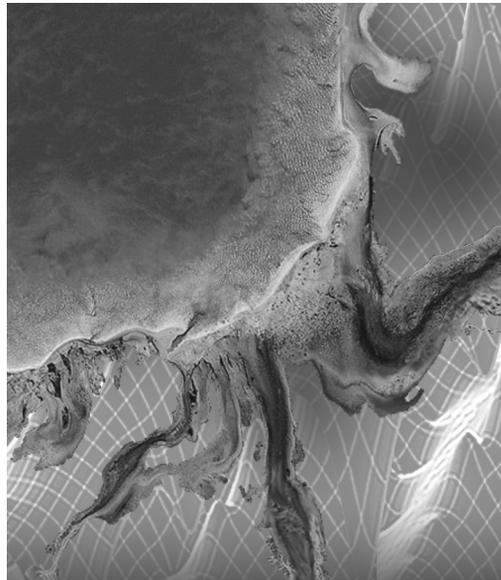


# **Grapher 8™** Getting Started Guide

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2D and 3D Graphing Software for  
Scientists, Engineers, & Business Professionals



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September 2009

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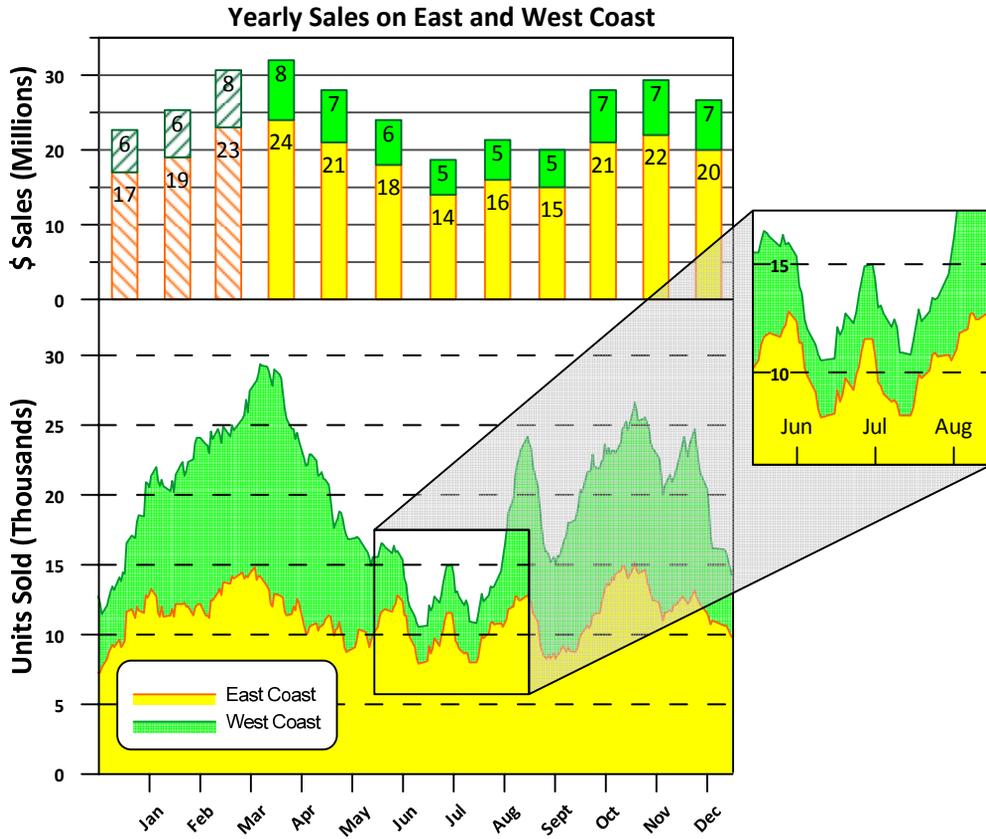
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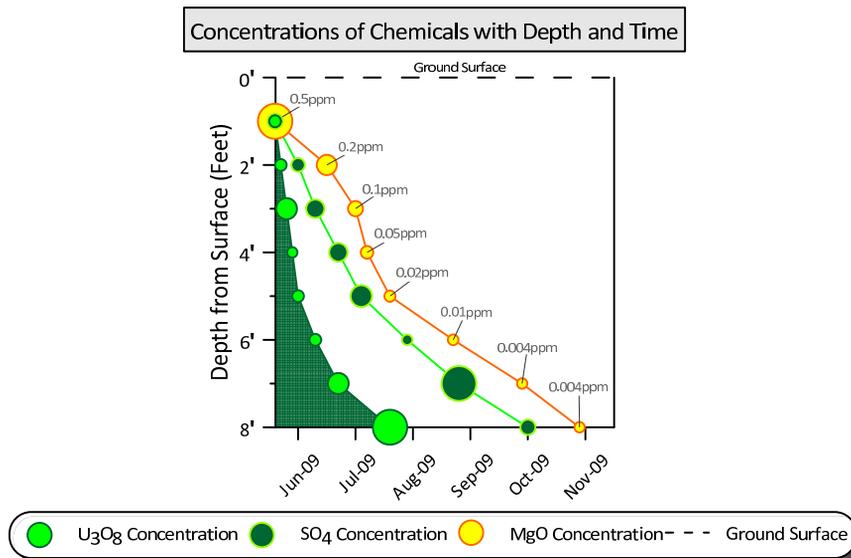
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## Introduction to Grapher

Welcome to **Grapher**, the easy-to-use technical graphing package for scientists, engineers, business professionals, or anyone who needs to generate graphs quickly and easily.

With **Grapher**, creating a graph is as easy as choosing the graph type, selecting the data file, and clicking the *Open* button. **Grapher** automatically selects reasonable default settings for each new graph, though all of the graph settings can be modified. For example, you can change tick mark spacing, tick labels, axis title, axis length, grid lines, line colors, symbol styles, fill opacity, and more. You can add legends, images, fit curves, and drawing objects to the graph. To apply the same custom settings to several graphs, you can create a **Grapher** template containing the preferred styles. Advanced automation is incorporated using Golden Software's **Scripter**™ program or any Active X automation program. Once the graph is complete, you can export it in a variety of formats for use in presentations and publications.



**Grapher** is extremely flexible. For example, you can combine multiple plot types, display graph titles, customize axis settings, customize labels, and display legends for graphs.

New features of **Grapher 8** are summarized:

- Online at: [www.goldensoftware.com/products/grapher/graphernew.shtml](http://www.goldensoftware.com/products/grapher/graphernew.shtml)
- In the online help by using the **Help | Contents** command.

## System Requirements

The minimum system requirements for **Grapher** are:

- Windows 2000, XP, Vista, or higher
- 512 MB RAM minimum for simple data sets, 1 GB RAM recommended
- At least 100 MB of free disk space
- 1024 x 768 or higher monitor resolution with a minimum of 16-bit color depth

## Installation Directions

Installing **Grapher 8** requires logging onto the computer with an account that has Administrator rights. Golden Software does not recommend installing **Grapher 8** over any previous version of **Grapher**. **Grapher 8** can co-exist with older versions (i.e. **Grapher 7**) as long as they are installed in different directories, which is the default. For detailed installation directions, see the README.RTF file.

To install **Grapher** from a CD:

1. Insert the **Grapher** CD into the CD-ROM drive. The install program automatically begins on most computers. If the installation does not begin automatically, double-click on the AUTORUN.EXE file located on the **Grapher** CD.
2. Choose *Install **Grapher*** from the **Grapher Auto Setup** dialog to begin the installation.

To install **Grapher** from a download:

1. Download **Grapher** according to the directions you received.
2. Double-click on the downloaded file to begin the installation process.

## Updating Grapher

To update **Grapher**, open the program and choose the **Help | Check for Update** command. This will launch the Internet Update program which will check Golden Software's servers for any updates. If there is an update for your version of **Grapher**, you will be prompted to download the update.

When **Grapher** is initially launched, you will be prompted to allow **Grapher** to automatically check for updates. It is highly recommended that you select Yes. You can turn this option on, off, or adjust the update interval by using the **Tools | Options** command and clicking on *Update* on the left side of the dialog.

### Uninstalling Grapher

**Windows 2000 and XP:** To uninstall **Grapher**, go to the Windows Control Panel and double-click on Add/Remove Programs. Select "**Grapher 8**" from the list of installed applications. Click the *Remove* button to uninstall **Grapher 8**.

**Windows Vista:** To uninstall **Grapher** when using the *Regular Control Panel Home*, click the *Uninstall a program* link. Select "**Grapher 8**" from the list of installed applications. Click the *Uninstall* button to uninstall **Grapher 8**.

**Windows Vista:** To uninstall **Grapher** when using the *Classic View*, go to the Windows Control Panel and double-click on Programs and Features. Select "**Grapher 8**" from the list of installed applications. Click the *Uninstall* button to uninstall **Grapher 8**.

### A Note about the Documentation

The **Grapher** documentation includes this getting started guide and the online help. General information is included in the getting started guide. Detailed information about each command and feature of **Grapher** is included in the online help. Use the **Help | Contents** command in the program to open the online help. In the event the information you need cannot be located in the online help, other sources of **Grapher** help include our support forum, knowledge base, FAQs, and our technical support engineers.

If you prefer printed documentation, you may print the online help in part or in full. See the *Printing the Online Help* section on page 43 in this getting started guide for more information.

Various font styles are used throughout the **Grapher** documentation. **Bold** text indicates menu commands, dialog names, window names, and page names. *Italic* text indicates items within a manager or dialog such as group names, options, and field names. For example, the **Save As** dialog contains a *Save as type* drop-down list. Bold and italic text also may be used occasionally for emphasis.

In addition, menu commands appear as **File | New**. This means, "click on the **File** menu at the top of the **Grapher** window, then click on **New** within the **File** menu list." The first word is always the menu name, followed by the commands within the menu list.

### Plot Types

Several different 2D and 3D plot types can be created with **Grapher**. The **Graph** menu includes **2D XY Graphs**, **Polar Graphs**, **Specialty Graphs**, **3D XYY Graphs**, **3D XYZ Graphs**, **Contour Maps**, and **Surface Maps**. Detailed information about each plot type and an example graphic is located in the online help in the *Introduction* book on the *Plot Types* page.

- **2D XY Graphs** include 2D line/scatter plots, class scatter plots, function plots, step plots, bar charts, floating bar charts, and histograms.
- **Polar Graphs** include polar line/scatter plots, polar class scatter plots, polar bar charts, polar function plots, radar plots, rose diagrams, and wind charts.
- **Specialty Graphs** include box-whisker plots, three variable bubble plots, hi-low-close plots, pie charts, stiff plots, ternary diagrams, and vector plots.
- **3D XYY Graphs** include 3D XYY ribbon/wall plots, function plots, step plots, bar charts, floating bar charts, histograms, and pie charts. The 3D XYY graphs are equivalent to 2D graphs with a 3D aspect.
- **3D XYZ Graphs** include 3D XYZ line/scatter plots, class scatter plots, bar charts, floating bar charts, and four variable bubble plots. The 3D XYZ graphs are all 3D graphs with three independent variable and axes.
- **Contour Maps** include contour data maps and contour grid maps. Contour maps can be displayed with an XY or XZ orientation.
- **Surface Maps** include surface data maps, grid maps, and function maps.

### File Types

Several file types are used in **Grapher**.

#### Grapher Files

There are three types of **Grapher** file extensions: **Grapher** [.GRF] files, **Grapher** [.GPJ] project files, and **Grapher** [.GRT] template files.

#### Grapher [.GRF] Files

**Grapher** [.GRF] files contain all of the information necessary to reproduce the graph, except for the data. When you save a **Grapher** file, all the scaling, formatting, and parameters for the graph are preserved in the file. **Grapher** [.GRF] files save a link to the data and do not store the data internally in the file. For example, if a [.GRF] file needs to be sent to a colleague, you would need to send the data file(s) used to create the graph, in addition to the [.GRF] file. This format is preferred for graphs where the data changes and needs to link to the external source data file.

### **Grapher [.GPJ] Project Files**

**Grapher** [.GPJ] project files store worksheet data inside the graph rather than saving a reference to the data file. All scaling, formatting, and parameters for the graph are preserved in the file. If a [.GPJ] file needs to be sent to a colleague, you would only need to send the [.GPJ] file. This format is preferred when you want to have the data and the graph contained in a single file.

### **Grapher [.GRT] Template Files**

**Grapher** [.GRT] template files are used to create a template with set graphing preferences. A saved template file does not contain any reference to a data file. This means that once the template graph is created, you can use the template with any data set. You can use the template to set options such as the number of decimal places on axis tick mark labels, label angles, axis labels, graph titles, line plot colors, fill colors, symbol size, or any other graphing option. If a [.GRT] file is sent to a colleague, they can use their own data set with the file to create a graph. This format is preferred when the layout of the graph needs to remain consistent with a variety of similarly formatted data files.

