

TechGraf Help Index

Welcome to TechGraf, a tool for the production and analysis of 2D line and scatter plots.

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Commands

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File menu commands

The File menu offers the following commands:

<u>New</u>	Creates a new document.
<u>Open</u>	Opens an existing document.
<u>Close</u>	Closes an opened document.
<u>Save</u>	Saves an opened document using the same file name.
<u>Save As</u>	Saves an opened document to a specified file name.
<u>Print</u>	Prints a document.
<u>Print</u>	Displays the document on the screen as it would appear printed.
<u>Preview</u>	
<u>Print Setup</u>	Selects a printer and printer connection.
<u>Exit</u>	Exits TechGraf.

Edit menu commands

The Edit menu offers the following commands:

<u>Cut</u>	Deletes data from the document and moves it to the clipboard.
<u>Copy</u>	Copies data from the document to the clipboard.
<u>Paste</u>	Pastes data from the clipboard into the document.
<u>Paste Link</u>	Pastes from the clipboard a link to data in another application.
<u>Delete</u>	Erases selection.
<u>Links</u>	List and edit links to embedded documents.
<u>Insert TechType</u>	Insert text object using TechType
<u>Label</u>	
<u>Insert New Object</u>	Embed new OLE object

View menu commands

The View menu offers the following commands:

<u>Z</u> oom	Change axes limits, selected graphically
<u>U</u> nzoom	Restore axes limits after Zoom command
<u>T</u> oolbar	Shows or hides the toolbar.
<u>S</u> tatus Bar	Shows or hides the status bar.
<u>V</u> iew Scale	Changes the displayed scale

View Scale command (View menu)

This command opens the View Scale dialog box, allowing you to specify a scaling factor for the display. Note that this scale factor does not change the printed image, or the sizes of the objects in inches or centimeters.

View Scale dialog box

This dialog box, opened with the View Scale command, allows you to specify the displayed scale factor. This is a multiplicative factor, rather than a percent, i.e. 1.0 is 100%, etc.

Window menu commands

The Window menu offers the following commands, which enable you to arrange multiple views of multiple documents in the application window:

<u>New Window</u>	Creates a new window that views the same document.
<u>Cascade</u>	Arranges windows in an overlapped fashion.
<u>Tile</u>	Arranges windows in non-overlapped tiles.
<u>Arrange Icons</u>	Arranges icons of closed windows.
<u>Log Window</u>	Displays the <u>Log Window</u>
<u>Window 1,</u> <u>2, ...</u>	Goes to specified window.

Help menu commands


The Help menu offers the following commands, which provide you assistance with this application:

<u>Index</u>	Offers you an index to topics on which you can get help.
<u>Using</u>	Provides general instructions on using help.
<u>Help</u>	
<u>About</u>	Displays the version number of this application.

New command (File menu)

Use this command to create a new document in TechGraf.
You can open an existing document (.tgr file) with the Open command.

Shortcuts


Toolbar: 
Keys: CTRL+N

Open command (File menu)

Use this command to open an existing document in a new window. You can open multiple documents at once. Use the Window menu to switch among the multiple open documents. See Window 1, 2, ... command.

You can create new documents with the New command.

Shortcuts

Toolbar: 
Keys: CTRL+O

File Open dialog box

The following options allow you to specify which file to open:

File Name

Type or select the filename you want to open. This box lists files with the extension you select in the List Files of Type box.

List Files of Type

Select the file extension you want to display.

Drives

Select the drive in which TechGraf stores the file that you want to open.

Directories

Select the directory in which TechGraf stores the file that you want to open.

Network...

Choose this button to connect to a network location, assigning it a new drive letter.

Close command (File menu)

Use this command to close all windows containing the active document. TechGraf suggests that you save changes to your document before you close it. If you close a document without saving, you lose all changes made since the last time you saved it. Before closing an untitled document, TechGraf displays the Save As dialog box and suggests that you name and save the document.


You can also close a document by using the Close icon on the document's window, as shown below:



Save command (File menu)

Use this command to save the active document to its current name and directory. When you save a document for the first time, TechGraf displays the Save As dialog box so you can name your document. If you want to change the name and directory of an existing document before you save it, choose the Save As command.

Shortcuts

Toolbar: 
Keys: CTRL+S

Save As command (File menu)

Use this command to save and name the active document. TechGraf displays the Save As dialog box so you can name your document.

To save a document with its existing name and directory, use the Save command.

File Save As dialog box

The following options allow you to specify the name and location of the file you're about to save:

File Name

Type a new filename to save a document with a different name. A filename can contain up to eight characters and an extension of up to three characters. TechGraf adds the extension you specify in the Save File As Type box.

Drives

Select the drive in which you want to store the document.

Directories

Select the directory in which you want to store the document.

Network...

Choose this button to connect to a network location, assigning it a new drive letter.

1, 2, 3, 4 command (File menu)

Use the numbers and filenames listed at the bottom of the File menu to open the last four documents you closed. Choose the number that corresponds with the document you want to open.

Exit command (File menu)

Use this command to end your TechGraf session. You can also use the Close command on the application Control menu. TechGraf prompts you to save documents with unsaved changes.

