Help Contents Vinny Graphics v1.95

Overview

VINNY GRAPHICS is designed as a tool for science and engineering students.   It is both a   graphing   and a data analysis package.   The intuitive Windows interface helps produce multi-parameter design or test data graphs and perform simple math operations on groups of cells.

INPUT is by:
> 1-<u>Cut, copy and paste</u> from external spread sheets.
> 2-Loading ascii <u>data files</u> in decimal or exponential format.
> 3-Key board entry into a series of internal mini spread sheets.   A dot or a comma (European format) decimal digit separation are both accepted.
> 4-Loading complete graph files.

MATH and REGRESSION analysis work on up to 21 independent data sets in Windows 95 and up to 12 independent data sets in Windows 3.1x.   Each set can contain up to 10,000 X,Y pairs.   Results are seen graphically as changes are made.   <u>Curve fits</u> are 1st to 5th order polynomial,   power,   exponential or log.

GRAPHS allow total freedom in setting up <u>scales</u> and <u>grids</u>.   Graph dialogs provide for both automatic selection and manual override.   <u>Log scales</u> with up to 20 cycles for each axis are available.

OUTPUT is by:
> 1-<u>Cut, copy and paste</u> to external spread sheets.
> 2-Saving complete <u>graph files</u> or individual <u>data set files</u>.
> 3-Saving sizable <u>graph bitmap files</u>.
> 4-High resolution color graph <u>printing</u>.
> 5-Complete data set and regression coefficient <u>printing</u>.

Getting Started

You can use the following steps to create your first graph:

1-Choose **FILE | NEW DATA** to open a new mini-spread sheet (Series#1).

2-Enter numerical data for the first X value.

3-Left click on the cell, index 1 column Y1, and enter the first Y value.

4-Continue until all desired X,Y points are entered. Tab or cursor keys can also be used to move between cells.

5-Choose **GRAPH | AUTO SCALE** to display a line and point graph of the entered data with an automatically generated scale and grid . Later you can modify these as desired.

6-Choose **WINDOW | TILE VERT** to arrange windows.

7-Choose **GRAPH | SCALE** to open the <u>scale dialog</u>.

8-Revise the **Max Min** scale values manually to nice round numbers.

9- Click the short cut **GRID** button to open the <u>grid dialog</u>.

10-Revise values for **Major** and **Minor Grids**, **Scale Ticks** and **Decimals**. You may prefer to use **AUTO X** and **AUTO YL** to automatically set grids, ticks and decimals. Click **OK.** Click **OK.**

11-Right click on series#1 mini-spread sheet to display the local pop up menu.

12-Choose **FIT** from the local pop up menu. This item is also found under **REGRESSION** on the top main menu.

13-Use radio buttons to select an equation for regression. Click **OK** to close the dialog.

14-Choose **GRAPH | LEGEND | MAIN, X, Y, and SERIES**, and enter desired <u>titles</u>. Click **OK** to close each dialog.

15-Select **GRAPH | GRAPH TYPE** from the top main menu. Pick the desired <u>graph type</u>. **GRAPH TYPE** is also on the mini-spread sheet local pop up menu.

16-Hint: If several data sets are open it is better to right click the desired data set and use the local pop up menu. This assures that the action is applied to the correct data set.

Editing

DATA ENTRY MODE (Small blinking cursor)

Use the cursor keys to move within the cells.   Enter numeric data in decimal or exponential format.   A dot or a comma (European format) decimal digit separation are both accepted.

CELL SELECTION MODE (Cells highlighted)

Use left mouse DRAG   or   SHIFT + CURSOR keys to select cells.

TO SWITCH BETWEEN ABOVE MODES

Use left mouse DOUBLE CLICK   or   CTRL + SHIFT key to switch alternately from data entry to cell selection mode.

Y ESTIMATE MODE

This is a special data entry mode which occurs after selecting a Y fit.

CUT,   COPY and PASTE

Selected cells or highlighted data can be copied or cut to the Windows clip board.   Use the EDIT menu items or short cut keys: cut=CTRL+X   copy=CTRL+C.   Copied or cut data can be pasted into any cells or into other applications.   To paste data into a data set,   select (i.e., left click on) the cell in the destination data set that will represent the upper left hand corner of the block to be pasted.   Then use EDIT | PASTE   or CTRL+V to paste the data block.