### **Data Files**

In most cases, there is a prompt for a data file when you create a graph in **Grapher**. Data files can be imported from a variety of sources, such as ASCII text files, Excel files, and databases. Data can be entered directly into **Grapher's** worksheet if the files do not already exist.

The data to be represented on a plot needs to be in column and row format. Each row is assigned to a single point on most plots. The columns contain the different variables to be represented on the plot.

Some of the most commonly used data types are described in the following sections.

#### **ASCII Data**

ASCII files are generic format files that can be read or produced by most applications. There are three common ASCII data formats: [.DAT], [.CSV], and [.TXT]. These files can also be imported into most applications, including word processors, spreadsheets, and ASCII editors. The files differ in the types of delimiters, or column separators, between the data. ASCII files do not contain any worksheet formatting information such as row height, column width, or cell formatting. This format does not have a limitation on the number of rows or columns.

## Excel Files

Microsoft Excel [.XLS] and [.XLSX] files contain data and retain some cell formatting in **Grapher**. Some information, such as formulas, is ignored. Excel files can preserve all formatting information available in the Golden Software worksheet. An Excel 2003 worksheet [.XLS] has a 65,536-row limit and a 256-column limit; therefore, this format cannot be used to store very large data sets. An Excel 2007 worksheet [.XLSX] has a 1,048,576 row limit and a 16,384 column limit.

### Use Caution when Saving Excel Files!

A file can be saved in an Excel [.XLS] format from **Grapher**, *but only one worksheet can be saved*. **Grapher** does not allow for saving multiple worksheets in a single Excel document. If a multi-worksheet Excel file is opened and saved as an [.XLS] file from the **Grapher** worksheet, be aware that only the single worksheet is saved in the document. If the existing file is overwritten, all the unused worksheets are destroyed. In this case, a warning message is issued.

## Retaining Excel Information

To save all the formatting, formulas, and worksheets in an [.XLS, .XLSX] file, you can use Excel directly in **Grapher**. Use the **File | Open Excel** command to utilize all of Excel's features, save multi-sheet files, and create graphs in **Grapher**.

## Database Files

In **Grapher 8**, graphs can be created from Access [.MDB] files and dBase [.DBF] files directly without first converting to a new worksheet. A graph is created directly from the database file and will reference the database. Changes made in the database table will automatically be updated on the graph.

Other database formats can be imported into **Grapher's** worksheet. Choose the **File | New** command, select *Worksheet*, and click the *OK* button. In the worksheet window, choose the **File | Import** command. In the **Merge** dialog, click the *Load Database* button. Step through the dialogs to import the file and the database is converted into a worksheet format. These files cannot be saved in their native format, but you can save the files in any of the available worksheet formats using the **File | Save As** command.

## Grid Files

Grid files are used to produce several different types of grid-based maps in **Grapher**. Grid files contain a regularly spaced rectangular array of Z data organized in columns and rows. Grid files can be imported from a wide variety of sources. For example, the *contour grid map.GPJ* sample file uses a **Surfer** [.GRD] file to create a contour XY grid map.

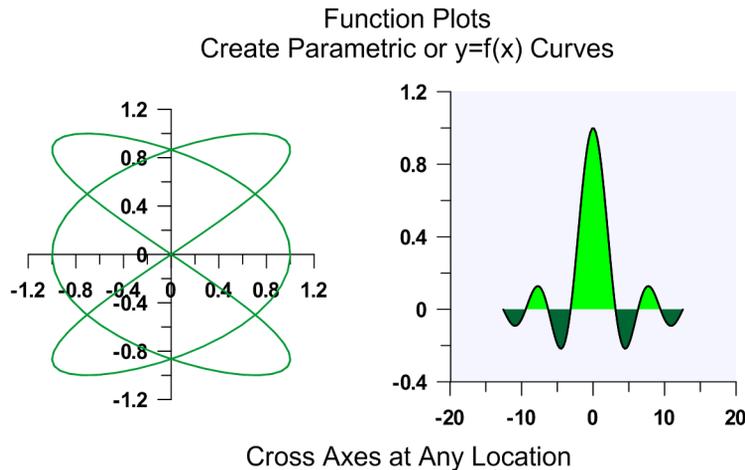
## Three-Minute Tour

We have included several example files with **Grapher** so that you can quickly see some of **Grapher's** capabilities. The sample files do not include all of **Grapher's** many plot types and features. After opening a sample file, the **Object Manager** is a good source of information as to what is included in each file.

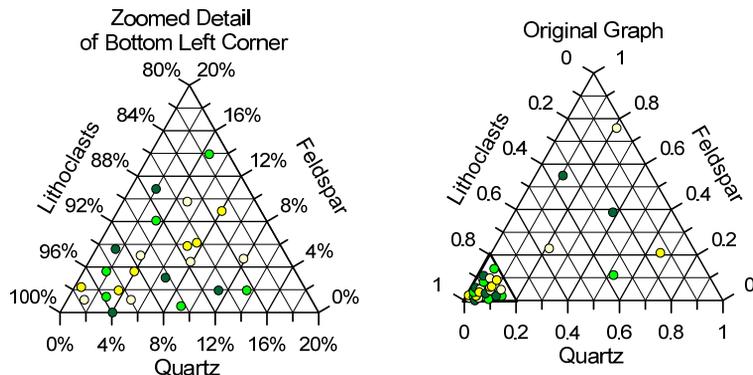
## View Sample Grapher Files

To view the sample **Grapher** files:

1. Open **Grapher**.
2. Choose the **File | Open** command. Click on a **Grapher** [.GRF] file or **Grapher** [.GPJ] project file located in the SAMPLES folder and click the *Open* button. The *SAMPLES* folder is located inside the **Grapher** installation folder, which is located at C:\Program Files\Golden Software\Grapher 8\Samples by default.



*In the function plot.grf sample file, two graphs are displayed. The first graph has a parametric function plot with custom axes. The second graph has two function plots with different fill colors and fill directions.*



*In the ternary.grf sample file, two ternary plots are displayed. One ternary diagram is a zoomed detail of the other.*

## Using Grapher

You can create graphs in several ways in **Grapher**. These various methods allow you to create graphs in a manner most comfortable for you. Graphs can be created using the plot window **Graph** menu, the **Graph Wizard**, the worksheet, and with templates. For more information on how to create a graph with these various methods, refer to the *Creating Graphs* section on page 20 in this getting started guide.

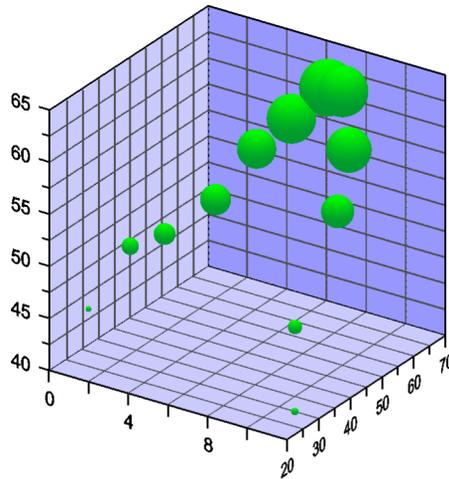
### Creating Graphs in the Plot Window

The most common method of creating graphs is to use the plot window **Graph** menu.

To create a graph in the plot window:

1. In the plot window, click the **Graph** menu.
2. Click **2D XY Graphs**, **Polar Graphs**, **Specialty Graphs**, **3D XYY Graphs**, **3D XYZ Graphs**, **Contour Maps**, or **Surface Maps**.
3. Select the plot type you would like to create.
4. In the **Open Worksheet** dialog, select a data file and click the *Open* button. If you are creating a contour grid map or surface grid map, you are prompted for a [.GRD] file. If you are creating any type of function plot, you are not prompted for a data file.

The graph is created with the default properties. You can change the properties of a selected plot or axis through the **Property Inspector**. See the *Grapher User Interface* section on page 10 in this getting started guide for information on the **Property Inspector**.



*This default 3D bubble plot was created using the **Graph | 3D XYZ Graphs | Bubble Plot** command and the tutorial.dat sample file.*

## Using Scripter

Tasks can be automated in **Grapher** using Golden Software's **Scripter** program or any ActiveX Automation-compatible client, such as visual BASIC. A script is a text file containing a series of instructions for execution when the script is run. You can do almost everything with a script that you can do manually with the mouse or from your keyboard. Scripts are useful for automating repetitive tasks and consolidating a sequence of steps. **Scripter** is installed in the same location as **Grapher**. Refer to the *Automation* section on page 23 in this getting started guide and the *Grapher Automation* help book in the online help for more information about **Scripter**.

## Example Script Files

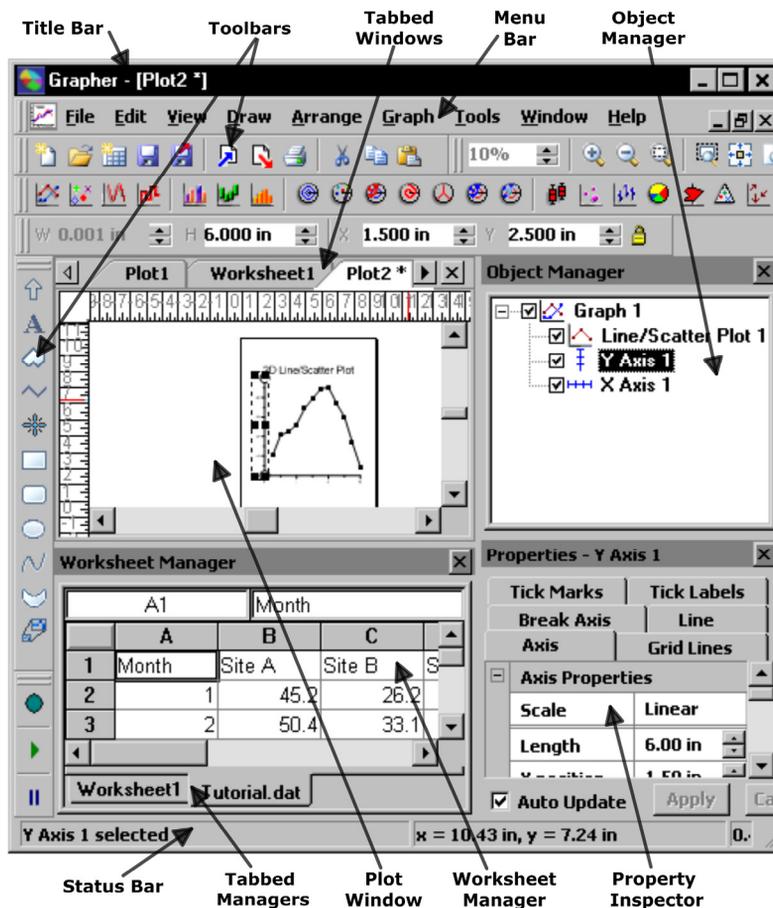
We have included several example scripts to display some of **Scripter's** capabilities.

To run a sample script:

1. Open **Scripter** by navigating to the installation folder, C:\Program Files\Golden Software\Grapher 8\Scripter. Double-click on the Scripter.EXE application file.
2. Choose the **File | Open** command and select a sample script file [.BAS] in the C:\Program Files\Golden Software\Grapher 8\Samples\Scripts folder.
3. Use the **Script | Run** command and the script is executed.

## Grapher User Interface

**Grapher** contains four document window types: the plot window, worksheet window, Excel worksheet window, and grid window. Graphs and maps are displayed and edited in the plot window. The worksheet window displays, edits, transforms, and saves data in a tabular format. The Excel worksheet window allows a native Excel window to be opened in **Grapher**. The grid window allows viewing of various grid files. The **Grapher** user interface consists of the title bar, menu bar, toolbars, tabbed windows, managers, and status bar.



This is the **Grapher** user interface with the components labeled.

The following table summarizes the function of the **Grapher** layout components.