Shortcuts

Mouse: Double-click the application's Control menu button.




Keys: ALT+F4

Cut command (Edit menu)

Use this command to remove the currently selected data from the document and put it on the clipboard. This command is unavailable if there is no data currently selected.

Cutting data to the clipboard replaces the contents previously stored there.

Shortcuts

Toolbar: 
Keys: CTRL+X

Delete command (Edit menu)

Use this command to delete the current selection. If more than one object is selected, TechGraf will prompt you to select one item.

Shortcuts


Keys: Del

Copy command (Edit menu)

Use this command to copy selected data onto the clipboard. This command is unavailable if there is no data currently selected.

Copying data to the clipboard replaces the contents previously stored there.


Shortcuts

Toolbar: 
Keys: CTRL+C

Paste command (Edit menu)

Use this command to insert a copy of the clipboard contents at the insertion point. This command is unavailable if the clipboard is empty.

Shortcuts

Toolbar: 
Keys: CTRL+V

Toolbar command (View menu)

Use this command to display and hide the Toolbar, which includes buttons for some of the most common commands in TechGraf, such as File Open. A check mark appears next to the menu item when the Toolbar is displayed.

See [Toolbar](#) for help on using the toolbar.

Toolbar



The toolbar is displayed across the top of the application window, below the menu bar. The toolbar provides quick mouse access to many tools used in TechGraf,

To hide or display the Toolbar, choose Toolbar from the View menu (ALT, V, T).

Click To



Open a new document.



Open an existing document. TechGraf displays the Open dialog box, in which you can locate and open the desired file.



Save the active document or template with its current name. If you have not named the document, TechGraf displays the Save As dialog box.



Opens a new data file.



Print the active document.



Remove selected data from the document and stores it on the clipboard.



Copy the selection to the clipboard.



Insert the contents of the clipboard at the insertion point.



Inserts a TechType text label via OLE.

Status Bar command (View menu)

Use this command to display and hide the Status Bar, which describes the action to be executed by the selected menu item or depressed toolbar button, and keyboard latch state. A check mark appears next to the menu item when the Status Bar is displayed.

See [Status Bar](#) for help on using the status bar.

Status Bar



The status bar is displayed at the bottom of the TechGraf window. To display or hide the status bar, use the Status Bar command in the View menu.

The left area of the status bar describes actions of menu items as you use the arrow keys to navigate through menus. This area similarly shows messages that describe the actions of toolbar buttons as you depress them, before releasing them. If after viewing the description of the toolbar button command you wish not to execute the command, then release the mouse button while the pointer is off the toolbar button.

The right areas of the status bar indicate which of the following keys are latched down:

Indicator	Description
CAP	The Caps Lock key is latched down.
NUM	The Num Lock key is latched down.
SCRL	The Scroll Lock key is latched down.

New command (Window menu)

Use this command to open a new window with the same contents as the active window. You can open multiple document windows to display different parts or views of a document at the same time. If you change the contents in one window, all other windows containing the same document reflect those changes. When you open a new window, it becomes the active window and is displayed on top of all other open windows.

Cascade command (Window menu)

Use this command to arrange multiple opened windows in an overlapped fashion.

Tile command (Window menu)

Use this command to arrange multiple opened windows in a non-overlapped fashion.

Tile Horizontal command (Window menu)

Use this command to vertically arrange multiple opened windows in a non-overlapped fashion.

Tile Vertical command (Window menu)

Use this command to arrange multiple opened windows side by side.

Window Arrange Icons Command

Use this command to arrange the icons for minimized windows at the bottom of the main window. If there is an open document window at the bottom of the main window, then some or all of the icons may not be visible because they will be underneath this document window.

1, 2, ... command (Window menu)

TechGraf displays a list of currently open document windows at the bottom of the Window menu. A check mark appears in front of the document name of the active window. Choose a document from this list to make its window active.

Index command (Help menu)

Use this command to display the opening screen of Help. From the opening screen, you can jump to step-by-step instructions for using TechGraf and various types of reference information.

Once you open Help, you can click the Contents button whenever you want to return to the opening screen.

Using Help command (Help menu)

Use this command for instructions about using Help.

About command (Help menu)

Use this command to display the copyright notice and version number of your copy of TechGraf.

Context Help command



Use the Context Help command to obtain help on some portion of TechGraf. When you choose the Toolbar's Context Help button, the mouse pointer will change to an arrow and question mark. Then click somewhere in the TechGraf window, such as another Toolbar button. The Help topic will be shown for the item you clicked.

Shortcut

Keys: SHIFT+F1

Title Bar

The title bar is located along the top of a window. It contains the name of the application and document.

To move the window, drag the title bar. Note: You can also move dialog boxes by dragging their title bars.

A title bar may contain the following elements:

- Application Control-menu button
- Document Control-menu button
- Maximize button
- Minimize button
- Name of the application
- Name of the document
- Restore button

Scroll bars

Displayed at the right and bottom edges of the document window. The scroll boxes inside the scroll bars indicate your vertical and horizontal location in the document. You can use the mouse to scroll to other parts of the document.