Files

DATA FILES (Extension=.prn)

SAVE DATA saves the X,Y points of the <u>active data set</u> in a file with a (.prn) extension. The extension is added automatically. Data files provide a means to save and read individual data sets. This allows different data sets to be viewed using the same graph settings. Data files can also be used to import externally generated data in multiple ascii columns. Vinny Graphics reads the first column as X values and any additional columns as Y values. It will read up to 22 columns for Windows 95 and 13 columns for Windows 3.1x. Each column can have up to 10,000 entries in decimal or exponential format.

GRAPH FILES (Extension=.gra)

This file type saves all data sets and graph settings in an ascii format arranged uniquely for this program. Use **SAVE GRAPH** to save in this format. The extension (.gra) is added automatically.

BITMAP FILES (Extension=.bmp)

This file type saves a Windows format bitmap of the current graph. Its size and shape are the same as that of the current graph display. Use **SAVE BITMAP** to save in this format. The extension (.bmp) is added automatically.

TEXT FILES (Extension=.txt or any)

A local text editor is provided as a convenience. Its files are saved and read in ascii format.

NEW DATA

This menu item creates and opens a new data file. The <u>preferences</u> dialog is used to set its size.

NEW TEXT

This menu item creates and opens a new ascii file in the local text editor.

OPEN

This menu item allows Vinny Graphics loading of existing Data, Graph and Text files. For Windows 95 it also allows reading any file into the local text editor.

OPEN TEXT ONLY (Windows 3.1x)

This menu item allows reading any file into the local text editor for Windows 3.1x.

Graph Type Dialog

Caution: Before making any of the selections below, be sure the series number at the top of the dialog designates the desired <u>active data set</u>. If it does not you can use the **NEXT** button to move to the desired data set.

GRAPH TYPE Buttons

LINE
Draws a straight line between the data points of the designated <u>active data set</u>.

BAR
Draws a bar to each data point of the designated <u>active data set</u>. The bar width can be set using the <u>preferences</u> dialog.

FIT
Draws the selected <u>curve fit</u> Y = f(X) for the designated <u>active data set</u>.

NONE
Displays only the data point symbols for the designated <u>active data set</u>.

LINE & BAR
Displays both line and bar for the designated <u>active data set</u>.

LINE & FIT
Displays both line and fit for the designated <u>active data set</u>.

BAR & FIT
Displays both bar and fit for the designated <u>active data set</u>.

POINTS
Allows showing or hiding of data symbols for the designated <u>active data set</u>.

Y AXIS
Select the left or the right Y axis scale for the designated <u>active data set</u>.

NEXT
Use the **NEXT** button to move to and designate the next series number as the <u>active data set</u>.

Grid Dialog

MAJOR GRIDS

These are the dark lines which divide the selected axis into 1 to 20 equal sections.

MINOR GRIDS

These are the light lines which divide the major grid sections into 1 to 10 equal subsections.

LOG GRIDS

These grids are drawn automatically and divide the selected axis into factor of 10 cycles and logarithmic subsections.   Use log scale to designate axis for log grids.

TICKS

These are small marks on the selected axis which designate where scale values are to be drawn.

DECIMALS

These are the number of digits in the scale values to the right of the decimal point.

OK

This button redisplays the graph with the new grid settings and closes the grid dialog.

VIEW

This button redisplays the graph with the new grid settings. It leaves the dialog box open for additional changes.

CLEAR

This button clears all grid settings.   It does NOT clear log grids.   To clear the log grids use the log scale dialog box.

AUTO X   AUTO YL   AUTO YR

These buttons compute GRID, TICK   and DECIMAL values for the selected axis.   Unlike the AUTO SCALE   commands these AUTO grid buttons make no changes in the max and min scale values.   It is therefore recommended that the desired max and min scale values be entered into the   scale dialog PRIOR to using the AUTO   grid buttons. When using both AUTO YL   and AUTO YR   grid buttons, the major and minor grids are set by the last AUTO grid button clicked.

SCALE

This button is a short cut to the scale dialog.

Window Hints

ACTIVE DATA SET

To designate a series as the active data set, left or right mouse click on it. The keys CTRL+TAB can also be used to move the window focus. Note, when a series is the active data set (i.e., has windows focus) its title is highlighted. If possible, when several data sets are open it is better to right click the desired data set and use the local pop up menu. This assures that your desired action is applied to the correct data set. The NEXT button inside dialogs can also be used to designate the next series number as the active data set.

