

	Model 421	Model 532	Model 629
East	4	40	62
Central	22	18	62
West	40	10	39

Column = 3  
Row = 1

---

**Important** In most chart types, each column in the data grid represents a series on the chart. However, First Impression supports a number of special chart types that require two or more columns to chart a series. Specific information about the data grid requirements of these special chart types is provided in “Data Grids for Special Chart Types” on page 95.

---

- Use the **ColumnLabelIndex** and **RowLabelIndex** properties to identify a specific row or column of labels. For example, if you want to change a label in the second level of column labels, you must set **ColumnLabelIndex** to 2. Levels of column labels are numbered from bottom to top, beginning at 1. Levels of row labels are numbered from right to left, beginning at 1.
- Use the **ColumnLabel** and **RowLabel** properties to change the label identifying a row or column. **ColumnLabel** holds the label text on the column identified by the **Column** property and in the level identified by the **ColumnLabelIndex** property. **RowLabel** holds the text associated with the row identified by the **Row** property and in the level identified by the **RowLabelIndex** property.

---

**Note** If you are removing an existing label from a column or row, highlight it in the Properties Window and press Delete. This tells First Impression to place a null string in the label. If you remove the existing label by highlighting it and pressing the space bar, you are actually replacing the label with spaces instead of a null string.

---

- Use the **Data** property to modify an individual value in the data grid. Use **Column** and **Row** properties to identify the data you wish to change before using the **Data** property which assigns the new data value. If you assign a value with the **Data** property, the **RandomFill** property is automatically set to FALSE to prevent you from losing the data you entered.
- Use **RandomFill** to generate random data for prototyping a chart.
- Use the **SetSize** method to change all the dimensions of the data grid at once. You can use this function to set the column count, row count, column label count, and row label count in one operation. This saves you from having to use four separate functions to set each parameter individually.

## Deleting Data Grid Elements

The methods and properties discussed in the previous section are used to delete columns, rows, or levels of labels from the “end” of each dimension. However, there are times when you need to delete elements in a specific location within the data grid. For each method, you must identify the first element to delete by number. You must also specify the total number of elements to delete.

- Use **DeleteColumns** to delete one or more specific columns from the data grid. Columns are deleted from the first column you specify to the right.
- Use **DeleteRows** to delete one or more specific rows from the data grid. Rows are deleted from the first row you specify down.

---

**Note** Both **DeleteColumns** and **DeleteRows** delete cells and their labels.

---

- Use **DeleteColumnLabels** to delete one or more specific levels of column labels from the data grid. Levels of column labels are deleted from the first level you specify up.
- Use **DeleteRowLabels** to delete one or more specific levels of row labels from the data grid. Levels of row labels are deleted from the first level you specify to the left.

## Inserting Data Grid Elements

You can also use methods to insert new elements at specific locations in the data grid.

---

**Important** When new labels are added to the data grid, either by adding a new level of labels or adding rows or columns to the data grid, they contain a null string. When new columns or rows of data are added, their status depends on the current setting of the **RandomFill** property. If **RandomFill** is set to False, the columns and rows contain a null value. If **RandomFill** is set to True, the columns and rows are filled with random data.

---

- Use **InsertColumns** to add one or more data columns to a specific location in the data grid. The new data columns are added to the left of the column you specify. You must also specify how many new columns to add.
- Use **InsertRows** to add one or more data rows to a specific location in the data grid. The new data rows are added above the row you specify. You must also specify how many new rows to add.
- Use **InsertColumnLabels** to add one or more levels of column labels at a specific location in the data grid. The new levels are added beneath the level you specify. You must also specify how many new levels to add.
- Use **InsertRowLabels** to add one or more levels of row labels at a specific location in the data grid. The new levels are added to the right of the level you specify. You must also specify how many new levels to add.

## Changing Data Grid Values or Text

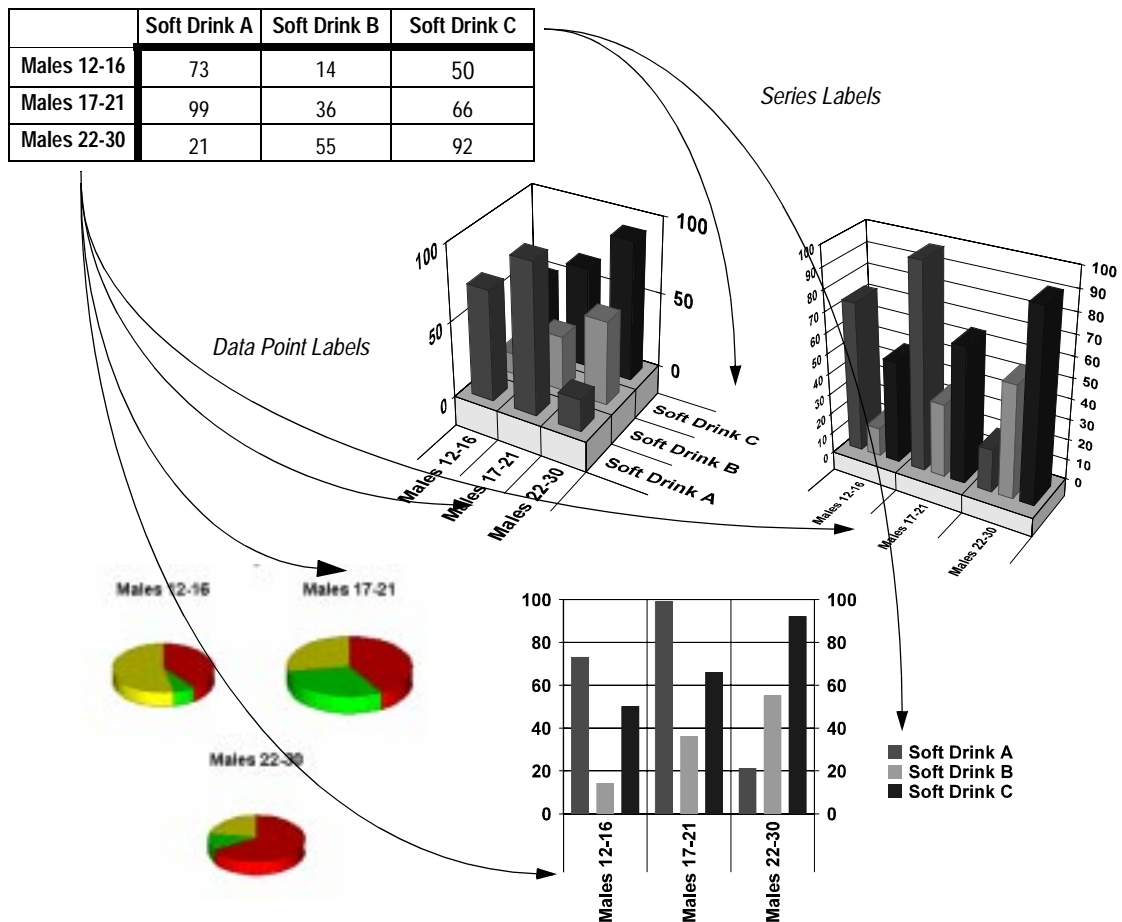
You can also use functions to change the data or labels in a data grid. When you use a function to change a data value or label, the data grid is updated internally and the chart is redrawn to reflect the new value.

- Use the **Data** property to return the value currently assigned to a specific point in the data grid or to set a new value for a specific point. You must identify the position by row and column number. You can also use this property to insert a null value in that position or return a null flag to determine if the data grid holds a null value in that position.
- Use **ColumnLabel** and **RowLabel** properties to return the text currently assigned to a specific position within the column or row label or to set a new label for a specific level on a specific row or column. You must identify the specific row or column which the label identifies and the specific level of label. To replace an existing label with a null string, you can enter zero as the label text argument.
- You can import data from an array by using the **CopyDataFromArray** method. You can import data into an array by using the **CopyDataToArray** method.

# Data Grid Requirements of Different Chart Types

Most of the common chart types such as area, line, bar, pie, doughnut, and radar charts expect the same organization of information in the data grid. The column labels are used to identify chart series. The row labels are used to identify categories in the chart. Each column of data in the data grid displays one series on the chart. Each row value in the column is an individual data point in that series.

The following illustration shows a sample data grid and several charts drawn based on that data.



## Data Grids for Special Chart Types

First Impression supports a number of chart types that require multiple columns of data to draw a series. For each of these charts, a series is drawn when there are enough columns of data available. Any extra columns of data are ignored. For example, on a polar chart, a series requires two columns of data; if there are three columns of data in the data grid, the third column is ignored. The column label on the first column in each series is used to identify the series in the legend. Additionally, any formatting applied to the first column is used to display the series on the chart. Any formatting applied to the second column is ignored.

When columns in the data grid are combined to create a series, the column identification numbers do not change. If you need to refer to a series in a function, refer to it by the number of the first column in the series. For example, the data grid in the following illustration contains six columns and is used to draw an XY chart. Since it requires two columns of data for each series in the chart, the six columns results in a chart with three series. These would be identified as series 1, series 3, or series 5.

	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
	Site 1		Site 2		Site 3	
	Temp	Humidity	Temp	Humidity	Temp	Humidity
10 AM	78	.56	76	.58	80	.53
11 AM	82	.57	77	.57	82	.55
12 AM	83	.56	80	.57	83	.57
1 PM	85	.57	82	.59	85	.57

Series 1

Series 3

Series 5

To turn on the display of guidelines in this series, refer to series three in the following code

```
Vtchart1.plot.seriescollection.item(3).showguideline
(vtchaxisidx) = True
```

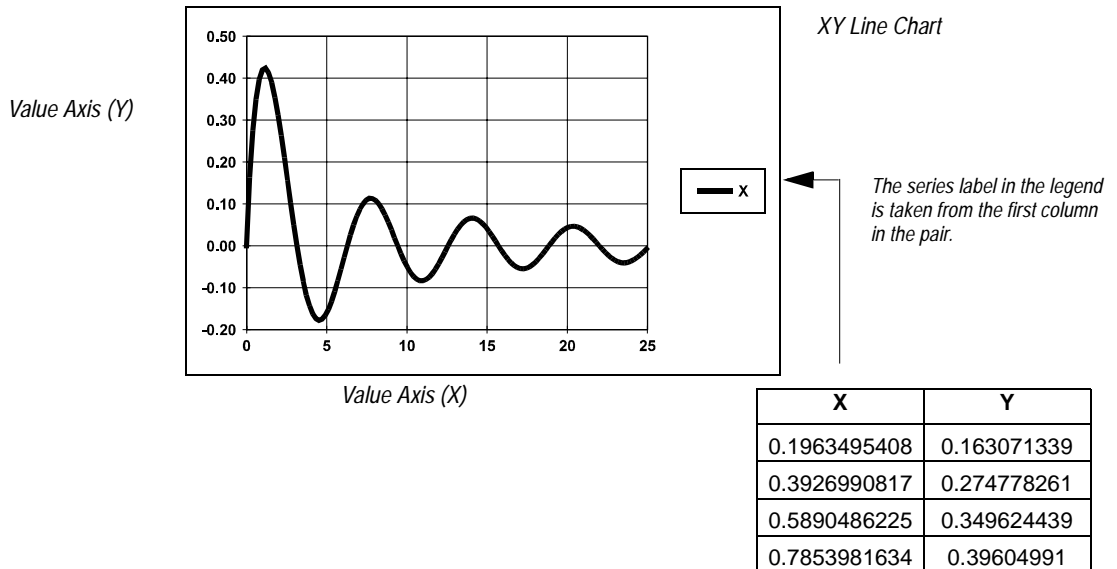
To change the value in this position in the data grid, refer to row 2, column 4 in the following code.

```
With VtChart1
column = 4
row = 2
data = 58
end with
```

For some chart types, data must be organized in a specific way in the data grid in order for the chart to display correctly. See the sections below for information about each special chart type.

## XY Charts

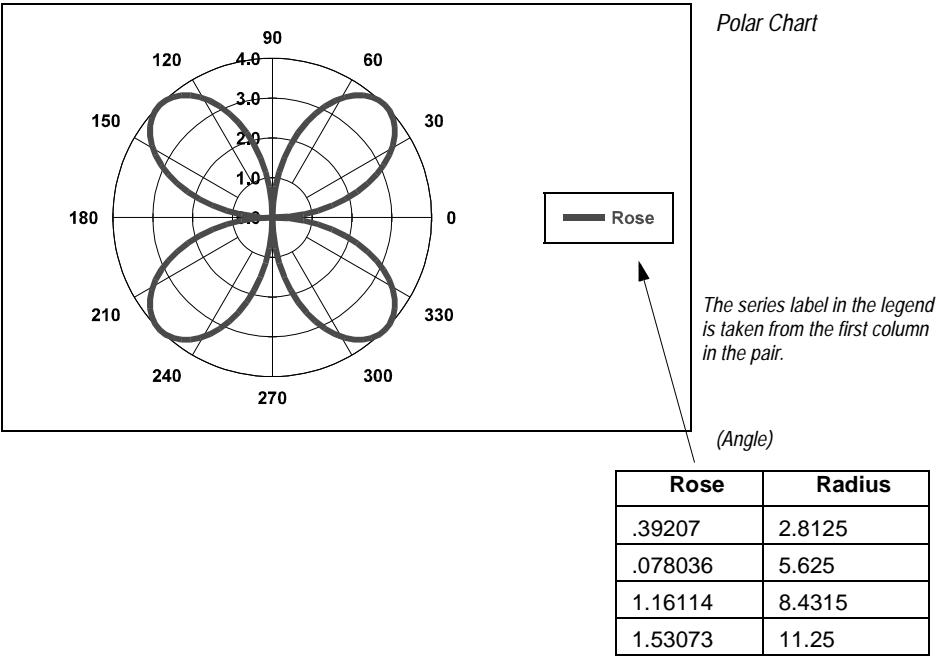
An XY chart plots two pairs of numbers as x and y coordinates. Each series on the chart requires two columns of data in the data grid. The first column holds the x coordinate and the second column the y coordinate. The partial data grid in the following illustration shows the organization required for an XY chart.





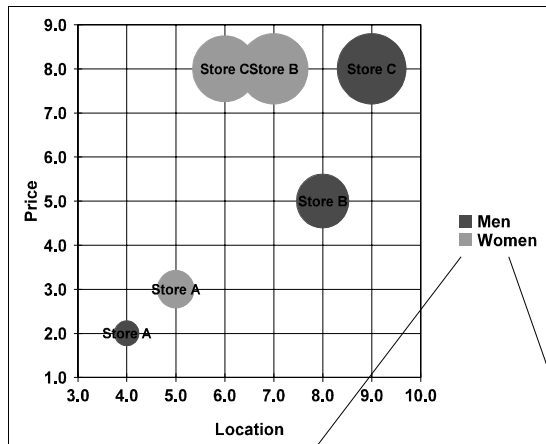
## Polar Charts

Polar charts require two columns in the data grid for each chart series: the first data column holds the distance from the center of the chart (the Radius) and the second column holds the angle from the zero (0) position of the chart (the Angle.) The column label on the first column in each series is used to identify the series in the legend. Additionally, any formatting applied to the first column is used to display the series on the chart. Any formatting applied to the second column is ignored. The partial data grid in the following illustration shows the organization required for a polar chart.



## Bubble Charts

Each series displayed on a bubble chart requires three columns of data in the data grid. The first column holds the X coordinate, the second column holds the Y coordinate, and the third column determines the relative bubble size. The column label on the first column in each series is used to identify the series in the legend. Additionally, any formatting applied to the first column is used to display the series on the chart. Any formatting applied to the second and third columns are ignored.



*Since this chart type requires three columns of data, every first column of three column labels is used to identify the series in the legend.*

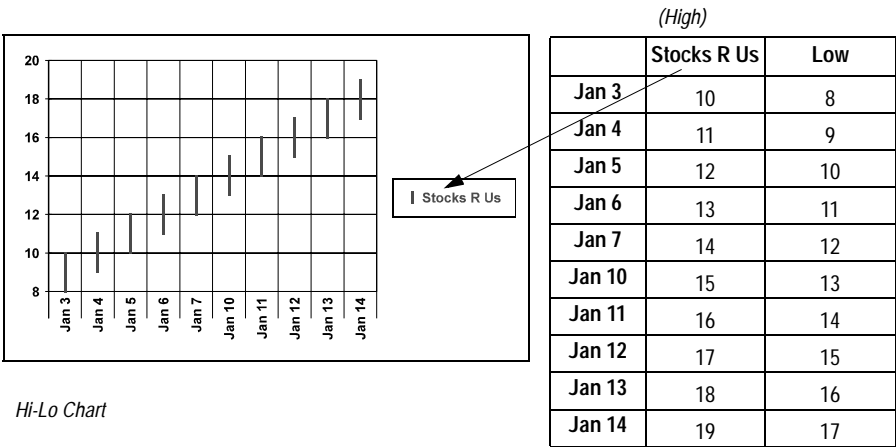
*In this illustration the category names are being displayed as data point labels.*

	(X)	(Y)	(Size)	(X)	(Y)	(Size)
	Men	Prices	Score	Women	Prices	Score
Store A	4	2	6	5	3	8
Store B	8	5	13	7	8	15
Store C	9	8	17	6	8	14

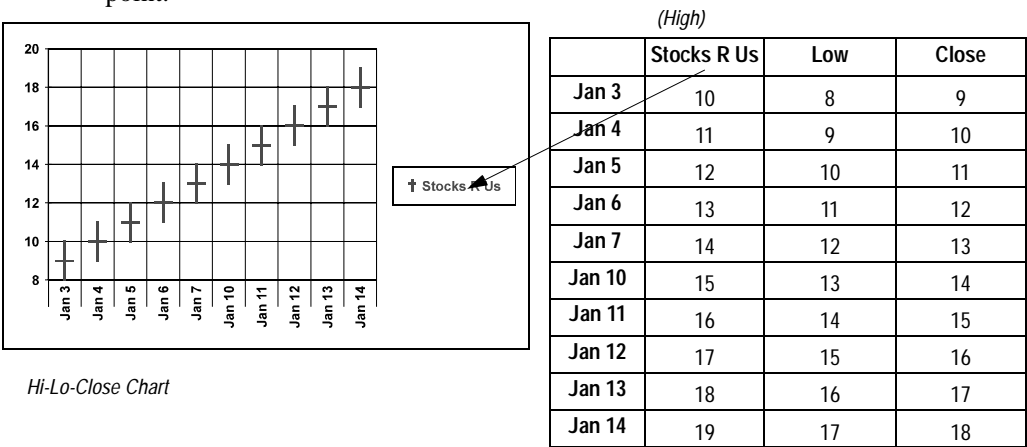
# Hi-Lo Charts

The data in the data grid must be organized appropriately for each type of hi-lo chart supported by first impression.

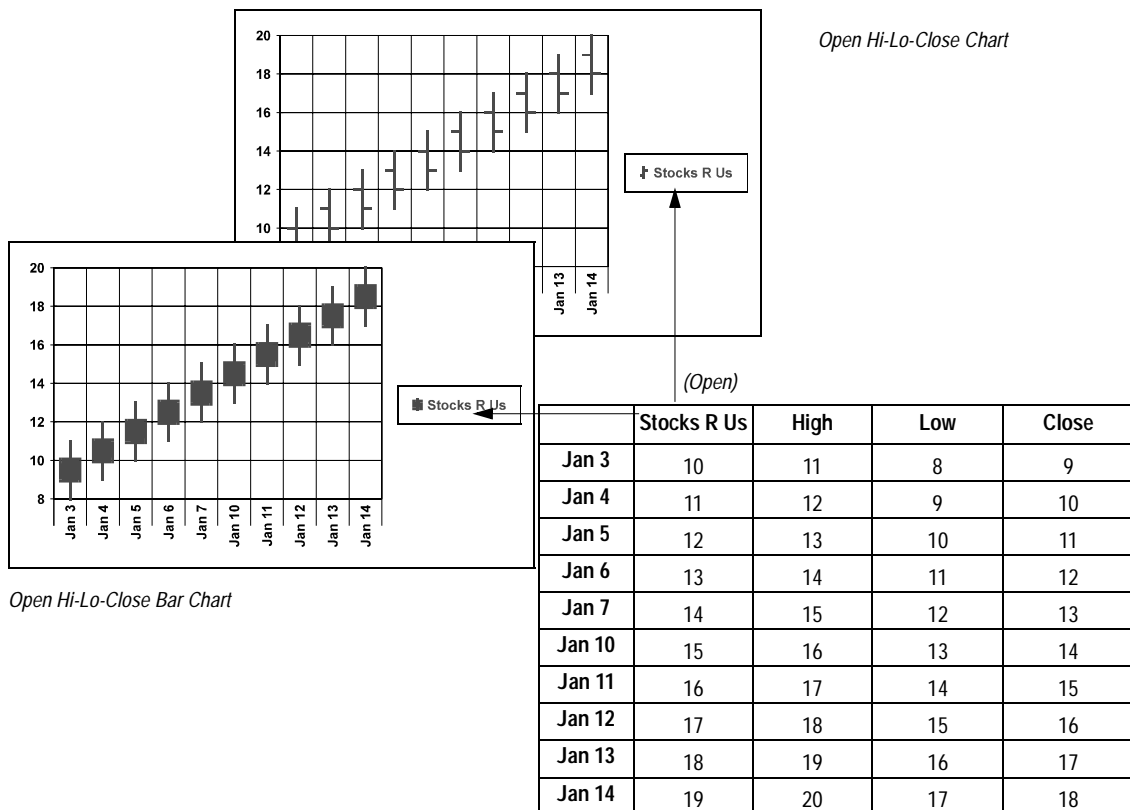
**Hi-lo** charts require two columns for each data series: the first column is used for the high point, and the second is used for the low point.



**Hi-lo-close** charts require three columns for each data series: the first column is used for the high point, the second for the low point, and the third for the closing point.



**Open-hi-lo-close** charts require four columns for each data series: the first column is used for the open point, the second for the high point, the third for the low point, and the fourth for the closing point.



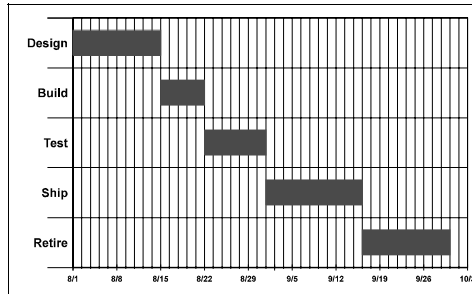
**Hi-lo charts with date/time axes** require one column that contains date information. (These are also called charts with computed date/time axes.)

For information about creating this type of chart, see “Formatting Charts with Computed Date/Time Axes” on page 208.

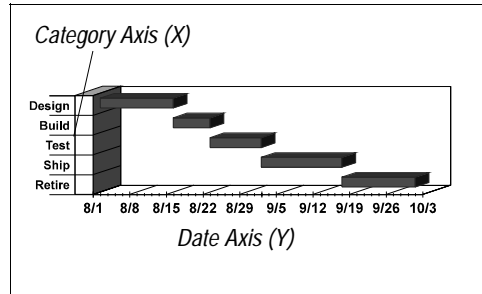
For information about entering the date and time information in this type of chart, see “Data Grids for Charts With Computed Date/Time Axes” on page 104.

## Gantt Charts

Use a Gantt chart to display range bars that indicate the relative time required for various activities within a project. This chart type requires two columns of data. The first column is the start time and the second column is the duration, in number of days. The column label on the first column is used to identify the series in the legend. Additionally, any formatting applied to the first column is used to display the series on the chart. Any formatting applied to the second column is ignored.



2D Gantt Chart



3D Gantt Chart

	Start Date	Duration
Design	34547	14
Build	34561	16
Test	34567	10
Ship	34577	15
Retire	34592	14

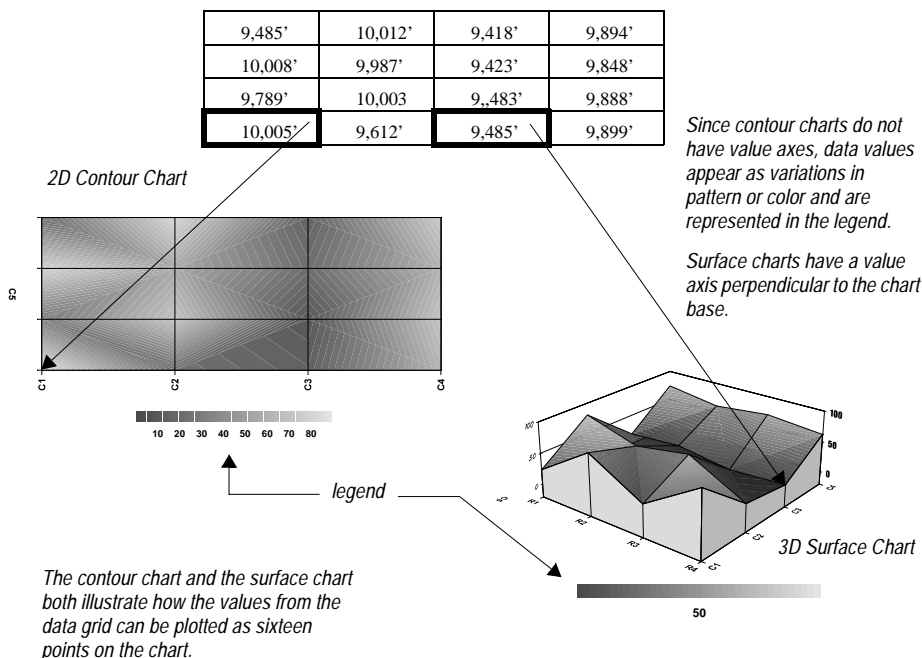
First Impression requires you to enter the starting dates in a special format. For information on how to enter the start dates, see “Data Grids for Charts With Computed Date/Time Axes” on page 104.

If this chart is linked to a Formula One worksheet, you can enter the dates in the worksheet in a normal date format, such as 1-23-93. The worksheet automatically stores that date as the number of days since January 1, 1900.

Also, when entering the duration in a Formula One worksheet linked to your Gantt chart, you can use an expression to subtract a start date from a finish date to determine the duration.

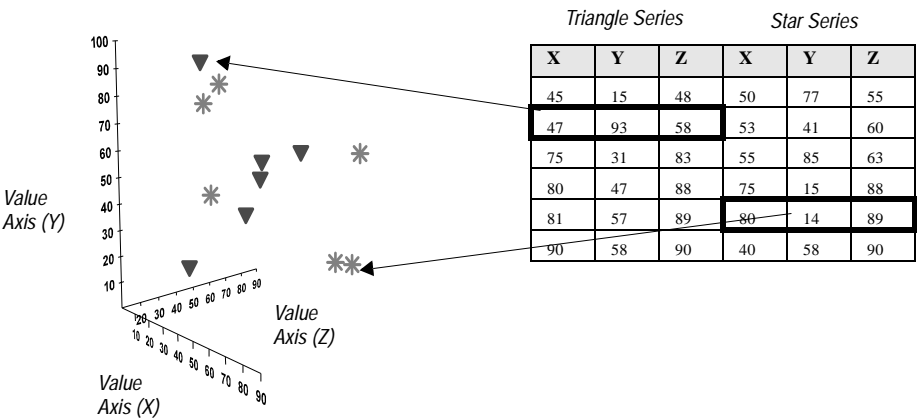
## Elevation Charts

Use elevation charts to display topographic data. There are two types of elevation charts: 2D contour charts and 3D surface charts. In contour charts, data values within a specific range appear on the chart in two-dimensional bands of the same color. In surface charts, data values within a specific range have the same elevation. Data values can also be illustrated with contour bands or lines of the same color projected on the three-dimensional surface model.



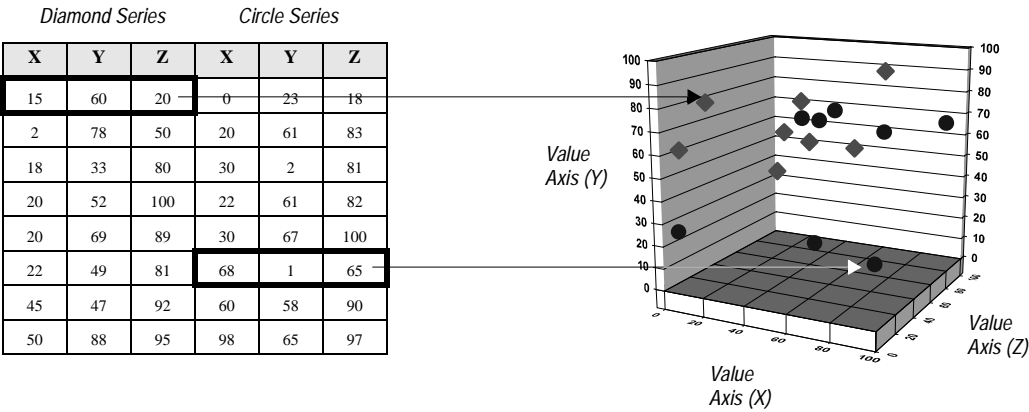
### 3D XYZ Charts

This chart displays variation and relationships over three sets of values plotted on a three-dimensional grid. Each series on the chart requires three columns of data in the data grid.



### 3D Scatter Charts

This chart is drawn as a three-dimensional grid with a base and walls. It plots data points created by the intersection of three different coordinate values. Each series on the chart requires three columns of data in the data grid.

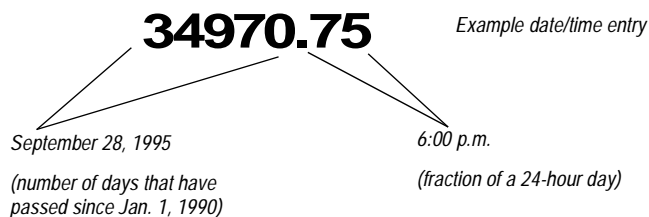


## Data Grids for Charts With Computed Date/Time Axes

Gantt charts and hi-lo charts with a date series have computed date/time axes. This means that, instead of values or categories, the axis shows dates and/or times. Setting up the data grid for these charts requires special planning.

Charts with computed date/time axes require at least two columns of data in the data grid. The first column contains the dates and/or times; the second and subsequent columns contain the chart data. The column label on the first column in each series is used to identify the series in the legend. Formatting applied to the first series is used to display the data on the chart. Formatting applied to the second and subsequent series is ignored.

In the date/time column of data (the first column), you enter date and time formats in the same cell as part of a single number. The numbers to the left of the decimal point represent the date, while the numbers to the right of the decimal point represent the time.



For dates, First Impression considers the integer portion of the number as the number of days since January 1, 1900. For example, to indicate July 4, 1995, enter 34884.

For times, First Impression considers the numbers behind the decimal point as the fraction of a 24-hour day. This decimal fraction can range from .0, representing 12:00 a.m., to 0.99999999, representing 11:59:59 p.m. To indicate 12:00 noon, enter .5. To indicate 6:00 p.m., enter .75.

---

**Note** If your chart is linked to a Formula One worksheet, First Impression will automatically convert the date and time information from the spreadsheet to the numeric format described above.

---

For more information about charts with computed date/time axes, see “Formatting Charts with Computed Date/Time Axes” on page 208.



# Using the Chart Wizard

The Chart Wizard is the first step in getting started with First Impression chart design. The Chart Wizard visually guides you through the process of creating a new First Impression chart or modifying an existing chart for use with your application. With the Chart Wizard, you can quickly accomplish many design tasks without directly setting a property or writing code. You point-and-click visual cues to design the chart you desire. Once you have created a basic chart, you can make further modifications by setting properties in code, or using the Chart Designer.

## Accessing the Chart Wizard

When you access the Chart Wizard, the Gallery page is displayed, which allows you to select a chart type. You can choose other chart settings as you navigate through the remaining Wizard pages.

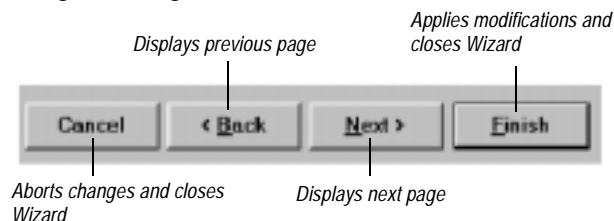
➤ **To access the Chart Wizard:**

1. Right-click the chart control on the form.
2. Select Wizard from the context menu.

The Chart Wizard displays.