Size command (System menu)

Use this command to display a four-headed arrow so you can size the active window with the arrow keys.



After the pointer changes to the four-headed arrow:

1. Press one of the DIRECTION keys (left, right, up, or down arrow key) to move the pointer to the border you want to move.
2. Press a DIRECTION key to move the border.
3. Press ENTER when the window is the size you want.

Note: This command is unavailable if you maximize the window.

Shortcut

Mouse: Drag the size bars at the corners or edges of the window.

Move command (Control menu)

Use this command to display a four-headed arrow so you can move the active window or dialog box with the arrow keys.



Note: This command is unavailable if you maximize the window.

Shortcut

Keys: CTRL+F7

Minimize command (application Control menu)

Use this command to reduce the TechGraf window to an icon.

Shortcut

Mouse: Click the minimize icon  on the title bar.
Keys: ALT+F9

Maximize command (System menu)

Use this command to enlarge the active window to fill the available space.

Shortcut

Mouse: Click the maximize icon  on the title bar; or double-click the title bar.
Keys: CTRL+F10 enlarges a document window.

Next Window command (document Control menu)

Use this command to switch to the next open document window. TechGraf determines which window is next according to the order in which you opened the windows.

Shortcut

Keys: CTRL+F6

Previous Window command (document Control menu)

Use this command to switch to the previous open document window. TechGraf determines which window is previous according to the order in which you opened the windows.

Shortcut

Keys: SHIFT+CTRL+F6

Close command (Control menus)

Use this command to close the active window or dialog box.

Double-clicking a Control-menu box is the same as choosing the Close command.



Note: If you have multiple windows open for a single document, the Close command on the document Control menu closes only one window at a time. You can close all windows at once with the Close command on the File menu.

Shortcuts

Keys: CTRL+F4 closes a document window
 ALT+F4 closes the TechGraf window or dialog box

Restore command (Control menu)

Use this command to return the active window to its size and position before you chose the Maximize or Minimize command.

Switch to command (application Control menu)

Use this command to display a list of all open applications. Use this "Task List" to switch to or close an application on the list.

Shortcut

Keys: CTRL+ESC

Dialog Box Options

When you choose the Switch To command, you will be presented with a dialog box with the following options:

Task List

Select the application you want to switch to or close.

Switch To

Makes the selected application active.

End Task

Closes the selected application.

Cancel

Closes the Task List box.

Cascade

Arranges open applications so they overlap and you can see each title bar. This option does not affect applications reduced to icons.

Tile

Arranges open applications into windows that do not overlap. This option does not affect applications reduced to icons.

Arrange Icons

Arranges the icons of all minimized applications across the bottom of the screen.

Choose Font dialog box

This dialog box allows you to change the font and color for the axis labels, or symbols on your plot.

Choose Color dialog box

This dialog box allows you to choose the color for your plot. Only "solid colors" are used.

Getting Started

Upon first entering TechGraf, you will first want to open a data file using the Open Data File command. After this command is executed, you will then format your plot. TechGraf uses an object oriented formatting interface. After formatting your plot, adding any additional plots to the page, etc., you can then save your work in a TechGraf file using the File | Save command.

No Help Available

No help is available for this area of the window.


No Help Available

No help is available for this message box.

Print command (File menu)

Use this command to print a document. This command presents a Print dialog box, where you may specify the range of pages to be printed, the number of copies, the destination printer, and other printer setup options.

Shortcuts

Toolbar: 
Keys: CTRL+P

Print dialog box

The following options allow you to specify how the document should be printed:

Printer

This is the active printer and printer connection. Choose the Setup option to change the printer and printer connection.

Setup

Displays a Print Setup dialog box, so you can select a printer and printer connection.

Print Range

Specify the pages you want to print:

All Prints the entire document.

Selectio Prints the currently selected text.

n

Pages Prints the range of pages you specify in the From and To boxes.

Copies

Specify the number of copies you want to print for the above page range.

Collate Copies

Prints copies in page number order, instead of separated multiple copies of each page.

Print Quality

Select the quality of the printing. Generally, lower quality printing takes less time to produce.

Print Progress Dialog

The Printing dialog box is shown during the time that TechGraf is sending output to the printer. The page number indicates the progress of the printing.

To abort printing, choose Cancel.

Print Preview command (File menu)

Use this command to display the active document as it would appear when printed. When you choose this command, the main window will be replaced with a print preview window in which one or two pages will be displayed in their printed format. The print preview toolbar offers you options to view either one or two pages at a time; move back and forth through the document; zoom in and out of pages; and initiate a print job.

Print Preview toolbar

The print preview toolbar offers you the following options:

Print

Bring up the print dialog box, to start a print job.

Next Page

Preview the next printed page.

Prev Page

Preview the previous printed page.

One Page / Two Page

Preview one or two printed pages at a time.

Zoom In

Take a closer look at the printed page.

Zoom Out

Take a larger look at the printed page.

Close

Return from print preview to the editing window.

Print Setup command (File menu)

Use this command to select a printer and a printer connection. This command presents a Print Setup dialog box, where you specify the printer and its connection.