DUPLICATE DATA SETS

Right click on any data set and chose DUPLICATE DATA from the local pop up menu to duplicate the data set. This can be used to protect original data while performing math operations on the duplicate set.

WINDOWS

Use TILE | VERT or TILE | HORZ to see all windows on the display at one time. Use Cascade to see all of the titles as the windows overlap across the display. CLOSE ALL closes all windows but does NOT clear the graph settings. CLEAR ALL closes all windows and also clears the graph settings.

CHANGING DATA WHILE RETAINING GRAPH SETTINGS.

1-Choose graph settings using an initial group of data sets.
2-Use SAVE GRAPH or several SAVE DATA commands to save the initial group.
3-Use WINDOWS | CLOSE ALL which leaves the graph settings unchanged.
4-Use OPEN or NEW Data to add data sets to the current graph settings.
5-Repeat the above as desired with different data sets.
Note: Individual data files can be opened or closed without affecting the current graph settings. However, opening a graph file replaces the current graph settings with those of the graph file being opened.

Legend

MAIN TITLE DIALOG
>   The top 3 title lines for the graph are entered in this dialog.   As lines are added the grid shrinks to accommodate them.

X AXIS TILLE DIALOG
>   The 3 title lines for the X axis are entered in this dialog.

Y AXIS TITLE DIALOG
>   The title lines for the Y left axis and Y right axis are entered in this dialog.

SERIES TITLE DIALOG (Each series data set can have its own title.)
>   To enter an individual data set title,   or label, select the main menu item **GRAPH | LEGEND | SERIES**. An alternate   way is to right click the desired data set or the graph and select **LEGEND | SERIES** from the local pop up menu.

>   **OK**
>   Use the **OK**   button to close the series dialog.

>   **NEXT**
>   Use the **NEXT**   button to move to and designate the next series number as the <u>active data set</u>.

>   **AUTO LABEL ALL**
>   These buttons,   also located in the series dialog,   automatically fill ALL the individual series labels with text as follows:
>   1-**Series + ##**   : The word "Series" followed by the data set number.
>   2-**"Text"+##**   : The text entered by the user in the edit box followed by the data set number.
>   3-**"Text" only**   : The text entered by the user in the edit box.
>   4-**Clear**   : Clears ALL individual series labels.
>   CAUTION: When using the above AUTO buttons ALL individual series labels are overwritten.

Log Scale Dialog

LOG SCALE

Log scales can   be selected for the X or Y axis or for both. Selecting both produces a log-log graph. Selecting X or Y produces a semi-log graph and selecting none produces a linear scale for both axis.

FORMAT LOG SCALE

The numerical format (exponential or decimal) of the log scale values,   written along side the X and Y axis,   can be selected using the format radio buttons.

AUTOMATIC LOG GRID

When a log scale is selected for an axis, the grid and the initial scale are set automatically to multiples of 10.   The user can modify the scale and thus the number of cycles by using the scale dialog.   Only one of the two Y axis scales controls the number of Y cycles.   By default it is the Y left axis,   unless it is not used by any series,   in which case control switches to Y right axis.   The log scale values of the Y left and Y right axis do not have to be the same,   however the number of cycles must be.

Math

CALCULATOR

Use this <u>calculator</u> dialog to convert the computers numeric key pad into a Reverse Polish Notation calculator. The RPN calculator allows direct use of key pad digits,   [+,-,*,/]   keys,   [Enter] and [Up/Down Arrow]   keys.   Trigonometric and logarithmic functions are provided by mouse clicking on dialog box buttons.

OPERATE ON CELLS

Use this to activate the <u>operate on cells</u> dialog box.   This dialog box allows simple math operations on the selected <u>highlighted cells</u> or on either all the X or all the Y cells of the <u>active data set</u>.   The pop up <u>operate on cells</u> dialog box also calculates and displays the   [Total, Average, and Sigma]   values for the cells in the chosen group.

FILL CELLS

Use this to activate the <u>fill cells</u> dialog box. This dialog box allows automatic filling of portions of the <u>active data set</u> cells with a user defined sequence of numbers.

X & Y OPERATIONS

Use this to activate the <u>X & Y operations</u> dialog box. This dialog box allows math operations which combine the X and Y columns of the <u>active data set</u>.   It includes a   Y cumulative sum   and a integral of f(x) dx operation.   It also allows interchanging,   switching,   the X and Y columns of data.

