

David Taylor Research Center

Bethesda, Maryland 20084-5000

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Ship Structures and Protection Department

Research and Development Report

'PLOT' -- A PROGRAM TO PLOT LINEAR, LOG, AND SEMI-LOG DATA
TO PC COMPUTER SCREENS, PEN PLOTTERS AND LASER PRINTERS (U)

by

William E. Gilbert

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NSWC CARDEROCK DIVISION

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CONTENTS

Abstract	1
Background and Purpose	1
Distribution and Maintenance	2
Installation	3
Use of the Program	4
Selection of Output Device	4
Plot Type Definition	5
The NEW Plot Option	5
The RECALL Plot Option	5
The ADD-a-Curve Option	5
Number of Curves	6
Type of Axes	6
Data Input and Formats	6
Data File Names	6
Data Format	7
Data Scaling	8
Expansion and Contraction of the Plot Range	9
Titles and Labels	10
Legends	10
Line of Text	11
Plot Size	11
Full Size	12
Report Size	12
Half Size	12

Quarter Size	12
Formal Plot Options -- Report Size Plots	12
Figure Number	13
Classification Markings	13
Figure Title	13
Page Number	13
Line Types and Plotting Symbols	14
Pen Plotters	14
Laser Printers	15
Plot Style	15
Continuation Menu Options	16
Start Again with a New Plot	17
Re-Drawing the Plot	17
Saving the Plot	17
Revising the DataFile List	18
Sample Plots	19
Reporting Difficulties and Suggestions	20
Appendix A. Sample Plots	21
Appendix B. Program Listings	33
Index	127

ABSTRACT

'PLOT' is a utility program written in BASIC and compiled for quick execution on any IBM-compatible personal computer. 'PLOT' will present up to six data curves in any rectilinear format such as linear, log-log, or semi-log format and the plot may be directed to either the computer screen, to a number of pen plotters, to a laser printer, or to a file. The program allows definition of a title, axis labels, a descriptive line of text on the plot, and curve legends.

A number of plot sizes, curve line types, plotting symbols, and grid line options are available. The data to be plotted may be in a wide range of formats, and data scaling and shifting options are available within the program. A formal plot option is also available in which a figure number and figure title may be defined and classification markings and a page number may be added. A report size plot is included which is specifically designed to fit on a reproduction layup sheet for printing.

This report documents the program and distributes it for individual use.

BACKGROUND AND PURPOSE

It is often necessary to plot the x-y variation of a function either to investigate its own variation or to compare it with others. Sometimes that function is instrumentation data such as strain-time data from a strain gage on a structural model in a dynamic test, or perhaps strain versus pressure data on the same model in a hydrostatic test. That function may be an analytic or empirical prediction of response or of some phenomena. In any event, it is often desirable to plot that function and sometimes to compare that function with others graphically. The 'PLOT' program was written to provide such a capability.

At the time the 'PLOT' program was initiated, no other tool was known which was capable of importing the data from multiple

curves in various formats and plotting them in both linear, log-log and semi-log forms. Some spreadsheets were being used for graphical data comparison, but these did not have the capability of log data presentation and were restricted in that each of the curves was required to share common ordinate data. Most plotting utilities did not offer log plots, and this was the primary motivation for the 'PLOT' program. However, many of the available utilities did not offer as much control over the plotting titles, axis labeling and particularly the legends as was desired by the author. Further, some packages generated plots with grid lines at odd increments (bastard scales). The author does not suggest that this package is the ultimate in graphic representation of data, but it did fit the author's needs better than commercial packages offered at the time and it is offered to you in that spirit.

DISTRIBUTION AND MAINTENANCE

The program has evolved over about four years. Features have been added and bugs have been found and fixed. While every attempt has been made to seek out and eliminate all bugs, there is no assurance that the last one is dead. If you use 'PLOT' and discover an error, you are requested to notify the author as soon as possible. Every attempt will be made to maintain the program and respond in a timely manner to these notifications, however, this code was developed as a utility by the Submarine Protection Division whose primary responsibilities are not in maintaining computer codes such as 'PLOT.'

If you think of a feature not currently present in 'PLOT' you are encouraged to make suggestions to the author for future updates. These suggestions should be in writing as the author's memory is not what it used to be. If you find 'PLOT' to be compatible with your needs and hardware, and you would like to be kept informed of future updates of the program, kindly notify the author and your name and address will be kept on a distribution list for notification of updates of the program.

While the 'PLOT' program source listing is provided in Appendix A for your information, the ownership of the program is retained by the author. You may use programming concepts and ideas demonstrated by the 'PLOT' program listing, but you may not give, or sell the 'PLOT' program as your own. Secondary distribution of the program in executable form is acceptable and encouraged. A copy of this documentation shall be provided with the program whenever further distribution is made. A machine-readable copy of the program will be provided on floppy disk on request. This disk will contain the following files:

PLOT.EXE
PLOTMAIN.EXE
PLOTSCRN.EXE
PLOTSWTP.EXE
PLOTLASR.EXE
PLOTPEMS.EXE

This report describes the installation of the program and instructions for use of the program.

INSTALLATION

A hard disk is required to run 'PLOT' as configuration information will be stored there. While the program need not be stored on the hard disk and can be run from a floppy disk if desired, better execution speed is obtained by installing the program on a hard disk. The total space required on the disk is less than 250 KBytes. In either case, the first time the program is run, configuration questions will be asked and a configuration file named PLOT.CFG will be written to the root directory of the 'C' drive (the hard drive). Should your hardware change, this file can be updated by simply deleting it and running 'PLOT' again. The absence of this file will trigger the configuration questions again.

Configuration information such as whether your computer is capable of color and what type of video system (EGA or CGA) your computer supports will be requested. Next, you will be asked if you have a pen plotter connected as a serial device, and if so, to which port is it connected (COM1, or COM2). Then, you will be asked if you have a pen plotter connected to a parallel port, and if so, to which port (LPT1, or LPT2). Then, you will be asked if you have a Kyocera Laser Printer. If you answer in the affirmative, you will be prompted to specify which model, and to which parallel port it is connected.

Finally, you will be asked to specify which drive and subdirectory to which you have copied the seven files containing the 'PLOT' program. This will allow the program to locate each portion of the program as it is required during a run of the program even though the default drive and subdirectory during the run is not where the program is located. This will be useful when you wish to make the drive and subdirectory where your data is located the default so that the addressing of those data files is facilitated. It is advisable that the drive and subdirectory which you have chosen to locate the 'PLOT' program files be added to your path to avoid having to name them each time you call 'PLOT.'

USE OF THE PROGRAM

While not necessary, it is advisable to first make the default drive and subdirectory the same as the address of the data to be plotted before initiating the 'PLOT' program. The 'PLOT' program is initiated by typing PLOT. If the drive and subdirectory where the program is stored is not in the path, then the drive and subdirectory address must precede PLOT (e.g. C:\SUBNAME\PLOT).

The rest of the program is menu driven. The user will be prompted for all the information necessary for the options selected. In many cases, default values may be accepted by pressing the return key. If an improper response is given, the question will be asked again until an acceptable answer is given by the user. In most cases the range of acceptable answers is specified with the prompt.

SELECTION OF OUTPUT DEVICE

A list of output devices is given and the user is prompted to select from the list which device her plot shall be routed to. The list of potential output devices is as follows and is not dependent on data specified in the configuration questions. Therefore, it is possible to specify a destination which the user does not have:

- 1) HP-7470 Pen Plotter
- 2) HP-Color Pro Pen Plotter
- 3) SWEET-P Plotter
- 4) Graphtec MP-2300-Serial Pen Plotter
- 5) Graphtec MP-2300-Parallel Pen Plotter
- 6) Screen
- 7) HPGL commands to a File

Initially, the screen is highlighted as the default selection. Hitting the return key would select this destination. If another choice is desired, the user may either arrow the highlighted bar to the desired choice and hit the return key or type the number of the destination. Generally, throughout the 'PLOT' program, when a menu is displayed with a list of choices, this method of selecting the choice is available. Note that if the selection is made by typing the number, or in some cases the letter of the choice, this need not be followed by hitting the return or 'enter' key. This was done to save keystrokes for the user.

PLOT TYPE DEFINITION

After the destination of the plot has been declared, the data defining the curve or curves is input. The first prompt is with the question of whether the plot is:

- N) A NEW plot
- R) A RECALL of a previously saved plot
- A) or ADDING a curve to a previously plotted plot

The NEW Plot Option

If the user has not done the plot before, the 'N' option should be selected as it assumes that all of the necessary information will be provided. The input of all of the curve definition data follows the selection of this option.

The RECALL Plot Option

Once a plot is fully defined and sent to its destination, the user will be given an option to save the fully defined plot for later recall. The 'R' option is the recall of such a plot. If a plot is recalled, only the destination need be declared and a few other minor pieces of data which will be discussed later. The titles, labels, and legends will be contained within a datafile, the name of which will be requested as soon as the user declares the 'R' option. Such a plot is sent immediately to the selected destination without modification. If it is intended to make modifications to a previously saved plot, it is recommended that the destination be selected as the screen. Those modifications may then be made from the Continuation Menu described later.

The ADD-a-Curve Option

This option is available only to certain plot destinations, the pen plotters. For this reason, if you have selected the screen or the laser printer as your plot destination, you will get an error message on selection of the 'A' option and offered the choice of another selection.

The purpose of this option is to allow the user to add a curve on the sheet of paper already produced previously as a NEW plot. The new data to be added will be added within the limits of the scales and extent of that previous plot. The option may be useful if the user wishes to put more than the limit of six curves on a single plot.

The user will be prompted for the name of the datafile with the additional curve data, and for the coordinate values at the origin and limits of the previously plotted plot.

NUMBER OF CURVES

The next prompt is for the user to declare the number of curves which the plot will compare. This number may be as high as six or as low as one. If a number out of this range is specified, the user will be prompted for the number of curves again. This out of range error is not caught immediately, but after the TYPE of plot is defined, the number of curves will again be requested.

TYPE OF AXES

This prompt asks the user to select the type of plot axes from the following list:

- 1) Linear X - Linear Y
- 2) Log X - Linear Y
- 3) Linear Y - Log X
- 4) Log X - Log Y

Keep in mind when selecting this option that the log of zero and negative numbers are not defined and therefore, some data should not be plotted on a log scale. Error checking is provided in the program to detect such a condition, and if detected, the user will be offered the option to edit the data or axes type.

DATA INPUT AND FORMATS

Data File Names

The data for each of the curves which you have indicated you wished to have plotted must be contained in a datafile. This prompt is for the data file names, including drives and subdirectories unless they are on the default drive and subdirectories. Hopefully, you have remembered to make the drive and subdirectory where most of your data is located your default prior to calling the 'PLOT' program to avoid all that needless typing. You are prompted for each of the data file names, in the order you want them plotted.

If you cannot remember the file names or their locations, simply type the the beginning of the file pathname, that is, the drive and subdirectory name, and all the files at that location

will be displayed. This request can be repeated as many times as necessary to locate the file or recall its name.

If a data file name is specified and the data file does not exist or does not exist at that location, an error message is given, and the user is again prompted for the data file name. The user will be prompted for a valid file name for each of the curves to be plotted. It should be noted here that the same file name may be given for more than one plot if desired. While the reason for doing so is a bit mysterious to this author, there is nothing in the program to prevent the user from doing so.

Data Format

Once each of the data files has been identified, the user is asked to specify the format for the data in each data file. The format is simply how the data are arranged in the data file. Eight valid formats are allowed for 'PLOT' program data. The valid formats are described in Table 1. Note that four of the formats are very similar to the other four formats; different only in that the number of data points in the data file is the first number in the data file in one case and not in the other.

In the event you do not remember the format of the data in one or more of your data files, simply hit the asterisk key in response to the request for the format for that data file and the first few lines of the data file will be displayed so that you may recall its format. The user may do this for each of the data files if necessary.

As soon as the format of the last data file has been specified, the program begins to read the data from the data files. Progress in this is noted on the screen by a message that states that the data from each filename is being 'counted' and then that the data from that filename is being 'read.' The program first counts the data points to check if the value of the initial number is the number of points or is instead part of the first data point description.

A plotted curve may not contain more than 350 points. This limitation is not a constraint on the number of points in the data file however. If a data file is found to contain more than 350 points, a message will be displayed stating that every n^{th} point will be read to fit the 350 point limit and still span the extent of the data for the curve. For example, if a data file with 900 points is selected, every 3rd data point would be read and plotted. A message is displayed for the user because this may cause truncation of peaks for some data files. A peak which would be missed by the 350 point limit would be quite sharp indeed, however, since the fidelity of the EGA screen would not

be sharp enough to distinguish it. In such an event, the user would be advised to consider plotting a shorter extent for that curve.

Table 1. Data File Format Options

Line No.	Format A	Format B	Format C	Format D
1	Pt #, X_1 , Y_1	X_1 , Y_1	Delta X	Y_1
2	Pt #, X_2 , Y_2	X_2 , Y_2	Y_1	Y_2
3	Pt #, X_3 , Y_3	X_3 , Y_3	Y_2	Y_2
4	Pt #, X_4 , Y_4	X_4 , Y_4	Y_3	Y_3
5	Pt #, X_5 , Y_5	X_5 , Y_5	Y_4	Y_4
etc	etc	etc	etc	etc

Notes: (1) The X-increment for Format D will be prompted from the screen.

(2) Alternate formats for A, B, and D insert the number of data points as the initial line of the data file.

(3) Alternate format for C includes the number of data points in the initial line of the data file with Delta-X (NPTS, Delta-X)

Data Scaling

When all the data have been read into memory, a summary table will appear listing each data file by name, specifying the number of points in the file and the minimum and maximum values of the data in the curve in both the x- and y- directions. The user is offered the opportunity at this point to scale each or all of the data functions in either the ordinate or abscissa directions (or both). While a shift in the ordinate direction is not offered, a shift in the abscissa direction is offered. The following menu offers the choices:

- 1) Accept the data
- 2) Scale the X-values
- 3) Shift the X-values by a constant
- 4) Scale the Y-amplitudes
- 5) Quit

If an option to scale or shift the data is selected, the user will be prompted for the number of the curve to be altered. If, instead of responding with the curve number, the response is 'A'

(for all), then all of the curves will be scaled or shifted by the specified constant.

If an option to alter the data is chosen and the data altered, the data summary table will be redisplayed with the changes and the menu again offered for further scaling. Once all the changes desired are made, then the option to accept the data is made. Option 5 is an option to quit. If this option is selected, the program execution will be terminated. Another way to terminate execution is by pressing the <F1> (Function One) key. This termination sometimes does not occur until the current prompt is answered, depending on which prompt is active.

Data scaling is used for a number of reasons. For example, if several curves are being plotted for comparison, scaling may be necessary to get them all into the same units. Another reason may arise out of the limits of the 'PLOT' program. Because of the use of the pen plotter integer scaling feature resident in the devices, the data must have an extent in both the ordinate and abscissa directions of at least 1.0. If the data does not have this extent, the plot extent will be increased in that direction to an extent of 1.0 and the data may not be a significant portion of the range. This requirement is on the combined extent of all of your data, rather than on a single curve unless you are plotting only a single curve. Another constraint imposed as a result of the integer scaling of the pen plotter is that the maximum value must be less than 32,000. Scaling your data allows you to live within these restrictions. The author has learned to live with them, too.

Expansion and Contraction of the Plot Range

Once the data for each curve has been scaled and shifted to meet the user's pleasure, and the data accepted, the user is presented with the question of whether she wants to expand or contract the effective range of the data for the plot. The minimum and the maximum value of all of the data points to be plotted are used to determine the limits of the grid line extents in both directions.

An answer of 'N' for 'NO' means that the program is free to use the data itself to define the limits of the grids. The program will pick those limits such that the data occupies a significant portion of the extent and the grid lines or tick marks will be placed at reasonable increments.

The user, however, may decide that she wants the plot to start at zero x-value rather than start and end at positive x-values, for example. Or, perhaps, the curve extends to very high amplitudes and that the interest is instead in the lower

amplitude portions of the data. The user could respond with 'Y' for 'YES' and then be presented with the following options to revise the 'effective' extent of the data in the following manner:

- 1) Horizontal Minimum
- 2) Horizontal Maximum
- 3) Vertical Minimum
- 4) Vertical Maximum
- 5) No Further Changes

The term 'effective' extent of the data is used here because the revised extent of the data is then used to determine the extent of the grid line and the grid increments. In other words, the revised extent may not actually be the extent of the plot in the same way that the actual extent of the data may not be the extent of the plot.

TITLES AND LABELS

Following the data definition, the titles and labels to be used on the plot are specified in response to prompts to the user. First, the PLOT TITLE is requested. This title will be printed above the plot in large bold letters. If no title is desired, simply hit the return key. Later, the user will be offered the option of such a key stroke meaning something other than a blank line in the case when a plot and titles have been defined already for a previous plot. But let's not get ahead of ourselves, that's part of the continuation menu and what happens when a plot is redone or a new plot is initiated from the continuation menu.

After the PLOT TITLE prompt, the user will respond to prompts for the X-Axis LABEL, and the Y-Axis LABEL. These are the descriptors that will describe the two axes.

LEGENDS

If the plot is of a single curve, no legends are necessary (or possible). However, legends are an option useful to distinguish and label one curve from another in a multi-curve plot.

Legends are not available to the screen. If you have selected any other destination for your plot and you have more than one curve on your plot, you will be prompted first to see if you would like to use legends. If you indicate in the

affirmative, you will then be prompted for labels to be used as legends. A legend will be requested for each curve.

The legends will be printed below the plot and the X-Axis label. If three or fewer curves are plotted, the legends will be arranged in a single row below the plot. If more than three curves are plotted, two rows of legends will be used. After the legend label for each curve, the line color, width, or plotting symbol will be displayed which will be chosen in a later prompt to designate that curve. But then, . . . that comes later.

LINE OF TEXT

Next, the LINE of TEXT is requested. This is a short descriptive text line which can be placed on the plot to offer further explanation or clarification of the meaning or basis for the plot. The location of this line depends on the selected destination for the plot. For example, if the plot is to the screen, the line of text will automatically be placed in the upper-right corner of the plot. If the plot is headed for a pen plotter or to the laser printer, the user will be offered a choice between:

- 1) Directly below the Plot TITLE (like a sub-title)
- 2) Upper Right (Within the Plot Region)
- 3) Upper Left (Within the Plot Region)

As with the PLOT TITLE, the user may elect to omit any of the labels or the line of text by hitting the return key at the prompt.

PLOT SIZE

Unless the plot is being sent to the screen, the user is offered a choice of plot sizes. The screen size is always the full size of the screen. There is no democracy here, that's the way it is. Other destinations have the following choice:

- F) Full Size
- R) Report Size
- H) Half Size
- Q) Quarter Size

Full Size

Full size plots are about 8 by 10 inches in size and have a solid line border around the plot. These are the largest size available by the 'PLOT' program. The plot is placed on the page in the landscape orientation.

Report Size

Report size plots are nearly as large, but do not have the border around them and are designed to fit on reproduction layout sheets for report printing. The plot is placed on the page in the landscape orientation. As you will shortly discover, the report size plot option also offers other options such as the formal plot options of classification markings, page numbering, etc. But wait a bit to learn the details of that.

Half Size

Half size plots are about half the size of a full size plot. They have the solid line border around the plot. If the plot is sent to a pen plotter, there is no option of where the plot is positioned on the page. However, if the plot is sent to the laser printer, a later prompt offers the choice of putting the plot on the upper or lower half of the page. On the pen plotter, the plot is placed on the page in the landscape orientation, while on the laser printer, the plot is placed on the page in the portrait orientation.

Quarter Size

Quarter size plots are about 1/4th the size of the full size plot, and have the solid line border around the plot. The plot is placed on the page in the landscape orientation and the user is prompted for the location on the page for the quarter size plot for both the laser printer destination and the pen plotters. The locations are as expected:

- 1) Upper Left
- 2) Upper Right
- 3) Lower Left
- 4) Lower Right

FORMAL PLOT OPTIONS -- REPORT SIZE PLOTS

If the plot size chosen is the 'R' or Report size, then additional labeling options are provided when the device is not the screen. These options are designated 'formal' plot options because they are used to label a plot intended to go into a

formal document. These labels are such things as figure number and title, classification markings on both the figure title and the plot itself, and a page number. If you have selected the 'R' size plot and your destination is a pen plotter or the laser printer, then a question will appear on the screen asking if you wish your plot to be 'FORMAL' or not. If you select the 'FORMAL' option, you will be prompted for that information.

Figure Number

First, you will be asked if you want a figure number on the formal plot. If you indicate that you do, you will be asked for the figure number. If not, no prompt for that number will be bothering you.

Classification Markings

Next, you will be asked if you wish to include classification markings. If you indicate that you do, you will be asked first for the classification of the figure title, and then for the plot itself. These two markings, of course, need not be the same. The categories offered are as follows:

- 1) Unclassified
- 2) For Official Use Only
- 3) Confidential
- 4) Secret
- 5) Other -- User Specified

If marking 5 is selected, you will be asked to further specify the marking. The classification marking on the figure title is placed between parentheses after the figure number (if specified) and before the figure title. The plot classification is placed just above the plot region on the left side of the plot.

Figure Title

Next, the figure title is prompted for. A highlighted zone is indicated on the screen indicating how long the title may be without risking overflowing the available space.

Page Number

Finally, the user is prompted with the question -- 'Do you want the page numbered?' If the answer is 'Y' for 'YES' then you will be prompted for that page number.

LINE TYPES AND PLOTTING SYMBOLS

If more than one curve is plotted, the curves must be distinguished from each other on the plot. On the screen, the curves are drawn with different colors on computers with color video systems, otherwise they are indistinguishable. Several means are available to distinguish one curve from another on device destinations however. Line width or line type can be used as well as color differences. Line types available on pen plotters are solid lines, dashed lines and line of other patterns of dashes and dots. Line thickness can also be used. In addition, the option of using plotting symbols in lieu of lines is offered as another option to the user. Because pen plotters are capable of color, they are the most flexible device for distinguishing curves, and so there are more options available for the pen plotter destinations, than for the laser printer.

Pen Plotter Options

The following is a menu of curve distinguishing methods available for pen plotter destinations:

- C) Solid Line -- Color Variance Only
- S) Line Style Variance Only -- Same Color
- B) Both -- Line Style and Color Variance
- P) Plotting Symbols Only -- Same Color
- Z) Plotting Symbols and Color Variance

The specific colors or the specific line style used for a particular curve are automatically selected by the 'PLOT' program. Pen plotter colors are user controlled by controlling which color pen is placed in which pen holder. The first curve is drawn with pen number two. For pen plotters with more than two pen holders, the pen holders are used sequentially for subsequent curves. For pen plotters with only two pen holders, the pen holders are used alternately for sequential curves. If the pen plotter is in this category (only two pen holders) and color variance is requested from the above menu, the user will be prompted with the question of whether a pause is desired for purposes of changing pens. If this is answered in the affirmative, a notice is posted on the screen when pen changes are needed and the plotting halts until the pens are changed and the message acknowledged.

If a plotting symbol option is selected, a menu of available plotting symbols is displayed and the user is asked to select a symbol (by number) from the list for each curve. While there is no prohibition to selecting the same symbol for more than one curve, this selection might be open to question by a less understanding author. The available symbols are as follows:

<u>Option</u>	<u>Symbol</u>
1	*
2	#
3	+
4	%
5	\$
6	o
7	^
8	.

Once a symbol has been selected for each curve, the user is prompted with the question -- 'Are these symbols correct?' If a mistake was made, a negative reply will offer the opportunity to revise the selections.

Laser Printer Options

The following is the more limited list of curve distinguishing options for the laser printer:

- C) Solid Line with Thickness Variations
- P) Plotting Symbols

The same set of plotting symbols described above for the pen plotters is available for the laser printer.

PLOT STYLE

Plot style is the term used to describe the details of the look of the plot. For example, the presence or absence of grid lines, the presence or absence of a border around the data area of the plot, usually used with tick marks on it. The user is offered a menu choice from the following:

- Grid Options -- Grid Lines -- BOTH Directions (B)
- HORIZONTAL Lines Only (H)
- VERTICAL Lines Only (V)
- Tick Marks Only (T)
- Tick Marks with Border (P)

If a tick mark option is selected (T or P), then no grid lines are drawn on the plot. The only axis lines drawn are the horizontal and vertical lines at the lower edge and the left edge of the plot. If this edge is not zero and zero is within the extent of the plot then another axis line with tick marks is drawn at the zero intercept. The exception to this is for the log axis of a semi-log plot or both axes of a log-log plot. In those cases, the cycle lines are drawn in as axis lines whenever they occur in the plot. Up to seven cycles may be included on a log plot. Tick marks will be placed at the grid spacing on each axis line drawn. Tick mark spacings and grid line spacings are automatic in the 'PLOT' program.

If the 'P' option is selected, the same axis lines are drawn as above, but in addition, the right edge of the plot and the top edge of the plot are bounded by axis lines with tick marks as well. This gives a log-log or semi-log plot a nice appearance. Some may find this look appealing even for a linear plot as well.

This is the final selection before the plot is sent to the destination device. If it is the screen, the plot will appear on the screen within seconds. If the destination is not the screen, a message appears warning the user that the device is about to be activated, and giving the chance to turn it on and armed with paper and pens if it is not already prepared for the plot. Hitting any key at this point begins the plot. Immediate action will be apparent at the pen plotter. The first time a plot is sent to the laser printer, a font is generated and this takes an extra minute or so before the plot is initiated. Otherwise the laser plot takes less than 20 seconds. A complicated pen plotter plot may take more than 2 minutes.

After the plot has been sent to the destination, the user is given the choice of quitting or continuing. The obvious happens if the former option is chosen; execution terminates without further adieu. Selection of the latter option presents the user with the continuation menu.

CONTINUATION MENU OPTIONS

The continuation menu presents the user with a number of options for proceeding from the point where a plot has been successfully completed. The following choices are offered in the menu:

- 1) Start Again -- New Plot
- 2) Re-Draw the Plot
- 3) Add a Curve to an Old Pen-Plotted Plot
- 4) Save the Plot to a File
- 5) Revise the Datafile List and Re-Draw
- 6) Quit

The 'Quit' choice has been offered before and thoroughly explained. The option to add a curve to a previously plotted plot on the pen plotter has also been discussed so it will not be treated again here. The remaining four options deserve some explanation.

Start Again with a New Plot

This selection means that a cold start is made as far as defining the data, scaling the data, defining the type of plot, etc. However, it is not truly a cold start if you don't want it to be as far as the titles, labels, and the line of text are concerned. If the recently completed plot defined these labels and titles, then those definitions are available for the new plot with the flick of the return key. The 'PLOT' program notes that titles and labels have been defined and presents the user with a choice as to whether the return key will mean a blank title or label or whether it will deliver the previously defined title or label. This feature has been found to be particularly useful when generating a family of plots, related to one another, and sharing either the title or perhaps the axis labels. The user is not constrained to use these previously defined labels, as she may always redefine the label.

Re-Drawing the Plot

The option to re-draw the plot is useful either to send the plot to another destination after it has been checked on the screen, or to re-draw the plot after correcting an error in it. Once this option is selected, the user must decide whether any editing is to be done on the plot or not. If no editing is to be done, then the only choice to be made is the plot destination. On the other hand, if the editing option is selected, every data scaling, plot style, label definition and all other choices made in creating the plot originally must be made again, except for declaring the number of curves to be plotted and the data files. It is assumed that the same data is to be plotted since it is a re-draw.

Saving the Plot

The option to save the plot offers the user the chance to create a file of data, named by the user, with the fully defined plot saved in it. If this option is selected, the user is immediately prompted for the name of the file to be used to save the plot data. Should that file already exist, the user is given

the chance to rename the file, or to overwrite the old file of that name.

All aspects of the plot are saved to the file, except for the plot destination and size. However, all features of the plot available peculiar to that destination, such as color distinguishing for the data curves are preserved in the file. Later, the data saved in this manner can be recalled using the 'R' for 'Recall' option described in the section entitled Recall Plot Option. If the user designates the same destination, the same plot will result. If another destination is selected instead, the plot will be as similar as possible. For example, suppose the plot was originally done on the laser printer and had legends and a line of text centered under the title. If the plot was saved and then later recalled with the screen selected as the destination, then no legends would be displayed, and the text would be placed on the upper-right of the plot instead of under the title.

The plot-save option is useful to preserve plots for historical filing or perhaps for use later in a report or presentation. The recalled plot is recreated almost instantly, without effort by the user.

Only one feature of the completed plot is not saved with the plot-save feature. Any revision in the effective extent of the plot data is not saved (see section on Expansion and Contraction of the Plot Range). Any such revision must be recreated when the plot is recalled. In such a case, it is recommended that the plot be recalled to the screen and then redrawn to the desired device and edited to recreate the effective extent of the data.

Revising the DataFile List

Another option from the continuation menu is to revise the datafile list and re-draw the plot. If this option is selected, the user is then asked if the labels and plot format are to be edited. If this is answered in the affirmative, then revisions in the title and labels are permitted as well as changes in the type of plot. For example, the plot type may be changed from linear to semi-log.

Next, a list of curve numbers and the datafiles used to define the data previously plotted is given followed by a menu of revisions options for the datafile list. Those options are as follows:

- S) Substitute a New Datafile for one on the list
- D) Delete a Data file on the list
- A) Add a Datafile to the list
- C) Complete -- no more revisions

The user may change (substitute) a new datafile for one on the list. If this option is chosen, the name of the new datafile will be prompted for as well as its data format, and the curve number of the datafile which it replaces. The file revision menu will then be reprinted on the screen with the revised datafile list, and the user is offered the option to select another revision. This cycle is continuously repeated until the user selects option 'C' for 'Complete.'

If the user elects to delete a datafile, the curve number of the datafile will be requested and the curve eliminated from the list. This causes all subsequent curves to move up the list, as will be displayed on the subsequent menu screen. Again, the user is free to keep deleting files with the exception that the last datafile may not be deleted. There must be at least one file to plot or else the 'PLOT' program becomes just a file handler.

If the user elects to add a datafile, the name of the datafile is requested and the number of curves is increased by one. The new datafile is added at the end of the list. The maximum number of curves (6) may not be exceeded by adding files to the list, but as before, the revision menu is continuously offered until the user indicates by selecting the 'C' option that the revisions are complete.

SAMPLE PLOTS

Samples of many of the plot options are found in the collection of sample plots presented in Appendix A. No full size plot is presented as it would not fit properly in this documentation. Samples generally are report-size, but several are included at half- and quarter-size. In those, the reduced size plot is shown at more than one location on the page.

All the samples were produced on a laser printer. Color plots can be produced on the pen plotters on either transparency or paper, but again are not included as they cannot properly be shown in this media.

The titles designate the features demonstrated in the samples. Single and multiple curve plots are shown. Linear, semi-log and log-log plots are included. Some plots show the tick mark option (with and without the border axes with tick marks) while others show grid lines. On some of the multi-curve samples, legends will be used to differentiate between the curves.

Formal plot options are illustrated on one of the report-size samples.

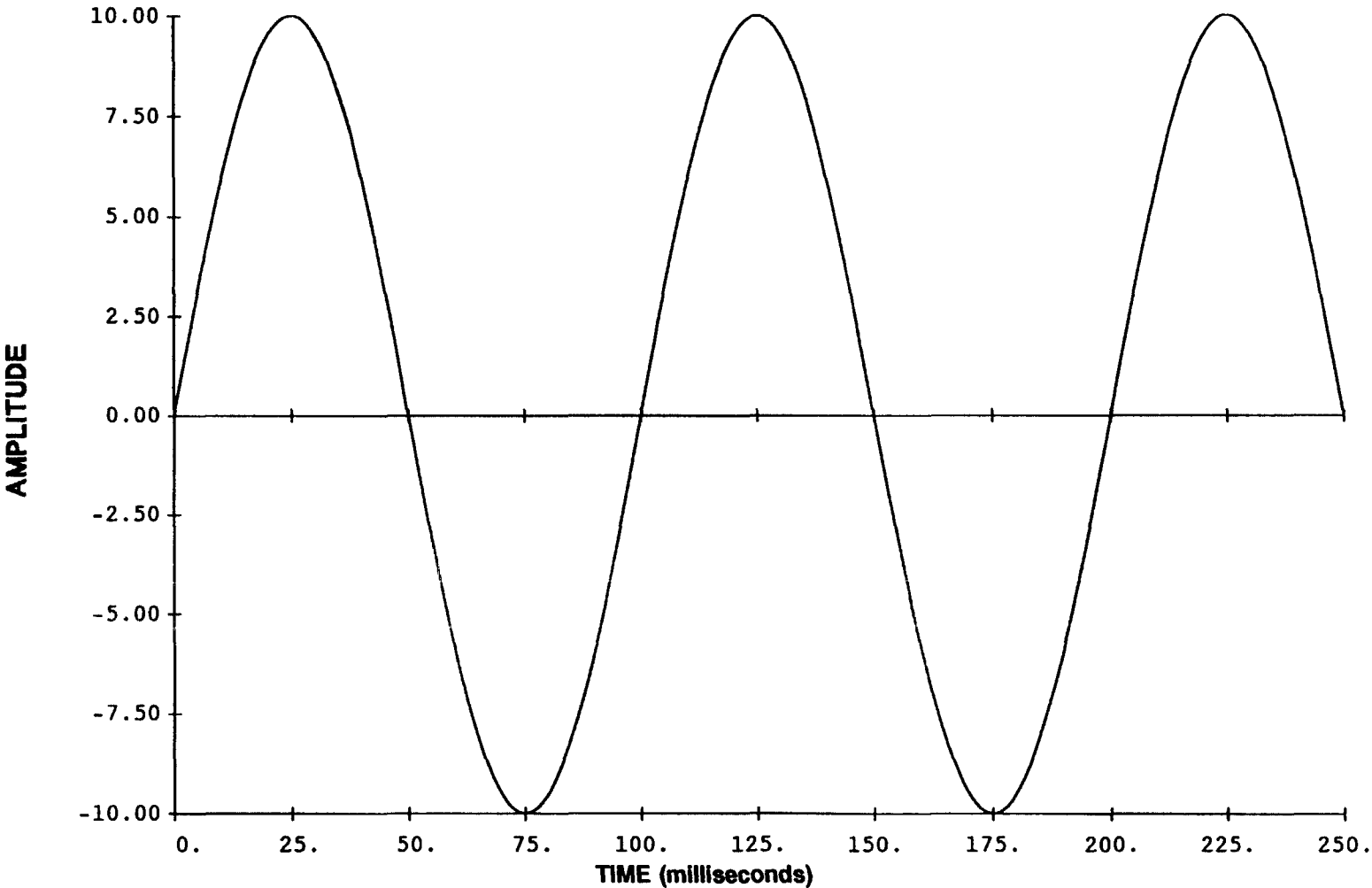
REPORTING DIFFICULTIES AND SUGGESTIONS

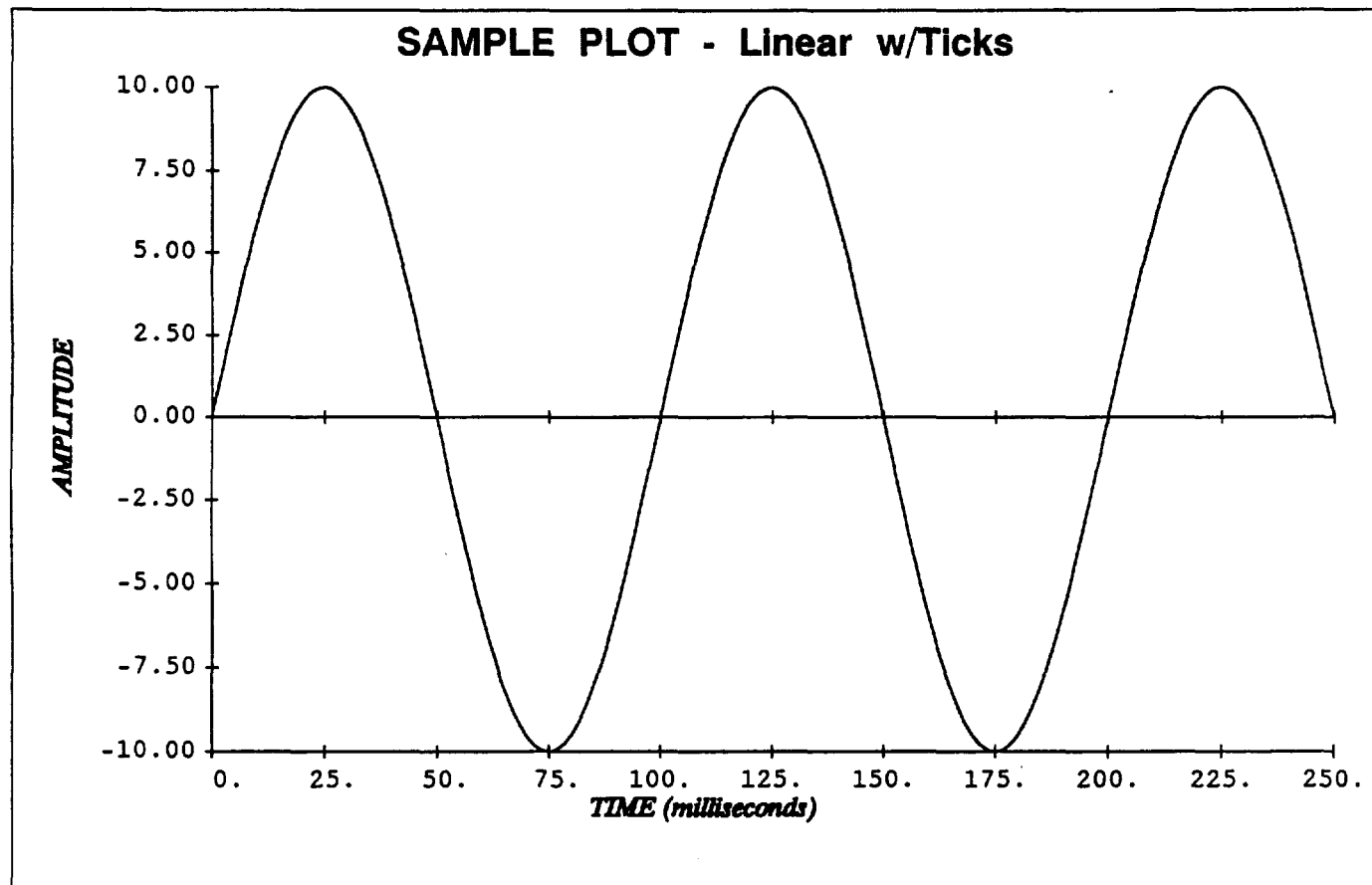
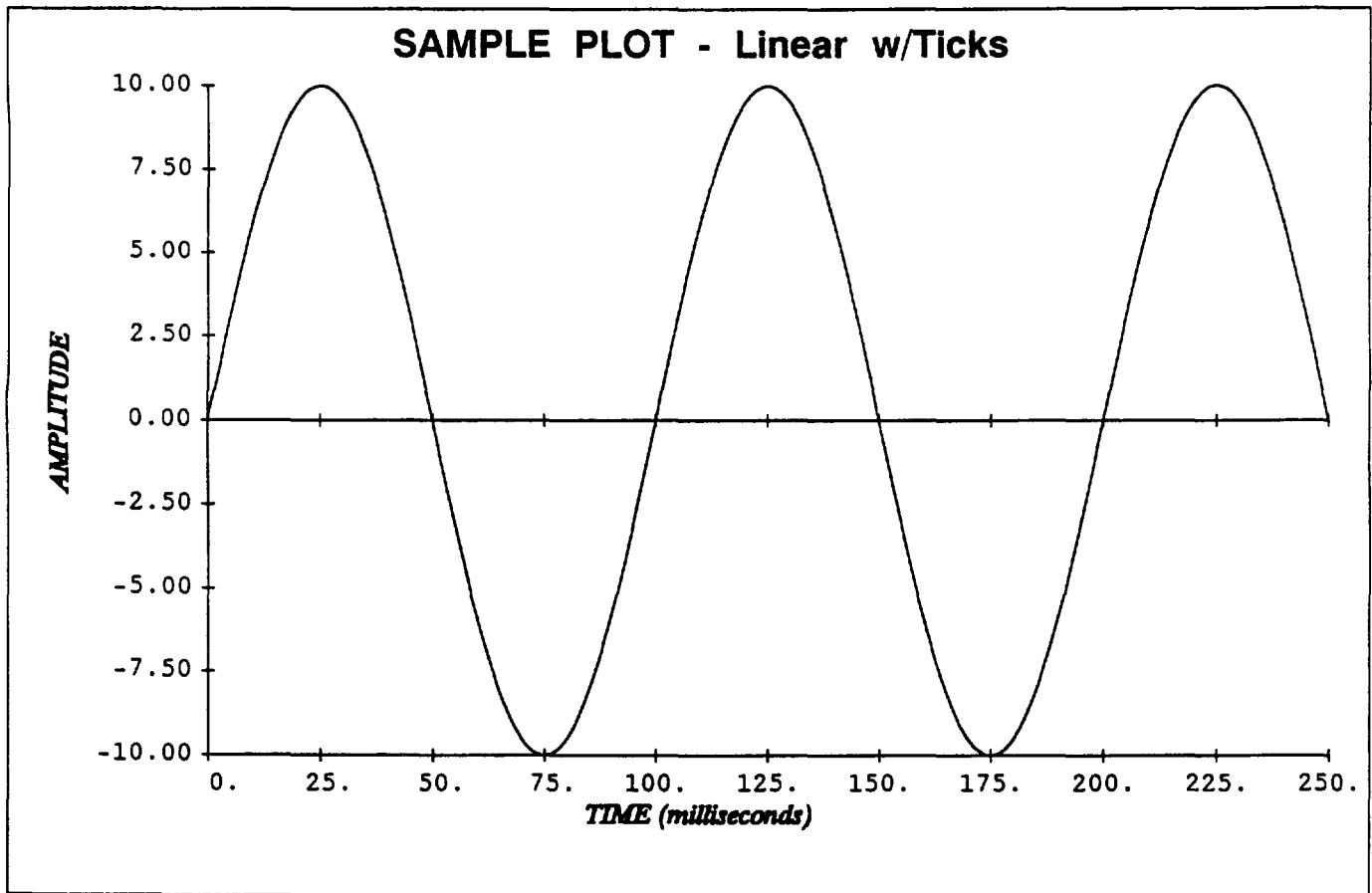
In the off chance that you encounter difficulties either in installation or execution of the 'PLOT' program, the author would appreciate being notified so that your problem can be fixed if possible, and the program can be revised in future updates. If you find that a particular datafile causes you problems, please send a machine-readable copy of the offending datafile with a list of the options you selected in running that datafile with 'PLOT' to the author at DTRC, Code 175.1.