Print Setup dialog box

The following options allow you to select the destination printer and its connection.

Printer

Select the printer you want to use. Choose the Default Printer; or choose the Specific Printer option and select one of the current installed printers shown in the box. You install printers and configure ports using the Windows Control Panel.

Orientation

Choose Portrait or Landscape.

Paper Size

Select the size of paper that the document is to be printed on.

Paper Source

Some printers offer multiple trays for different paper sources. Specify the tray here.

Options

Displays a dialog box where you can make additional choices about printing, specific to the type of printer you have selected.

Network...

Choose this button to connect to a network location, assigning it a new drive letter.

Paste Link command (Edit menu)

Use this command to paste an OLE object, such as a sound file or bitmap picture, contained in an external file. When the external file is modified, the representation in your TechGraf will reflect those changes.

Before using this command, an OLE object must have been copied to the clipboard from an OLE server application (e.g. Paintbrush, Sound Recorder).

Links command (Edit menu)

Use this command to display a Links dialog box which lets you edit links between your document and other documents.

This command is unavailable if you have no links in your document.

Links dialog box

The following options are available in the Links dialog box:

Links

Displays all links in a document. The four columns contain the application, filename, item name, and type or status of link.

Update

Select the type of link you want for the selected links in the Links box:

Automatic Inserts new data as soon as it is available.

Manual Inserts new data only when you ask for it by choosing the Update Now button.

Locked

Prevents updates to a selected link. If you lock a link, the Update Now option is unavailable.

Open Source

Opens the source of a selected link -- for example, choosing the Open Source button opens up a linked chart in Microsoft Excel if you have a Microsoft Excel chart linked to your document.

Update Now

Updates all links selected in the Links box, and then closes the dialog box.

Cancel Link

Breaks links for all selected links between data and the document, and then closes the Links dialog box.

Change Link

Displays a dialog box so you can change the selected link to receive data from another application, file, or item.

Object verb (Edit menu)

Use this command to open the application in which the selected object was created and display the object so you can edit it. This command is available only when you have selected an existing object in your document. When you finish editing and close the application window, TechGraf incorporates the changes into your document. This menu name changes depending on the object you select.

For example, if you select a Sound Recorder sound, you can select either Edit or Play from the Sound Object submenu.

Shortcut

Mouse: Double-click the object with the left mouse button.

Insert New Object command (Edit menu)

Use this command to insert an object from another application. The application supplying the object will become active on your screen.

If a focus rectangle is defined, TechGraf will attempt to format the new object into the focus rectangle.

Select the object you want to insert into your document using the Insert New Object dialog box.

Insert New Object dialog box

Choose the Object command from the Insert menu to insert an object from another application. Select the object you want to insert into your document from the Insert New Object dialog box.

Object Type

Some common objects are drawings, graphs, spreadsheets, and equations.

Technical Support

The author can be contacted at the following address (e-mail preferred):

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I also monitor the Intelec BBS net Shareware and Windows conferences.

All questions and comments are welcome. Priority will be given to registered users.

Registration Information

Thank you for your interest in TechGraf. TechGraf is distributed as shareware. You may evaluate TechGraf for a period not to exceed 30 days. Following the evaluation period, if you wish to continue using TechGraf, you must register. Upon registration, you will receive a key file which will eliminate the shareware reminder dialog box.

To register, first print out this registration form (using the File|Print Topic command in WinHelp). Fill out the form and mail it with a check for US\$30 to:

Ronald B. Jones
3715 Lexington Dr.
Hoffman Estates, IL 60195
USA

If you have an Internet e-mail address and can accept your key file electronically, you may reduced your payment to \$28.

Thank you for supporting TechGraf!

TechGraf Registration Form

Name: _____

Address: _____

E-mail Address: _____

Comments: _____

Format menu commands

The Format menu offers the following commands:

<u>File Settings</u>	Choose which column to plot and assign axes to a <u>data set</u> .
<u>Axes</u>	Change axis limits, axis type and other settings.
<u>Object</u>	Format any object currently defined.
<u>Defaults</u>	Set default options for axis length, font sizes, etc.
<u>Center Page</u>	Centers all objects on page

Note that these commands are usually accessed by clicking with the right mouse button on the object that you wish to format.

File Settings Command (Format Menu)

This command will, after prompting for a data set if more than one is defined, open the File Settings dialog box. This dialog box allows changing basic properties for a data set, such as the axes to use and the columns to plot from the data set.

Format Axes Command (Format Menu)

After prompting for an axis to format, this command will open the Format Axes dialog box. This dialog box allows you to set the limits and type (log or linear) for an axis.

Format Object Command (Format Menu)

This command will present you with a list of all objects (Axes, data files, OLE objects) currently defined in your document. Upon selecting an object, the applicable dialog box is called.

Format Defaults Command (Format Menu)

This command will open the TechGraf Defaults dialog box, allowing various defaults to be set for newly created objects. When the dialog box is closed, the selected defaults will be written in the techgraf.ini file in your Windows subdirectory.