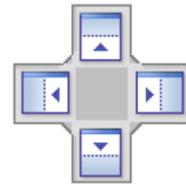
Component Name	Component Function
Title Bar	The title bar lists the program name plus the saved <b>Grapher</b> file name, if any. An asterisk (*) after the file name indicates the file has been modified.
Toolbars	The toolbars contain <b>Grapher</b> tool buttons, which are shortcuts to menu commands. Move the cursor over each button to display a screen tip describing the command. Toolbars can be customized with the <b>Tools   Customize</b> command. Toolbars can be docked or floating.
Menu Bar	The menu bar contains the commands used to run <b>Grapher</b> .
Status Bar	The status bar displays information about the activity in <b>Grapher</b> . The status bar is divided into three sections that contain information about the selected command, object, or position.
Tabbed Windows	Multiple plot windows, worksheet windows, Excel worksheet windows and grid windows can be display as tabs. Click on the tab to display that window.
Managers	<p><b>Grapher</b> contains several managers. Changes made in any manager are automatically reflected in the plot window, and vice versa. Managers can be dragged and placed at any location on the screen.</p> <ul style="list-style-type: none"> <li>▪ The <b>Object Manager</b> contains a hierarchical list of the objects in a <b>Grapher</b> plot window. These objects can be selected, arranged, and renamed in the <b>Object Manager</b>. The <b>Object Manager</b> is initially docked on the right side above the <b>Property Inspector</b>.</li> <li>▪ The <b>Property Inspector</b> allows you to edit any of the properties of a selected object. Multiple objects can be edited at the same time by selecting all of the objects and changing the shared properties.</li> <li>▪ The <b>Worksheet Manager</b> contains a view of all data loaded in <b>Grapher</b>. Edits made in the <b>Worksheet Manager</b> to any worksheet are automatically reflected in the graph. Right-click in the <b>Worksheet Manager</b> to save, edit, transform, sort, or obtain statistics on cells.</li> <li>▪ The <b>Script Manager</b> controls scripts that are recorded and run within <b>Grapher</b>. Right-click in the <b>Script Manager</b> to see relevant menu commands for opening, saving, and running scripts.</li> </ul>

## Changing the Window Layout

The windows, toolbars, managers, and menu bar display in a docked view by default; however, they can also be displayed as floating windows. The visibility, size, and position of each item may also be changed. Refer to the *Changing the Window Layout* topic in the online help for more information on layout options.

### Manager Docking Mechanism

Use the **Tools | Options** command and click on *Display* to set the *Visual look* of **Grapher** to *VS 2005* or *VS 2008* to activate the docking mechanism feature that allows for easy docking of managers. With these visual looks, left-click the title bar of a manager and drag it to a new location while holding down the left mouse button. The docking mechanism displays with arrow indicators as you move the manager.



*The docking mechanism has docking indicators.*

When the cursor touches one of the docking indicators in the docking mechanism, a blue rectangle shows the window docking position. Release the left mouse button to allow the manager to be docked in the specified location.

### Customizing the Toolbars and Menu Bar

You may customize **Grapher's** toolbars and menus. Choose the **Tools | Customize** command, the **View | Toolbars/Managers | Customize** command, or right-click on a toolbar and select **Customize** from the context menu. This is useful to create custom toolbars, rearrange menus, menu commands, and toolbar buttons. You can display image, text, or image and text depending on your preference. You can also create a new button appearance for a command.

### Customizing Exercise

In this exercise, we will move commands from one menu to another.

1. Choose the **Tools | Customize** command.
2. In the **Customize** dialog, click the **Commands** tab.
3. Select the command you want to move.
4. Hold down the left mouse button. Drag the mouse to the menu where you want to place the command.
5. The menu will expand and you can insert the mouse into the desired position. Release the mouse button to add the command to the new menu.
6. Click the *Close* button in the **Customize** dialog.

## Plot Window

A plot window is the area used for creating and modifying graphs. You are presented with an empty plot window when **Grapher** is first started. Multiple plot windows can be open at one time. Tabs can be used to easily move between multiple plot windows. The **View | Tabbed Documents** command turns tabs on and off.

## Menu Commands

The menus contain commands that allow you to add, edit, and control the objects on the plot window page. See the *Introduction* help book in the online help for the *Plot Window Commands* help book that detail the various plot window menu commands.

## Toolbars

Toolbars display buttons that represent menu commands for easy access. Use the **View | Toolbars/Managers** command to show or hide a toolbar. A check mark is displayed next to visible toolbars.

Hold the cursor over any tool button on the toolbar to display the function of the button as a screen tip. A more detailed description is displayed in the status bar at the bottom of the window.

## Status Bar

The status bar is located at the bottom of the window. Use the **View | Status Bar** command to show or hide the status bar. The status bar displays information about the current command or activity in **Grapher**. The status bar is divided into three sections. The left section shows the selected object name. If a menu command is selected, a brief description of the command appears in the left section. The middle section shows the cursor coordinates in inches or centimeters. The middle section also displays the graph's X and Y coordinates when using the **Graph | Digitizing** commands, or when *Display value on click* is enabled. The right section displays the dimensions of the selected object or the **Property Inspector** option name and value.

## Managers

There are four managers in **Grapher**. These managers allow you to select, create, and edit objects; select, create, and edit worksheet data; and automate tasks. Each manager is described in more detail below.

### Object Manager

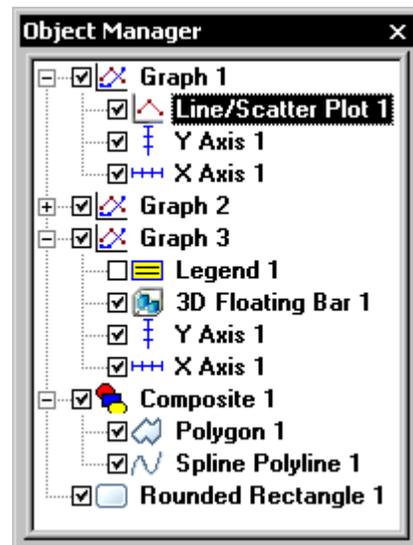
The **Object Manager** contains a hierarchical list of the objects in a **Grapher** plot window. The objects can be selected, arranged, removed, and renamed in the **Object Manager** or through the plot window menu commands. Changes made in the **Object Manager** are reflected in the plot window, and vice versa.

Use the **View | Toolbars/Managers | Object Manager** command to show or hide the **Object Manager**. A check mark indicates the manager is visible. No check mark indicates the manager is hidden.

Each item in the list consists of an icon indicating the object type, a text label for the object, and a check box. A  indicates that the object is visible; a  indicates that the object is not visible. Click the check box to the left of an object icon to change its visibility status. Invisible objects do not appear in the plot window and do not appear on printed output.

If an object contains sub-objects, a  or  button displays to the left of the object name. Click on the  or  button to expand or collapse the list. For example, a graph object contains a plot, e.g., line/scatter plot, plus at least two axes. To expand the *Graph 1* tree to see the axes and plots, click on the  button next to *Graph 1*. To collapse the *Graph 1* tree, click on the  button next to *Graph 1*.

Click on the object name to select an object and display its properties in the **Property Inspector**. The selection handles in the plot window change to indicate the selected item and the status bar displays the name of the selected object. To select multiple objects in the **Object Manager**, hold down the CTRL key and click on each object. To select multiple contiguous objects at the same level in the **Object Manager** tree, click on the first object's name, hold down the SHIFT key, and then click on the last object's name.

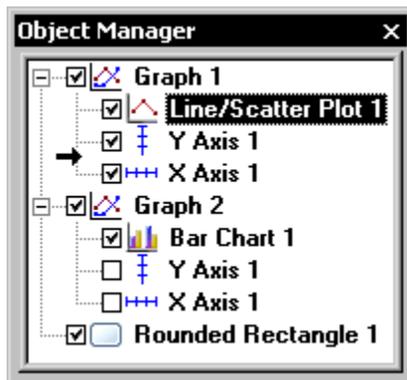


*The Legend 1 object in Graph 3 does not have a check mark and is not visible. The Graph 2 object is collapsed. The Graph 1, Graph 3, and Composite 1 objects are expanded.*

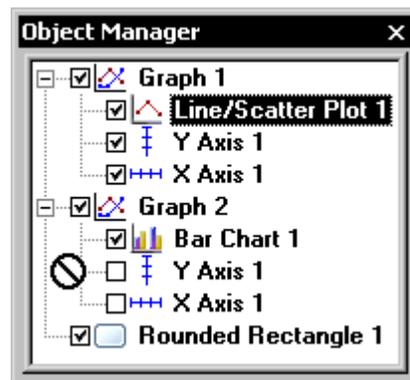
To edit an object's text ID, select the object and then click again on the selected item (two slow clicks) to edit the text ID associated with an object. You must allow enough time between the two clicks so it is not interpreted as a double-click. Enter the new name into the box. Alternatively, you can right-click on an object name and select **Rename Object**. Enter an ID in the **Rename Object** dialog and click the *OK* button.

To change the display order of the objects with the mouse, select an object and drag it to a new position in the list above or below an object at the same level in the tree. The cursor changes to a black arrow if the object can be moved to the cursor location or a black circle with a diagonal line if the object cannot be moved to the indicated location. For example, a line/scatter plot can be moved anywhere within its graph object, but not into a composite object or into another graph object.

To delete an object, select the object and press the DELETE key. Some objects cannot be deleted. For example, you cannot delete an axis used by a plot in a graph.



*The cursor changes to a horizontal arrow if an object can be moved to the selected position.*



*The cursor changes to a circle with a diagonal line if an object cannot be moved to the selected position.*

## Property Inspector

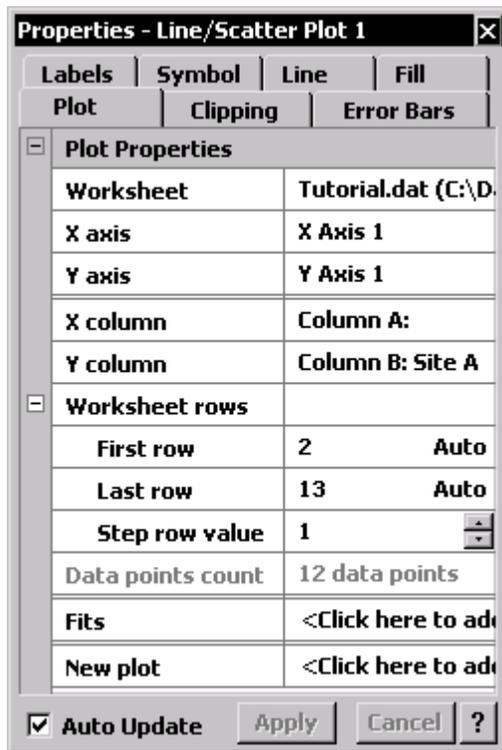
The **Property Inspector** allows you to edit the properties of an object, such as a line or axis. The **Property Inspector** contains a list of all properties for a selected object. The **Property Inspector** is left open and docked on the right side of the plot window, by default, so the properties of selected objects are always visible. Information about the object properties is located in the online help.

Features with multiple options appear with a  or  button to the left of the name. To expand a group, click on the  button. To collapse the group, click on the  button. For example, the expanded *Worksheet* rows section contains three options, *First row*, *Last row*, and *Step row value*.

To change a property, select an item in the plot window or **Object Manager**. Click on the property's value in the **Property Inspector**, and select a new value. Scroll to a new number using the  buttons, select a new value from the drop-down list or palette, or type a new value and press ENTER on your keyboard. The property access depends on the property type.

You can also modify more than one object at a time. For example, click on *X Axis 1* in the **Object Manager**. Hold the CTRL key down and click on *Y Axis 1*. You can change the common properties of each axis simultaneously in the **Property Inspector**.

Occasionally, some properties are dependent on other selections. For example, there is a *Gradient fill* option on the **Fill** page. This option is disabled (grayed out) unless you have selected a *Gradient type* other than *None*.



The **Property Inspector** is used to change properties of selected objects.

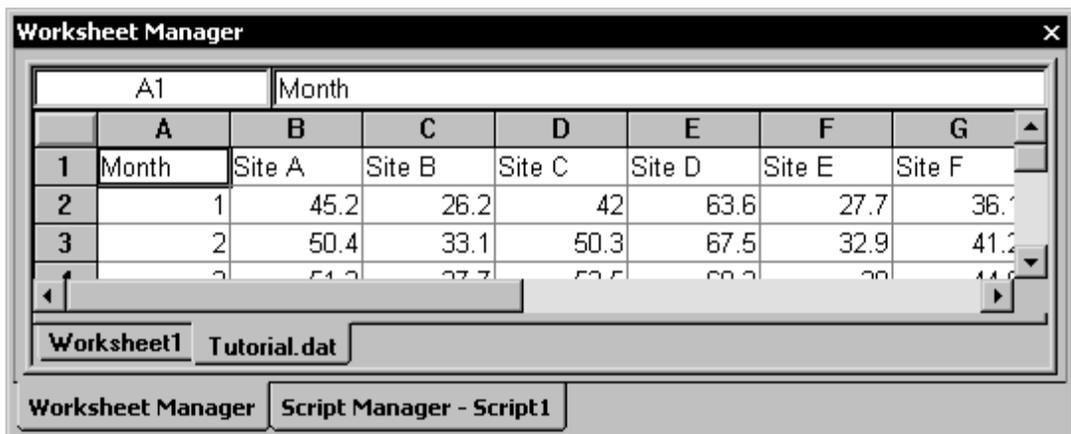
By default, the object properties automatically update after you make changes in the **Property Inspector**. If you want to disable the automatic update of properties, uncheck the *Auto Update* box at the bottom of the **Property Inspector**. This allows multiple changes to be made without updating the plot window. This can be convenient with large data sets because the redraw time is reduced. After making all changes, click the *Apply* button to update object properties in the plot window.