If you find that your use of 'PLOT' would be enhanced by the addition of a new feature, that information would be helpful as well. Also, if you find that one or two features in 'PLOT' are particularly useful to you, the author would appreciate that knowledge as well. That information, particularly, will keep the author from growing surly if nothing but complaints and calls for revisions in 'PLOT' are received.

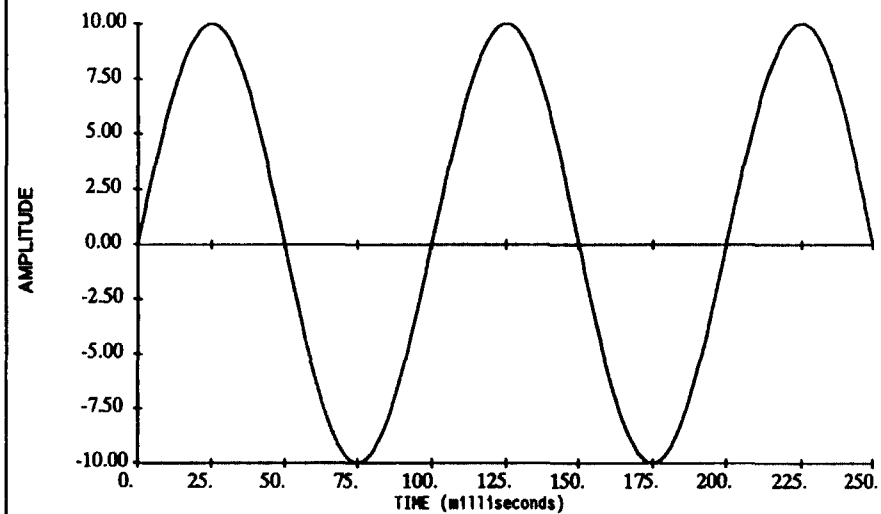
APPENDIX A. Sample Plots

SAMPLE PLOT - Linear w/Ticks



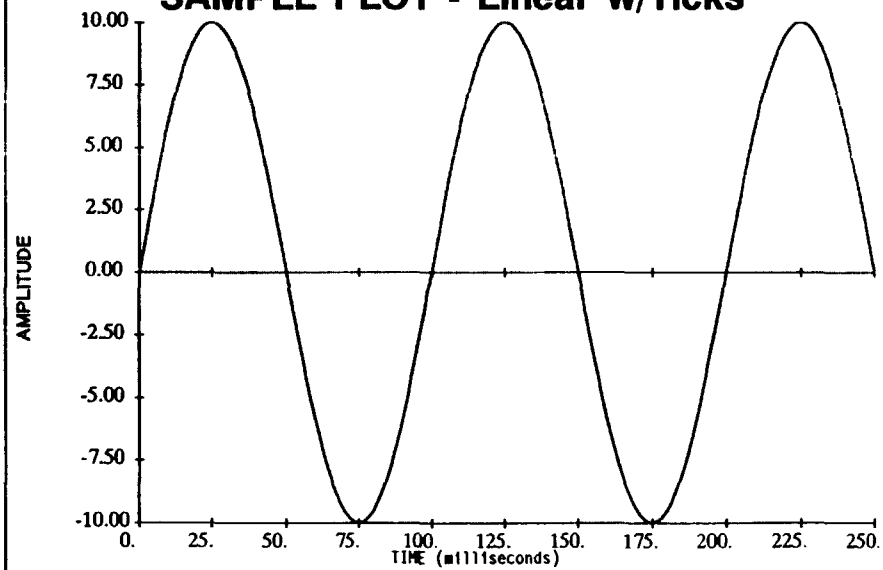


SAMPLE PLOT - Linear w/Ticks

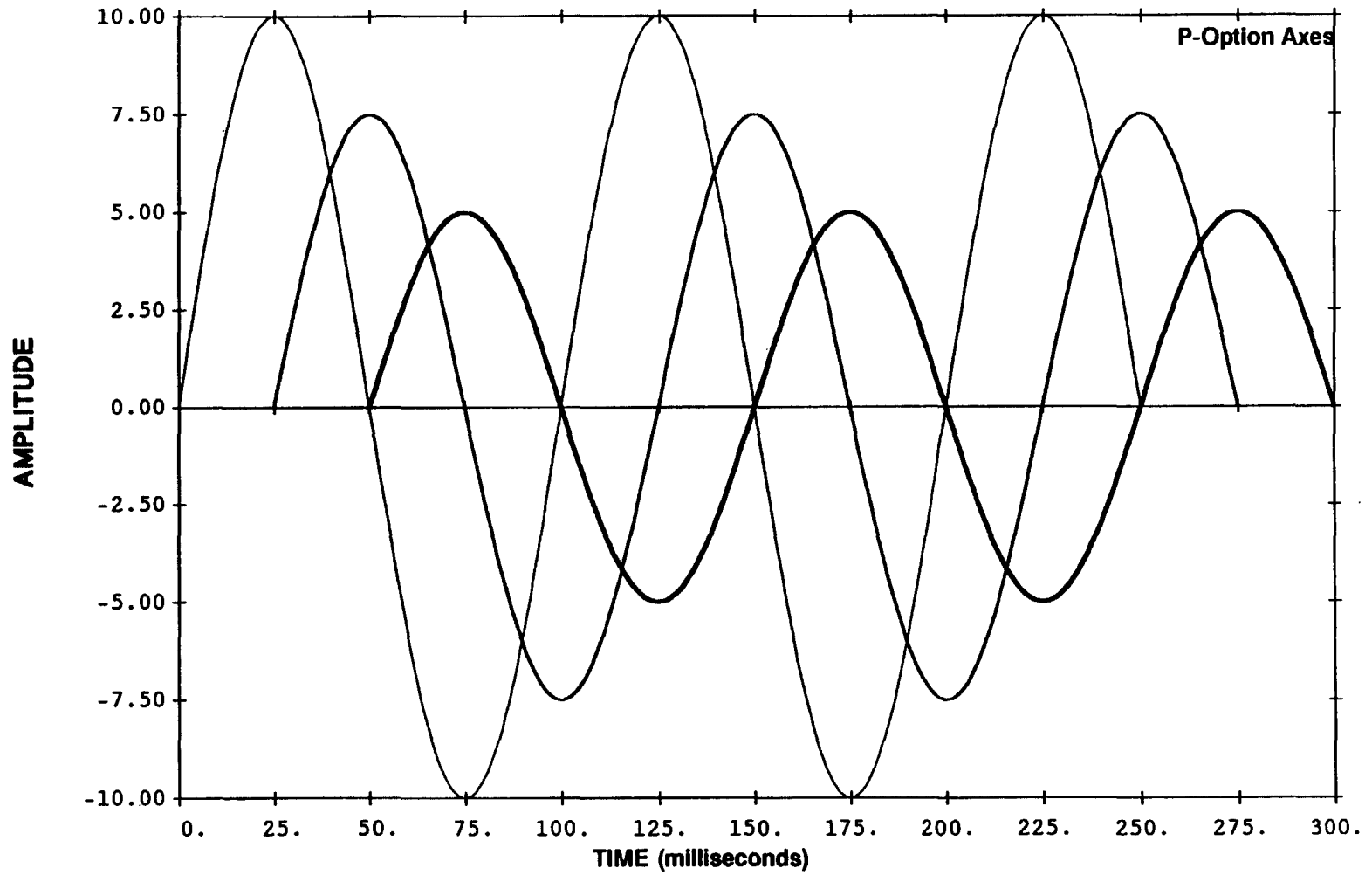


24

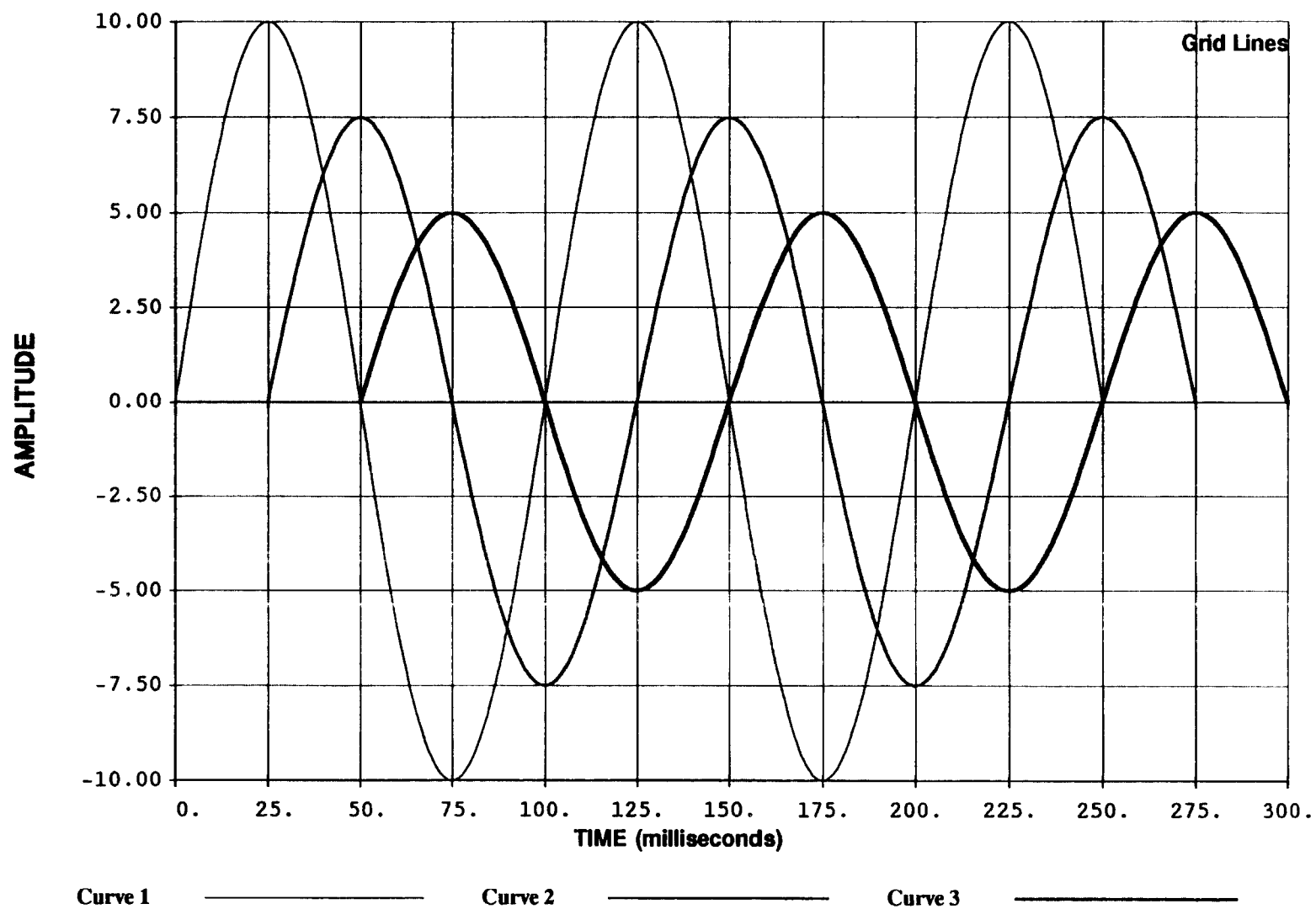
SAMPLE PLOT - Linear w/Ticks



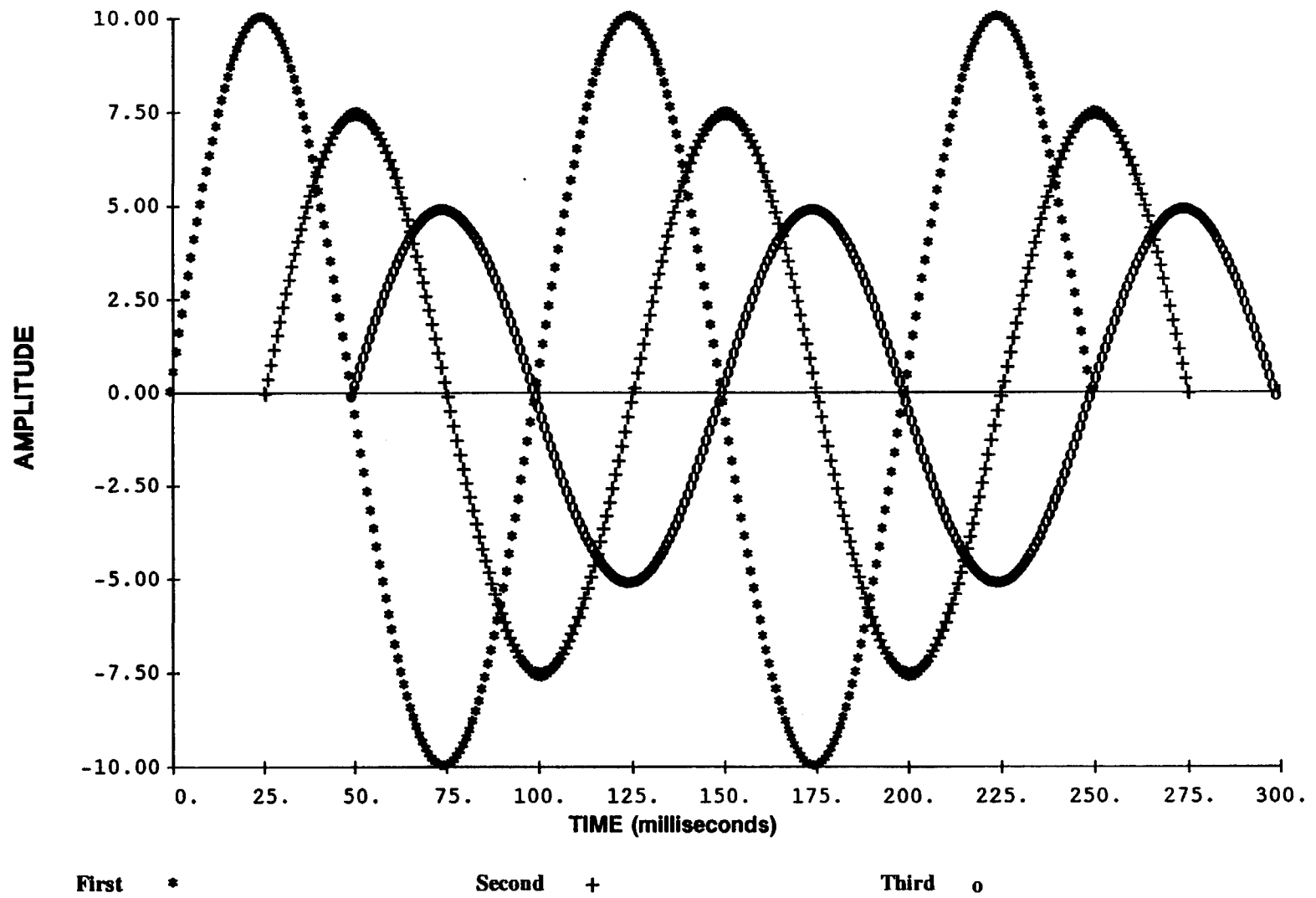
SAMPLE PLOT - Linear w/ Legends

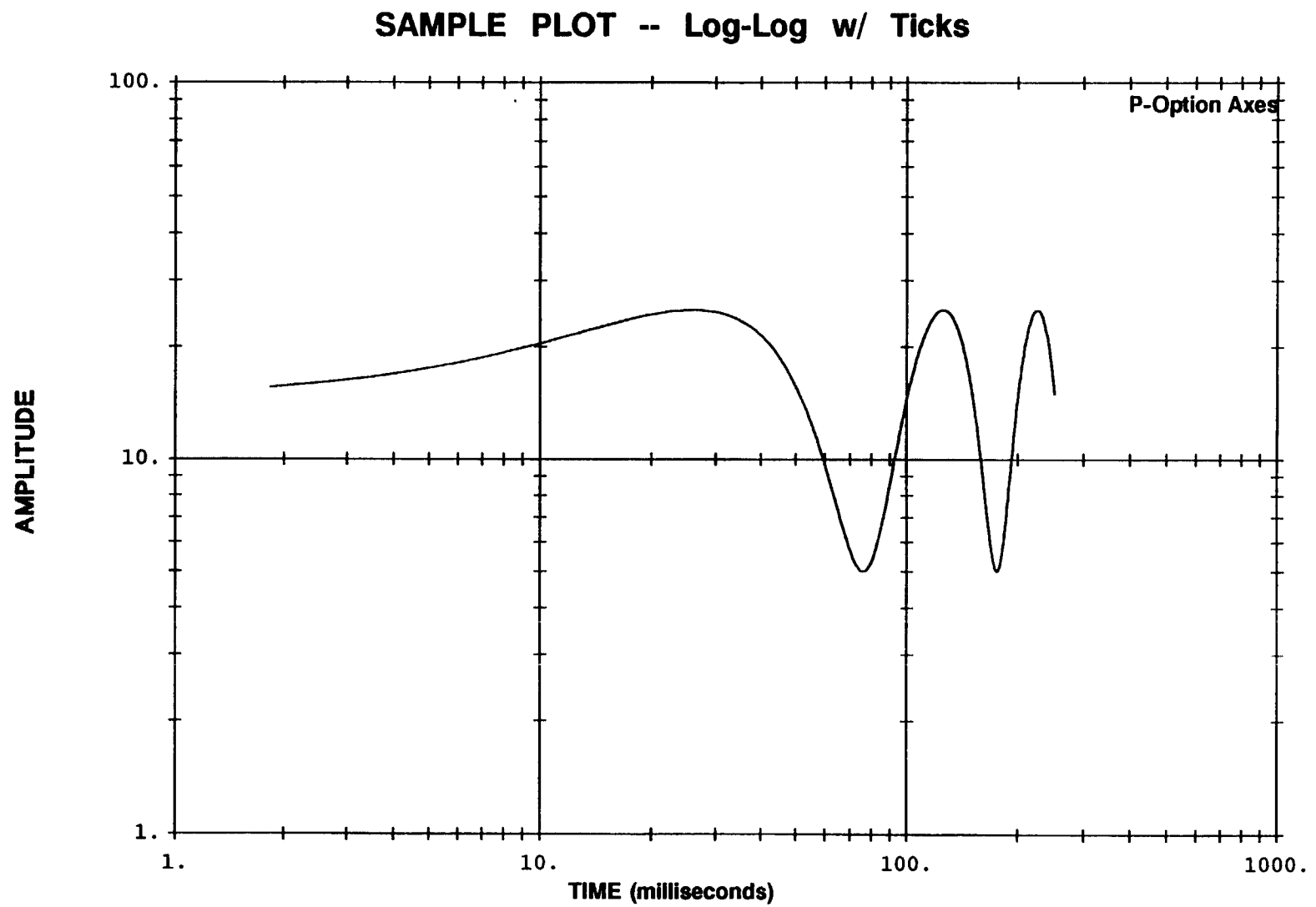


Curve 1 Curve 2 Curve 3

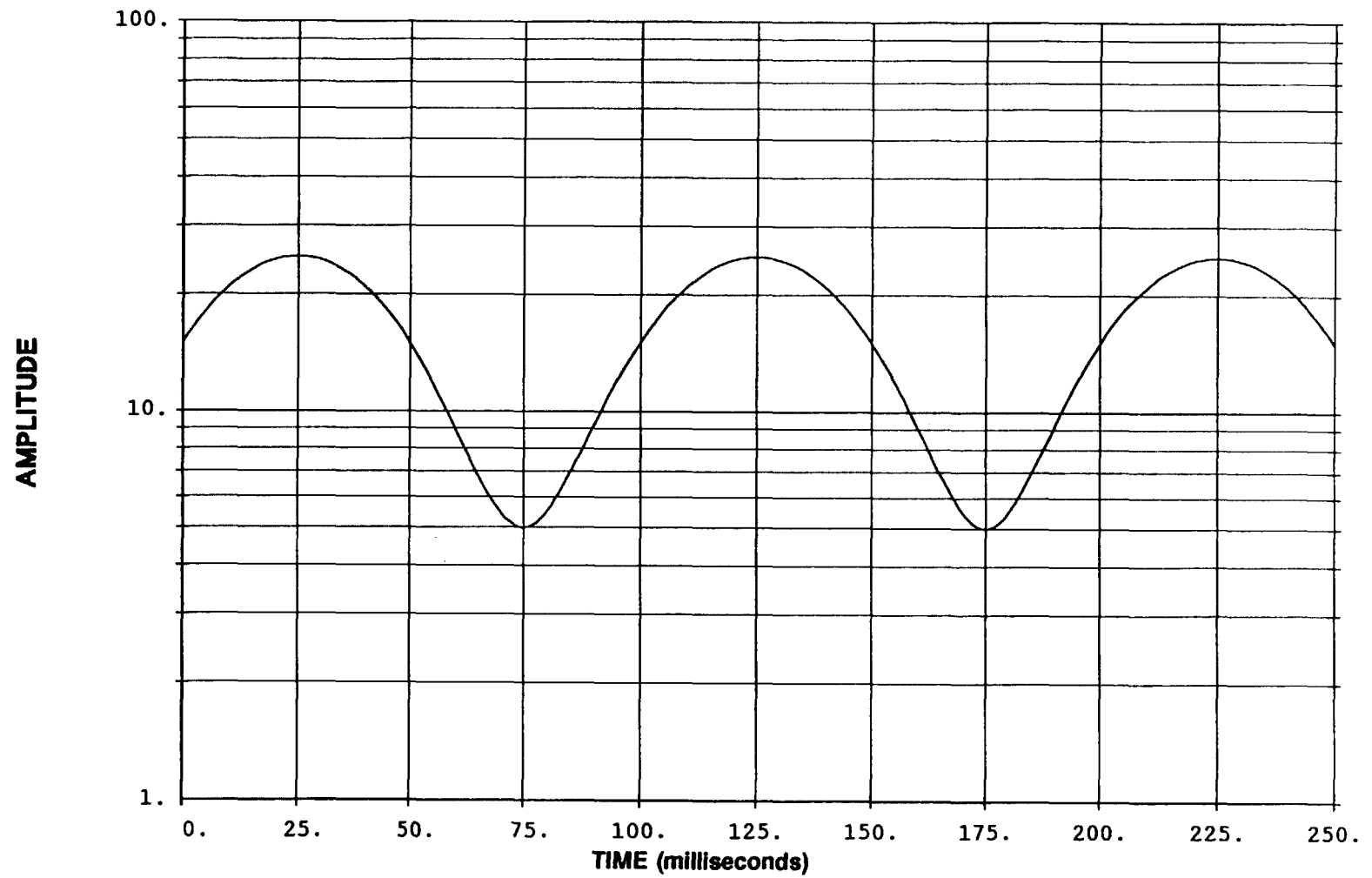
SAMPLE PLOT - Linear w/ Legends

SAMPLE PLOT - Linear w/Symbols & Legends





SAMPLE PLOT - Semi-Log w/grid



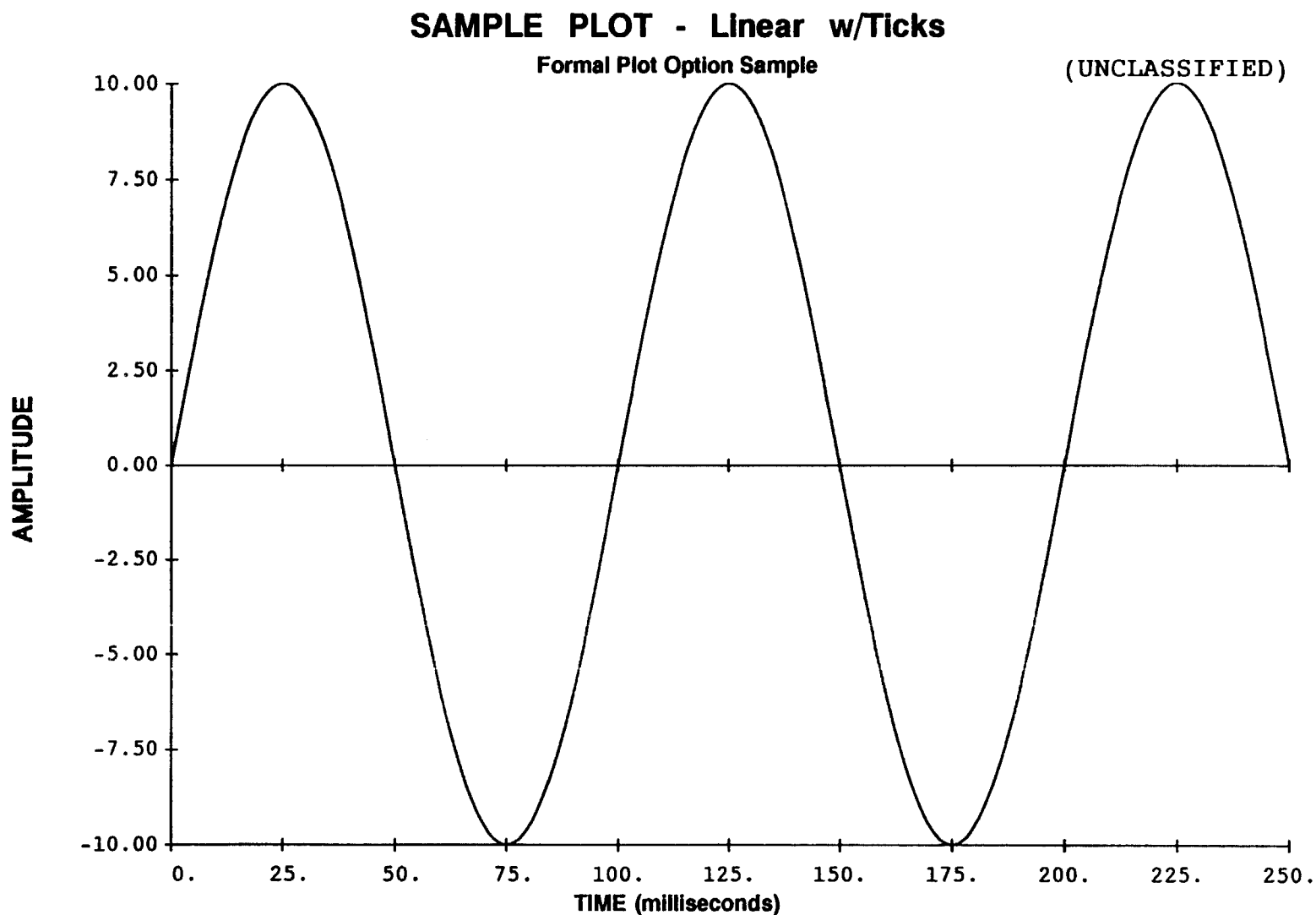
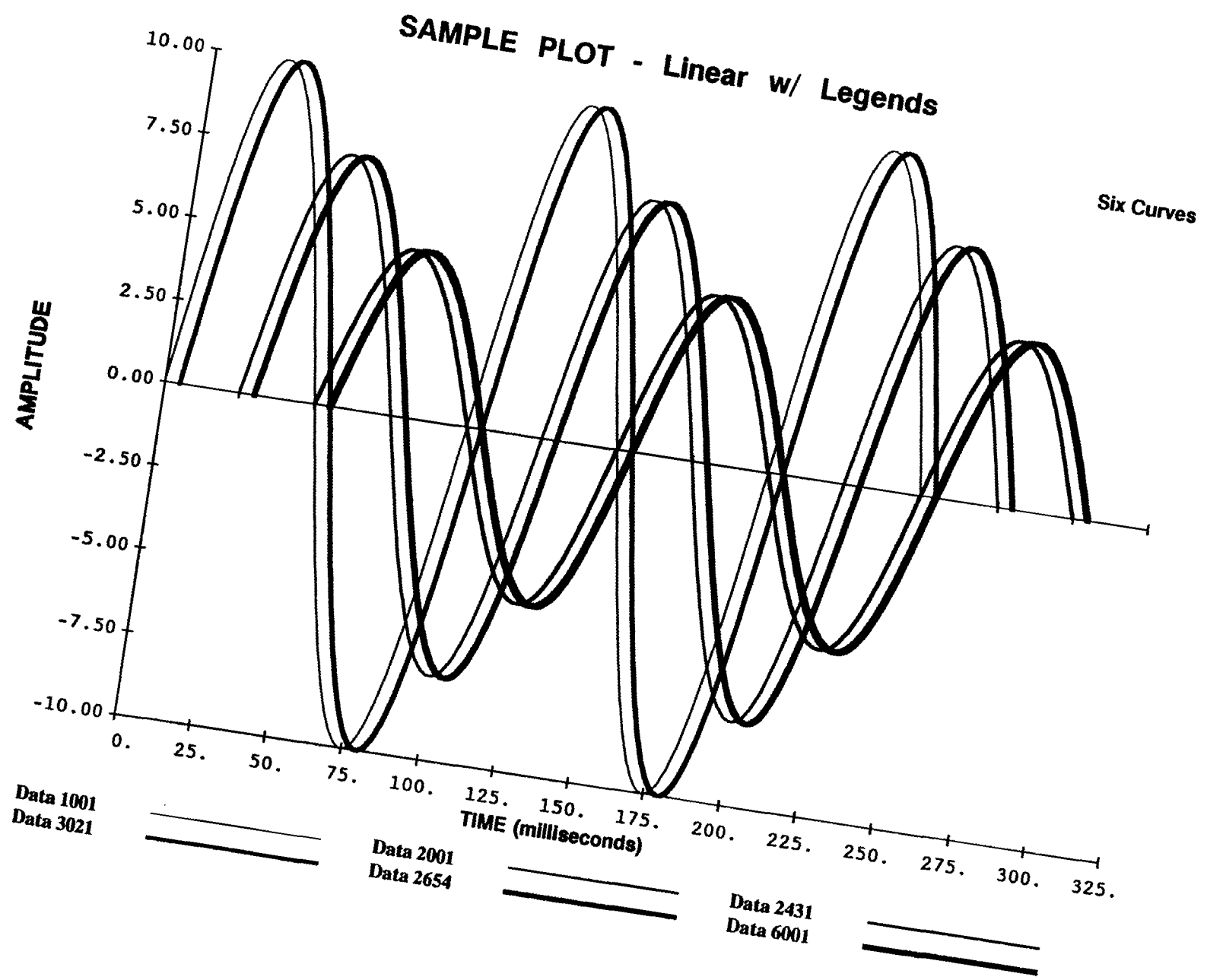
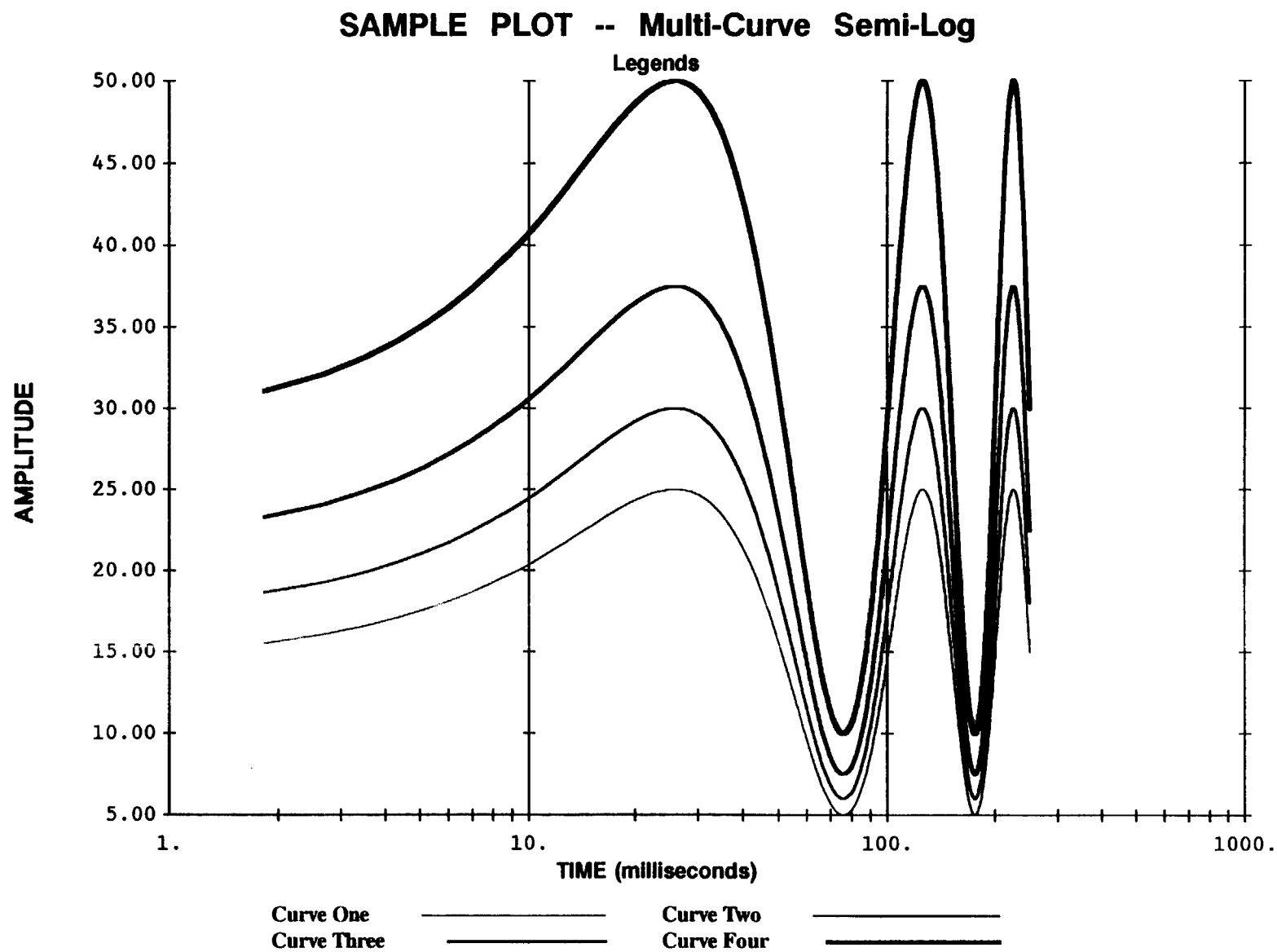