SORT X

Use this to sort the <u>active data set</u> pairs on X, in ascending or descending order.   This operation also packs data, eliminating entries which are not paired.

Math Operations on Cells

This dialog box allows simple math operations on the selected <u>highlighted cells</u> or on either all the X or all the Y cells of the <u>active data set</u>.   It also calculates and displays the   [Total, Average, and Sigma]   values for the cells in the chosen group.

Operate on Radio Buttons

Use these radio buttons to choose the group of cells for subsequent math operations.   The three choices are:

1-The selected <u>highlighted cells</u> of the <u>active data set</u>.

2-The cells in the X column of the <u>active data set</u>.

3-The cells in the Y column of the <u>active data set</u>.

The   [Total, Average, and Sigma]   of the chosen group of cells is calculated, displayed and automatically updated as changes are made by any operation or selection.

Operation Radio Buttons

Use these radio buttons to choose the operation to be performed.   The prescribed operation works individually on each of the cells in the chosen group.   For some of the operations a numeric constant is required.   Use the   [Enter Constant K]   edit box to input the desired value.   For the   [Round(Cell)] operation the constant K sets the number of digits after the decimal point.   The   <u>calculator</u> dialog can be used to modify or calculate the   [Constant K].

Calculator Button

Use this button to open the Reverse Polish Notation   <u>calculator</u>.

Operate Button

Use this button to execute the chosen operation on the chosen group of cells with the input value of K. This button is the only button which actually changes the data values in the data set.

Caution: There is no protection from overwriting existing data except that most operations have a logical inverse.   Do NOT use this button until the desired group of cells, the math operation and the constant value have all been chosen and entered.

OK Button

Use this button to close the dialog box.

Note: This button does not perform any operation other than closing the dialog box.   Use the Operate button to change the data set values.

Copy Button

This button also closes the dialog box and sends the current values of   [Total, Average, and Sigma]   to the Windows clipboard for later pasting.

NEXT

Use the NEXT   button to move to and designate the next series number as the <u>active data set</u>.

Calculator Dialog

This dialog converts the computers numeric key pad into a Reverse Polish Notation calculator.   It allows direct use of key pad digits,   [+,-,*,/]   keys,   [Enter] and   [Up/Down Arrow]   keys.   Trigonometric and logarithmic functions are provided by mouse clicking on dialog box buttons. Numbers can be input in decimal or exponential   format.   A period or a comma (European format) can be used to separate the hole number digits from the decimal digits.   Values computed in the X register can be copied to the Windows clipboard.   When using the <u>operate on cells</u>   dialog the constant K is automatically transferred to and from the calculator X register.

KEYBOARD KEYS

[ENTER] KEY
The calculator is set up with a four register stack.   In most RPN calculators only the bottom register is displayed to the user.   This calculator displays all four registers.   They are:
T: T or top register.
Z: Z register.
Y: Y register.
X: X   or working register.
The X register is used for data entry and display of all results.   All other registers are read only and are displayed for information and to help in understanding the operation of RPN. When a digit is keyed in from the numeric key pad it appears in the X register.   When all the desired digits are keyed in for a given number the user presses the computer [Enter]   key to complete the data entry.   This pushes the X value into the Y register, the Y value into the Z register and the Z value into the T register. Note the value in the T register is pushed off the stack and is lost.   Each time the [Enter] key is struck the stack is pushed up one notch.

[UP/DOWN] ARROWS KEYS
The [Up] and [Down] arrow keys roll the registers as follows:
[Up]:   X=T;   Y=X;   Z=Y;   T=Z
[Down]:   X=Y;   Y=Z;   Z=T;   T=X

[+] [-] [*] [/] KEYS
The plus, minus, multiply and divide keys operate as follows:
[+]: X = Y + X
[-]:   X = Y -   X
[*]: X = Y * X
[/]:   X = Y /   X
After any of these operations the stack is moved down one notch as follows:
X = Result of operation;
Y=Z;
Z=T;
T=T
As you can see the value in the T resister is duplicated in the Z register.   This automatic downward movement of the stack in RPN calculators makes chain calculations very convenient.