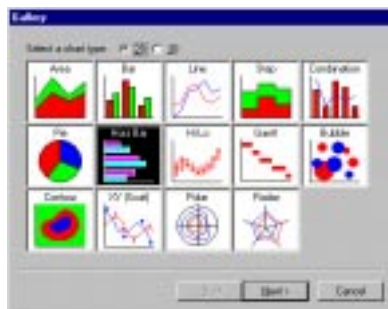
## Navigating in the Chart Wizard

The Chart Wizard allows you to control various design aspects such as choosing a chart type, setting chart options, controlling chart layout, and specifying chart and axis titles. Use the navigation buttons at the bottom of the Wizard pages to navigate through the Chart Wizard.

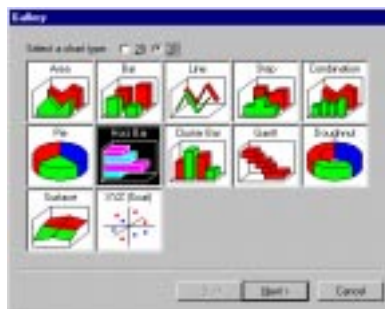


## Using the Gallery Page

The Gallery page allows you to select the type of chart you wish to design. Two radio buttons allow you to differentiate between 2D chart types and 3D chart types. The following illustrations show the Gallery page for 2D and 3D charts.



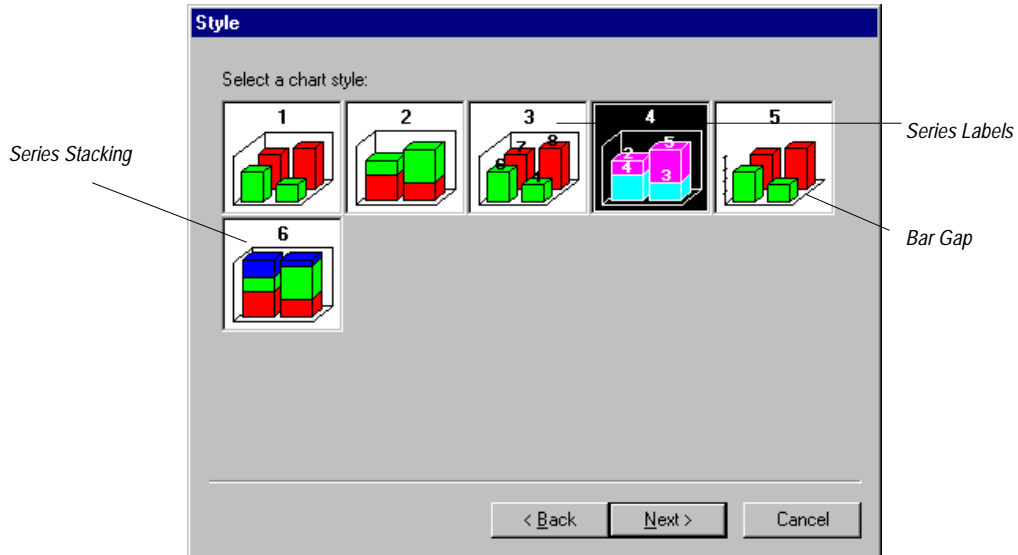
2D Charts



3D Charts

# Using the Style Page

The Style page lets you set the style for the selected chart type. Using the Style page, you can easily set chart display options such as series labels, stacking, and bar gap. The illustration you see will be different depending on the type of chart you are designing, but the buttons will be the same.



## Using the Layout Page

The Layout page provides methods for determining the elements and layout of the chart plot such as chart titles, chart footnotes, and chart legends. The chart preview image shows you how the chart will look with your settings. The preview will be different depending on the type of chart you are designing, but the buttons, text boxes, and drop-down lists will be the same.

**Layout**

Enter desired layout settings:

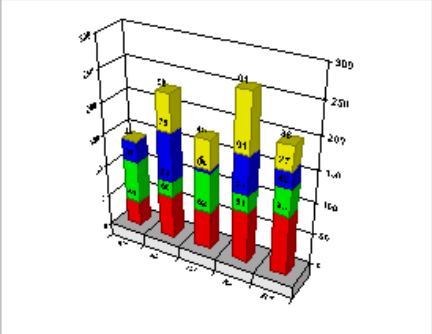


Chart Title:

Chart Footnote:

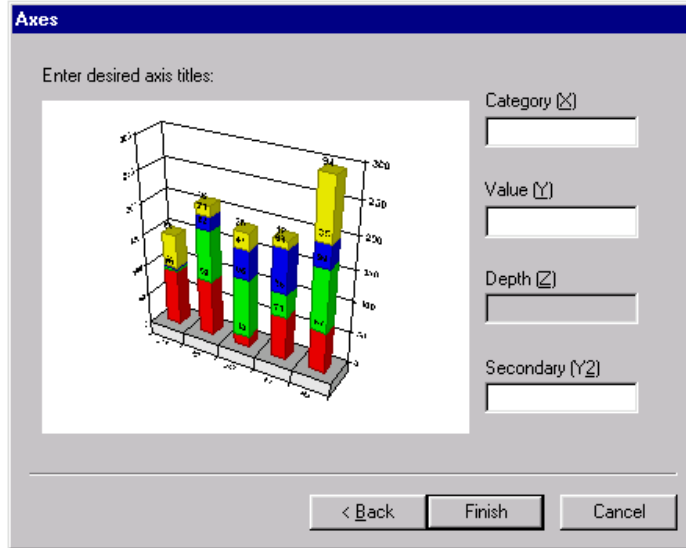
Chart Legend:

Series Data along:  
☐ Rows ☒ Cols

*Read data from grid columns*

## Using the Axes Page

The Axes page allows you to optionally label chart axes. The preview you see will be different depending on the type of chart you are designing, but the buttons and text boxes will be the same..



Enter desired axis titles:

Category (X)

Value (Y)

Depth (Z)

Secondary (Y2)

< Back Finish Cancel

## Modifying Charts with the Wizard

When you use the Chart Wizard to modify existing charts, the Wizard returns the chart to its default settings and then restores only those features it controls in the Gallery, Layout, and Axes pages. This means that formats and properties that you may have previously set for individual chart elements may be lost when you re-format using the Wizard. Exercise care when you modify existing charts that were originally created without the Wizard. You might need to manually adjust some chart settings after using the Wizard.

Tidestone

# Formatting Common Chart Elements

Once you select a chart type, the chart can include a title, a legend, a plot area, and a footnote. This chapter includes the following topics that describe how to:

- Select a chart type.
- Specify a backdrop.
- Specify a picture backdrop.
- Add and position chart elements.
- Format and specify text.
- Specify text alignment and orientation.
- Specify text.
- Format fonts.

---

**Note** The Location tab controls whether titles, legends, or footnotes are visible on charts. For more information about the Location tab, refer to “Adding and Positioning Chart Elements” on page 123.

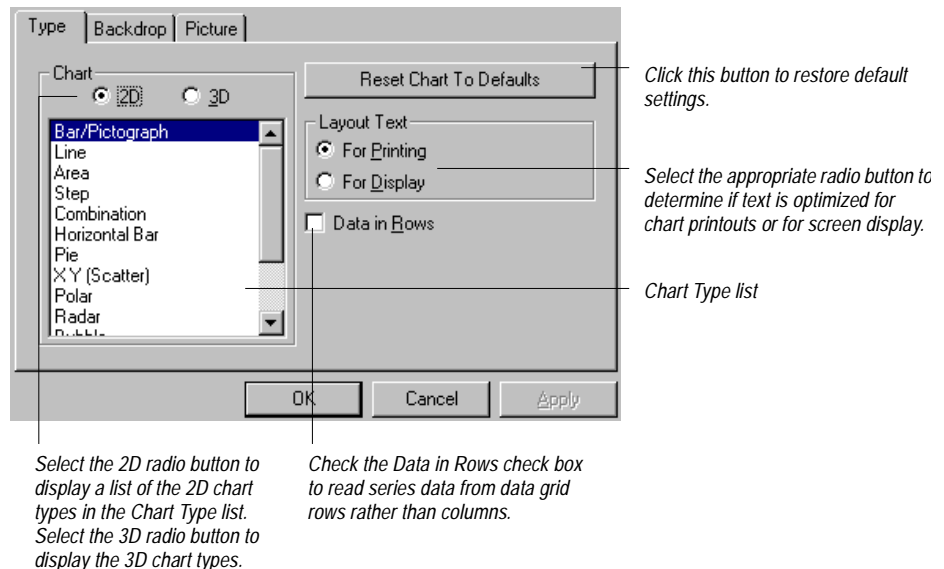
---

## Selecting a Chart Type

The Type tab of the Chart Designer controls the chart type and text for printing.

► **To control the chart type and text for printing:**

1. Right-click the chart control on the form and choose Chart Designer from the context menu.
2. Select Chart from the Chart Designer tree view.
3. Select the Type tab, if necessary. The Type tab displays as shown in the following example.



4. Select a chart type from the Chart Type list.
5. Select the For Printing radio button to use TrueType virtual font metrics to optimize text layout for printing. TrueType virtual font metrics might not be very accurate for text displayed on the screen. Text displayed on the screen might be larger or smaller than the virtual metrics requested. Larger text might not fit where it is supposed to and part of a character, a whole character, or even in some cases words might be clipped.

Alternatively, select the For Display radio button to optimize text layout for the screen. Text in charts laid out for screen display always fits correctly within its chart area. The printed text is generally somewhat smaller; therefore, the text might appear in slightly different places.

6. Click OK or Apply to redraw the chart to reflect the changes.

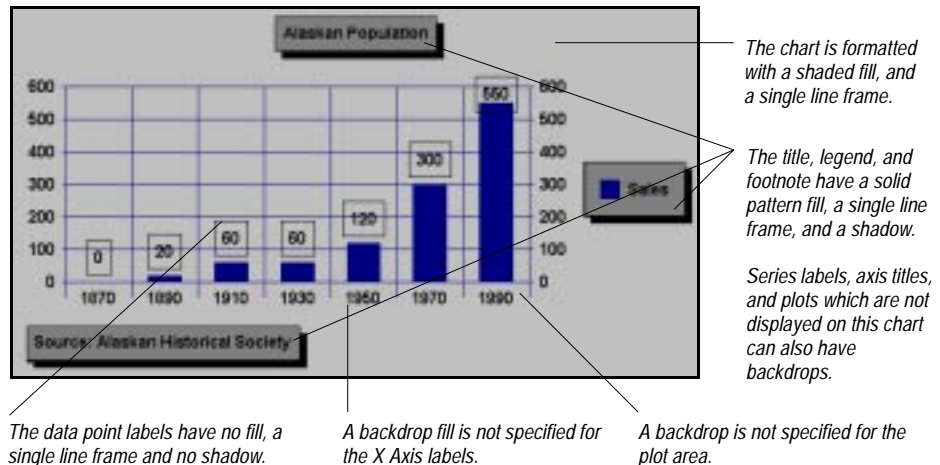


# Specifying a Backdrop

The Backdrop tab of the Chart Designer controls the display of the backdrop. You can enhance a chart's appearance by placing a backdrop on the chart, and on individual chart elements. A backdrop can include a frame or box around the chart or chart element, a shadow behind the element, and a pattern or gradient behind the element. The Backdrop tab applies to charts, axis titles, data point labels, footnotes, labels, legends, plots, and series labels.

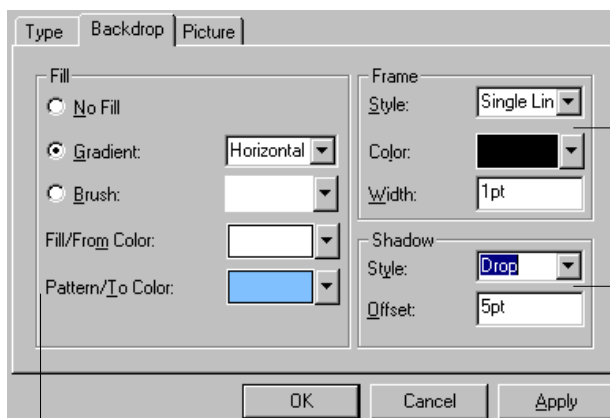
**Note** If you select a default data point label, these options apply to all the non-custom data point labels. If you select a specific data point label, these options apply to only that data point label and override default data point label settings.

The following illustration shows the various chart elements that can be assigned a backdrop.



➤ **To edit a backdrop using the Chart Designer:**

1. In the Chart Designer tree view, select the chart element for which you want to edit the backdrop.
2. Select the Backdrop tab. The following illustration shows the Backdrop tab.



*The style, color, and width of a backdrop frame is determined using these settings.*

*The style and offset of a backdrop shadow is determined using these settings.*

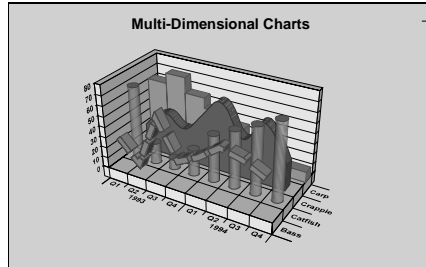
*A backdrop fill is determined using these settings.*

3. When your changes are complete, click OK or Apply to redraw the chart to reflect the modifications.

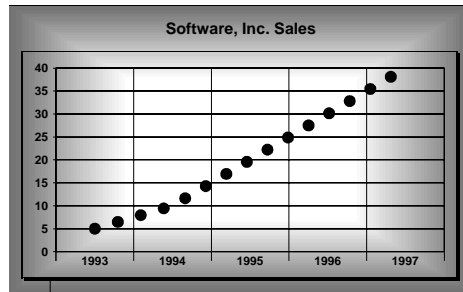
Specific information about backdrop fills, backdrop frames, and backdrop shadows is provided in the following sections.

## Choosing Backdrop Fills

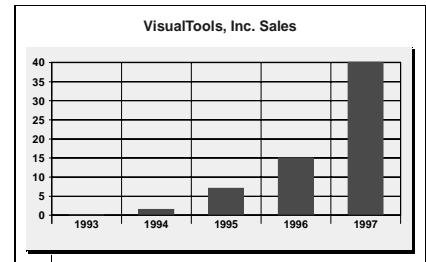
The fill settings in the Backdrop tab allow you to set the gradient type or brush type, and the fill/from color and the pattern/to color. You can choose among a number of types of backdrop fills. The following illustrations show examples of fill types.



*This is an example of a solid fill. To specify a solid fill, select the Brush radio button, and select a solid pattern.*



*This is an example of a gradient fill. A gradient blends two colors to create the fill. The colors can be blended from top to bottom, left to right, in concentric rectangles, or concentric ovals.*



*This is an example of a brush fill. One or two colors are used to display a pattern in the chart control or chart element.*

**Note** You can specify that the chart control or chart elements have no fill. For example, any formatting applied to the surface behind them shows through. To specify this, select the No Fill radio button. A picture can still be applied to an element without a fill. Refer to “Specifying a Picture Backdrop” on page 120 to learn more about using pictures as backdrops.

Refer to the following procedures to learn how to specify fill settings.

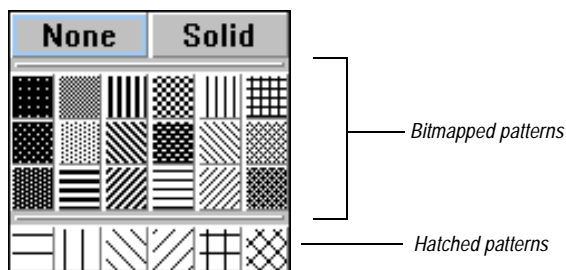
### ➤ To specify a brush fill:

1. In the Chart Designer tree view, select the chart element for which you want to edit the backdrop.
2. Select the Backdrop tab.
3. Select the Brush radio button.
4. Select a pattern or solid fill from the Brush list.

Patterns are bitmaps. A low resolution version of each bitmap displays the pattern on the screen. When you print a chart, a high resolution version of the bitmap is used if the output device prints at more than 144 dpi. The higher the resolution of the output device, the smaller the copies of the bitmaps that make up the patterns are reproduced.

At high resolutions, First Impression adjusts the patterns to prevent the lines from getting too close together. Hatches are not bitmaps, but actual lines drawn to fill the object. They always appear the same regardless of the output resolution. Hatches can be used to output First Impression charts on a plotter.

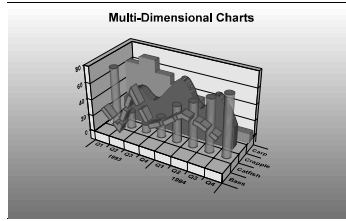
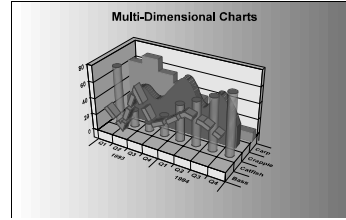
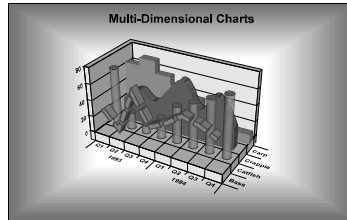
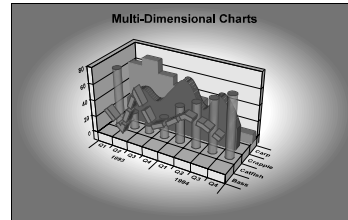
The following illustration shows which patterns in the Pattern list are bitmaps and which are hatches.



5. In the Fill/From Color list, select a predefined color or click Custom to create your own color. The fill color is used to create a solid pattern.
6. In the Pattern/To Color list, select a color or click Custom to create your own color. The pattern color is drawn on top of the fill color.
7. Click OK or Apply to redraw the chart to reflect the changes.

➤ **To specify a gradient fill:**

1. In the Chart Designer tree view, select the chart element for which you want to edit the backdrop.
2. Select the Backdrop tab.
3. Select the Gradient radio button.
4. Select a type of gradient from the Gradient list. The following illustrations show examples of the various types of gradients.

*Horizontal Gradient**Vertical Gradient**Rectangle Gradient**Oval Gradient*

5. Select the color used as the top color in a horizontal gradient, the left color in a vertical gradient, and the center color in a rectangle or oval gradient from the Fill/From color list.
6. Select the color used as the bottom color in a horizontal gradient, the right color in a vertical gradient, and the outer color in a rectangle or oval gradient from the Pattern/To Color list.
7. Click OK or Apply to redraw the chart to reflect the changes.

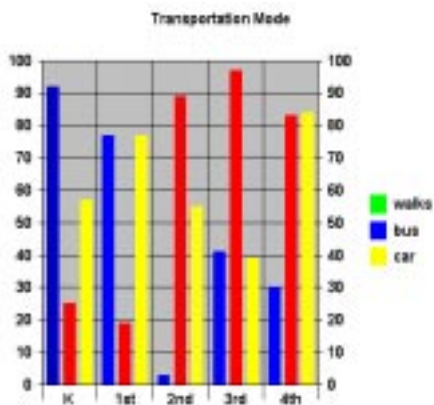
## Creating Backdrop Frames

The settings in the Frame section of the Backdrop tab allow you to create a frame for the current backdrop.

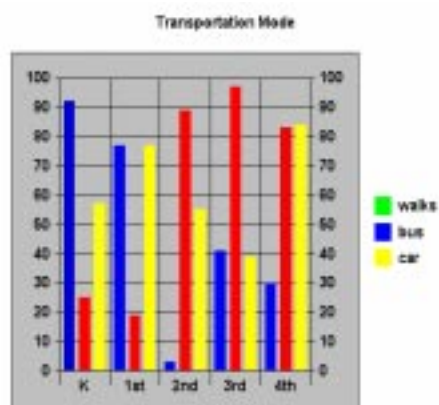
### ► To create a frame:

1. In the Chart Designer tree view, select the chart element for which you want to edit the backdrop.
2. Select the Backdrop tab.

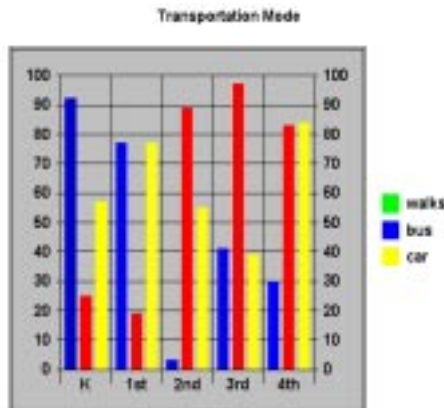
3. Select a frame style from the Style list in the Backdrop tab. The following illustrations show the various types of frames around the plot area of the chart.



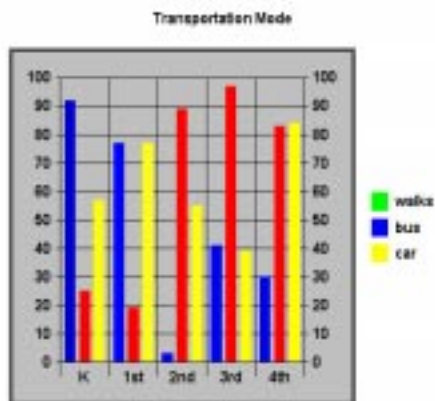
No Frame



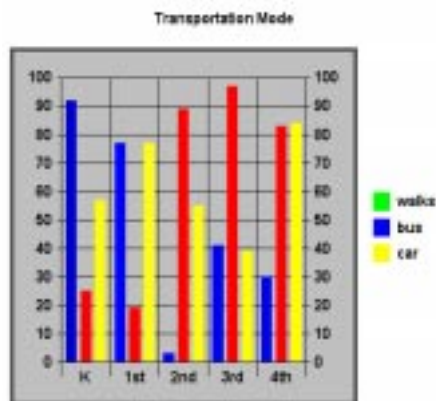
Single Line



Double Line



Thick Inner Line

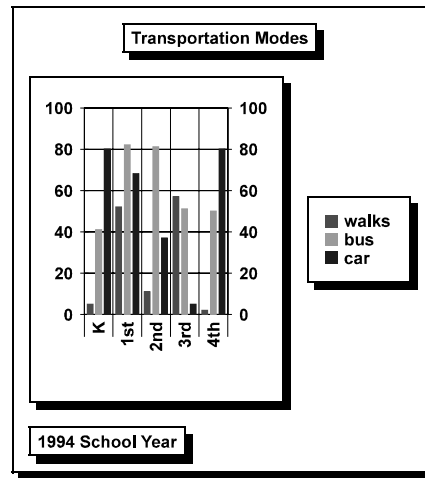


Thick Outer Line

4. Select a color for the frame lines from the Color list.
5. Enter the number of points to be used as the width for the frame lines in the Width text box. A point is 1/72 of an inch. For the Thick Inner and Thick Outer frames, the width sets the thick line.
6. Click OK or Apply to redraw the chart to reflect the changes.

## Specifying Backdrop Shadows

The settings in the Shadow section of the Backdrop tab allow you to create a shadow for the current backdrop. The following illustration shows shadows around the chart control, plot, title, legend, and footnote.



### ➤ To specify a shadow:

1. In the Chart Designer tree view, select the chart element for which you want to edit the backdrop.
2. Select the Backdrop tab.
3. Select Drop from the Shadow list in the Backdrop tab.
4. In the Offset text box, enter the number of points the shadow is offset from the frame.
5. Click OK or Apply to redraw the chart to reflect the changes.

## Specifying a Picture Backdrop

The Picture tab of the Chart Designer specifies a graphic image to use as the picture backdrop, previews the picture, selects a method for fitting the picture into the background, and specifies whether the graphic is saved with the chart.

You can specify a picture backdrop for the same chart elements as other backdrops. You can use a picture fill on an element regardless of its pattern or gradient setting. If the graphic does not cover the entire backdrop area, any specified pattern or gradient covers the remaining area.

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**Note** Although the VtPicture object can be used to display many chart types, any chart part that is rendered in 3D perspective does not support pictures. This includes 3D bars, 3D axis label backdrops, 3D axis title backdrops, 3D data point label backdrops, and 3D markers. Backdrops for charts, plots, titles, footnotes, and legends on 3D charts can support pictures because these chart parts are not rendered in 3D perspective. Refer to the First Impression on-line Help for more information about the VtPicture object.

---

The following further describes the options available in the Picture tab:

- **Picture.** This setting displays a preview of the graphic. When you enter a valid path and file name in the File text box, or paste a graphic from the clipboard, the picture is previewed in the Picture control.

---

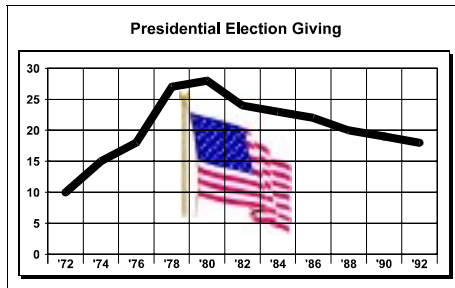
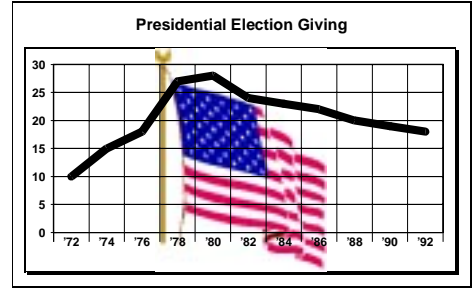
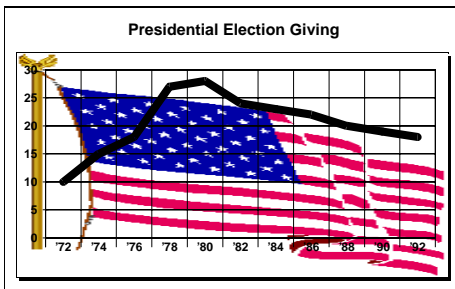
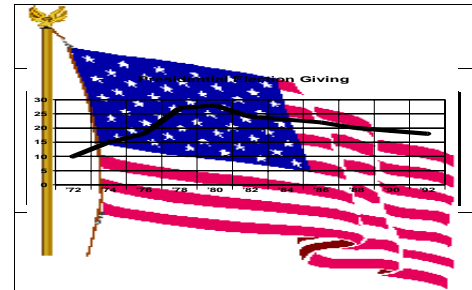
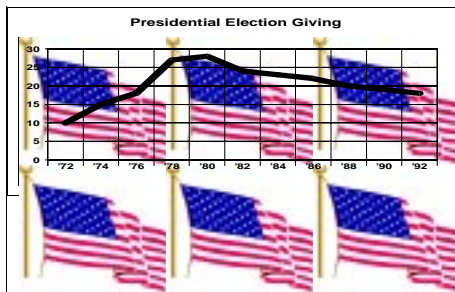
**Note** If you use a Windows metafile for the graphic, it does not show up if you use the copy command to copy the chart to the clipboard. Windows limits you from having a metafile that contains a metafile. If you plan to copy the chart to the clipboard, use a bitmap for the graphic instead of a metafile.

---

Some graphics products output bitmap files in an older format that is compatible with OS/2. First Impression does not support these bitmaps. If you attempt to use one of these files, you receive an error, "Invalid picture format." You can read these files into PaintBrush and save them as BMPs to convert them to the newer bitmap format. First Impression can then use these files without any problems.

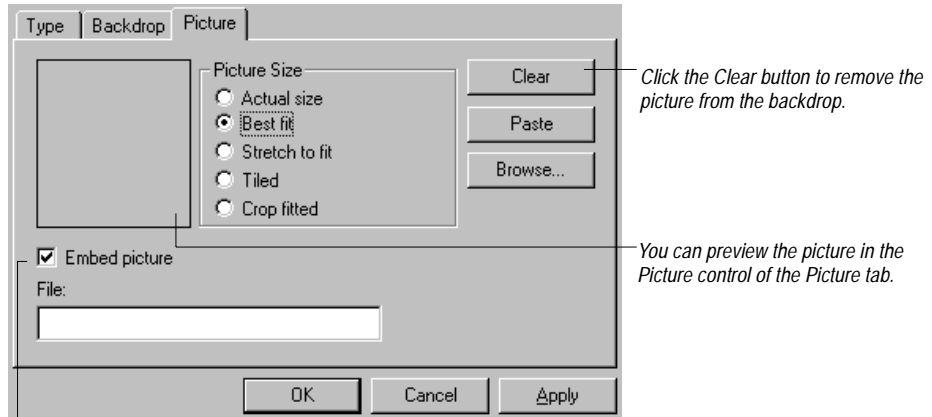


- **Picture Size.** These setting provide various methods to fit the graphic into the backdrop space. The following illustrations show each of the options:

*Actual Size**Best Fit**Stretch to Fit**Crop Fitted**Tiled*

➤ **To specify a picture for a backdrop:**

1. In the Chart Designer tree view, select the chart element for which you want to specify a backdrop picture.
2. Select the Picture tab. The following illustration shows the Picture tab.



To save the picture file with the chart, check the Embed Picture check box. To save space, you should not embed pictures unless they are not going to be available later.

3. Enter a valid path and file name in the File text box, or click the Browse button to select a file name from the Open Picture dialog box. To paste a .wmf, .bmp, or .jpg file from the clipboard into the current backdrop, click the Paste button. The picture is previewed in the Picture control.

---

**Note** You can also paste a graphic into an existing backdrop by selecting the backdrop on the screen and selecting the Paste command from the context menu. Select the graphic file you want to paste into the backdrop and click OK.

---

4. Select the appropriate radio button to select a fit method from the Picture Size section. These options allow you to fit the graphic into the backdrop space. The following table lists the options for fitting graphics:

Constant	Description
Actual Size	Displays the graphic at the original size it was created. If the original size of the graphic is too large to display in the backdrop, the graphic is cropped. If the original size of the graphic is too small to fill the backdrop, it is centered in the backdrop.
Best Fit	Scales the graphic proportionally to fit entirely within the backdrop.
Stretch to Fit	Scales the graphic to fit backdrop regardless of its original proportions.
Tiled	Duplicates the graphic repeatedly to fill the backdrop.
Crop Fitted	Centers the graphic and scales it proportionally to fill the backdrop. Any part of the image that falls outside the backdrop is cropped.

- Click OK or Apply to redraw the chart to reflect the changes.

**Note** Some graphics files can be very large. In order to minimize performance problems on some systems, it is recommended that you always clear one picture from the backdrop before specifying a new one. This prevents the system from having to deal with two large graphics files simultaneously.

## Adding and Positioning Chart Elements

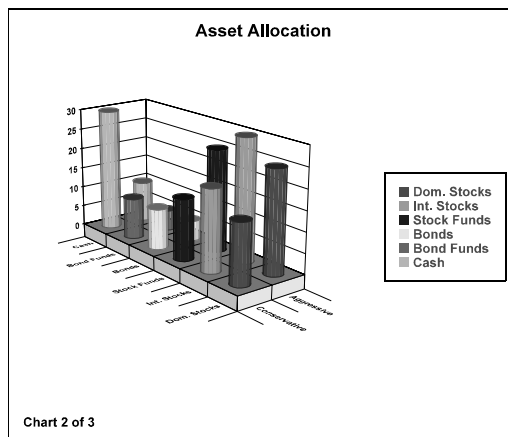
The Location tab of the Chart Designer applies to footnotes, legends, and titles. Use this tab to make chart elements visible and move chart elements to custom or predefined positions.

The Position tab of the Chart Designer only applies to plots. Use this tab to move plots to a custom or predefined position.

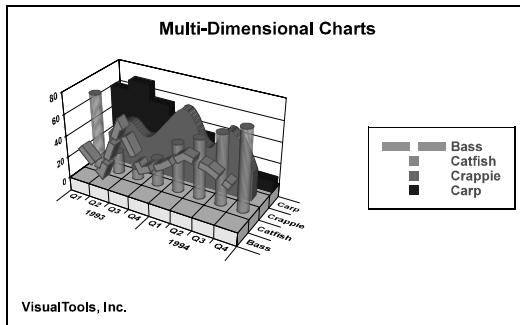
### ► To show or hide titles, footnotes, or legends:

- In the Chart Designer tree view, select the chart element for which you want to show or hide.
- Select the Location tab, if necessary.
- Check the Visible check box to make the chart element visible. Alternatively, uncheck the Visible check box to hide the chart element.
- Click OK or Apply to redraw the chart to reflect the changes.

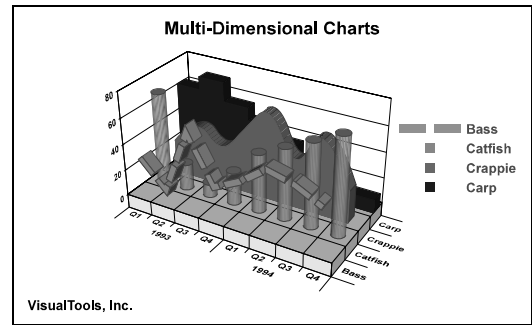
By default, when you add a title, footnote, plot, or legend, First Impression puts the object in a specific location. The following illustration shows the default position for these objects.