Fig. 41. (U) This is the Formal Figure Title - A FORMAL Figure Option





APPENDIX A. Program Listings

PLOT	34
PLOTMAIN	39
PLOTLASR	72
PLOTPENS	86
PLOTSCRN	99
PLOTSWTP	108

PLOT Listing

```

10 '   PLOT   Program
20 '
30 DIM DTAS$(6),CNMS$(6),NPTS(6),FMT(6),X(6,350),Y(6,350),XMIN(6),XMAX(6),YMIN(6),YMAX(6),DSC(33),
   LGND$(6),PUS$(7),BK(7),LGX(12),LGY(12),AL$(172),MK$(6),MKZ$(6),SYM(6),LGNDOS$(6)
40 COMMON CNMS(),BLANK$,DSC(),DTAS(),NPTS(),FMT(),X(),Y(),XMIN(),XMAX(),YMIN(),YMAX(),MKZ$(),
   PORT,SPORT,XML,XMU,YML,YMU,FFLG,F$,PARFLG
50 COMMON LGND$(),PUS$(),BK(),LGX(),LGY(),NCURVE,XBOT,XBOTE,XTOP,XTOPE,YBOT,YBOTE,YTOP,YTOPE,
   DXGRID,DYGRID,CTYP$,GRID$,TITLE$,TITLEX$,TITLEY$,TXT$,XNDX,YNDX,AL$(),TXTQ$,VERSION$,REVISEFLAG
60 COMMON IBM$,CLR$,TMLP,FG,BG,FG1,EGA$,TXTLOC$,SCALE,PAUZ$,LTYP$,PSIZE$,TITLEO$,TITLEXO$,TITLEYO$,
   TXTO$,LQST$,SYM(),LGNDOS$(),SCRNFLG,TESTQ$,PRGDIR$,LCC,LASTYPE,RFORM,CLASSPLOT$,FORMALTITLE$,
   PENFLG,PAGEQ$,PAGEN$,LASPORT
70 DATA "FIRST","SECOND","THIRD","FOURTH","FIFTH","SIXTH"
80 DATA .001,.002,.005,.01,.02,.025,.05,.1,.2,.25,.5,1,2,2.5,5,10,20,25,50,100,200,250,500,1000,
   2000,2500,5000,10000,20000,25000,50000,100000,200000
90 KEY OFF
100 FOR I=1 TO 6
110 READ CNMS$(I)
120 NEXT I
130 FOR I=1 TO 33
140 READ DSC(I)
150 NEXT I
160 VERSION$="22 February 1990"
170 IBM$="N": EGA$="N"
180 CLR$="N"
190 TMLP=1 : SCRNFLG=0
200 FG=7 : BG=0 : FG1=7
210 GOSUB 680 : REM SUBROUTINE TO CHECK OR CREATE A CONFIGURATION FILE
215 IF CONFLAG > 0 THEN GOSUB 1800 : ' routine to fix a faulty configuration file
220 IF IBM$="Y" AND CLR$="Y" THEN FG=11 : FG1=12
230 BLANK$=""
240 CHAIN PRGDIR$+"plotmain.exe"
250 ' 29 Sept 86 Version added extension of extent to one.
260 ' 4 Oct 86 Version corrected a bug in 3010 of PLOTSCRN
270 ' 10 October '86 added IBM$ for IBM compatibility
280 ' 6 November 86 Version removed an assumption that X's were in order for search for maximums
290 ' 22 Jan 87 version added timing loop for plotter interface problems & CLR$
300 ' 2 Feb 87 version added EGA colors to the screen plotting
310 ' 18 Feb 87 version changed ibm timing loop scheme
320 ' 25 Feb 87 version added two calls to long timing loop at 4795 & 4815
330 ' 2 Mar 87 version changed the timing loops near Start of Plot of 1st curve
340 ' 10 Mar 87 version corrected a bug in the integer extent of the plot
350 ' 11 Mar 87 version added handshaking definition in the open com statements
360 ' 17 Mar 87 version added optional legends and handled extents of 1 better
370 ' 1 Apr 87 version changed length of line pattern and big in legend input
380 ' 3 Apr 87 version added an epsilon to the xtops and ytops calcs
390 ' 20 May 87 version added the SWEET-P Plotter

```

```

400 ' 23 May 87 version added defaults on the titles.
410 ' 3 Jun 87 version added NPTS to summary table and fixed addcurve end bug.
420 ' 9 June 87 version added edit options on titles and data display
430 ' 15 June 87 version added plot symbol options & fixed bug in log plot extent
440 ' 20 June 87 version added plotting symbols for any curve.
450 ' 5 Aug 87 version corrected file list bug
460 ' 30 Sept 87 ver added recall of previous legends and Graphtec Plotters
470 ' 2 Oct 87 ver added save and restart capability
480 ' 19 Oct 87 ver added a configuration option
490 ' 30 Aug 88 ver corrected a bug in the add-a-curve feature with symbols
500 ' 9 Sep 88 ver added a data format option D
510 ' 17 Sep 88 ver revised all input formats to eliminate NPTS definition
520 ' 24 Sep 88 ver added old formats and directory info to cnf file
530 ' 1 Oct 88 ver added windowing of the data plot
540 ' 13 Oct 88 ver corrected a bug causing div zero error when logx plots run
550 ' 2 Dec 88 ver added a report size option with no border
560 ' 21 Jan 89 ver corrected bug in p-grid on log plots
570 ' 3 Feb 89 ver added scale for ALL curves
580 ' 10 April 89 ver added the laser printer capability
590 ' 19 Apr 89 ver refined the graph extent logic with xmu,xml, etc
600 ' 5 May 89 ver fixed a semi-log zero line tick mark bug
610 ' 12 May 89 ver added a file output option
620 ' 7 Jun 89 ver corrected add-a-curve option extent alter bug in plotmain
630 ' 7 Aug 89 ver distinguished between the Kyocera F1010 & the F1000A Lasers
640 ' 11 Dec 89 ver added an error trap for saving a plot file (disk full)
650 ' 15 Jan 90 ver added the formal plot and classification
660 ' 6 Feb 90 ver added page numbers and options to revise file list
661 ' 16 Feb 90 ver corrected the HPGL filename problem
670 END
680 REM SUBROUTINE TO CHECK OR CREATE A CONFIGURATION FILE
690 ON ERROR GOTO 2010
695 CONFLAG=0
700 OPEN "c:\PLOT.CNF" FOR INPUT AS #1
710 INPUT #1, IBM$
720 INPUT #1, CLR$
730 INPUT #1, EGA$
740 INPUT #1, PORT
750 INPUT #1,SPORT
760 INPUT #1,LASTYPE
765 IF LASTYPE = 1 OR LASTYPE = 2 THEN GOTO 770
766 CONFLAG=1 : GOTO 790
770 INPUT #1, LASPORT
775 IF LASPORT = 1 OR LASPORT = 2 THEN GOTO 780
776 CONFLAG=2 : GOTO 790
780 INPUT #1,PRGDIR$
790 CLOSE #1
800 RETURN
810 REM SUBROUTINE TO CREATE THE CONFIGURATION FILE
820 CLS : LOCATE 8,10
830 PRINT " The PLOT Program Configuration File has not been Located"
840 PRINT

```

```

850 PRINT "          Is the Computer System:"
860 PRINT "          A) IBM Compatible"
870 PRINT "          B) Zenith Z-120 Compatible"
880 PRINT
890 PRINT "          Selection (A or B) --- "; : Q$=INPUT$(1) : PRINT ""
900 IF Q$="A" OR Q$="a" THEN IBM$="Y" : GOTO 930
910 IF Q$="B" OR Q$="b" THEN IBM$="N" : GOTO 930
920 GOTO 890
930 PRINT : PRINT
940 PRINT "          Is the Computer/Monitor System:"
950 PRINT "          A) Capable of Color"
960 PRINT "          B) Monochrome"
970 PRINT
980 PRINT "          Selection (A or B) --- "; : Q$=INPUT$(1) : PRINT ""
990 IF Q$="A" OR Q$="a" THEN CLR$="Y" : GOTO 1020
1000 IF Q$="B" OR Q$="b" THEN CLR$="N" : EGA$="N" : CLS : LOCATE 5,1 : GOTO 1110
1010 GOTO 980
1020 CLS : LOCATE 5,1
1030 PRINT "          Is the Computer/Monitor System:"
1040 PRINT "          A) EGA Capable"
1050 PRINT "          B) NOT EGA Capable"
1060 PRINT
1070 PRINT "          Selection (A or B) --- "; : Q$=INPUT$(1) : PRINT ""
1080 IF Q$="A" OR Q$="a" THEN EGA$="Y" : GOTO 1110
1090 IF Q$="B" OR Q$="b" THEN EGA$="N" : GOTO 1110
1100 GOTO 1070
1110 PRINT : PRINT
1120 PRINT "          Do you have a PARALLEL PEN PLOTTER (Y/N) --- "; : Q$=INPUT$(1):PRINT ""
1130 IF Q$="Y" OR Q$="y" THEN GOTO 1160
1140 IF Q$="N" OR Q$="n" THEN PORT=0 : GOTO 1260
1150 GOTO 1120
1160 PRINT : PRINT
1170 PRINT "          Is the Plotter Connected to:"
1180 PRINT "          A) LPT1:"
1190 PRINT "          B) LPT2:"
1200 PRINT
1210 PRINT "          Selection (A or B) --- "; : Q$=INPUT$(1) : PRINT ""
1220 IF Q$="A" OR Q$="a" THEN PORT=1 : GOTO 1250
1230 IF Q$="B" OR Q$="b" THEN PORT=2 : GOTO 1250
1240 GOTO 1210
1250 CLS : LOCATE 5,1
1260 PRINT : PRINT
1270 PRINT "          Do you have a SERIAL PEN PLOTTER (Y/N) --- "; : Q$=INPUT$(1):PRINT ""
1280 IF Q$="Y" OR Q$="y" THEN GOTO 1310
1290 IF Q$="N" OR Q$="n" THEN SPORT=0 : GOTO 1400
1300 GOTO 1270
1310 PRINT : PRINT
1320 PRINT "          Is the Plotter Connected to:"
1330 PRINT "          A) COM1:"
1340 PRINT "          B) COM2:"
1350 PRINT

```

```

1360 PRINT "          Selection (A or B) --- "; : Q$=INPUT$(1) : PRINT ""
1370 IF Q$="A" OR Q$="a" THEN SPORT=1 : GOTO 1400
1380 IF Q$="B" OR Q$="b" THEN SPORT=2 : GOTO 1400
1390 GOTO 1360
1400 CLS : LOCATE 5,1
1410 PRINT "          Do you have a Kyocera LASER Printer (Y/N) --- "; : Q$=INPUT$(1):PRINT ""
1420 IF Q$="Y" OR Q$="y" THEN GOTO 1450
1430 IF Q$="N" OR Q$="n" THEN LASTYPE=2 : LASPORT=1 : GOTO 1550
1440 GOTO 1410
1450 PRINT : PRINT
1460 PRINT "          Is the LASER Printer:"
1470 PRINT "          A) Kyocera F1010"
1480 PRINT "          B) Kyocera F1000A (or later)"
1490 PRINT
1500 PRINT "          Selection (A or B) --- "; : Q$=INPUT$(1) : PRINT ""
1510 IF Q$="A" OR Q$="a" THEN LASTYPE=1 : GOTO 1540
1520 IF Q$="B" OR Q$="b" THEN LASTYPE=2 : GOTO 1540
1530 GOTO 1500
1540 PRINT : PRINT
1541 PRINT "          Is the Laser Printer Connected to:"
1542 PRINT "          1) LPT1:"
1543 PRINT "          2) LPT2:"
1544 PRINT
1545 PRINT "          Selection (1 or 2) --- "; : Q$=INPUT$(1) : PRINT ""
1546 IF Q$="1" THEN LASPORT=1 : GOTO 1549
1547 IF Q$="2" THEN LASPORT=2 : GOTO 1549
1548 GOTO 1545
1549 CLS : LOCATE 5,1
1550 PRINT : PRINT
1560 INPUT " What is the DRIVE:Subdirectory address for the PLOT Program? -- ",PRGDIR$
1570 LTRS=LEN(PRGDIR$)
1580 LAST$=MID$(PRGDIR$,LTRS,1)
1590 IF LAST$="\ " THEN GOTO 1610
1600 PRGDIR$=PRGDIR$+"\ "
1610 OPEN "c:\plot.cnf" FOR OUTPUT AS #1
1615 PRINT #1, IBM$
1620 PRINT #1, CLR$
1630 PRINT #1, EGA$
1640 PRINT #1, PORT
1650 PRINT #1, SPORT
1660 PRINT #1,LASTYPE
1665 PRINT #1,LASPORT
1670 PRINT #1,PRGDIR$
1675 CLOSE #1
1680 RETURN
1800 ' Routine to fix a faulty configuration file
1810 CLS : LOCATE 7,8
1830 PRINT " A Problem has been found with the PLOT Program Configuration File" : PRINT
1840 IF CONFLAG=1 THEN GOSUB 1410 : GOTO 2000 : ' Resume at Laser Printer Model
1850 PRINT "          Which Port does your Kyocera LASER Printer Connect to:"
1860 GOSUB 1542 : ' Resume at Laser Printer Port Definition

```

```
2000 RETURN
2010 IF ERR=53 AND ERL=700 THEN GOSUB 810 : RESUME 800
2015 CLS : LOCATE 7,10 : PRINT " The PLOT Program Configuration File is not" : PRINT "
consistent with the Program version being used." : GOSUB 840 : RESUME 800
2020 END
```