[Page Down] [Page Up] KEYS CHANGE SIGN OF X AND EXPONENT OF X
The [Page Down] key has been designated to act as a sign change key for the value in the X register. (ie The [Page Down]   key toggles the X register value between plus and minus.)   The [Page Up] key has been designated to act as sign change key for the exponent of the value in the X register. (ie The [Page Up] key toggles the X register exponent value between plus and minus.)

[CTRL C] [CTRL X] [CTRL V]

[Ctrl C] Copies the value in the X register to the Windows clipboard.
[Ctrl X] Copies the value in the X register to the Windows clipboard and deletes the value from the X register.
[Ctrl V] Pastes any value in the Windows clipboard into the X register and moves the stack up one notch.

DIALOG BUTTONS

ENTER, +,   -, *, /,
Left mouse clicking these dialog buttons works the same as striking the corresponding keyboard keys.

CA, CX, YX, R, EDIT X
Left mouse clicking these dialog buttons provides extra register control as follows:
C: Clears all registers values.
CE: Clears X register value.
XY: Interchanges X an Y register values.
R: Down rolls register values. X=Y;   Y=Z;   Z=T;   T=X
Edit X: Allows editing of the digits in the number in the X register.

+/- , Y^X , SQRT(X), X^2, 1/X , E+/-
Left mouse clicking these dialog buttons performs the following functions:
+/-: Changes the sign of the X register value.
Y^X: Sets X=Y^X and moves the rest of the stack down one notch.
SQRT(X): Sets X=X^0.5 and has no other effect on the stack.
X^2: Sets X=X^2 and has no other effect on the stack.
1/X: Sets X= 1/X and has no other effect on the stack.
E+/-: Changes the sign of the exponent of the X register value.

DEG/RAD, DEG>RAD, DEG<RAD
Left mouse clicking these dialog buttons performs the following functions:
DEG/RAD: Alternately changes the trigonometric functions units from working with degrees to radians and back again.   The word degree or radian is displayed on the dialog   box in red to indicate the current trigonometric units state.
DEG>RAD: Converts the X register value from degrees to radians.
DEG<RAD: Converts the X register value from radians to degrees.

TRIGONOMETRIC AND LOGRITHMETRIC FUNCTIONS
Left mouse clicking these dialog buttons performs the indicated function on the value in the X register and has no other effect on the stack.

STO,   RCL
In addition to the stack registers one extra internal memory register (M) is provided.   Data can be stored and recalled from this memory location by left mouse clicking   the STO and RCL buttons.   The STO button sets M=X.   The RCL button sets X=M and moves the stack up one notch.

Copy, Paste
Left mouse clicking the Copy button copies the value in the X register to the Windows clipboard. Left mouse clicking the Paste button pastes any value in the Windows clipboard into the X register and move the stack up one notch.   The Windows shortcut keys [CTRL C] and [CTRL V] can also be used to activate Copy and Paste.   These functions provide for data transfer between the calculator and other parts of Vinny Graphics or other Windows applications.

Top,   Back
The Top/Back button is used to make the calculator window either stay on top or allow it to be hidden

by other windows.   When the button displays TOP the calculator window is   set to stay on top.   When the button displays BACK the calculator windows can be covered by other application.

Shrunk,   Trig

The Shrunk/Trig button changes the calculator window size.   When the button displays SHRUNK the calculator window size has been reduced by eliminating the log an trig functions.   When the button displays TRIG the calculator window is at full size and the log and trig functions are available.

DATA FORMAT

Decimal or Exponential

If the result of a calculation is to large or to small it is automatically displayed in   exponential format.   For example:

The decimal number:

 1 230 000 000 000 000   is displayed as 1.23E+15.

The decimal number:

0.000 000 000 000 001 23 is displayed as 1.23E-15.

Numbers can be input in decimal or exponential   format.   A period or a comma (European format) can be used to separate the hole number digits from the decimal digits.   Use the [Page Up] key or the E+/- button to change the sign of the exponent value.

Math Fill Cells

This dialog box allows automatic filling of a portion of the <u>active data set</u> cells with a user defined sequence of numbers.

Operate on Radio Buttons
Use these radio buttons to choose the group of cells for subsequent fill operations.   The two choices are:
1-The cells in the X column of the <u>active data set</u>.
2-The cells in the Y column of the <u>active data set</u>.

Selected Fill Limits
Use these four edit boxes to enter values for:
1-Start Index: The cell index number for the first sequence value.
2-Stop Index: The cell index number for the last sequence value.
3-Start Value: The value of the first number in the sequence.
4-Step Value: The increase in value from one cell to the next.