Center Page Command (Format Menu)

This command centers the graph on the page, given the current page settings, indicated by the dashed line on the display. If the page settings are updated using the Control Panel while Techgraf is running, run the Print Preview Command from the File menu to update the page setting.

TechGraf Defaults dialog box

This dialog box allows various default settings to be specified for newly created objects. When the OK button is selected, the settings are written to the file "techgraf.ini" in your Windows subdirectory. The dialog contains the following fields:

X, Y Axis Length: The default length for X and Y axes, specified in inches (or cm).

Label Font Size: The default label point size.

Label Font: The default label face name.

Title Font Size: The default point size for new axis titles.

Title Font: The default face name for new axis titles.

Tick Direction: Specifies whether ticks point "In" (towards the data) or "Out" (away) from the data by default. This default can be overridden by the Angle field in the Format Ticks dialog box.

Label Spacing: The default distance in inches (or cm) from the axis to the axis labels.

Symbol Font Size: The default symbol size for scatter plots.

Symbol Font: The default face name for scatter plot symbols.

Symbol Character: The Ascii value of the default character to be used for scatter plots.

Title Spacing: The default distance in inches (or cm) from the axis to the axis titles.

Origin Pos. (X,Y): The origin for new plots in empty documents.

cm/Inch: Units for page position and length measurements. When this choice is changed, all other fields in this dialog are converted to the new units. Therefore it is best to make this choice first, before changing the other defaults.

Default Scale: The initial viewing scale. See the View Scale command.

Data menu Commands

The Data menu offers the following commands:

<u>Open Data File</u>	Reads a data file and starts the File Settings dialog.
<u>Reread Data</u>	Rereads all data files from disk.
<u>Interpolate</u>	Interpolates on a data set.
<u>Integrate</u>	Numerically integrates a data set.
<u>Data Readout</u>	Displays the coordinates of the cursor relative to a data set
<u>Fit</u>	Generate a least square fit of a data set
<u>Write Data</u>	Writes a data set to a XY file
<u>Smooth</u>	Generate a sliding average of the data
<u>Error Bars</u>	Assign error bars to a plot

Zoom Command (View Menu)

This command will change the axes limits to match the boundaries defined by a focus rectangle. This command is useful for taking a closer look at features in your data, and can be undone with the Unzoom command.

Unzoom Command (View Menu)

This command restores the affected axes to the limits existing before the last Zoom command.

Write Data Command (Data Menu)

This command allows data to be written to an external [data file](#). This command is usually used with fitted or smoothed [data sets](#) that are normally stored in your [TechGraf \(.tgr\) file](#).

See Also:

[Fit submenu commands](#)

[Smooth](#)

Smooth Data Command (Data Menu)

This command generates a sliding average of your data. You are first prompted to choose which data set to smooth and then the Data Smooth dialog box is opened, allowing the size of the averaging window to be chosen. The smoothed data is then plotted, without erasing the original plot. The smoothed data is stored in your TechGraf (.tgr) file, and can then be written to disk with the Write Data command.

The smoothing is performed by replacing each data point with the average of the "N" data points surrounding it, where N is the window size specified in the Data Smooth dialog box. This procedure is a "quick and dirty" way of finding trends and features in noisy data. There are better ways, eg. low pass filtering in the fourier domain, that can be found in a number of numerical analysis and scientific computing books, but this method is fast, simple, and requires few assumptions about your data.

Error Bar Command (Data menu)

This command will first prompt for a data set, then opens the Error Bar dialog box, allowing a data column and file to be chosen for the error bar data. Error bar data specifies the error for each point. Error bars are drawn to plus or minus the value in the error bar data. Only Y errors are supported.

Error Bar Dialog Box

This dialog box allows data to be selected for error bars. If error bars are being created for the first time, the file is set to the same file as the regular data, and the column for the error data is set to the last column in the file. The dialog box contains the following fields:

Data File Name: The data file that we are choosing error data for

Error File Name: The name of the file that the error data comes from. Will usually be the same as the Data File Name.

Error Bar Column: The column that contains the error data.

Change Error File: Launches a File Open dialog box allowing a new file to be chosen for the error data

Remove Error Bars: Removes the error bars from the plot.

Data Smooth Dialog Box

This dialog box is called by the Smooth Data command. The Window Size field allows you to specify the number of points averaged at each position. in the data. This number must be odd. If an even number is specified, a warning is posted and the window size is reduced by one.

Fit Submenu Commands (Data Menu)

This command allows you to generate least squares fits to a variety of functions. When any of the submenu commands are selected, you are first prompted as to which data set to fit to. A dialog box will then open allowing parameters to be set for the fit. Several of the fields are the same for all of the functions:

Use X Data: Uses the x values of the data for the plotted fit. This is useful if the fit data is to be saved to disk using the Write Data command.

Even X values: Plots data points evenly spaced from the start X to the end X values.

Number of points: Specifies the number of points to plot from the fit function if the "Even X values" button is selected.

X start, X end: Specifies the starting and ending X values for the fit and the fitted plot. These fields will be initialized with the left and right edges of the focus rectangle if one is defined.