When the *Auto Update* box is not checked, click *Cancel* to cancel any changes made in the **Property Inspector**. Changes can be canceled in this manner only if the *Apply* button has not been clicked. If *Auto Update* is checked, use the **Edit | Undo** command to undo the changes that have automatically been made.

### Worksheet Manager

The **Worksheet Manager** contains a view of all data loaded into **Grapher**. Multiple data files are displayed in a tabbed format. Use the **View | Toolbars/Managers | Worksheet Manager** command to show or hide the **Worksheet Manager**. A check mark indicates the manager is visible. No check mark indicates the manager is hidden. By default, the **Worksheet Manager** appears at the bottom of the **Grapher** window below the plot window.

Right-click inside the **Worksheet Manager** to open the worksheet menu commands. Use the **New Graph** menu commands to create a graph in the current plot window. Use the **Data** menu commands to transform, sort, or generate statistics for the worksheet data.

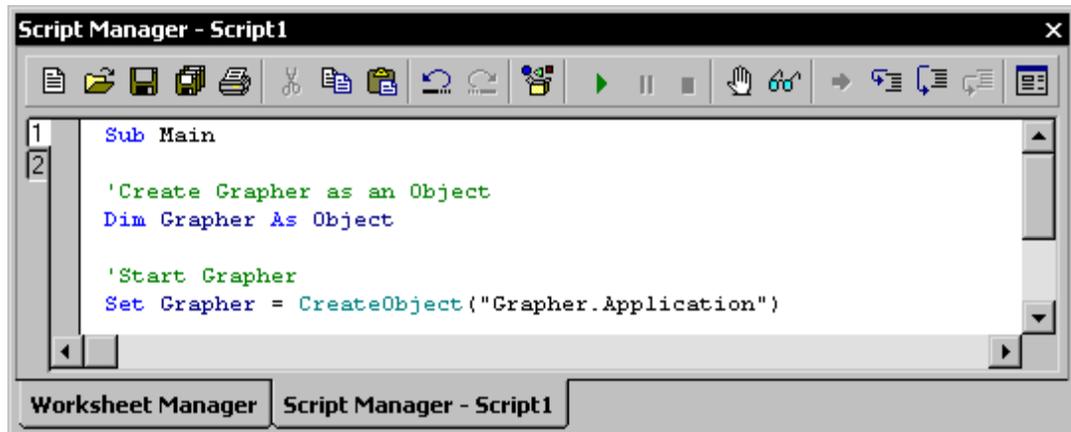


See all data files currently open by all open plot windows in the **Worksheet Manager**.

### Script Manager

The **Script Manager** allows you to work with automation within **Grapher** rather than opening Golden Software's automation program, **Scripter**, separately. All of **Scripter's** toolbars, menus, etc. are available within the **Script Manager**. You need to right-click in the **Script Manager** to access **Scripter's** menu commands. Detailed information about **Scripter**, plus details about **Grapher's** automation objects, methods, and properties are located in the online help. Open the automation help by choosing the **Help | Automation** command in the **Grapher** program.

Use the **View | Toolbars/Managers | Script Manager** command to show or hide the **Script Manager**. A check mark indicates the manager is visible. No check mark indicates the manager is hidden. Typically, the **Script Manager** is located at the bottom of the **Grapher** window, tabbed with the **Worksheet Manager**.



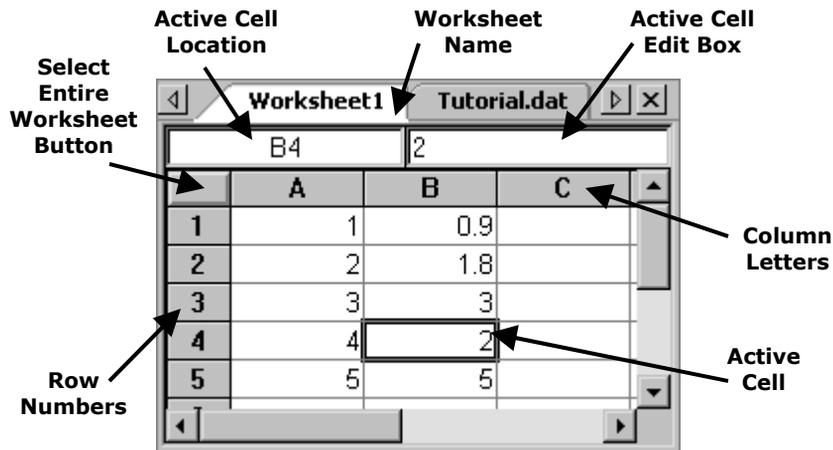
*Use the **Script Manager** to view, edit, and run scripts. The **Script Manager** is tabbed with the **Worksheet Manager** by default.*

Sample scripts can be found in the SCRIPTS folder, located in the **Grapher** installation folder. By default, the installation folder is located in C:\Program Files\Golden Software\Grapher 8\Samples\Scripts. If your version of **Grapher** was installed elsewhere, look in that installation folder. The SCRIPTS folder has a variety of [.BAS] script files ready for you to use. Sample scripts can also be downloaded from [www.goldensoftware.com](http://www.goldensoftware.com).

The **Script Recorder** is a great way to use scripting and become familiar with automation. Complete the *Lesson 7 - Working with the Script Recorder* on page 37 in this getting started guide to practice using the **Script Recorder**.

## Worksheet Window

To enter data in a worksheet, use the **File | Open** command to open an existing data file or choose the **File | New** command to create a blank worksheet. Data already used to create plots can be opened in the worksheet window with the **Graph | Display Worksheet** command. See the *Worksheet Window Commands* help book, located in the *Introduction* help book in the online help for detailed information on the worksheet menu commands. The components of a worksheet window are displayed below.



*This is the worksheet window with the components labeled.*

Component Name	Component Function
Column Letters	The column letters identify a column of the worksheet.
Row Numbers	The row numbers identify a row of the worksheet.
Active Cell	The cell highlighted with a bold outline. The active cell receives data input (numeric values or text strings) from the keyboard. Only one cell is active at a time.
Active Cell Location	The location of the active cell is indicated with the column letter and row number (i.e. B4).
Active Cell Edit Box	The box displaying the data or text contained in the active cell. Data typed into an empty cell appears in both the edit box and the active cell.
Worksheet Name	The name of the data file displayed in the worksheet or the worksheet number prior to saving.
Select Entire Worksheet Button	The button used to select all cells in the worksheet.

### Creating Graphs

Graphs can be created using the plot window **Graph** menu commands, the **Graph Wizard** dialog, the worksheet window **New Graph** menu commands, and templates.

#### Creating Graphs in the Plot Window

The most common method of creating graphs is to use the plot window **Graph** menu commands. This method is discussed in the *Three-Minute Tour* section on page 8 of this getting started guide.

#### Creating Graphs with the Graph Wizard

The graph wizard leads you through the necessary steps to create a new graph or add a plot to an existing graph. This is often the simplest way to make a graph if you are not familiar with **Grapher** or if you want to change some portion of the graph before it is created. You can set some of the plot features through the wizard, although most plot parameters use the default settings to create the graph.

To create a graph with the graph wizard:

1. In the plot window, choose the **Graph | Graph Wizard** command.
2. In the **Graph Wizard** dialog, select the plot category from the *Plot Categories* list, and select a plot type from the *Plot Types* section. A description of the selected plot type is listed in the *Description* section.
3. If you want to create a new graph, select *New graph* next to *Add plot to*. If you want to add a curve to an existing graph, select the graph name next to *Add plot to*.
4. Check the box next to *Display preview*, if a plot preview of the data is desired.
5. Click the *Next* button.
6. In the **Open Worksheet** dialog, choose a new data file to open, or click on a previously opened data file in the *Open worksheets* list. Click the *Open* button.
7. In the **Graph Wizard** dialog, set the plot, line, and fill properties. You can review the plot properties and see the *Plot Preview* if the *Display preview* option is checked. If these settings are not acceptable, click the *Back* button to make changes. If the settings are acceptable, click the *Finish* button to create the graph. You can always change the graph properties later.

The graph is created with the specified properties. You can change the properties of a selected graph, plot, or axis through the **Property Inspector**.

## Creating Graphs from the Worksheet

If you are working with the data in the worksheet, you can create a graph without switching to the plot window. Simply select the columns you wish to plot and choose the graph type you wish to create.

To create a graph from the worksheet:

1. Open a data file by choosing the **File | Open** command, selecting a data file in the **Open** dialog, and clicking the *Open* button.
2. Highlight the columns to use in the plot.
3. Click the **New Graph** menu.
4. Click **2D XY Graphs, Polar Graphs, Specialty Graphs, 3D XYY Graphs, 3D XYZ Graphs, Contour Maps,** or **Surface Maps.**
5. Select the plot type you would like to create and the graph is created with the default plot properties in a new plot window. You can change the properties of a selected graph, plot, or axis through the **Property Inspector.**

If you are working with the data in the **Worksheet Manager**, right-click anywhere in the window and select the **New Graph** menu command in step 3.

## Creating Graphs from a Grapher [.GRT] Template File

Template graphs are used to set graphing preferences in **Grapher**. When a template file is saved, it does not contain a reference to any data file. This means that once the template graph is created, you can use it to create a new graph with any compatible data set.

To create a template:

1. In a plot window, design the graph exactly the way you want the final graph to appear. Create any plot type, set the axes properties, add titles, format legends, etc.
2. Choose the **File | Save As** command.
3. In the **Save As** dialog, specify a *Save in* location, a *File name*, and choose *Plot Template (\*.grt)* for the *Save as type*. Click the *Save* button to save the completed template file.

To create a new plot from a template:

1. Choose the **File | New** command.
2. In the **New** dialog, select *Plot*. Check the *Prompt for template* option and click the *OK* button.
3. In the **Open** dialog, select a [.GRT] template file, and click the *Open* button.
4. If prompted, select a data file to use with the template. Check the *Use this worksheet for remaining items* if all the plots in a template use the same worksheet. Check the *Set columns* if you want to change the column specifications for individual plots in the graph. Click the *Open* button and the new plot is created.

Alternatively, you can choose the **File | Open** command, select a [.GRT] file in the **Open** dialog, and click the *Open* button. Select a data file to use with the template. Check the *Use this worksheet for remaining items* if all the plots in a template use the same worksheet. Check the *Set columns* if you want to change the column specifications for individual plots in the graph. Click the *Open* button and the new plot is created.

## Setting Defaults

Defaults can be set in **Grapher** using the **Tools | Options** command and the **Tools | Defaults** command.

### Tools | Options

Use the **Tools | Options** command to change the program options, such as ruler display or if back up files are created. The **Tools | Options** command also controls default line, fill, symbol, font, or digitize format properties. These properties are shared by all objects that use the specific format. For example, if you change the line color, all new axes, line/scatter plots, drawn polygons, lines, etc will have the new line color.

### Options Property Exercise

In this exercise, we will change the default symbol from a cross to a filled circle.

1. Choose the **Tools | Options** command.
2. In the **Options** dialog,
  - a. In the left column, click the  next to *Defaults*. Click *Symbol* on the left.
  - b. On the right side of the dialog, click the  next to *Symbol* to expand the symbol palette.
  - c. Select symbol number 12 (filled circle). The *Symbol* is updated to  <sup>12</sup>.
3. Click the *OK* button to close the dialog and save changes.

The next time you draw a symbol, it will be a filled circle.

## Tools | Defaults

Use the **Tools | Defaults** command to change the default properties for basic objects, graphs, plots, axes, and legends. Changing these default properties makes the change only for the selected object type.

### Defaults Property Exercise

In this exercise, we will change the default line property for the graph title box from solid to invisible. The default is a solid black line, creating a bounding box around any title you add to a graph. If you prefer not to have a bounding box around your graph titles, changing the default property will save time and increase your work efficiency.