The following illustrations show the results of resizing and repositioning chart elements.



Automatic Layout

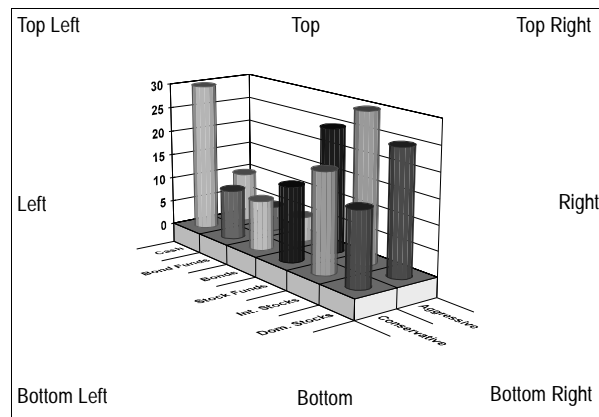


Custom Layout

*The custom chart was given more impact by enlarging the plot and repositioning it higher in the chart. The border was also removed from the legend and it was repositioned slightly to better fit with the resized plot.*

➤ **To move a title, footnote, or legend to a new predefined position:**

1. In the Chart Designer tree view, select the chart element for which you want to move to a new predefined position.
2. Select the Location tab, if necessary.
3. Check the Visible check box to make the chart element visible.
4. In the Location section of this tab, select the appropriate radio button to specify the new position. The following illustration shows the position of the available options.



5. Click OK or Apply to redraw the chart to reflect the changes.

➤ **To move a title, footnote, or legend to a custom position:**

1. In the Chart Designer tree view, select the chart element for which you want to move to a custom position.
2. Select the Location tab, if necessary.
3. Check the Visible check box to make the chart element visible.
4. Select the Custom Location radio button, if it not already selected.
5. Enter values in the Top, Left, Height, and Width text boxes to describe the coordinates of the upper left corner of the object and its height and width.  
First Impression uses the measurement unit specified in your Windows default settings.
6. Click OK or Apply to redraw the chart to reflect the changes.

➤ **To move a plot to a custom position:**

1. In the Chart Designer tree view, select the plot for which you want to move to a custom position.
2. Select the Position tab, if necessary.
3. Uncheck the Automatic Location check box.
4. Enter values in the Top, Left, Height, and Width text boxes to describe the coordinates of the upper left corner of the object and its height and width.  
First Impression uses the measurement unit specified in your Windows default settings.
5. Click OK or Apply to redraw the chart to reflect the changes.

---

**Note** You can also resize or reposition objects manually. Refer to Chapter 3 for more information about resizing and reposition objects.

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## Formatting and Specifying Text

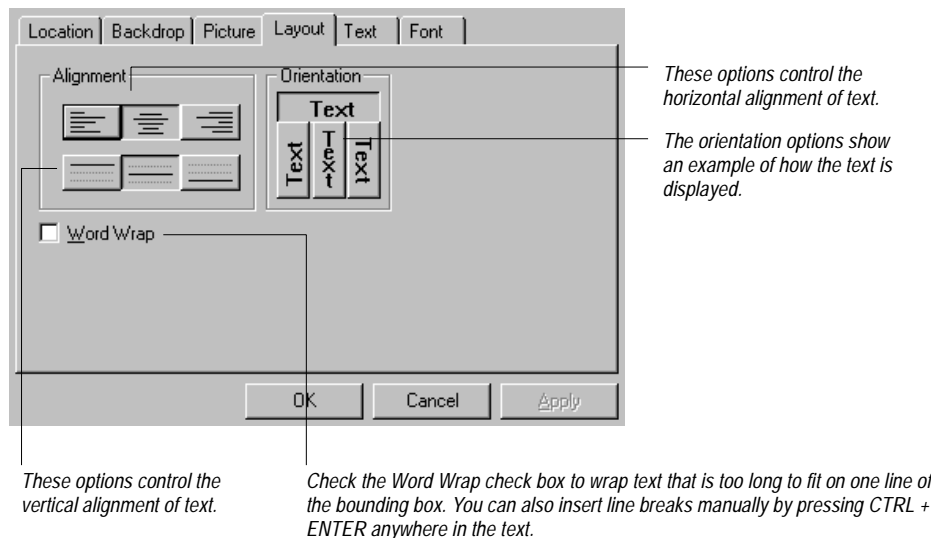
Similar methods are used to format most of the text on a chart. This section discusses the formatting of fonts used to display all chart text as well as the orientation and alignment of chart titles, footnotes, legend text, and axis titles.

### Specifying Text Alignment and Orientation

The Layout tab of the Chart Designer controls the alignment, orientation, and word wrap of text for axis titles, data point labels, footnotes, labels, series labels, and titles. The horizontal and vertical alignment of text is only observed if you enlarge the rectangle holding the text.

➤ **To control the alignment, orientation and word wrap of text:**

1. In the Chart Designer tree view, select the chart element for which you want to format the text.
2. Select the Layout tab. The Layout tab is shown in the following illustration.



3. In the Alignment section, click the appropriate button to control the horizontal alignment of text. You can align text on the left margin, in the center, or on the right margin.
4. In the Alignment section, click the appropriate button to control the vertical alignment of text. You can align text at the top margin, in the middle, or at the bottom margin.
5. In the Orientation section, click the appropriate button to control the orientation of the text.
6. Click OK or Apply to redraw the chart to reflect the changes.

## Specifying Text

The Text tab of the Chart Designer specifies the text of axis titles, data point labels, footnotes, and series labels.

➤ **To specify text:**

1. In the Chart Designer tree view, select the chart element for which you want to specify text.
2. Select the Text tab.

3. In the Text text box, enter the text that you want to display for the chart element.
4. Click OK or Apply to redraw the chart to reflect the changes.

## Formatting Fonts

The Font tab of the Chart Designer specifies the font, font style, font size, and special effects used to display text elements on a chart. You can specify font formats for axis titles, data point labels, footnotes, labels, series labels, titles, and legends.

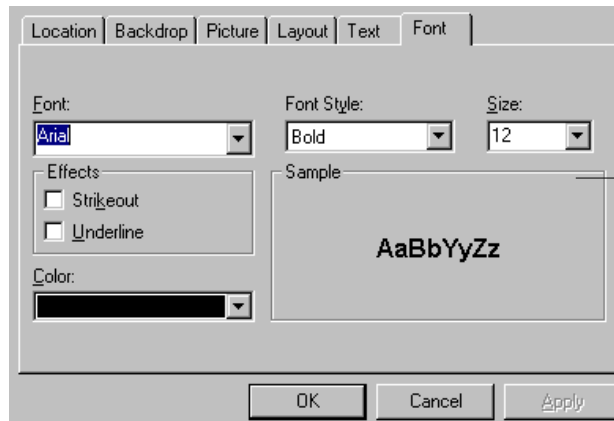
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**Note** If you select a default data point label, these options apply to all the non-custom data point labels. If you select a specific data point label, these options apply to only that data point label and override any default data point settings.

---

► **To specify the format of text fonts:**

1. In the Chart Designer tree view, select the chart element for which you want to format the font.
2. Select the Font tab. The Font tab is shown in the following illustration.



3. Select a font from the Font list. A list of fonts installed on your Windows system is available.
4. Select a style from the Font Style list. A list of supported styles for the font you selected is available.
5. Select a size from, or type a valid size in the Size combo box.
6. Check either or both of the Strikeout and Underline check boxes to apply those effects to the text.

7. In the Color list, choose a predefined color or click Custom to create your own color.
8. Click OK or Apply to redraw the chart to reflect the changes.



# Formatting Plots

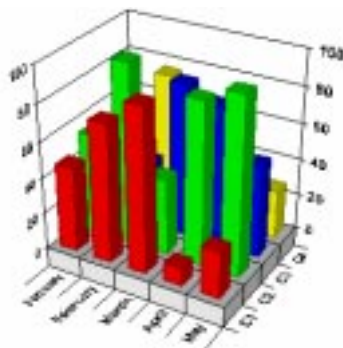
There are a number of formatting options that you can specify for 2D and 3D charts. This chapter discusses how to:

- Format chart plot walls.
- Format chart plot bases.
- Customize the appearance of chart plots.
- Control chart direction.
- Control bar spacing.
- Change the 3-D view.
- Change the 3-D lighting.

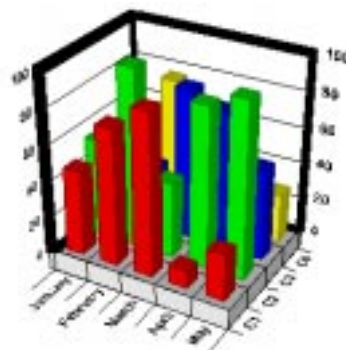
Some tabs in the Chart Designer are available for all the charts. However, some tabs only apply to certain charts such as 3-D charts. The following sections describe which tabs apply to certain charts, as well as how to use the tabs to apply chart settings. For more information about pie, bubble, contour, and elevation charts, refer to Chapter 11.

## Formatting Chart Plot Walls

The Walls tab of the Chart Designer changes the colors and patterns applied to the walls of 2D and 3D charts, the colors used to draw wall lines, and the widths of walls. This tab applies to all the 2D and 3D charts. The following illustrations show a 3D chart formatted without a wall and a 3D chart formatted with a wall.



*A wall setting is not specified for this chart.*



*This chart is drawn with a five point wall width, a solid pen style, a four point pen width, and a black pen color.*

### ➤ To specify wall widths for 3D charts:

1. In the Chart Designer tree view, select Plot to format the chart walls.
2. Select the Walls tab.
3. In the Wall Width text box, enter the number of points for the wall width.
4. Click OK or Apply to redraw the chart to reflect the changes.

### ➤ To format a wall pen style:

1. In the Chart Designer tree view, select Plot to format the chart walls.
2. Select the Walls tab.
3. Select a line style for the lines that frame the walls from the Style list.
4. In the Width list, choose a predefined width or click Custom to create your own width.
5. In the Color list, choose a predefined color or select Custom to create your own color. The fill color is used to create a solid pattern.
6. Click OK or Apply to redraw the chart to reflect the changes.

➤ **To format a wall fill:**

1. In the Chart Designer tree view, select Plot to format the chart walls.
2. Select the Walls tab.
3. Select a pattern or solid fill from the Pattern list.

Refer to “Choosing Backdrop Fills” on page 115 to learn more about patterns.

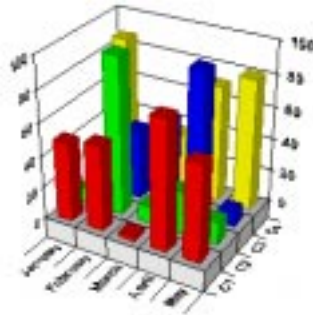
4. In the Fill Color list, select a predefined color or click Custom to create your own color.

The fill color is used to create a solid pattern. It is used as the background color for any other type of pattern. By default, the line color for an element matches this fill color.

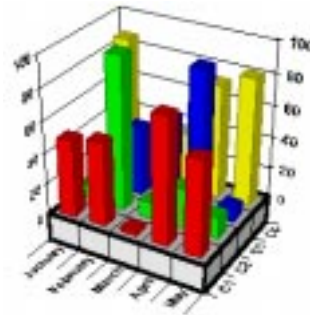
5. In the Pattern Color list, select a color or click Custom to create your own color. The pattern color is drawn on top of the fill color.
6. Click OK or Apply to redraw the chart to reflect the changes.

## Formatting Chart Plot Bases

The Base tab of the Chart Designer changes the colors and patterns applied to the bases of 3D charts, the colors used to draw base lines, and the heights of bases. The Base tab applies to all the 3D charts. The following illustrations show a 3D chart formatted with the default base setting and a 3D chart formatted with additional base settings.



*The default base setting (18 points) is applied to this chart.*



*This chart is drawn with a 36 point base height, a solid pen style, a two point pen width, and a black pen color.*

➤ **To specify a base height:**

1. In the Chart Designer tree view, select Plot to format the chart base.
2. Select the Base tab.
3. In the Base Height text box, enter the number of points for the base height.
4. Click OK or Apply to redraw the chart to reflect the changes.

➤ **To format a base pen style:**

1. In the Chart Designer tree view, select Plot to format the chart base.
2. Select the Base tab.
3. Select a line style for the lines that frame the base from the Style list.
4. In the Width list, choose a predefined width or click Custom to create your own width.
5. In the Color list, choose a predefined color or select Custom to create your own color.
6. Click OK or Apply to redraw the chart to reflect the changes.

➤ **To format a base fill:**

1. In the Chart Designer tree view, select Plot to format the chart base.
2. Select the Base tab.
3. Select a pattern or solid fill from the Pattern list.

Refer to “Choosing Backdrop Fills” on page 115 to learn more about patterns.

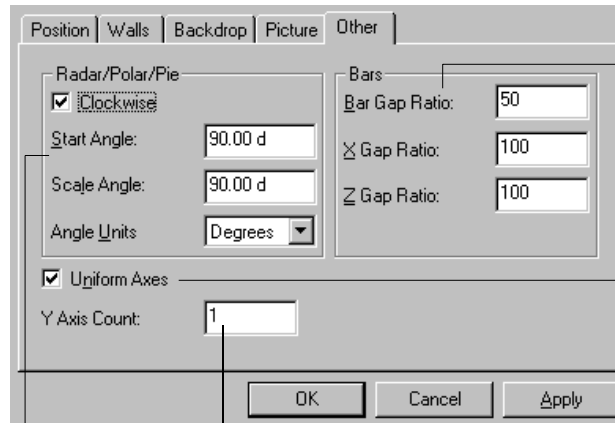
4. In the Fill Color list, select a predefined color or click Custom to create your own color.

The fill color is used to create a solid pattern. It is used as the background color for any other type of pattern. By default, the line color for an element matches this fill color.

5. In the Pattern Color list, select a color or click Custom to create your own color. The pattern color is drawn on top of the fill color.
6. Click OK or Apply to redraw the chart to reflect the changes.

# Customizing the Appearance of Chart Plots

The Other tab of the Chart Designer changes the gap ratios of bars on bar and hi-lo charts and the chart elements of doughnut, radar, polar, and pie charts. This tab is available to all the 2D and 3D charts; however, all the options might not apply to the different types of charts. The following illustration shows the Other tab.



*These options control the spacing between bars.*

*Check this check box to specify whether the unit scale for all value axes in a chart is uniform.*

*This option lets you add multiple Y axes to the chart.*

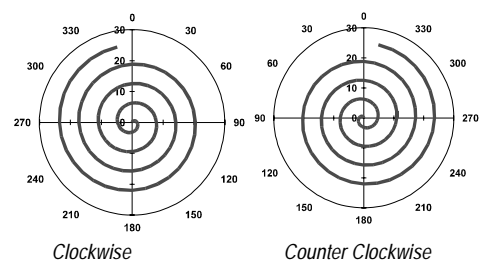
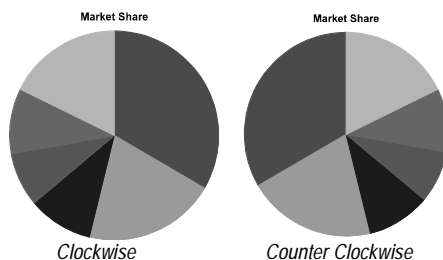
*These options control the chart direction of doughnut, radar, polar, and pie charts.*

The following sections describe how to customize the appearance of chart plots using the options in this tab.

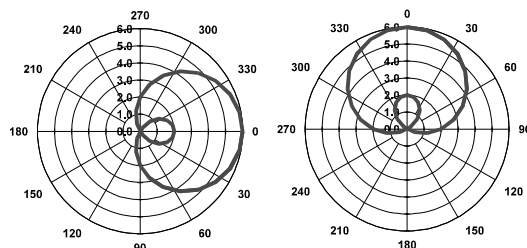
## Controlling Chart Direction

The options in the Radar/Polar/Pie section of the Other tab control how pie, doughnut, polar, and radar charts are drawn. Settings that you specify using the controls in the Radar/Polar/Pie section of the Other tab are:

- **Clockwise.** This setting allows you to control the direction of charts. The following illustrations show pie charts in a clockwise and counterclockwise position.



- **Start Angle.** This setting allows you to specify the start position of charts. A start angle of 0 indicates a 3 o'clock position. A start angle of 90 degrees moves the starting position to 12 o'clock if the direction is set to counterclockwise, or to 6 o'clock if the direction is set to clockwise. The value is displayed in degrees, radians, or grad, depending on your selection in the Angle Units list in the Other tab. The following illustrations show start angles specified at different degrees



Start Angle 0

Start Angle 90

- **Scale Angle.** This setting specifies where you want to display the scale on the chart. Angles are measured in the direction specified by the Clockwise check box. A value of 0 starts at the 3 o'clock position.
- **Angle Units.** This setting allows you to select the unit of measure for all the angles in the chart. This affects the unit of measure used for: drawing the angle (Y coordinate) in a polar chart; the starting angle for polar, pie and doughnut charts; scale angle for radar and polar charts; and the rotation and elevation of 3D charts. Choose degrees, radians, or grads.

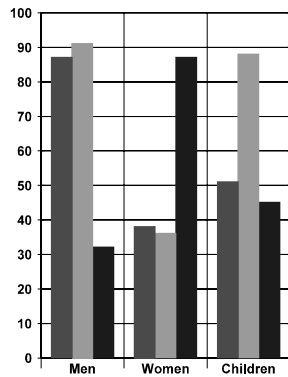
### ► To control chart direction:

1. In the Chart Designer tree view, select Plot to format the chart.
2. Select the Other tab.
3. Check the Clockwise check box to draw pie, doughnut, polar, and radar charts in a clockwise direction. Alternatively, uncheck the check box to draw the charts in a counterclockwise direction.
4. Enter a value between -360 and 360 degrees in the Start Angle text box to indicate the point on a circle at which drawing starts for pie, doughnut, polar, and radar charts.
5. Enter a value between -360 to 360 degrees in the Scale Angle text box to choose where you want to display the scale on a chart.
6. Select a unit of measure from the Angle Units list to choose the unit of measure for all angles in the chart.
7. Click OK or Apply to redraw the chart to reflect the changes.

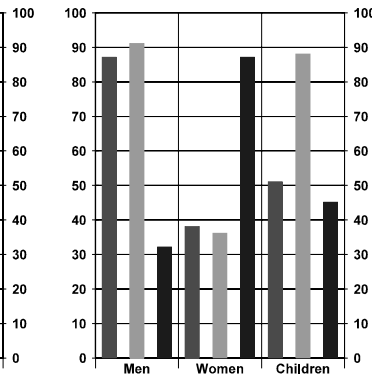
## Controlling Bar Spacing

The options in the Bar section of the Other tab control the gap ratios of bars on bar and hi-lo charts. The settings that you specify using the controls in the Radar/Polar/Pie section of the Other tab are:

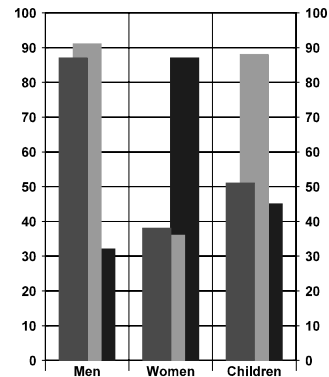
- **Bar Gap Ratio.** The Bar Gap Ratio controls the distance between bars within a category. The default bar gap of 50 percent places a space between each bar that is half as wide as the bars. The following illustrations show the results of bar gap settings.



*Bar Gap of 0.*

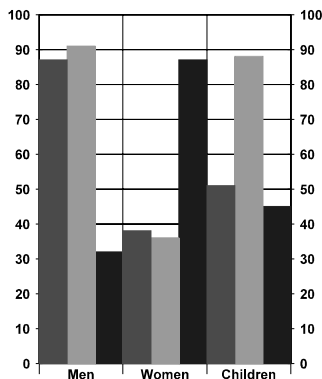


*Bar Gap of 100 percent.*

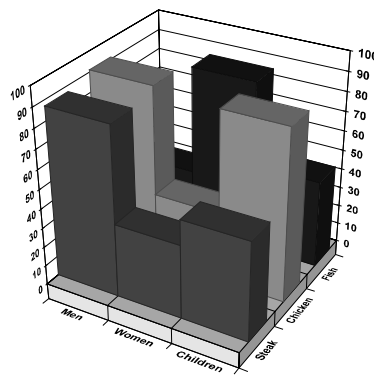


*Bar Gap of -50 percent.*

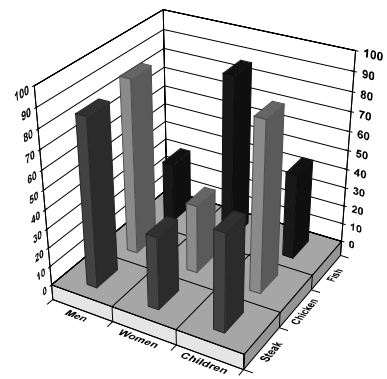
- **X Gap Ratio.** The X Gap Ratio controls the distance between individual bars on the X axis of a 3D bar chart and the space between categories of bars on 2D bar and hi-lo charts. The following illustrations show various X Gap settings.



*Bar Gap of 0  
and X Gap of 0.*

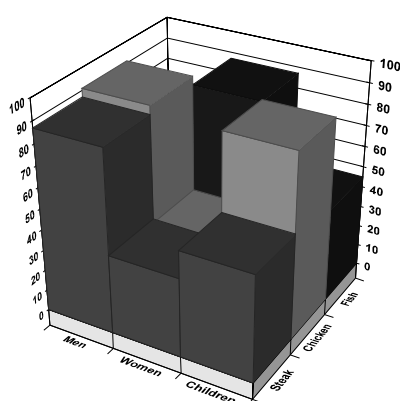


*X Gap of 0  
Z Gap of 100 percent.*

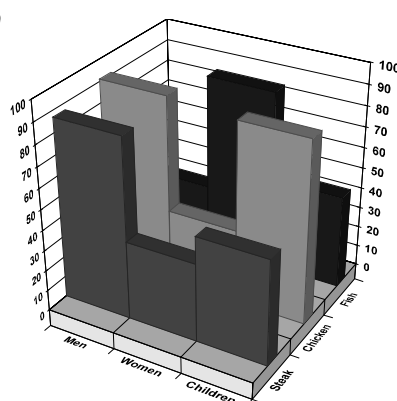


*X Gap of 500  
Z Gap of 100 percent*

- **Z Gap Ratio.** The Z Gap Ratio controls the distance between series of bars on the z axis of a 3D chart. The following illustrations show various Z Gap settings.



*X Gap of 0  
Z Gap of 0*



*X Gap of 0  
Z Gap of 300*

➤ **To control bar gap ratios:**

1. In the Chart Designer tree view, select Plot to format the chart.
2. Select the Other tab.
3. Enter a bar gap value between 10,000 and -100 in the Bar Gap Ratio text box to control the distance between bars within a category.
4. Enter a value between 0 and 10,000 in the X Gap Ratio text box to control the distance between individual bars on the X axis of a 3D bar chart and the space between categories of bars on 2D bar and hi-lo charts.
5. Enter a value between 0 and 10,000 in the Z Gap Ratio text box to control the distance between series of bars on the Z axis of a 3D chart.
6. Click OK or Apply to redraw the chart to reflect the changes.

## Controlling Axis Display Options

The Axis options in the Other tab let you add multiple Y axes to the chart and make any secondary Y axis display a different scale than the primary Y axis. For more information on multiple and secondary Y axes, see “Multiple Y Axes and Secondary Y Axes” on page 209.

➤ **To create multiple Y axes on the chart:**

1. Enter the number of Y axes you want in the Y Axis Count box.
2. Click OK or Apply to redraw the chart to reflect the changes.

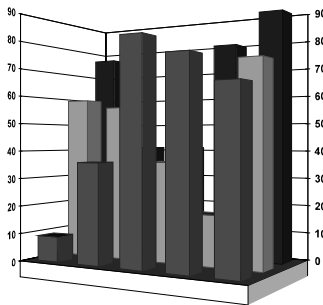


- To make the secondary Y axis show a different scale than the primary Y axis:
1. Uncheck the Uniform Axes check box.
  2. Click OK or Apply to redraw the chart to reflect the changes.
  3. To change the axis scale display for the secondary Y axis, select the secondary Y axis node in the tree view, then change the settings on the Value Scale tab.  
For more information on axis scaling, see “Specifying Settings Common to All Axes” on page 151.

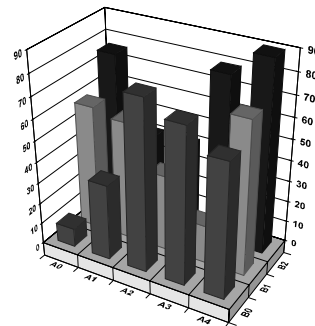
## Changing the 3-D View

The 3-D View tab changes how 3D charts are viewed. The settings that you specify using the controls in the 3D View tab are:

- **Elevation.** This setting specifies the relative height from which the chart is viewed. If you set the elevation to 90, you look directly down on the top of the chart. If you set the elevation to 0, you look directly at the side of the chart. The following illustrations show the same chart with elevation settings of 0 degrees and 30 degrees.

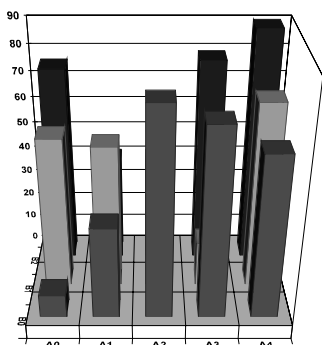


*This chart has an elevation of 0.*

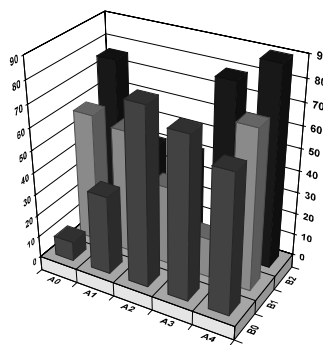


*This chart has the default elevation of 30 degrees.*

- **Rotation.** This setting specifies the angle the chart is turned from the viewer. If you are using an angle measurement other than degrees, enter the proper equivalents. The following illustrations show rotation settings at 90 degrees and 60 degrees.

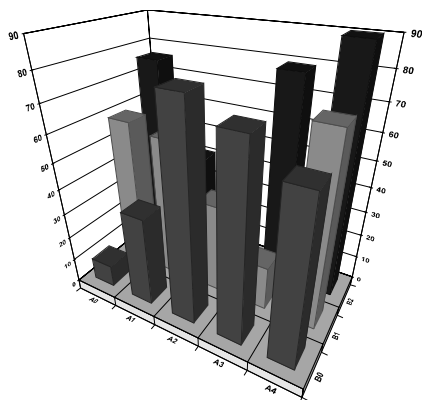


*This chart has a rotation of 90 degrees.*

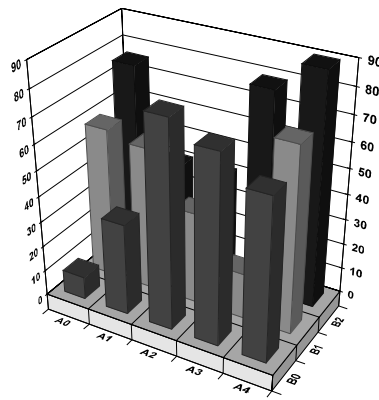


*This chart has the default rotation of 60 degrees.*

- **Viewing Distance.** This setting represents the distance from which the chart is viewed as a percentage of the depth of the chart. The perspective of an object changes as you move closer to it or farther away from it. The same is true of a 3D chart. By default, 3D charts are viewed from a distance of 200 percent of the chart's depth. The following illustrations show the same chart at viewing distances of 50 percent and 200 percent.

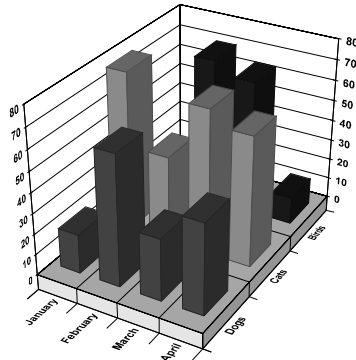


*This chart is drawn with a viewing distance of 50 percent.*

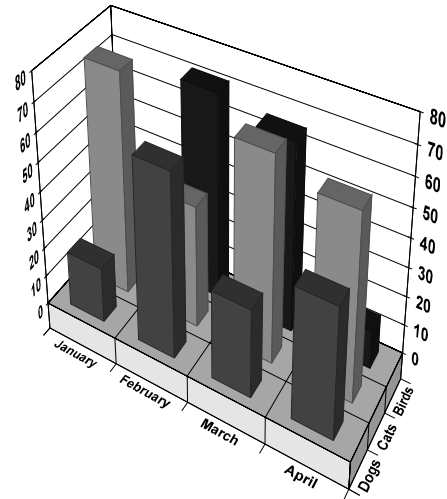


*This chart is drawn with the default viewing distance of 200 percent.*

- **Width To Height and Depth To Height.** These settings represent the percentage of the chart's height used to draw the chart's width and depth. The following illustrations show the same chart at two different width and depth settings.

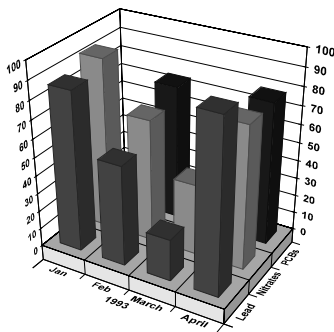


*This chart has a width ratio of 100 and a depth ratio of 200.*

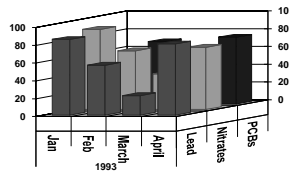


*This chart has a width ratio of 200 and a depth ratio of 100.*

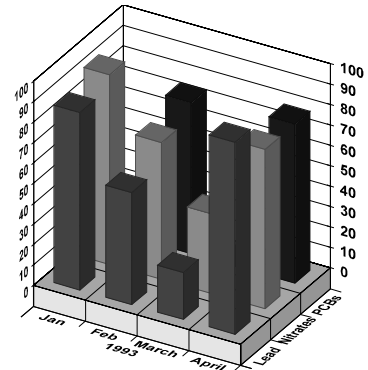
- **Projection.** This setting specifies the projection method of the chart. When you look at a 3D chart on a computer screen or a printed piece of paper, you are looking at an object that is specially drawn to give a 3D appearance in a 2D plane. The following illustrations show the same chart drawn using perspective, oblique, and, orthogonal projection methods.



*Perspective*



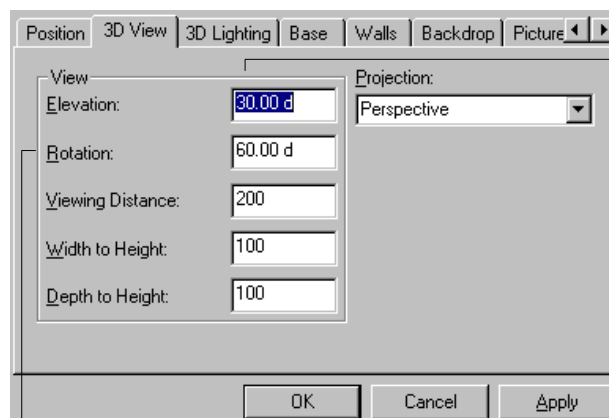
*Oblique*



*Orthogonal*

► **To change the 3D view:**

1. In the Chart Designer tree view, select Plot to format the chart.
2. Select the 3D View tab. The following illustration shows the 3D View tab.