When OK is selected in the dialog box, the fit is performed and the coefficients are reported to the log window. A new data set is created based on the fit functions and the parameters selected in the dialog box. The data for this data set is stored in your TechGraf (.tgr) file, and can be saved to disk using the Write Data command. Once the fit is performed, the fitted plot will not reflect any changes in the original data set. If your data changes, the fit process must be redone.

See also:
Fit functions

Fit functions

Polynomial: Fit to the function $c[0] + c[1]x + c[2]x^2 + c[3]x^3 + \dots$
The order of the fit is selected in the dialog box (1 for linear, 2 for quadratic, etc.).

Power: Fit to the function ax^n . See note below.

Exponential: Fit to the function $aebx$. See note below.

Gaussian: Fit to the functions $a \exp(-b^2(x-x_0)^2)$. See note below.

Note that the Power, Exponential, and Gaussian fits require taking the logarithm of the data. The data must therefore not be zero or negative. If the data set contains negative data, you will be prompted to continue with absolute values.

Data Cursor Dialog Box

This modeless dialog displays the mouse position in your data coordinate system, along with the position of the nearest point in the data set. The dialog contains the following fields:

Data Set: Combo box allows you to pick which data set will be used to determine the coordinate system used and the data points to represent in the "Cursor" and "Data" X and Y fields.

Close: Button to close the dialog box. The dialog will also close if a data set is deleted, or if the Close command is selected from the system menu.

Cursor: X and Y position of the mouse cursor, in the coordinates defined by the data set selected in the Data Set combo box.

Data: X and Y position of the data point that has the highest X value that is less than the cursor X position. This data point is also marked on the plot.

Data Readout Command (Data Menu)

The Data Readout command allows you to read points from your data sets using the mouse cursor. The command opens the Data Cursor dialog, which displays the mouse position in your data coordinate system, along with the position of the nearest point in the data set.

Focus Rectangle

A "focus rectangle" is a rectangular area on the screen defined by the user. It is defined by holding down the left mouse button and dragging. Any objects in the focus rectangle will be selected. These objects can then be dragged as a group around the screen. There are several other uses for the focus rectangle:

If a focus rectangle is defined when the Open Data File command is selected, the new data set is plotted using new axes defined by the focus rectangle.

The Zoom command uses the focus rectangle to define new axis limits.

The Integrate and Fit commands use the focus rectangle to establish default start and end points for the analysis.

A new embedded object or pasted object is placed in the lower left corner of the focus rectangle.

Numerically integrating data

This command allows you to numerically integrate your data. This command opens the Integrate Data dialog box. If a focus rectangle is defined, the initial and final limits of the dialog box are initialized to the boundaries of the focus rectangle.

Log Window

The Log Window reports the results of all interpolations, fits, and integrations. The text in the Log Window can be copied to the clipboard using the Edit|Copy command, or saved to a text file using the File|Save As command.

Interpolating values from a data set

This command allows you to interpolate and extrapolate points on your data sets. This command opens the [Interpolate Data](#) dialog box.

A modeless dialog box can stay open while you perform other work in TechGraf.

Integrate Data Dialog

This modeless dialog allows you to choose parameters and perform numerical integration on your data. The dialog contains the following fields:

Data to Integrate: Combo box with list of all current data sets. List updates itself when data sets are deleted.

Start X: The lower limit for the integration.

End X: The upper limit for the integration.

Integrate: Button starts the trapezoidal rule integration. The result is displayed in the "Integration" field (below the button) and is also reported to the Log Window

Close: Closes the dialog box.

Interpolate Data Dialog

This modeless dialog allows you to choose parameters for interpolation and extrapolation. The dialog contains the following fields:

Data to Interpolate: Combo box with list of all current data sets. List updates itself when data sets are deleted.

X: Enter the x value for the interpolation or extrapolation

Y: Shows the result of the last interpolation.

Interp: Button performs the interpolation on the data set selected in the "Data to Interpolate" box at the position in the "X:" field. The result of the interpolation is written to the "Y:" field and also to the Log Window

Order: Enter the order of the interpolation, i.e. "1" for linear, "2" for quadratic, etc.

Close: Closes the dialog box.

Rereading data


This command rereads all open data files from disk. For example, if you have plotted the result of a numerical computation, you can rerun the computation using different parameters, select this command, thereby seeing the new results.

Opening a data file

This command prompts for a file name and attempts to read a data file. If the file is read successfully, the File Settings dialog box is loaded.

If the data file has already been loaded for another data set, the copy of the data file in memory is reused. This allows multiple data sets from a large data file to be plotted quickly. If you change the data file using another program after it has been read by TechGraf, use the Reread Data command to reread the file and update your plots.

Shortcut

Toolbar: 

A data set consists of an X column and a Y column from a data file

Data File Format

TechGraf reads comma, space, or tab delimited Ascii files. Data may have up to 20 columns and up to 4,294,967,295 rows, or as many as can fit in available memory. Data are represented internally as double precision floating point numbers. Up to three lines of textual information (data headings or comments) at any point in the file will be ignored.