1. Choose the **Tools | Defaults** command.
2. In the **Defaults** dialog,
  - a. In the left column, click the  next to *Graphs*.
  - b. Click *2D Graph* to display the shared 2D graph default properties.
  - c. On the right side of the dialog, click the  next to *Box line properties* to see the available options.
  - d. Click the solid line next to *Style* to open the line palette. Click on the *Invisible* line style, which is the second entry in the line palette list.
3. Click the *OK* button to close the dialog and save changes.

The next time you create a 2D graph, the title box will be invisible by default.

## Automation

**Grapher** operations can be controlled through automation scripts. You can do almost everything with a script that you can do manually with the mouse or from the keyboard. Scripts are used to automate repetitive tasks, consolidate a complicated sequence of steps, or act as a "front end" to help novice users access **Grapher's** capabilities without having to become familiar with **Grapher**. Since **Grapher** exposes its services through automation, you can use any programming tool that accesses automation objects. Such tools include Visual BASIC, Windows Scripting Host, and many of the Microsoft Office applications, among others.

## Scripter

Golden Software's **Scripter** is a program for developing and running scripts. A script is a text file containing a series of instructions carried out when the script is run. Instructions are written in a Visual BASIC-like programming language. **Scripter** offers many features to help you write, edit, and debug scripts. Its features include language syntax coloring, a list of the procedures defined in the script, an object browser for examining procedures available in external objects, a visual dialog editor, break

points, single-step execution (including options to step over and to step out of procedures), a watch window for displaying the values of script variables, and more.

To start the **Scripter** program, select it from the Windows Start menu. **Scripter** is installed in the same program group as **Grapher 8**. To open **Scripter**, click the Windows Start button and locate **Golden Software Grapher 8 | Scripter**. If **Scripter** is not present, the installation of **Scripter** may have been skipped when **Grapher** was installed. See the README.RTF file for information about the installation process.

### Script Recorder

**Grapher 8** includes a **Script Recorder**, accessed through the **Edit | Script**

**Recorder** commands or the  toolbar. The **Script Recorder** records all commands as you make them in **Grapher**. When the script is run, **Grapher** performs all the recorded steps for you. This is ideal for users who need to perform repetitive tasks but are unfamiliar with automation, for advanced users who do not want to manually enter all of the syntax, or for average users who have difficulties with syntax. Open the **Script Manager** with the **View | Toolbars/Managers | Script Manager** command, if you would like to view a script while it is recording. Recording must be stopped before you can edit scripts in the **Script Manager**.

### Script Recorder Exercise

To record a script:

1. Choose the **Edit | Script Recorder | Record** command. The script recorder toolbar run button changes to a red circle to indicate recording mode.
2. Choose the **Draw | Ellipse** command.
3. Left-click anywhere in the plot window, hold the left mouse button down, drag the mouse to create an ellipse, and release the mouse button to draw the ellipse.
4. Hold down the CTRL button on the keyboard and repeat step 3 to draw a circle.
5. Press the ESC button on the keyboard to exit draw mode.
6. Select *Ellipse 1* in the **Object Manager** and click on the **Line** tab in the **Property Inspector**.
7. Change the *Color* of the line from *Black* to *Blue*.
8. Choose the **Edit | Script Recorder | Stop** command.
9. In the **Save As** dialog, select a *File name* and click the *Save* button. Your script is now saved and ready to use.

## Tutorial

This tutorial is designed to introduce you to some of **Grapher's** basic features. After you have completed the tutorial, you should be able to begin creating your own graphs. We strongly encourage completion of the tutorial before proceeding with **Grapher**. The lessons should be completed in order; however, they do not need to be completed in one session. The tutorial should take less than an hour to complete.

### Tutorial Lesson Overview

The following is an overview of lessons included in the tutorial.

- *Lesson 1 - Creating a Graph* shows you one way to create a graph.
- *Lesson 2 - Viewing and Editing Data* shows you how to view and edit the data file used in the graph.
- *Lesson 3 - Modifying Plot Properties* shows you how to open and edit the plot properties.
- *Lesson 4 - Editing Axes* shows you how to add an axis title, how to change the tick mark spacing, and how to change the tick label source.
- *Lesson 5 - Adding Additional Plots to the Graph* shows you how to add a second plot to an existing graph.
- *Lesson 6 - Adding and Editing a Legend* shows you how to create and edit a legend.
- *Lesson 7 - Working with the Script Recorder* shows you how to use the **Script Recorder** with the techniques in the previous lessons and adds a few new items. This is an optional advanced lesson. Because other features are covered in this advanced lesson, it is highly encouraged that you complete *Lesson 7*, even if you do not wish to use the script recorder.

Use the **Help | Tutorial** command to open the online help version of the tutorial. In the online help tutorial, each topic contains several links to other topics. Additional advanced lessons are available in the online help.

### Starting Grapher

To begin a **Grapher** session:

1. Navigate to the installation folder, C:\Program Files\Golden Software\Grapher 8 by default.
2. Double-click on the Grapher.EXE application file.
3. **Grapher** starts with a new empty plot window. This is the work area for producing graphs. The first time you open **Grapher** you are prompted for your serial number. Your serial number is located on the inside front cover of this getting started guide or in the email download instructions, depending on how you purchased **Grapher**.

If you already have been working with **Grapher**, open a new plot window before starting the tutorial.

To open a new plot window:

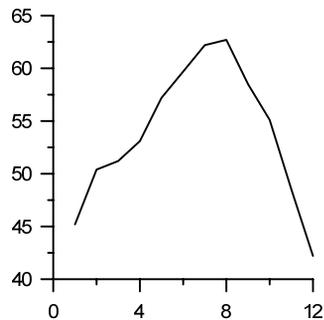
1. Choose the **File | New** command.
2. In the **New** dialog, select *Plot*, and click the *OK* button.

## Lesson 1 - Creating a Graph

You can create graphs in several ways in **Grapher**. The various methods are discussed in the *Creating Graphs* section on page 20 of this getting started guide. In the tutorial, we use the most common method, creating a graph through the **Graph** menu, to create a line/scatter plot from an existing data set.

To create a line/scatter graph:

1. Choose the **Graph | 2D XY Graphs | Line/Scatter** command or click the  button.
2. The **Open Worksheet** dialog appears. Browse to **Grapher's** SAMPLES folder using the *Look in* list. The location of this folder varies depending on where the software was installed. If the software was installed in the default folder, the path is C:\Program Files\Golden Software\Grapher 8\Samples.
3. Double-click on the *Tutorial.dat* file to create the graph from it. Alternatively, you can left-click once on the *Tutorial.dat* file and click the *Open* button.



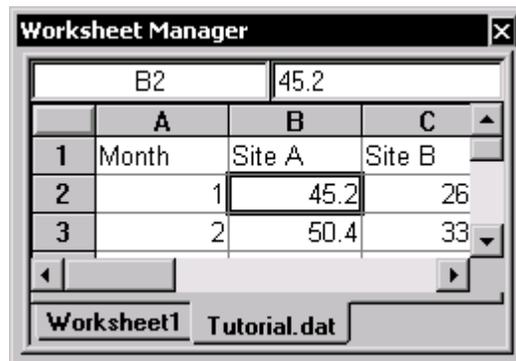
*Your line/scatter plot should look similar to this example.*

A line/scatter plot is created using the default properties. By default, **Grapher** uses the first two columns containing numeric or date/time data in the data file. With this data file, the X Axis is displaying column A and the Y Axis is displaying column B.

## Lesson 2 - Viewing and Editing Data

If you would like to view or edit data, you can open the data file in **Grapher**. There are several ways to view a data file. The most common method is to use the **Worksheet Manager**. The other methods are described in the *Data in the Plot* topic in the online help.

The **Worksheet Manager** is visible at the bottom of the **Grapher** window by default. If you do not see the manager, choose the **View | Toolbars/Managers | Worksheet Manager** command. Click the **Tutorial.dat** tab at the bottom of the **Worksheet Manager** to view the data used in the line/scatter plot. Note that you may not see the [.DAT] file extension, as its visibility is dependent on your computer setup.



B2		45.2	
	A	B	C
1	Month	Site A	Site B
2	1	45.2	26
3	2	50.4	33

Worksheet1 Tutorial.dat

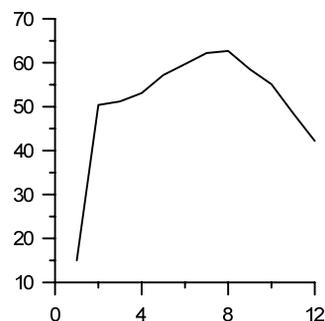
*Click the **Tutorial.dat** tab to view the data used in the plot.*

The **Worksheet Manager** is a convenient way to review, enter, and revise data. Right-click in the **Worksheet Manager** to access all menu commands available in the worksheet. The **Worksheet Manager** is a good tool to use if a plot does not appear as you expect. For example, if a typographical error is present in the data, you can edit it in the **Worksheet Manager**. For example, you might notice that cell B2 should be 15, not 45.2.

To revise the data:

1. Click in cell B2.
2. Type 15 and press ENTER on your keyboard.

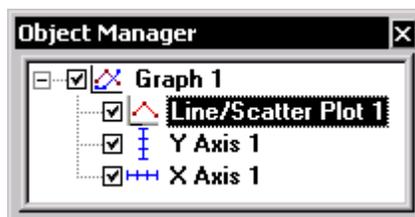
Notice that the data in cell B2 has updated. Also, notice that the plot has changed to reflect the data change.



*The graph updates to reflect the data change.*

## Lesson 3 - Modifying Plot Properties

You can edit any of the graph properties after the graph has been created. You can edit the axis size, tick mark spacing, plot line color, symbol display, or just about anything you see on the graph. In this example, let's change the line plot created in the *Lesson 1 - Creating a Graph* section to a scatter plot. The graph from *Lesson 1 - Creating a Graph* should already exist in the plot window before you proceed with this lesson.



*Click on the object name, Line/Scatter Plot 1, to select the plot and display the properties.*

### Selecting the Line/Scatter Plot

The **Object Manager** is the easiest way to select an object, so this method is used throughout the rest of the tutorial. Methods for selecting objects are discussed in detail in the online help topic, *Selecting Objects*. Once an object is selected, its properties are available for editing in the **Property Inspector**.

To select the line/scatter plot:

1. Make sure the **Object Manager** is open. If you do not see the **Object Manager**, choose the **View | Toolbars/Managers | Object Manager** command. A check mark is displayed next to the visible managers.
2. In the **Object Manager**, left-click the *Line/Scatter Plot 1* object. This selects the line/scatter plot and opens the line/scatter plot properties in the **Property Inspector**.

### Changing the Line/Scatter Plot Properties

The **Property Inspector** contains all of the properties for the selected object on multiple pages. A line/scatter plot contains **Plot**, **Clipping**, **Error Bars**, **Labels**, **Symbol**, **Line**, and **Fill** pages. Click the tab name to open that property page.

You may need to click on the  or  buttons next to section names to access the properties as discussed in the *Property Inspector* section on page 16 of this getting started guide.

### Displaying Plot Labels

Labels can be displayed at any data point on the plot. Labels can come from the X or Y data columns or from any other data column in the worksheet. To display labels for the data points:

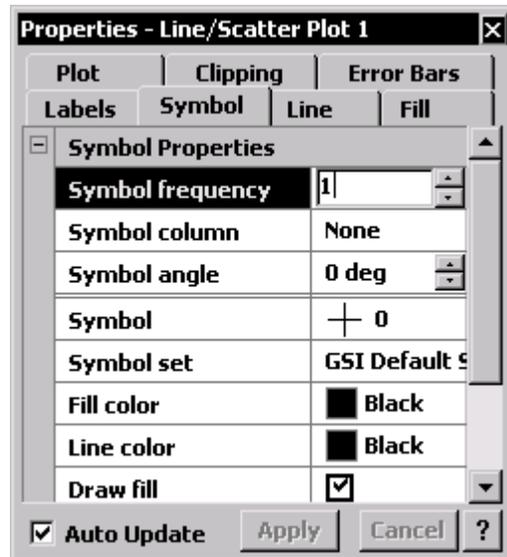
1. Select the *Line/Scatter Plot 1* and click the **Labels** tab to display the plot label properties.
2. Check the box next to *Display labels*.

The Y data values as labels are added to the data points on the plot. By default, the column used for the labels is the Y data column, although you can uncheck the *Labels in Y column* and set the *Column* to any worksheet column to display the label from that column. This is useful when you are wanting to display point names or IDs.