Operate Button
Use this button to fill the chosen group of cells with a user defined sequence of numbers.   This button is the only button which actually changes the data values in the data set.
Caution: There is no protection from overwriting existing data.   Do NOT use this button until the desired group of cells is chosen and the sequence start index, stop index, start value and step value have all been entered.

OK Button
Use this button to close the dialog box.
Note: This button does not perform any operation other than closing the dialog box.   Use the Operate button to fill a portion of the data set with the user defined sequence of numbers.

NEXT
Use the NEXT   button to move to and designate the next series number as the <u>active data set</u>.

Math X & Y Operations

X & Y Operations Radio Buttons
Use these buttons to choose the desired operation.

Switch X & Y Operation
This operation interchanges each pair of X & Y cell values.

Y = Sum(Y) Operation
This operation first sorts data on X ascending.   Then for each succeeding   X value it cumulates a running sum of Y and uses it to replace the original   Y values.

Y = Integral of f(x) dx   Operation
This operation first sorts data on X ascending. Then it computes the area under Y=f(x) data set as a cumulative   function of X and uses it to replace the original   Y values.   Each area element equals the average value of Y for the current and proceeding point times the difference in X values for the same two points.

Operate Button
Use this button to execute the chosen operation.   This button is the only button which actually changes the data values in the data set.   For the   [Switch X & Y]   operation each pair of X & Y cells values are interchanged.   For the other operations the results from each pair of X & Y cells overwrites the Y cell value.
Caution: There is no protection from overwriting existing data except that most operations have a logical inverse.   Do NOT use this button until the desired operation is chosen.

OK Button
Use this button to close the dialog box.
Note: This button does not perform any operation other than closing the dialog box.   Use the Operate button to change the data set values.

NEXT
Use the NEXT   button to move to and designate the next series number as the active data set.

Preferences

TOOLBAR

Show or hide the toolbar with this menu item.   The toolbar provides shortcuts to several frequently used menu items.   Placing the mouse pointer over a toolbar icon displays the name of the menu item shortcut.   Other menu item shortcuts can be accessed by right mouse clicking on the graph or on a data set.

PREFERENCES DIALOG

MAX DATA INDEX

This setting changes the size of the next <u>new data</u> set opened.   Its range is form 1 to 10,000 points.   Use the smallest value which accommodates your data.

BAR WIDTH

If   BAR   is selected as a <u>graph type</u> for a data set,   this parameter sets the width of the bar.   The range is from 1 to 10.

PRINTER MINOR GRID COLOR

Use these radio buttons if you are having trouble printing out the minor graph grids.   The default option gives good results with most black and white and color printers.

PRINTER FONT SIZE

Use the LARGE   font size radio button for large title printer output.   This selection increases the font size of the Main,   X Axis and Y Axis Titles.
Note: Some very long titles may overflow allocated space in the portrait mode when using LARGE fonts.

SAVING PREFERENCES

Preferences are saved automatically in a small configuration file and in the user saved <u>graph files</u>   (.gra).

Printing

PRINT DATA

All data sets are output to the printer.   If the user has selected a curve fit, then   the <u>Y fit</u> values, coefficients,   and equation are also output.   If available the main top graph titles are printed as a header.

PRINT GRAPH

A high resolution redraw of the graph display is output to the printer in portrait or landscape mode.   If the printer is capable, the graph will print in color.

PRINTER COLOR DIALOG

Printer output colors for each data set are selected automatically.   These values can be overridden by right mouse clicking on any data set and selecting   **PRINTER COLOR**   from the local pop up menu. These color selections affect only the printer output and NOT the screen display.   In the dialog the **NEXT** button moves to and designates the next series number as the <u>active data set</u>.

PRINT TEXT

The local text editor contents are output to the printer.

GRID PRINTING

The <u>preferences dialog</u>   allows fine tuning of minor grid printing.

PRINTER FONT SIZE

The <u>preferences dialog</u>   also allows selection of a **LARGE** font size for **Main,   X Axis and Y Axis Titles.**

Regression

FIT

This menu item opens the regression fit dialog.   Choose a regression equation for the <u>active data set</u> using the radio buttons.   Once an equation is selected, the third column in the mini-spread sheet displays the Y fit values.   Additionally, data entry into the mini-spread sheet is modified as follows.   Any additional X values that the user inputs produce a <u>Y estimate</u>.   Any additional Y values that the user enters reset the fit equation to none and clear the Y fit column values, returning data entry to the normal mode.