*The default elevation is 30 degrees. If you are using an angle measurement other than degrees, enter the proper equivalents.*

*Rotation does not apply to 3D pie or doughnut charts.*

3. Enter a number between 0 and 90 degrees in the Elevation text box to control the relative height from which a chart is viewed.
4. Enter a number between 0 and 360 degrees in the Rotation text box to specify the angle that the chart is turned from the viewer.
5. Enter a positive number that represents the distance from which the chart is viewed as a percentage of the depth of the chart in the Viewing Distance text box.
6. Enter a positive number in the Width to Height and Depth to Height text boxes to represent the percentage of the chart's height used to draw the chart's width and depth.
7. Select a projection setting from the Projection list. The following table describes the settings:

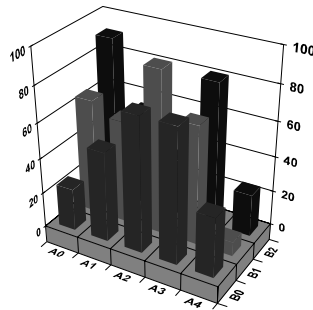
Projection	Description
Oblique	This is sometimes referred to as 2.5 dimensional. The chart has depth, but the XY plane does not change when the chart is rotated or elevated.
Orthogonal	Perspective is not applied to the chart. The advantage of using this type of projection is that vertical lines remain vertical, making some charts easier to read.
Perspective	This provides the most realistic 3D appearance. Objects farther away from you converge toward a vanishing point.

8. Click OK or Apply to redraw the chart reflecting the changes.

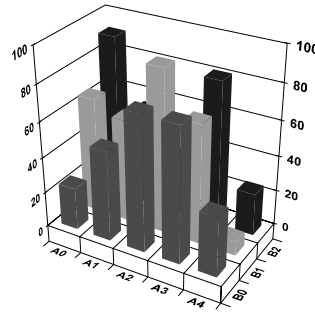
## Changing the 3-D Lighting

The 3-D Lighting tab of the Chart Designer changes the lighting of all the 3-D charts. For example, when light falls on a 3D object some areas of the object are brightly illuminated, and other areas are in shadows. You have complete control of how much light strikes the chart, and from what direction. Settings that you specify using the controls in the 3D Lighting tab are:

- **Ambient light.** Ambient light shines on all the sides of chart elements and is cast in addition to light from fixed light sources. If ambient light is set to 100 percent, all sides of the chart elements are illuminated equally no matter what light sources you turn on. If ambient light is set to 0, only the sides of chart elements facing the active light sources are illuminated. The following illustrations show charts displayed with ambient light set at 50 percent and 100 percent.

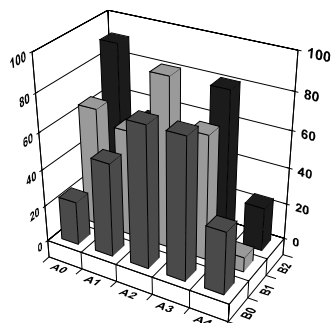


*Ambient light 50 percent  
No edge lights  
No light sources*

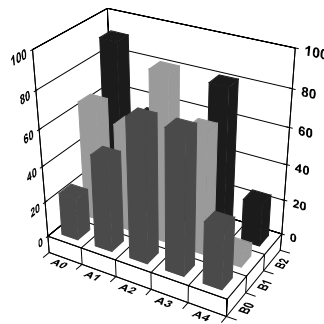


*Ambient light 100 percent  
No edge lights  
No light sources*

- **Edge Intensity.** Edge lights vary the illumination of the edges of the chart elements. An edge light intensity of 0 draws the edges as black lines. An edge light intensity of 100 percent fully illuminates the edges using the edge pen's color. The default edge pen color is the same as the series fill color. The following illustrations show charts displayed with edge light set at 0 percent and 100 percent.

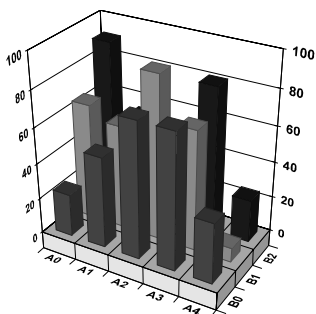


*Ambient light 100 percent  
Edge lights on at 0  
No light sources*

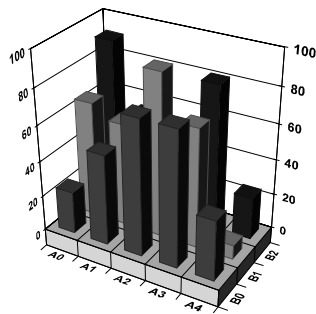


*Ambient light 100 percent  
Edge lights on at 100 percent  
No light sources*

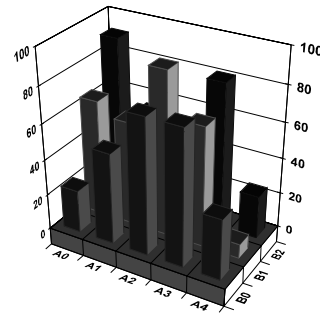
- **Light sources.** Light sources control infinite light. An infinite light source means that while there is a direction towards which the light shines, there is not a fixed distance from which the light is shone. The position of the light source is at infinity with reference to the chart. This allows a more uniform illumination and shading of the chart surfaces. At an intensity of 100 percent, chart surfaces perpendicular to the light source are fully illuminated. At an intensity of 50 percent, these surfaces receive 50 percent illumination from this light. You can “turn on” or “turn off” up to nine preset infinite light sources on your chart. A setting of 0 turns off the light source. The following illustrations show charts displayed with various light source settings.



*Ambient light 15  
Edge Lights on at 50 Center  
Light Source at 100*



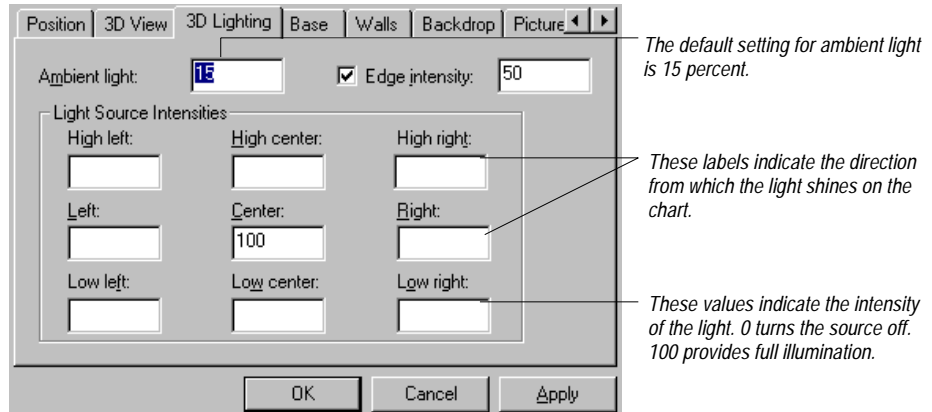
*Ambient light 15  
Edge Lights on at 50  
High Left Light Source at 100*



*Ambient light 15  
Edge Lights on at 50  
Low Right Light Source at 100*

► **To change the 3D lighting on a chart:**

1. In the Chart Designer tree view, select Plot to format the chart.
2. Select the 3D Lighting tab. The following illustration shows the 3D Lighting tab.



3. Enter a number between 0 and 100% in the Ambient Light text box to control how light shines on all sides of chart elements, and is cast in addition to light from fixed light sources.
4. Check the Edge Intensity check box to use edge lights. Alternatively, uncheck the Edge intensity check box to disable edge lighting.

Enter a number between 0 and 100 percent in the Edge Intensity text box to specify the amount of lighting applied to the edges of 3D objects such as bars, lines, pies or doughnuts.

5. For each of the light sources, enter a value between 0 and 100 percent in the Light Source Intensities text boxes.
6. Click OK or Apply to redraw the chart to reflect the changes.

---

**Important** A chart surface's total illumination is the sum of the contributions of the ambient light and each of the infinite lights.

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Tidestone



# Formatting Axes

You can format a number of axis settings on 2D and 3D charts. In addition to setting the backdrop or picture backdrop, layout, text, and font, you can:

- Change the axis scaling, settings, and type.
- Specify formatting for dates and times on axis labels.
- Change the color, width, and style of pens.

## Axis Terminology

Axes can be identified by their position or by their function.

**Position** In terms of their position, axes can be identified as X, Y, and Z axes. In general, X axes are horizontal and show category information, while Y axes are vertical and show value information. Z axes appear only on 3D charts to show depth. They usually display series information. For special chart types like polar, radar, pie, and Gantt, the X, Y, and Z axes function differently. See “Common Axis Elements” on page 147 for information on axes and special chart types.

**Function** In terms of their function, axes can be identified as value axes, category axes, or date/time axes. Category axes have text labels identifying the category or series in the chart. Value axes display numbers as values or percents. Date/time axes display a range of dates and times.

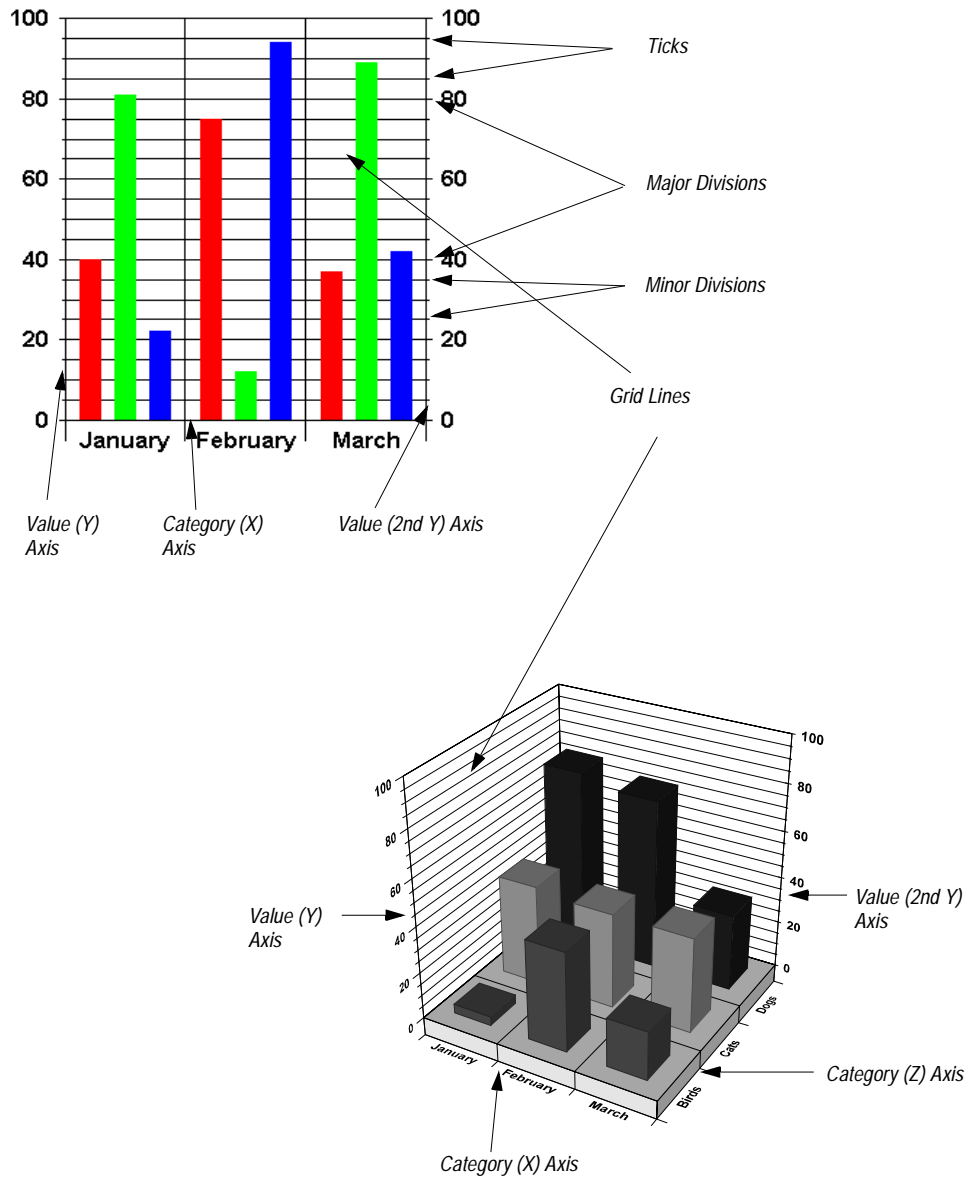
It is important to know the position and function of the axes in your charts, because any formatting applied to an axis is maintained when you switch to a new chart type.

The following table shows which functions correspond to the X, Y, secondary Y, and Z axes for each chart type.

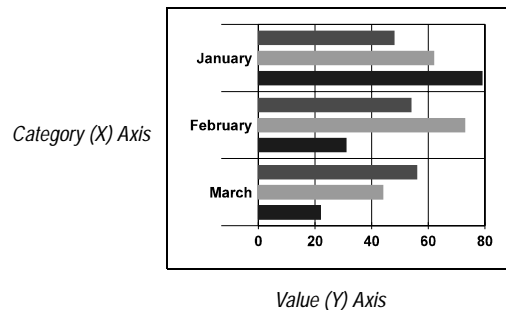
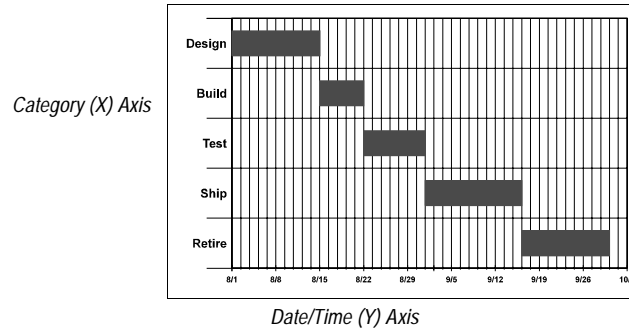
<b>Chart Types</b>	<b>X</b>	<b>Y</b>	<b>2nd Y</b>	<b>Z</b>
2D Area	Category	Value	Value	N/A
2D Bar/Pictograph	Category	Value	Value	N/A
2D Combination	Category	Value	Value	N/A
2D Contour	Category	Value	N/A	Category
2D Gantt	Category	Date/Time	N/A	N/A
2D Horizontal Bar	Category	Value	N/A	N/A
2D Line	Category	Value	Value	N/A
2D Pie	N/A	N/A	N/A	N/A
2D Step	Category	Value	Value	N/A
3D Area	Category	Value	Value	Category
3D Bar (Column)	Category	Value	Value	Category
3D Clustered Bar	Category	Value	Value	Category
3D Combination	Category	Value	Value	Category
3D Doughnut	N/A	N/A	N/A	N/A
3D Gantt	Category	Date/Time	Date/Time	Category
3D Horizontal Bar	Category	Value	Value	Category
3D Line (Tape)	Category	Value	Value	Category
3D Pie	N/A	N/A	N/A	N/A
3D Scatter	Value	Value	Value	Value
3D Step	Category	Value	Value	Category
3D Surface	Category	Value	Value	Category
3D XYZ	Value	Value	N/A	Value
Bubble	Value	Value	N/A	N/A
Hi-Lo	Date/Time or Category	Value	Value	N/A
Polar	Value	Value	N/A	N/A
Radar	Category	Value	N/A	N/A
XY (Scatter)	Value	Value	N/A	N/A

## Common Axis Elements

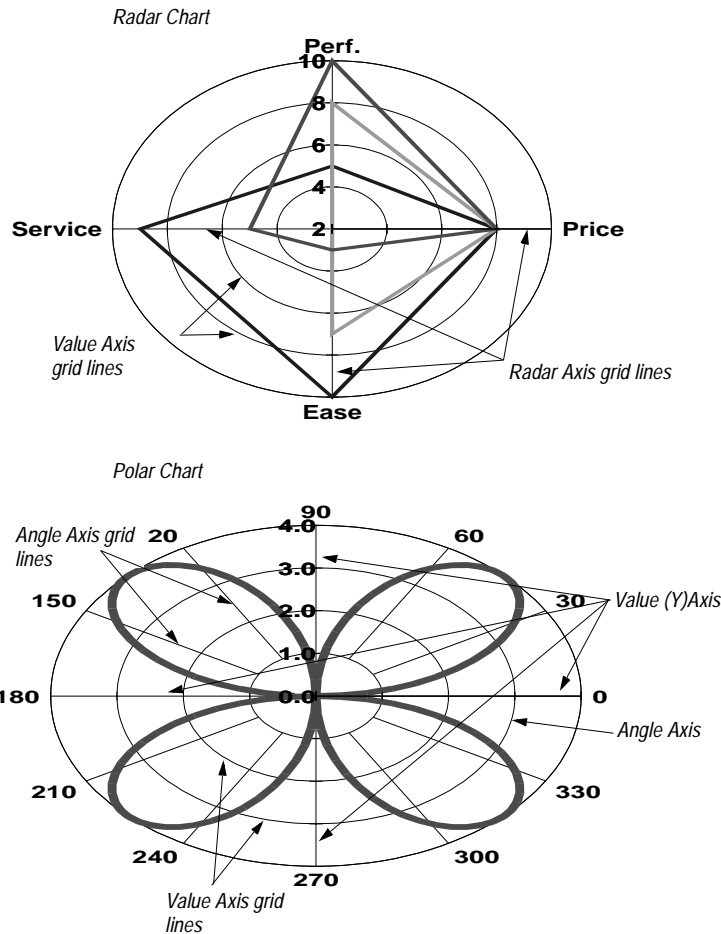
The axis elements that appear on a chart vary from one chart type to another. The following illustration shows the common axis elements on 2D and 3D bar, line, area, and step charts.



Almost all charts display the category (X) axis horizontally. However, both Gantt and horizontal bar charts display the category (X) axis vertically along the left side of the chart. Gantt charts display the date/time (Y) axis along the bottom of the chart. Horizontal bar charts display the value (Y) axis along the bottom of the chart.



The axis elements on radar and polar charts are slightly different. The following illustration shows the axis elements displayed on these two types.



**Note** Pie and doughnut charts have no axis information. They use the format settings for X axis labels to format the labels on the pieces of the pie or doughnut.

## Chart Designer Tabs for Chart Types and Axes

The tabs that the Chart Designer displays for formatting axes vary for the different chart types and axes. The tabs available for 2D and 3D chart types are listed in the following table:

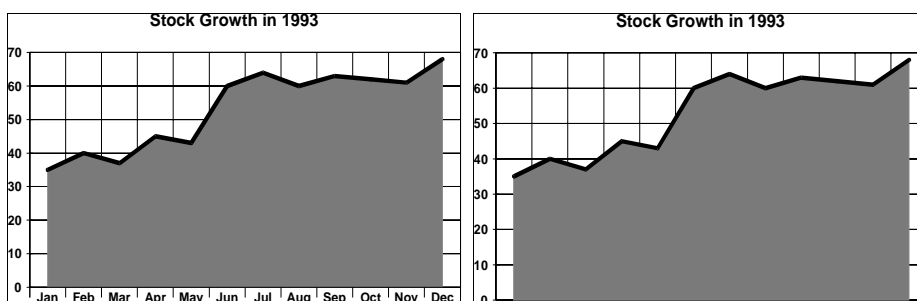
Chart Types	X Axis	Y Axis	2nd Y Axis	Z Axis
2D Bar	Category Scale Pens	Value Scale Scale Type Pens	Value Scale Scale Type Pens	None
2D Line				
2D Area				
2D Step				
2D Combination				
2D Hi-lo				
3D Bar	Category Scale Pens	Value Scale Scale Type Pens	Value Scale Scale Type Pens	Category Scale Pens
3D Line				
3D Area				
3D Step				
3D Combination				
3D Horizontal Bar				
3D Clustered Bar				
3D Surface				
2D Scatter	Value Scale Scale Type Pens	Value Scale Scale Type Pens	None	None
2D Polar				
2D Bubble				
2D Horizontal Bar	Category Scale Pens	Value Scale Scale Type Pens	None	None
2D Radar				
2D Gantt	Category Scale Pens	Date Scale Date Formats Pens	None	None
3D Gantt				
2D Contour	Category Scale Pens	Value Scale Scale Type Pens	None	Category Scale Pens
3D Scatter				
3D XYZ	Value Scale Scale Types Pens	Value Scale Scale Type Pens	None	Value Scale Scale Type Pens
2D and 3D Pie				
3D Doughnut	None	None	None	None

## Specifying Settings Common to All Axes

The Category Scale tab, Value Scale tab, and Date Scale tab of the Chart Designer are similar. They include options that are specific to the type of axis for the chart. They also include options that are common to all types of axes.

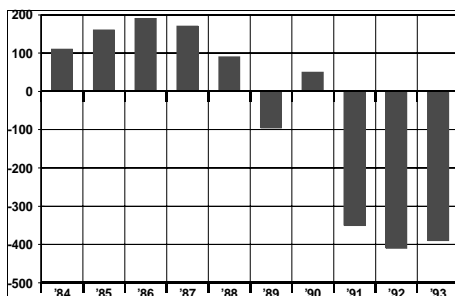
The Category Scale tab, Value Scale tab, and Date Scale tab of the Chart Designer provide the following common settings for formatting axes:

- **Show.** This setting allows you to show or hide the axis scale, value scale or date/time scale. When you use the Category Scale tab, this setting also allows you to show or hide lines, ticks, and titles on the axis. The following illustration shows the same chart, first with the X axis scale on, and then with the X axis scale turned off.

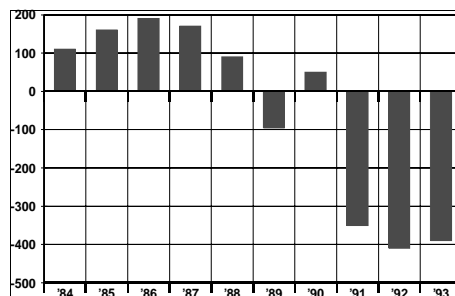


- **Automatic (Scale).** This setting allows you to let First Impression scale the axis based on the data being charted.
- **Ticks (Style).** These settings allow you to select a style to specify the position of the tick on the axis.
- **Ticks (Length).** This setting allows you to enter a length in points for the major tick marks. Minor tick marks are drawn at half the length of the major tick marks.
- **Automatic (Intersection).** This setting allows you to automatically have the axes intersect at their usual position.
- **Cross At.** This setting allows you to specify the position where you want the current axis to cross its intersecting axis.

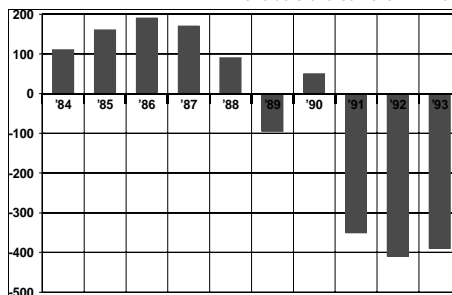
- **Labels Inside Plot.** This setting allows you to move the axis labels with the axis to the new intersection point or leave the labels in their original position. If you move axis labels, labels might display on top of the chart plot. Only the axis line and tick marks are drawn at the new intersection point. The following illustrations show a moved axis intersection.



*Normal Axis Position*



*X axis intersection has been moved to 0 on the Y axis.  
Axis labels are still drawn in the original axis position.*



*X axis intersection and axis labels have been moved to 0 on the Y axis.*

➤ **To display the Category Scale tab, Value Scale tab, or Date Scale tab:**

1. In the Chart Designer tree view, select the appropriate axis to format the scale settings.
2. Select the Category Scale, Value Scale tab, or Date Scale tab.
3. Once the appropriate tab is displayed, format the axes using the procedures listed in the following sections.

➤ **To show or hide the axis scale, value scale or date/time scale:**

1. In the Scale section of the tab, check the Show check box. Alternatively, uncheck the Show check box to hide the axis elements.

When you are using the Category Scale tab, this setting also applies to lines, ticks, and titles.

2. Click Apply or OK to redraw the chart to reflect the changes.



➤ **To position the tick on the axis:**

1. In the Ticks section of the tab, select the appropriate radio button for a tick position. The following table lists the available tick position settings.

Position	Description
None	No tick marks are displayed on the axis.
Center	Tick marks are centered across the axis.
Inside	Tick marks are displayed inside the axis.
Outside	Tick marks are displayed outside the axis.

2. Click Apply or OK to redraw the chart to reflect the changes.

➤ **To specify a custom intersection setting:**

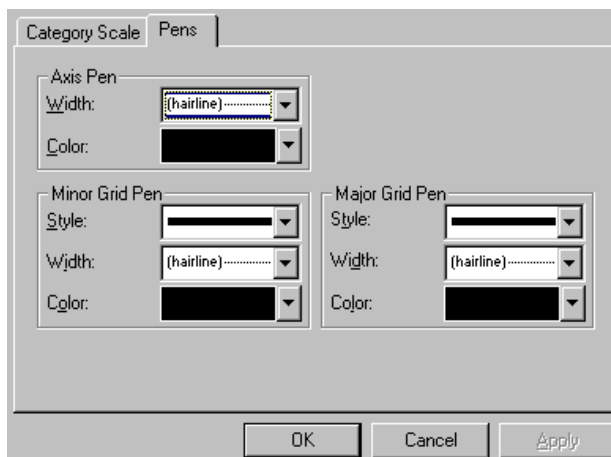
1. In the Intersection section of the tab, uncheck the Automatic check box.
2. In the Cross At text box, enter the position where you want the current axis to cross its intersecting axis. If the intersecting axis is a value axis, enter the value where you want to place the current axis. If the intersecting axis is a date/time or category axis, enter the division number at which you want to place the current axis.
3. If desired, check the Labels Inside Plot check box to move the axis labels with the axis to the new intersection point.
4. Click Apply or OK to redraw the chart to reflect the changes.

## Specifying Axis Pen Color, Width, and Style

The Pens tab of the Chart Designer, which applies to X axes, Y axes, 2nd Y axes, and Z axes, changes the line width and color of the axis line, and the style, width, and color of minor and major grid lines.

► **To change the style and color of the axis pen:**

1. In the Chart Designer tree view, select an axis to format a chart.
2. Select the Pens tab. The Pens tab is shown in the following illustration.



3. In the Axis Pen section of the Pens tab, select a predefined width from the Width list, or select Custom to define your own width.
4. From the Color list, select a predefined color or click Custom to create your own color.
5. Click Apply or OK to redraw the chart to reflect the changes.

► **To change the style, width, and color of the minor or major grid pen:**

1. In the Minor Grid Pen or Major Grid Pen section of the Pens tab, select a predefined style from the Style list, or select Custom to define your own width.
2. Select a predefined width from the Width list, or select Custom to define your own width.
3. From the Color list, choose a predefined color or click Custom to create your own color.
4. Click Apply or OK to redraw the chart to reflect the changes.

# Specifying Category Axis Settings

This section discusses axis settings specific to category axes.

## Specifying Category Axis Label and Tick Settings

The Category Scale tab, shown below, lets you specify label and tick settings for category axes.

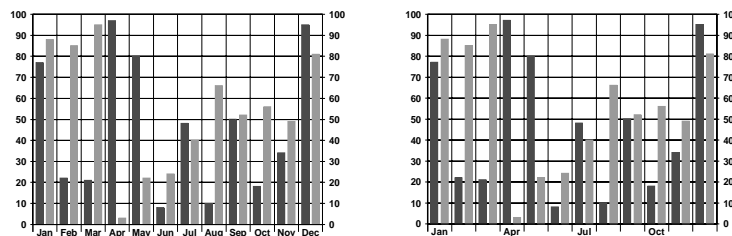
Check the *Show* check box, and uncheck the *Automatic* check box to enter the number of label and tick divisions in the *Divisions* text boxes.

Check this check box to center each label on a tick mark, or uncheck it to center each label between two tick marks.

The following includes specific information about these category scale settings.

- **Per Label.** This setting allows you to set divisions for labels. A value of 1 labels every division. A value greater than 1 labels the first division and skips the labels for the extra divisions.
- **Per Tick.** This setting allows you to set divisions for ticks. A value of 1 places a tick mark at every division. A value greater than 1 places a tick mark at the first division and skips the tick marks for the extra divisions.

Skipping labels and tick marks can help reduce the clutter of labels that can occur when you have a large number of divisions. The following illustration demonstrates the use of this option.



In order to minimize the clutter of labels on the first chart, *Divisions per label* is set to 3. The first label is displayed, two are skipped, and then another label displayed. Ticks are still displayed at every division

➤ **To specify divisions per label:**

1. In the Scale section of the Category Scale tab, check the Show check box and uncheck the Automatic check box.
2. In the Per Label text box, enter a value for the number of divisions for each label.
3. Click Apply or OK to redraw the chart to reflect the changes.

➤ **To specify divisions per tick:**

1. In the Scale section of the Category Scale tab, check the Show check box and uncheck the Automatic check box.
2. In the Per Tick text box, enter a value for the number of divisions for each tick.
3. Click Apply or OK to redraw the chart to reflect the changes.

➤ **To position labels on tick marks:**

1. In the Scale section of the Category Scale tab, check the Labels on Ticks check box to center each label on a tick mark. Alternatively, uncheck this check box to center each label between two tick marks.
2. Click Apply or OK to redraw the chart to reflect the changes.

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**Note** Labels on tick marks only applies to certain chart types.

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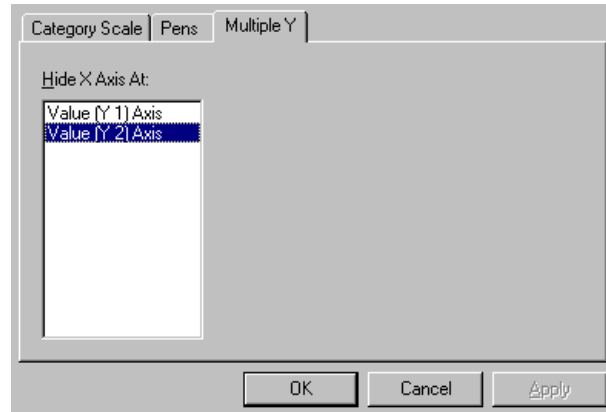
## Specifying Category Axis Hiding Settings

The Multiple Y tab lets you hide one or more of the X axes displayed on multiple Y axis charts. This avoids repeating unnecessary axis information, since all sub-charts on multiple Y axis charts use the same X axis.

The Multiple Y tab is only available on charts that have multiple Y axes.

➤ **To use the Chart Designer to hide an X axis on a multiple Y axis chart:**

1. Select the X axis node and click on the Multiple Y tab, shown below.



2. Select the Y axis that you DON'T want to display an X axis. Y axes are stacked by ascending order of their numbers, so Y1 is on the bottom, Y2 above that, Y3 above that, etc. You may select more than one.

3. Click Apply or OK to redraw the chart to reflect your changes.

➤ **To use properties to hide an X axis on a multiple Y axis chart:**

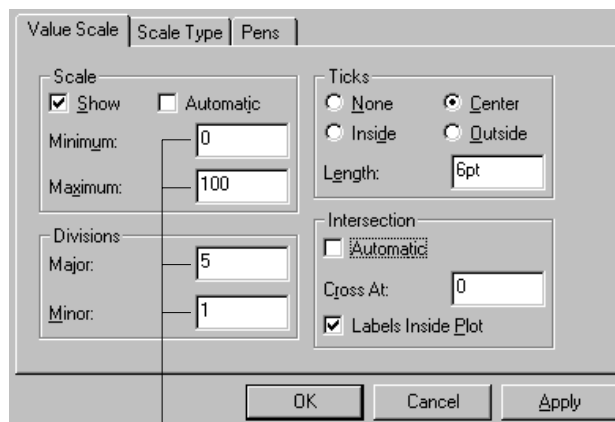
- Use the **HideXAtYIndex** property.

## Specifying Value Axis Settings

This section discusses axis settings specific to value axes.

### Specifying Value Axis Minimum and Maximum Values

The Value Scale tab, shown below, lets you specify minimum and maximum settings for value axes.



*You must uncheck the Automatic check box in the Scale section to enable these options.*

The minimum and maximum values represent the lowest or beginning value and the highest or ending value that is displayed on the scale. You can also specify the major divisions that you want on the axis, and the number of minor divisions between each major division of the axis.

---

**Note** The only scaling change you can make for a radar axis is to turn the display of the axis on or off. Unchecking the Show check box turns off the category labels at the end of each value axis. The value axes on a radar chart can be formatted like any other value axis.

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**Note** The radius axis on a polar chart can be formatted just like any other value axis. Scaling the polar axis allows you to control the number of radial grid lines and labels that are displayed around the perimeter of the chart.