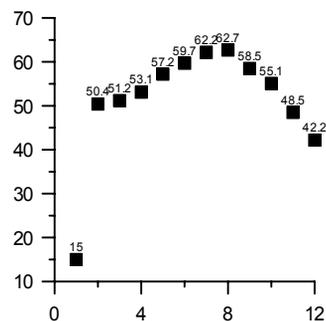
### Changing Line Plot to a Scatter Plot

To change the line plot to a scatter plot:

1. In the **Property Inspector**, click the **Symbol** tab to open the symbol properties.
2. Next to the *Symbol frequency* option, highlight the number 0, type the number 1, and press ENTER on your keyboard. Alternatively, you can click the up arrow once and press ENTER. The graph is updated with the default symbol at every data value.
3. The current symbol is located next to *Symbol*. Click the current symbol, which by default is a  $\dagger$ . Clicking on the current symbol opens the symbol palette. Click on the filled square, symbol *Number 10*, two rows down from the default symbol. Once you click on the filled square, the symbol palette closes and the plot automatically updates to show the new symbol.
4. Click on the **Line** tab to open the line properties.
5. Click on the current line style, which by default is a solid line, next to *Style*, to open the line style palette. Click on the invisible line style, which is the second entry in the list. Once you click on the invisible line style, the line style palette closes and the plot changes to a scatter plot.



Type the number "1" in the Symbol frequency box to add a symbol at every data point to the line/scatter plot.



A scatter plot is created by adding symbols and changing the line to invisible. Plot labels can be added to display data values.

## Lesson 4 - Editing Axes

**Grapher's** axes can be modified to fit any design needs. The axis scale, axis length, tick mark spacing, tick labels, axis titles, colors, etc. can all be customized.

### Selecting the Axis

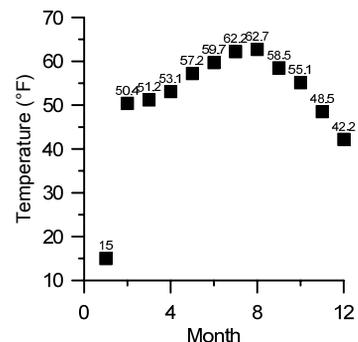
The graph from *Lesson 1 - Creating a Graph* should already exist in the plot window before proceeding with this lesson. Select the *Y Axis 1* to open the axis properties.

### Adding an Axis Title

Once the axis is selected, all of the axis properties are displayed in the **Property Inspector**. Standard axes, such as the selected *Y Axis 1*, have **Axis**, **Grid Lines**, **Tick Marks**, **Tick Labels**, **Break Axis**, and **Line** pages. The axis title options are on the **Axis** property page.

To add an axis title:

1. Click the **Axis** tab to open the axis properties.
2. Open the *Axis title* section by clicking the  next to *Axis title*, if necessary. In the *Axis title* section, click the words *<Click here to edit text>* next to the *Title* option. This opens the **Text Editor**.
3. In the **Text Editor**, type the word "Temperature (F)" (without quotes).
4. Click in the space just before the F. Click the  button.
5. In the **Symbol Properties** dialog, change the *Symbol Set* to *Arial* and select the degree symbol, *Number 144*. Click the *OK* button.
6. Next, let's change the properties of the axis title. In the **Text Editor**, highlight the text "Temperature (°F)" and change the font size to 20 points. The font size is located to the right of the font name in the upper left corner of the dialog. Highlight the existing font size and type 20 or use the up arrow to scroll to the new font size. Only the highlighted text changes size.
7. Click the *OK* button to close the **Text Editor** dialog and save the axis title.



*Axis titles are added by selecting the axis and then adding the title in the **Property Inspector**.*

The text "Temperature (°F)" now appears along the Y axis. Use this same procedure to add the title "Month" to the *X Axis 1*.

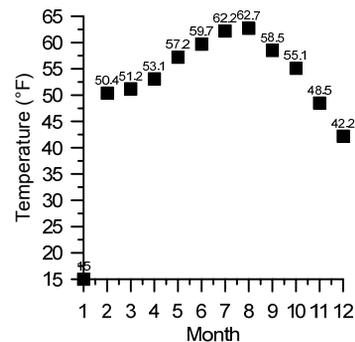
## Changing the Tick Mark Spacing

Tick marks are a means of indicating units of measure and are typically equally spaced like the lines on a ruler. Tick marks are the lines that protrude perpendicularly from an axis. Longer tick marks are typically the major tick marks while the shorter tick marks between them are the minor tick marks. In the graph created in *Lesson 1 - Creating a Graph*, the major tick mark spacing on the Y axis is ten units, i.e., 10, 20, 30, 40, 50, 60, and 70. In the following exercise, the tick spacing is changed to five units.

To change the tick mark spacing:

1. Left-click on the *Y Axis 1* in the **Object Manager**.
2. In the **Property Inspector**, click the **Tick Marks** tab to open the tick mark properties.
3. In the *Major ticks* section, change the *Spacing* from 10 to 5. Highlight the number 10, type the number 5, and press ENTER on your keyboard.

The *Y Axis 1* tick mark spacing changes to five in the plot window. Apply this procedure to edit the X axis and change the tick mark spacing from four to one.



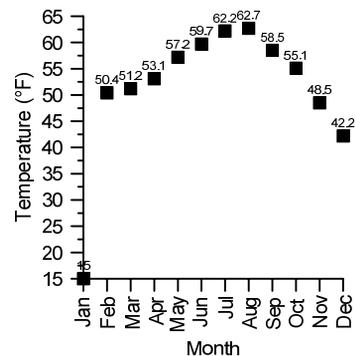
*Customize the axis properties, including changing the tick mark spacing.*

## Changing the Tick Labels

Tick labels can be displayed using different label sources including *Automatic*, *Date/Time*, and *From worksheet*. Automatic labels are the default, however there may be situations where either using a date/time or worksheet source may be useful. For this tutorial, we will change the X axis labels to use a data column from the worksheet where we have tick label names specified.

To change the tick labels source:

1. Left-click the *X Axis 1* in the **Object Manager**.
2. In the **Property Inspector**, click the **Tick Labels** tab to open the tick labels properties.
3. In the *Major label text* section, change the *Label source* from *Automatic* to *From worksheet*. This activates the *Worksheet* option.
4. Next to *Worksheet*, click the word *None* to display a drop-down list of open worksheets and the *Browse* option. The *Browse* option would be used to select a



*Customize tick labels to display information from a column in the worksheet.*

worksheet that is not already open. In this tutorial, the worksheet we want to use is already open. Select the *Tutorial.dat* file from the list.

5. Set the *Data column* to *Column A: Month*.
6. Set the *Label column* to *Column J: Month Name*.
7. In the *Major labels* section, change the *Angle* to 90 degrees. This rotates the tick labels so they are perpendicular to the axis.

The graph updates with the worksheet labels at the desired angle.

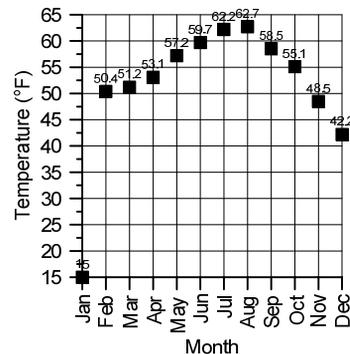
## Adding Grid Lines

Grid lines make it easier to see how the data relate to the axes. You can add grid lines at major tick marks, minor tick marks, or at values specified in a data file. All of the line properties such as color, width, and style can also be edited.

If you are making the same change to multiple objects, all of the items can be selected and edited simultaneously. Since we want grid lines on both axes, we can select both axes and add grid lines to both at the same time.

To add grid lines to both axes:

1. In the **Object Manager**, click on *X Axis 1*, hold down the CTRL key on your keyboard, and click on *Y Axis 1*. This selects both axes.
2. Note the **Property Inspector** title bar contains **Multiple Objects Selected**. Only properties common to all selected objects appear in the **Property Inspector** when multiple objects are selected. Since both objects are axes, all of the axis properties are displayed. Click on the **Grid Lines** tab to open the grid line properties.
3. Check the box next to *At major ticks*. A check mark should be displayed in the box and grid lines appear on both axes on the graph.
4. In the *Major line properties* section, click on the current color, which by default is *Black*, next to the *Color* option, to open the color palette. Click on the *20% Black* color, which is the color directly below *Black* in the color palette. Once you click on the *20% Black* color, the palette closes and the graph is updated with the newly colored grid lines.



Select both axes to add grid lines to both axes at one time.

## Lesson 5 - Adding Additional Plots to the Graph

You can add several plots to one graph in **Grapher**. In *Tutorial.dat*, columns B through I are additional Y data, making it simple to add additional plots to the graph.

### Adding a New Plot to an Existing Graph

1. Select *Line/Scatter Plot 1*. This opens the line/scatter plot properties in the **Property Inspector**.
2. Click the **Plot** tab in the **Property Inspector** and click the words *<Click here to add a new plot>* next to the *New plot* option.

Once *<Click here to add a new plot>* is clicked, the **Property Inspector** title changes to **Properties - Line/Scatter Plot 2** and the Y column changes to *Column C: Site B*. Notice there are now two plots on the graph. The new plot uses the same axes and properties as the first plot.

All of the data must be contained in one data file to use the *New plot* feature. In addition, not all plot types have this option. See the *Plot - Add to Graph* topic in the *Plots* book in the *Graph Features* book in the online help for more information about adding additional plots to a graph with the **Graph | Add to Graph | Plot** command. With this command, additional axes, plots, legends, summation plots, duplicate axes, and magnifiers can be added to a graph.

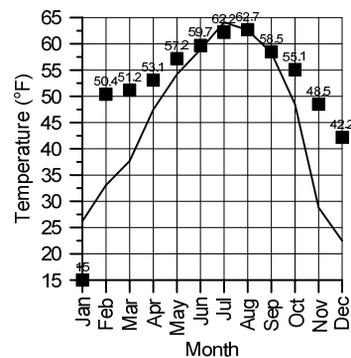
### Changing the Plot Type

When creating additional plots with the *New plot* command, the new plot uses the same data file, increments the Y column, and uses the same properties as the existing plot. Let's change the scatter plot into a line plot to help differentiate between the two curves. Previously, we changed from a line plot to a scatter plot by editing the **Line** and **Symbol** properties in the **Property Inspector**. There is also a shortcut to changing between plot types.

To change a scatter plot into a line plot:

1. Select the *Line/Scatter Plot 2*.
2. Choose the **Graph | Change Plot To | Line** command.
3. On the **Labels** page, uncheck the box next to *Display labels*.

The scatter plot changes to a line plot. Note that the **Graph | Change Plot To** command is not available for all plot types. See the *Change Plot to* topic in the *Plots* book in the *Graph Features* book in the online help for additional information.

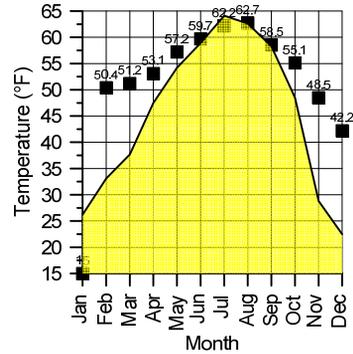


*Change the properties in the new plot to distinguish it from the first plot.*

### Adding Semi-Transparent Fill to the Line Plot

Adding a semi-transparent fill to the line plot will help distinguish it from the scatter plot. To add fill to the line plot:

1. Select *Line/Scatter Plot 2* if it is not already selected.
2. Click on the **Fill** tab display the fill properties.
3. Next to *Foreground*, click *Black* and select *Yellow* from the color palette.
4. Next to *Foreground Opacity*, enter 50% and press ENTER. The line plot is now filled with semi-transparent yellow.



Fill the line plot with semi-transparent yellow.

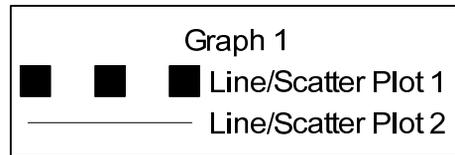
### Lesson 6 - Adding and Editing a Legend

Legends provide information for interpreting a graph. You can add a legend for most plot types. Typically, legends are linked to the graph so that any changes made to the graph are automatically updated in the legend. The legend features, such as font and legend placement, can be customized.

#### Adding a Legend

To add a legend:

1. Select any part of the graph by clicking on an object in the graph, such as *Y Axis 1* or *Line/Scatter Plot 2*.
2. Choose the **Graph | Add to Graph | Legend** command.