See also:

[TechGraf Files](#)

TechGraf (.tgr) Files

TechGraf (.tgr) files contain formatting information, OLE data, data from fitted or smoothed data sets, and pointers to data files. TechGraf files do NOT store your data, only the file name. Your data is read fresh each time that the TechGraf file is opened, and your plots will reflect any changes made in the data. If you change your data with another program while a TechGraf file is loaded, the data may be reread with the Reread Data command.

TechGraf files store the complete path name of your data files, allowing data and TechGraf files to be stored in different directories. If the data file is not found when the TechGraf file is opened, the directory that the TechGraf file is in is also searched. This allows, e.g., copying TechGraf and data files to a floppy drive and read on another computer.

See also:

Data Files

Format Axes Dialog Box

This dialog allows you to set the properties for an axis. Fields include:

Name: Name of the axis. Each axis must have a unique name. The name can be changed to anything you wish, as long as it is not used by any other object in the document.

Position X, Y: Position of the origin in inches from the lower left corner of the page.

Length: Length of the axis in inches.

Start, End: The start and end limits for the axis. The minimum and maximum data values for the data sets associated with the axis are also shown.

Auto: This checkbox will reset the Start and End fields to default values. This control is disabled if there are no data sets associated with the axis.

Log: Specifies that the axis is logarithmic. This control is enabled only if the Start and End limits are positive.

Title: Creates an axis title if one does not already exist and opens the Format Axis Title dialog box.

Ticks and Labels: Opens the Format Ticks dialog box for the axis.

Format Ticks Dialog Box

This dialog allows options to be set pertaining to ticks and data labels for an axis. Fields include:

Ticks Spacing: Spacing in data units between ticks.

Label Interval: Number of tick intervals between label ticks, i.e. a value of "1" means every tick is labelled, "2" means every other tick is labelled, etc.

First Label: The value of the first label. This is useful if you do not want the start coordinate of the axis to correspond with the first ticks.

Tick Angle: The angle of the ticks in degrees. X axes default to 90, Y axes default to 0.

Minor, Major Tick Length: Length of the major (labelled) and minor (unlabelled) ticks. The ticks can be made into grid lines by changing this value to equal the axis length.

Automatic Ticks: Resets the above fields to reasonable default values. If this value is set, the tick settings will reset if the axis settings change. If this is not set, the tick settings must be changed manually. If, for example, the addition of another data set changes the axis limits, the tick settings above will adjust if this setting is checked.

The following fields control the formatting for the labels:

Decimal/Exponential/Auto: Specifies if decimal or exponential notation is used for data labels. Auto uses the numerical value of the label to decide which to use.

Decimal Digits: Specifies the number of decimal places to show in the labels. If the "Auto" box is checked, a reasonable default will be used.

Label Offset: The X and Y distance in inches from the axis to the label.

Fonts: Opens the Font dialog allowing the label font and color to be set.

Hide Labels: Hides the labels. Allows major ticks to be written without labels, usually for top and right side axes.

File Settings Dialog

The File Settings dialog allows fundamental parameters to be set for a data set. Fields include:

X Column	Chooses the column for the x data. Column '0' plots the numbers 1... N where N is the numbers of rows in the data.
Y Column	Same for y data. If more than one data set is desired for a <u>data file</u> , open the file again with the <u>Open Data File</u> command.
Description	Specifies the name for the data set. Each data set in a document must have a unique name. If the name you choose is not unique, TechGraf will prompt you for a new name.
Origin	Specifies the position for the origin of the plot. If these data are changed, the positions for the associated x and y axes will be changed accordingly.
Linetype	Opens the <u>Format Linetype</u> dialog for this data set
Axes	Prompts for an axis and opens the <u>Format Axis</u> dialog.
X,Y Axis controls	The combo box allows a previously created axis to be chosen. The 'new' button creates a new axis for the x or y axis. The 'edit' button launches <u>Format Axis</u> dialog.

Inserting Text Objects

Text labels are supported in TechGraf through the TechType OLE server. Selecting the Edit|Insert TechType Label command will start TechType. Input your label in TechType, and select File|Update in TechType. If a focus rectangle was defined when TechType was started, your label will appear in the focus rectangle. Otherwise, the label will appear in the lower left corner of your document.

If TechType fails to start, there may be a problem with your registration database. First, try running TechType from the File|Run menu of Program or File Manager. TechType will then attempt to re-register itself. Exit TechGraf, then restart and try again. If TechType still doesn't start, try using the regedit utility included with Windows 3.1

Shortcut

Toolbar:



Line Type Dialog Box

This dialog allows you to specify the appearance of the plot of the selected data set. Fields include:

Line/Symbol/Both: Specifies if a line, scatter, or combination plot is to be displayed.

Line Type: Specifies whether the line is solid, dashed, etc. This control is disabled if the Symbol button is selected, or if the "Thin" box is not checked..

Color: Opens the Choose Color which allows you to specify the color of the line.

Width: Specifies the width of the line in inches. Placing a value in this field unchecks the "Thin" box and sets the Line Type to Solid.