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➤ **To enter values for scaling a value axis:**

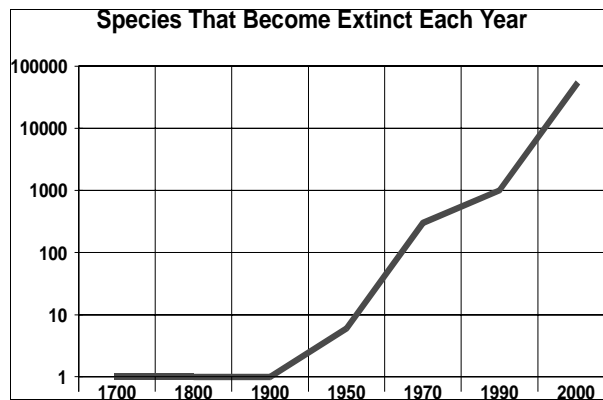
1. In the Scale section of the Value Scale tab, uncheck the Automatic check box.
2. Check the Show check box, if necessary.
3. Enter the lowest or beginning value for the scale in the Minimum text box.

4. Enter the highest or ending value for the scale in the Maximum text box.
5. Enter the major divisions that you want on the axis in the Major text box.
6. Enter the minor divisions that you want between each major division of the axis in this text box.
7. Click Apply or OK to redraw the chart to reflect the changes.

## Specifying Value Axis Scale Types

The Scale Type tab of the Chart Designer, which applies to X axes, Y axes, 2nd Y axes, and Z axes, provides settings for formatting scales that include:

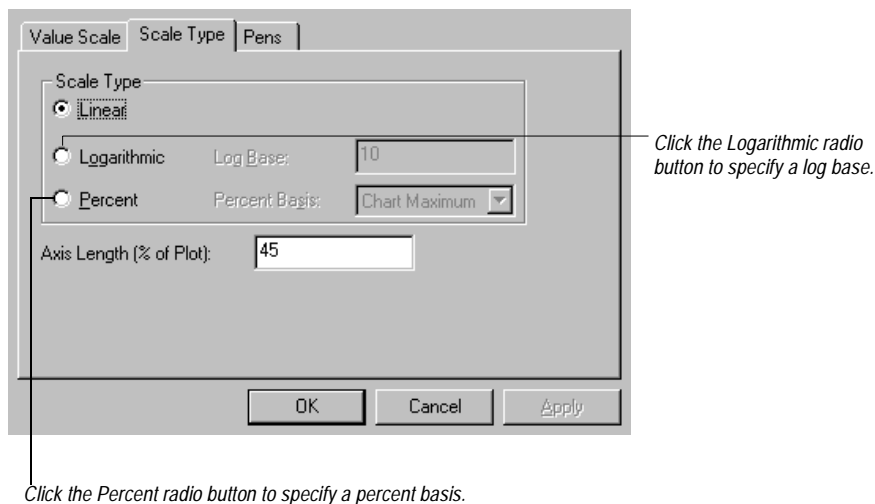
- **Scale Type.** The settings in this section of the tab allow you to select the type of scale, such as linear, logarithmic, or percent that you want to use on the value axis. The following illustration shows an example of a chart using a logarithmic scale.



- **Log Base.** This setting specifies the logarithm base for a logarithmic scale axis. The default base is 10.
- **Percent Basis.** This setting specifies a methods for calculating percentages.
- **Axis Length (% of Plot).** This setting lets you determine how much space each multiple Y axis takes up in the plot of the chart. For charts that do not have multiple Y axes, this option does nothing. For more information on multiple Y axes, see “Formatting Charts with Multiple Y Axes” on page 209.

► **To specify axis scaling:**

1. In the Chart Designer tree view, select an axis to format a chart.
2. Select the Scale Type tab. The Scale Type tab is shown in the following illustration.



3. Select the appropriate radio button for axis scaling. The following table describes the choices:

Type	Description
Linear	Data points are plotted in a linear scale with values ranging from the minimum to the maximum chart value. This is the default scale type.
Logarithmic	Data points are plotted in a logarithmic scale with values based on a specific log scale. Logarithmic axes are not appropriate for zero or negative data.
Percent	Data points are plotted in a linear scale as percentages of the chart values. Changing the percent basis of a chart is useful for determining overall the trends in data rather than specific values.

4. If you select the Logarithmic radio button, enter a number in the Log Base text box for the logarithm base.



5. If you select the Percent radio button, select a percentage type from the Percent Basis list. The following table describes the options:

Percentage Type	Description
Chart Maximum	The largest value in the chart is considered 100 percent and all the other values on the chart are displayed as percentages of that value.
Category Maximum	The largest value in each category is considered 100 percent and all the other values in that category are displayed as percentages of that value.
Series Maximum	The largest value in each series is considered 100 percent and all the other values in that series are displayed as percentages of that value.
Chart Total	All the values in the chart are added together, and that value is considered 100 percent. All the values in the chart are displayed as percentages of that value.
Category Total	All the values in each category are added together to give a total value for each category. All the values are displayed as a percentage of their category total.
Series Total	All the values in each series are added together to give a total value for each series. All the values are displayed as a percentage of their series total.

6. Click Apply or OK to redraw the chart to reflect the changes.

➤ **To specify axis length as a percentage of the total plot size:**

1. In the Chart Designer tree view, select one of your multiple Y axes. The bottom Y axis is Y1, with Y2 on top of it, Y3 on top of that, etc.
2. Select the Scale Type tab, shown above.
3. In the Axis Length (% of Plot) box, enter the percentage of the plot length that you want this axis to take up. For example, to make this axis half of the plot length, enter 50.

If the numbers you enter here for all the Y axes on your chart add up to less than 100, there will be extra space between your Y axes. If the numbers add up to more than 100, then Y1 will display normally and Y2 and any other Y axes will be truncated.

4. Click Apply or OK to redraw the chart to reflect your changes.

## Specifying Date/Time Axis Settings

This section discusses axis settings specific to date/time axes.

### Specifying Date/Time Axis Minimum and Maximum Values

The Date Scale tab, shown below, lets you specify minimum and maximum settings and tick settings for date/time axes.

*Check this check box to not display dates that fall on weekends. Uncheck this check box to display all the dates regardless of the day of the week.*

The Minimum and Maximum values represent the lowest or beginning date and/or time and the highest or ending date and/or time that is displayed on the scale. You can also specify how many intervals pass before a tick mark is placed on the axis.

➤ **To set minimum and maximum values for the scale:**

1. Uncheck the Automatic check box in the Scale section of the Date Scale tab.
2. Check the Show check box, if necessary.
3. Enter the lowest or beginning date and/or time in the Minimum text box.
4. Enter the highest or ending date and/or time in the Maximum text box.
5. Click Apply or OK to redraw the chart to reflect the changes.

➤ **To specify when tick marks are displayed:**

1. Uncheck the Automatic check box in the Scale section of the Date Scale tab.
2. Check the Show check box, if necessary.
3. In the Major Intervals and Minor Intervals text boxes, enter a number to specify how many intervals pass before a tick mark is placed on the axis.

4. Select an interval type from the list to specify when tick marks are displayed. The major ticks and grid lines appear at major intervals, and the minor ticks and grid lines appear at minor intervals. Axis labels are drawn at major intervals. The following table describes the settings for these options.

Type	Description
None	No tick marks or axis labels appear.
Yearly	A tick mark appears on January 1.
Monthly	A tick mark appears on the 1st of the month.
Semi-monthly	A tick mark appears on the 1st and 15th of the month.
Weekly	A tick mark appears on Mondays.
Daily	A tick mark appears per day.
Hour	A tick mark appears per hour.
Minute	A tick mark appears per minute.
Second	A tick mark appears per second.
Millisecond	A tick mark appears per millisecond.

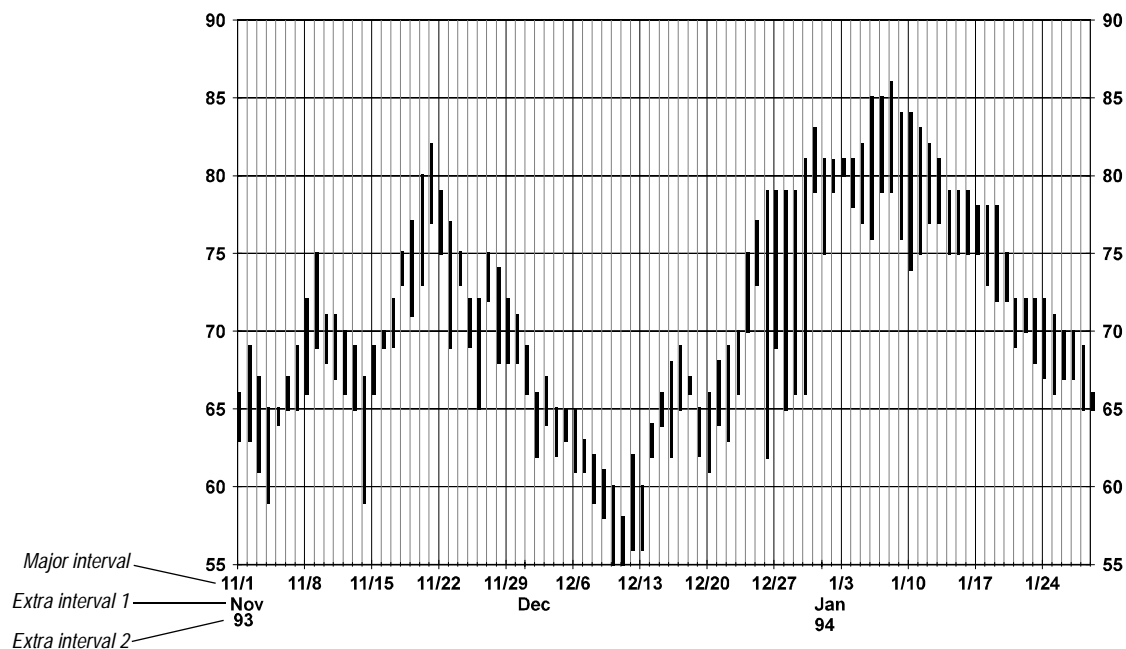
For example, to make the major interval be a quarter of a year, set the number of major divisions to 3 and set the interval to months.

5. Click Apply or OK to redraw the chart to reflect the changes.

## Specifying Date/Time Axis Extra Intervals

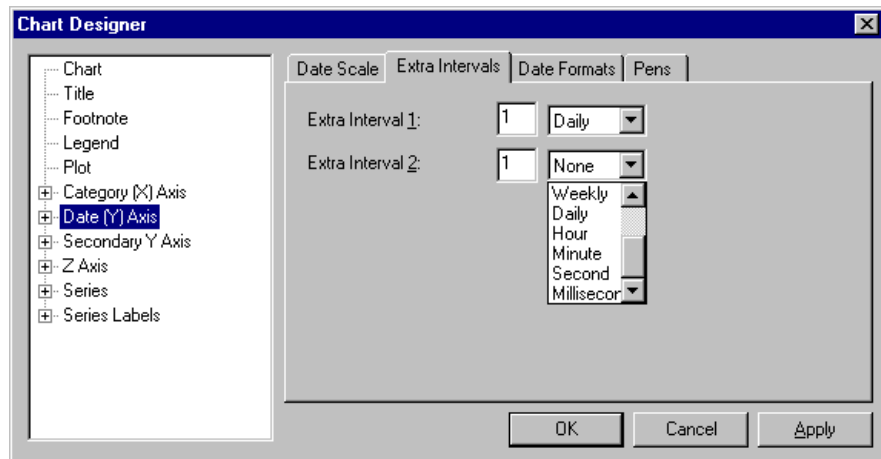
The Extra Intervals tab of the Chart Designer allows you to indicate how often tick marks and axis labels (if desired) appear on the date/time axis. These intervals are marked in addition to the Major and Minor interval markings entered on the Designer Date Scale Tab, discussed above.

The following illustration shows the use of the Major Format, Extra Interval 1, and Extra Interval 2 options.



➤ **To display extra interval axis labels on a date/time axis:**

1. In the Chart Designer tree view, select the Date/Time axis node and select the Extra Intervals tab, shown below.



2. In the small text box, enter the number of time units that must pass before the interval is marked.
3. Select a time unit from the list box. For example, if you enter 6 in the small text box and choose Months in the Interval list box, a tick mark and axis label (if desired) will appear every six months. The intervals are the same as the Major and Minor intervals, described in the table above.
4. Click OK or Apply to redraw the chart and see your changes.

To label the tick marks, choose the appropriate date and/or time label format in the Designer Date Formats Tab, discussed below.

## Specifying Date/Time Axis Label Formats

The Date Formats tab of the Chart Designer allows you to format labels for computed date/time axes for Gantt and hi-lo charts. For more information on computed date/time axes, see “Formatting Charts with Computed Date/Time Axes” on page 208.

The Date Formats tab, which applies to date/time axes, includes the following settings.

- **Major Format.** This setting specifies a date/time format that displays the first level of axis labels. You can add additional levels of labels to indicate additional date/time intervals on the date/time axis.

This setting applies to the major interval established in Date Scale tab. If the Show box on the Date Scale tab is unchecked, the major interval tick marks and labels will not appear on the date scale, and the label format you choose here will not appear, either.

- **Extra Interval 1.** This setting specifies a format to indicate the second level of date/time axis labels.
- **Extra Interval 2.** This setting specifies a format to indicate the third level of date/time axis labels.

The settings in the Extra Interval 1 and 2 boxes apply to the intervals defined in the Extra Intervals tab. If those intervals have not been defined, the extra interval tick marks and labels will not appear, any label format you set here will not appear, either.

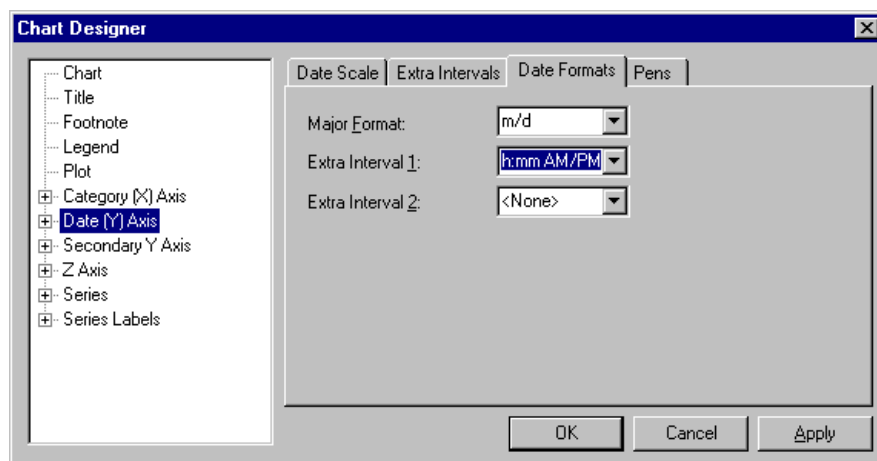
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**Note** First Impression displays dates and times in this tab using the Windows environment date format assigned through the Control Panel. A confusing situation can occur when using dates earlier than 1920. If you have your date format set to not show centuries, the Date Scale tab assumes the date displayed is between 1/1/1920 and 12/31/2019. So, if you have a date axis minimum of Jan 1, 1905, displayed as 1/1/05, First Impression converts it to Jan 1, 2005. The solution is to use centuries in your Windows date format if you want to deal with dates outside the range 1/1/1920 to 12/31/2019.

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➤ **To specify date/time formats on axis labels on computed date/time axes:**

1. In the Chart Designer tree view, select the Date/Time axis node.
2. Select the Date Formats tab, shown below.



3. Select a date/time format from the Major Formats list to indicate the major date/time distinction.
4. If you want to apply a second level of labels, select a format from the Extra Intervals 1 list to indicate the interval.
5. If you want to apply a third level of labels, select a format from the Extra Intervals 2 list to indicate the interval.
6. Click Apply or OK to redraw the chart to reflect the changes.

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**Note** Label formats for date/time axes can also be set by selecting the Axis Labels node for the date/time axis and clicking on the Format tab. Changes you make in the Date Formats tab will be reflected in the Format tab, and vice versa.

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Tidestone



# Formatting Series and Data Points

There are a number of things that you can do to format series data or data points in a chart. You can:

- Plot series data from rows or columns in the data grid.
- Change how series data is displayed.
- Reorder series data.
- Hide or exclude a series.
- Plot the series on a secondary Y axis.
- Add or modify markers used to identify series elements or individual data points.
- Change the appearance of the elements that make up the series.
- Add guidelines or statistics lines to highlight series information.
- Change the fill and line colors used to display series elements or individual data points.
- Change the color and pattern of the edge pen used to display series elements.
- Control data point markers for a series.
- Reset data points to their default settings.

## Supplying Series Data

When you chart series data, you might first want to indicate that the data being plotted on the chart is read from rows in the data grid rather than from columns.

➤ **To read chart data from rows:**

1. Select Chart from the Chart Designer tree view and select the Type tab, if necessary.
2. Check the Data in Rows check box.
3. Click OK or Apply to redraw the chart to reflect the modifications.

## Formatting Series Type

The Series Type tab of the Chart Designer specifies how series data is displayed.

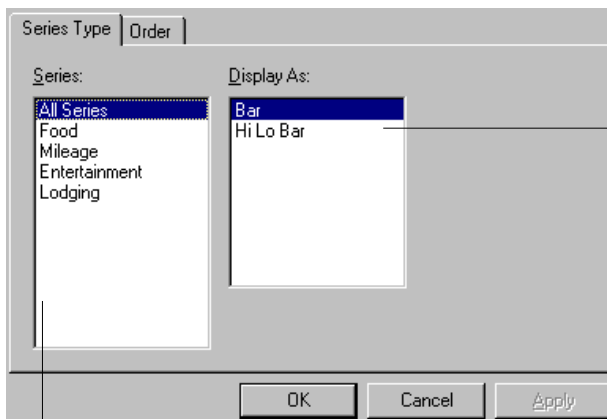
For many charts, you will want to (or are required to) display each series on the chart in the same way. But for some special chart types, First Impression gives you the option of displaying different series in different ways.

The following chart types allow you to display different series on the chart differently.

Chart type	Series can be displayed as
Bar	Bar, Hi-Lo Bar
Combo	Bar, Line, Area, Step, Hi-Lo
Horizontal bar	Horizontal Bar, Hi-Lo Horizontal Bar
Radar	Line (radar), Area (radar)
Hi-lo	Bar, Line, Area, Step, Hi-Lo, Hi-Lo Close, Hi-Lo Close R, Open Hi-Lo Close, Open Hi-Lo Close Bar, Hi-Lo bar, Dates
Clustered Bar	Clustered Bar, Hi-Lo Bar

### ► To change how series data is displayed:

1. In the Chart Designer tree view, select Series.
2. Select the Series Type tab, if necessary. The following illustration shows the Series Type tab



*The options in this list can be applied to all the series data or to individual rows or columns.*

*Row labels or column labels, depending on your selection in the Type tab, are displayed in the Series list.*

3. Select All Series from the Series list to change the display of all the Series data. Alternatively, select an individual row or column label to change the display of the data for it.

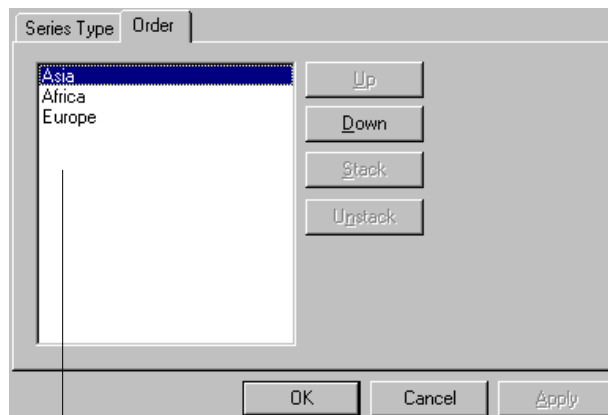
4. In the Display As list, select the series type you want to use to display data from the Display As list.
5. Click OK or Apply to redraw the chart to reflect the modifications.

## Reordering Series

The Order tab of the Chart Designer changes the order in which the series in a chart is displayed. This can be particularly useful if one series obscures the view of the data in another series. By rearranging the series, you can find the most aesthetically pleasing way to present your data.

► **To reorder the series in a chart:**

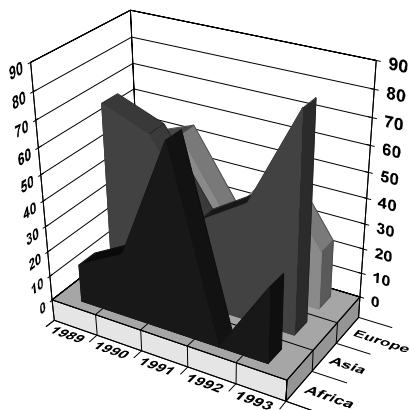
1. In the Chart Designer tree view, select Series.
2. Select the Order tab, if necessary. The following illustration shows the Order tab



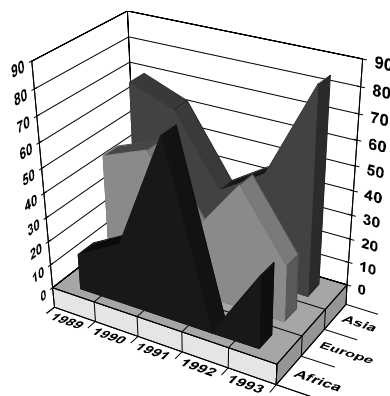
*The Series Order list shows the list of all the series in the order they are drawn on the chart.*

3. Select a series from the Series Order list.
4. Click the Up button to move the selected series up one position in the list. Alternatively, click the Down button to move the series data down one position in the list.
5. Click OK or Apply to redraw the chart to reflect the modifications.

The following illustrations show the result of moving the series labeled Europe in front of the series labeled Asia.



Before



After

*Notice that more data is visible in the new drawing order.*

You can also use the buttons on the Order tab to stack and unstack series and to change the order of stack series.

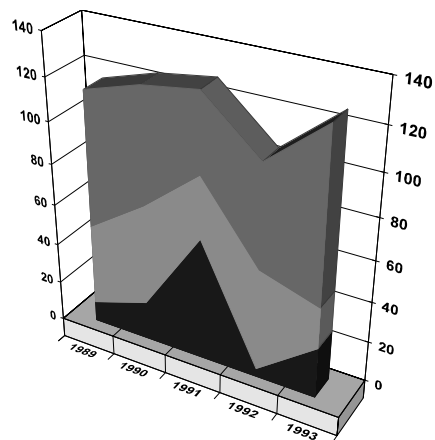
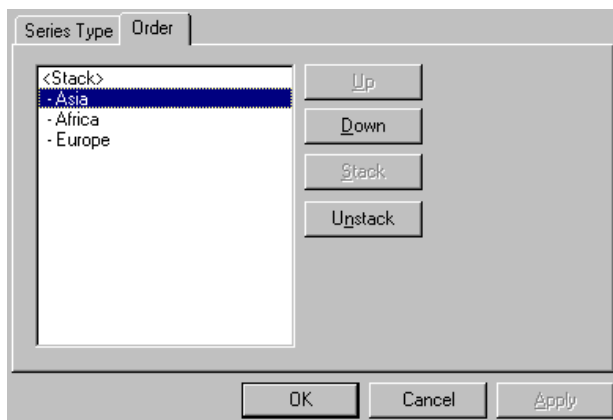
➤ **To stack series data:**

1. Select the last series in the Series Order list.
2. Click the Stack button.

The series that you highlighted is shown as stacked with the preceding series.

3. Select <Stack> from the Series Order list and click the Stack button again.

The two stacked columns are now stacked with the preceding series. The order in which they appear in the stacked list is the order in which they are drawn, first series on the bottom of the stack. The following illustration shows an example:



4. Click OK or Apply to redraw the chart to reflect the modifications.

To unstack the series, select the stack associated with the series in the Series Order list and click Unstack.

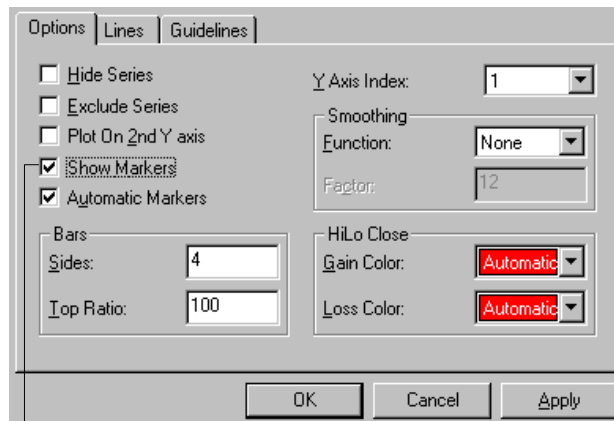
## Setting Series Options

The Options tab of the Chart Designer specifies options for charts that display series data. The options discussed in the following sections include:

- hide series, exclude series, and plot on second Y axis
- show markers and automatic markers
- bars
- Y axis index
- smoothing
- hi-lo close

### ► To display the Options tab:

1. In the Chart Designer tree view, open the Series node and select the series for which you want to change display options.
2. Select the Options tab, if necessary. The following illustration shows the Options tab.

The image shows a dialog box titled 'Options' with three tabs: 'Options', 'Lines', and 'Guidelines'. The 'Options' tab is selected. It contains several settings: 'Hide Series' (unchecked), 'Exclude Series' (unchecked), 'Plot On 2nd Y axis' (unchecked), 'Show Markers' (checked), and 'Automatic Markers' (checked). There are also input fields for 'Y Axis Index' (set to 1), 'Smoothing Function' (set to None), and 'Factor' (set to 12). Under the 'Bars' section, there are input fields for 'Sides' (set to 4) and 'Top Ratio' (set to 100). Under the 'HiLo Close' section, there are dropdown menus for 'Gain Color' and 'Loss Color', both set to 'Automatic'. At the bottom of the dialog are 'OK', 'Cancel', and 'Apply' buttons.

*Use the Show Markers and Automatic Markers check boxes to set defaults for any data points that you display.*

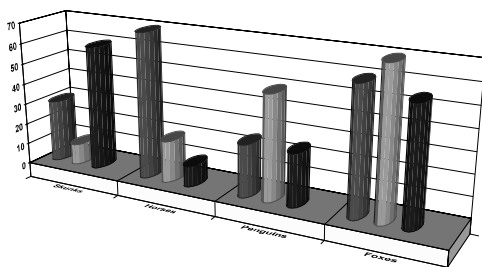
3. Specify the options as described in the following section, and click OK or Apply to redraw the chart to reflect the changes.

## Hiding Series, Excluding Series, and Plotting on Second Y Axis

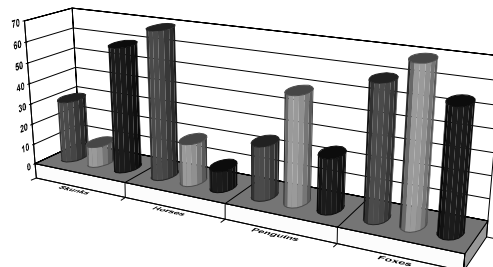
The Hide Series, Exclude Series, and Plot on Second Y Axis check boxes are available in the Options tab. The following describes these check boxes in detail.

- **Hide Series.** Check this box to turn off display of the current series. The space occupied by the series is still shown on the chart, but the data is not displayed. Uncheck this box to redisplay a hidden series. In pie and doughnut charts, room is still reserved for hidden series pie slices, even though they are not displayed.
- **Exclude Series.** Check this box to remove a series from a chart. The data is not displayed and the space occupied by the series is removed from the chart. Uncheck this box to return an excluded series to the chart.

The following illustration shows the difference between hiding and excluding a series.

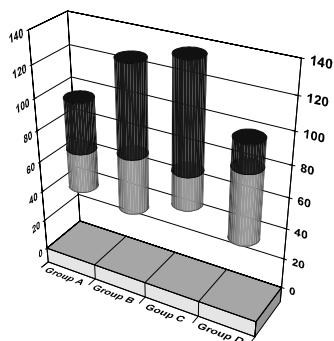


*The last series in each category is hidden.*



*The last series in each category is excluded.*

The following illustration shows how hiding a series in a stacked chart can produce floating chart elements.



- **Plot On 2nd Y Axis.** Check this box to plot the current series on the secondary Y axis, which is the axis drawn on the right side of the chart. (Do not confuse the secondary Y axis with multiple Y axes. For more information, see “Multiple Y Axes and Secondary Y Axes” on page 209.)

After plotting a series on a secondary Y axis, you may want to change the scale, type, or format of the secondary axis to best display the series data.

## Showing Markers and Using Automatic Markers

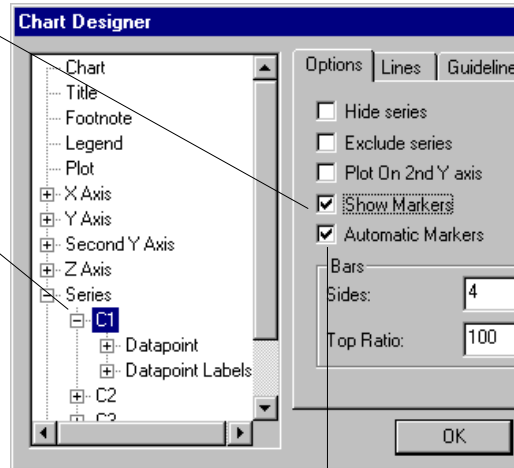
The Show Markers and Automatic Markers options allow you to set marker options for a series, and automatically determine the type of marker used by the series.

► **To show and set markers for a selected series:**

1. In the Chart Designer tree view, select a series as shown in the following illustration:

*When you select an individual series, the Show Markers check box determines that markers are displayed for that series on a chart.*

*Individual series selection*



*When an individual series is selected, the Automatic Markers check box determines that the series automatically assigns a marker to all the non-custom data points in a series. A non-custom data point is any data point that does not have custom attributes.*

2. Check the Show Markers check box to display markers for the currently selected series.

You can also set this option for the series at the data point level.

3. Check the Automatic Markers check box to automatically assign a marker to all the non-custom data points in a series. Uncheck this check box to select your own choice of marker.

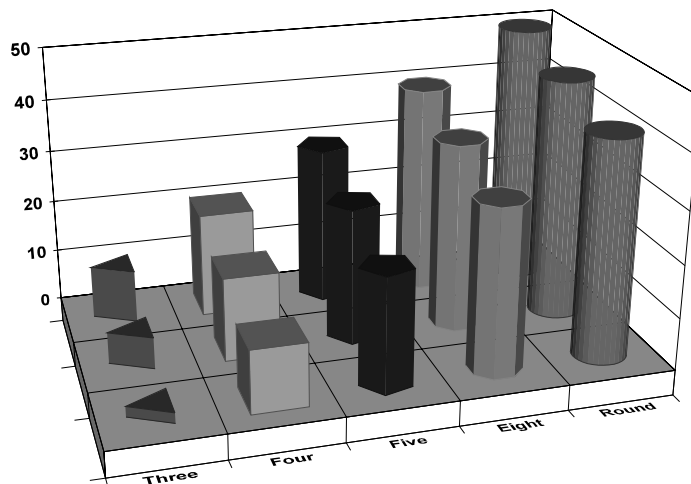
Custom marker settings for a specific series disable the Automatic Markers setting. For more information about specifying custom marker settings, refer to “Controlling Data Point Markers” on page 188.

4. Click Apply or OK to redraw the chart to reflect your changes.

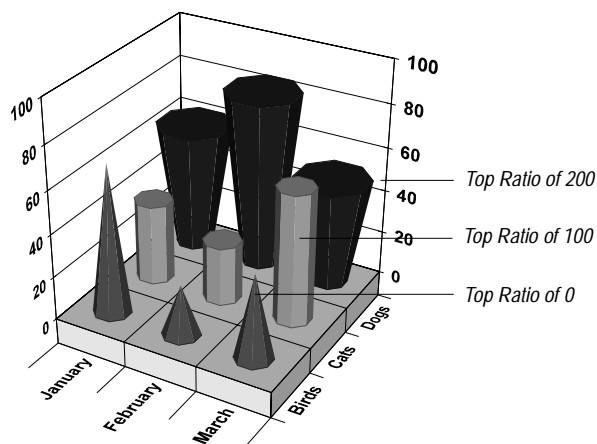
## Specifying Bar Shapes

The settings in the Bar section of the Options tab control the appearance of bars in 3D bar charts; including horizontal bar charts, Gantt charts, and clustered bar charts. The following describes the Sides and Top Ratio options, in detail.

- **Sides.** The following illustration shows a number of different bar styles that can be created by changing the number of sides.



- **Top Ratio.** The following illustration shows the effects of changing the top ratio on several bars.





➤ **To specify the shape of bars:**

1. In the Bars section of the Options tab, enter a value between 1 and 360 in the Side text box to indicate the number of sides for the bars.