PLOTMAIN Listing

```

100 '          PLOTMAIN
110 '
120 DIM DTAS(6),CNM$(6),NPTS(6),FMT(6),X(6,350),Y(6,350),XMIN(6),XMAX(6),YMIN(6),YMAX(6),DSC(33),LGND$(6),
    PUS$(7),BK(7),LGX(12),LGY(12),AL$(172),MK$(6),MKZ$(6),SYM(6),LGNDOS(6)
130 COMMON CNM$( ),BLANK$,DSC( ),DTAS( ),NPTS( ),FMT( ),X( ),Y( ),XMIN( ),XMAX( ),YMIN( ),YMAX( ),MKZ$( ),PORT,SPORT,
    XML,XMU,YML,YMU,FFLG,F$,PARFLG
140 COMMON LGND$( ),PUS$( ),BK( ),LGX( ),LGY( ),NCURVE,XBOT,XBOTE,XTOP,XTOPE,YBOT,YBOTE,YTOP,YTOPE,DXGRID,DYGRID,
    CTYP$,GRID$,TITLE$,TITLX$,TITLY$,TXT$,XNDX,YNDX,AL$( ),TXTQ$,VERSION$,REVISEFLAG
150 COMMON IBM$,CLR$,TMLP,FG,BG,FG1,EGA$,TXTLOC$,SCALE,PAUZ$,LTYP$,PSIZE$,TITLEO$,TITLEXO$,TITLEYO$,TXTO$,
    LQST$,SYM( ),LGNDOS( ),SCRNFLG,TESTQ$,PRGDIR$,LCC,LASTYPE,RFORM,CLASSPLOT$,FORMALTITLE$,PENFLG,PAGEQ$,
    PAGEN$,LASPORT
155 KEY 1,""
156 ON KEY (1) GOSUB 13230
157 KEY (1) ON
160 ON ERROR GOTO 3070
165 REFFILEFLG=0
170 IF SCRNFLG=1 THEN GOTO 2740
180 COLOR FG,BG
190 REDOFLG=0 : EDTFLG=1
200 CLS : LOCATE 1,19
210 COLOR BG,FG
220 IF CLR$="Y" THEN COLOR BG,10
230 PRINT " T H E   P L O T T E R   P R O G R A M "
240 COLOR FG1,BG
250 LOCATE 2,28 : PRINT "(Version ";VERSION$;)":PRINT
260 IF CLR$="Y" THEN COLOR FG,BG : GOTO 280
270 COLOR FG,BG
280 PRINT "                               Written by"
290 PRINT
300 PRINT "                               William E. Gilbert"
310 PRINT "                               David Taylor Research Center"
330 LOCATE 9,1
340 PRINT " PURPOSE -- This program is written to plot data either to Pen Plotters, a,"
350 PRINT "                               Laser Printer, or to the Screen. It will prepare LINEAR, SEMI-LOG,"
360 PRINT "                               or LOG-LOG Report-Quality plots from several Data Sources."
380 LOCATE 13,1 : COLOR FG1,BG
390 PRINT "                               PLOT DESTINATION OPTIONS"
400 YPOS=20 : NL=7
410 LOCATE 14,31 : IF YPOS=14 THEN COLOR BG,FG ELSE COLOR FG,BG
420 PRINT "1) HP-7470 Plotter"
430 LOCATE 15,31 : IF YPOS=15 THEN COLOR BG,FG ELSE COLOR FG,BG
440 PRINT "2) HP-Color Pro Plotter"
450 LOCATE 16,31 : IF YPOS=16 THEN COLOR BG,FG ELSE COLOR FG,BG
460 PRINT "3) SWEET-P Plotter"
470 LOCATE 17,31 : IF YPOS=17 THEN COLOR BG,FG ELSE COLOR FG,BG
480 PRINT "4) Graphtec MP-2300 - Serial (HP)"
490 LOCATE 18,31 : IF YPOS=18 THEN COLOR BG,FG ELSE COLOR FG,BG
500 PRINT "5) Graphtec MP-2300 - Parallel (HP)"
510 LOCATE 19,31 : IF YPOS=19 THEN COLOR BG,FG ELSE COLOR FG,BG

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520 PRINT "6) Kyocera Laser Printer"
521 LOCATE 20,31 : IF YPOS=20 THEN COLOR BG,FG ELSE COLOR FG,BG
522 PRINT "7) Screen"
523 LOCATE 21,31 : IF YPOS=21 THEN COLOR BG,FG ELSE COLOR FG,BG
524 PRINT "8) HPGL to a File"
530 LOCATE 23,1 : COLOR FG1,BG : PRINT " Type your Choice Number or Arrow to it and hit Return " ;:COLOR
BG,10:PRINT "<F1 to QUIT Anytime>"; : COLOR FG,BG
540 GOSUB 15810 : REM BAR LOCATION
550 IF SELF1G=1 THEN GOTO 590
560 IF YPOS < 14 THEN YPOS=21 : GOTO 410
570 IF YPOS > 21 THEN YPOS=14 : GOTO 410
580 GOTO 410
590 IF P$="" THEN TESTQ$=CHR$(YPOS+35) : GOTO 610
600 TESTQ$=P$
610 COLOR FG,BG
614 FFLG=0
615 CLS : LOCATE 8,1
620 IF TESTQ$="2" THEN PENFLG=1 : PARFLG=0 : GOTO 740
630 IF TESTQ$="1" THEN TESTQ$="2" : PENFLG=0 : PARFLG=0 : GOTO 790
640 IF TESTQ$="4" THEN TESTQ$="2" : PENFLG=1 : PARFLG=0 : GOTO 840
650 IF TESTQ$="5" THEN TESTQ$="2" : PENFLG=1 : PARFLG=1 : GOTO 960
660 IF TESTQ$="3" THEN TESTQ$="1" : GOTO 690
670 IF TESTQ$="7" THEN TESTQ$="3" : GOTO 990
675 IF TESTQ$="6" THEN TESTQ$="4" : GOTO 725
676 IF TESTQ$="8" THEN TESTQ$="2" : FFLG=1 : GOTO 981
680 GOTO 530
690 PRINT " NOTE -- This option will create a file for the SWEET-P Plotter."
700 PRINT
720 GOTO 860
725 PRINT " NOTE -- This option will plot to a Hewlett-Packard Laser Jet Printer."
726 PRINT
727 GOTO 860
730 CLS : LOCATE 8,1
740 PRINT " NOTE -- This option will plot to the HP-Color Pro plotter on a Serial Port."
760 PRINT
770 GOTO 860
790 PRINT " NOTE -- This option will plot to the HP plotter on a Serial Port."
810 PRINT
820 GOTO 860
840 PRINT " NOTE -- This option will plot to the Graphtec plotter set up in serial mode."
850 PRINT
860 IF REDOFLG=1 THEN GOTO 1050
870 PRINT : PRINT " (":COLOR FG1,BG : PRINT "N":COLOR FG,BG :PRINT ")ew Plot, (":COLOR FG1,BG : PRINT
"R":COLOR FG,BG : PRINT ")ecall of a Saved Plot, or (":COLOR FG1,BG : PRINT "A":COLOR FG,BG : PRINT
")dding a curve to a previous plot?"
880 PRINT : PRINT " What is your Selection? (":COLOR FG1,BG : PRINT "N, R, or A":COLOR FG,BG
: PRINT ") -- ";
885 OLD$=INKEY$:IF OLD$="" THEN GOTO 885
886 PRINT ""
890 IF OLD$="N" OR OLD$="n" THEN DATAFLG=0 : REDOFLG=0 : EDTFLG=1 : GOTO 1000
900 IF OLD$="R" OR OLD$="r" THEN OLD$="R" : DATAFLG=1 : GOSUB 14800 : GOTO 1490

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901 IF TESTQ$="3" OR TESTQ$="4" THEN GOTO 905 : ELSE GOTO 930
905 MESS$="          This Option not available to selected destination! "
910 IF OLD$="A" OR OLD$="a" THEN PRINT : PRINT MESS$ : PRINT : GOTO 860
930 IF OLD$="A" OR OLD$="a" THEN OLD$="A" : DATAFLG=0 : GOTO 2740
940 GOTO 870
960 PRINT " NOTE -- This option will plot to the Graphtec plotter set up in Parallel mode."
970 PRINT
980 GOTO 860
981 INPUT "          File destination for HPGL Output -- ",F$
982 GOTO 860
990 PRINT "          NOTE -- This option will plot to the Screen." : PRINT : PRINT : GOTO 860
1000 CLS : LOCATE 8,1
1010 SCAT$="1"
1020 CLOSE
1030 INPUT "          How MANY curves do you wish to put on the plot? (6 is maximum) -- ", NCURVE
1040 PRINT
1050 IF EDTFLG=0 THEN GOTO 1490
1060 GOSUB 12890 : REM GRAPH
1070 IF REDOFLG=1 THEN GOTO 1470
1080 IF NCURVE < 1 OR NCURVE > 6 THEN GOTO 1000
1090 CLS : LOCATE 7,1
1100 PRINT " To Recall Filenames, Type the Drive followed by a colon or subdirectory name.": PRINT : PRINT
1110 IF NCURVE > 1 THEN GOTO 1180
1120 I=1
1130 INPUT " What is the DRIVE:FILENAME for the Curve data? -- ",DTA$(1)
1140 GOSUB 13670 : REM FILENAMES
1150 IF RECALL=1 THEN RECALL=0 : GOTO 1130
1160 OPEN DTA$(1) FOR INPUT AS #2
1170 GOTO 1250
1180 FOR I=1 TO NCURVE
1190 II=I+1
1200 PRINT " What is the DRIVE:FILENAME for the ";CNM$(I);" Curve data? -- ";:INPUT "", DTA$(I)
1210 GOSUB 13670 : REM FILENAMES
1220 IF RECALL=1 THEN RECALL=0 : GOTO 1200
1230 OPEN DTA$(I) FOR INPUT AS #II
1240 NEXT I
1250 GOSUB 9170 : REM FORMATS
1260 CLS
1270 FOR I = 1 TO NCURVE
1280 LOCATE 8,1
1290 II=I+1
1300 PRINT SPACE$(79) : PRINT SPACE$(79) : LOCATE 7,1
1310 PRINT "          Counting data points in ";DTA$(I);" -- Standby . . . . . "
1311 TEMP$="          Reading the data from "+DTA$(I)+" -- Standby . . . . . "
1315 IF FMT(I)=4 THEN GOSUB 19000 : GOTO 1340 : REM COUNT IN D FMT
1330 GOSUB 19160 : REM COUNT
1335 IF FMT(I) = 3 THEN INPUT #II,DELTA
1340 IF NPTS(I) <= 350 THEN GOTO 1440
1350 RDSKP=INT(NPTS(I)/350)+1
1360 LOCATE 10,10 : COLOR BG,FG : PRINT "WARNING --- The number of points in the data set is too large"
1370 LOCATE 11,19 : PRINT "Points will be taken every";RDSKP;"points instead":COLOR FG,BG

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1380 LOCATE 14,22 : PRINT "----- Hit any key to Acknowledge ----- ";:TMP$=INPUT$(1):PRINT ""
1390 LOCATE 10,1
1400 FOR NSP=1 TO 5 : PRINT SPACE$(79) : NEXT NSP
1416 LOCATE 8,1 : PRINT TEMP$
1420 ON FMT(I) GOSUB 10520,10620,10720,10720
1430 GOTO 1450
1440 LOCATE 8,1 : PRINT TEMP$
1445 ON FMT(I) GOSUB 10340,10390,10440,10440
1450 CLOSE #II
1460 NEXT I
1470 IF REVFILEFLG=1 THEN GOSUB 19500 : REVFILEFLG=0 : ' Revise the input data
1475 GOSUB 3160 : REM MINS
1480 IF MODOPT$="5" THEN GOTO 2740
1490 IF REVFILEFLG=1 THEN GOTO 1470
1495 GOSUB 4360 : REM SCALING
1500 IF CTYP$="1" THEN GOTO 1620
1510 GOSUB 10850 : REM LOG SCALE
1520 IF LGFLAG=1 THEN GOTO 1550
1530 IF LGFLAG=9 THEN GOTO 1580
1540 GOTO 1620
1550 PRINT:COLOR BG,FG1:PRINT " ERROR -- You have 0 or Negative data in a LOG Plot -- You CANNOT Continue "
1560 COLOR FG,BG : PRINT "                               Hit Any Key to Start Again ";:TEMP$=INPUT$(1):PRINT ""
1570 GOTO 1610
1580 PRINT:COLOR BG,FG1:PRINT "ERROR--LOG data can't extend more than 7 cycles or below 0.001 --Can't
Continue"
1590 COLOR FG,BG
1600 PRINT "                               Hit Any Key to Start Again ";:TEMP$=INPUT$(1):PRINT ""
1610 GOTO 1000
1620 IF EXTNTFLG = 0 THEN GOTO 1850
1630 PRINT : COLOR BG,FG:PRINT " The total extent of your data is less than 1 in either the X or Y direction
" : COLOR FG,BG
1640 PRINT "If you continue, the plot will have an extent of at least 1 in that direction"
1650 PRINT
1660 PRINT "                               Will you (S)cale the Data or (C)ontinue? (S/C) --- ";:EXT$=INPUT$(1) : PRINT ""
1670 IF EXT$="S" OR EXT$="s" THEN GOTO 1470
1680 IF EXT$="C" OR EXT$="c" THEN GOTO 1700
1690 GOTO 1660
1700 IF EXTNTY=0 THEN GOTO 1770
1710 YLOW=INT(YYMIN)
1720 YHI=INT(YYMAX)
1730 IF ABS(YHI-YYMAX) < .0001 THEN GOTO 1750
1740 YHI=YHI+1
1750 YMIN(1)=YLOW
1760 YMAX(1)=YHI
1770 IF EXTNTX=0 THEN GOTO 1840
1780 XLOW=INT(XXMIN)
1790 XHI=INT(XXMAX)
1800 IF ABS(XHI-XXMAX)<.0001 THEN GOTO 1820
1810 XHI=XHI+1
1820 XMIN(1)=XLOW
1830 XMAX(1)=XHI

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1840 GOTO 1490
1850 IF DATAFLG=1 OR EDTFLG=0 THEN GOTO 1870
1860 GOSUB 4940 : REM GRAPH LABELS
1870 CLS : LOCATE 2,1
1880 IF TESTQ$="3" THEN LTYP$="C" : FOR MN=1 TO NCURVE : SYM(MN)=MN : NEXT MN : GOTO 2430
1890 SCALE=1
1900 IF CLR$="Y" THEN COLOR FG1,BG
1910 PRINT " ----- PLOT STYLE PARAMETER SELECTION -----"
1920 IF CLR$="Y" THEN COLOR FG,BG
1930 PRINT
1940 PRINT "          Plot Size -- FULL SIZE (F)"
1945 PRINT "          REPORT SIZE (R)"
1950 PRINT "          HALF SIZE (H)"
1955 IF TESTQ$="1" THEN GOTO 1970
1960 PRINT "          QUARTER SIZE (Q)"
1970 PRINT
1980 PRINT "          PLOT SIZE OPTION SELECTION (F, R, H, or Q) --- ";PSIZE$=INPUT$(1):PRINT ""
1990 IF PSIZE$="F" OR PSIZE$="f" THEN PSIZE$="F" : GOTO 2010
1991 IF PSIZE$="R" OR PSIZE$="r" THEN PSIZE$="R" : GOTO 2010
1992 IF PSIZE$="H" OR PSIZE$="h" THEN PSIZE$="H" : GOTO 2010
1993 IF TESTQ$="1" THEN GOTO 1980
1995 IF PSIZE$="Q" OR PSIZE$="q" THEN PSIZE$="Q" : GOTO 2010
2000 GOTO 1980
2010 IF PSIZE$="F" OR PSIZE$="R" OR PSIZE$="H" THEN GOTO 2090
2020 PRINT
2030 SCALE=.5
2040 PRINT "          QUARTER-SIZE PLOT LOCATION ON THE PAPER -- 1) Upper Left"
2050 PRINT "          2) Upper Right":PRINT "
3) Lower Left": PRINT "          4) Lower Right":PRINT
2060 PRINT "          LOCATION OPTION SELECTION (1, 2, 3, or 4) --- ";LCC$=INPUT$(1) : PRINT ""
2065 LCC=VAL(LCC$)
2070 IF LCC=1 OR LCC=2 OR LCC=3 OR LCC=4 THEN GOTO 2090
2080 GOTO 2060
2090 IF PSIZE$="H" THEN SCALE=.75
2095 IF PSIZE$="R" THEN SCALE=.875 : GOSUB 8000: ' formal plot questions
2096 IF OLD$="R" THEN GOTO 2280
2100 PRINT
2105 IF TESTQ$="4" THEN FOR MN=1 TO NCURVE : SYM(MN)=MN : NEXT MN : PRINT "          Line Type -- C)
Solid Line with Thickness Variations":PRINT "          P) Plotting Symbols" : PRINT :
GOTO 2200
2110 IF EDTFLG=0 OR DATAFLG=1 THEN GOTO 2320
2120 IF NCURVE=1 THEN PAUZ$="N"
2130 PRINT "          Line Type -- C) Solid Line -- Color Variance Only "
2140 IF NCURVE=1 THEN GOTO 2180
2150 IF TESTQ$="1" THEN PAUZ$="Y" : GOTO 2180
2160 PRINT "          S) Line STYLE Variance only -- Same Color "
2170 PRINT "          B) Both -- Line Style and Color Variance"
2180 PRINT "          P) Plotting Symbols only -- Same Color"
2190 PRINT "          Z) Plotting Symbols and Color Variance" : PRINT
2200 PRINT "          LINE TYPE SELECTION --- ";LTYP$=INPUT$(1):PRINT ""
2210 IF LTYP$="c" THEN LTYP$="C"

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2220 IF LTPP$="s" THEN LTPP$="S"
2230 IF LTPP$="b" THEN LTPP$="B"
2240 IF LTPP$="p" THEN LTPP$="P"
2250 IF LTPP$="z" THEN LTPP$="Z"
2260 IF LTPP$="C" OR LTPP$="S" OR LTPP$="B" OR LTPP$="P" OR LTPP$="Z" THEN GOTO 2280
2270 GOTO 2200
2280 IF TESTQ$="1" AND LTPP$="S" THEN CLS : GOTO 2100
2290 IF TESTQ$="1" AND LTPP$="B" THEN CLS : GOTO 2100
2291 IF TESTQ$="4" AND LTPP$="S" THEN CLS : GOTO 2100
2292 IF TESTQ$="4" AND LTPP$="B" THEN CLS : GOTO 2100
2293 IF TESTQ$="4" AND LTPP$="Z" THEN CLS : GOTO 2100
2300 IF NCURVE=1 AND LTPP$="S" THEN GOTO 2200
2310 IF NCURVE=1 AND LTPP$="B" THEN GOTO 2200
2315 IF OLD$="R" THEN GOTO 2330
2320 IF LTPP$="P" OR LTPP$="Z" THEN SKFLG=1 : SCAT$="2" : GOSUB 13890 : REM SYMBOL
2330 IF NCURVE=1 THEN GOTO 2430
2340 IF TESTQ$="1" OR TESTQ$="4" THEN GOTO 2430
2350 IF LTPP$="S" OR LTPP$="P" OR NCURVE=1 THEN PAUZ$="N" : GOTO 2430
2360 IF PENFLG=1 THEN PAUZ$="N" : GOTO 2430
2370 PRINT
2380 PRINT "                Pauses for Pen Changes -- YES (Y)"
2390 PRINT "                                NO (N)": PRINT
2400 PRINT "                PAUSE OPTION SELECTION (Y or N) --- ": PAUZ$=INPUT$(1):PRINT ""
2410 IF PAUZ$="Y" OR PAUZ$="N" OR PAUZ$="y" OR PAUZ$="n" THEN GOTO 2430
2420 GOTO 2400
2430 CLS : LOCATE 5,1
2440 IF DATAFLG=1 OR EDTFLG=0 THEN GOTO 2560
2450 COLOR FG1,BG
2460 PRINT " ----- PLOT STYLE PARAMETER SELECTION -----"
2470 COLOR FG,BG
2480 PRINT
2490 PRINT "                Grid Options -- GRID Lines -- BOTH Directions (B)"
2500 PRINT "                                HORIZONTAL Lines Only (H)"
2510 PRINT "                                VERTICAL Lines Only (V)"
2520 PRINT "                                TICK Marks Only (T)"
2525 PRINT "                                TICK Marks with Border (P) : PRINT
2530 PRINT "                GRID LINE OPTION SELECTION (B, H, V, T or P) --- ":GRID$=INPUT$(1):PRINT ""
2540 IF GRID$="B" OR GRID$="H" OR GRID$="V" OR GRID$="T" OR GRID$="P" OR GRID$="b" OR GRID$="h" OR GRID$="v"
OR GRID$="t" OR GRID$="p" THEN GOTO 2560
2550 GOTO 2530
2560 IF TESTQ$="1" OR TESTQ$="2" THEN GOTO 2590
2565 IF TESTQ$="4" THEN CHAIN PRGDIR$+"plotlasr.exe"
2570 CLS : LOCATE 12,23 : PRINT "Standby for Screen Plotting . . . . . "
2580 CHAIN PRGDIR$+"PLOTSCRN.exe"
2590 IF TESTQ$="2" THEN GOTO 2595
2591 IF TESTQ$="1" THEN PRINT : PRINT "                Standby . . . ": GOTO 2610
2595 IF FFLG=1 THEN GOTO 2650
2596 PRINT : PRINT : PRINT "                PLOTTER Ready? ": PRINT "
<Hit Any Key to Start the Plot>" ;:QQ$=INPUT$(1): PRINT ""
2600 PRINT : PRINT : PRINT "                Plotting Underway, Standby . . . . . "
2610 IF TESTQ$="1" THEN CHAIN PRGDIR$+"PLOTSWTP.EXE"

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2650 CHAIN PRGDIR$+"PLOTPEXS.EXE"
2740 CLS : LOCATE 8,1
2750 COLOR FG1,BG
2760 PRINT " ----- PLOTTER PROGRAM COMPLETE ----- "
2770 COLOR FG1,BG : LOCATE 10,11 : PRINT "OPTIONS TO CONTINUE --"
2780 YPOS=10 : DATAFLG=0
2790 NL=5
2800 LOCATE 10,35 : IF YPOS=10 THEN COLOR BG,FG : ELSE COLOR FG,BG
2810 PRINT "1) Start Again -- New Plot"
2820 LOCATE 11,35 : IF YPOS=11 THEN COLOR BG,FG : ELSE COLOR FG,BG
2830 PRINT "2) Re-Draw the Plot"
2840 LOCATE 12,35 : IF YPOS=12 THEN COLOR BG,FG : ELSE COLOR FG,BG
2850 PRINT "3) Add a Curve to an Old Pen-Plotted Plot"
2860 LOCATE 13,35 : IF YPOS=13 THEN COLOR BG,FG : ELSE COLOR FG,BG
2870 PRINT "4) Save the Plot to a File"
2875 LOCATE 14,35 : IF YPOS=14 THEN COLOR BG,FG : ELSE COLOR FG,BG
2876 PRINT "5) Revise the Datafile List and Re-Draw"
2880 LOCATE 15,35 : IF YPOS=15 THEN COLOR BG,FG : ELSE COLOR FG,BG
2890 PRINT "6) Quit"
2900 PRINT
2910 LOCATE 17,1 : COLOR FG1,BG : PRINT "      Arrow to your choice and Hit return or Type the Choice Number
";
2920 GOSUB 15810 : REM BAR LOCATION
2930 IF SELFLG=1 THEN GOTO 2970
2940 IF YPOS < 10 THEN YPOS=15 : GOTO 2800
2950 IF YPOS > 15 THEN YPOS=10 : GOTO 2800
2960 GOTO 2800
2970 IF P$="" THEN CTN$=CHR$(YPOS+39) : GOTO 2990
2980 CTN$=P$
2990 COLOR FG,BG
3000 IF CTN$="6" THEN GOSUB 13230 : REM SIGN-OFF
3010 IF CTN$="1" THEN REDOFLG=0 : EDTFLG=1 : PAGEQ$="N" : GOTO 200
3020 IF CTN$="2" THEN REDOFLG=1 : GOSUB 15550 : GOTO 200
3025 IF CTN$="5" THEN REVFILEFLG=1 : REDOFLG=1 : GOSUB 15550 : GOTO 200
3030 IF CTN$="3" AND TESTQ$="3" THEN PRINT : PRINT : COLOR FG1,BG : PRINT " This Option NOT AVAILABLE to the
SCREEN -- Hit any key to Continue " : Q$=INPUT$(1) : GOTO 2740
3040 IF CTN$="3" THEN REDOFLG=0 : OLD$="A" : DATAFLG=0 : GOSUB 9480: REM SUBROUTINE TO ADD A CURVE
3050 IF CTN$="4" THEN GOSUB 15130 : REM SAVE THE PLOT
3060 GOTO 2740
3070 MSG$=" ***** FILE NOT FOUND --- Respecify *****"
3075 IF ERR=53 AND ERL=1160 THEN PRINT :PRINT MSG$: RESUME 1130
3080 IF ERL=13730 THEN PRINT : PRINT " ***** DRIVE OR DIRECTORY NOT RECOGNIZEABLE -- TRY AGAIN
***** " : PRINT : COLOR FG,BG : RESUME 13750
3090 IF ERR=53 AND ERL=1230 THEN PRINT :PRINT MSG$: RESUME 1200
3100 IF ERR=53 AND ERL=9610 THEN PRINT :PRINT MSG$: RESUME 9580
3110 IF ERR=53 AND ERL=14870 THEN PRINT :PRINT MSG$: RESUME 14840
3120 IF ERR=62 AND ERL=13810 THEN RESUME 13840
3130 IF ERR=53 AND ERL=15210 THEN RESUME 15260
3131 IF ERR=62 AND ERL=15100 THEN CLASSPLOT$="" : FORMALTITLE$="" : RFORM=1 : PAGEQ$="N" : RESUME 15110
3135 IF ERR=61 THEN PRINT " DISK FULL --": RESUME 15180
3136 IF ERR=53 AND ERL=20095 THEN PRINT :PRINT MSG$: RESUME 20070

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3140 PRINT : PRINT " ---- Non-Standard End, ERROR NUMBER = ";ERR;" at line number ";ERL:PRINT
3150 END
3160 REM MINS AND MAXES
3170 PUI$= " #   ###   \           \ #####.### #####.### #####.### #####.###"
3180 CLS :LOCATE 3,1
3190 COLOR FG1,BG
3200 PRINT " ----- MINIMUM AND MAXIMUM AMPLITUDES -----"
3210 COLOR BG,FG : LOCATE 5,17
3220 PRINT "NOTE -- Maximum Allowable Extent of X or Y is 32,000"
3230 COLOR FG,BG
3240 PRINT " CURVE   SIZE      FILE NAME      X-MIN      X-MAX      Y-MIN      Y-MAX":PRINT
3250 FOR I=1 TO NCURVE
3260 XMIN(I)=X(I,1) : XMAX(I)=X(I,1)
3270 YMIN(I)=Y(I,1) : YMAX(I)=Y(I,1)
3280 FOR N=2 TO NPTS(I)
3290 IF X(I,N) > XMAX(I) THEN XMAX(I)=X(I,N)
3300 IF X(I,N) < XMIN(I) THEN XMIN(I)=X(I,N)
3310 IF Y(I,N) > YMAX(I) THEN YMAX(I)=Y(I,N)
3320 IF Y(I,N) < YMIN(I) THEN YMIN(I)=Y(I,N)
3330 NEXT N
3340 PRINT USING PUI$; I,NPTS(I),DTA$(I),XMIN(I),XMAX(I),YMIN(I),YMAX(I)
3350 NEXT I
3360 PRINT : PRINT
3370 COLOR FG1,BG
3380 PRINT " ----- OPTIONS TO MODIFY THE DATA SETS SELECTED ----- "
3390 COLOR FG,BG
3400 PRINT
3410 PRINT "          1) Accept all data as entered."
3420 PRINT "          2) SCALE the X-AXIS AMPLITUDE of data"
3430 PRINT "          3) SHIFT the X-AXIS of data"
3440 PRINT "          4) SCALE the Y-AXIS AMPLITUDE of data"
3450 PRINT "          5) QUIT"
3460 PRINT
3470 PRINT "          Which option is selected? (1, 2, 3, 4, or 5) --- " :MODOPT$=INPUT$(1):PRINT ""
3480 PRINT
3490 IF MODOPT$="1" THEN GOTO 3550
3500 IF MODOPT$="5" THEN GOTO 3670
3510 IF MODOPT$="2" OR MODOPT$="3" OR MODOPT$="4" THEN GOTO 3530
3520 GOTO 3470
3530 GOSUB 3680 : REM SCALE OR SHIFT
3540 IF MODOPT$="5" THEN GOTO 3670
3550 FOR I=1 TO NCURVE
3560 IF ABS(XMIN(I)) > 32000 OR ABS(XMAX(I)) > 32000 THEN GOTO 3640
3570 IF ABS(YMIN(I)) > 32000 OR ABS(YMAX(I)) > 32000 THEN GOTO 3640
3600 NEXT I
3610 GOTO 3660
3620 PRINT : COLOR BG,FG1 : PRINT " *** UNACCEPTABLE -- One of the curves is less than 1.0 in X- or Y-
length *** " :COLOR FG,BG
3630 GOTO 3470
3640 PRINT : COLOR BG,FG1: PRINT " **** UNACCEPTABLE -- At least one of the curves exceeds allowable limits
**** " :COLOR FG,BG

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3650 GOTO 3470
3660 PRINT "                      Standby . . . . . ."
3670 RETURN
3680 REM SCALE OR SHIFT
3690 GOTO 3970
3700 CLS :LOCATE 3,1
3710 COLOR FG1,BG
3720 PRINT " ----- MINIMUM AND MAXIMUM AMPLITUDES -----"
3730 COLOR BG,FG : LOCATE 5,17
3740 PRINT "NOTE -- Maximum Allowable Extent of X or Y is 32,000"
3750 COLOR FG,BG
3760 PRINT " CURVE   SIZE      FILE NAME      X-MIN      X-MAX      Y-MIN      Y-MAX":PRINT
3770 FOR I=1 TO NCURVE
3780 PRINT USING PU1$; I,NPTS(I),DTAS(I),XMIN(I),XMAX(I),YMIN(I),YMAX(I)
3790 NEXT I
3800 PRINT : PRINT
3810 COLOR FG1,BG
3820 PRINT " ----- OPTIONS TO MODIFY THE DATA SETS SELECTED ----- "
3830 COLOR FG,BG
3840 PRINT
3850 PRINT "          1) Accept all data as entered."
3860 PRINT "          2) SCALE the X-AXIS AMPLITUDE of data"
3870 PRINT "          3) SHIFT the X-AXIS of data"
3880 PRINT "          4) SCALE the Y-AXIS AMPLITUDE of data"
3890 PRINT "          5) QUIT"
3900 PRINT
3910 PRINT "          Which option is selected? (1, 2, 3, 4 or 5) --- ";;MODEPT$=INPUT$(1):PRINT ""
3920 PRINT
3930 ' START OF SCALING
3940 IF MODEPT$="1" THEN GOTO 4350
3950 IF MODEPT$="2" OR MODEPT$="3" OR MODEPT$="4" OR MODEPT$="5" THEN GOTO 3970
3960 GOTO 3910
3970 '
3980 IF MODEPT$="5" THEN GOTO 4350
3990 IF NCURVE=1 THEN NMOD=1: NMOD$="x" : GOTO 4020
4000 PRINT "          Which CURVE Number is to be modified ";;COLOR FG1,0 : PRINT "(A for all)";:COLOR FG,0 :
PRINT "? --- ";;NMOD$=INPUT$(1) : PRINT ""
4001 IF NMOD$="A" OR NMOD$="a" THEN NMOD$="A" : GOTO 4020
4002 NMOD=VAL(NMOD$)
4010 IF NMOD > NCURVE THEN GOTO 4000
4020 PRINT
4030 IF MODEPT$="3" THEN GOTO 4270
4040 IF MODEPT$="2" THEN GOTO 4160
4050 PRINT "          Each Y-AXIS value will be MULTIPLIED by the SCALE FACTOR"
4060 INPUT "          Specify the SCALE Factor for the AMPLITUDE --- ",SCALE
4065 IF NMOD$="A" THEN GOTO 4066 : ELSE GOTO 4070
4066 FOR NMOD=1 TO NCURVE
4070 FOR I=1 TO NPTS(NMOD)
4080 Y(NMOD,I)=Y(NMOD,I)*SCALE
4090 NEXT I
4100 YMIN(NMOD)=YMIN(NMOD)*SCALE

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4110 YMAX(NMOD)=YMAX(NMOD)*SCALE
4120 YTEMP1=YMAX(NMOD) : YTEMP2=YMIN(NMOD)
4130 IF YTEMP2 > YMAX(NMOD) THEN YMAX(NMOD)=YTEMP2
4140 IF YTEMP1 < YMIN(NMOD) THEN YMIN(NMOD)=YTEMP1
4145 IF NMOD$="A" THEN GOTO 4148 : ELSE GOTO 4150
4148 NEXT NMOD
4150 GOTO 3700
4160 PRINT "          Each X-AXIS value will be MULTIPLIED by the SCALE FACTOR"
4170 INPUT "          Specify the SCALE Factor for the X-AXIS --- ",SCALE
4175 IF NMOD$="A" THEN GOTO 4176 : ELSE GOTO 4180
4176 FOR NMOD=1 TO NCURVE
4180 FOR I=1 TO NPTS(NMOD)
4190 X(NMOD,I)=X(NMOD,I)*SCALE
4200 NEXT I
4210 XMIN(NMOD)=XMIN(NMOD)*SCALE
4220 XMAX(NMOD)=XMAX(NMOD)*SCALE
4230 XTEMP1=XMAX(NMOD) : XTEMP2=XMIN(NMOD)
4240 IF XTEMP2 > XMAX(NMOD) THEN XMAX(NMOD)=XTEMP2
4250 IF XTEMP1 < XMIN(NMOD) THEN XMIN(NMOD)=XTEMP1
4255 IF NMOD$="A" THEN GOTO 4256 : ELSE GOTO 4260
4256 NEXT NMOD
4260 GOTO 3700
4270 PRINT "  A Positive SHIFT in the X-AXIS ADDS the shift value to each X-value"
4280 INPUT "          Specify the X-AXIS SHIFT Value --- ",SHIFT
4285 IF NMOD$="A" THEN GOTO 4286 : ELSE GOTO 4290
4286 FOR NMOD=1 TO NCURVE
4290 FOR I=1 TO NPTS(NMOD)
4300 X(NMOD,I)=X(NMOD,I)+SHIFT
4310 NEXT I
4320 XMIN(NMOD)=XMIN(NMOD)+SHIFT
4330 XMAX(NMOD)=XMAX(NMOD)+SHIFT
4335 IF NMOD$="A" THEN GOTO 4336 : ELSE GOTO 4340
4336 NEXT NMOD
4340 GOTO 3700
4350 RETURN
4360 ' PLOT SCALING
4370 ' DELTA GRID
4380 YYMIN=YMIN(1) : YYMAX=YMAX(1)
4390 XXMIN=XMIN(1) : XXMAX=XMAX(1)
4400 IF NCURVE = 1 THEN GOTO 4465
4410 FOR I=2 TO NCURVE
4420 IF YMIN(I) < YYMIN THEN YYMIN=YMIN(I)
4430 IF YMAX(I) > YYMAX THEN YYMAX=YMAX(I)
4440 IF XMIN(I) < XXMIN THEN XXMIN=XMIN(I)
4450 IF XMAX(I) > XXMAX THEN XXMAX=XMAX(I)
4460 NEXT I
4465 GOSUB 16200 : REM REVISE EXTENT
4470 IF CTYP$="3" OR CTYP$="4" THEN GOTO 4500
4480 IF INT(YYMIN+.0001)+1 < INT(YYMAX+.0001) THEN GOTO 4500
4490 YYMIN=INT(YYMIN+.0001)
4500 IF CTYP$="2" OR CTYP$="4" THEN GOTO 4530

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4510 IF INT(XXMIN+.0001)+1 < INT(XXMAX+.0001) THEN GOTO 4530
4520 XXMIN=INT(XXMIN+.0001)
4530 EXTNTFLG=0 : EXTNTY=0 : EXTNTX=0
4540 IF CTYP$="4" THEN GOTO 4930
4550 IF CTYP$="3" THEN GOTO 4570
4560 IF YYMAX-YYMIN < 1 THEN YYOLD=YYMAX : YYMAX=YYMIN+1 : EXTNTFLG=1 : EXTNTY=1
4570 IF CTYP$="2" THEN GOTO 4590
4580 IF XXMAX-XXMIN < 1 THEN XXOLD=XXMAX : XXMAX=XXMIN+1 : EXTNTFLG=1 : EXTNTX=1
4590 DYTOT=(YYMAX-YYMIN)/7.5
4600 DXTOT=(XXMAX-XXMIN)/7.5
4610 DYGRID=DSC(1)
4620 FOR I=2 TO 33
4630 IF DYTOT >= DSC(I) THEN DYGRID=DSC(I): GOTO 4660
4640 YNDX=I-1
4650 GOTO 4670
4660 NEXT I
4670 DXGRID=DSC(1)
4680 FOR I=2 TO 33
4690 IF DXTOT >= DSC(I) THEN DXGRID=DSC(I) : GOTO 4720
4700 XNDX=I-1
4710 GOTO 4730
4720 NEXT I
4730 ' STARTING POINT
4740 YBOT=INT(YYMIN/DYGRID)*DYGRID
4750 IF EXTNTY=0 THEN GOTO 4790
4760 YTEMP=YBOT+1
4770 IF YTEMP-YYOLD > .0001 THEN YYMAX=YTEMP : GOTO 4790
4780 YYMAX=YYOLD
4790 XBOT=INT(XXMIN/DXGRID)*DXGRID
4800 IF EXTNTX=0 THEN GOTO 4840
4810 XTEMP=XBOT+1
4820 IF XTEMP-XXOLD > .0001 THEN XXMAX=XTEMP : GOTO 4840
4830 XXMAX=XXOLD
4840 XTOP=XBOT : YTOP=YBOT
4850 FOR I=1 TO 20
4860 YTOP=YTOP+DYGRID
4870 IF ABS(YTOP-YYMAX) <= .0001 OR YTOP-YYMAX > .0001 THEN GOTO 4890
4880 NEXT I
4890 FOR I=1 TO 20
4900 XTOP=XTOP+DXGRID
4910 IF ABS(XTOP-XXMAX) <= .0001 OR XTOP-XXMAX > .0001 THEN GOTO 4930
4920 NEXT I
4930 RETURN
4940 REM GRAPH LABELS
4950 TITLE$=TITLE$ : TITLEX$=TITLEX$ : TITLEY$=TITLEY$ : TXT$=TXT$ : FOR MM=1 TO NCURVE :
LGND$(MM)=LGND$(MM) : NEXT MM
4960 TITLE$="" : TITLEX$="" : TITLEY$="" : TXT$="" : FOR MM=1 TO NCURVE : LGND$(MM)="" : NEXT MM
4970 TTLFLG=0
4980 IF TITLE$="" THEN GOTO 5070
4990 CLS : LOCATE 8,1 : COLOR FG1,BG
5000 PRINT " ----- GRAPH, AXES, AND TEXT LABELS -----" : PRINT : COLOR FG,BG

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5010 PRINT "                TITLES have previously been defined" : PRINT
5020 PRINT "                DEFAULT OPTIONS -- 1) Return accepts previous Title": PRINT "
2) Return accepts Blank Title" : PRINT
5030 PRINT "                Which DEFAULT OPTION do you select? (1 or 2) -- ";DFO$=INPUT$(1) : PRINT ""
5040 IF DFO$="1" THEN TTLFLG=1 : GOTO 5070
5050 IF DFO$="2" THEN TTLFLG=0 : TITLE0$="" : TITLEX0$="" : TITLEY0$="" : TXT0$="" : FOR MM=1 TO NCURVE :
LGND0$(MM)="" : NEXT MM : GOTO 5070
5060 GOTO 5030
5070 CLS : LOCATE 3,1 : COLOR FG,BG
5080 PRINT "                ----- GRAPH, AXES, AND TEXT LABELS -----" : COLOR FG,BG
5090 IF TTLFLG=1 THEN GOTO 5110
5100 PRINT "                <Hit Return for no Titles>" : PRINT : GOTO 5120
5110 PRINT "                <Hit Return to Accept the Defaults>" : PRINT
5120 PRINT " GRAPH TITLE <" ; TITLE0$ ; ">"
5130 PRINT " TITLE -- "; : COLOR BG,FG:PRINT "
5140 LOCATE 7,18
5150 INPUT "",TITLES$
5160 TST$=MID$(TITLES$,1,1)
5170 IF TST$="" THEN TITLES$=TITLE0$
5180 COLOR FG,BG
5190 LOCATE 9,1
5200 PRINT " X-AXIS TITLE <" ; TITLEX0$ ; ">"
5210 PRINT " X-AXIS TITLE -- "; : COLOR BG,FG:PRINT "
5220 LOCATE 10,25
5230 INPUT "",TITLEX$
5240 TST$=MID$(TITLEX$,1,1)
5250 IF TST$="" THEN TITLEX$=TITLEX0$
5260 COLOR FG,BG
5270 LOCATE 12,1
5280 PRINT " Y-AXIS TITLE <" ; TITLEY0$ ; ">"
5290 PRINT " Y-AXIS TITLE -- "; : COLOR BG,FG:PRINT "
5300 LOCATE 13,25
5310 INPUT "",TITLEY$
5320 TST$=MID$(TITLEY$,1,1)
5330 IF TST$="" THEN TITLEY$=TITLEY0$
5340 COLOR FG,BG
5350 LOCATE 14,1
5360 IF NCURVE =1 OR TESTQ$="3" THEN LQST$="N" : GOTO 5610
5370 PRINT : PRINT " Do you wish to designate LEGENDS for each of the curves? (Y/N) --
";:LQST$=INPUT$(1):PRINT ""
5380 IF LQST$="Y" OR LQST$="y" THEN LQST$="Y" : PRINT : GOTO 5410
5390 IF LQST$="N" OR LQST$="n" THEN LQST$="N" : GOTO 5610
5400 GOTO 5370
5410 LOCATE 17,45 : PRINT "DATAFILE                Prev. Legend"
5420 LOCATE 18,1 : PRINT " LEGEND -- Curve 1 --- ";:COLOR BG,FG :PRINT "
5430 LOCATE 18,45 : PRINT DTA$(1) : COLOR FG,BG
5440 LOCATE 18,64 : PRINT "<" ; LGND0$(1) ; ">" : COLOR BG,FG
5450 LOCATE 18,27
5460 INPUT "",LGND$(1)
5470 TST$=MID$(LGND$(1),1,1)
5480 IF TST$="" THEN LGND$(1)=LGND0$(1)

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5490 COLOR FG,BG
5500 FOR I=2 TO NCURVE
5510 LOCATE 17+I,1
5520 PRINT "          Curve";I;"--- ";;COLOR BG,FG:PRINT "
5530 LOCATE 17+I,45 : PRINT DTAS(I) : COLOR FG,BG
5540 LOCATE 17+I,64 : PRINT "<;LGNDOS(I);>" : COLOR BG,FG
5550 LOCATE 17+I,27
5560 INPUT "",LGND$(I)
5570 TST$=MID$(LGND$(I),1,1)
5580 IF TST$="" THEN LGND$(I)=LGNDOS(I)
5590 COLOR FG,BG
5600 NEXT I
5610 CLS: LOCATE 8,1
5620 PRINT " DO YOU WISH TO PLACE A LINE OF TEXT ON THE PLOT? (Y/N) --- ";;TXTQ$=INPUT$(1):PRINT ""
5630 IF TXTQ$="Y" OR TXTQ$="y" THEN GOTO 5650
5635 TXTQ$="N"
5640 GOTO 5810
5650 LOCATE 10,1
5660 PRINT " Line of text -- <;TXTQ$;>"
5670 PRINT "          Line of Text -- ";;COLOR BG,FG:PRINT "
5680 LOCATE 11,25
5690 INPUT "",TXT$
5700 TST$=MID$(TXT$,1,1)
5710 IF TST$="" THEN TXT$=TXTQ$
5720 COLOR FG,BG
5730 IF TESTQ$="3" THEN TXTLOC$="2" : GOTO 5810
5740 LOCATE 13,1
5750 PRINT "          Where do you want the Line of Text?"
5760 PRINT "          1) A Subtitle of the Graph Title"
5770 PRINT "          2) Upper-Right (Within the Plot Region)" : PRINT "          3) Upper-Left
(Within the Plot Region)" : PRINT
5780 PRINT "          Which option is selected? (1, 2 or 3) -- ";;TXTLOC$=INPUT$(1):PRINT ""
5790 IF TXTLOC$="1" OR TXTLOC$="2" OR TXTLOC$="3" THEN GOTO 5810
5800 GOTO 5740
5810 GOSUB 14520 : ' show TITLES
5820 IF CORTTL$="y" OR CORTTL$="Y" THEN GOTO 5840
5830 IF CORTTL$="n" OR CORTTL$="N" THEN GOTO 4950
5840 RETURN
6680 REM DRAW THE CURVES
6690 PU2$=" & #####.### #####.### &"
6700 PRINT #1,"SM;"
6725 PRINT #1,"SI 0.15,0.225;"
6730 IPEN=0
6740 IF PENFLG=1 THEN IPEN=1
6760 FOR N=1 TO NCURVE
6770 IF LTYP$="C" OR LTYP$="P" OR LTYP$="Z" THEN GOTO 6820
6780 IF N=1 THEN PRINT #1," LT;" : GOTO 6810
6790 IF N=2 THEN PRINT #1," LT ";N,";" : GOTO 6810
6800 PRINT #1," LT ";N,"",7;"
6810 IF LTYP$="S" THEN GOTO 6970
6820 IF SCAT$="2" THEN PRINT #1,"SM";MK$(N);";"

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6960 PRINT #1,"SP2;"
6970 FOR II=1 TO NPTS(N)
6971 IF X(N,II) >= XML AND X(N,II) <= XMU THEN GOTO 6972 ELSE GOTO 6974
6972 IF Y(N,II) >= YML AND Y(N,II) <= YMU THEN GOTO 6976 ELSE GOTO 6974
6974 NEXT II
6975 GOTO 7070
6976 FIRST=II+1
6977 IF SCAT$="1" THEN GOTO 7000
6980 PRINT #1,USING PU2$;"PA ";X(N,II),Y(N,II),";"
6990 GOTO 7010
7000 PRINT #1,USING PU2$;"PU ";X(N,II),Y(N,II),";"
7010 FOR I=FIRST TO NPTS(N)
7011 IF X(N,I) >=XML AND X(N,I) <=XMU THEN GOTO 7012 ELSE GOTO 7060
7012 IF Y(N,I) >=YML AND Y(N,I) <=YMU THEN GOTO 7020 ELSE GOTO 7060
7020 IF SCAT$="1" THEN GOTO 7050
7030 PRINT #1,USING PU2$;"PA ";X(N,I),Y(N,I),";"
7040 GOTO 7060
7050 PRINT #1,USING PU2$;"PD ";X(N,I),Y(N,I),";"
7060 NEXT I
7070 '
7080 PRINT #1,"SM;"
7090 NEXT N
7100 PRINT #1,"PU;SP;"
7110 CLOSE
7120 RETURN
8000 ' Subroutine to ask formal plot questions
8005 IF OLD$="R" THEN GOTO 9000
8010 CLS : LOCATE 3,22 : COLOR FG1,BG
8020 PRINT "REPORT-SIZE GRAPH FORMALITY OPTIONS"
8040 COLOR FG,BG
8045 LOCATE 5,15
8050 PRINT "1) Not Formal (Just a Size Specification)"
8055 LOCATE 6,15
8060 PRINT "2) Formal (Figure #, Classification, & Formal Title)"
8065 LOCATE 8,20 : COLOR FG1,BG
8070 PRINT "Which Formality Option is Selected? (1 or 2) -- "; RFORM = VAL(INPUT$(1)): PRINT ""
8075 IF RFORM = 1 OR RFORM = 2 THEN GOTO 8080 ELSE GOTO 8070
8080 COLOR FG,BG
8090 IF RFORM = 1 THEN FIGQ$="N" : CLASSQ$="N" : GOTO 9000
8100 LOCATE 10,15
8110 PRINT "Do you wish to Declare a Figure Number? (Y/N) -- "; FIGQ$=INPUT$(1): PRINT ""
8120 IF FIGQ$="y" OR FIGQ$="Y" THEN FIGQ$="Y" : GOTO 8150
8130 IF FIGQ$="n" OR FIGQ$="N" THEN FIGQ$="N" : FIGNO$="" : GOTO 8160
8140 GOTO 8100
8150 LOCATE 11,20 : COLOR FG1,BG : INPUT "What is the Figure Number? -- ",FIGNO$
8155 FIGNO$="Fig. "+FIGNO$+" "
8160 COLOR FG,BG : LOCATE 12,15
8170 PRINT "Do you wish use Classification Markings? (Y/N) -- "; CLASSQ$=INPUT$(1):PRINT ""
8180 IF CLASSQ$="y" OR CLASSQ$="Y" THEN CLASSQ$="Y" : GOTO 8210
8190 IF CLASSQ$="n" OR CLASSQ$="N" THEN CLASSQ$="N" : CLASSTITLE$="" : GOTO 8500
8200 GOTO 8160

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8210 LOCATE 14,22 : COLOR FG1,BG : PRINT "CLASSIFICATION MENU" : COLOR FG,BG
8215 LOCATE 15,15 : PRINT "1) Unclassified"
8220 LOCATE 16,15 : PRINT "2) For Official Use Only"
8230 LOCATE 17,15 : PRINT "3) Confidential"
8240 LOCATE 18,15 : PRINT "4) Secret"
8250 LOCATE 19,15 : PRINT "5) Other - User Specified"
8260 COLOR FG1,BG
8270 LOCATE 16,46 : PRINT "What Level (1, 2, 3, 4, or 5)"
8280 LOCATE 17,53 : PRINT "is the Title? -- "; Q$= INPUT$(1): PRINT ""
8285 Q=VAL(Q$)
8290 IF Q < 1 OR Q > 5 THEN GOTO 8280
8291 IF Q=1 THEN CLASSTITLE$="(U) " : GOTO 8310
8292 IF Q=2 THEN CLASSTITLE$="" : GOTO 8310
8293 IF Q=3 THEN CLASSTITLE$="(C) " : GOTO 8310
8294 IF Q=4 THEN CLASSTITLE$="(S) " : GOTO 8310
8295 LOCATE 21,15 : PRINT "User-Specified TITLE Classification (e.g. (TS) ) --";:COLOR FG,BG:INPUT "
",CLASSTITLE$
8296 LOCATE 21,15 : PRINT " ";
8297 IF LEN(CLASSTITLE$) = 0 THEN CLASSTITLE$=" " : GOTO 8310
8300 IF (MID$(CLASSTITLE$,1,1) <> "(") AND (MID$(CLASSTITLE$,LEN(CLASSTITLE$),1) <> ")") THEN
CLASSTITLE$="(" + CLASSTITLE$ + ")" ELSE CLASSTITLE$=CLASSTITLE$ + " "
8310 COLOR FG1,BG : LOCATE 18,53 : PRINT "is the Plot? -- ";: Q$= INPUT$(1): PRINT ""
8315 Q=VAL(Q$)
8320 IF Q < 1 OR Q > 5 THEN GOTO 8310
8321 IF Q=1 THEN CLASSPLOT$="(UNCLASSIFIED)" : GOTO 8500
8322 IF Q=2 THEN CLASSPLOT$="(FOR OFFICIAL USE ONLY)" : GOTO 8500
8323 IF Q=3 THEN CLASSPLOT$="(CONFIDENTIAL)" : GOTO 8500
8324 IF Q=4 THEN CLASSPLOT$="(SECRET)" : GOTO 8500
8330 IF Q=5 THEN LOCATE 21,15 : PRINT "User-Specified PLOT Classification --";:COLOR FG,BG:INPUT "
",CLASSPLOT$
8331 IF LEN(CLASSPLOT$) = 0 THEN CLASSPLOT$=" " : GOTO 8500
8332 IF (MID$(CLASSPLOT$,1,1) <> "(") AND (MID$(CLASSPLOT$,LEN(CLASSPLOT$),1) <> ")") THEN
CLASSPLOT$="(" + CLASSPLOT$ + ")"
8500 LOCATE 12,1
8501 FOR BLN=1 TO 8
8502 PRINT SPACE$(79)
8503 NEXT BLN
8505 COLOR FG,BG : LOCATE 14,1 : PRINT "Figure Title --" : COLOR BG,FG : LOCATE 14,17 : PRINT "
";
8510 LOCATE 14,17 : COLOR BG,FG : INPUT "",FORMALTITLE$
8513 FORMALTITLE$=FIGNO$+CLASSTITLE$+FORMALTITLE$
8515 COLOR FG,BG
8520 LOCATE 16,10 : PRINT "Do you want the PAGE Numbered? (Y/N) -- ";: PAGEQ$=INPUT$(1)
8525 IF PAGEQ$="Y" OR PAGEQ$="y" THEN PAGEQ$="Y" : GOTO 8530
8526 IF PAGEQ$="N" OR PAGEQ$="n" THEN PAGEQ$="N" : PAGEN$="$99999$" : GOTO 9000
8527 GOTO 8520
8530 LOCATE 16,56 : INPUT "Page Number -- ",PAGEN$
9000 RETURN
9170 ' FORMATS
9180 CLS
9190 FOR N=1 TO NCURVE

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9200 IF N > 1 THEN GOTO 9240
9210 IF CLR$="Y" THEN COLOR FG1,BG
9220 PRINT "          -----  DEFINITION OF INPUT FORMATS  -----"
9230 IF CLR$="Y" THEN COLOR FG,BG
9240 IF REVFILEFLG=1 AND N=1 AND SUBFILE > 1 THEN COLOR FG,BG : LOCATE 4,1 : GOTO 9260
9245 LOCATE 3,25 : PRINT "                                     ": COLOR BG,FG : LOCATE
3,25 : PRINT "Data for Curve";N;" --- ";DTA$(N) :COLOR FG,BG
9250 IF N > 1 THEN GOTO 9350
9260 LOCATE 5,1
9270 PRINT "          TYPE 'A'          TYPE 'B'          TYPE 'C'          TYPE 'D'"
9280 PRINT "Line -----"
9290 PRINT " 1   Pt-# X(1) Y(1)      X(1) Y(1)      Delta-X      Y(1)"
9300 PRINT " 2   Pt-# X(2) Y(2)      X(2) Y(2)      Y(1)          Y(2)"
9310 PRINT " 3   Pt-# X(3) Y(3)      X(3) Y(3)      Y(2)          Y(3)"
9320 PRINT " 4   Pt-# X(4) Y(4)      X(4) Y(4)      Y(3)          Y(4)"
9330 PRINT " 5   Pt-# X(5) Y(5)      X(5) Y(5)      Y(4)          Y(5)"
9340 PRINT " .      etc.          etc.          etc.          etc."
9342 PRINT: PRINT " ALTERNATE FORMATS: #-of-points as Line 1 (TYPE C -- #-of-Points, Delta-X)"
9350 LOCATE 16,1
9355 IF REVFILEFLG=1 AND N <> SUBFILE THEN GOTO 9460
9360 FOR NV=1 TO 8 : PRINT BLANK$ : NEXT NV : LOCATE 16,1
9370 PRINT "    Which DATA FORMAT is the data in FILE ";
9380 COLOR BG,FG : PRINT DTA$(N);
9390 COLOR FG,BG : PRINT " arranged in?"
9400 PRINT " Select from Types Described Above (A, B, C, D, or * to see the data) --
";:FMT$=INPUT$(1):PRINT ""
9410 IF FMT$="A" OR FMT$="a" THEN FMT(N)=1 : GOTO 9460
9420 IF FMT$="B" OR FMT$="b" THEN FMT(N)=2 : GOTO 9460
9430 IF FMT$="C" OR FMT$="c" THEN FMT(N)=3 : GOTO 9460
9435 IF FMT$="D" OR FMT$="d" THEN FMT(N)=4 : GOTO 9460
9440 IF FMT$="*" THEN GOSUB 13760 : GOTO 9370
9450 GOTO 9350
9460 NEXT N
9470 RETURN
9480 REM ADD A CURVE
9490 CLS : LOCATE 5,1
9500 COLOR FG1,BG
9510 PRINT "          *****  OPTION TO ADD AN EXTRA CURVE  *****": PRINT:PRINT
9520 COLOR FG,BG
9530 PRINT " --- This option is intended to ADD a curve to a plot PREVIOUSLY COMPLETED --- "
9540 GOSUB 12890 : REM GRAPH TYPE
9550 PRINT : PRINT
9560 NCURVE=1 : II=2 : I=1
9570 PRINT " To Recall Filenames, Type the Drive followed by a colon or subdirectory name.": PRINT : PRINT
9580 INPUT " What is the DRIVE:FILENAME for the Curve data? -- ",DTA$(1)
9590 GOSUB 13670 : REM RECALL FILENAMES
9600 IF RECALL=1 THEN GOTO 9580
9610 OPEN DTA$(1) FOR INPUT AS #2
9620 GOSUB 9170 : REM DATA FORMAT
9630 CLS
9640 LOCATE 8,1

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9650 PRINT "          Reading data from ";DTA$(1); " -- Standby . . . . . "
9660 IF FMT(I)=4 THEN GOSUB 19000 : GOTO 9680 : REM COUNT THE POINTS IN D FORMAT
9665 GOSUB 19160 : REM COUNT DATA POINTS
9670 IF FMT(1) = 3 THEN INPUT #II,DELTAX
9680 IF NPTS(I) <= 500 THEN GOTO 9780
9690 RDSKP=INT(NPTS(I)/500)+1
9700 LOCATE 10,10 : COLOR BG,FG : PRINT "WARNING --- The number of points in the data set is too large"
9710 LOCATE 11,14 : PRINT "Points will be taken every";RDSKP;"points instead":COLOR FG,BG
9720 LOCATE 14,22 : PRINT "----- Hit any key to Acknowledge ----- ";TEMP$=INPUT$(1):PRINT ""
9730 LOCATE 14,22 : PRINT "          "
9740 LOCATE 10,1 : PRINT BLANK$
9750 LOCATE 11,1 : PRINT BLANK$
9760 ON FMT(1) GOSUB 10520,10620,10720
9770 GOTO 9790
9780 ON FMT(1) GOSUB 10340,10390,10440
9790 CLOSE #2
9800 GOSUB 3160 : REM MINS AND MAXES
9810 IF MODOPT$="5" THEN GOTO 10330
9811 XXMIN=XMIN(1)
9812 XXMAX=XMAX(1)
9813 YYMIN=YMIN(1) : YYMAX=YMAX(1)
9815 GOSUB 16200
9820 IF CTYP$="1" THEN GOTO 9840
9830 GOSUB 13020 : REM CONVERT ADDATA TO LOG
9840 IF TESTQ$="2" THEN GOTO 9880
9850 XBOTS=INT(.14*2450) : XTOPS=INT(.96*2450)
9860 YBOTS=INT(30+.15*(1830-30)) : YTOPS=INT(1830-.1*(1830-30))
9870 GOTO 9920
9880 CLOSE #1
9890 IF PARFLG=1 AND PORT=1 THEN OPEN "LPT1:" AS #1 : GOTO 9910
9895 IF PARFLG=1 AND PORT=2 THEN OPEN "LPT2:" AS #1 : GOTO 9910
9896 IF SPORT=2 THEN OPEN "COM2:9600,n,8,1,CS20000,DS20000" AS #1 : GOTO 9910
9897 '
9899 '
9900 OPEN "COM1:9600,n,8,1,CS20000,DS20000" AS #1
9910 PRINT #1,"IN;"
9920 CLS : LOCATE 8,1
9930 PRINT : PRINT " Place Previously Plotted FULL-SIZE plot in the plotter"
9950 P1X=1654 : P1Y=1462 : P2X=9613 : P2Y=6922 : X0=300 : Y0=370 : X1=10000 : Y1=7650
9960 PRINT "          ----- Hit any Key to Continue -----"
9970 PRINT "":TEMP$=INPUT$(1):PRINT ""
9980 CLS : LOCATE 8,1
9990 INPUT " Now specify the X-Value and Y-Value of the LOWER-LEFT point --- ",XBOT,YBOT
10000 PRINT
10010 INPUT " Now specify the X-Value and Y-Value of the UPPER-RIGHT point --- ",XTOP,YTOP
10020 IF CTYP$="1" THEN GOTO 10070
10030 IF CTYP$="2" THEN GOTO 10060
10040 YBOTE=YBOT : YBOT=LOG(YBOT) : YTOPE=YTOP : YTOP=LOG(YTOP)
10050 IF CTYP$="3" THEN GOTO 10070
10060 XBOTE=XBOT : XBOT=LOG(XBOT) : XTOPE=XTOP : XTOP=LOG(XTOP)
10070 IF TESTQ$="1" THEN GOSUB 13520 : GOTO 10120

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10080 GOSUB 12520 : ' ADJUST TO INTEGER SCALING
10090 PUL4$="& #####.#####.#####.#####.#####.#####.##### &"
10100 PRINT #1,"IP ";P1X,P1Y,P2X,P2Y,";"
10110 PRINT #1,USING PUL4$;"LT;SC ";XBOTS,XTOPS,YBOTS,YTOPS,";"
10120 PRINT :PRINT
10130 COLOR FG1,BG
10140 PRINT "                CURVE OPTIONS FOR THE ADDED CURVE"
10150 COLOR FG,BG
10160 PRINT "                1) Standard Curve -- Solid Line"
10170 PRINT "                2) Scatter Plot -- No line": PRINT "
Plotting symbol at each Data Point":PRINT
10180 PRINT "                Which Option is Selected? (1 or 2) --- ";;SCAT$=INPUT$(1):PRINT ""
10190 IF TESTQ$="1" THEN GOTO 10250
10200 IF SCAT$="1" THEN SCAT=1 : LTYP$="C" : PRINT #1,"SM;" : GOTO 10230
10210 IF SCAT$="2" THEN SCAT=2 : LTYP$="P" : SKFLG=0 : GOSUB 13890 : GOTO 10230 : REM SELECT PLOTTING SYMBOL
10220 GOTO 10180
10230 PRINT : PRINT "                PUT THE PEN DESIRED IN SLOT 2 AND PRESS ANY KEY TO START THE PLOT
";:TEMP$=INPUT$(1):PRINT ""
10240 GOTO 10290
10250 IF SCAT$="1" THEN SCAT=1 : GOTO 10290
10260 IF SCAT$="2" THEN SCAT=2 : SKFLG=0 : GOSUB 13890 : GOTO 10290
10270 GOTO 10180
10290 PRINT :PRINT "                Plotting Underway, Standby . . . . . ."
10310 IF TESTQ$="1" THEN GOSUB 13340 : GOTO 10330 : REM DRAW SWEET-P CURVE
10320 GOSUB 6680 : REM DO THE PLOT
10330 RETURN
10340 REM DATA -- FORMAT 1
10350 FOR N=1 TO NPTS(I)
10360 INPUT #II,A,X(I,N),Y(I,N)
10370 NEXT N
10380 RETURN
10390 REM DATA -- FORMAT 2
10400 FOR N=1 TO NPTS(I)
10410 INPUT #II,X(I,N),Y(I,N)
10420 NEXT N
10430 RETURN
10440 REM DATA -- FORMAT 3
10450 INPUT #II,Y(I,1)
10460 X(I,1)=0
10470 FOR N=2 TO NPTS(I)
10480 INPUT #II,Y(I,N)
10490 X(I,N)=X(I,N-1)+DELTA X
10500 NEXT N
10510 RETURN
10520 REM DATA -- FORMAT 1 WITH SKIPS
10530 COUNT=0
10540 INDX=RDSKP-1
10550 FOR N=1 TO NPTS(I)
10560 INPUT #II,T1,T2,T3
10570 INDX=INDX+1
10580 IF INDX=RDSKP THEN INDX=0 : COUNT=COUNT+1 : X(I,COUNT)=T2 : Y(I,COUNT)=T3

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```

10590 NEXT N
10600 NPTS(I)=COUNT
10610 RETURN
10620 REM DATA -- FORMAT 2 WITH SKIPS
10630 COUNT=0
10640 INDX=RDSKP-1
10650 FOR N=1 TO NPTS(I)
10660 INPUT #II,T2,T3
10670 INDX=INDX+1
10680 IF INDX=RDSKP THEN INDX=0 : COUNT=COUNT+1 : X(I,COUNT)=T2 : Y(I,COUNT)=T3
10690 NEXT N
10700 NPTS(I)=COUNT
10710 RETURN
10720 REM DATA -- FORMAT 3 WITH SKIPS
10730 COUNT=0
10740 INDX=0
10750 INPUT #II,Y(I,1)
10760 X(I,1)=0 : T2=0
10770 FOR N=2 TO NPTS(I)
10780 INPUT #II,T3
10790 T2=T2+DELTAX
10800 INDX=INDX+1
10810 IF INDX=RDSKP THEN INDX=0 : COUNT=COUNT+1 : X(I,COUNT)=T2 : Y(I,COUNT)=T3
10820 NEXT N
10830 NPTS(I)=COUNT
10840 RETURN
10850 REM LOG PLOT SCALING
10860 LGFLAG=0 : ERLG=.00001
10870 IF CTYP$="2" THEN GOTO 11070
10880 IF CTYP$="3" THEN GOTO 11200
10890 IF Y(1,1) <= 0 OR X(1,1) <= 0 THEN LGFLAG=1 : GOTO 11810
10900 IF Y(1,1)+ERLG < .001 OR X(1,1)+ERLG < .001 THEN LGFLAG=9 : GOTO 11810
10910 YYMIN=LOG(Y(1,1)) : XXMIN=LOG(X(1,1)) : YYMAX=YYMIN : XXMAX=XXMIN
10920 FOR N=1 TO NCURVE
10930 FOR I=1 TO NPTS(N)
10940 IF X(N,I) <= 0 THEN LGFLAG=1 : GOTO 11810
10950 IF Y(N,I) <= 0 THEN LGFLAG=1 : GOTO 11810
10960 IF X(N,I)+ERLG < .001 THEN LGFLAG=9 : GOTO 11810
10970 IF Y(N,I)+ERLG < .001 THEN LGFLAG=9 : GOTO 11810
10980 X(N,I)=LOG(X(N,I))
10990 Y(N,I)=LOG(Y(N,I))
11000 IF X(N,I) > XXMAX THEN XXMAX=X(N,I) : GOTO 11020
11010 IF X(N,I) < XXMIN THEN XXMIN=X(N,I)
11020 IF Y(N,I) > YYMAX THEN YYMAX=Y(N,I) : GOTO 11040
11030 IF Y(N,I) < YYMIN THEN YYMIN=Y(N,I)
11040 NEXT I
11050 NEXT N
11060 GOTO 11320
11070 IF X(1,1) <= 0 THEN LGFLAG=1 : GOTO 11810
11080 IF X(1,1)+ERLG < .001 THEN LGFLAG=9 : GOTO 11810
11090 XXMIN=LOG(X(1,1)) : XXMAX=XXMIN