EQUATION,   COEFFICIENTS AND DETERMINATION

The selected regression equation along with the value of its coefficients as well as its coefficient of determination are displayed in the regression fit dialog.

NEXT

Use the NEXT   button to move to and designate the next series number as the <u>active data set</u>.

REGRESSION | CLEAR FIT

This main menu item sets the <u>active data set</u> regression equation to none and clears the Y fit column values.

REGRESSION | FIT ERROR %

This main menu item displays the percent error between each Y point and the corresponding Y fit value in the Y fit column of the <u>active data set</u>.

Scale Dialog

MULTI-SCALE MODE

This is the default mode.   Each data set is automatically scaled to its own max min values.   Scale values are different for each data set,   thus the scale values are not shown on the graph.   You can force return to this mode with the MULTI-SCALE   radio buttons.

USER SET SCALE MODE

User can enter max and min scale values for each axis.   Opening the scale dialog activates this mode.

LOG SET SCALE MODE

The designated log scale axis are setup and numbered automatically.   The user can modify them in multiples of 10 using the scale dialog.   This mode is activated when a log scale is selected.

FIND

Finds the max and min for all data sets for the selected axis.

AUTO

Generates automatic scales and grid settings for the selected axis.   The scale values can be revised manually in the scale dialog.   The grid settings can be revised in the grid dialog.   The GRAPH | AUTO SCALE   menu item is the equivalent of clicking both the X and the Y left axis AUTO scale buttons.   Auto scaling the Y right axis can only be done with the Y right AUTO   scale button.   When using both Y left and Y right auto scaling, the major and minor grids are set by the last AUTO   scale button clicked.   Note these AUTO   scale commands modify the max and min scale setting in an attempt to achieve reasonable grid settings while retaining a maximum view of the data points.   If you prefer you can set your own max and min values for each axis and then use the AUTO   grid buttons in the grid   dialog.

OK

This button redisplays the graph with the new scale values and closes the scale dialog.

VIEW

This button redisplays the graph with the new scale values. It leaves the dialog box open for additional changes.

GRID

This button is a short cut to the grid dialog.

FIND ALL

Finds the max and min data values for all data sets and all axis.   This button also clears all grids and grid settings.   This is a good starting point for a new graph.   After clicking FIND ALL revise scale values manually to nice round numbers and then click the short cut to the grid dialog.   Use the AUTO grid buttons to set grids for the new graph.

LOST DATA

Find lost data by using the FIND ALL   button or by forcing return to MULTI-SCALE MODE.   The advantage of the MULTI-SCALE MODE   is that it does not change graph settings.

Y Estimate

ESTIMATE VALUE OF Y GIVEN X

To estimate a value of Y for a given value of X, first choose a <u>regression</u> equation. Then, return to the data set. Enter an X value in any empty X cell. The corresponding Y cell will display an estimate of Y for the entered X value (based on the regression equation). This can be done for as many points as desired. If a Y value is entered, the regression equation is set to none, the Y fit values are cleared, and new X, Y data pairs can be added to the data set.

ESTIMATE VALUE OF X GIVEN Y

This can NOT be done directly, however in most cases the following will work. Use **MATH | X & Y OPERATIONS | SWITCH** <u>X & Y</u> columns and then follow the instructions above.

Graph

VIEW
Displays a graph of all data sets.

AUTO SCALE
Generates an automatic set of scales and grids for the X and Y left axis.   The scale values can be revised using the scale dialog and the grid settings can be revised using the grid dialog.   If you prefer you can use the scale dialog to set your own max and min values for each axis and then use the AUTO grid commands in the grid   dialog to compute the grid settings.

SCALE
Opens the   scale   dialog.   This dialog allows the user to enter manually,   or to use AUTO scale to compute,   the max and min scale values.

GRID
Opens the grid dialog.   This dialog allows the user to enter manually,   or to use AUTO grid to compute,   the grid settings

LOG SCALE
Opens the log scale dialog.   This allows the user to select a log scale   for the X and/or Y axis for the designated active data set.

GRAPH TYPE
Opens the graph type dialog.   This allows the user to select a graph type for the designated active data set.

LEGEND
Allows the user to enter text for main,   X,   Y   and series   titles.