If you enter 1, First Impression determines how many sides are necessary to create a round column, given the size of the bar.

2. Enter a number between 0 and 10,000 in the Top Ratio text box to indicate the percent of the bottom diameter used to draw the top of the chart.

Values less than 100 result in a top smaller than the bottom. Values greater than 100 result in the top wider than the bottom.

3. Click OK or Apply to redraw the chart to reflect the changes.

## Choosing the Y Axis

The Y Axis Index box on the Options tab controls which of the sub-charts of a multiple Y axis chart this series will display on. For more information about multiple Y axes, see “Formatting Charts with Multiple Y Axes” on page 209.

Once you have set up your 2D chart to have multiple Y axes, you must choose which Y axis to plot each series on.

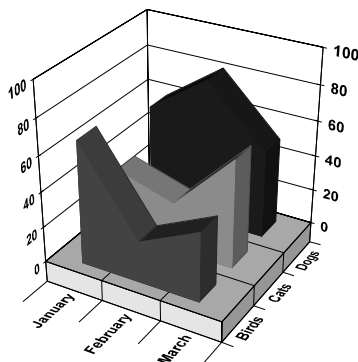
➤ **To specify which Y axis to plot a series on:**

1. In the Y Axis Index box of the Options tab, select the number of the Y axis where you want this series to appear. Y axis number Y1 appears at the bottom of the chart plot, with Y2 above it, Y3 above that, etc.
2. Click OK or Apply to redraw the chart to reflect the changes.

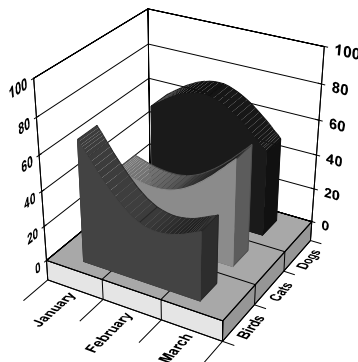
## Smoothing Series Data

The options in the Smoothing section of the Options tab control the smoothing of series data. Smoothing is the process of using one of several mathematical formulas to divide the chart data into a number of facets. When the chart is drawn using these facets, the result is a smoother curve to the series lines.

You can smooth line and area series chart types. The following illustration shows the results of smoothing the series in a 3D area chart.



*No smoothing is applied to this chart.*



*Cubic B-Spline smoothing with 12 facets is applied to each series in this chart.*

### ► To specify a smoothing type and smoothing factor:

1. In the Smoothing section of the Options tab, select a smoothing type from the Function list. The following table describes the smoothing types.

Smoothing Type	Description
None	No smoothing is applied to the data.
QuadraticBSpline	A quadratic B-spline formula determines the smoothing applied to the data. This form of smoothing results in a less-smooth curve that stays closer to the data points.
CubicBSpline	A cubic B-spline formula determines the smoothing applied to the data. This form of smoothing results in a smoother curve, but varies further from the data point than a QuadraticB spline curve.

2. If you select Quadratic BSpline or CubicBSpline, enter the number of facets or points sampled between the chart data points in the Factor text box.

The higher the number, the more smoothing occurs.

3. Click OK or Apply to redraw the chart to reflect the changes.

## Specifying Colors for Hi-Lo Close

The settings in the Hi-Lo Close section of the Options tab control the colors used to display the elements of a hi-lo chart. The gain color reflects all the elements that represent a gain, and the loss color reflects all the elements that represent a loss.

➤ **To specify a gain and loss in color:**

1. In the hi-lo close section of the Options tab, select a color or click Custom to create your own color from the Gain Color list.

You can also click Automatic to have all the elements that reflect a gain in value use the fill color defined for the series.

2. Select a color or click Custom to create your own color from the Loss Color list.

You can also click Automatic to have all the elements that reflect a loss in value use the fill color defined for the series.

3. Click OK or Apply to redraw the chart to reflect the changes.

---

**Note** Gains and losses are calculated differently between open-hi-lo-close bar charts and other variations of hi-lo-close charts. A hi-lo-close chart calculates whether the close value for a point was a gain or a loss from the close value of the previous point. In other words, the first data point never has a gain or loss color, but sets the basis for deciding if the next data point displays a gain or loss. The open-hi-lo-close bar chart calculates whether the close point was a gain or loss from the open value for the same point.

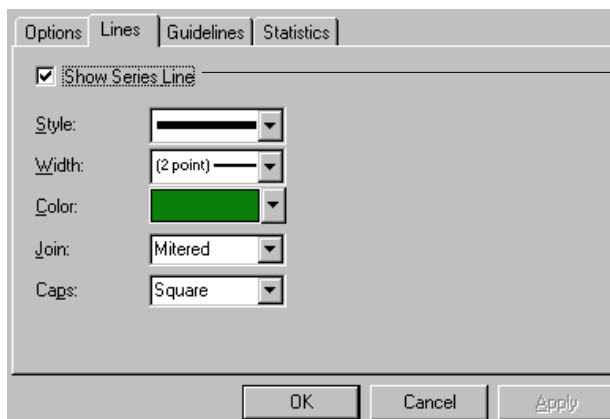
---

## Formatting Series Lines

The controls in the Lines tab of the Chart Designer format 2D and 3D lines and the lines in XY, radar, polar, and hi-lo charts. The settings discussed in this section control the style, width, color, join, and end caps used to display lines.

► **To display the Lines tab:**

1. In the Chart Designer tree view, select a row or column label for the series data.
2. Select the Lines tab. The following illustration shows the Lines tab



*Check this check box to display lines on a 2D chart. Uncheck this check box to hide the lines on the chart.*

3. Specify the options as described in the following steps, and click OK or Apply to redraw the chart to reflect the changes.

► **To specify the style, width, and color of lines:**

1. In the Lines tab of the Chart Designer, check the Show Series Line check box, if necessary.
2. From the Style list, select a line style or select NULL to hide the line.
3. From the Width list, select a preset line width or select Custom to assign your own width.
4. From the Color list, choose a predefined color or click Custom to create your own color.
5. Click OK or Apply to redraw the chart to reflect the changes.

➤ **To specify a join type:**

1. In the Lines tab of the Chart Designer, check the Show Series Line check box, if necessary.
2. From the Join list, select a join type. Join types are described in the following table:

Join Types	Description
------------	-------------

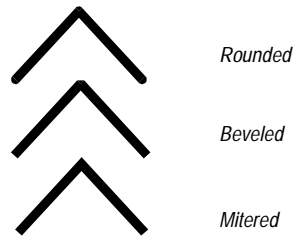
Mitered	The outer edges of the two lines are extended until they meet.
Round	A circular arc is drawn around the point where the two lines meet.
Beveled	The notch between the ends of two joining lines is filled.

---

**Important** Very acute mitered joins are automatically beveled to avoid drawing large spikes along the line.

---

The following illustration shows an example of each join style.



3. Click OK or Apply to redraw the chart to reflect the changes.

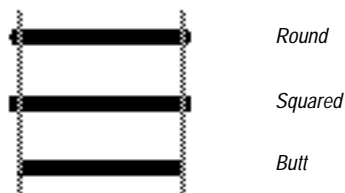
➤ **To specify a cap type:**

1. In the Lines tab of the Chart Designer, check the Show Series Line check box, if necessary.
2. Select a cap type from the Caps list to specify how the ends of lines are displayed. Cap types are described in the following table.

Cap Type	Description
----------	-------------

Butt	The line is squared off at the endpoint.
Round	A semicircle with a diameter of the line thickness is drawn at the end of the line.
Squared	The line continues beyond the endpoint for a distance equal to half the line thickness and is squared off.

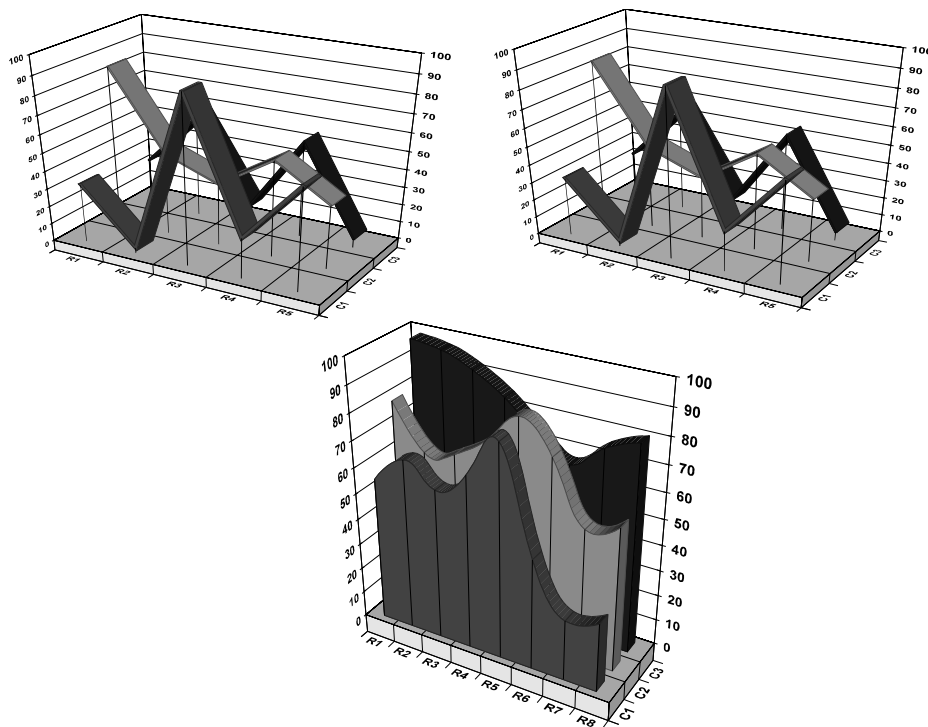
The following illustration shows an example of each cap type.



3. Click OK or Apply to redraw the chart to reflect the changes.

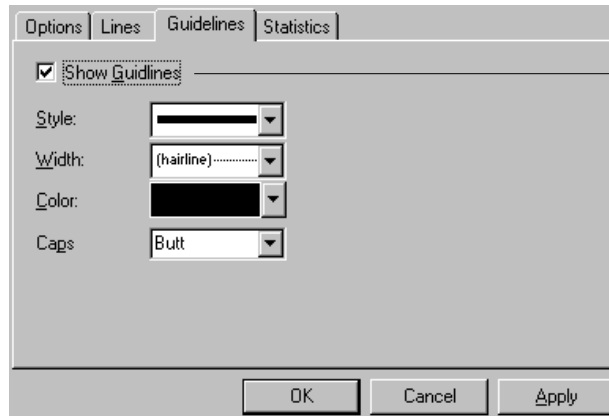
## Formatting Series Guidelines

The Guidelines tab of the Chart Designer controls the display and format of guidelines for the series in 2D and 3D line, area, step charts and bubble charts as well as 3D XYZ and scatter charts. Guidelines are lines that are drawn from a data point to one or more axis to better identify the data point position. The following illustration shows guidelines on several types of charts.



► **To display the Guidelines tab:**

1. In the Chart Designer tree view, select a row or column label for the series data.
2. Select the Guidelines tab. The following illustration shows the Guidelines tab



*Check this box to display guidelines for the series. Uncheck this box to remove guidelines*

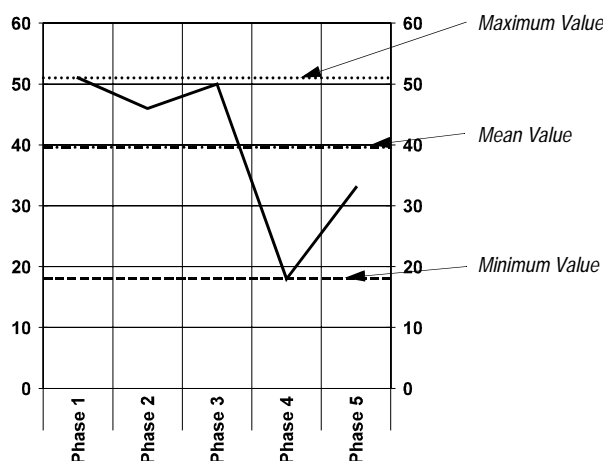
3. After you modify the settings, click OK or Apply to redraw the chart to reflect the changes.

For specific information about each of these settings refer to “Formatting Series Lines” on page 180.

## Formatting Series Statistics Lines

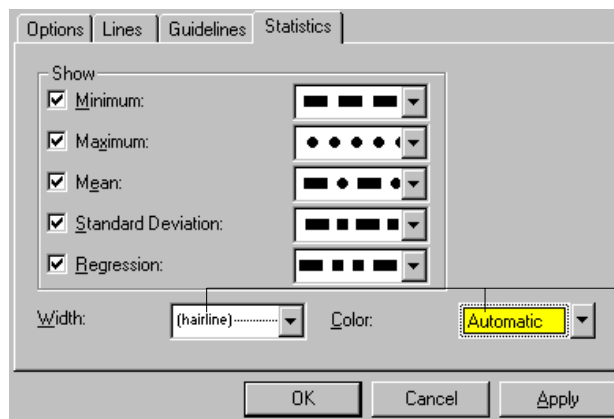
The options in the Statistics tab of the Chart Designer control the display and appearance of statistics lines for a series. Statistics lines are useful for analyzing data by showing information such as minimum value, maximum value, mean value, standard deviation, and regression trendlines. You can only display statistics lines on 2D line and XY charts.

The following illustration shows the type of statistics lines that are displayed for the current series and the appearance of each line.



### ► To display the Statistics tab:

1. In the Chart Designer tree view, select a row or column label for the series data.
2. Select the Statistics tab. The following illustration shows the Statistics tab



The Width and Color lists become available for each check box that is checked in the Show section.



3. Specify the options as described in the following steps, and click OK or Apply to redraw the chart to reflect the changes.

➤ **To specify formatting for statistic lines:**

1. In the Statistics tab of the Chart Designer, check the check box for a statistic type that you want to format. Alternatively, uncheck the check box to remove the line. The following table describes each type of statistic:

Statistic Type	Description
Minimum	Shows the minimum Y value in the series.
Maximum	Shows the maximum Y value in the series.
Mean	Shows the mathematical mean of the Y values in the series.
Standard Deviation	Shows the standard deviation of the Y values in the series.
Regression	Shows a trend line indicated by the Y values in a series.

2. For each type of statistic, select a line style from the list that uniquely identifies it.
3. In the Width list, select a preset line width or select Custom to assign your own width.
4. In the Color list, choose a predefined color or click Custom to create your own color.
5. Click OK or Apply to redraw the chart to reflect the changes.

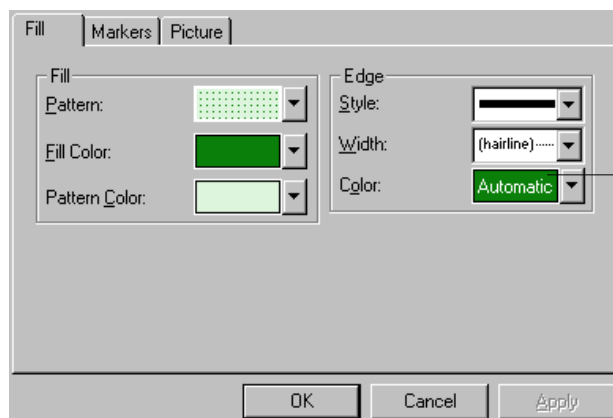
## Changing Series Data Point Fills

You can use options on the Fill tab of the Chart Designer to change the color, pattern, and edge pen for data points.

If you select a default data point, these options apply to all the non-custom data points. If you select a specific data point, these options apply to only that data point and override any default data point settings.

➤ **To display the Fill tab:**

1. In the Chart Designer tree view, select Datapoint for a series.
2. Select the Fill tab. The following illustration shows the Fill tab.



*You can click Automatic to have the outline drawn in the same color as the object's fill color.*

3. Specify the options as described in the following sections, and click OK or Apply to redraw the chart to reflect the changes.

## Setting Fill Color and Pattern

The controls in the Fill section of the Fill tab control the color and pattern used to display data points.

➤ **To control the fill color and pattern:**

1. In the Fill section of the Fill tab, select a pattern or solid fill from the Brush list. Refer to “Choosing Backdrop Fills” on page 115 to learn more about patterns.
2. In the Fill Color list, select a predefined color or click Custom to create your own color.

The fill color is used to create a solid pattern. It is used as the background color for any other type of pattern. By default, the line color for an element matches this fill color.

3. In the Pattern Color list, select a color or click Custom to create your own color. The pattern color is drawn on top of the fill color.
4. Click OK or Apply to redraw the chart to reflect the changes.

## Setting Edge Color and Width

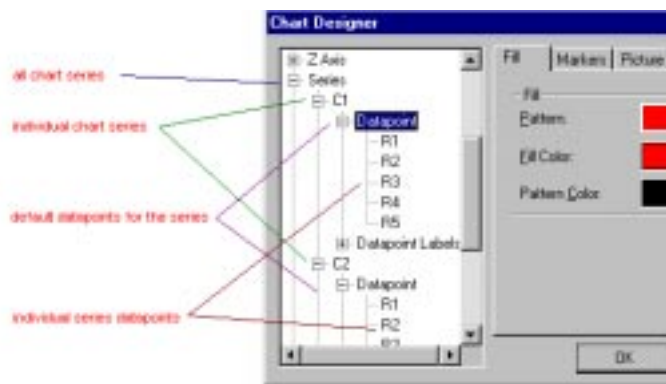
The edge pen outlines all the 3D objects and all the 2D elements except the lines in line, XY, hi-lo, radar, and polar charts.

► **To control the edge style, color, and width:**

1. In the Edge section of the Fill tab, select a line style from the Style list or select NULL to hide the line.
2. From the Width list, select a preset line width or select Custom to assign your own width.
3. From the Color list, choose a predefined color or click Custom to create your own color.
4. Click OK or Apply to redraw the chart to reflect the changes.

## Setting Options for Default Datapoints

Default data points are not tangible data points, but rather a set of characteristics that serve as default settings for non-custom data points in a series. A custom data point is any data point that has custom attributes set for it. You can specify default options by selecting the default data point in the Chart Designer tree view, and setting options on either the Markers, Fill or Picture tab of the Chart Designer.

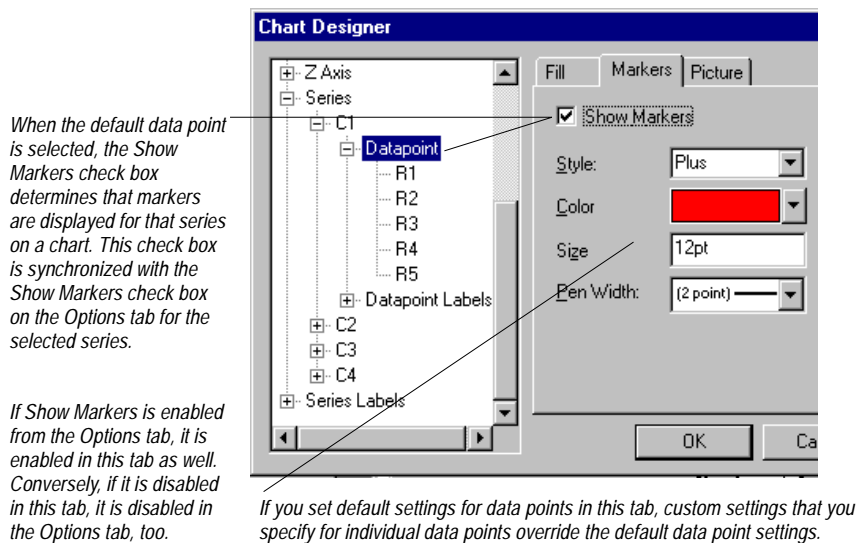


# Controlling Data Point Markers

The Markers tab of the Chart Designer is used to set default data points, as well as to set custom attributes for data points. You can modify the style, color, size, and pen width used to display markers for data points. Markers can be displayed on all the chart types except pies, doughnuts, 2D contour, and 3D surface.

► **To set default markers for all the data points in a series:**

1. In the Chart Designer tree view select a series data point, and then select the Markers tab as shown in the following illustration.



2. Check the Show Markers check box.
3. From the Style list, select a marker type to identify the data points in the current series. The following table shows examples of all the markers.

Dash	—	Down Triangle	▼
Plus	+	Filled Circle	●
X	×	Filled Square	■
Star	*	Filled Diamond	◆
Circle	○	Filled Up Triangle	▲
Square	□	Filled Down Triangle	▼
Diamond	◇	3D Ball	●
Up Triangle	▲		

4. From the Color list, choose a predefined color or click Custom to create your own color.
5. From the Size list, select a size for the marker.
6. From the Pen Width list, select a preset line width or select Custom to assign your own width.
7. Click OK or Apply to redraw the chart to reflect the changes.

There might be times that you want to highlight one or more data points in a series. To highlight individual data points, you apply custom settings to them. Custom settings are defined as any variation to the default data point settings for the series.

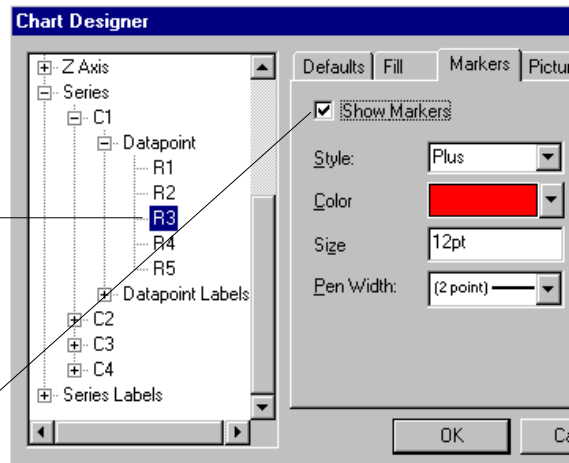
► **To set custom formats for individual data point markers:**

1. In the Chart Designer tree view, select an individual series data point, and then select the Markers tab as shown in the following illustration.

*Custom data point marker settings override the Automatic Markers setting for all the series.*

*When you select a specific data point in a series and apply settings to it, this is considered a custom setting.*

*You can turn series markers off at the data point level by unchecking the Show Markers check box.*



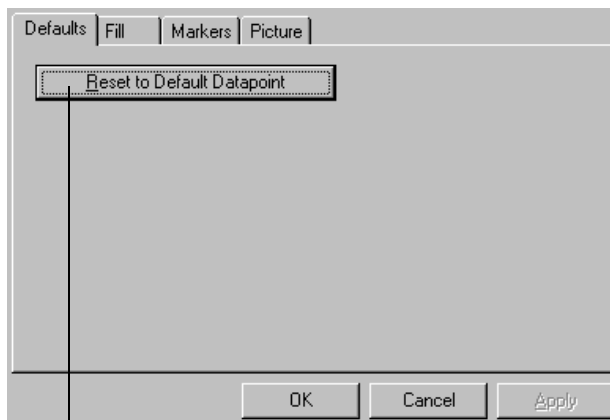
2. Select the Markers tab to modify the marker options for the data point.
3. Specify the marker settings as described in the previous set of steps.
4. Click OK or Apply to redraw the chart to reflect the changes.

## Resetting Data Points to the Default Setting

Once a data point has custom settings applied to it, it is unaffected by settings that you make to the default data point. However, you can discard a custom setting and return the data point to the default setting using the Defaults tab.

► **To discard a custom data point setting:**

1. In the Chart Designer tree view, select an individual series data point, and then select the Defaults tab. The following illustration shows the Defaults tab.



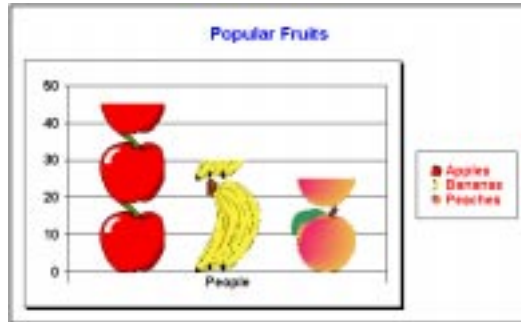
*Click this button to reset selected data points to their default settings. This discards any custom settings you have made for the data points and resets all the options to the series defaults.*

2. Click OK or Apply to redraw the chart to reflect the changes.

## Changing Series Pictures

If the series is a 2D bar type, you can specify a graphic image to use as the fill for the bars. For more information, refer to “Specifying a Picture Backdrop” on page 120.

The following illustration shows an example of a different graphic used to identify each series in a chart using the stacked fit method.



**Note** You can also fill 2D bars with pictures interactively. First copy the picture you want to fill the bar with onto the clipboard. Then display the chart. Go into edit mode by selecting Edit from the context menu. Select the bar you want to fill on the chart, click the right mouse button to display the context menu, and select Paste.

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# Formatting Labels

You can change the format of labels for axes, for individual data points, or for series of data points. In addition, you can use series labels instead of a legend to identify each series on a line, area, step, XY, polar, or radar chart. This chapter discusses how to:

- Change the display and format of axis labels.
- Use and format data point labels, including location, number formats, and line styles.
- Use and format series labels, including location and line styles.

## Using Axis Labels

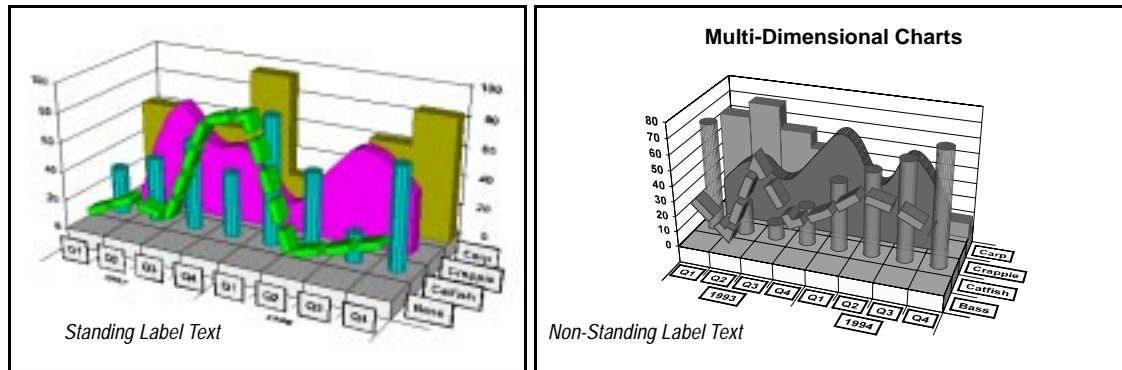
You may change the location and format of axis labels. You may apply built-in number formats to the labels, or you may make your own custom formats. You can make these changes using the Display and Format tabs of the Chart Designer.

## Changing Axis Label Location

The Display tab of the Chart Designer provide settings for changing the display of labels. These settings include:

- **Automatic Rotation.** This setting allows First Impression to rotate the labels if necessary to optimize the chart layout.
- **Standing Labels.** This option rotates labels up on the text baseline to stand in the Y plane. Standing text can make the labels more legible if you are viewing the chart at very low elevations. This option applies only to labels on an X or Z axis on most charts, and the Y axis on horizontal charts.

The following illustration shows a chart with standing label text and non-standing label text.



➤ **To change the display of labels:**

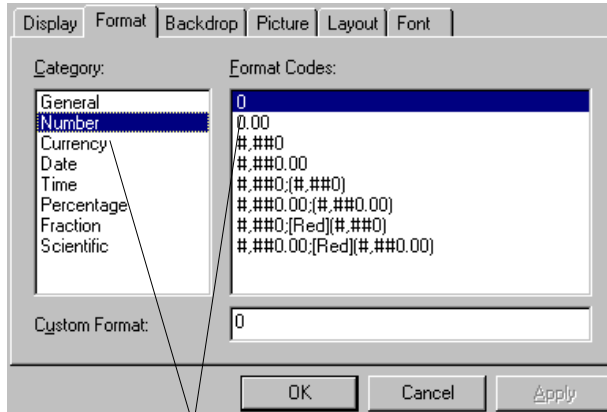
1. In the Chart Designer tree view, select Axis Labels for an axis to format the labels on a chart.
2. Select the Display tab, if necessary.
3. Check the Automatic Rotation check box for First Impression to rotate the labels to optimize the chart layout. Alternatively, uncheck this box to set a specific horizontal and vertical alignment and orientation for the label text.
4. Check the Standing Labels check box to rotate labels up on the text baseline to stand in the Y plane. Alternatively, uncheck this box to return labels to their standard position in the X or Z plane.
5. Click Apply or OK to redraw the chart to reflect the changes.

## Assigning Built-in Number Formats to Axis Labels

The Format tab of the Chart Designer provides built-in number formats for formatting the display of axis labels.

► **To assign a built-in number format to labels:**

1. In the Chart Designer tree view, select Axis Labels for an axis to format the labels on a chart.
2. Select the Format tab. The following illustration shows the Format tab.



*The option selected in the Category list determines the options that are displayed in the Format Codes list.*

3. From the Category list, select a category to display a pre-set list of format strings appropriate for the type of label in the Format Codes list.
4. Select one of the predefined formats from the Format Codes list. The Built-in Number Formats table, below, shows results of applying each format.
5. Click Apply or OK to redraw the chart to reflect the changes.

---

**Note** Label formats for date/time axes can also be set by selecting the Date Axis node for the date/time axis and clicking on the Date Formats tab. Changes you make in the Date Formats tab will be reflected in the Format tab, and vice versa.

---

## Built-in Number Formats

This table shows the built-in number formats for a US English locale and the result after the format is applied to a positive, negative, and decimal number.

Category and Format	3	-3	.3
<b>General</b>	3	-3	.3
<b>Currency</b>			
\$\$,##0_);(\$,##0)	\$3	(\$3)	\$0
\$\$,##0_);[Red](\$,##0)	\$3	(\$3) in red	\$0
\$\$,##0.00_);(\$,##0.00)	\$3.00	(\$3.00)	\$0.30
\$\$,##0.00_);[Red](\$,##0.00)	\$3.00	(\$3.00) in red	\$0.30
_\$(* #,##0_);(\$* #,##0);_(\$* "-" _)			
:_(@_)	\$ 3	(\$ 3)	\$ 0
_\$(* #,##0.00_);(\$* #,##0.00);_(\$* "-" ??_)			
:_(@_)	\$ 3.00	(\$ 3.00)	\$ 0.30
<b>Fixed</b>			
0	3	-3	0
0.00	3.00	-3.00	0.30
#,##0	3	-3	0
#,##0.00	3.00	-3.00	0.30
#,##0_);(#,##0)	3	(3)	0
#,##0_);[Red](#,##0)	3	(3) in red	0
#,##0.00_);(#,##0.00)	3.00	(3.00)	0.30
#,##0.00_);[Red](#,##0.00)	3.00	(3.00) in red	0.30
_(* #,##0_);(* #,##0);_(* "-" _);:_(@_)	3	( 3)	0
_(* #,##0.00_);(* #,##0.00);_(* "-" ??_)			
:_(@_)	3.00	( 3.00)	0.30
<b>Percent</b>			
0%	300%	-300%	30%
0.00%	300.00%	-300.00%	30.00%
<b>Fraction</b>			
# ?/?	3	-3	2/7
# ??/??	3	-3	3/10
<b>Scientific</b>			
0.00E+00	3.00E+00	-3.00E+00	3.00E-01
##0.0E+0	300.0E-2	-300.0E-2	300.0E-3

The following table shows the built-in date formats for a US English locale and the result after the format is applied to a date.

<b>Format</b>	<b>04/18/95</b>
m/d/yy	4/18/95
d-mmm-yy	18-Apr-95
d-mmm	18-Apr
mmm-yy	Apr-95
m/d/yy h:mm	4/18/95 0:00

The following table shows the built-in time formats for a US English locale and the result after the format is applied to a time.

<b>Format</b>	<b>12:02:02</b>
h:mm AM/PM	12:02 PM
h:mm:ss AM/PM	12:02:02 PM
h:mm	12:02 PM
h:mm:ss	12:02:02
m/d/yy h:mm	4/18/95 12:02 PM
mm:ss	02:02
[h]:mm:ss	12:02:02
mm:ss.0	02:02.0

## Assigning Custom Number Formats to Axis Labels

### ➤ To create a custom number format for labels:

1. In the Format tab of the Chart Designer, enter valid format symbols in the Custom Format text box. You may use any of the symbols in the Custom Number Format Symbols table below.
2. Click Apply or OK to redraw the chart to reflect the changes.