```

```

11100 FOR N=1 TO NCURVE
11110 FOR I=1 TO NPTS(N)
11120 IF X(N,I) <= 0 THEN LGFLAG=1 : GOTO 11810
11130 IF X(N,I)+ERLG < .001 THEN LGFLAG=9 : GOTO 11810
11140 X(N,I)=LOG(X(N,I))
11150 IF X(N,I) > XXMAX THEN XXMAX=X(N,I) : GOTO 11170
11160 IF X(N,I) < XXMIN THEN XXMIN=X(N,I)
11170 NEXT I
11180 NEXT N
11190 GOTO 11320
11200 IF Y(1,1) <= 0 THEN LGFLAG=1 : GOTO 11810
11210 IF Y(1,1)+ERLG < .001 THEN LGFLAG=9 : GOTO 11810
11220 YYMIN=LOG(Y(1,1)) : YYMAX=YYMIN
11230 FOR N=1 TO NCURVE
11240 FOR I=1 TO NPTS(N)
11250 IF Y(N,I) <= 0 THEN LGFLAG=1 : GOTO 11810
11260 IF Y(N,I)+ERLG < .001 THEN LGFLAG=9 : GOTO 11810
11270 Y(N,I)=LOG(Y(N,I))
11280 IF Y(N,I) > YYMAX THEN YYMAX=Y(N,I) : GOTO 11300
11290 IF Y(N,I) < YYMIN THEN YYMIN=Y(N,I)
11300 NEXT I
11310 NEXT N
11320 IF CTYP$="2" THEN GOTO 11360
11330 IF CTYP$="3" THEN GOTO 11370
11340 XXBOT=EXP(XXMIN) : XXTOP=EXP(XXMAX)
11350 YYBOT=EXP(YYMIN) : YYTOP=EXP(YYMAX) : GOTO 11380
11360 XXBOT=EXP(XXMIN) : XXTOP=EXP(XXMAX) : GOTO 11380
11370 YYBOT=EXP(YYMIN) : YYTOP=EXP(YYMAX)
11380 IF CTYP$="3" THEN GOTO 11590
11390 '
11400 ' ROUND XXMIN & XXMAX
11410 '
11420 XBOT=.001
11430 FOR I=1 TO 7
11440 XTEMP=XBOT*10
11450 IF XXBOT < XTEMP-.00001 THEN GOTO 11480
11460 XBOT=XTEMP
11470 NEXT I
11480 XTOP=XBOT
11490 FOR I=1 TO 7
11500 XTEMP=XTOP*10
11510 IF XTEMP >= XTOP THEN GOTO 11550
11520 XTOP=XTEMP
11530 NEXT I
11540 LGFLAG=9 : GOTO 11810
11550 XTOP=XTEMP
11560 XBOTE=XBOT : XTOPE=XTOP
11570 XBOT=LOG(XBOT) : XTOP=LOG(XTOP) : XML=XBOT : XMU=XTOP
11580 IF CTYP$="2" THEN GOTO 11810
11590 '
11600 ' ROUND YYMIN & XXMAX

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11610 '
11620 YBOT=.001
11630 FOR I=1 TO 7
11640 YTEMP=YBOT*10
11650 IF YYBOT < YTEMP-.00001 THEN GOTO 11680
11660 YBOT=YTEMP
11670 NEXT I
11680 YTOP=YBOT
11690 FOR I=1 TO 7
11700 YTEMP=YTOP*10
11710 IF YTEMP >= YYTOP THEN GOTO 11750
11720 YTOP=YTEMP
11730 NEXT I
11740 LGFLAG=9 : GOTO 11810
11750 YTOP=YTEMP
11760 YBOTE=YBOT : YTOPE=YTOP
11770 YBOT=LOG(YBOT) : YTOP=LOG(YTOP) : YML=YBOT : YMU=YTOP
11780 '
11790 ' END OF CYCLE END POINT
11800 '
11810 RETURN
12520 ' ADJUST SCALING
12530 XBOTS=INT(XBOT)+1 : XTOPS=INT(XTOP+.0001) : YBOTS=INT(YBOT)+1 : YTOPS=INT(YTOP+.0001)
12540 DFFX=P2X-P1X : DFFY=P2Y-P1Y : DFTX=XTOP-XBOT : DFTY=YTOP-YBOT
12550 IF INT(XBOT) = XBOT THEN XBOTS=XBOT
12551 IF INT(YBOT) = YBOT THEN YBOTS=YBOT
12555 IF XBOTS < XTOPS THEN GOTO 12575
12560 XBOTS=XBOTS-1 : P1XT=P1X+DFFX*(XBOTS-XBOT)/DFTX
12561 IF P1XT > 0 THEN P1X=P1XT : GOTO 12576
12562 XBOTS=XBOTS+1 : P1X=P1X+DFFX*(XBOTS-XBOT)/DFTX
12563 XTOPS=XTOPS+1 : P2XT=P2X+DFFX*(XTOPS-XTOP)/DFTX
12564 IF P2XT <= 10300 THEN P2X=P2XT : GOTO 12579 : ELSE P2X=10300 : GOTO 12579
12575 P1X=P1X+DFFX*(XBOTS-XBOT)/DFTX
12576 P2X=P2X+DFFX*(XTOPS-XTOP)/DFTX
12579 IF YBOTS < YTOPS THEN GOTO 12599
12580 YBOTS=YBOTS-1 : P1YT=P1Y+DFFY*(YBOTS-YBOT)/DFTY
12581 IF P1YT > 0 THEN P1Y=P1YT : GOTO 12600
12582 YBOTS=YBOTS+1 : P1Y=P1Y+DFFY*(YBOTS-YBOT)/DFTY
12583 YTOPS=YTOPS+1 : P2YT=P2Y+DFFY*(YTOPS-YTOP)/DFTY
12584 IF P2YT <= 7650 THEN P2Y=P2YT : GOTO 12610 : ELSE P2Y=7650 : GOTO 12610
12599 P1Y=P1Y+DFFY*(YBOTS-YBOT)/DFTY
12600 P2Y=P2Y+DFFY*(YTOPS-YTOP)/DFTY
12610 RETURN
12890 ' SELECT GRAPH TYPE
12900 PRINT
12910 IF CLR$="Y" THEN COLOR FG1,BG
12920 PRINT "          ----- CURVE TYPE OPTIONS -----" : PRINT
12930 IF CLR$="Y" THEN COLOR FG,BG
12940 PRINT "
12950 PRINT "
12960 PRINT "
1) LINEAR-X -- LINEAR-Y
2) LOG-X -- LINEAR-Y"
3) LINEAR-X -- LOG-Y"

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12970 PRINT "                                4) LOG-X -- LOG-Y":PRINT
12980 PRINT "                                Which CURVE TYPE is Selected? (1, 2, 3 or 4) --- ":CTYP$=INPUT$(1):PRINT ""
12990 IF CTYP$="1" OR CTYP$="2" OR CTYP$="3" OR CTYP$="4" THEN PRINT :PRINT : GOTO 13010
13000 GOTO 12980
13010 RETURN
13020 ' CONVERSION ADDTL LOG DATA
13030 IF CTYP$="2" THEN GOTO 13070
13040 FOR I=1 TO NPTS(1)
13050 Y(1,I)=LOG(Y(1,I))
13060 NEXT I
13070 IF CTYP$="3" THEN GOTO 13110
13080 FOR I=1 TO NPTS(1)
13090 X(1,I)=LOG(X(1,I))
13100 NEXT I
13110 RETURN
13230 ' SIGN-OFF MESSAGE with TIME OF DAY
13240 CLS: LOCATE 11,28
13250 IF TIME$ < "12:00:00" THEN PRINT "Have a Nice Morning!": GOTO 13280
13260 IF TIME$ < "17:00:00" THEN PRINT "Have a Nice Afternoon!": GOTO 13280
13270 PRINT "Have a Nice Evening!"
13280 LOCATE 23,1: END
13290 RETURN
13300 ' SCALE TO SWEET-P PLANE FROM ZX AND ZY TO XX AND YY
13310 XX=INT((ZX-XBOT)/(XTOP-XBOT)*(XTOPS-XBOTS)+XBOTS)
13320 YY=INT((ZY-YBOT)/(YTOP-YBOT)*(YTOPS-YBOTS)+YBOTS)
13330 RETURN
13340 REM SUBROUTINE TO DRAW THE CURVES
13341 CLS : LOCATE 8,1
13342 INPUT "    What FILENAME shall the SWEET-P Data be Written to? -- ",SWTPFLE$
13343 OPEN SWTPFLE$ FOR OUTPUT AS #1
13350 N=1
13360 IF SYM(N)=4 OR SYM(N)=5 OR SYM(N)=6 THEN PRINT #1,"CS 1;" : GOTO 13380
13370 PRINT #1,"CS 2;"
13380 C$="," : CC$=";"
13390 ZX=X(N,1) : ZY=Y(N,1) : GOSUB 13300
13400 PRINT #1,"MA ";XX;C$;YY;CC$
13410 IF SCAT=2 THEN PRINT #1,MKZ$(1)
13420 FOR I=2 TO NPTS(N)
13430 ZX=X(N,I) : ZY=Y(N,I) : GOSUB 13300
13440 IF SCAT=2 THEN GOTO 13470
13450 PRINT #1,"DA ";XX;C$;YY;CC$
13460 GOTO 13480
13470 PRINT #1,"MA ";XX;C$;YY;CC$ : PRINT #1,MKZ$(1)
13480 NEXT I
13490 PRINT #1,"PU;"
13500 PRINT #1,"MA 2500,1838;"
13505 CLOSE #1
13510 RETURN
13520 REM SUBROUTINE TO ADJUST XTOPS AND YTOPS FOR INTEGER GRID
13530 IF CTYP$="4" THEN GOTO 13660
13540 IF CTYP$="3" THEN GOTO 13600

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13550 PRINT : PRINT
13560 INPUT "          What is the Grid Spacing for the 'Y' Axis? -- ",DYGRID
13570 DYGRIDS=INT(DYGRID/(YTOP-YBOT)*(YTOPS-YBOTS)+.0001)
13580 NYGRID=INT((YTOP-YBOT+.001)/DYGRID)
13590 YTOPS=YBOTS+NYGRID*DYGRIDS
13600 IF CTYP$="2" THEN GOTO 13660
13610 PRINT : PRINT
13620 INPUT "          What is the Grid Spacing for the 'X' Axis? -- ",DXGRID
13630 DXGRIDS=INT(DXGRID/(XTOP-XBOT)*(XTOPS-XBOTS)+.0001)
13640 NXGRID=INT((XTOP-XBOT+.001)/DXGRID)
13650 XTOPS=XBOTS+NXGRID*DXGRIDS
13660 RETURN
13670 REM SUBROUTINE TO RECALL FILENAMES
13680 RECALL=0
13690 LFLE=LEN(DTA$(I))
13695 IF LFLE <=0 THEN RECALL=1 : DTA$(I)="9$$$$$$$9" : GOTO 13750
13700 LFF= ASC(MID$(DTA$(I),LFLE,1))
13710 IF LFF=58 OR LFF=92 THEN RECALL=1
13720 COLOR FG1,BG
13730 IF RECALL=1 THEN PRINT : PRINT "          The Following are the Files in DRIVE ";DTA$(I) :
FILES DTA$(I) : PRINT
13740 COLOR FG,BG
13750 RETURN
13760 REM SUBROUTINE TO RECALL A BIT OF THE DATA FILE
13770 LOCATE 16,1 : FOR NV=1 TO 8 : PRINT BLANK$ : NEXT NV : LOCATE 16,1
13780 ILM=N+1
13790 COLOR FG1,BG
13800 FOR III=1 TO 5
13810 LINE INPUT #ILM,AA$
13820 PRINT AA$
13830 NEXT III
13840 PRINT
13850 COLOR FG,BG
13860 CLOSE #ILM
13870 OPEN DTA$(N) FOR INPUT AS #ILM
13880 RETURN
13890 REM SUBROUTINE TO SELECT PLOTTING SYMBOL FOR SCATTER PLOT (Concept by Bob Hill 6-15-87 -- most of the
programming by Bill Gilbert since.)
13900 CLS
13910 FOR NCV=1 TO NCURVE
13920 IF DATAFLG=1 OR EDTFLG=0 THEN GOTO 14270
13930 COLOR FG1,BG : LOCATE 2,10
13940 IF NCURVE=1 THEN GOTO 14000
13950 PRINT "Select the plotting symbol (by number) for curve ";
13960 COLOR BG,FG
13970 PRINT NCV
13980 GOTO 14020
13990 LOCATE 4,30
14000 PRINT "Select the plotting symbol (by number) for the curve"
14010 IF NCV > 1 THEN GOTO 14190
14020 COLOR FG,BG

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14030 LOCATE 4,30
14040 PRINT "1  *"
14050 LOCATE 6,30
14060 PRINT "2  #"
14070 LOCATE 8,30
14080 PRINT "3  +"
14090 LOCATE 10,30
14100 PRINT "4  x"
14110 LOCATE 12,30
14120 PRINT "5  $"
14130 LOCATE 14,30
14140 PRINT "6  o"
14150 LOCATE 16,30
14160 PRINT "7  ^"
14170 LOCATE 18,30
14180 PRINT "8  ."
14190 COLOR FG1,BG
14200 LOCATE 7,50
14210 PRINT "CURVE  SYMBOL SELECTED"
14220 LOCATE 8+NCV,53
14222 PRINT NCV
14223 LOCATE 8+NCV,63
14230 SYM$ = INKEY$: IF SYM$ = "" THEN 14230
14240 SYM(NCV) = VAL(SYM$)
14250 IF SYM(NCV) > 8 OR SYM(NCV) < 1 THEN GOTO 14230
14260 COLOR FG,BG
14270 IF SYM(NCV) = 1 THEN MK$(NCV)="*" : GOTO 14360
14280 IF SYM(NCV) = 2 THEN MK$(NCV)="#" : GOTO 14360
14290 IF SYM(NCV) = 3 THEN MK$(NCV)="+" : GOTO 14360
14300 IF SYM(NCV) = 4 THEN MK$(NCV)="x" : GOTO 14360
14310 IF SYM(NCV) = 5 THEN MK$(NCV)="$" : GOTO 14360
14320 IF SYM(NCV) = 6 THEN MK$(NCV)="o" : GOTO 14360
14330 IF SYM(NCV) = 7 THEN MK$(NCV)="^" : GOTO 14360
14340 IF SYM(NCV) = 8 THEN MK$(NCV)="."
14350 IF DATAFLG=1 OR EDTFLG=0 THEN GOTO 14380
14360 COLOR FG,BG
14370 PRINT MK$(NCV)
14380 IF SKFLG=1 THEN GOTO 14400
14400 IF TESTQ$="1" THEN MKZ$(NCV)="MK;" + MK$(NCV) + ";"
14405 IF TESTQ$="4" THEN MKZ$(NCV)=MK$(NCV)
14410 NEXT NCV
14420 IF DATAFLG=1 OR EDTFLG=0 THEN GOTO 14500
14430 LOCATE 9+NCV,45
14440 COLOR FG1,BG
14450 PRINT "Plotting symbol(s) correct? (Y/N)  "
14460 COLOR FG,BG
14470 KX$ = INKEY$: IF KX$="" THEN 14470
14480 IF KX$ <> "Y" AND KX$ <> "y" AND KX$ <> "N" AND KX$ <> "n" THEN 14470
14490 IF KX$="N" OR KX$="n" THEN GOTO 13900
14500 CLS : LOCATE 8,1
14510 RETURN

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14520 ' DISPLAY TITLES
14530 IF TITLE$="" AND TITLX$="" AND TITLY$="" AND TXT$="" THEN CORTTL$="Y" : GOTO 14790
14540 CLS : COLOR FG1,BG
14550 LOCATE 5,18
14560 PRINT " ***** TITLES AND LABELS SELECTED ***** "
14570 COLOR FG,BG
14580 PRINT
14590 PRINT "          GRAPH TITLE -- ";TITLE$
14600 PRINT
14610 PRINT "          X-AXIS TITLE -- ";TITLX$
14620 PRINT "          Y-AXIS TITLE -- ";TITLY$
14630 PRINT
14640 PRINT "          LINE OF TEXT -- ";TXT$
14650 IF NCURVE=1 OR TESTQ$="3" THEN GOTO 14720
14660 COLOR FG1,BG
14670 PRINT : PRINT "                      LEGENDS"
14680 COLOR FG,BG
14690 FOR IC=1 TO NCURVE
14700 PRINT "                      CURVE ";IC;"-- ";LGND$(IC)
14710 NEXT IC
14720 PRINT: PRINT
14730 COLOR FG1,BG
14740 PRINT "                      Are Titles Correct? (Y/N) -- "; CORTTL$=INPUT$(1) : PRINT ""
14750 COLOR FG,BG
14760 IF CORTTL$="y" OR CORTTL$="Y" THEN GOTO 14790
14770 IF CORTTL$="n" OR CORTTL$="N" THEN GOTO 14790
14780 GOTO 14740
14790 RETURN
14800 ' READ RECALL PLOT
14810 CLS : LOCATE 8,1
14820 PRINT "          Plot Data will be Recalled from a Datafile."
14830 PRINT " To Recall Filenames, Type the Drive followed by a colon or subdirectory name.": PRINT : PRINT
14840 INPUT "          What DRIVE:FILENAME is the Data stored in? ",RFILE$
14850 GOSUB 15710 : ' RECALL FILENAMES
14860 IF RECALL=1 THEN RECALL=0 : GOTO 14840
14870 OPEN RFILE$ FOR INPUT AS #2
14880 INPUT #2, NCURVE
14890 INPUT #2, CTYP$
14900 INPUT #2, LTYP$
14910 INPUT #2, GRID$
14920 INPUT #2, TITLE$
14921 IF TITLE$="999" THEN TITLE$=""
14930 INPUT #2, TITLX$
14931 IF TITLX$="999" THEN TITLX$=""
14940 INPUT #2, TITLY$
14941 IF TITLY$="999" THEN TITLY$=""
14950 INPUT #2, TXT$
14951 IF TXT$="999" THEN TXT$=""
14960 INPUT #2, LQST$
14970 INPUT #2, TXTQ$
14980 INPUT #2, TXTLOC$

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14990 FOR I=1 TO NCURVE
15000 INPUT #2, DTAS(I)
15010 INPUT #2, LGND$(I)
15011 IF LGND$(I)="999" THEN LGND$=""
15020 INPUT #2, SYM(I)
15030 INPUT #2, NPTS(I)
15040 INPUT #2, YMIN(I), YMAX(I), XMIN(I), XMAX(I)
15050 NEXT I
15060 FOR I=1 TO NCURVE
15070 FOR J=1 TO NPTS(I)
15080 INPUT #2, X(I,J), Y(I,J)
15090 NEXT J
15095 NEXT I
15100 INPUT #2, RFORM
15101 INPUT #2, CLASSPLOT$
15102 INPUT #2, FORMALTITLE$
15105 IF CLASSPLOT$="999" THEN CLASSPLOT$=""
15106 IF FORMALTITLE$="999" THEN FORMALTITLE$=""
15107 INPUT #2, PAGEQ$
15108 IF PAGEQ$="Y" THEN INPUT #2, PAGEN$
15110 CLOSE #2
15115 GOSUB 24000 : ' Routine to translate SYM to MKZ$ on a recalled plot
15120 RETURN
15130 REM SUBROUTINE TO SAVE THE PLOT TO A FILE
15140 CLS : LOCATE 8,14
15150 PRINT " Plot will be saved to a DATAFILE -- "
15154 IF REVISEFLAG=1 THEN GOTO 15155 ELSE GOTO 15160
15155 PRINT : COLOR FG1,0
15156 PRINT "      NOTICE: You have EXTENDED the Plot Range. The Saved Plot will be "
15157 PRINT "      saved with AUTOMATIC Range Scaling. Saving the plot with"
15158 PRINT "      Extended Ranges is not currently possible."
15159 COLOR FG,0 : PRINT
15160 PRINT "      To Recall EXISTING Filenames, Type the Drive followed "
15170 PRINT "      by a colon or subdirectory name.": PRINT : PRINT
15180 INPUT "      What DRIVE:FILENAME will the Data be stored in? ",RFILES
15190 GOSUB 15710 : REM SUBROUTINE TO RECALL FILENAMES
15200 IF RECALL=1 THEN RECALL=0 : GOTO 15180
15210 OPEN RFILES$ FOR INPUT AS #2
15220 CLOSE #2
15230 PRINT : PRINT " The file already exists -- Do you REALLY want to overwrite it? (Y/N) -- "; :
Q$=INPUT$(1) : PRINT ""
15240 IF Q$="y" OR Q$="Y" THEN GOTO 15260
15250 GOTO 15140
15260 OPEN RFILES$ FOR OUTPUT AS #2
15265 BL999$="999"
15270 PRINT #2, NCURVE
15280 PRINT #2, CTYP$
15290 PRINT #2, LTYP$
15300 PRINT #2, GRID$
15305 IF TITLE$="" THEN PRINT #2, BL999$ : GOTO 15315
15310 PRINT #2, TITLE$

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15315 IF TITLEX$="" THEN PRINT #2, BL999$ : GOTO 15325
15320 PRINT #2, TITLEX$
15325 IF TITLEY$="" THEN PRINT #2, BL999$ : GOTO 15335
15330 PRINT #2, TITLEY$
15335 IF TXT$="" THEN PRINT #2, BL999$ : GOTO 15350
15340 PRINT #2, TXT$
15350 PRINT #2, LQST$
15360 PRINT #2, TXTQ$
15370 PRINT #2, TXTLOC$
15380 FOR I=1 TO NCURVE
15390 PRINT #2, DTAS(I)
15395 IF LGND$(I) ="" THEN PRINT #2, BL999$ : GOTO 15410
15400 PRINT #2, LGND$(I)
15410 PRINT #2, SYM(I)
15420 PRINT #2, NPTS(I)
15430 PRINT #2, YMIN(I), YMAX(I), XMIN(I), XMAX(I)
15440 NEXT I
15450 FOR I=1 TO NCURVE
15460 FOR J=1 TO NPTS(I)
15470 IF CTYP$="2" THEN PRINT #2, EXP(X(I,J)), Y(I,J) : GOTO 15510
15480 IF CTYP$="3" THEN PRINT #2, X(I,J), EXP(Y(I,J)) : GOTO 15510
15490 IF CTYP$="4" THEN PRINT #2, EXP(X(I,J)), EXP(Y(I,J)) : GOTO 15510
15500 PRINT #2, X(I,J), Y(I,J)
15510 NEXT J
15515 NEXT I
15516 IF PSIZE$="R" AND RFORM=2 THEN GOTO 15520
15517 PRINT #2, "1" : PRINT #2, BL999$ : PRINT #2, BL999$
15518 PRINT #2, "N" : PRINT #2, BL999$
15519 GOTO 15544
15520 PRINT #2, RFORM
15521 IF PSIZE$="R" AND RFORM=2 AND CLASSPLOT$="" THEN PRINT #2, BL999$ : GOTO 15525
15522 IF PSIZE$="R" AND RFORM=2 THEN PRINT #2, CLASSPLOT$
15525 IF PSIZE$="R" AND RFORM=2 AND FORMALTITLE$="" THEN PRINT #2, BL999$ : GOTO 15532
15526 IF PSIZE$="R" AND RFORM=2 THEN PRINT #2, FORMALTITLE$
15532 IF PAGEQ$="Y" THEN PRINT #2, PAGEQ$ ELSE PRINT #2, "N"
15533 IF PAGEQ$="Y" THEN PRINT #2, PAGENS$
15544 CLOSE #2
15545 RETURN
15550 REM SUBROUTINE TO INITIATE THE RE-DO OPTION
15560 IF CTYP$="1" THEN GOTO 15640
15570 FOR NC=1 TO NCURVE
15580 FOR NP=1 TO NPTS(NC)
15590 IF CTYP$="2" THEN X(NC,NP)=EXP(X(NC,NP)) : GOTO 15620
15600 IF CTYP$="3" THEN Y(NC,NP)=EXP(Y(NC,NP)) : GOTO 15620
15610 X(NC,NP)=EXP(X(NC,NP)) : Y(NC,NP)=EXP(Y(NC,NP))
15620 NEXT NP
15630 NEXT NC
15635 IF REVFILEFLG=1 THEN PRINT : PRINT : PRINT "          The Datafiles will be Revised and Re-Plotted. "
: GOTO 15650
15640 PRINT : PRINT : PRINT "          The Data will be Re-Plotted. "
15650 EDTFLG=0

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15655 IF REVFILEFLG=1 THEN PRINT : PRINT "      Do you want to edit the labels or change the Plot Format?
(Y/N) "; : Q$=INPUT$(1) : PRINT "" : GOTO 15670
15660 PRINT : PRINT "Do you want to edit the data or the labels or change the Plot Format? (Y/N) "; :
Q$=INPUT$(1) : PRINT ""
15670 IF Q$="y" OR Q$="Y" THEN EDTFLG=1 : GOTO 15700
15680 IF Q$="n" OR Q$="N" THEN EDTFLG=0 : GOTO 15700
15690 GOTO 15660
15700 RETURN
15710 REM SUBROUTINE TO RECALL FILENAMES
15720 RECALL=0
15730 LFLE=LEN(RFILE$)
15735 IF LFLE <= 0 THEN RECALL=1 : RFILE$="9$$$$$$$9" : GOTO 15790
15740 LFF= ASC(MID$(RFILE$,LFLE,1))
15750 IF LFF=58 OR LFF=92 THEN RECALL=1
15760 COLOR FG1,BG
15770 IF RECALL=1 THEN PRINT : PRINT "      The Following are the Files in DRIVE ";RFILE$ : FILES
RFILE$ : PRINT
15780 COLOR FG,BG
15790 RETURN
15800 FG=7 : FG1=15 : BG=0 : NCURVE=2 : GOTO 13890
15810 REM SUBROUTINE TO DO BAR INTERPRETATION
15820 IF IBM$="N" THEN GOSUB 15970 : GOTO 15960 : REM SUBROUTINE TO HANDLE NON-IBM BAR
15830 SELFLG=0
15840 A$=INKEY$ : IF A$="" THEN GOTO 15840
15850 A1$=MID$(A$,1,1)
15860 A=ASC(A1$)
15870 IF A=0 THEN A=ASC(MID$(A$,2,1)) : GOTO 15910
15880 IF A=13 THEN P$="" : SELFLG=1 : GOTO 15960
15890 IF A < 49 OR A > NL+49 THEN GOTO 15840
15900 P$=CHR$(A) : SELFLG=1 : GOTO 15960
15910 IF A = 72 OR A =80 THEN GOTO 15920 ELSE GOTO 15840
15920 IF A=80 THEN GOTO 15930 ELSE GOTO 15950
15930 YPOS=YPOS+1
15940 GOTO 15960
15950 YPOS=YPOS-1
15960 RETURN
15970 REM SUBROUTINE TO DO BAR INTERPRETATION
15980 SELFLG=0
15990 A$=INKEY$ : IF A$="" THEN GOTO 15990
16000 A1$=MID$(A$,1,1)
16010 A=ASC(A1$)
16020 IF A=13 THEN P$="" : SELFLG=1 : GOTO 16100
16030 IF A=30 OR A=31 THEN GOTO 16060
16040 IF A < 49 OR A > NL+49 THEN GOTO 15990
16050 P$=CHR$(A) : SELFLG=1 : GOTO 16100
16060 IF A=31 THEN GOTO 16070 ELSE GOTO 16090
16070 YPOS=YPOS+1
16080 GOTO 16100
16090 YPOS=YPOS-1
16100 RETURN
16110 FG=7 : BG=0 : FG1=7 : NCURVE=3 : FOR MM=1 TO NCURVE : DTAS(MM)="FILENAME" : NEXT MM : TESTQ$="3" :

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IBM$="N" : CLR$="N" : EGA$="N" : GOTO 200
16200 REM SUBROUTINE TO REVISE EXTENT OF GRAPH
16210 REVISEFLAG=0
16215 XML=XXMIN:XMU=XXMAX:YML=YYMIN:YMU=YYMAX
16220 IF OLD$="R" OR OLD$="r" OR CTYP$="4" THEN GOTO 16690
16230 CLS : LOCATE 4,5: COLOR FG,0
16240 PRINT " OPTION TO MANUALLY EXPAND OR CONTRACT THE GRAPH DISPLAY AREA"
16250 PRINT : COLOR FG,0
16260 IF REVISEFLAG=1 THEN GOTO 16290
16270 PRINT "          The actual data extent is as follows:"
16280 GOTO 16300
16290 PRINT "          The REVISED extent of the plot is as follows:"
16300 IF CTYP$="2" THEN GOTO 16320
16310 PRINT "          Horizontal Scale:  ";; COLOR FG,0 : PRINT XXMIN;; COLOR FG,0 : PRINT " to ";; COLOR
FG,0 : PRINT XXMAX : COLOR FG,0
16320 IF CTYP$="3" THEN GOTO 16340
16330 PRINT "          Vertical Scale:  ";; COLOR FG,0 : PRINT YYMIN;; COLOR FG,0 : PRINT " to ";; COLOR
FG,0 : PRINT YYMAX
16340 PRINT
16350 IF REVISEFLAG=1 THEN GOTO 16400
16360 COLOR FG,0 : PRINT "   Do you wish to EXPAND or CONTRACT the RANGE of the Plot? (Y/N) --
";Q$=INPUT$(1) : PRINT ""
16370 IF Q$="N" OR Q$="n" THEN GOTO 16690
16380 IF Q$="Y" OR Q$="y" THEN GOTO 16400
16390 GOTO 16690
16400 COLOR FG,0 : PRINT
16410 IF CTYP$="2" OR CTYP$="4" THEN GOTO 16440
16420 PRINT "                  1) Horizontal Minimum"
16430 PRINT "                  2) Horizontal Maximum"
16440 IF CTYP$="3" OR CTYP$="4" THEN GOTO 16470
16450 PRINT "                  3) Vertical Minimum"
16460 PRINT "                  4) Vertical Maximum"
16470 PRINT : PRINT "                  5) No Further Changes"
16480 COLOR FG,0 : PRINT
16490 PRINT "          What is your selection? -- ";QN$=INPUT$(1) : PRINT ""
16500 COLOR FG,0
16510 IF QN$="1" THEN GOTO 16520 ELSE GOTO 16550
16520 INPUT "          What is the new Horizontal Minimum? -- ",XML
16530 XXMIN=XML
16540 REVISEFLAG=1 : GOTO 16230
16550 IF QN$="2" THEN GOTO 16560 ELSE GOTO 16590
16560 INPUT "          What is the new Horizontal Maximum? -- ",XMU
16570 XXMAX=XMU
16580 REVISEFLAG=1 : GOTO 16230
16590 IF QN$="3" THEN GOTO 16600 ELSE GOTO 16630
16600 INPUT "          What is the new Vertical Minimum? -- ",YML
16605 IF YML > YYMIN THEN COLOR BG,BG : PRINT " WARNING -- This Compaction may Chop Minimums and alter the
Shape of the Plot " : COLOR FG,BG : GOSUB 17000
16610 YYMIN=YML
16620 REVISEFLAG=1 : GOTO 16230
16630 IF QN$="4" THEN GOTO 16640 ELSE GOTO 16670

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16640 INPUT "                      What is the new Vertical Maximum? -- ",YMU
16645 IF YMU < YYMAX THEN COLOR BG,FG : PRINT "  WARNING -- This Compaction may Chop Peaks and alter the
Shape of the Plot " : COLOR FG,BG : GOSUB 17000
16650 YYMAX=YMU
16660 REVISEFLAG=1 : GOTO 16230
16670 IF QN$="5" THEN GOTO 16690
16680 GOTO 16490
16690 RETURN
17000 REM PAUSE
17010 LOCATE 22,28 : PRINT "Hit Any Key to Continue" ;: Q$=INPUT$(1)
17020 RETURN
19000 REM COUNT THE D- POINTS
19010 INPUT #II,TESTPTS
19020 FOR NQ=2 TO 2000000!
19030 IF EOF(II) THEN NPTS(I)=NQ-2 : GOTO 19060
19040 INPUT #II,DUMMY$
19050 NEXT NQ
19060 CLOSE #II
19065 IF LEN(DUMMY$) < 1 THEN NPTS(I)=NPTS(I)-1
19070 OPEN DTA$(I) FOR INPUT AS #II
19080 IF NPTS(I)=TESTPTS THEN INPUT #II,DUMMY : GOTO 19100
19090 NPTS(I)=NPTS(I)+1
19100 LOCATE 10,1
19110 COLOR FG1,0
19120 INPUT " What is the X-Increment for the Data File? -- ",DELTAX
19130 COLOR FG,BG
19140 LOCATE 10,1 : PRINT BLANK$
19150 RETURN
19160 REM COUNT THE A- B- & C- POINTS
19170 INPUT #II,TESTPTS
19180 FOR NQ=2 TO 2000000!
19190 IF EOF(II) THEN NPTS(I)=NQ-2 : GOTO 19220
19200 LINE INPUT #II,DUMMY$
19210 NEXT NQ
19220 CLOSE #II
19225 IF LEN(DUMMY$) < 1 THEN NPTS(I)=NPTS(I)-1
19230 IF FMT(I)=3 THEN NPTS(I)=NPTS(I)-1
19240 OPEN DTA$(I) FOR INPUT AS #II
19250 IF NPTS(I)=TESTPTS THEN INPUT #II,DUMMY : GOTO 19270
19260 IF FMT(I)=3 THEN NPTS(I)=NPTS(I)+1
19270 RETURN
19500 ' Subroutine to Revise the input data
19510 CLS : LOCATE 8,15 : COLOR FG1,BG
19520 PRINT "INPUT DATA FILES CURRENTLY SPECIFIED"
19525 COLOR FG,BG : PRINT
19527 PRINT "          Curve      Filename"
19530 FOR NF=1 TO NCURVE
19540 PRINT "          ";NF;"          ";DTA$(NF)
19550 NEXT NF
19555 COLOR FG,BG : PRINT
19556 ROWTEMP = CSRLIN

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19560 PRINT "          You can ("; : COLOR FG1,BG : PRINT "S"; : COLOR FG,BG : PRINT ")UBSTITUTE a NEW
Datafile for one of these,"
19561 PRINT "          ("; : COLOR FG1,BG : PRINT "D"; : COLOR FG,BG : PRINT ")elete one of these
(to a mimimum of 1),"
19562 PRINT "          ("; : COLOR FG1,BG : PRINT "A"; : COLOR FG,BG : PRINT ")dd another datafile
(to a maximum of six),"
19563 PRINT "          or ("; : COLOR FG1,BG : PRINT "C";:COLOR FG,BG : PRINT ")omplete -- No more
changes to be specified" : PRINT
19565 COLOR FG1,BG : PRINT "          Which Revision option is selected? (S, D, A, or C) --
";:Q$=INPUT$(1) : PRINT "" : COLOR FG,BG
19570 IF Q$="S" OR Q$="s" THEN GOSUB 19650 : GOSUB 20000 : GOTO 19510
19580 IF Q$="D" OR Q$="d" THEN GOSUB 19650 : GOSUB 21000 : GOTO 19510
19590 IF Q$="A" OR Q$="a" THEN GOSUB 19650 : GOSUB 22000 : GOTO 19510
19600 IF Q$="C" OR Q$="c" THEN GOTO 19610
19605 GOTO 19565
19610 RETURN
19650 ' Routine to blank the file substitution options list and reposition at top
19660 LOCATE ROWTEMP,1
19670 FOR NROW=1 TO 8
19680 PRINT SPACE$(79)
19690 NEXT NROW
19695 LOCATE ROWTEMP,1
19700 RETURN
20000 ' Subroutine to Substitute a New Datafile
20020 PRINT "          Which datafile shall be Substituted for? -- ";: Q$=INPUT$(1) : PRINT ""
20030 SUBFILE=VAL(Q$)
20040 I=SUBFILE
20045 II=SUBFILE+1
20050 IF SUBFILE < 1 OR SUBFILE > NCURVE THEN GOTO 20020
20060 PRINT
20065 PRINT " To Recall Filenames, Type the Drive followed by a colon or subdirectory name.": PRINT
20070 PRINT "          What is the New Filename for Curve"; SUBFILE; : INPUT " -- ",DTA$(SUBFILE)
20080 GOSUB 13670 : REM FILENAMES
20090 IF RECALL=1 THEN RECALL=0 : GOTO 20070
20095 OPEN DTA$(SUBFILE) FOR INPUT AS #II
20100 GOSUB 23000 : ' routine to read in the new data
20900 RETURN
21000 ' Subroutine to Delete a Datafile
21020 PRINT "          Which datafile shall be Deleted? -- ";: Q$=INPUT$(1) : PRINT ""
21030 SUBFILE=VAL(Q$)
21050 IF NCURVE = 1 THEN LOCATE ,10 : COLOR BG,FG1 : PRINT " ERROR -- You may not have less than 1 curve
" : COLOR FG,BG : PRINT : PRINT : PRINT : GOSUB 17000: GOTO 21900
21055 NCURVE=NCURVE-1
21060 FOR MMD=SUBFILE TO NCURVE
21070 NPTS(MMD)=NPTS(MMD+1)
21080 DTA$(MMD)=DTA$(MMD+1)
21090 FMT(MMD)=FMT(MMD+1)
21100 LGND$(MMD)=LGND$(MMD+1)
21110 LGNDO$(MMD)=LGNDO$(MMD+1)
21120 SYM(MMD)=SYM(MMD+1)
21130 MK$(MMD)=MK$(MMD+1)

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21140 MKZ$(MMD)=MKZ$(MMD+1)
21160 FOR MI=1 TO NPTS(MMD)
21170 X(MMD,MI)=X(MMD+1,MI)
21180 Y(MMD,MI)=Y(MMD+1,MI)
21190 NEXT MI
21500 NEXT MMD
21900 RETURN
22000 ' Subroutine to Add another Datafile
22030 SUBFILE=NCURVE+1
22040 I=SUBFILE
22045 II=SUBFILE+1
22050 IF SUBFILE > 6 THEN LOCATE ,10 : COLOR BG,FG1 : PRINT "   ERROR -- You may not have more than 6 curves
" : COLOR FG,BG : PRINT : PRINT : PRINT : GOSUB 17000 : GOTO 22900
22055 NCURVE=NCURVE+1
22065 PRINT " To Recall Filenames, Type the Drive followed by a colon or subdirectory name.": PRINT
22070 PRINT "           What is the Filename for the Added Curve"; SUBFILE; : INPUT " -- ",DTA$(SUBFILE)
22080 GOSUB 13670 : REM FILENAMES
22090 IF RECALL=1 THEN RECALL=0 : GOTO 22070
22095 OPEN DTA$(SUBFILE) FOR INPUT AS #II
22100 GOSUB 23000 : ' routine to read in the new data
22900 RETURN
23000 ' Subroutine to read in a single new data file into curve subfile
23055 GOSUB 9170 : REM FORMATS
23060 CLS
23080 LOCATE 8,1
23100 PRINT SPACE$(79) : PRINT SPACE$(79) : LOCATE 7,1
23110 PRINT "           Counting data points in ";DTA$(I); " -- Standby . . . . ."
23111 TEMP$="           Reading the data from "+DTA$(I)+" -- Standby . . . . ."
23115 IF FMT(I)=4 THEN GOSUB 19000 : GOTO 23140 : REM COUNT IN D FMT
23130 GOSUB 19160 : REM COUNT
23135 IF FMT(I) = 3 THEN INPUT #II,DELTAX
23140 IF NPTS(I) <= 350 THEN GOTO 23240
23150 RDSKP=INT(NPTS(I)/350)+1
23160 LOCATE 10,10 : COLOR BG,FG : PRINT "WARNING --- The number of points in the data set is too large"
23170 LOCATE 11,19 : PRINT "Points will be taken every";RDSKP;"points instead":COLOR FG,BG
23180 LOCATE 14,22 : PRINT "----- Hit any key to Acknowledge ----- ";:TMP$=INPUT$(1):PRINT ""
23190 LOCATE 10,1
23200 FOR NSP=1 TO 5 : PRINT SPACE$(79) : NEXT NSP
23216 LOCATE 8,1 : PRINT TEMP$
23220 ON FMT(I) GOSUB 10520,10620,10720,10720
23230 GOTO 23250
23240 LOCATE 8,1 : PRINT TEMP$
23245 ON FMT(I) GOSUB 10340,10390,10440,10440
23250 CLOSE #II
23260 RETURN
24000 ' Routine to translate SYM to MKZ$ on a recalled plot
24010 FOR NCV=1 TO NCURVE
24270 IF SYM(NCV) = 1 THEN MK$(NCV)="*" : GOTO 24400
24280 IF SYM(NCV) = 2 THEN MK$(NCV)="#" : GOTO 24400
24290 IF SYM(NCV) = 3 THEN MK$(NCV)="+" : GOTO 24400
24300 IF SYM(NCV) = 4 THEN MK$(NCV)="x" : GOTO 24400

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24310 IF SYM(NCV) = 5 THEN MK$(NCV)="$" : GOTO 24400
24320 IF SYM(NCV) = 6 THEN MK$(NCV)="o" : GOTO 24400
24330 IF SYM(NCV) = 7 THEN MK$(NCV)="^" : GOTO 24400
24340 IF SYM(NCV) = 8 THEN MK$(NCV)="."
24400 IF TESTQ$="1" THEN MKZ$(NCV)="MK;" + MK$(NCV) + ";" : GOTO 24410
24405 IF TESTQ$="4" THEN MKZ$(NCV)=MK$(NCV)
24410 NEXT NCV
24420 RETURN
```