Thin: Check box sets the width of the line to one pixel, regardless of the device (display or printer)

Font/Size: Displays the currently selected font for your plot symbols. Techgraf uses TrueType fonts for plot symbols, with 10 point Wingdings as the default. There are several characters in this font that are very suitable for plotting symbols.

Font...: Opens the Choose Font dialog box allowing the font, size and color of the plot symbols to be selected. This button is disabled if the "Line" button is selected.

Character: Combo box (under the Font button) allowing the character for the plot symbols to be selected.

Formatting Your Plots

TechGraf uses an object oriented, right-mouse-button-gets-a-menu interface. What this means is that when you right-click on an object in your plot, a menu or dialog box is called allowing formatting options to be set.

Currently, there are four object types defined:

Axes

Axis Titles

Plots

OLE Objects

In addition to these on demand menus, some objects can be moved and sized directly via the mouse.

Objects are selected in two ways. Individual objects can be selected by left-clicking on the object. Multiple objects can be selected by drawing a focus rectangle around them.

Selected objects can be copied to the clipboard using the Copy or Cut commands, deleted with the delete key or the Delete command, or moved by dragging with the mouse. Axes and OLE objects can be sized by clicking and dragging the sizing handles that appear when the object is selected.

Axes

Axes define the x and y coordinates for your plots. When your first data file is opened, creating your first plot for the document, x and y axes are created. Additional axes can be created in several ways. When a focus rectangle is defined and the Open Data File command is selected, new axes are created with lengths and positions matching the left and bottom sides of the focus rectangle. Additional axes can also be created in the File Settings dialog box. Finally, axes can be created by using the Mirror X Axis or Mirror Y Axis commands from the Plot menu.

Right clicking on an axis will bring up the following menu:

- Settings...** Opens the Format Axis dialog box.
- Ticks...** Opens the Format Ticks dialog box
- Font...** Opens the Choose Font dialog box, allowing the font for the axis labels to be set.
- Title...** Creates or modifies an Axis Title for the axis. Opens the Format Axis Title dialog box for the title.

When axes are selected, they may be moved or sized with the mouse. To move, simply click and drag inside the focus rectangle. To size, click and drag the sizing handles.

Axis Titles

An axis title is a simple title added to an axis. The axis title is always centered on the associated axis, with the distance from the axis being adjustable. When the axis is moved, the axis label is moved along with it. An axis title is created by right clicking on the axis and selecting the "Title" command, or by clicking on the "Title" button in the Format Axis dialog box. An axis title can only contain a single font, and does not support subscripts or superscripts. If you require more complex formatting, you can use a TrueType object or other OLE object.

The text of the title, the distance from the axis and the font can be set by right clicking on the title and opening the Format Axis Title dialog box.

Format Axis Title Dialog Box

This dialog box allows formatting of an axis title. It includes the following fields:

Text: The text of the title.

Font: Opens the Choose Font dialog box, allowing the font, font size and color of the title to be set.

Distance from Axis: Specifies how far below (for X axes) or to the left (for Y axes) of the axis the title is placed.

Plots

A plot is the visual representation of a data set. Plots can be created by the Open Data File command, by the Smooth command and by the various fit commands. Plots always have an X and Y axis associated with the plot, which forms the data coordinates for the plot. Plots can not be moved or sized directly with the mouse. To move a plot with the mouse, select the axes and move them. You can select the plot and all axes by drawing a focus rectangle around all the objects.

Right clicking on a plot will bring up the following menu:

Data Settings	Opens the <u>File Settings</u> dialog box
Line Type	Opens the <u>Line Type</u> dialog box
Color	Opens the <u>Choose Color</u> dialog box for setting the color of the line
Symbol Font	Opens the <u>Choose Font</u> dialog box allowing the font, size and color of the plot symbols to be set
Mirror X, Y Axis	Copies the X or Y axis to the other side of the plot, rotating the ticks by 180 degrees, and hiding the labels on the copy. Used to quickly create "top" and "right" side axes for a finished appearance
Error Bars	Opens the <u>Error Bar</u> dialog box

OLE Objects

OLE objects are imported from other programs, such as TechType or Paintbrush. OLE objects are created by the Insert Object command, or the Paste Link command. TechType OLE objects can also be created with the Insert TechType Label command. Once created, the server application can be launched by double clicking on the object. OLE objects can be moved or sized with the mouse. Right clicking on an OLE Object will open the Format OLE Object dialog box. TechGraf currently supports OLE 1.0 only, with OLE 2.0 support in a future version.

Format OLE Object Dialog Box

This dialog allows the appearance of OLE objects to be altered. It contains the following fields:

Position: The X and Y coordinates (in inches) of the lower left corner of the object. Note that the object can also be moved by dragging with the mouse.

Angle: Rotates the object. Note that changing this from zero will cause the object to not print properly on some printers. The text angle for TechType labels should be set by the Format Angle command in TechType, rather than here.

Scale: The X and Y scaled value, in percent. Note that this feature also does not work properly on all printers. Scaling can also be done by selecting the object, and dragging one of the sizing handles.

The units used for page positions, axis length etc. can be changed from inches to cm with the Format Defaults command.