## Custom Number Format Symbols

This table lists the format symbols that can be used in a custom format string.

Format Symbol	Description
General	Displays the number in General format.
0	Digit placeholder. If the number contains fewer digits than the format contains placeholders, the number is padded with 0's. If there are more digits to the right of the decimal than there are placeholders, the decimal portion is rounded to the number of places specified by the placeholders. If there are more digits to the left of the decimal than there are placeholders, the extra digits are retained.
#	Digit placeholder. This placeholder functions the same as the 0 placeholder except the number is not padded with 0's if the number contains fewer digits than the format contains placeholders.
?	Digit placeholder. This placeholder functions the same as the 0 placeholder except that spaces are used to pad the digits.
. (period)	Decimal point. Determines how many digits (0's or #'s) are displayed on either side of the decimal point. If the format contains only #'s left of the decimal point, numbers less than 1 begin with a decimal point. If the format contains 0's left of the decimal point, numbers less than 1 begin with a 0 left of the decimal point.
%	Displays the number as a percentage. The number is multiplied by 100 and the % character is appended.
, (comma)	Thousands separator. If the format contains commas separated by #'s or 0's, the number is displayed with commas separating thousands. A comma following a placeholder scales the number by a thousand. For example, the format 0, scales the number by 1000 (e.g., 10,000 would be displayed as 10).
E- E+ e- e+	Displays the number as scientific notation. If the format contains a scientific notation symbol to the left of a 0 or # placeholder, the number is displayed in scientific notation and an E or an e is added. The number of 0 and # placeholders to the right of the decimal determines the number of digits in the exponent. E- and e- place a minus sign by negative exponents. E+ and e+ place a minus sign by negative exponents and a plus sign by positive exponents.
\$ - + / ( ) : space	Displays that character. To display a character other than those listed, precede the character with a backslash (\) or enclose the character in double quotation marks (" "). You can also use the slash (/) for fraction formats.
\	Displays the next character. The backslash is not displayed. You can also display a character or string of characters by surrounding the characters with double quotation marks (" ").  The backslash is inserted automatically for the following characters: ! ^ & ` (left quote) ' (right quote) ~ { } = < >

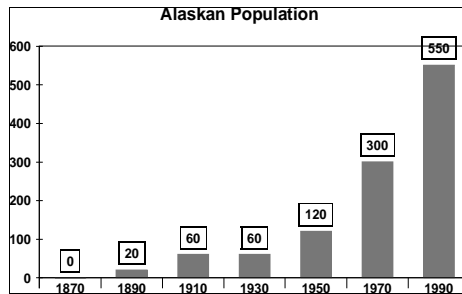
Format Symbol	Description
* (asterisk)	Repeats the next character until the width of the column is filled. You cannot have more than one asterisk in each format section.
_ (underline)	Skips the width of the next character. For example, to make negative numbers surrounded by parentheses align with positive numbers, you can include the format _) for positive numbers to skip the width of a parenthesis.
"text"	Displays the text inside the quotation marks.
@	Text placeholder. If there is text in the cell, the text replaces the @ format character.
m	Month number. Displays the month as digits without leading zeros (e.g., 1-12). Can also represent minutes when used with h or hh formats.
mm	Month number. Displays the month as digits with leading zeros (e.g., 01-12). Can also represent minutes when used with the h or hh formats.
mmm	Month abbreviation. Displays the month as an abbreviation (e.g., Jan-Dec).
mmmm	Month name. Displays the month as a full name (e.g., January-December).
d	Day number. Displays the day as digits with no leading zero (e.g., 1-2).
dd	Day number. Displays the day as digits with leading zeros (e.g., 01-02).
ddd	Day abbreviation. Displays the day as an abbreviation (e.g., Sun-Sat).
dddd	Day name. Displays the day as a full name (e.g., Sunday-Saturday).
yy	Year number. Displays the year as a two-digit number (e.g., 00-99).
yyyy	Year number. Displays the year as a four-digit number (e.g., 1900-2078).
g	If you are using a Japanese locale, this displays the Latin letter for an era.
gg	If you are using a Japanese locale, this displays the first character of an era name.
ggg	If you are using a Japanese locale, this displays the full era name.
e	If you are using a Japanese locale, this displays the full era year.
ee	If you are using a Japanese locale, this displays the full era year with a leading 0 if the year is less than 10.
h	Hour number. Displays the hour as a number without leading zeros (e.g., 0-23). If the format contains one of the AM or PM formats, the hour is based on a 12-hour clock. Otherwise, it is based on a 24-hour clock.
hh	Hour number. Displays the hour as a number with leading zeros (e.g., 00-23). If the format contains one of the AM or PM formats, the hour is based on a 12-hour clock. Otherwise, it is based on a 24-hour clock.
m	Minute number. Displays the minute as a number without leading zeros (e.g., 0-59). The m format must appear immediately after the h or hh symbol. Otherwise, it is interpreted as a month number.
mm	Minute number. Displays the minute as a number with leading zeros (e.g., 00-59). The mm format must appear immediately after the h or hh symbol. Otherwise, it is interpreted as a month number.

Format Symbol	Description
s	Second number. Displays the second as a number without leading zeros (e.g., 0-59).
ss	Second number. Displays the second as a number with leading zeros (e.g., 00-59).
AM/PM am/pm A/P a/p	12-hour time. Displays time using a 12-hour clock. Displays AM, am, A, or a for times between midnight and noon; displays PM, pm, P, or p for times from noon until midnight.
[h]	Outputs total number of hours.
[m]	Outputs total number of minutes.
[s]	Outputs total number of seconds.
s.0, s.00, s.000, ss.0, ss.00, ss.000	Outputs fractional part of second.
[Black]	Displays cell text in black.
[Blue]	Displays cell text in blue.
[Cyan]	Displays cell text in cyan.
[Green]	Displays cell text in green.
[Magenta]	Displays cell text in magenta.
[Red]	Displays cell text in red.
[White]	Displays cell text in white.
[Yellow]	Displays cell text in yellow.
[Colorn]	Displays cell text using the corresponding color in the color palette. n is a color in the color palette.
[conditional value]	<p>Each format can have as many as four sections: one each for positive numbers, negative numbers, zeros, and text. Using the conditional value brackets ([ ]), you can designate a different condition for each section. For example, you might want positive numbers displayed in black, negative numbers in red, and zeros in blue. The following string formats a number for these conditions:</p> <p>[&gt;0][Black]General; [&lt;0][Red]General; [Blue]General</p>

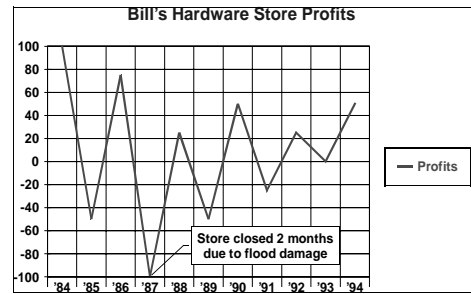


# Using Data Point Labels

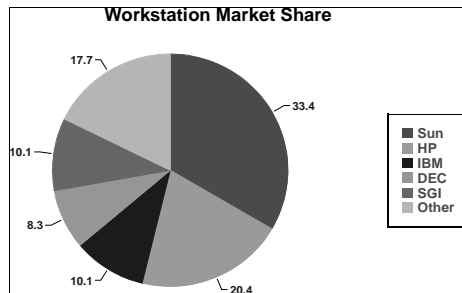
You can place labels on a series of data points or on individual data points to annotate the chart or draw attention to a certain chart element. The following illustrations show several uses of data point labels.



*Data point labels show the value of each data point.*



*A data point label highlights one data point.*



*Data point labels show the value of each pie slice.*

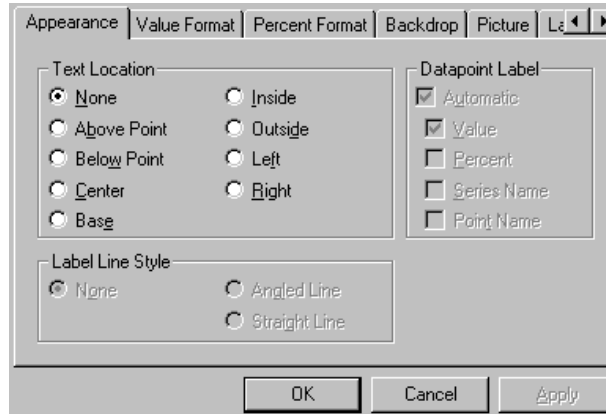
## The Appearance Tab

The Appearance tab of the Chart Designer controls the display, position, and label type of data point labels as well as the line style used to connect labels to the data points.

**Note** If you select a default data point label, these options apply to all the non-custom data point labels. If you select a specific data point label, these options apply to that data point label only and override any default data point label settings.

► **To display the Appearance tab:**

1. In the Chart Designer tree view, select Datapoint Labels.
2. Select the Appearance tab, if necessary. The Appearance tab is shown in the following illustration.



3. Specify the options as described in the following sections, and click OK or Apply to redraw the chart to reflect the changes.

## Controlling Data Point Label Location

To display a data point label on the chart, select a Text Location radio button for a predefined position. The following table describes the valid positions for series labels:

Positions	Description	Applies to chart type
None	No label displayed.	none
Above Point	The label is displayed above the data point.	bar, line, area, step, XY, polar, radar, and bubble
Below Point	The label is displayed below the data point.	bar, line, area, step, XY, polar, radar, and bubble
Center	The label is displayed centered on the data point.	bar, line, area, and step
Base	The label is displayed along the category axis, directly beneath the data point.	bar, line, area, and step
Inside	The label is displayed inside a pie or doughnut slice.	pie and doughnut
Outside	The label is displayed outside a pie or doughnut slice.	pie and doughnut

Positions	Description	Applies to chart type
Left	The label is displayed to the left of the data point.	XY, polar, radar, and bubble
Right	The label is displayed to the right of the data point.	XY, polar, radar, and bubble

## Setting Data Point Label Line Style

To display a line connecting a label to the data point it represents, select a Label Line Style radio button as described in the following table:

Line Styles	Description
None	No line connects the label and series.
Angled Line	An angled line connects the label and series.
Straight Line	A straight line connects the label and series.

## Specifying Data Point Label Type

You can specify a pre-defined label type or automatically display the data point value. Check the Automatic check box, in the Label Type section of the Appearance tab, to automatically display the data point value. To choose a pre-defined label type, select a Label Type radio button for a predefined position. The following table describes the valid label types for data point labels:

Label Types	Description
Value	The value of the data point appears in the label.
Percent	The value of the data point is displayed in the label as a percentage according to the axis percent basis.
Series Name	The series name is used to label the data point.
Data Point Name	The category name is used to label the data point.

## Data Point Label Number Formats

You can specify a built-in or custom number format to control the appearance of the data point labels.

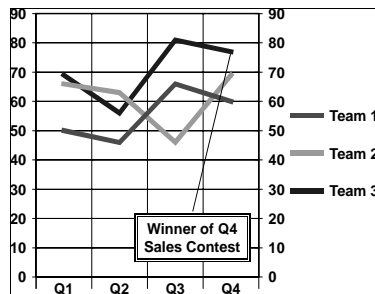
The number formats for data point labels are the same as the number formats for axis labels, and the process of choosing and applying them is the same. For more information about number formats, see “Assigning Built-in Number Formats to Axis Labels” on page 195.

➤ **To apply a built-in or custom number format to your data point label(s):**

1. In the Chart Designer tree view, select a Datapoint Labels node for the labels you want to format.
2. If your data points are values, select the Value Format tab. If your data points are percents, select the Percent Format tab.
3. If you want to apply a built-in number format, select it by clicking on it. For a list of each format and the result after the format is applied to a positive, negative, and decimal number, see “Built-in Number Formats” on page 196.
4. If you want to create a custom number format, enter it in the Custom Format box. For a list of the symbols you can use when creating custom formats, see “Custom Number Format Symbols” on page 198.
5. Click OK or Apply to redraw the chart to reflect the modifications.

## Using Series Labels

In addition to data point labels, you can use series labels to annotate the chart or draw attention to a certain chart element. The following illustration shows how a series label can add important information.



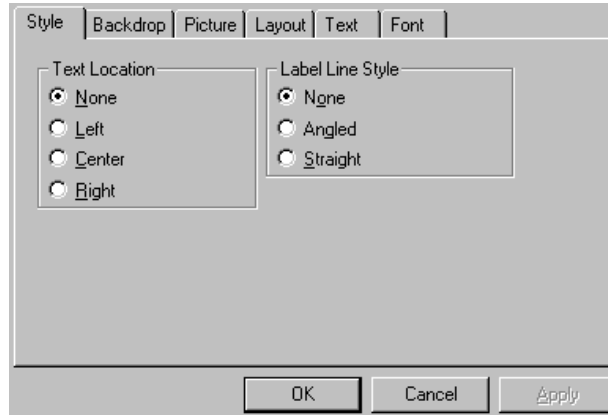
*A series label provides information about the series.*

## The Style Tab

Series labels can be used instead of the legend as a way to identify each series on a line, area, step, XY, or radar chart. Use the Style tab of the Chart Designer to format series labels.

➤ **To format a series label:**

1. In the Chart Designer tree view, open the Series Labels node and select a series label.
2. Select the Style tab, if necessary. The Style tab is shown in the following illustration.



3. Specify the options as described in the following sections, and click OK or Apply to redraw the chart to reflect the changes.

## Controlling Series Label Location

To display a series label on the chart, select one of the Text Location radio buttons that represents a predefined position. The following table describes the valid positions for series labels:

Positions	Description
None	Hides the label.
Left	The label is displayed to above the first data point in the series.
Center	The label is displayed above the middle data point in the series.
Right	The label is displayed above the last data point in the series.

## Setting Series Label Line Style

To display a line connecting a label to a series it represents, select one of the Label Line Style radio buttons described in the following table:

Line Styles	Description
None	No line connects the label and series.
Angled	An angled line connects the label and series.
Straight	A straight line connects the label and series.

Tidestone

# Using Complex Charts

First Impression's robust chart design system works especially well when you create complex charts such as combination, radar, hi-lo, pie, bubble, contour, and elevation charts. Sometimes when you change the chart from a simple chart type to a more complex type, you have additional choices to make. This chapter describes how to:

- Format combination charts.
- Create charts with computed date/time axes.
- Create charts with multiple Y axes.
- Use radar charts.
- Format hi-lo charts.
- Manipulate pie charts.
- Format bubble charts.
- Set options for a complex elevation chart.

## Formatting Combination Charts

If you select Combination as the chart type, you must also specify the series type used to display each series in the chart.

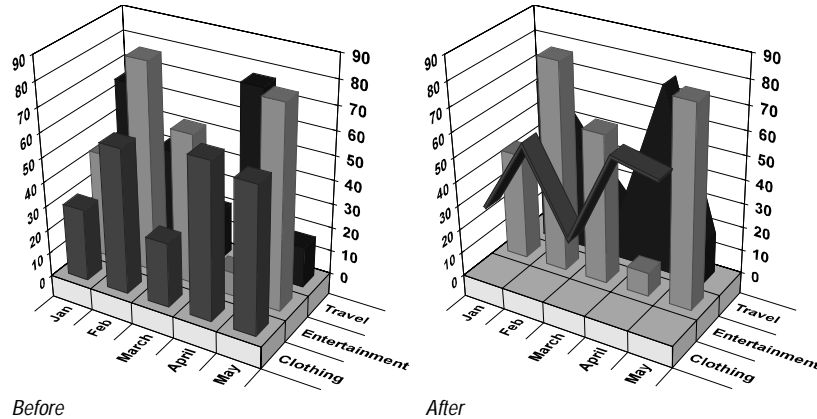
➤ **To change a series type:**

1. In the Chart Designer tree view, select Series.
2. Select the Series Type tab, if necessary.
3. In the Series Name list, select a series or select All Series to set the same type for all series in the chart.

The Display As list shows the valid types for the selected series.

4. Select the type you want to use for the selected series.
5. Continue specifying types for each series as necessary.
6. Click Apply or OK to redraw the chart to reflect the changes.

The following illustration shows the results of changing the Clothing series to a line chart and the Travel series to an area chart.



## Formatting Charts with Computed Date/Time Axes

You may manually create charts that have date/time axes by naming the categories with date or time names. You may also create charts with date/time axes that First Impression computes for you.

- **To use the Chart Designer to create a chart with a computed date/time axis:**
1. Set up the date/time data correctly in the data grid editor, as explained in “Data Grids for Charts With Computed Date/Time Axes” on page 104. If your chart is linked to a range of cells in a Formula One worksheet, the date/time data entered in Formula One does not have to be changed.
  2. In the Chart Designer, select the Chart node, click the Designer Chart Type Tab, and choose hi-lo as the chart type.
  3. Select the Series node and click the Designer Series Type Tab.
  4. Select the first series in the Series box and choose the Dates type.
  5. Select the second series in the Series box and select the chart type to display that series in. You may choose from among the bar, line, area, step, hi-lo, hi-lo-close, and open hi-lo-close types. (For detailed information about displaying different chart series differently, see “Formatting Series Type” on page 170.)
  6. Click Apply or OK to redraw the chart and see your changes.



7. To make your date/time axis gridlines and axis labels display the way you want them to, you will probably want to make formatting changes using the Date Scale and Date Formats tabs. (For detailed information about axis settings for date/time axes, see “Specifying Date/Time Axis Settings” on page 162.)

➤ **To use properties to create a chart with a computed date/time axis:**

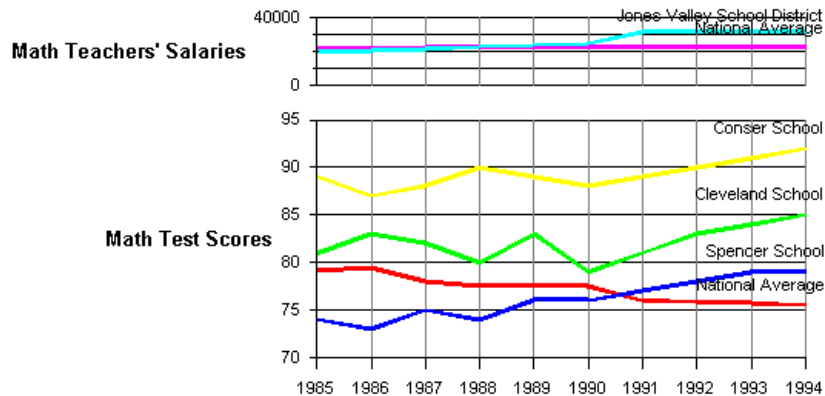
- Use the **Frequency** and **Interval** properties.

## Formatting Charts with Multiple Y Axes

You may define more than one Y axis on a chart, allowing you to compare two or more dissimilar things. For example, you could show the performance of a stocks over a week’s time on one axis and the volume of trading for that same time period on another axis. Multiple Y axes are especially helpful when you want to compare things with scales that are grossly dissimilar.

### What Are Multiple Y Axes?

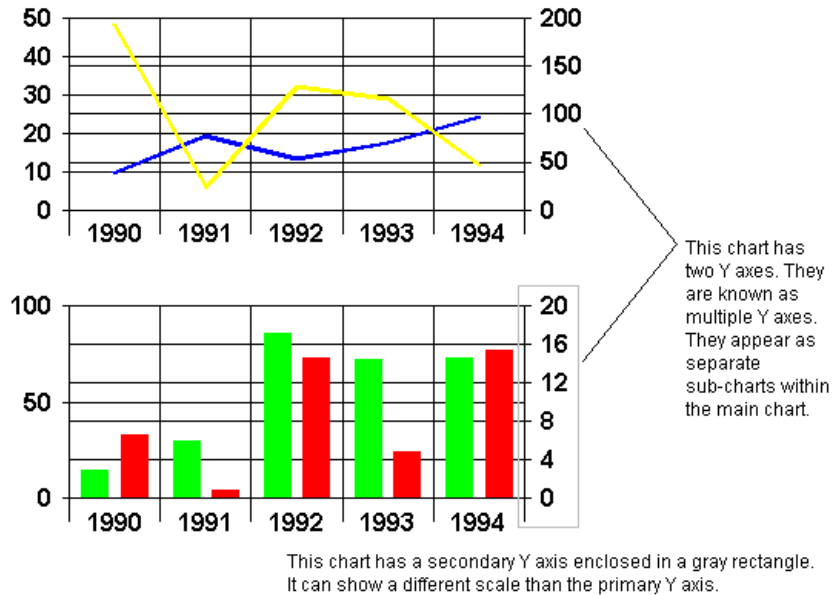
When you create multiple Y axes, First Impression actually draws more than one sub-chart, one on top of the other. The sub-charts share the same X axis. The sample chart below has two Y axes to compare test scores and teachers’ salaries over a number of years.



Multiple Y axes are only supported in 2D charts.

## Multiple Y Axes and Secondary Y Axes

Multiple Y axes should not be confused with secondary Y axes. The secondary Y axis is the axis drawn on the right side of a chart. Multiple Y axes are actually separate sub-charts. Each of the multiple Y axes can have its own secondary Y axis.



## Creating Charts with Multiple Y Axes

- **To use the Chart Designer to create a chart with multiple Y axes:**
  1. In the Chart Designer, select the Plot node, click the Other tab, and enter the number of Y axes you want in your chart in the Y Axis Count text box. You may have as many Y axes as you want. (For more information about axis options, see “Controlling Axis Display Options” on page 136.)
  2. Click Apply and watch First Impression create the additional Y axes. First Impression also creates a Y axis node on the tree view of the Chart Designer for every Y axis on your chart.
  3. To determine which series should appear on which Y axis, select a series by opening the Series node and clicking on one of the series. Choose the Options tab. In the Y Axis Index dropdown box, select the number of the Y axis where you want this series to appear. (For detailed information about matching chart series with Y axes, see “Choosing the Y Axis” on page 177.)
  4. To establish how much of the chart area each Y axis should take up, select a Y axis node and click on the Scale Type tab. In the Axis Length (% of Plot) text

box, enter the percentage of the chart plot that that Y axis should take up. Repeat this step for all the Y axes on your chart. (For detailed information about axis length (% of plot), see page 161.)

5. Since all the Y axis share one X axis, you may choose to hide the X axis for one or more of the Y axes. To do this, select the X axis node and click on the Multiple Y tab. Select the X axes that you want to hide and click Apply or OK. (For detailed information about hiding X axes, see “Specifying Category Axis Hiding Settings” on page 157.)

➤ **To use properties and methods to create a chart with multiple Y axes:**

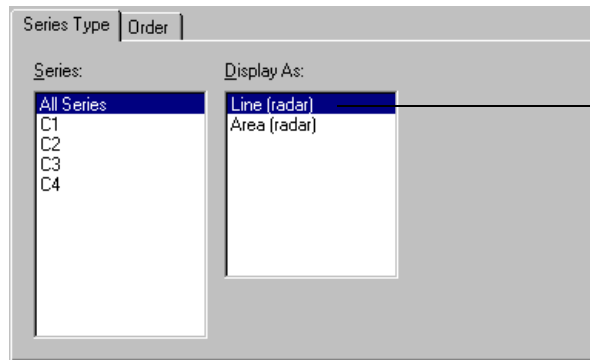
- Use the **YAxisCount**, **YAxisIndex**, **LengthRatio**, and **HideXAtYIndex** properties.

## Using Radar Charts

When you select Radar as the chart type, you can specify whether each series is displayed as a line or filled area.

➤ **To change the variation of a radar chart:**

1. In the Chart Designer tree view, select Chart.
2. Select the Type tab if necessary, and select the 2D radio button to display a list of the 2D chart types.
3. Select Radar in the Chart Type list and click the Apply button.
4. Select Series in the Chart Designer tree view, and select the Series Type tab, if necessary. The following illustration shows the Series Type tab.

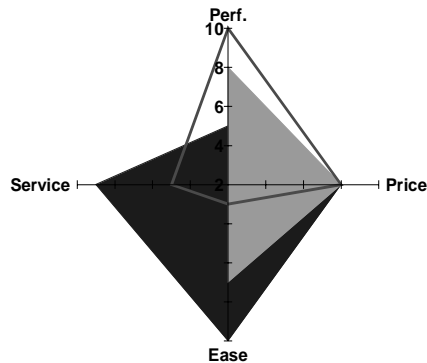


*The Display As list shows valid series types for the selected series.*

5. Select a series from the Series list.
6. Select a series type from the Display As list.

7. Continue selecting types for additional series as necessary.
8. Click Apply or OK to redraw the chart to reflect your changes.

The following illustration shows a radar chart with two series displayed as area and one series displayed as line.

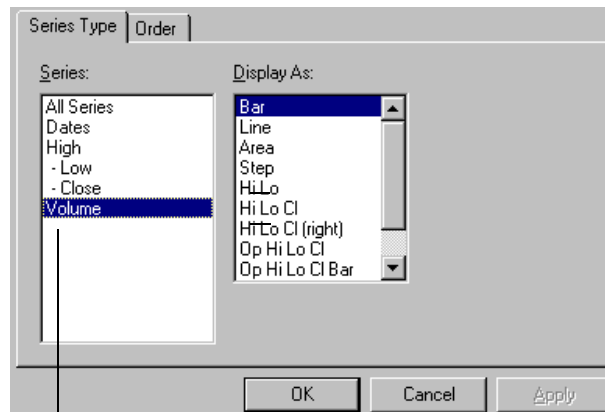


## Formatting Hi-Lo Charts

When you select Hi-Lo as the chart type, you can specify the variation of the hi-lo chart you want to display, as well as assign different chart types to other series.

### ► To specify a Hi-Lo-Close chart with volume information:

1. In the Chart Designer tree view, select Chart.
  2. Select the 2D radio button to display a list of the 2D chart types.
  3. Select Hi-Lo from the Chart Type list.
  4. In the tree view, select Series and then select the Series Type tab, if necessary.
- The following illustration shows the Series Type tab.



*Notice that since the Hi-Lo-Close chart requires three columns of data, the second and third columns that make up the series are indented to show that they are part of the first series.*

5. If a column in the data grid holds dates, select that series name from the Series list, and then select the Dates series type from the Display As list.

This instructs First Impression to use the values in this column to create a computed date/time axis for this chart. The series is automatically excluded so that it is not actually charted. For more information about formatting a computed date/time axis, “Formatting Charts with Computed Date/Time Axes” on page 208.

6. Select the first series that holds stock information from the Series list.
7. Select one of the hi-lo-close variations in the Display As list.

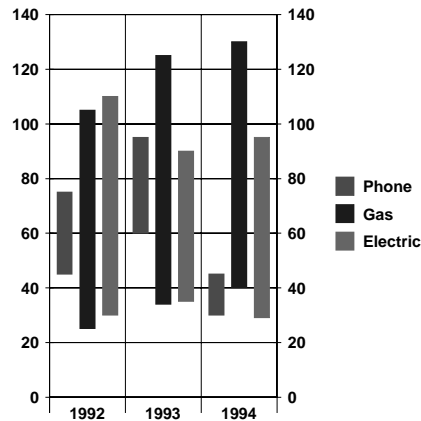
The second and third column in every series are indented to show that the series requires three columns of data to chart a hi-lo-close chart.

8. Select the series that contains volume information from the Series list.
9. Select the series type from the Display As list that you want to use to display volume data. Bar, Line, and Area are typical choices for displaying volume data.
10. Click Apply or OK to redraw the chart to reflect the changes.

Since volume information is usually very different from the high, low, and close price of stock, you might need to follow the next steps to finish the chart.
11. In the tree view, select the Volume series for the chart.
12. If necessary, select the Options tab.
13. Check the Plot on 2nd Y Axis check box.
14. Click Apply or OK to redraw the chart to reflect the changes.

## Displaying Hi-Lo Bars In Other Chart Types

You can use hi-lo bars to represent a range of values from a beginning point other than zero. Hi-lo bars are a series type available on bar, combination, horizontal bar, hi-lo and clustered bar charts. Each bar requires two columns from the data grid: a beginning value and an end value. The following illustration shows hi-lo bars in a bar chart.



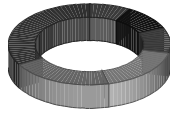
*The hi-lo bars in this chart show the range of utility costs over three years.*

## Manipulating Pie Charts

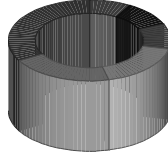
The Pie tab of the Chart Designer changes the appearance of pie charts. Settings that you specify using the controls in the Pie tab are:

- **Area or Diameter Weighting.** The area weighting setting weights pies and doughnuts by the area of the chart element. The diameter weighting setting weights pies and doughnuts by the diameter of each chart element.
- **Basis.** This setting controls the size of each pie or doughnut in relation to the other pies or doughnuts in the same chart.
- **Label Position.** This setting controls where the labels for each pie or doughnut are placed on the chart. These labels are actually category labels. They use the font and backdrops defined for the X axis labels.
- **Sorting.** This setting controls the order in which the slices of pie and doughnut charts are drawn.

- **Thickness Ratio.** This setting specifies the percentage of the pie or doughnut radius that determines the height of a 3D pie or doughnut. The higher the percentage, the taller the pie or doughnut. The following illustrations show various thickness ratios.

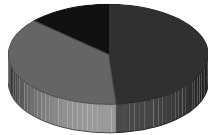


*Thickness Ratio of 33 percent*

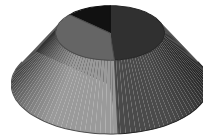


*Thickness Ratio of 100 percent*

- **Top Radius Ratio.** This setting specifies the percentage of the pie radius that is used to draw the top of a 3D pie. A ratio of 100 draws a cylinder; values less than 100 result in a tapering of the top of the pie. A value of 0 results in a cone. The following illustrations show various top radius ratios.

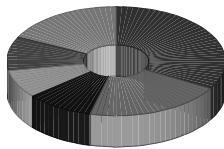


*This pie has the default thickness ratio of 33 percent and a top radius ratio of 100 percent.*

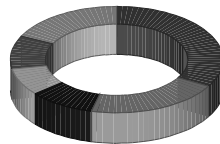


*This pie has a thickness ratio of 60 percent and top radius ratio 65 percent.*

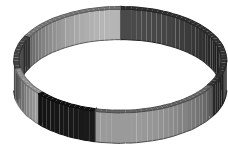
- **Interior Ratio.** This setting describes the ratio of the entire doughnut size that is used to display the interior “hole” of the doughnut. The following illustrations show “hole” settings.



*This doughnut has an interior ratio of 30 percent.*

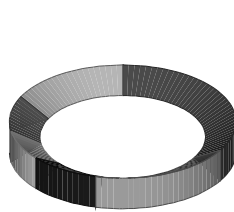


*This doughnut has an interior ratio of 67 percent.*

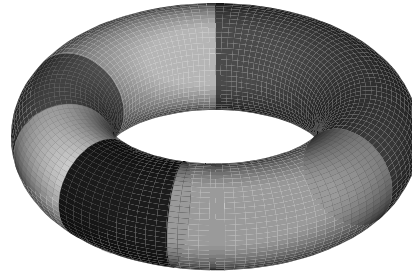


*This doughnut has an interior ratio of 95 percent.*

- **Sides.** This setting controls the number of sides used to draw a doughnut. More sides give the doughnut a rounder, smoother appearance. If you enter a value of 1 in this option, First Impression determines the number of sides needed to draw a round doughnut based on the size of the doughnut. The following illustrations show a doughnut with three sides, and a doughnut with 60 sides



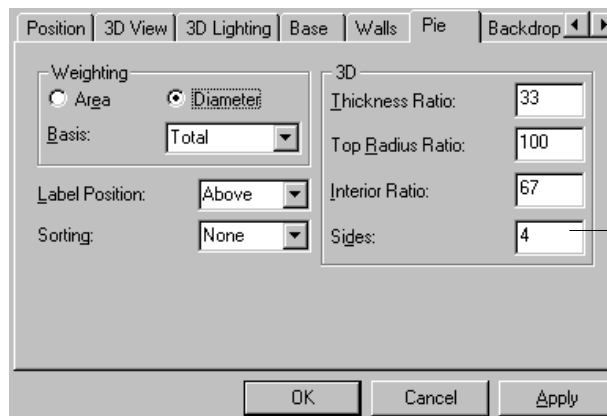
*This doughnut has 3 sides.*



*This doughnut has 60 sides.*

► **To display the Pie tab:**

1. In the Chart Designer tree view, select Plot to format a pie or doughnut chart.
2. Select the Pie tab. The following illustration shows the Pie tab.