PLOTLASR Listing

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'          PLOTLASR
20 '
30 DIM DTA$(6),CNM$(6),NPTS(6),FMT(6),X(6,350),Y(6,350),XMIN(6),XMAX(6),YMIN(6),YMAX(6),DSC(33),LGND$(6),
    PUS$(7),BK(7),LGX(12),LGY(12),AL$(172),MK$(6),MKZ$(6),SYM(6),LGND0$(6)
40 COMMON CNM$(),BLANK$,DSC(),DTA$(),NPTS(),FMT(),X(),Y(),XMIN(),XMAX(),YMIN(),YMAX(),MKZ$(),PORT,SPORT,
    XML,XMU,YML,YMU,FFLG,F$,PARFLG
50 COMMON LGND$(),PUS$(),BK(),LGX(),LGY(),NCURVE,XBOT,XBOTE,XTOP,XTOPE,YBOT,YBOTE,YTOP,YTOPE,DXGRID,
    DYGRID,CTYP$,GRID$,TITLE$,TITLEX$,TITLEY$,TXT$,XNDX,YNDX,AL$(),TXTQ$,VERSION$,REVISEFLAG
60 COMMON IBM$,CLR$,TMLP,FG,BG,FG1,EGA$,TXTLOC$,SCALE,PAUZ$,LTP$,PSIZE$,TITLE0$,TITLEX0$,TITLEY0$,TXTO$,
    LQST$,SYM(),LGND0$(),SCRNFLG,TESTQ$,PRGDIR$,LCC,LASTYPE,RFORM,CLASSPLOT$,FORMALTITLE$,PENFLG,PAGEQ$,
    PAGEN$,LASPORT
70 '
80 '   STARTS LASER PLOTTING
90 IF LASPORT=1 THEN DEST$="lpt1:" ELSE DEST$="lpt2:"
100 '
110 C$=" "
120 CLS : LOCATE 10,33 : PRINT "PRINTER Ready?"
130 PRINT "          <Hit Any Key to Start the Plot>";:QQ$=INPUT$(1) : CLS
135 IF QQ$="@" THEN OPEN "temp.out" FOR OUTPUT AS #1 : GOTO 150
140 OPEN DEST$ FOR OUTPUT AS #1
150 IF PSIZE$="Q" THEN GOSUB 6170
160 IF PSIZE$="F" OR PSIZE$="R" THEN GOSUB 6240
170 GOSUB 300 : REM INITIATE PLOTTER & SCALES
180 IF TXTQ$="N" OR TXTQ$="n" THEN GOTO 200
190 GOSUB 3130 : REM PLACE TEXT LABEL
200 GOSUB 1800 : REM PLACE LABELS
210 GOSUB 3470 : REM ADD LEGENDS
220 GOSUB 760 : REM DRAW THE GRID LINES
230 IF CTYP$="1" THEN GOTO 250
240 GOSUB 4410 : REM DRAW LOG GRID LINES
250 GOSUB 1580 : REM DRAW THE CURVES
260 PRINT #1, "IRI RES;SPO P; FONT 1; PAGE; EXIT, E;"
270 CLOSE #1
280 GOSUB 5990 : ' Continue Option
290 END
300 REM INITIATE PLOTTER & SCALES
310 CLS : LOCATE 8,1
320 IF PSIZE$="H" THEN GOTO 420
330 PRINT #1,"IRI RES; SPO L; UNIT D;"
340 IF PSIZE$="Q" THEN GOTO 600
350 IF PSIZE$="R" THEN GOTO 580
360 '
370 '   This is the full size plot with the border
380 '
390 PIX=595 :PIY=1866 : P2X=2965 : P2Y=261
400 XO=172:YO=75:X1=3052:Y1=2205
410 GOTO 720
420 '   Start of Half Size Plot

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430 PRINT #1,"IRI RES; SPO P; UNIT D;"
440 CLS: LOCATE 8,1 : COLOR FG,BG
450 PRINT "      On the Laser Printer, Half-Size Plots can be"
460 PRINT "      on the Upper or Lower Half of the Page." : PRINT
470 COLOR FG1,BG
480 PRINT "      Which do you want? (U) or (L) -- "; HLCC$=INPUT$(1) : PRINT "" : COLOR FG,BG
490 IF HLCC$="U" OR HLCC$="u" THEN HLCC$="U" : GOTO 550
500 IF HLCC$="L" OR HLCC$="l" THEN HLCC$="L" : GOTO 520
510 GOTO 470
520 X0=147 :Y0=1595 :X1=2277 :Y1=2985
530 P1X=460 :P1Y=2764 : P2X=2213 : P2Y=1716
540 GOTO 720
550 X0=147 :Y0=105 :X1=2277 :Y1=1495
560 P1X=460 :P1Y=1274 : P2X=2213 : P2Y=226
570 GOTO 720
580 P1X=742 :P1Y=1800 : P2X=2812 : P2Y=405
590 GOTO 720
600 ON LCC GOTO 610,640,670,700
610 P1X=378 : P1Y=939 : P2X=1532 : P2Y=262
620 X0=172:Y0=75 :X1=1574:Y1=1103
630 GOTO 720
640 P1X=1855 : P1Y=939 : P2X=3009 : P2Y=262
650 X0=1649:Y0=75 :X1=3051 :Y1=1103
660 GOTO 720
670 P1X=378 : P1Y=2042 : P2X=1532 : P2Y=1268
680 X0=172:Y0=1178 : X1=1574 : Y1=2206
690 GOTO 720
700 P1X=1855 : P1Y=2042 : P2X=3009 : P2Y=1268
710 X0=1649:Y0=1178:X1=3051 :Y1=2206
720 ' start of box
730 CLS : LOCATE 8,12 : PRINT "Plotting to the Laser Printer underway, standby . . . "
740 GOSUB 5830 : ' routine to do the box to variable size
750 RETURN
760 REM DRAW GRID LINES
770 PG1$="&#####&"
780 PG2$="& #####.#####.#####.#####.#####.#####&"
790 PG3$="& #####.##### & #####.##### &"
800 PG4$="& #####.##### &"
810 C$=", "
820 LX=XTOP : LY=YBOT : GOSUB 5760 : PRINT #1,USING PG1$;"IRI MAP ",LXX,C$,LYY,";"
830 LX=XBOT : LY=YBOT : GOSUB 5760 : PRINT #1,USING PG1$;"DAP ",LXX,C$,LYY,";"
840 LX=XBOT : LY=YTOP : GOSUB 5760 : PRINT #1,USING PG1$;"DAP ",LXX,C$,LYY,";"
850 IF GRID$="P" OR GRID$="p" THEN GOTO 860 ELSE GOTO 880
860 LX=XTOP : LY=YTOP : GOSUB 5760 : PRINT #1,USING PG1$;"DAP ",LXX,C$,LYY,";"
870 LX=XTOP : LY=YBOT : GOSUB 5760 : PRINT #1,USING PG1$;"DAP ",LXX,C$,LYY,";"
880 LX=XBOT : LY=YBOT : GOSUB 5760 : PRINT #1,USING PG1$;"MAP ",LXX,C$,LYY,";"
890 IF CTYP$="4" THEN GOTO 1560
900 IF CTYP$="2" THEN GOTO 1120
910 IF XBOT >= 0 OR XTOP <= 0 THEN GOTO 1020
920 LX=0 : LY=YBOT : GOSUB 5760 : PRINT #1,USING PG1$;"MAP ",LXX,C$,LYY,";"
930 LX=0 : LY=YTOP : GOSUB 5760 : PRINT #1,USING PG1$;"DAP ",LXX,C$,LYY,";"

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940 IF CTYP$="3" THEN GOTO 1230
950 Y=YBOT-DYGRID
960 FOR I=1 TO 20
970 Y=Y+DYGRID
980 IF Y > YTOP+.00001 THEN GOTO 1020
990 LX=0 : LY=Y : GOSUB 5760 : PRINT #1,USING PG1$;"MAP ",LXX-12*SCALE,C$,LYY,";"
1000 PRINT #1,USING PG1$;"DAP ",LXX+12*SCALE,C$,LYY,";"
1010 NEXT I
1020 IF CTYP$="3" THEN GOTO 1230
1030 IF GRID$="P" OR GRID$="p" THEN GOTO 1040 ELSE GOTO 1110
1040 Y=YBOT-DYGRID
1050 FOR I=1 TO 20
1060 Y=Y+DYGRID
1070 IF Y > YTOP+.00001 THEN GOTO 1100
1080 LX=XTOP : LY=Y : GOSUB 5760 : PRINT #1,USING PG1$;"MAP ",LXX-12*SCALE,C$,LYY,";" : PRINT #1,USING
PG1$;"DAP ",LXX+12*SCALE,C$,LYY,";"
1090 NEXT I
1100 '
1110 IF CTYP$="3" THEN GOTO 1330
1120 IF YBOT >= 0 OR YTOP <= 0 THEN GOTO 1230
1130 X=XBOT-DXGRID
1140 LX=XBOT : LY=0 : GOSUB 5760 : PRINT #1,USING PG1$;"MAP ",LXX,C$,LYY,";"
1150 LX=XTOP : LY=0 : GOSUB 5760 : PRINT #1,USING PG1$;"DAP ",LXX,C$,LYY,";"
1160 IF CTYP$="2" THEN GOTO 1460
1170 FOR I=1 TO 20
1180 X=X+DXGRID
1190 IF X > XTOP+.00001 THEN GOTO 1230
1200 LX=X : LY=0 : GOSUB 5760 : PRINT #1,USING PG1$;"MAP ",LXX,C$,LYY-12*SCALE,";"
1210 PRINT #1,USING PG1$;"DAP ",LXX,C$,LYY+12*SCALE,";"
1220 NEXT I
1230 IF CTYP$="2" THEN GOTO 1460
1240 IF GRID$="P" OR GRID$="p" THEN GOTO 1250 ELSE GOTO 1330
1250 X=XBOT-DXGRID
1260 FOR I=1 TO 20
1270 X=X+DXGRID
1280 IF X > XTOP+.00001 THEN GOTO 1320
1290 LX=X : LY=YTOP : GOSUB 5760 : PRINT #1,USING PG1$;"MAP ",LXX,C$,LYY-12*SCALE,";"
1300 PRINT #1,USING PG1$;"DAP ",LXX,C$,LYY+12*SCALE,";"
1310 NEXT I
1320 '
1330 X=XBOT-DXGRID : Y=YBOT-DYGRID
1340 IF CTYP$="4" THEN GOTO 1560
1350 IF CTYP$="2" THEN GOTO 1460
1360 X=XBOT-DXGRID
1370 FOR I=1 TO 20
1380 X=X+DXGRID
1390 IF X > XTOP+.00001 THEN GOTO 1460
1400 LX=X : LY=YBOT : GOSUB 5760 : PRINT #1,USING PG1$;"MAP ",LXX,C$,LYY-12*SCALE,";"
1410 PRINT #1,USING PG1$;"DAP ",LXX,C$,LYY+12*SCALE,";"
1420 IF GRID$="H" OR GRID$="h" OR GRID$="T" OR GRID$="t" OR GRID$="P" OR GRID$="p" THEN GOTO 1440
1430 LX=X : LY=YTOP : GOSUB 5760 : PRINT #1,USING PG1$;"SPD 1;DAP ",LXX,C$,LYY,";SPD 2;"

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1440 NEXT I
1450 '
1460 IF CTYP$="3" THEN GOTO 1560
1470 Y=YBOT-DYGRID
1480 FOR I=1 TO 20
1490 Y=Y+DYGRID
1500 IF Y > YTOP+.00001 THEN GOTO 1560
1510 LX=XBOT : LY=Y : GOSUB 5760 : PRINT #1,USING PG1$;"MAP ",LXX-12*SCALE,C$,LYY,";"
1520 PRINT #1,USING PG1$;"DAP ",LXX+12*SCALE,C$,LYY,";"
1530 IF GRID$="V" OR GRID$="v" OR GRID$="T" OR GRID$="t" OR GRID$="P" OR GRID$="p" THEN GOTO 1550
1540 LX=XTOP : LY=Y : GOSUB 5760 : PRINT #1,USING PG1$;"SPD 1;DAP ",LXX,C$,LYY,";SPD 2;"
1550 NEXT I
1560 '
1570 RETURN
1580 REM DRAW THE CURVES
1590 SCAT$="1"
1592 IF LTYP$="P" THEN GOSUB 6700 : ' Symbol font definition
1600 PRINT #1,"IRI SPD ";2*N,"; EXIT, E;"
1610 PU2$="#####&"
1620 FOR N=1 TO NCURVE
1621 IF LTYP$="C" THEN GOTO 1630
1622 IF SYM(N)=8 THEN SYMSHIFTX=-3 : SYMSHIFTY=1 : GOTO 1630
1630 IF LQST$="N" THEN GOTO 1650
1640 PRINT #1,"IRI SPD ";2*N,"; EXIT, E;"
1650 FOR II=1 TO NPTS(N)
1660 IF X(N,II) >= XML AND X(N,II) <= XMU THEN GOTO 1670 ELSE GOTO 1680
1670 IF Y(N,II) >= YML AND Y(N,II) <= YMU THEN GOTO 1700 ELSE GOTO 1680
1680 NEXT II
1690 GOTO 1770
1700 FIRST=II+1
1710 LX=X(N,II) : LY=Y(N,II) : GOSUB 5760 : PRINT #1,USING PU2$;"IRI MAP ",LXX,C$,LYY,"; EXIT, E;"
1715 IF LTYP$="P" THEN PRINT #1,"IRI MRP ",SYMSHIFTX,C$,SYMSHIFTY,"; TEXT '";MKZ$(N);"' : EXIT, E;"
1720 FOR I=FIRST TO NPTS(N)
1730 IF X(N,I) >= XML AND X(N,I) <= XMU THEN GOTO 1740 ELSE GOTO 1760
1740 IF Y(N,I) >= YML AND Y(N,I) <= YMU THEN GOTO 1750 ELSE GOTO 1760
1750 LX=X(N,I) : LY=Y(N,I) : GOSUB 5760
1752 IF LTYP$="C" THEN PRINT #1,USING PU2$;"IRI DAP ",LXX,C$,LYY,"; EXIT, E;" : GOTO 1760
1754 PRINT #1,USING PU2$;"IRI MAP ",LXX,C$,LYY,";"
1755 PRINT #1,"MRP ",SYMSHIFTX,C$,SYMSHIFTY,";"
1756 PRINT #1,"TEXT '";MKZ$(N);"' : EXIT, E;"
1760 NEXT I
1770 GOSUB 4330 : REM LEGEND LINES
1780 NEXT N
1790 RETURN
1800 REM LABEL THE AXES & TITLE
1810 PUL3$="#####&"
1820 PUS$(1)=" ###.###" : BK(1)=6.5
1830 PUS$(2)=" #####.##" : BK(2)=6.5
1840 PUS$(3)=" #####." : BK(3)=7
1850 PUS$(4)=" #####." : BK(4)=6.5
1860 PUS$(5)="#####." : BK(5)=6

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1870 PUS$(6)="#####." : BK(6)=5.5
1880 PUS$(7)="#####." : BK(7)=5
1890 CSWT=.38*SCALE : CSHT=.54*SCALE
1900 '
1910 IF PSIZE$="F" THEN SPNP=38 : PRINT #1,"FONT 29; SFA 50, 70, P, 3, 21, 67;" :GOTO 1960
1920 IF PSIZE$="R" THEN SPNP=37 : PRINT #1,"FONT 29; SFA 44, 60, P, 3, 21, 60;" :GOTO 1960
1930 IF PSIZE$="H" THEN SPNP=36 : PRINT #1,"FONT 10; SFA 37, 52, P, 0, 21, 50;" :GOTO 1960
1940 SPNP=34 : PRINT #1,"FONT 29; SFA 25, 35, P, 3, 21, 32;" :GOTO 1960
1950 '
1960 BACK=-LEN(TITLE$)/2
1970 IF PSIZE$="F" THEN PRINT #1,"MAP 1680, 150;" : GOTO 2050
1980 IF PSIZE$="R" THEN PRINT #1,"MAP 1680, 320;" : GOTO 2050
1990 IF PSIZE$="H" AND HLCC$="U" THEN PRINT #1,"MAP 1230, 180;" : GOTO 2050
2000 IF PSIZE$="H" AND HLCC$="L" THEN PRINT #1,"MAP 1230, 1665;" : GOTO 2050
2010 IF PSIZE$="Q" AND LCC=1 THEN PRINT #1,"MAP 880, 150;" : GOTO 2050
2020 IF PSIZE$="Q" AND LCC=2 THEN PRINT #1,"MAP 2347, 150;" : GOTO 2050
2030 IF PSIZE$="Q" AND LCC=3 THEN PRINT #1,"MAP 880, 1247;" : GOTO 2050
2040 IF PSIZE$="Q" AND LCC=4 THEN PRINT #1,"MAP 2347, 1247;"
2050 IF LASTYPE=2 THEN PRINT #1,"CTXT '";TITLE$;"' : GOTO 2090
2060 SPN=INT(LEN(TITLE$)/2)+1
2070 PRINT #1, "MRP ";SPNP*SPN;" , 0;"
2080 PRINT #1, "RTXT '";TITLE$;"' ;"
2090 IF PSIZE$="R" AND RFORM = 2 THEN GOSUB 6500 : ' Place formal title
2091 '
2100 ' X-AXIS AND Y-AXIS LABELS
2110 '
2120 CSWT=.22*SCALE : CSHT=.33 *SCALE
2130 '
2140 IF PSIZE$="F" THEN SPNP=26 : PRINT #1,"FONT 30;" : GOTO 2190
2150 IF PSIZE$="R" THEN SPNP=22 : PRINT #1,"FONT 31;" : GOTO 2190
2160 IF PSIZE$="H" THEN SPNP=21 : PRINT #1,"FONT 40;" : GOTO 2190
2170 SPNP=15 : PRINT #1,"FONT 36;"
2180 '
2190 IF PSIZE$="F" THEN PRINT #1,"MAP 1680, 2010;" : GOTO 2270
2200 IF PSIZE$="R" THEN PRINT #1,"MAP 1680, 1920;" : GOTO 2270
2210 IF PSIZE$="H" AND HLCC$="U" THEN PRINT #1,"MAP 1230, 1380;" : GOTO 2270
2220 IF PSIZE$="H" AND HLCC$="L" THEN PRINT #1,"MAP 1230, 2865;" : GOTO 2270
2230 IF PSIZE$="Q" AND LCC=1 THEN PRINT #1,"MAP 915, 1010;" : GOTO 2270
2240 IF PSIZE$="Q" AND LCC=2 THEN PRINT #1,"MAP 2385, 1010;" : GOTO 2270
2250 IF PSIZE$="Q" AND LCC=3 THEN PRINT #1,"MAP 915, 2105;" : GOTO 2270
2260 IF PSIZE$="Q" AND LCC=4 THEN PRINT #1,"MAP 2385, 2105;"
2270 IF LASTYPE=2 THEN PRINT #1,"CTXT '";TITLEX$;"' : GOTO 2300
2280 SPN=INT(LEN(TITLEX$)/2)+1
2290 PRINT #1, "MRP ";SPNP*SPN;" , 0;" : PRINT #1, "RTXT '";TITLEX$;"' ;"
2300 IF PSIZE$="H" THEN GOTO 2330
2310 PRINT #1,"SPO P; UNIT D;"
2320 GOTO 2350
2330 PRINT #1,"SPO L; UNIT D;"
2340 '
2350 SPNP=29
2360 IF PSIZE$="F" THEN PRINT #1,"MAP 1200, 2800;" : GOTO 2440

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2370 IF PSIZE$="R" THEN PRINT #1,"MAP 1200, 2613;" : GOTO 2440
2380 SPNP=22 : IF PSIZE$="H" AND HLCC$="U" THEN PRINT #1,"MAP 2355, 150;" : GOTO 2440
2390 IF PSIZE$="H" AND HLCC$="L" THEN PRINT #1,"MAP 855, 150;" : GOTO 2440
2400 SPNP=18: IF PSIZE$="Q" AND LCC=1 THEN PRINT #1,"MAP 685, 2880;" : GOTO 2440
2410 IF PSIZE$="Q" AND LCC=2 THEN PRINT #1,"MAP 685, 1405;" : GOTO 2440
2420 IF PSIZE$="Q" AND LCC=3 THEN PRINT #1,"MAP 1770, 2880;" : GOTO 2440
2430 IF PSIZE$="Q" AND LCC=4 THEN PRINT #1,"MAP 1770, 1405;"
2440 GOSUB 5880 : ' Subroutine to establish the ROTATED Font
2450 IF LASTYPE=2 THEN PRINT #1,"CTXT '";B$;"' : GOTO 2490
2460 SPN=INT(LEN(B$)/2)+1
2470 PRINT #1, "MRP ";SPNP*SPN;" , 0;"
2480 PRINT #1, "RTXT '";B$;"' ;"
2490 '
2500 '
2510 ' X-AXIS AND Y-AXIS NUMBERS
2520 '
2530 IF PSIZE$="F" THEN PRINT #1,"SPO L; UNIT D; FONT 26; EXIT, E;" : SCLN=1 : GOTO 2570
2540 IF PSIZE$="R" THEN PRINT #1,"SPO L; UNIT D; FONT 23; EXIT, E;" : SCLN=1 : GOTO 2570
2550 IF PSIZE$="H" THEN PRINT #1,"SPO P; UNIT D; FONT 6; EXIT, E;" : SCLN=1 : GOTO 2570
2560 PRINT #1,"SPO L; UNIT D; FONT 22; EXIT, E;" : SCLN=.49
2570 IF CTYP$="4" OR CTYP$="2" THEN GOTO 2810
2580 NT=1
2590 IF XNDX < 8 THEN GOTO 2660
2600 FOR I=15 TO 31 STEP 4
2610 NT=NT+1
2620 IF XNDX > I THEN GOTO 2640
2630 GOTO 2660
2640 NEXT I
2650 NT=NT+1
2660 PUSX$=PUS$(NT)
2670 BAKN=-BK(NT) : XSTRT=XBOT : XSTP=DXGRID
2680 MN=ABS(XTOP-XBOT)/DXGRID : MNT=ABS(XTOP)
2690 IF NT < 3 AND MN > 11 THEN GOTO 2730
2700 IF NT > 2 AND MN > 11 AND MNT > 9999 THEN GOTO 2730
2710 IF NT > 4 THEN GOTO 2730
2720 GOTO 2810
2730 XSTP=DXGRID+DXGRID
2740 IF XBOT >= 0 OR XTOP <= 0 THEN GOTO 2810
2750 Z=XBOT-DXGRID
2760 FOR I=1 TO 15 STEP 2
2770 Z=Z+DXGRID+DXGRID
2780 IF Z > XTOP THEN GOTO 2810
2790 IF Z=0 THEN XSTRT=XBOT+DXGRID : GOTO 2810
2800 NEXT I
2810 NT=1
2820 IF YNDX < 8 THEN GOTO 2890
2830 FOR I=15 TO 31 STEP 4
2840 NT=NT+1
2850 IF YNDX > I THEN GOTO 2870
2860 GOTO 2890
2870 NEXT I

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2880 NT=NT+1
2890 PUSY$=PUS$(NT)
2900 '
2910 ' Y NUMBERS
2920 '
2930 '
2940 IF CTYP$="1" OR CTYP$="2" THEN GOTO 2970
2950 GOSUB 5160 : REM SUBROUTINE TO PLACE THE NUMBERS FOR A LOG PLOT
2960 GOTO 3020
2970 FOR Y=YBOT TO YTOP STEP DYGRID
2980 LX=XBOT : LY=Y : GOSUB 5760: PRINT #1,USING PUL3$;"IRI MAP ",LXX-250*SCLN,C$,LYY+12*SCALE,"; EXIT, E;"
2990 PRINT #1,USING PUSY$;Y
3000 NEXT Y
3010 '
3020 ' X NUMBERS
3030 '
3040 IF CTYP$="4" THEN GOTO 3120
3050 IF CTYP$="1" OR CTYP$="3" THEN GOTO 3080
3060 GOSUB 5160 : REM PLACE LOG NUMBERS
3070 GOTO 3120
3080 FOR X=XSTRT TO XTOP STEP XSTP
3090 LX=X : LY=YBOT : GOSUB 5760 : PRINT #1,USING PUL3$;"IRI MAP ",LXX+BAKN*25*SCLN,C$,LYY+75*SCALE,"; EXIT, E;"
3100 PRINT #1,USING PUSX$;X
3110 NEXT X
3120 RETURN
3130 REM PLACE TEXT
3140 PUL5$="#####&"
3150 '
3160 IF PSIZE$="F" THEN PRINT #1,"FONT 31;" : GOTO 3210
3170 IF PSIZE$="R" THEN PRINT #1,"FONT 31;" : GOTO 3210
3180 IF PSIZE$="H" THEN PRINT #1,"FONT 40;" : GOTO 3210
3190 PRINT #1,"FONT 22;"
3200 '
3210 IF TXTLOC$="3" THEN GOTO 3270
3220 IF TXTLOC$="1" THEN GOTO 3320
3230 XTL=XTOP : YTL=YTOP
3240 LX=XTL : LY=YTL : GOSUB 5760 : PRINT #1,USING PUL5$; "MAP ",LXX,C$,LYY+60*SCALE,";"
3250 PRINT #1, "RTXT '";TXT$;"';"
3260 GOTO 3450
3270 XTL=XBOT : YTL=YTOP
3280 LX=XTL : LY=YTL : GOSUB 5760 : PRINT #1,USING PUL5$; "MAP ",LXX+100*SCALE,C$,LYY+60*SCALE,";"
3290 PRINT #1, "TEXT '";TXT$;"';"
3300 GOTO 3450
3310 SPNP=22
3320 IF PSIZE$="F" THEN PRINT #1,"MAP 1680, 215;" : GOTO 3400
3330 IF PSIZE$="R" THEN PRINT #1,"MAP 1680, 385;" : GOTO 3400
3340 IF PSIZE$="H" AND HLCC$="U" THEN PRINT #1,"MAP 1230, 210;" : GOTO 3400
3350 IF PSIZE$="H" AND HLCC$="L" THEN PRINT #1,"MAP 1230, 1695;" : GOTO 3400
3360 SPNP=18 : IF PSIZE$="Q" AND LCC=1 THEN PRINT #1,"MAP 880, 195;" : GOTO 3400
3370 IF PSIZE$="Q" AND LCC=2 THEN PRINT #1,"MAP 2347, 195;" : GOTO 3400

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3380 IF PSIZE$="Q" AND LCC=3 THEN PRINT #1,"MAP 880, 1292;" : GOTO 3400
3390 IF PSIZE$="Q" AND LCC=4 THEN PRINT #1,"MAP 2347, 1292;"
3400 IF LASTYPE=2 THEN PRINT #1, "CTXT '";TXT$;"'"; : GOTO 3440
3410 SPN=INT(LEN(TXT$)/2)+1
3420 PRINT #1, "MRP ";SPNP*SPN;" , 0;"
3430 PRINT #1, "RTXT '";TXT$;"'";
3440 '
3450 '
3460 RETURN
3470 REM PLACE LEGENDS
3480 IF NCURVE=1 THEN GOTO 4320
3490 IF LQST$="N" THEN GOTO 4320
3500 '
3510 SPNP=26
3520 IF PSIZE$="F" THEN PRINT #1,"IRI FONT 21;" : GOTO 3570
3530 IF PSIZE$="R" THEN PRINT #1,"IRI FONT 21;" : GOTO 3570
3540 IF PSIZE$="H" THEN SPNP=22 : PRINT #1,"IRI FONT 42;" : GOTO 3570
3550 SPNP=18 : PRINT #1,"IRI FONT 73;"
3560 '
3570 XDIF=XTOP-XBOT : YDIF=YTOP-YBOT
3580 LLGND=XDIF*15/48
3590 LSPACE=XDIF*2.5/48
3600 LGNY1=YBOT-YDIF*.137
3610 LGNY2=YBOT-YDIF*.173
3620 LGNYM=YBOT-YDIF*.155
3630 LEFT3=XBOT-XDIF*4.25/48
3640 LEFT2=XBOT+XDIF*4.5/48
3650 ON NCURVE GOTO 4320,3690,3770,3890,4010,4150
3660 '
3670 ' 2 CURVES
3680 '
3690 LGX(1)=LEFT2 : LGY(1)=LGNYM
3700 LGX(7)=LGX(1)+LLGND : LGY(7)=LGNYM
3710 LGX(2)=LGX(1)+LLGND+LSPACE : LGY(2)=LGNYM
3720 LGX(8)=LGX(2)+LLGND : LGY(8)=LGNYM
3730 GOTO 4270
3740 '
3750 ' 3 CURVES
3760 '
3770 LGX(1)=LEFT3 : LGY(1)=LGNYM
3780 LGX(7)=LGX(1)+LLGND : LGY(7)=LGNYM
3790 FOR I=2 TO 3
3800 LGX(I)=LGX(I-1)+LLGND+LSPACE
3810 LGY(I)=LGY(I-1)
3820 LGX(I+6)=LGX(I+5)+LLGND+LSPACE
3830 LGY(I+6)=LGY(I)
3840 NEXT I
3850 GOTO 4270
3860 '
3870 ' 4 CURVES
3880 '