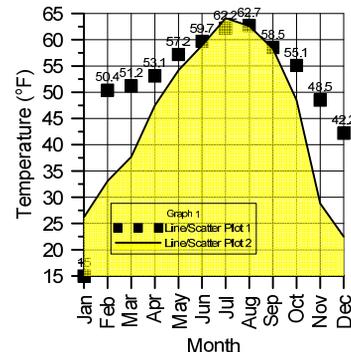
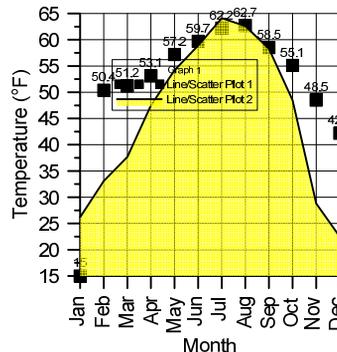


When a legend is first created, it contains the graph and plot names listed in the **Object Manager**.

A legend is created for the graph using the default properties. These properties can be changed. Currently, the legend displays "Graph 1" for the title and "Line/Scatter Plot 1" and "Line/Scatter Plot 2" for the plot names. Let's move the legend, and change the names to reflect the data.

#### Moving the Legend

You can move the legend by clicking on *Legend 1* in the **Object Manager**, positioning the cursor over the legend in the plot window, holding down the left mouse button, and dragging the legend to a new location.



Drag the legend to the desired location.

### Editing the Legend Title

To change the legend title:

1. Select the *Legend 1* to open the legend properties in the **Property Inspector**.
2. On the **Legend** page, click the words *<Click here to edit text>* next to *Title*. This opens the **Text Editor** and allows you to edit the legend title.
3. In the **Text Editor**, highlight *Graph 1* and type the title "Research Results" (without quotes), and click the *OK* button. The legend is updated.

### Editing the Plot Names

To change the plot names in the legend:

1. Select the *Legend 1*.
2. In the **Property Inspector**, click on the **Legend** tab to open the legend properties.
3. Next to the *Entries* option, click the words *<Click here to edit entries>*. This opens the **Legend Entries** dialog.
4. In the **Legend Entries** dialog, click *Line/Scatter Plot 1* under the *Name* column and click the *Rename* button. This opens the **Text Editor**.
5. In this example, *Line/Scatter Plot 1* used a column labeled *Site A*, so change the name to *Site A* by highlighting "Line/Scatter Plot 1" in the **Text Editor** and then typing "Site A" (without quotes). Click the *OK* button to close the **Text Editor**.
6. In the **Legend Entries** dialog, click *Line/Scatter Plot 2* under the *Name* column and click the *Rename* button. This opens the **Text Editor**.
7. Highlight the *Line/Scatter Plot 2* text and press *DELETE* on your keyboard.
8. Click the *Worksheet* button, select the *Tutorial.dat* file and click the *Open* button.
9. Click the *Insert Cell* button to open the **Enter Cell** dialog. Type *C1* and click the *OK* button in the **Enter Cell** dialog.
10. Click the *OK* button in the **Text Editor**. The *Line/Scatter Plot 2* is updated to *Site B*, as indicated in cell *C1* of the specified worksheet. This text will update if the text in cell *C1* of the worksheet changes.
11. Click the *OK* button to close the **Legend Entries** dialog. The legend updates with the modified names.



*The legend title is updated with the changes made in the **Text Editor**.*

### Changing the Number of Symbols

The number of symbols in a legend can be set from 0 to 3.

To change the number of symbols:

1. Select *Legend 1* if it is not already selected.
2. In the **Property Inspector**, click on the **Legend** tab to open the legend properties.
3. Click on the number 3 next to the *Number of symbols* option and select 1 from the list. The legend is updated with one symbol.



*The displayed number of symbols in a legend can be 0, 1, 2, or 3.*

## Changing the Symbol Size

To change the symbol size to match that of the symbols on the plot:

1. On the **Legend** page, click the text *<Click here to edit entries>* next to the *Entries* option to open the **Legend Entries** dialog.
2. Select the *Site A* in the *Name* column and click the *Symbol Size* button to open the **Symbol Size** dialog.
3. Change the *Size* from *Fixed* to *Plot size* and click the *OK* button in the **Symbol Size** dialog and the **Legend Entries** dialog. The symbol in the legend now matches the symbol in the plot.

## Changing the Line Length

In addition to changing the number and size of the symbols, the length of the displayed line can be changed.

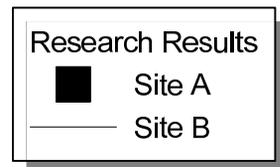
To change the line length:

1. Select *Legend 1* if it is not already selected.
2. On the **Legend** page, highlight the value next to the *Line length* value, type 0.5 and press ENTER on the keyboard.

## Adding a Drop Shadow

To add a shadow behind the legend:

1. Select *Legend 1* if it is not already selected.
2. On the **Legend** page in the **Property Inspector**, click the box next to *Display shadow* to add a shadow behind the legend. Click the color next to *Shadow color* to open the color palette and change the shadow color if desired.

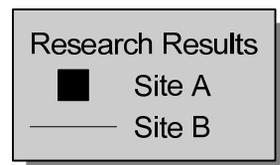


*A drop shadow can be added to a legend.*

## Filling the Legend

To add fill to the legend:

1. Select *Legend 1* if it is not already selected.
2. Click the **Fill** tab in the **Property Inspector** to open the fill properties.
3. On the **Fill** page, next to *Foreground*, select *Black* to open the color palette. Choose *20% Black*. The *Pattern* automatically changes to *Solid* and the legend now has a gray background. Adjust the *Foreground Opacity* value if you want the background to be semi-transparent.



*The legend can be filled with a pattern and custom opacity.*

## Lesson 7 - Working with the Script Recorder

**Scripter** is Golden Software's automation program. You may record your actions in **Grapher** with the **Script Recorder** rather than writing the scripts manually in **Scripter**. Detailed information about automation is located in the online help. The online help's table of contents includes a *Grapher Automation* book which contains all the help topics related to automation.

New **Grapher** users should go through the steps in this lesson to learn a bit more about **Grapher** - even if you do not intend to use automation.

The **Script Recorder** can be used for many tasks. We will provide one scenario to demonstrate the **Script Recorder**. For example, let's say you receive a data file once a quarter. The file has the same file name each quarter and the same number of columns, but the information contained in the file updates each time. Each quarter you need to create the graph and then export the graph for reports. You could automate this process with the **Script Recorder** to save time and increase efficiency.

The graph in this example is fairly simple for time's sake, but keep in mind that complex graphs are very well suited to automation. We will record the process of creating a graph, changing some features of the graph, and exporting the graph. The creation of this graph uses the features included in the previous lessons and includes a few new items. If you do not understand part of the directions, review the material in the previous lessons or consult the online help.

### Opening the Script Manager

The **Script Manager** can be used to view scripts as they record. Choose the **View | Toolbars/Managers | Script Manager** command to display the **Script Manager**. A check mark is displayed next to visible managers. By default, the **Script Manager** is located at the bottom of the **Grapher** window, tabbed with the **Worksheet Manager**. Click the **Script Manager** tab to view the **Script Manager**.

### Script Recorder Toolbar

The script recorder toolbar is used to start and stop recording scripts. The script recorder toolbar is docked on the left side of the screen by default. If you do not see the script recorder toolbar, choose the **View | Toolbars/Manager | Script Recorder** command. A check mark is displayed next to visible managers.



This is the **Script Recorder** toolbar.

### Start Recording

To start recording, choose the **Edit | Script Recorder | Record** command or click the  button on the script recorder toolbar. The button changes color from bluish green

to red to indicate that the script is recording. Information appears in the **Script Manager** as soon as recording begins. This code starts **Grapher** when the script is run later. Every action taken will be recorded in the **Script Manager** until the recording is stopped.

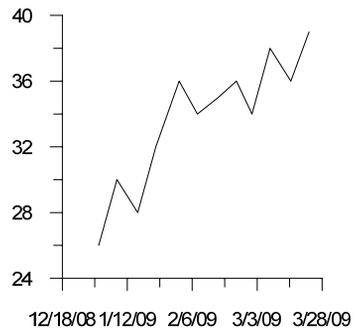
### Opening a New Plot Window

Let's open a new plot window to start. Choose the **File | New** command and select *Plot* in the **New** dialog. Click the *OK* button to create a new plot window.

### Creating a Line/Scatter Plot

To create the line/scatter plot:

1. Choose the **Graph | 2D XY Graphs | Line/Scatter** command.
2. The **Open Worksheet** dialog appears. Browse to **Grapher's** SAMPLES folder using the *Look in* list. The location of this folder varies depending on where the software was installed. If the software was installed in the default folder, the path is C:\Program Files\Golden Software\Grapher 8\Samples.
3. Double-click on the *tutorial script recorder.xls* file to create a graph from it. Alternatively, you can left-click once on the *tutorial script recorder.xls* file and click the *Open* button.



*The line/scatter plot is created using default properties.*

A 2D line/scatter plot is created with the first two available columns using the default properties. **Grapher** can create graphs from data containing date/time information. In this example, column A contains dates so dates are plotted on the X Axis.

### Changing the X Axis Date/Time Limits

The axis limits can use the default limits or can be changed to show only a portion of the graph. Limits can be based on numerical values or on date/time values. To change the X Axis limits using date/time:

1. Select the *X Axis 1* and click on the **Axis** tab to display the axis properties.
2. Click the  to the left of the *Axis limits* section to expand the axis limits.
3. Click the 12/18/08 value next to *Minimum date/time* to open the **Select Date/Time** dialog.
4. Change the *Date* to 1/1/2009 and click the *OK* button.
5. Click the 3/28/09 value next to *Maximum date/time* to open the **Select Date/Time** dialog.
6. Change the *Date* to 4/1/2009 and click the *OK* button.

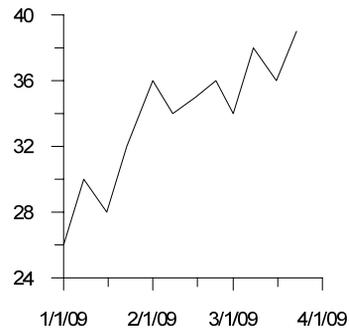
The X Axis limits now range from 1/1/09 to 4/1/09.

### Changing the X Axis Date/Time Tick Mark Spacing

Tick marks can be spaced at any desired interval. Tick marks can be changed to show one tick mark every X number of units or can be based on date/time units, such as minutes, days, months, or years. To set the tick marks to display one tick and label spacing per month:

1. Select the *X Axis 1* and click on the **Tick Marks** tab to display the tick mark properties.
2. Click the  to the left of the *Major ticks* section to expand the major tick options.
3. Check the box next to *Use date/time spacing*.
4. Next to *Date/time spacing*, click *Every Year* to open the **Date/Time Spacing** dialog. Change *Year* to *Month* and click the *OK* button.

The X Axis major tick marks are displayed as 1/1/09, 2/1/09, 3/1/09, and 4/1/09.

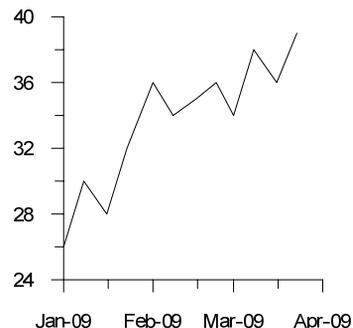


*The X Axis tick mark spacing can be based on date/time units.*

### Changing the X Axis Date/Time Tick Label Format

There are a variety of tick label formatting options available. One of the options is to change the display of the date/time labels. There are many different predefined date/time labels available or you could create your own new label format. To change the major label format from m/d/yy (1/1/2009) to mmm-yy (Jan-09):

1. Select the *X Axis 1* and click on the **Tick Labels** tab to display the tick label properties.
2. Click the  to the left of the *Major labels* section to expand the major label options.
3. Next to *Label format*, click the words *<Click here to set label format>* to open the **Label Format** dialog.
4. Click the **Format** tab to open the **Format** page.
5. Change the *Date/Time Format* from m/d/yy to mmm-yy and click the *OK* button.



*The X Axis date/time labels can be formatted with a predefined or custom format.*

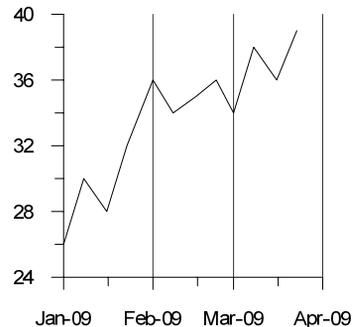
The X Axis tick labels are displayed as Jan-09, Feb-09, Mar-09, and Apr-09.

## Adding X Axis Grid Lines

Grid lines make it easier to determine the data values on a graph. There are many options for grid lines, such as showing the grid lines at major ticks, minor ticks, or at values defined in a worksheet.