*A very large number of sides might impact performance.*

3. Once the Pie tab is displayed, format the pie or doughnut chart using the procedures listed in the following sets of steps.



➤ **To specify weighting settings:**

1. In the Weighting section of the Pie tab, select the Area radio button to weight pies and doughnuts by the area of the chart element. Alternatively, select the Diameter radio button to weight pies and doughnuts by the diameter of each chart element.
2. Select an option from the Basis list to control the size of each pie or doughnut in relation to the other pies and doughnuts in the same chart. The following table lists the options for this setting:

Setting	Description
None	All pies and doughnuts are drawn the same size.
Total	The slice values in each pie are totaled and the pie with the highest total identified. The size of each pie in the chart is determined by the ratio of its total value compared to the largest pie.
Series	The size of a pie is determined by the relationship of values in the first series of each pie. The larger the value in the first series, the bigger the pie. It is most common to exclude this first series so that the values are not drawn as pie slices.

3. Click Apply or OK to redraw the chart to reflect the changes.

➤ **To position a label:**

1. Select a label position from the Label Position list in the Pie tab to position the chart labels. The following table lists the options for this setting:

Setting	Description
None	No label is displayed.
Above	The label is displayed above the pie or doughnut.
Below	The label is displayed below the pie or doughnut.
Center	The label is centered on the pie or doughnut.

2. Click Apply or OK to redraw the chart to reflect the changes.

➤ **To specify a sorting setting:**

1. Select a sorting setting from the Sorting list in the Pie tab to control the order in which the slices of pie and doughnut charts are drawn. The following table lists the options for this setting:

Setting	Description
None	Pie slices are drawn in the order the data appears in the data grid.
Ascending	Pie slices are drawn from the smallest to the largest slice, starting at the defined starting angle.
Descending	Pie slices are drawn from the largest to the smallest slice, starting at the defined starting angle.

2. Click Apply or OK to redraw the chart to reflect the changes.

➤ **To specify 3D settings:**

1. In the 3D section of the Pie tab, enter a value between 0 and 100 percent in the Thickness Ratio text box to control the thickness of the chart.
2. Enter a value in the Top Radius Ratio text box that represents the pie radius that is used to draw the top of the chart.
3. Enter a number between 0 percent and 100 percent in the Interior Ratio text box to size the “hole” of the doughnut.
4. Enter the total number of sides, up to 360, in the Sides text box for a doughnut.
5. Click OK or Apply to redraw the chart to reflect the changes.

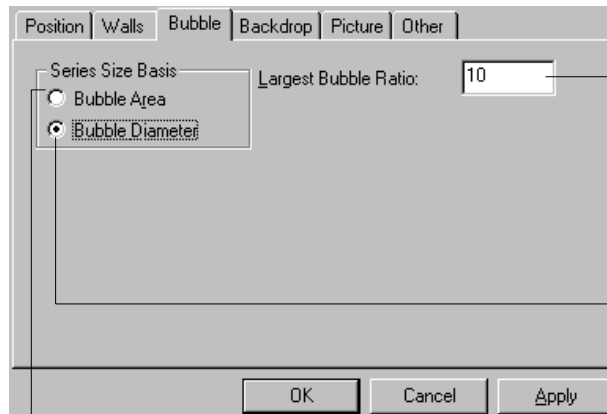
# Formatting Bubble Charts

The Bubble tab of the Chart Designer changes the appearance of bubble charts. Settings that you specify using the controls in the Bubble tab are:

- **Series Size Basis.** These settings determine how series data determines the relative size of bubbles drawn on a bubble chart. Bubble charts require three columns of data, with the third column determining relative bubble size.
- **Largest Bubble Ratio.** This setting applies the percentage of the shortest chart axis that is used as the diameter of the largest bubble. All the other bubbles are sized according to their relationship to the largest bubble.

► **To specify the appearance of a bubble chart:**

1. In the Chart Designer tree view, select Chart.
2. Select the 2D radio button to display a list of the 2D chart types.
3. Select Bubble from the Chart Type list.
4. In the tree view, select Plot to format the chart.
5. Select the Bubble tab. The following illustration shows the Bubble tab



*This value is used to draw the largest bubble. For example, if this value is 50, then 50 percent of the shortest chart axis length is used as the diameter or area of the largest bubble. All other bubbles are sized in relation to the largest bubble.*

*With this value selected, a value of seven would produce a bubble with half the diameter of a bubble with a value of 14.*

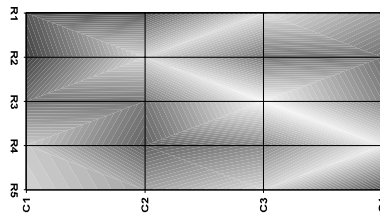
*With this value selected, a value of seven would produce a bubble with half the area of a bubble with a value of 14.*

6. Choose either the Bubble Area or Bubble Diameter button to determine whether bubbles are sized by area or diameter. The series value of each bubble determines its relative size, as compared to the series value of the largest bubble.

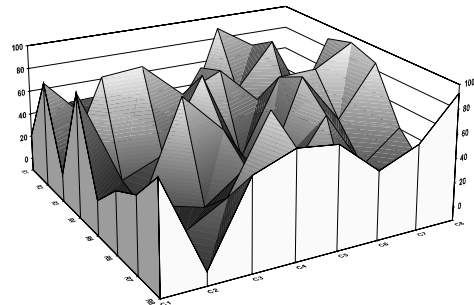
7. Enter a percentage in the Largest Bubble Ratio text box to set the size of the largest bubble in relation to the shortest chart axis. All other bubbles are sized relative to the largest bubble.
8. Click OK or Apply to redraw the chart to reflect the changes.

## Modifying Contour and Elevation Charts

The Type tab of the Chart Designer specifies contour and surface chart settings. Elevation charts can be drawn as a 2D contour chart or a 3D surface chart. The following illustrations show a contour chart and a surface chart.



*2D Contour Chart*



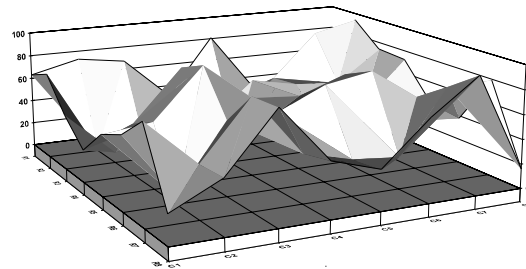
*3D Surface Chart*

Once you specify the chart type you wish to draw, you can format both elevation and contour information for the chart. Contour and elevation options are divided between two tabs in the Chart Designer. The Elevation tab contains basic contour and surface options. The Contour tab controls the assignment of colors and line widths used in the actual contour bands and lines. In each tab, the available options depend on the chart type you have specified and are disabled (grayed) if they do not apply to the current chart type.

## Specifying Contour Options

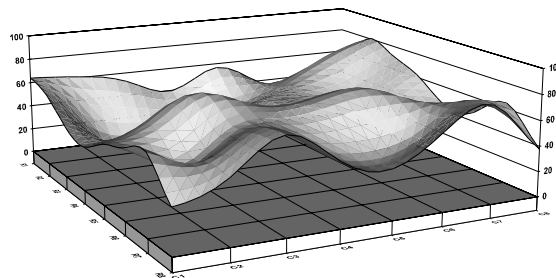
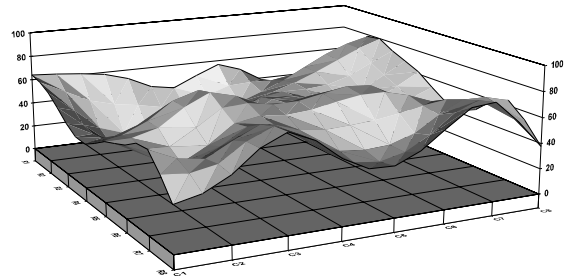
The Contour tab customizes 2D contour charts and 3D surface charts. The elements that you can customize include:

- **Contour Style.** You can select bands or lines as a contour style. Bands are displayed as bands of color. Lines are displayed as colored lines.
- **Smoothing.** You can use smoothing to create rounder, smoother contours. First Impression uses the bi cubic B spline formula to determine how to smooth the chart data based on the smoothing factor you specify. The following illustrations show various smoothing factors.



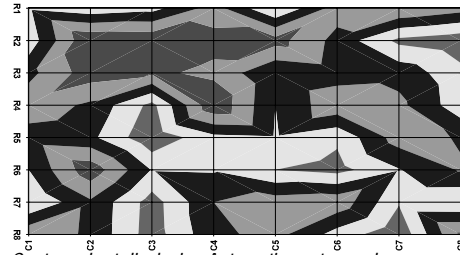
*Surface chart with no surface smoothing*

*Surface chart with surface smoothing factor of 2*

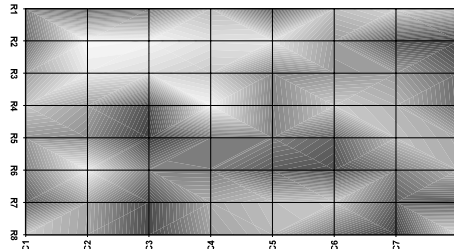


*Surface chart with surface smoothing factor of 4*

- **Contour List.** You can customize contours by modifying existing contours and adding or deleting contours when the Automatic Values check box is not checked. You can also specify value labels, that take the place of contour values, that you wish to appear in the legend.
- **Colors.** You can control how color is displayed on the chart. The options provided for color types include Automatic, Gradient, and Manual (custom). The following illustrations demonstrate color types for contour charts.



*Contour chart displaying Automatic contour color*

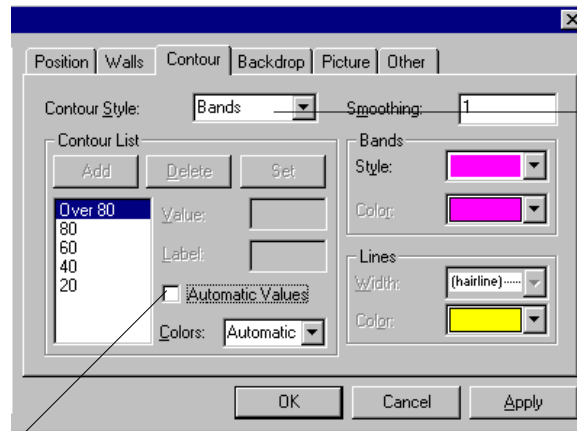


*Contour chart displaying Gradient contour color*

- **Band Styles and Colors.** You can specify band styles and colors for contours.
- **Line Widths and Colors.** You can specify line widths and colors for contours.

➤ **To display the Contour tab:**

1. In the Chart Designer tree view, select Plot to format a contour or surface chart.
2. Select the Contour tab. The following illustration shows the Contour tab.



Select Bands or Lines for the contour or surface chart. You can control the style and color for the bands, and the width and color for the lines.

Uncheck Automatic Values to add values for custom contours. Check this check box to have each major axis division represent a separate contour.

3. Once the Contour tab is displayed, format the contour or surface chart using the procedures in the following sections.

➤ **To specify a smoothing factor:**

1. Type a smoothing factor in the Smoothing text box. The following table describes valid smoothing factors:

Factor	Description
0	The raw grid data is used with no smoothing.
1	This factor samples the spline data only at the original data grid locations.
2-32	A factor of 2 or more breaks the row and column locations into the specified number of subdivisions. For example, a factor of 2 breaks the row and column locations into 2 subdivisions.

2. Click Apply or OK to redraw the chart to reflect the changes.

**Note** Since smoothing occurs for both rows and columns, a smoothing factor of 2 breaks a surface patch into 4 subpatches while a smoothing factor of 4 breaks a patch into 16 subpatches. Higher smoothing factors might slow drawing speed significantly.

➤ **To add a contour:**

1. Uncheck the Automatic Values check box, if necessary.
2. Enter a contour value in the Value text box.
3. Type a value in the Label text box, if desired.
4. Click the Add button.

The value is added to the Contour list, the values are reordered, and the new value is displayed in the appropriate location.

5. Click Apply or OK to redraw the chart to reflect the changes.

➤ **To modify a contour:**

1. Select a contour value from the Contour list.
2. Double-click the number displayed in the Value text box.
3. Type the new value for the contour
4. Double-click the value label displayed in the **Label** text box.
5. Type the new label for the contour, if desired.
6. Click the Set button.

The value is modified in the Contour list, and the new value is displayed in the appropriate location.

7. Click Apply or OK to redraw the chart to reflect the changes.

---

**Note** Values that display as “Over...” can not be modified.

---

➤ **To delete an existing contour:**

1. Select a contour value or value label from the Contour list.
2. Click the Delete button.

The value is deleted from the Contour list and the values and labels are reordered.

3. Click Apply or OK to redraw the chart to reflect the changes.



➤ **To specify a contour style:**

1. Select a contour style from the Contour Style list. The following table describes the options:

Type	Description
Bands	The surface displays changes in data with contour bands.
Lines	The surface is represented by a wireframe and displays changes in data with contour lines.

2. Click Apply or OK to redraw the chart to reflect the changes.

➤ **To specify how color is displayed on a chart:**

1. Select a color option from the Colors list. The following table describes the options:

Type	Description
Automatic	The contour colors are displayed as the default series colors.
Gradient	The surface is represented by a wireframe and displays changes in data with contour lines.
Manual	Custom contour colors can be specified and modified.

2. Click Apply or OK to redraw the chart to reflect the changes.

The following sections describe how to modify colors and styles when the Manual or Gradient option is selected.

➤ **To modify manual band styles and colors:**

1. Select Manual from the Colors list.
2. Select a value from the Contour list.
3. In the Bands section, select a predefined band color from the Color list or click Custom to create your own color.
4. Select a pattern style from the Style list.
5. Repeat the steps for each value listed in the Contour list for which you want to modify the style and color.
6. Click Apply or OK to redraw the chart to reflect the changes.

➤ **To modify manual line widths and colors:**

1. Select Manual from the Colors list.
2. Select a value from the Contour list.
3. In the Lines section, select a predefined line color from the Color list or click Custom to create your own color.
4. In the Width list, choose a predefined width or select Custom to create your own width.
5. Repeat the steps for each value listed in the Contour list for which you want to modify the width and color.
6. Click Apply or OK to redraw the chart to reflect the changes.

➤ **To modify gradient band colors:**

1. Select Gradient from the Colors list.
2. Select the From value in the Contour list.
3. In the Bands section, select a predefined band color from the Color list or click Custom to create your own color.
4. Select the To value in the Contour list.
5. Select a predefined band color from the Color list or click Custom to create your own color.
6. Click Apply or OK to redraw the chart to reflect the changes.

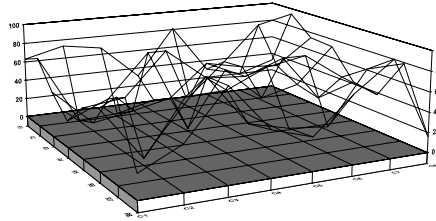
➤ **To modify gradient line widths and colors:**

1. Select Gradient from the Colors list.
2. Select the From value in the Contour list.
3. In the Lines section, select a predefined width or select Custom to create your own width from the Width list.
4. Select a predefined line color from the Color list or click Custom to create your own color.
5. Select the To value listed in the Contour list.
6. In the Lines section, select a predefined width or select Custom to create your own width from the Width list.
7. Select a predefined line color from the Color list or click Custom to create your own color.
8. Click Apply or OK to redraw the chart to reflect the changes.

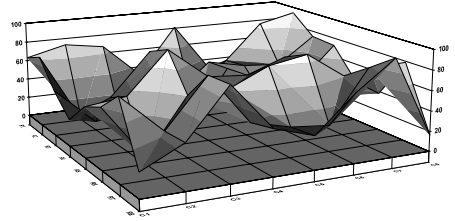
## Specifying Elevation Options

The Elevation tab of the Chart Designer customizes 2D contour charts and 3D surface charts. The elements that you can customize include:

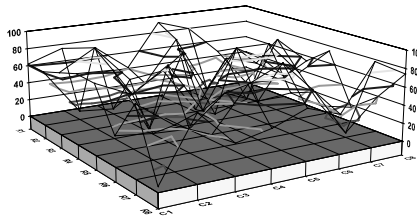
- **Surface Style and Surface Color.** Surface styles control how the surface itself is represented on a 3D surface chart using this setting. The Surface Color setting specifies a color for the surface. The following illustrations display examples of the charts with each of the surface styles selected.



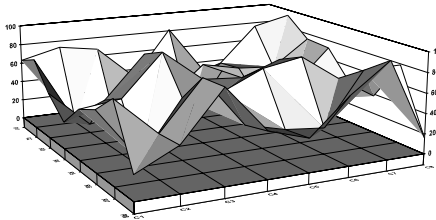
*Surface chart with surface type None.*



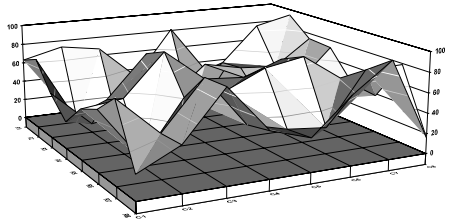
*Surface chart with surface type Bands.*



*Surface chart with surface type Lines.*

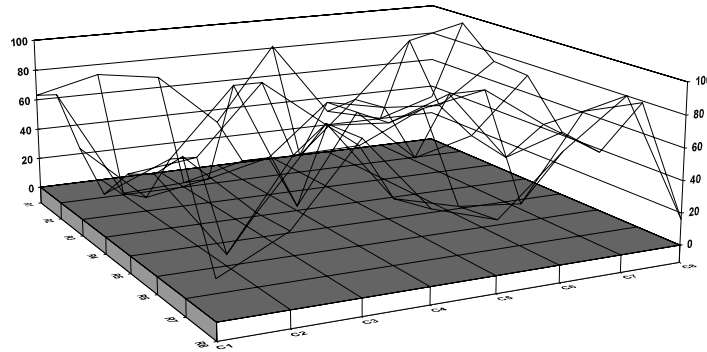


*Surface chart with surface type Solid.*

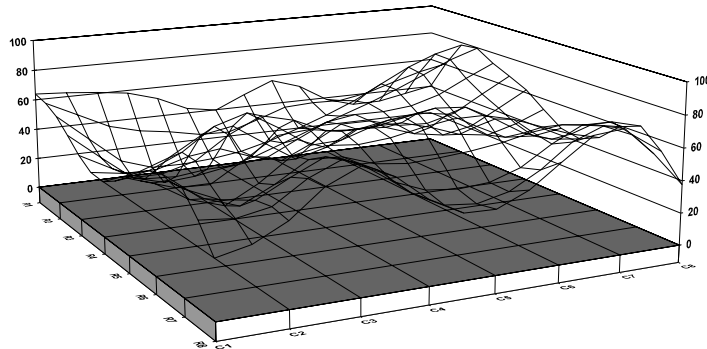


*Surface chart with surface type Solid with Lines.*

- **Wireframe Styles, Wireframe Widths, and Wireframe Colors.** Wireframe styles control the appearance of the wireframe drawn upon a surface chart. You can also specify the color and width of the wireframe. The following illustrations display examples of the charts with different wireframe styles selected

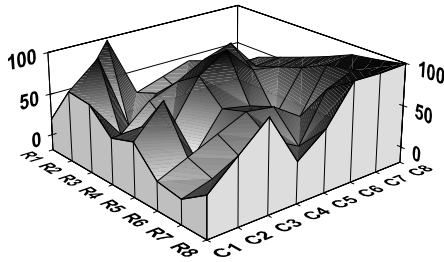


*Surface chart with major wireframe surface*

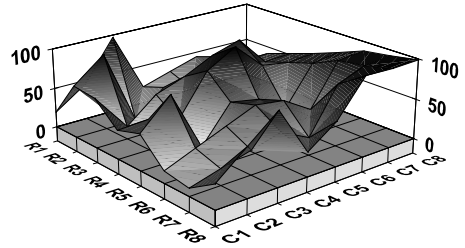


*Surface chart major and minor wireframe surface*

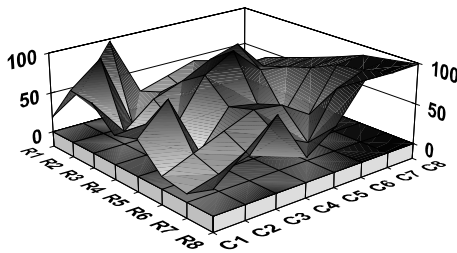
- **Base.** Base settings control how the base of a surface chart is represented. The following illustrations display examples of the charts with each of the base options selected



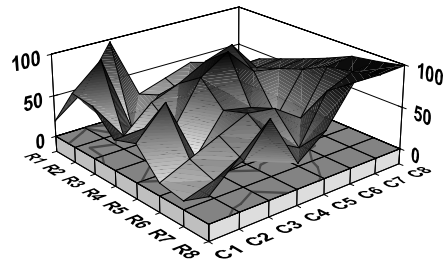
*Surface chart with pedestal base*



*Surface chart with standard base*

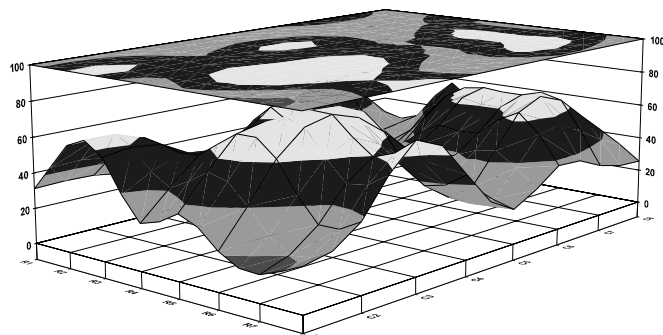


*Surface chart with contour bands base*

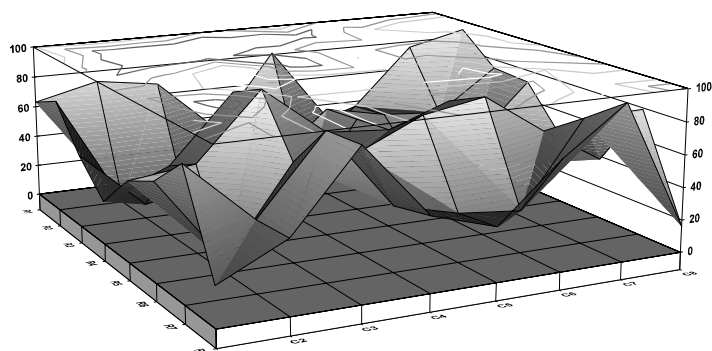


*Surface chart with contour lines base*

- **Projection.** Projection settings control the appearance of the planar contour chart projected above a surface chart. The following illustrations show a projection that displays the contours of the surface chart below it.

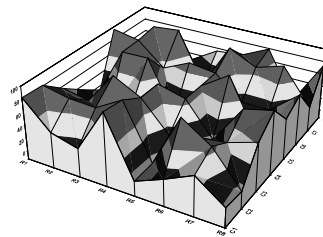


*Surface chart with contour bands projection method*

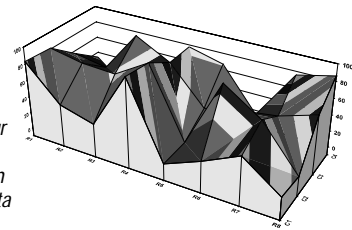


*Surface chart with contour line projection method*

- **Contour Data Options.** Contour data options control the display of both contouring and elevation data. A contour chart displays only contour data, but a surface chart can display both contouring and elevation data. When Use Separate Contour Data is enabled, a surface chart displays surface contours that do not necessarily conform to the shape of the surface. For example, a surface chart displaying separate contour and elevation data might depict snowfall across a mountain range. The following illustrations demonstrate how the Use Separate Contour Data check box affects a surface chart display:



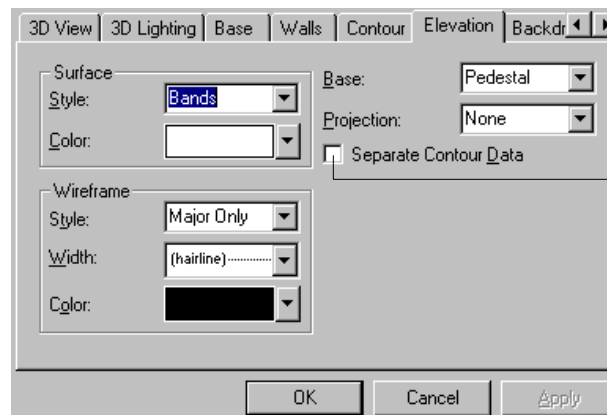
*Surface chart with Use Separate Contour Data disabled. The contour bands conform to the shape of the surface so in this case, elevation and contour data illustrate the same thing on the chart.*



*Surface chart with Use Separate Contour Data enabled. Contour bands do not conform to the shape of the surface so in this case, elevation data and contour data represent separate information.*

► **To display the Elevation tab:**

1. In the Chart Designer tree view, select Plot to format a surface chart.
2. Select the Elevation tab. The following illustration shows the Elevation tab.



*When this check box is checked, the data grid is divided vertically between columns into two equal subranges of data. The left subrange contains elevation data, and the right subrange contains contouring data.*

3. Once the Elevation tab is displayed, format the chart using the procedures in the following sections.

➤ **To select a surface style and color:**

1. Select a surface style from the Style list in the Style section. The following table describes the options:

Type	Description
None	The surface data is represented exclusively by a wireframe.
Bands	The surface displays changes in data with contour bands.
Lines	The surface is represented by a wireframe and displays changes in data with contour lines.
Solid	The surface is drawn with a solid color.
Solid with Lines	The surface is drawn with a solid color. Changes in data are indicated by contour lines super imposed on the solid color.

2. Select a predefined line color from the Color list.
3. Click Apply or OK to redraw the chart to reflect the changes.

➤ **To select a wireframe style and color:**

1. Select a wireframe style from the Style list in the Wireframe section. The following table describes the options:

Type	Description
None	The surface is represented by the surface color only.
Major	The wireframe indicates the original data grid values.
Major and Minor	The wireframe is drawn upon the surface along the original data grid values and any additional rows or columns generated by the smoothing process.

2. In the Width list, choose a predefined width or select Custom to create your own width.
3. Select a predefined line color from the Color list.
4. Click Apply or OK to redraw the chart to reflect the changes.



➤ **To select a base style:**

1. Select a base style from the Base list. The following table describes the options:

Type	Description
Pedestal	The base is displayed as a solid area that rises up to meet the surface.
Standard	The base is displayed as a flat area beneath the chart surface.
Bands	The base reflects the chart's contours as a series of contour bands.
Lines	The base reflects the chart's contours as a series of contour lines.

2. Click Apply or OK to redraw the chart to reflect the changes.

➤ **To specify a projection style:**

1. Select a projection style from the Projection list. The following table describes the options:

Method	Description
None	No projection is displayed above the chart.
Bands	The planar chart reflects the chart's contours in contour bands.
Lines	The planar chart reflects the chart's contours in contour lines.

2. Click Apply or OK to redraw the chart to reflect the changes.

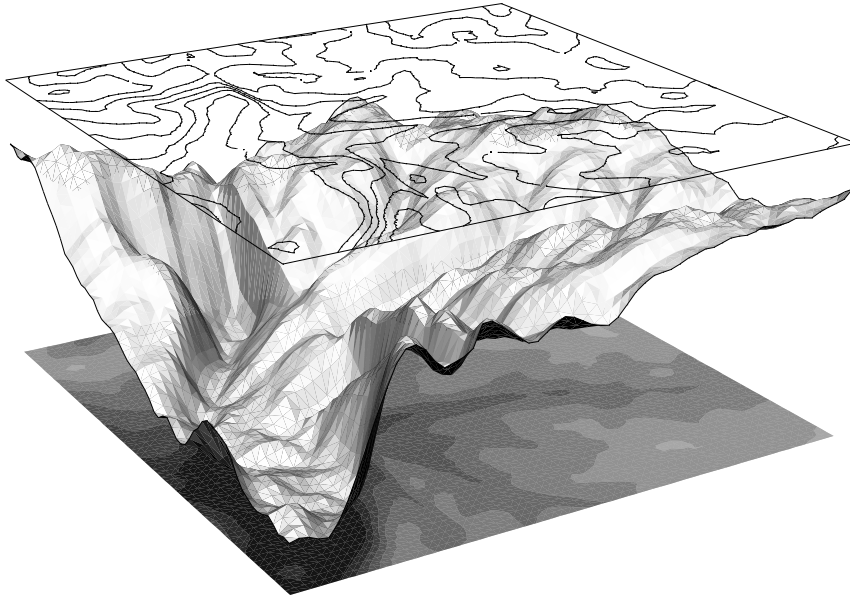
➤ **To separate contour data:**

1. Uncheck the Separate Contour Data check box to use all the data in the data grid for both contouring and elevation. Alternatively, check this check box to provide separate contour and elevation data.
2. Click Apply or OK to redraw the chart to reflect the changes.

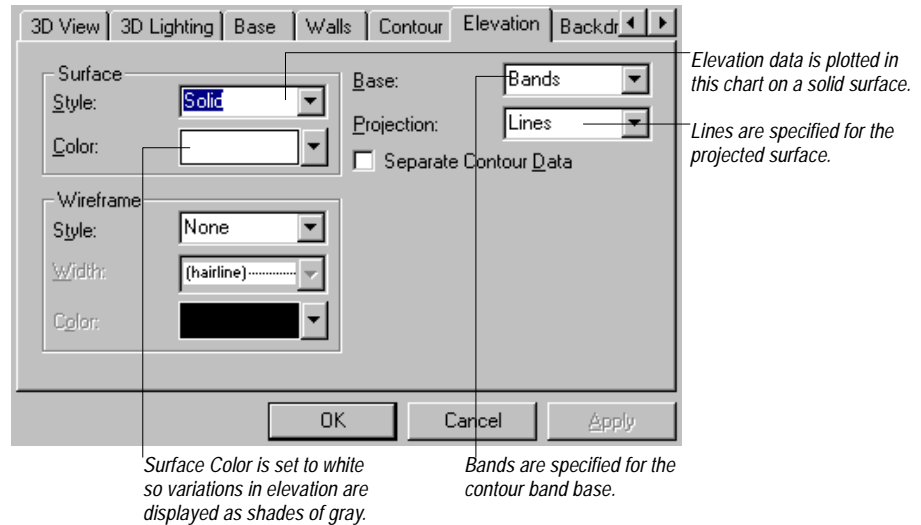
## Setting Options for a Complex Elevation Chart

The following diagram illustrates how surface projection and smoothing can create realistic elevation charts. This chart plots the elevation data of Carroll County, Arkansas. The elevation data is displayed as contour bands in the base and contour lines in the projected surface above the chart.

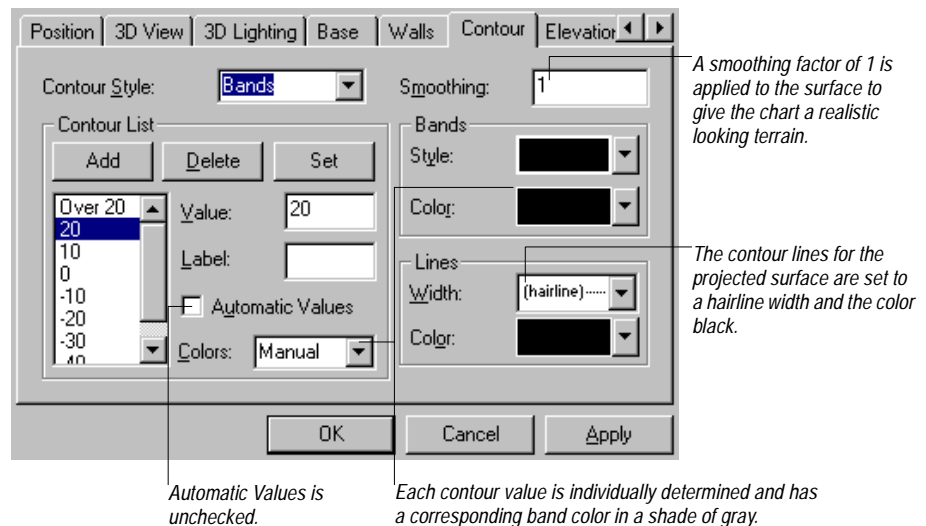
**Contour Map of Carroll County, Arkansas**



To create an elevation chart like the one displayed on the previous page, set the following options in the Elevation tab of the Chart Designer:



The base contour colors for this chart are set in the Contour tab of the Chart Designer:



Tidestone

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