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3890 LGX(1)=LEFT2           :   LGY(1)=LGNY1
3900 LGX(7)=LGX(1)+LLGND    :   LGY(7)=LGNY1
3910 LGX(2)=LGX(1)+LLGND+LSPACE :   LGY(2)=LGNY1
3920 LGX(8)=LGX(2)+LLGND    :   LGY(8)=LGNY1
3930 FOR I=3 TO 4
3940 LGX(I)=LGX(I-2)        :   LGY(I)=LGNY2
3950 LGX(I+6)=LGX(I+4)      :   LGY(I+6)=LGNY2
3960 NEXT I
3970 GOTO 4270
3980 '
3990 ' 5 CURVES
4000 '
4010 LGX(1)=LEFT3           :   LGY(1)=LGNY1
4020 LGX(7)=LGX(1)+LLGND    :   LGY(7)=LGNY1
4030 FOR I=2 TO 3
4040 LGX(I)=LGX(I-1)+LLGND+LSPACE:   LGY(I)=LGNY1
4050 LGX(I+6)=LGX(I+5)+LLGND+LSPACE: LGY(I+6)=LGNY1
4060 NEXT I
4070 LGX(4)=LEFT2           :   LGY(4)=LGNY2
4080 LGX(10)=LGX(4)+LLGND   :   LGY(10)=LGNY2
4090 LGX(5)=LGX(4)+LLGND+LSPACE :   LGY(5)=LGNY2
4100 LGX(11)=LGX(5)+LLGND+LSPACE :   LGY(11)=LGNY2
4110 GOTO 4270
4120 '
4130 ' 6 CURVES
4140 '
4150 LGX(1)=LEFT3           :   LGY(1)=LGNY1
4160 LGX(7)=LGX(1)+LLGND    :   LGY(7)=LGNY1
4170 FOR I=2 TO 3
4180 LGX(I)=LGX(I-1)+LLGND+LSPACE:   LGY(I)=LGNY1
4190 LGX(I+6)=LGX(I+5)+LLGND+LSPACE: LGY(I+6)=LGNY1
4200 NEXT I
4210 LGX(4)=LEFT3           :   LGY(4)=LGNY2
4220 LGX(10)=LGX(4)+LLGND   :   LGY(10)=LGNY2
4230 FOR I=5 TO 6
4240 LGX(I)=LGX(I-1)+LLGND+LSPACE:   LGY(I)=LGNY2
4250 LGX(I+6)=LGX(I+5)+LLGND+LSPACE: LGY(I+6)=LGNY2
4260 NEXT I
4270 FOR I=1 TO NCURVE
4280 LX=LGX(I) : LY=LYG(I) : GOSUB 5760 : PRINT #1,USING "&#####&";"MAP ",LXX,C$,LYY+12*SCALE,";"
4290 PRINT #1,"TEXT '";LGND$(I);";"
4300 NEXT I
4310 PRINT #1,"EXIT, E;"
4320 RETURN
4330 REM INSTALL LEGEND LINES
4340 IF NCURVE=1 THEN GOTO 4400
4350 IF LQST$="Y" THEN GOTO 4360 : ELSE GOTO 4400
4360 LONG=LEN(LGND$(N))+1
4380 LX=LGX(N) : LY=LYG(N) : GOSUB 5760 : PRINT #1,USING "&#####&#####&";"IRI MAP
",LXX+LONG*SPNP+32,C$,LYY,"; EXIT, E;"
4390 LX=LGX(N+6) : LY=LYG(N+6) : GOSUB 5760

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4392 IF LTYP$="C" THEN PRINT #1,USING "#####&";"IRI DAP ",LXX,C$,LYY,";EXIT, E;" : GOTO 4400
4393 PRINT #1,"IRI MRP ",SYMSHIFTX,C$,SYMSHIFTY,";"
4394 PRINT #1,"TEXT '";MKZ$(N);"' : EXIT, E;"
4400 RETURN
4410 REM LOG GRIDS OR TICKS
4420 PUL1$="#####&#####&"
4430 PUL11$="& #####.#####.##### &"
4440 ' Start of Verticals
4450 IF CTYP$="3" THEN GOSUB 5500 : GOTO 4800
4460 XLAGE=XBOTE
4470 FOR IC=1 TO 7
4480 XL=LOG(XLAGE)
4490 LX=XL : LY=YBOT : GOSUB 5760 : PRINT #1,USING PG1$;"MAP ",LXX,C$,LYY,";"
4500 LX=XL : LY=YTOP : GOSUB 5760 : PRINT #1,USING PG1$;"DAP ",LXX,C$,LYY,";"
4510 IF GRID$="B" OR GRID$="b" OR GRID$="H" OR GRID$="h" THEN GOTO 4670
4520 IF CTYP$="2" THEN GOTO 4600
4530 YLAGE=YBOTE
4540 FOR IVT=1 TO 7
4550 IF YLAGE*10 > YTOPE THEN GOTO 4670
4560 FOR I=1 TO 10 : YL=LOG(I*YLAGE): LX=XL : LY=YL : GOSUB 5760 : PRINT #1,USING PUL1$;"MAP ",LXX-
12*SCALE,C$,LYY,";" : PRINT #1,USING PUL1$;"DAP ",LXX+12*SCALE,C$,LYY,";" : NEXT I
4570 YLAGE=YLAGE*10
4580 NEXT IVT
4590 GOTO 4670
4600 FOR I=0 TO 20
4610 YL=YBOT+I*DYGRID
4620 IF YL > YTOP THEN GOTO 4670
4630 LX=XL : LY=YL : GOSUB 5760 : PRINT #1,USING PG1$;"MAP ",LXX-12*SCALE,C$,LYY,";"
4640 PRINT #1,USING PG1$;"DAP ",LXX+12*SCALE,C$,LYY,";"
4650 NEXT I
4660 IF CTYP$="3" THEN GOTO 4800
4670 '
4680 IF XLAGE*10 > XTOPE THEN GOTO 4800
4690 FOR IL=2 TO 10
4700 XL=LOG(IL*XLAGE)
4710 LX=XL : LY=YBOT : GOSUB 5760 : PRINT #1,USING PG1$;"MAP ",LXX,C$,LYY-12*SCALE,";"
4720 PRINT #1,USING PG1$;"DAP ",LXX,C$,LYY+12*SCALE,";"
4730 IF GRID$="H" OR GRID$="h" OR GRID$="T" OR GRID$="t" OR GRID$="P" OR GRID$="p" THEN GOTO 4750
4740 LX=XL : LY=YTOP : GOSUB 5760 : PRINT #1,USING PG1$;"SPD 1;DAP ",LXX,C$,LYY,";SPD 2;"
4750 '
4760 NEXT IL
4770 XLAGE=XLAGE*10
4780 NEXT IC
4790 ' Start of Horizontals
4800 IF CTYP$="2" THEN GOSUB 5630 : GOTO 5150
4810 YLAGE=YBOTE
4820 FOR IC=1 TO 7
4830 YL=LOG(YLAGE)
4840 LX=XBOT : LY=YL : GOSUB 5760 : PRINT #1,USING PG1$;"MAP ",LXX,C$,LYY,";"
4850 LX=XTOP : LY=YL : GOSUB 5760 : PRINT #1,USING PG1$;"DAP ",LXX,C$,LYY,";"
4860 IF GRID$="B" OR GRID$="b" OR GRID$="V" OR GRID$="v" THEN GOTO 5030

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4870 IF CTYP$="3" THEN GOTO 4970
4880 XLAGE=XBOTE
4890 FOR IVT=1 TO 7
4900 IF XLAGE*10 > XTOPE THEN GOTO 5030
4910 FOR I=1 TO 10 : LX=LOG(I*XLAGE): LY=YL : GOSUB 5760 : PRINT #1,USING PUL1$;"MAP ",LXX,C$,LYY-
12*SCALE,";"
4920 PRINT #1,USING PUL1$;"DAP ",LXX,C$,LYY+12*SCALE,";"
4930 NEXT I
4940 XLAGE=XLAGE*10
4950 NEXT IVT
4960 GOTO 5030
4970 FOR I=0 TO 20
4980 XL=XBOT+I*DXGRID
4990 IF XL > XTOP THEN GOTO 5030
5000 LX=XL : LY=YL : GOSUB 5760 : PRINT #1,USING PG1$;"MAP ",LXX,C$,LYY-12*SCALE,";"
5010 PRINT #1,USING PG1$;"DAP ",LXX,C$,LYY+12*SCALE,";"
5020 NEXT I
5030 IF YLAGE*10 > YTOPE THEN GOTO 5140
5040 FOR IL=2 TO 10
5050 YL=LOG(IL*YLAGE)
5060 LX=XBOT : LY=YL : GOSUB 5760 : PRINT #1,USING PG1$;"MAP ",LXX-12*SCALE,C$,LYY,";"
5070 PRINT #1,USING PG1$;"DAP ",LXX+12*SCALE,C$,LYY,";"
5080 IF GRID$="V" OR GRID$="v" OR GRID$="T" OR GRID$="t" OR GRID$="P" OR GRID$="p" THEN GOTO 5100
5090 LX=XTOP : LY=YL : GOSUB 5760 : PRINT #1,USING PG1$;"SPD 1;DAP ",LXX,C$,LYY,";SPD 2;"
5100 '
5110 NEXT IL
5120 YLAGE=YLAGE*10
5130 NEXT IC
5140 '
5150 RETURN
5160 REM SUBROUTINE TO PLACE THE NUMBERS FOR A LOG PLOT
5170 IF CTYP$="2" THEN GOTO 5270
5180 YE=YBOTE
5190 FOR IC=1 TO 7
5200 Y=LOG(YE)
5210 YZ=YE : GOSUB 5390 : REM SUBROUTINE TO FORMAT THE LOG NUMBERS
5220 LX=XBOT : LY=Y : GOSUB 5760 : PRINT #1,USING PUL3$;"IRI MAP ",LXX-250*SCLN,C$,LYY+12*SCALE,";EXIT, E;"
5230 PRINT #1, USING PUL2$;YE
5240 YE=YE*10
5250 IF YE > YTOPE THEN GOTO 5270
5260 NEXT IC
5270 IF CTYP$="3" THEN GOTO 5380
5280 XE=XBOTE
5290 FOR IC=1 TO 7
5300 X=LOG(XE)
5310 YZ=XE : GOSUB 5390 : REM SUBROUTINE TO FORMAT THE LOG NUMBERS
5320 BAKN=-BKZN
5330 LX=X : LY=YBOT : GOSUB 5760 : PRINT #1,USING PUL3$;"IRI MAP ",LXX+BAKN*25*SCLN,C$,LYY+75*SCALE,"; EXIT,
E;"
5340 PRINT #1,USING PUL2$;XE
5350 XE=XE*10

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5360 IF XE > XTOPE THEN GOTO 5380
5370 NEXT IC
5380 RETURN
5390 REM SUBROUTINE TO FORMAT THE LOG NUMBERS
5400 IF YZ < .01 THEN PUL2$="      #.###" : BKZN=6.5 : GOTO 5490
5410 IF YZ < .1 THEN PUL2$="    #.##" : BKZN=71 : GOTO 5490
5420 IF YZ < 1 THEN PUL2$="   #.#" : BKZN=7.5 : GOTO 5490
5430 IF YZ < 10 THEN PUL2$="  #." : BKZN=81 : GOTO 5490
5440 IF YZ < 100 THEN PUL2$=" ##." : BKZN=7.5 : GOTO 5490
5450 IF YZ < 1000 THEN PUL2$=" ###." : BKZN=71 : GOTO 5490
5460 IF YZ < 10000 THEN PUL2$=" ####." : BKZN=6.5 : GOTO 5490
5470 IF YZ < 100000 THEN PUL2$=" #####." : BKZN=61 : GOTO 5490
5480 PUL2$=" #####." : BKZN=5.5 : GOTO 5490
5490 RETURN
5500 REM RIGHT LINE - CTYP$=3 PLOT
5510 TFL=0 : XTMP=XTOP
5520 IF GRID$="T" OR GRID$="t" THEN GOTO 5590
5530 YLAGE=YBOTE
5540 FOR IVT=1 TO 7
5550 IF YLAGE*10 > YTOPE THEN GOTO 5590
5560 FOR I=1 TO 10 : YL=LOG(I*YLAGE): LX=XTMP : LY=YL : GOSUB 5760 : PRINT #1,USING PUL1$;"MAP ",LXX-
12*SCALE,C$,LYY,";" : PRINT #1,USING PUL1$;"DAP ",LXX+12*SCALE,C$,LYY,";" : NEXT I
5570 YLAGE=YLAGE*10
5580 NEXT IVT
5590 IF TFL=1 THEN GOTO 5620
5600 IF XBOT >=0 OR XTOP <= 0 THEN GOTO 5620
5610 TFL=1 : XTMP=0 : GOTO 5530
5620 RETURN
5630 REM TOP LINE - CTYP$=2 PLOT
5640 TFL=0 : YTMP=YTOP
5650 IF GRID$="T" OR GRID$="t" THEN GOTO 5720
5660 XLAGE=XBOTE
5670 FOR IVT=1 TO 7
5680 IF XLAGE*10 > XTOPE THEN GOTO 5720
5690 FOR I=1 TO 10 : XL=LOG(I*XLAGE): LY=YTMP : LX=XL : GOSUB 5760 : PRINT #1,USING PUL1$;"MAP ",LXX,C$,LYY-
12*SCALE,";" : PRINT #1,USING PUL1$;"DAP ",LXX,C$,LYY+12*SCALE,";" : NEXT I
5700 XLAGE=XLAGE*10
5710 NEXT IVT
5720 IF TFL=1 THEN GOTO 5750
5730 IF YBOT >=0 OR YTOP <= 0 THEN GOTO 5750
5740 TFL=1 : YTMP=0 : GOTO 5660
5750 RETURN
5760 REM LINEAR SCALING TO THE LASER PRINTER
5770 '
5780 ' this routine will take lx & ly input and put out lxx and lyy
5790 '
5800 LXX=(LX-XBOT)/(XTOP-XBOT)*(P2X-P1X)+P1X
5810 LYY=(LY-YBOT)/(YTOP-YBOT)*(P2Y-P1Y)+P1Y
5820 RETURN
5830 ' routine for boxaround the plot
5840 IF PSIZE$="R" THEN GOTO 5870

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5850 PRINT #1,"MAP ";X0;"", ";Y0;":""
5860 PRINT #1,"BOX ";X1-X0;"", ";Y1-Y0;":""
5870 RETURN
5880 ' subroutine to use the rotated font
5890 IF PSIZE$="H" THEN B$=TITLE$ : GOTO 5950
5900 B$=""
5910 L=LEN(TITLE$)
5920 FOR J=1 TO L
5930 B$=B$+MID$(TITLE$,L+1-J,1)
5940 NEXT J
5950 IF PSIZE$="F" OR PSIZE$="R" THEN PRINT #1,"FONT 201;" : GOTO 5980
5960 IF PSIZE$="H" THEN PRINT #1,"FONT 69;" : GOTO 5980
5970 PRINT #1,"FONT 202;"
5980 RETURN
5990 ' SUBROUTINE TO DO CONTINUE OPTION
6000 COLOR FG,BG
6010 CLS: LOCATE 10,1 : COLOR FG1,BG
6020 PRINT "          OPTIONS TO CONTINUE FROM LASER PRINTER PLOT" : COLOR FG,BG
6030 PRINT "          1) Continue"
6040 PRINT "          2) QUIT" : PRINT
6050 PRINT "          What continuation option is selected? (1 or 2) --- " ;:A$=INPUT$(1):PRINT ""
6060 IF A$="1" THEN SCRNFLG=1 : GOTO 6090
6070 IF A$="2" THEN GOSUB 6120 : REM SUBROUTINE FOR SIGN-OFF
6080 GOTO 6050
6090 CLS : LOCATE 10,1 : PRINT "          Standby . . . . . "
6100 CHAIN PRGDIR$+"PLOTMAIN.EXE"
6110 RETURN
6120 REM SUBROUTINE TO PRINT SIGN-OFF MESSAGE
6130 CLS: LOCATE 11,28
6140 PRINT " Have a Nice Day!": GOTO 6150
6150 LOCATE 23,1: END
6160 RETURN
6170 ' subroutine to set up laser rotated font for QUARTER size
6180 PRINT #1,"IRI RES;UNIT P;"
6190 PRINT #1,"GENF 202, 'DYNAMIC1',"
6200 PRINT #1,"6, 32, 126, 32, 1, 0, 2, 0, 3, 3;"
6210 PRINT #1,"FTMD 15;EXIT, E;"
6220 PRINT #1,"IRI SPO L; UNIT D;EXIT, E;"
6230 RETURN
6240 ' subroutine to set up laser rotated font for full and 'R' size
6250 CLS : LOCATE 10,18 : COLOR 11,0 : PRINT "Standby, Laser Printer Fonts Being Set Up . . . ."
6260 PRINT #1,"IRI RES;"
6270 PRINT #1,"UNIT P;"
6280 PRINT #1,"GENF 201, 'DYNAMIC1',"
6290 PRINT #1,"10, 32, 126, 32, 1, 0, 2, 0, 5, 5;"
6300 PRINT #1,"FTMD 15;EXIT, E;"
6310 PRINT #1,"IRI SPO L; UNIT D;EXIT, E;"
6320 RETURN
6500 ' Subroutine to place a formal title
6510 SPNP=22 : PRINT #1,"FONT 17;"
6520 PRINT #1,"MAP 1555, 2148;"

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6530 IF LASTYPE=2 THEN PRINT #1,"CTXT '";FORMALTITLE$;"':" : GOTO 6560
6540 SPN=INT(LEN(FORMALTITLE$)/2)+1
6550 PRINT #1, "MRP ";SPNP*SPN;"", 0;" : PRINT #1, "RTXT '";FORMALTITLE$;"':"
6560 GOSUB 6580 : ' Place classification labels
6565 GOSUB 6900 : ' Place page number
6570 RETURN
6580 ' Subroutine to place classification labels
6590 PRINT #1,"FONT 17;"
6600 PRINT #1,"MAP 2812, 391;"
6610 PRINT #1,"RTXT '";CLASSPLOT$;"':"
6620 RETURN
6700 ' Symbol Font Definition Routine
6760 IF PSIZE$="F" OR PSIZE$="R" THEN PRINT #1,"IRI FONT 32; EXIT, E;" : SYMSHIFTX=-17 : SYMSHIFTY=15 : GOTO
6800
6780 PRINT #1,"IRI FONT 33; EXIT, E;" : SYMSHIFTX=-13 : SYMSHIFTY=11 : GOTO 6800
6800 RETURN
6900 ' Place page number
6910 IF PAGEQ$="N" THEN GOTO 6990
6920 PRINT #1,"SPO P;FONT 1; MAP 1220,2860;"
6930 IF LASTYPE=2 THEN PRINT #1,"CTXT '";PAGEN$;"':" : GOTO 6960
6940 SPN=INT(LEN(PAGE$)/2)+1
6950 PRINT #1, "MRP ";SPNP*SPN;"", 0;" : PRINT #1, "RTXT '";PAGEN$;"':"
6960 PRINT #1,"SPO L;"
6990 RETURN

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PLOTPENS Listing

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100 '          PLOTPENS
110 '
120 DIM DTA$(6),CNM$(6),NPTS(6),FMT(6),X(6,350),Y(6,350),XMIN(6),XMAX(6),YMIN(6),YMAX(6),DSC(33),LGND$(6),
    PUS$(7),BK(7),LGX(12),LGY(12),AL$(172),MK$(6),MKZ$(6),SYM(6),LGND0$(6)
130 COMMON CNM$( ),BLANK$,DSC( ),DTA$( ),NPTS( ),FMT( ),X( ),Y( ),XMIN( ),XMAX( ),YMIN( ),YMAX( ),MKZ$( ),PORT,SPORT,
    XML,XMU,YML,YMU,FFLG,F$,PARFLG
140 COMMON LGND$( ),PUS$( ),BK( ),LGX( ),LGY( ),NCURVE,XBOT,XBOTE,XTOP,XTOPE,YBOT,YBOTE,YTOP,YTOPE,DXGRID,
    DYGRID,CTYP$,GRID$,TITLE$,TITLEX$,TITLEY$,TXT$,XNDX,YNDX,AL$( ),TXTQ$,VERSION$,REVISEFLAG
150 COMMON IBM$,CLR$,TMLP,FG,BG,FG1,EGA$,TXTLOC$,SCALE,PAUZ$,LTYP$,PSIZE$,TITLE0$,TITLEX0$,TITLEY0$,
    TXT0$,LQST$,SYM( ),LGND0$( ),SCRNFLG,TESTQ$,PRGDIR$,LCC,LASTYPE,RFORM,CLASSPLOT$,FORMALTITLE$,PENFLG,
    PAGEQ$,PAGEN$,LASPORT
2620 '
2630 '      STARTS PLOTTER
2640 '
2650 GOSUB 5850 : ' INITIATE PLOTTER
2655 PRINT #1,"VS 10;"
2660 GOSUB 6160 : ' GRID LINES
2670 IF CTYP$="1" THEN GOTO 2685
2680 GOSUB 11820 : ' LOG GRID LINES
2685 PRINT #1,"VS;"
2690 GOSUB 8270 : ' LEGENDS
2700 GOSUB 7130 : ' LABELS
2710 IF TXTQ$="N" OR TXTQ$="n" THEN GOTO 2730
2720 GOSUB 8060 : ' TEXT
2730 GOSUB 6680 : ' DRAW CURVES
2740 GOSUB 10000 : REM continuation options
2750 END
5850 ' initiate plotter
5860 CLOSE #1
5861 IF FFLG=1 THEN OPEN F$ FOR OUTPUT AS #1 : GOTO 5890
5870 IF PARFLG=1 AND PORT=1 THEN OPEN "LPT1:" AS #1 : GOTO 5890
5875 IF PARFLG=1 AND PORT=2 THEN OPEN "LPT2:" AS #1 : GOTO 5890
5876 IF SPORT=2 THEN OPEN "COM2:9600,n,8,1,CS20000,DS20000" AS #1 : GOTO 5890
5880 OPEN "COM1:9600,N,8,1,CS20000,DS20000" AS #1
5890 IF PSIZE$="H" THEN GOTO 5940
5900 IF PSIZE$="Q" THEN GOTO 5970
5905 IF PSIZE$="R" THEN GOTO 5961
5910 PIX=1654 :PIY=1462 : P2X=9613 : P2Y=6922
5920 X0=300:Y0=370:X1=10000:Y1=7650
5930 GOTO 6090
5940 PIX=1317 :PIY=1083 : P2X=7290 : P2Y=4645
5950 X0=300 :Y0=370 :X1=7580 :Y1=5120
5960 GOTO 6090
5961 PIX=2152 :PIY=1803 : P2X=9115 : P2Y=6581
5962 GOTO 6090
5970 ON LCC GOTO 5980,6010,6040,6070
5980 PIX=963 : PIY=4651 : P2X=4860 : P2Y=7296
5990 X0=300:Y0=4110:X1=5050:Y1=7650

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6000 GOTO 6090
6010 PIX=5913 : PIY=4641 : P2X=9810 : P2Y=7296
6020 XO=5250:YO=4110:X1=10000:Y1=7650
6030 GOTO 6090
6040 PIX=963 : PIY=901 : P2X=4860 : P2Y=3556
6050 XO=300:YO=370:X1=5050:Y1=3910
6060 GOTO 6090
6070 PIX=5913 : PIY=906 : P2X=9810 : P2Y=3556
6080 XO=5250:YO=370:X1=10000:Y1=3910
6090 GOSUB 12520 : ' adjust scaling
6100 PRINT #1,"IN;IP ";PIX,PIY,P2X,P2Y,";"
6110 PRINT #1,"PA;LT;SP1;PU";XO,YO,";"
6115 IF PSIZE$="R" THEN GOTO 6140
6120 PRINT #1,"PD";XO,Y1,X1,Y1,"PU;"
6130 PRINT #1,"PD";X1,YO,XO,YO,";PU;"
6140 PRINT #1,"SC ";XBOTS,XTOPS,YBOTS,YTOPS,";"
6150 RETURN
6160 ' grid lines
6170 PG1$="& #####.##### &"
6180 PG2$="& #####.##### &##### &##### &"
6190 PG3$="& #####.##### &##### &"
6200 PG4$="& #####.##### &"
6210 PRINT #1,USING PG1$;"PU";XBOT,YBOT,";"
6220 PRINT #1,USING PG1$;"PD ";XTOP,YBOT,";"
6221 IF GRID$="P" OR GRID$="p" THEN GOTO 6222 ELSE GOTO 6230
6222 PRINT #1,USING PG1$;"PD";XTOP,YTOP,";"
6223 PRINT #1,USING PG1$;"PD";XBOT,YTOP,";"
6224 PRINT #1,USING PG1$;"PD";XTOP,YTOP,";"
6225 PRINT #1,USING PG1$;"PD";XTOP,YBOT,";"
6230 PRINT #1,USING PG1$;"PD";XBOT,YBOT,";"
6240 PRINT #1,USING PG2$;"PD ";XBOT,YTOP,XBOT,YBOT,";"
6250 PRINT #1,"TL;"
6260 IF CTYP$="4" THEN GOTO 6660
6270 IF CTYP$="2" THEN GOTO 6380
6280 IF XBOT >= 0 OR XTOP <= 0 THEN GOTO 6360
6290 PRINT #1,USING PG3$; "PU 0,";YBOT,";PD 0,";YTOP,";"
6295 IF CTYP$="3" THEN GOTO 6470
6300 Y=YBOT-DYGRID
6310 FOR I=1 TO 20
6320 Y=Y+DYGRID
6330 IF Y > YTOP+.00001 THEN GOTO 6360
6340 PRINT #1,USING PG4$;"PA 0,";Y,";YT;"
6350 NEXT I
6360 PRINT #1,"PU;" : IF CTYP$="3" THEN GOTO 6460
6361 IF GRID$="P" OR GRID$="p" THEN GOTO 6362 ELSE GOTO 6370
6362 PRINT #1,USING PG1$;"PU ";XTOP,YBOT,";" : Y=YBOT-DYGRID
6363 FOR I=1 TO 20
6364 Y=Y+DYGRID
6365 IF Y > YTOP+.00001 THEN GOTO 6368
6366 PRINT #1,USING PG1$;"PA ";XTOP,Y,";YT;"
6367 NEXT I

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6368 PRINT #1,"PU;"
6370 IF CTYP$="3" THEN GOTO 6470
6380 IF YBOT >= 0 OR YTOP <= 0 THEN GOTO 6460
6390 X=XBOT-DXGRID
6400 PRINT #1,USING PG3$; "PU ";XBOT,".0;PD ";XTOP,".0;"
6405 IF CTYP$="2" THEN GOTO 6460
6410 FOR I=1 TO 20
6420 X=X+DXGRID
6430 IF X > XTOP+.00001 THEN GOTO 6460
6440 PRINT #1,USING PG4$; "PA ";X,".0;XT;"
6450 NEXT I
6460 PRINT #1,"PU;" : IF CTYP$="2" THEN GOTO 6580
6461 IF GRID$="P" OR GRID$="p" THEN GOTO 6462 ELSE GOTO 6470
6462 PRINT #1,USING PG1$;"PU ";XBOT,YTOP,";" : X=XBOT-DXGRID
6463 FOR I=1 TO 20
6464 X=X+DXGRID
6465 IF X > XTOP+.00001 THEN GOTO 6468
6466 PRINT #1,USING PG1$;"PA ";X,YTOP,";XT;"
6467 NEXT I
6468 PRINT #1,"PU;"
6470 X=XBOT-DXGRID : Y=YBOT-DYGRID
6480 IF CTYP$="4" THEN GOTO 6660
6490 IF CTYP$="2" THEN GOTO 6580
6495 X=XBOT-DXGRID
6500 FOR I=1 TO 20
6510 X=X+DXGRID
6520 IF X > XTOP+.00001 THEN GOTO 6580
6530 PRINT #1,USING PG1$; "PA ";X,YBOT,";XT;"
6540 IF GRID$="H" OR GRID$="h" OR GRID$="T" OR GRID$="t" OR GRID$="P" OR GRID$="p" THEN GOTO 6560
6550 PRINT #1,USING PG1$; "PD ";X,YTOP,";PU;"
6560 NEXT I
6570 PRINT #1,"PU;"
6580 IF CTYP$="3" THEN GOTO 6660
6585 Y=YBOT-DYGRID
6590 FOR I=1 TO 20
6600 Y=Y+DYGRID
6610 IF Y > YTOP+.00001 THEN GOTO 6660
6620 PRINT #1,USING PG1$;"PA ";XBOT,Y,";YT;"
6630 IF GRID$="V" OR GRID$="v" OR GRID$="T" OR GRID$="t" OR GRID$="P" OR GRID$="p" THEN GOTO 6650
6640 PRINT #1,USING PG1$; "PD ";XTOP,Y,";PU;"
6650 NEXT I
6660 PRINT #1,"PU;"
6670 RETURN
6680 REM DRAW THE CURVES
6690 PU2$=" & #####.### #####.### &"
6700 PRINT #1,"SM;"
6705 IF OLD$="A" OR OLD$="a" THEN GOTO 6725
6710 SCAT$="1"
6720 IF LTYP$="P" OR LTYP$="Z" THEN SCAT$="2"
6725 PRINT #1,"SI 0.15,0.225;"
6730 IPEN=0

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6740 IF PENFLG=1 THEN IPEN=1
6760 FOR N=1 TO NCURVE
6770 IF LTYP$="C" OR LTYP$="P" OR LTYP$="Z" THEN GOTO 6820
6780 IF N=1 THEN PRINT #1," LT;" : GOTO 6810
6790 IF N=2 THEN PRINT #1," LT ";N,";" : GOTO 6810
6800 PRINT #1," LT ";N,"7;"
6810 IF LTYP$="S" THEN GOTO 6970
6820 IF SCAT$="2" THEN PRINT #1,"SM";MK$(N);";"
6830 IF OLD$="A" OR LTYP$="P" THEN GOTO 6960
6840 IPEN=IPEN+1
6850 IF PENFLG=1 THEN PRINT #1,"SP;SP";IPEN;";" : GOTO 6970
6860 IF IPEN <= 1 THEN GOTO 6960
6870 IF PAUZ$="N" OR PAUZ$="n" THEN GOTO 6930
6880 PRINT #1,"PU;SP;"
6890 PRINT #1,"PU;SP;"
6900 LOCATE 18,1 : COLOR BG,FG1
6910 PRINT "   Change Pens at this time for the next plot(s).  Hit any key when ready.
";:TEMP$=INPUT$(1):PRINT ""
6920 LOCATE 18,1 : COLOR FG,BG : PRINT BLANK$
6930 IPEN=0
6940 PRINT #1,"SP1;"
6950 GOTO 6970
6960 PRINT #1,"SP2;"
6970 FOR II=1 TO NPTS(N)
6971 IF X(N,II) >= XML AND X(N,II) <= XMU THEN GOTO 6972 ELSE GOTO 6974
6972 IF Y(N,II) >= YML AND Y(N,II) <= YMU THEN GOTO 6976 ELSE GOTO 6974
6974 NEXT II
6975 GOTO 7070
6976 FIRST=II+1
6977 IF SCAT$="1" THEN GOTO 7000
6980 PRINT #1,USING PU2$;"PA ";X(N,II),Y(N,II),";"
6990 GOTO 7010
7000 PRINT #1,USING PU2$;"PU ";X(N,II),Y(N,II),";"
7010 FOR I=FIRST TO NPTS(N)
7011 IF X(N,I) >=XML AND X(N,I) <=XMU THEN GOTO 7012 ELSE GOTO 7060
7012 IF Y(N,I) >=YML AND Y(N,I) <=YMU THEN GOTO 7020 ELSE GOTO 7060
7020 IF SCAT$="1" THEN GOTO 7050
7030 PRINT #1,USING PU2$;"PA ";X(N,I),Y(N,I),";"
7040 GOTO 7060
7050 PRINT #1,USING PU2$;"PD ";X(N,I),Y(N,I),";"
7060 NEXT I
7070 GOSUB 9070 : REM LEGEND LINES
7080 PRINT #1,"SM;"
7090 NEXT N
7100 PRINT #1,"PU;SP;"
7110 CLOSE
7120 RETURN
7130 ' LABEL AXES
7140 PUL3$="& #####.#####  #####.##### &"
7150 PUS$(1)="& ###.###" : BK(1)=6.5
7160 PUS$(2)="& #####.##" : BK(2)=6.5

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7170 PUS$(3)="& #####." : BK(3)=7
7180 PUS$(4)="& #####." : BK(4)=6.5
7190 PRINT #1,"PU;"
7200 PUS$(5)="&#####." : BK(5)=6
7210 PUS$(6)="&#####." : BK(6)=5.5
7220 PUS$(7)="&#####." : BK(7)=5
7230 CSWT=.38*SCALE : CSHT=.54*SCALE
7240 XTL=XBOT+(XTOP-XBOT)/2*.876 : YTL=YTOP+(YTOP-YBOT)*.06
7250 PRINT #1,USING PUL3$;"PU ";XTL,YTL,";"
7260 PRINT #1,"SI ";CSWT,CSHT,";SL .3;"
7270 BACK=-LEN(TITLE$)/2
7280 PRINT #1,"CP ";BACK,"0;"
7290 PRINT #1,"LB";TITLE$;CHR$(3)
7295 IF PSIZE$="R" AND RFORM=2 THEN GOSUB 13500 : ' Place formal title
7300 '
7310 ' X-AXIS & Y-AXIS
7320 '
7330 CSWT=.22*SCALE : CSHT=.33 *SCALE
7340 PRINT #1,"SI ";CSWT,CSHT,";SL;"
7350 BACK=LEN(TITLEX$)/2
7360 XTLX=(XTOP-XBOT)/2+XBOT : XTLY=YBOT-(YTOP-YBOT)*.088
7370 YTLX=XBOT-(XTOP-XBOT)*.11 : YTLY=(YTOP-YBOT)/2+YBOT
7380 PRINT #1,USING PUL3$;"PU ";XTLX,XTLY,";"
7390 PRINT #1,"CP ";-BACK,"0;"
7400 PRINT #1,"LB";TITLEX$;CHR$(3)
7410 BACK=LEN(TITLEY$)/2
7420 PRINT #1,USING PUL3$;"PU ";YTLX,YTLY,";"
7430 PRINT #1,"DI 0,1;CP ";-BACK,"0;"
7440 PRINT #1,"LB";TITLEY$;CHR$(3),"DI 1,0;"
7450 '
7460 ' #'s
7470 '
7475 IF CTYP$="4" OR CTYP$="2" THEN GOTO 7690
7480 NT=1
7490 IF XNDX < 8 THEN GOTO 7560
7500 FOR I=15 TO 31 STEP 4
7510 NT=NT+1
7520 IF XNDX > I THEN GOTO 7540
7530 GOTO 7560
7540 NEXT I
7550 NT=NT+1
7560 PUSX$=PUS$(NT)
7570 BAKN=-BK(NT) : XSTRT=XBOT : XSTP=DXGRID
7600 MN=ABS(XTOP-XBOT)/DXGRID : MNT=ABS(XTOP)
7601 IF NT < 3 AND MN > 11 THEN GOTO 7610
7602 IF NT > 2 AND MN > 11 AND MNT > 9999 THEN GOTO 7610
7605 IF NT > 4 THEN GOTO 7610
7606 GOTO 7690
7610 XSTP=DXGRID+DXGRID
7620 IF XBOT >= 0 OR XTOP <= 0 THEN GOTO 7690
7630 Z=XBOT-DXGRID

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7640 FOR I=1 TO 15 STEP 2
7650 Z=Z+DXGRID+DXGRID
7660 IF Z > XTOP THEN GOTO 7690
7670 IF Z=0 THEN XSTRT=XBOT+DXGRID : GOTO 7690
7680 NEXT I
7690 NT=1
7700 IF YNDX < 8 THEN GOTO 7770
7710 FOR I=15 TO 31 STEP 4
7720 NT=NT+1
7730 IF YNDX > I THEN GOTO 7750
7740 GOTO 7770
7750 NEXT I
7760 NT=NT+1
7770 PUSY$=PUS$(NT)
7780 '
7790 ' Y #'s
7800 '
7810 CSWT=.15*SCALE : CSHT=.225*SCALE
7820 PRINT #1,"SI ";CSWT,CSHT,";"
7830 IF CTYP$="1" OR CTYP$="2" THEN GOTO 7860
7840 GOSUB 12620 : ' NUMBERS - LOG
7850 GOTO 7930
7860 FOR Y=YBOT TO YTOP STEP DYGRID
7870 PRINT #1,USING PUL3$;"PU ";XBOT,Y,";"
7880 PRINT #1,"CP -10,-.25;"
7890 PRINT #1,USING PUSY$;"LB";Y
7900 PRINT #1,CHR$(3)
7910 NEXT Y
7920 '
7930 ' X NUMBERS
7940 '
7950 IF CTYP$="4" THEN GOTO 8050
7960 IF CTYP$="1" OR CTYP$="3" THEN GOTO 7990
7970 GOSUB 12620 : ' log #'s
7980 GOTO 8050
7990 FOR X=XSTRT TO XTOP STEP XSTP
8000 PRINT #1,USING PUL3$;"PU ";X,YBOT,";"
8010 PRINT #1,"CP ";BAKN,"",-1.25;"
8020 PRINT #1,USING PUSX$;"LB";X
8030 PRINT #1,CHR$(3)
8040 NEXT X
8050 RETURN
8060 REM PLACE TEXT
8070 PUL5$="& #####.##### #####.##### &"
8080 CSWT=.15*SCALE : CSHT=.225*SCALE
8090 PRINT #1,"SI ";CSWT,CSHT,";"
8100 IF TXTLOC$="3" THEN GOTO 8150
8110 IF TXTLOC$="1" THEN GOTO 8170
8120 LONG=-LEN(TXT$)-3
8130 XTL=XTOP : YTL=YTOP
8140 GOTO 8200