To add grid lines to the X Axis:

1. Select the *X Axis 1* and click on the **Grid Lines** tab to display the grid line properties.
2. Check the box next to *At major ticks*.
3. Click the  to the left of *Major line properties* to expand the major line properties.
4. Next to *Color*, click *Black* to open the color palette and select *20% Black*. The color palette automatically closes with the new line color selected. 20% black grid lines are added to the graph at the major ticks.



*Add grid lines to easily determine data locations.*

## Adding Linked Text to the Graph Title

It would be a good idea to add text explaining the information contained in the graphs. In this file, cell A1 contains the data's time range, January through March 2009. The next quarter's data file will contain April through June 2009. With linked text, the information is updated on the graph any time the information changes in the cell in the data file. When the script is run, the date in the data file appears on the graphs.

To add linked text information to the graph title:

1. Select *Graph 1* in the **Object Manager**.
2. Click the **Title** tab to open the graph title properties.
3. Click the  to the left of *Graph Title* to expand the graph title properties.
4. Next to *Title*, click the words *<Click here to edit text>* to open the **Text Editor**.
5. Click the  button to select the worksheet that contains the text.
6. In the **Open Worksheet** dialog, select the *tutorial script recorder.xls* file from the *Open worksheets* section and click the *Open* button. The worksheet name is updated in the **Text Editor**.
7. Click the  button in the **Text Editor**. Type "a1" (without quotes) into the **Enter Cell** dialog and click the *OK* button. `<<@a1>>` appears in the **Text Editor**.
8. Highlight all of the text in the **Text Editor**. Change the size of the text to 24 by typing 24 in the size box or using the up arrow next to the size box to change the size to 24. The size box is located to the right of the font name.

`<<@a1>>`

*The **Text Editor** contents will look like this.*

9. Change any other properties, such as text color, if desired.
10. Click the *OK* button in the **Text Editor** to close the dialog and apply the changes.

Although we could add many more features to the graph, we will stop here. Additional features may be added now if you like.

### Exporting the Graph

Since the graphs are used to create a report, the graph must be exported for use in another program.

To export the graph:

1. Choose the **File | Export** command or click the  button.
2. Type "tutorial script recorder" (without quotes) into the *File name* field in the **Export** dialog.
3. Select *EMF Windows Enhanced Metafile (\*.emf)* from the *Save as type* list.
4. Check the *Show options dialog* box. Checking this option enables you to make any changes in the exported options.
5. Uncheck the *Use graph coordinates for export (when applicable)* box. The *Use graph coordinates for export (when applicable)* exports the graph using graph coordinates. For reports and images, it is best to have this option unchecked.
6. Uncheck the *Selected options only* box. The *Selected options only* option only exports the items that are currently selected in the graph window.
7. Click the *Save* button.
8. In the **Export Options** dialog, accept the defaults and click the *OK* button.

### Stopping and Saving the Script

Now that the graph has been created, it is time to stop recording and save the script.

To stop recording and save the script:

1. Choose the **Edit | Script Recorder | Stop** command or click the  button in the script recorder toolbar.
2. In the **Save As** dialog, type "tutorial script recorder" (without quotes) into the *File name* box.
3. Click the *Save* button.
4. Right-click in the **Script Manager** and select **File | Close** to close the script in the **Script Manager**.

The recording is stopped and the *tutorial script recorder.bas* is saved for future use.

## Running Scripts within Grapher

Assuming the file name is the same each time; the graphs are automatically created and updated each time the script is run. The script can be run from **Scripter** or from **Grapher**. In our tutorial scenario, when you receive the next set of data, with the same file name, run the script and produce the [.EMF] file to use as needed.

To run the script within **Grapher**:

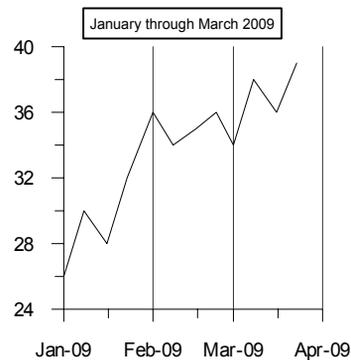
1. Choose the **Edit | Script Recorder | Run** command or click the  button.
2. Click on *tutorial script recorder.bas* in the **Open** dialog, and then click the *Open* button. You can watch the graph as it is created.

## Running Scripts from Scripter

Scripts can also be run from **Scripter**.

To run the script from **Scripter**:

1. Click on the Windows Start button.
2. Open the program list, select **Golden Software Grapher 8**, and click the **Scripter** link.
3. Choose the **File | Open** command in **Scripter** and locate the *tutorial script recorder.bas* file.
4. Select the *tutorial script recorder.bas* file and click the *Open* button.
5. Choose the **Script | Run** command or click the  button to start the script.



*The script will run and recreate what you recorded. This is what the first quarter sample data looks like.*

## Automation Help

Advanced users needing help in **Scripter** can use the **Help | Contents** command for general information about **Scripter**; the **Help | Automation** command for information about objects, methods, and properties; and the **Help | BASIC Language Help** command for information about BASIC.

Congratulations, you have completed the **Grapher** tutorial.

## Getting Help

The getting started guide is a quick way to learn about the basics in **Grapher**. There are also other sources of help with **Grapher**.

## Online Help

Extensive information about **Grapher** is located in the online help. Use the **Help | Contents** command to access the online help. You can navigate the online help using the **Contents**, **Index**, **Search**, and **Favorites** pages in the navigation pane to the left of the topic page.

- The **Contents** page allows you to search the predefined table of contents. The table of contents has a variety of help books and help topic pages.
- The **Index** page allows you to search index words to find a help topic. If you do not find a topic with an index word, try a search on the **Search** page.
- The **Search** page offers advanced search options including phrases, wildcards, Boolean, and nested searches.
- The **Favorites** page allows you to add help pages to a custom list. This allows you to quickly find favorite help topics that you reference frequently.

## Printing the Online Help

The online help topics may be printed. You can print a single topic, a section of the table of contents, or all topics in the table of contents. Open the online help by selecting the **Help | Contents** command in the **Grapher** window.

### Printing One Topic

To print one topic:

1. Click the topic you want to print.



2. Click the  button.
3. If the **Contents** page is open in the help navigation pane, the **Print Topics** dialog appears. Select *Print the selected topic* and click the *OK* button.

### Printing One Book

To print one book, the tutorial for example:

1. Click the **Contents** page on the left side navigation pane.
2. Expand the *Grapher 8* book and click on the *Tutorial* book.



3. Click the  button.

4. If the **Contents** page is open in the help navigation pane, the **Print Topics** dialog appears. Select *Print the selected heading and all subtopics* and click the *OK* button. All the topics included in the *Tutorial* book are printed.

## Printing the Entire Help File

To print all of the topics in the help file table of contents:

1. Select the top-level book in the help book, **Grapher 8**.



2. Click the  button within the help window.
3. The **Print Topics** dialog appears. Select *Print the selected heading and all subtopics* and then click the *OK* button. All the topics included in the online help table of contents are printed. **WARNING:** Printing the entire help file takes hundreds of letter-sized sheets of paper and is very time consuming to print. There is no table of contents or index printed with the file.

## Context-Sensitive Help

**Grapher** also contains context-sensitive help. Highlight a menu command, window region, or dialog and then press the F1 key to display help for the highlighted item. You may also access context-sensitive help by pressing SHIFT+F1 or clicking on the



button. When the pointer appears as , click the item for which help is required and its help topic appears.

In addition, the dialogs and the **Property Inspector** contain a  button. Click the help button in a dialog title bar or at the bottom of the **Property Inspector** to open the help topic for the displayed properties.

## Internet Resources

There are several Internet help resources.

- Click the *Forums* button in the online help (**Help | Contents** command) to research a **Grapher** question or to post a new question to the group.
- Use the **Help | Feedback** commands to send a problem report, suggestion, or information request by email directly to a technical support engineer.
- Search the FAQs on our website at [www.goldensoftware.com](http://www.goldensoftware.com).
- Search the knowledge base on our website at [www.goldensoftware.com](http://www.goldensoftware.com).
- Direct links to the Golden Software home page, the **Grapher** product page, frequently asked questions, and the knowledge base are available by selecting **Help | Golden Software on the Web**.

### Technical Support

Golden Software's technical support is free to registered users of Golden Software products. Our technical support staff is trained to help you find answers to your questions quickly and accurately. We are happy to answer all of your questions about any of our products, both before and after your purchase. We also welcome suggestions for improvements to our software and encourage you to contact us with any ideas you may have for adding new features and capabilities to our programs.

Technical support is available Monday through Friday 8:00 AM to 5:00 PM Mountain Time, excluding major United States holidays. We respond to email and fax technical questions within one business day. When contacting us with your question, have the following information available:

- Your **Grapher** serial number, found in the **Help | About Grapher** dialog, in the original email you received with download instructions, or on the inside front cover of your printed getting started guide
- Your **Grapher** version number, found in **Help | About Grapher**
- The operating system you are using (Windows 2000, XP, Vista, or higher)
- The steps you took prior to experiencing your problem
- The exact wording of the first error message (if any) that appeared

If you encounter problems with **Grapher**, you are welcome to send an email message to Golden Software using the **Help | Feedback | Problem Report** command or by sending an email to [graphersupport@goldensoftware.com](mailto:graphersupport@goldensoftware.com). Report the steps you perform when the problem occurs and include the full text of any error messages that are displayed. You are welcome to attach a [.ZIP] file (10 MB maximum) containing files that illustrate the problem. Contact technical support for other arrangements if you have very large zipped attachments to send.

### Contact Information

Telephone: 303-279-1021

Fax: 303-279-0909

Email: [graphersupport@goldensoftware.com](mailto:graphersupport@goldensoftware.com)

Web: [www.goldensoftware.com](http://www.goldensoftware.com) (includes FAQs, knowledge base, support forum, training videos, newsletters, downloads, and more!)

Mail: Golden Software, Inc., 809 14<sup>th</sup> Street, Golden, Colorado 80401-1866, USA

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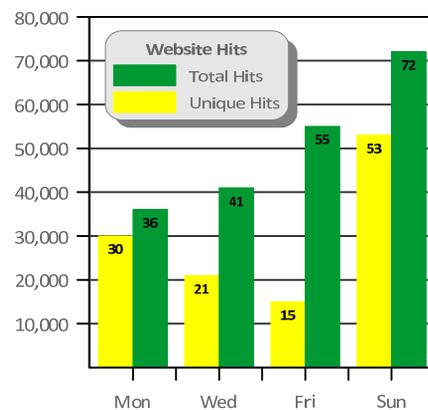
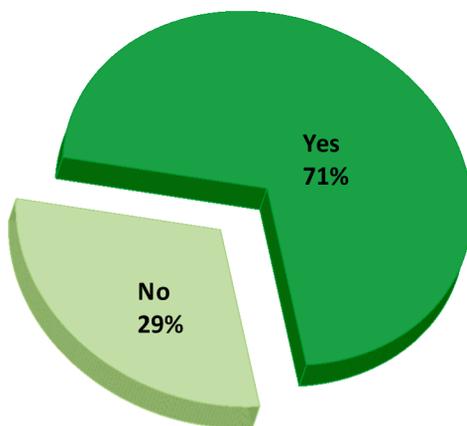
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## Customer Service Resources

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Before calling, please check the following available resources as your question may already be answered.

<b>Registration:</b> Fax or mail in the card on the inside front cover of this getting started guide or register online at <a href="http://www.goldensoftware.com">www.goldensoftware.com</a> and click on Register
<b>Knowledge Base:</b> <a href="http://www.goldensoftware.com/activekb">www.goldensoftware.com/activekb</a> or in the <b>Grapher</b> program using the <b>Help   Golden Software on the Web   Knowledge Base</b> command
<b>Forums:</b> <a href="http://www.goldensoftware.com/forum">www.goldensoftware.com/forum</a> or in the <b>Grapher</b> program using the <b>Help   Contents</b> command and click on Forums
<b>Frequently Asked Questions:</b> In the <b>Grapher</b> program using the <b>Help   Golden Software on the Web   Frequently Asked Questions</b> command
<b>Tutorial:</b> Complete the tutorial section in this getting started guide or in the <b>Grapher</b> program using the <b>Help   Tutorial</b> command
<b>Online Help:</b> In the <b>Grapher</b> program using the <b>Help   Contents</b> command
<b>Support Videos:</b> <a href="http://www.goldensoftware.com">www.goldensoftware.com</a>

## Business Hours

Technical Support

Monday through Friday, 8:00 AM – 5:00 PM, Mountain Time

Product Sales

Online orders available 24 hours, 7 days a week with 2 business hour delivery

## Golden Software Contact Information

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