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8150 LONG=3 : XTL=XBOT : YTL=YTOP
8160 GOTO 8200
8170 LONG=-LEN(TXT$)/2
8180 XTL=XBOT+(XTOP-XBOT)/2*.876
8190 YTL=YTOP+(YTOP-YBOT)*.06
8200 PRINT #1,USING PUL5$; "PU ";XTL,YTL,";"
8210 IF TXTLOC$="1" THEN GOTO 8240
8220 PRINT #1, "CP ";LONG,"-1.5;"
8230 GOTO 8250
8240 PRINT #1, "CP ";LONG,"-1.25;"
8250 PRINT #1, "LB";TXT$;CHR$(3)
8260 RETURN
8270 REM PLACE LEGENDS
8280 IF NCURVE=1 THEN GOTO 9060
8290 IF LQST$="N" THEN GOTO 9060
8300 CSWT=.15*SCALE : CSHT=.225*SCALE
8310 PRINT #1,"SI ";CSWT,CSHT,";"
8320 XDIF=XTOP-XBOT : YDIF=YTOP-YBOT
8330 LLGND=XDIF*15/48
8340 LSPACE=XDIF*2.5/48
8350 LGNY1=YBOT-YDIF*.137
8360 LGNY2=YBOT-YDIF*.173
8370 LGNYM=YBOT-YDIF*.155
8380 LEFT3=XBOT-XDIF*4.25/48
8390 LEFT2=XBOT+XDIF*4.5/48
8400 ON NCURVE GOTO 9060,8440,8520,8640,8760,8900
8410 '
8420 ' 2 CURVES
8430 '
8440 LGX(1)=LEFT2 : LGY(1)=LGNYM
8450 LGX(7)=LGX(1)+LLGND : LGY(7)=LGNYM
8460 LGX(2)=LGX(1)+LLGND+LSPACE : LGY(2)=LGNYM
8470 LGX(8)=LGX(2)+LLGND : LGY(8)=LGNYM
8480 GOTO 9020
8490 '
8500 ' 3 CURVES
8510 '
8520 LGX(1)=LEFT3 : LGY(1)=LGNYM
8530 LGX(7)=LGX(1)+LLGND : LGY(7)=LGNYM
8540 FOR I=2 TO 3
8550 LGX(I)=LGX(I-1)+LLGND+LSPACE
8560 LGY(I)=LGNY(I-1)
8570 LGX(I+6)=LGX(I+5)+LLGND+LSPACE
8580 LGY(I+6)=LGNY(I)
8590 NEXT I
8600 GOTO 9020
8610 '
8620 ' 4 CURVES
8630 '
8640 LGX(1)=LEFT2 : LGY(1)=LGNY1
8650 LGX(7)=LGX(1)+LLGND : LGY(7)=LGNY1

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8660 LGX(2)=LGX(1)+LLGND+LSPACE : LGY(2)=LGNY1
8670 LGX(8)=LGX(2)+LLGND : LGY(8)=LGNY1
8680 FOR I=3 TO 4
8690 LGX(I)=LGX(I-2) : LGY(I)=LGNY2
8700 LGX(I+6)=LGX(I+4) : LGY(I+6)=LGNY2
8710 NEXT I
8720 GOTO 9020
8730 '
8740 ' 5 CURVES
8750 '
8760 LGX(1)=LEFT3 : LGY(1)=LGNY1
8770 LGX(7)=LGX(1)+LLGND : LGY(7)=LGNY1
8780 FOR I=2 TO 3
8790 LGX(I)=LGX(I-1)+LLGND+LSPACE: LGY(I)=LGNY1
8800 LGX(I+6)=LGX(I+5)+LLGND+LSPACE: LGY(I+6)=LGNY1
8810 NEXT I
8820 LGX(4)=LEFT2 : LGY(4)=LGNY2
8830 LGX(10)=LGX(4)+LLGND : LGY(10)=LGNY2
8840 LGX(5)=LGX(4)+LLGND+LSPACE : LGY(5)=LGNY2
8850 LGX(11)=LGX(5)+LLGND+LSPACE : LGY(11)=LGNY2
8860 GOTO 9020
8870 '
8880 ' 6 CURVES
8890 '
8900 LGX(1)=LEFT3 : LGY(1)=LGNY1
8910 LGX(7)=LGX(1)+LLGND : LGY(7)=LGNY1
8920 FOR I=2 TO 3
8930 LGX(I)=LGX(I-1)+LLGND+LSPACE: LGY(I)=LGNY1
8940 LGX(I+6)=LGX(I+5)+LLGND+LSPACE: LGY(I+6)=LGNY1
8950 NEXT I
8960 LGX(4)=LEFT3 : LGY(4)=LGNY2
8970 LGX(10)=LGX(4)+LLGND : LGY(10)=LGNY2
8980 FOR I=5 TO 6
8990 LGX(I)=LGX(I-1)+LLGND+LSPACE: LGY(I)=LGNY2
9000 LGX(I+6)=LGX(I+5)+LLGND+LSPACE: LGY(I+6)=LGNY2
9010 NEXT I
9020 FOR I=1 TO NCURVE
9030 PRINT #1,USING "&#####.## #####.##&";"PU ";LGX(I),LGY(I),";CP 0,-.25;"
9040 PRINT #1,"LB";LGND$(I);CHR$(3)
9050 NEXT I
9060 RETURN
9070 ' LEGEND LINES
9080 IF NCURVE=1 THEN GOTO 9160
9090 IF LQST$="N" THEN GOTO 9160
9100 LONG=LEN(LGND$(N))+1
9110 IF LTYP$="P" OR LTYP$="Z" THEN GOTO 9140
9120 PRINT #1,USING "&#####.## #####.##& #####.## & #####.## #####.## &";"PU ";LGX(N),LGY(N),";CP
";LONG,"0;PD ";LGX(N+6),LGY(N+6),";PU;"
9130 GOTO 9160
9140 PRINT #1,USING "&#####.## #####.##& #####.## &";"SM;PU ";LGX(N),LGY(N),";CP ";LONG+1,"-0.25;"
9150 PRINT #1,"LB"MK$(N);CHR$(3);PU;"

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9160 RETURN
10000 ' SUBROUTINE TO DO CONTINUE OPTION
10010 COLOR FG,BG
10020 CLS: LOCATE 10,1 : COLOR FG1,BG
10030 PRINT "                OPTIONS TO CONTINUE FROM PEN PLOTTER PLOT" : COLOR FG,BG
10040 PRINT "                        1) Continue"
10050 PRINT "                        2) QUIT" : PRINT
10060 PRINT "                What continuation option is selected? (1 or 2) --- " ; A$=INPUT$(1):PRINT ""
10070 IF A$="1" THEN SCRNFLG=1 : GOTO 10100
10080 IF A$="2" THEN GOSUB 10130 : REM SUBROUTINE FOR SIGN-OFF
10090 GOTO 10060
10100 CLS : LOCATE 10,1 : PRINT "                Standby . . . . . "
10110 CHAIN PRGDIR$+"PLOTMAIN.EXE"
10120 RETURN
10130 REM SUBROUTINE TO PRINT SIGN-OFF MESSAGE
10140 CLS: LOCATE 11,28
10150 PRINT " Have a Nice Day!": GOTO 10160
10160 LOCATE 23,1: END
10170 RETURN
11820 REM LOG GRIDS OR TICKS
11830 PUL1$="& #####.##### &"
11840 PUL11$="& #####.##### &"
11845 ' Start of Verticals
11850 IF CTYP$="3" THEN GOSUB 17800 : GOTO 12180
11860 XLAGE=XBOTE
11870 FOR IC=1 TO 7
11880 XL=LOG(XLAGE)
11890 PRINT #1,USING PUL11$;"PU ";XL,YBOT,";"
11900 PRINT #1,USING PUL11$;"PD ";XL,YTOP,";"
11910 IF GRID$="B" OR GRID$="b" OR GRID$="H" OR GRID$="h" THEN GOTO 12060
11920 IF CTYP$="2" THEN GOTO 12010
11930 YLAGE=YBOTE
11940 FOR IVT=1 TO 7
11950 IF YLAGE*10 > YTOPE THEN GOTO 12060
11960 FOR I=1 TO 10 : YL=LOG(I*YLAGE): PRINT #1,USING PUL11$;"PA ";XL,YL,";YT;"
11970 NEXT I
11980 YLAGE=YLAGE*10
11990 NEXT IVT
12000 GOTO 12060
12010 FOR I=0 TO 20
12020 YL=YBOT+I*DYGRID
12030 IF YL > YTOP THEN GOTO 12060
12040 PRINT #1,USING PUL11$;"PA ";XL,YL,";YT;"
12050 NEXT I
12055 IF CTYP$="3" THEN GOTO 12180
12060 PRINT #1, "PU;"
12070 IF XLAGE*10 > XTOPE THEN GOTO 12180
12080 FOR IL=2 TO 10
12090 XL=LOG(IL*XLAGE)
12100 PRINT #1,USING PUL11$;"PU ";XL,YBOT,";PD;"
12110 PRINT #1,USING PUL11$;"PA ";XL,YBOT,";XT;"

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12120 IF GRID$="H" OR GRID$="h" OR GRID$="T" OR GRID$="t" OR GRID$="P" OR GRID$="p" THEN GOTO 12140
12130 PRINT #1,USING PUL11$;"PD ";XL,YTOP,"";PU;"
12140 PRINT #1,"PU;"
12150 NEXT IL
12160 XLAGE=XLAGE*10
12170 NEXT IC
12175 ' Horizontals
12180 IF CTYP$="2" THEN GOSUB 18000 : GOTO 12510
12190 YLAGE=YBOTE
12200 FOR IC=1 TO 7
12210 YL=LOG(YLAGE)
12220 PRINT #1,USING PUL11$;"PU ";XBOT,YL,";"
12230 PRINT #1,USING PUL11$;"PD ";XTOP,YL,";"
12240 IF GRID$="B" OR GRID$="b" OR GRID$="V" OR GRID$="v" THEN GOTO 12390
12250 IF CTYP$="3" THEN GOTO 12340
12260 XLAGE=XBOTE
12270 FOR IVT=1 TO 7
12280 IF XLAGE*10 > XTOPE THEN GOTO 12390
12290 FOR I=1 TO 10 : XL=LOG(I*XLAGE): PRINT #1,USING PUL1$;"PA ";XL,YL,"";XT;"
12300 NEXT I
12310 XLAGE=XLAGE*10
12320 NEXT IVT
12330 PRINT #1,"PU;" : GOTO 12390
12340 FOR I=0 TO 20
12350 XL=XBOT+I*DXGRID
12360 IF XL > XTOP THEN GOTO 12390
12370 PRINT #1,USING PUL1$;"PA ";XL,YL,"";XT;"
12380 NEXT I
12390 PRINT #1, "PU;" : IF YLAGE*10 > YTOPE THEN GOTO 12500
12400 FOR IL=2 TO 10
12410 YL=LOG(IL*YLAGE)
12420 PRINT #1,USING PUL1$;"PU ";XBOT,YL,"";PD;"
12430 PRINT #1,USING PUL1$;"PA ";XBOT,YL,"";YT;"
12440 IF GRID$="V" OR GRID$="v" OR GRID$="T" OR GRID$="t" OR GRID$="P" OR GRID$="p" THEN GOTO 12460
12450 PRINT #1,USING PUL1$;"PD ";XTOP,YL,"";PU;"
12460 PRINT #1,"PU;"
12470 NEXT IL
12480 YLAGE=YLAGE*10
12490 NEXT IC
12500 PRINT #1,"PU;"
12510 RETURN
12520 ' ADJUST SCALING
12530 XBOTS=INT(XBOT)+1 : XTOPS=INT(XTOP+.0001) : YBOTS=INT(YBOT)+1 : YTOPS=INT(YTOP+.0001)
12540 DFFX=P2X-P1X : DFFY=P2Y-P1Y : DFTX=XTOP-XBOT : DFTY=YTOP-YBOT
12550 IF INT(XBOT) = XBOT THEN XBOTS=XBOT
12551 IF INT(YBOT) = YBOT THEN YBOTS=YBOT
12555 IF XBOTS < XTOPS THEN GOTO 12575
12560 XBOTS=XBOTS-1 : P1XT=P1X+DFFX*(XBOTS-XBOT)/DFTX
12561 IF P1XT > 0 THEN P1X=P1XT : GOTO 12576
12562 XBOTS=XBOTS+1 : P1X=P1X+DFFX*(XBOTS-XBOT)/DFTX
12563 XTOPS=XTOPS+1 : P2XT=P2X+DFFX*(XTOPS-XTOP)/DFTX

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12564 IF P2XT <= 10300 THEN P2X=P2XT : GOTO 12579 : ELSE P2X=10300 : GOTO 12579
12575 P1X=P1X+DFFX*(XBOTS-XBOT)/DFTX
12576 P2X=P2X+DFFX*(XTOPS-XTOP)/DFTX
12579 IF YBOTS < YTOPS THEN GOTO 12599
12580 YBOTS=YBOTS-1 : P1YT=P1Y+DFFY*(YBOTS-YBOT)/DFTY
12581 IF P1YT > 0 THEN P1Y=P1YT : GOTO 12600
12582 YBOTS=YBOTS+1 : P1Y=P1Y+DFFY*(YBOTS-YBOT)/DFTY
12583 YTOPS=YTOPS+1 : P2YT=P2Y+DFFY*(YTOPS-YTOP)/DFTY
12584 IF P2YT <= 7650 THEN P2Y=P2YT : GOTO 12610 : ELSE P2Y=7650 : GOTO 12610
12599 P1Y=P1Y+DFFY*(YBOTS-YBOT)/DFTY
12600 P2Y=P2Y+DFFY*(YTOPS-YTOP)/DFTY
12610 RETURN
12620 ' PLACE log NUMBERS
12630 IF CTYP$="2" THEN GOTO 12750
12640 YE=YBOTE
12650 FOR IC=1 TO 7
12660 Y=LOG(YE)
12670 PRINT #1,USING PUL1$;"PU ";XBOT,Y,";"
12680 PRINT #1,"CP -10,-.25;"
12690 YZ=YE : GOSUB 13120 : ' FORMAT LOG Nos
12700 PRINT #1, USING PUL2$;"LB";YE
12710 PRINT #1,CHR$(3)
12720 YE=YE*10
12730 IF YE > YTOPE THEN GOTO 12750
12740 NEXT IC
12750 IF CTYP$="3" THEN GOTO 12880
12760 XE=XBOTE
12770 FOR IC=1 TO 7
12780 X=LOG(XE)
12790 PRINT #1,USING PUL1$;"PU ";X,YBOT,";"
12800 YZ=XE : GOSUB 13120 : ' FORMAT LOG #'s
12810 BAKN=-BKZN
12820 PRINT #1,"CP ";BAKN,"",-1.25;"
12830 PRINT #1, USING PUL2$;"LB";XE
12840 PRINT #1,CHR$(3)
12850 XE=XE*10
12860 IF XE > XTOPE THEN GOTO 12880
12870 NEXT IC
12880 RETURN
13120 ' FORMAT LOG Nos
13130 IF YZ < .01 THEN PUL2$="&    #.###" : BKZN=6.5 : GOTO 13220
13140 IF YZ < .1 THEN PUL2$="&    #.##" : BKZN=71 : GOTO 13220
13150 IF YZ < 1 THEN PUL2$="&    #.#" : BKZN=7.5 : GOTO 13220
13160 IF YZ < 10 THEN PUL2$="&    #." : BKZN=81 : GOTO 13220
13170 IF YZ < 100 THEN PUL2$="&    ##." : BKZN=7.5 : GOTO 13220
13180 IF YZ < 1000 THEN PUL2$="&    ###." : BKZN=71 : GOTO 13220
13190 IF YZ < 10000 THEN PUL2$="&    ####." : BKZN=6.5 : GOTO 13220
13200 IF YZ < 100000! THEN PUL2$="&    #####." : BKZN=61 : GOTO 13220
13210 PUL2$="&    #####." : BKZN=5.5 : GOTO 13220
13220 RETURN
13500 ' Subroutine to place a formal title

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13510 CSWT=.2*SCALE : CSHT=.3*SCALE
13520 XTL=XBOT+(XTOP-XBOT)/2*.876 : YTL=YBOT-(YTOP-YBOT)*.25
13530 PRINT #1,USING PUL3$;"PU ";XTL,YTL,";"
13540 PRINT #1,"SI ";CSWT,CSHT,";"
13550 BACK=-LEN(FORMALTITLE$)/2
13560 PRINT #1,"CP ";BACK,"0;"
13570 PRINT #1,"LB";FORMALTITLE$;CHR$(3)
13600 GOSUB 14000 : ' Place classification labels
13605 GOSUB 15000 : ' place page number
13999 RETURN
14000 ' Subroutine to place classification labels
14010 CSWT=.15*SCALE : CSHT=.225*SCALE
14020 XTL=XTOP : YTL=YTOP+(YTOP-YBOT)*.01
14030 PRINT #1,USING PUL3$;"PU ";XTL,YTL,";"
14040 PRINT #1,"SI ";CSWT,CSHT,";"
14050 BACK=-LEN(CLASSPLOT$)
14060 PRINT #1,"CP ";BACK,"0;"
14070 PRINT #1,"LB";CLASSPLOT$;CHR$(3)
14999 RETURN
15000 ' place page number
15010 IF PAGEQ$="N" THEN GOTO 15090
15020 XTL=XBOT-(XTOP-XBOT)*.234 : YTL=YBOT+(YTOP-YBOT)*.47
15030 PRINT #1,USING PUL3$;"PU ";XTL,YTL,";"
15050 BACK=INT(LEN(PAGEN$)/2)
15060 PRINT #1,"DI 0,-1;CP ":-BACK,"0;"
15065 PRINT
15070 PRINT #1,"LB";PAGEN$;CHR$(3),"DI 1,0;"
15090 RETURN
17800 ' RIGHT & 0 LINE - CTYP$=3
17805 XTMP=XTOP : TFL=0
17810 IF GRID$="T" OR GRID$="t" THEN GOTO 17880
17820 YLAGE=YBOTE
17830 FOR IVT=1 TO 7
17840 IF YLAGE*10 > YTOPE THEN GOTO 17880
17850 FOR I=1 TO 10 : YL=LOG(I*YLAGE): PRINT #1,USING PUL11$;"PA ";XTMP,YL,";YT;":NEXT I
17860 YLAGE=YLAGE*10
17870 NEXT IVT
17880 IF TFL=1 THEN GOTO 17890
17885 IF XBOT >= 0 OR XTOP <= 0 THEN GOTO 17890
17886 TFL=1 : XTMP=0 : GOTO 17820
17890 RETURN
18000 ' TOP & 0 LINE - CTYP$=2
18005 YTMP=YTOP : TFL=0
18010 IF GRID$="T" OR GRID$="t" THEN GOTO 18080
18020 XLAGE=XBOTE
18030 FOR IVT=1 TO 7
18040 IF XLAGE*10 > XTOPE THEN GOTO 18080
18050 FOR I=1 TO 10 : XL=LOG(I*XLAGE): PRINT #1,USING PUL1$;"PA ";XL,YTMP,";XT;":NEXT I
18060 XLAGE=XLAGE*10
18070 NEXT IVT
18080 IF TFL=1 THEN GOTO 18090

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18085 IF YBOT >= 0 OR YTOP <= 0 THEN GOTO 18090
18086 TFL=1 : YTMP=0 : GOTO 18020
18090 RETURN
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PLOTSCRN Listing

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100 '          THIS IS 'PLOTSCRN' -- THE SCREEN PLOTTING PART OF PLOT
110 '
120 DIM DTA$(6),CNM$(6),NPTS(6),FMT(6),X(6,350),Y(6,350),XMIN(6),XMAX(6),YMIN(6),YMAX(6),DSC(33),LGND$(6),
    PUS$(7),BK(7),LGX(12),LGY(12),AL$(172),MK$(6),MKZ$(6),SYM(6),LGNDOS(6)
130 COMMON CNM$( ),BLANK$,DSC( ),DTA$( ),NPTS( ),FMT( ),X( ),Y( ),XMIN( ),XMAX( ),YMIN( ),YMAX( ),MKZ$( ),PORT,SPORT,
    XML,XMU,YML,YMU,FFLG,F$,PARFLG
140 COMMON LGND$( ),PUS$( ),BK( ),LGX( ),LGY( ),NCURVE,XBOT,XBOTE,XTOP,XTOPE,YBOT,YBOTE,YTOP,YTOPE,DXGRID,
    DYGRID,CTYP$,GRID$,TITLE$,TITLEX$,TITLEY$,TXT$,XNDX,YNDX,AL$( ),TXTQ$,VERSION$,REVISEFLAG
150 COMMON IBM$,CLR$,TMLP,FG,BG,FG1,EGAS$,TXTLOC$,SCALE,PAUZ$,LTP$,PSIZE$,TITLEO$,TITLEXO$,TITLEYO$,TXTO$,
    LQST$,SYM( ),LGNDOS( ),SCRNFLG,TESTQ$,PRGDIR$,LCC,LASTYPE,RFORM,CLASSPLOT$,FORMALTITLE$,PENFLG,PAGEQ$,
    PAGEN$,LASPORT
160 '
170 '    THIS STARTS THE SCREEN INTERFACE AND COMMANDS LOGIC
180 '
190 IF EGAS$="Y" THEN SCREEN 9 : COLOR FG,BG : GOTO 210
200 IF IBM$="Y" THEN SCREEN 2
210 GOSUB 2990 : REM SUBROUTINE TO DEFINE THE CHARACTER SET FOR THE SCREEN
220 CLS
230 GOSUB 520 : REM SUBROUTINE TO INITIATE THE SCREEN AND SET UP THE SCALES
240 GOSUB 600 : REM SUBROUTINE TO DRAW THE GRID LINES OR TICK MARKS
250 IF CTYP$="1" THEN GOTO 270
260 GOSUB 2110 : REM SUBROUTINE TO DRAW THE LOG GRID LINES OR TICK MARKS
270 GOSUB 1270 : REM SUBROUTINE TO PLACE THE LABELS ON THE GRAPH
280 IF CTYP$="1" THEN GOTO 300
290 GOSUB 2750 : REM SUBROUTINE TO PLACE NUMBERS ON A LOG SCALE
300 IF TXTQ$="N" OR TXTQ$="n" THEN GOTO 320
310 GOSUB 2040 : REM SUBROUTINE TO PLACE A TEXT LABEL ON THE GRAPH
320 GOSUB 1170 : REM SUBROUTINE TO DRAW THE CURVES
330 A$=INKEY$ : IF A$ = "" THEN 330
340 IF IBM$="Y" THEN SCREEN 0
350 COLOR FG,BG
360 CLS: LOCATE 10,1 : COLOR FG1,BG
370 PRINT "          OPTIONS TO CONTINUE FROM SCREEN PLOT" : COLOR FG,BG
380 PRINT "          1) Continue"
390 PRINT "          2) QUIT" : PRINT
400 PRINT "          What continuation option is selected? (1 or 2) --- ";A$=INPUT$(1):PRINT ""
410 IF A$="1" THEN SCRNFLG=1 : GOTO 440
420 IF A$="2" THEN GOSUB 3880 : REM SUBROUTINE FOR SIGN-OFF
430 GOTO 400
440 CLS : LOCATE 10,1 : PRINT "          Standby . . . . . "
450 CHAIN PRGDIR$+"PLOTMAIN.EXE"
460 END
470 '
480 REM SUBROUTINE TO SCALE TO THE SCREEN PLANE FROM ZX AND ZY TO XX AND YY
490 XX=(ZX-XBOT)/(XTOP-XBOT)*(P2X-P1X)+P1X
500 YY=(ZY-YBOT)/(YTOP-YBOT)*(P2Y-P1Y)+P1Y
510 RETURN
520 REM SUBROUTINE TO INITIATE THE SCREEN AND SET UP THE SCALES

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530 CLS
540 IF EGA$="Y" THEN P1X=89 : P1Y=297 : P2X=614 : P2Y=22 : X0=0 : Y0=349 : X1=639 : Y1=0 : GOTO 580
550 IF IBM$="Y" THEN P1X=89 : P1Y=169 : P2X=614 : P2Y=22 : X0=0 : Y0=199 : X1=639 : Y1=0 : GOTO 580
560 P1X=89 : P1Y=191 : P2X=614 : P2Y=22
570 X0=0:Y0=224:X1=639:Y1=0
580 LINE (X0,Y0)-(X1,Y0) : LINE -(X1,Y1) : LINE -(X0,Y1) : LINE -(X0,Y0)
590 RETURN
600 REM SUBROUTINE TO DRAW THE GRID LINES AND TICK MARKS
610 ZX=XBOT : ZY=YBOT
620 GOSUB 480 : REM SUBROUTINE FOR SCREEN TRANSLATION
630 XBOTS=XX : YBOTS=YY
640 ZX=XTOP : ZY=YTOP
650 GOSUB 480
660 XTOPS=XX : YTOPS=YY
670 DYGRIDS=DYGRID/(YTOP-YBOT)*(YTOPS-YBOTS)
680 DXGRIDS=DXGRID/(XTOP-XBOT)*(XTOPS-XBOTS)
690 LINE (XBOTS,YBOTS)-(XBOTS,YTOPS) : LINE (XBOTS,YBOTS)-(XTOPS,YBOTS)
695 IF GRID$="P" OR GRID$="p" THEN GOTO 696 ELSE GOTO 700
696 LINE -(XTOPS,YTOPS)
697 LINE -(XBOTS,YTOPS)
700 TICKY$="R3L6R3"
710 TICKX$="U2D4U2"
720 ZX=0 : ZY=0 : GOSUB 480 : ZEROX=XX : ZEROY=YY
730 IF CTYP$="4" THEN GOTO 1140
740 IF CTYP$="2" THEN GOTO 850
750 IF XBOT >= 0 OR XTOP <= 0 THEN GOTO 831
760 LINE (ZEROX,YBOTS)-(ZEROX,YTOPS)
765 IF CTYP$="3" THEN GOTO 940
770 Y=YBOTS-DYGRIDS
780 FOR I=1 TO 16
790 Y=Y+DYGRIDS
800 IF Y < YTOPS-.00001 THEN GOTO 830
810 PSET (ZEROX,Y) : DRAW TICKY$
820 NEXT I
830 PSET (ZEROX,YTOPS) : DRAW TICKY$
831 IF CTYP$="3" THEN GOTO 940
832 IF GRID$="P" OR GRID$="p" THEN GOTO 833 ELSE GOTO 840
833 Y=YBOTS-DYGRIDS
834 FOR I=1 TO 20
835 Y=Y+DYGRIDS
836 IF Y < YTOPS-.00001 THEN GOTO 839
837 PSET(XTOPS,Y) : DRAW TICKY$
838 NEXT I
839 PSET (XTOPS,YTOPS) : DRAW TICKY$
840 IF CTYP$="3" THEN GOTO 940
850 IF YBOT >= 0 OR YTOP <= 0 THEN GOTO 935
860 X=XBOTS-DXGRIDS
870 LINE (XBOTS,ZEROY)-(XTOPS,ZEROY)
875 IF CTYP$="2" THEN GOTO 1060
880 FOR I=1 TO 16
890 X=X+DXGRIDS

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900 IF X > XTOPS +.00001 THEN GOTO 930
910 PSET (X,ZEROY) : DRAW TICKX$
920 NEXT I
930 PSET (XTOPS,ZEROY) : DRAW TICKX$
935 IF CTYP$="2" THEN GOTO 1060
940 IF GRID$="P" OR GRID$="p" THEN GOTO 941 ELSE GOTO 949
941 X=XBOTS-DXGRIDS
942 FOR I=1 TO 20
943 X=X+DXGRIDS
944 IF X > XTOPS+.00001 THEN GOTO 948
945 PSET (X,YTOPS) : DRAW TICKX$
946 NEXT I
948 PSET (XTOPS,YTOPS) : DRAW TICKX$
949 X=XBOTS-DXGRIDS : Y=YBOTS-DYGRIDS
950 IF CTYP$="4" THEN GOTO 1160
960 IF CTYP$="2" THEN GOTO 1060
965 X=XBOTS-DXGRIDS
970 FOR I=1 TO 16
980 X=X+DXGRIDS
990 IF X > XTOPS+.00001 THEN GOTO 1040
1000 PSET (X,YBOTS) : DRAW TICKX$
1010 IF GRID$="H" OR GRID$="h" OR GRID$="T" OR GRID$="t" OR GRID$="P" OR GRID$="p" THEN GOTO 1030
1020 LINE -(X,YTOPS)
1030 NEXT I
1040 PSET (XTOPS,YBOTS) : DRAW TICKX$
1050 IF GRID$="V" OR GRID$="v" OR GRID$="B" OR GRID$="b" THEN LINE (XTOPS,YBOTS)-(XTOPS,YTOPS)
1060 IF CTYP$="3" THEN GOTO 1160
1065 Y=YBOTS-DYGRIDS
1070 FOR I=1 TO 16
1080 Y=Y+DYGRIDS
1090 IF Y < YTOPS-.00001 THEN GOTO 1140
1100 PSET (XBOTS,Y) : DRAW TICKY$
1110 IF GRID$="V" OR GRID$="v" OR GRID$="T" OR GRID$="t" OR GRID$="P" OR GRID$="p" THEN GOTO 1130
1120 LINE -(XTOPS,Y)
1130 NEXT I
1140 PSET (XBOTS,YTOPS) : DRAW TICKY$
1150 IF GRID$="H" OR GRID$="h" OR GRID$="B" OR GRID$="b" THEN LINE (XBOTS,YTOPS)-(XTOPS,YTOPS)
1160 RETURN
1170 REM SUBROUTINE TO DRAW THE CURVES
1180 FOR N=1 TO NCURVE
1181 FOR II=1 TO NPTS(N)
1182 IF X(N,II) >= XML AND X(N,II) <= XMU THEN GOTO 1183 ELSE GOTO 1184
1183 IF Y(N,II) >= YML AND Y(N,II) <= YMU THEN GOTO 1186 ELSE GOTO 1184
1184 NEXT II
1185 GOTO 1240
1186 FIRST=II+1
1190 ZX=X(N,II) : ZY=Y(N,II) : GOSUB 480 : PSET (XX,YY)
1200 IF EGA$="Y" THEN COLOR 8+N,BG
1210 FOR I=FIRST TO NPTS(N)
1211 IF X(N,I) >= XML AND X(N,I) <= XMU THEN GOTO 1212 ELSE GOTO 1230
1212 IF Y(N,I) >= YML AND Y(N,I) <= YMU THEN GOTO 1220 ELSE GOTO 1230

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1220 ZX=X(N,I) : ZY=Y(N,I) : GOSUB 480 : LINE -(XX,YY)
1230 NEXT I
1240 NEXT N
1250 IF EGA$="Y" THEN COLOR FG,BG
1260 RETURN
1270 REM SUBROUTINE TO LABEL THE AXES AND THE TITLE
1280 PUL3$="& #####.##### #####.##### &"
1290 PUS$(1)="&   ##.###" : BK(1)=6.5
1300 PUS$(2)="&   ###.##" : BK(2)=6.5
1310 PUS$(3)="&   ####." : BK(3)=7
1320 PUS$(4)="&   #####." : BK(4)=6.5
1330 PUS$(5)="&   #####." : BK(5)=6
1340 PUS$(6)="&   #####." : BK(6)=5.5
1350 PUS$(7)="&#####." : BK(7)=5
1360 XTLS=XBOTS+(XTOPS-XBOTS)/2*.876 : YTLS=YTOPS+(YTOPS-YBOTS)*.025
1370 PRESET (XTLS,YTLS)
1380 DRAW "S8"
1390 BACK=INT(LEN(TITLE$)/2)
1400 FOR ICP=1 TO BACK
1410 DRAW "BL8"
1420 NEXT ICP
1430 DRAW "C7"
1440 FOR ILTR=1 TO LEN(TITLE$)
1450 DEC=ASC(MID$(TITLE$,ILTR,1))
1460 DRAW AL$(DEC)
1470 NEXT ILTR
1480 ' X-AXIS AND Y-AXIS LABELS
1490 '
1500 DRAW "S4"
1510 BACK=INT(LEN(TITLEX$)/2)
1520 XTLXS=(XTOPS-XBOTS)/2+XBOTS : XTLYS=YBOTS-(YTOPS-YBOTS)*.15
1530 YTLXS=XBOTS-(XTOPS-XBOTS)*.11 : YTLS=(YTOPS-YBOTS)/2+YBOTS
1540 PRESET (XTLXS,XTLYS)
1550 FOR ICHR=1 TO BACK
1560 DRAW "BL8"
1570 NEXT ICHR
1580 DRAW "C7"
1590 FOR ICHR=1 TO LEN(TITLEX$)
1600 DEC=ASC(MID$(TITLEX$,ICHR,1))
1610 DRAW AL$(DEC)
1620 NEXT ICHR
1630 BACK=INT(LEN(TITLEY$)/2)
1640 PRESET (YTLXS,YTLYS)
1650 DRAW "A1"
1660 FOR ICHR=1 TO BACK
1670 DRAW "BL8"
1680 NEXT ICHR
1690 DRAW "C7"
1700 FOR ICHR=1 TO LEN(TITLEY$)
1710 DEC=ASC(MID$(TITLEY$,ICHR,1))
1720 DRAW AL$(DEC)

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1730 NEXT ICHR
1740 DRAW "A0"
1750 ' X-AXIS AND Y-AXIS NUMBERS
1760 '
1770 IF CTYP$="4" THEN GOTO 2030
1780 IF CTYP$="2" THEN GOTO 1910
1790 NT=1
1800 IF XNDX < 8 THEN GOTO 1870
1810 FOR I=15 TO 31 STEP 4
1820 NT=NT+1
1830 IF XNDX > I THEN GOTO 1850
1840 GOTO 1870
1850 NEXT I
1860 NT=NT+1
1870 PUSX$=PUS$(NT)
1880 BAKN=BK(NT) : XSTR=XBOT : XSTP=DXGRID
1890 LOCATE 23,12+BAKN : PRINT USING PUSX$;" ",XBOT
1900 LOCATE 23,75+BAKN : PRINT USING PUSX$;" ",XTOP
1910 NT=1
1920 IF CTYP$="3" THEN GOTO 2030
1930 IF YNDX < 8 THEN GOTO 2000
1940 FOR I=15 TO 31 STEP 4
1950 NT=NT+1
1960 IF YNDX > I THEN GOTO 1980
1970 GOTO 2000
1980 NEXT I
1990 NT=NT+1
2000 PUSY$=PUS$(NT)
2010 LOCATE 3,2 : PRINT USING PUSY$;"",YTOP
2020 LOCATE 22,2 : PRINT USING PUSY$;"",YBOT
2030 RETURN
2040 REM SUBROUTINE TO PLACE A LINE OF TEXT ON THE SCREEN PLOT
2050 LONG=LEN(TXT$)
2060 LOCATE 4,76-LONG
2070 IF EGA$="Y" THEN COLOR FG1,BG
2080 PRINT TXT$
2090 IF EGA$="Y" THEN COLOR FG,BG
2100 RETURN
2110 REM SUBROUTINE TO LOCATE AND DRAW LOG GRIDS OR TICKS
2120 DYGRIDS=DYGRID/(YTOP-YBOT)*(YTOPS-YBOTS)
2130 DXGRIDS=DXGRID/(XTOP-XBOT)*(XTOPS-XBOTS)
2140 '      Start of Vertical log grid lines
2145 IF CTYP$="3" THEN GOSUB 4000 : GOTO 2450
2150 XLAG=XBOTE
2160 FOR IC=1 TO 7
2170 XL=LOG(XLAG)
2180 ZX=XL : GOSUB 480 : XLS=XX
2190 LINE (XLS,YBOTS)-(XLS,YTOPS)
2200 IF GRID$="B" OR GRID$="b" OR GRID$="H" OR GRID$="h" THEN GOTO 2350
2210 IF CTYP$="2" THEN GOTO 2290
2220 YLAG=YBOTE

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2230 FOR IVT=1 TO 7
2240 IF YLAGE*10 > YTOPE THEN GOTO 2350
2250 FOR I=1 TO 10 : YL=LOG(I*YLAGE): ZY=YL : GOSUB 480 : YLS=YY : PSET (XLS,YLS) : DRAW TICKY$ : NEXT I
2260 YLAGE=YLAGE*10
2270 NEXT IVT
2280 GOTO 2350
2290 FOR I=0 TO 16
2300 YL=YBOT+I*DYGRID
2310 YLS=YBOTS+I*DYGRIDS
2320 IF YL > YTOP THEN GOTO 2350
2330 PSET (XLS,YLS) : DRAW TICKY$
2340 NEXT I
2350 IF CTYP$="3" THEN GOTO 2440
2355 IF XLAGE*10 > XTOPE THEN GOTO 2440
2360 FOR IL=2 TO 10
2370 XL=LOG(IL*XLAGE)
2380 ZX=XL : GOSUB 480 : XLS=XX : PSET (XLS,YBOTS) : DRAW TICKX$
2390 IF GRID$="H" OR GRID$="h" OR GRID$="T" OR GRID$="t" OR GRID$="P" OR GRID$="p" THEN GOTO 2410
2400 LINE (XLS,YBOTS)-(XLS,YTOPS)
2410 NEXT IL
2420 XLAGE=XLAGE*10
2430 NEXT IC
2440 '      Start of Horizontal log grid lines
2450 IF CTYP$="2" THEN GOSUB 4500 : GOTO 2740
2455 YLAGE=YBOTE
2460 FOR IC=1 TO 7
2470 YL=LOG(YLAGE)
2480 YZ=YL : GOSUB 480 : YLS=YY
2490 LINE (XBOTS,YLS)-(XTOPS,YLS)
2500 IF GRID$="B" OR GRID$="b" OR GRID$="V" OR GRID$="v" THEN GOTO 2650
2510 IF CTYP$="3" THEN GOTO 2590
2520 XLAGE=XBOTE
2530 FOR IVT=1 TO 7
2540 IF XLAGE*10 > XTOPE THEN GOTO 2650
2550 FOR I=1 TO 10 : XL=LOG(I*XLAGE): ZX=XL : GOSUB 480 : XLS=XX : PSET (XLS,YLS) : DRAW TICKX$ : NEXT I
2560 XLAGE=XLAGE*10
2570 NEXT IVT
2580 GOTO 2650
2590 FOR I=0 TO 16
2600 XL=XBOT+I*DXGRID
2610 XLS=XBOTS+I*DXGRIDS
2620 IF XL > XTOP THEN GOTO 2650
2630 PSET (XLS,YLS) : DRAW TICKX$
2640 NEXT I
2650 IF YLAGE*10 > YTOPE THEN GOTO 2740
2660 FOR IL=2 TO 10
2670 YL=LOG(IL*YLAGE)
2680 ZY=YL : GOSUB 480 : YLS=YY : PSET (XBOTS,YLS) : DRAW TICKY$
2690 IF GRID$="V" OR GRID$="v" OR GRID$="T" OR GRID$="t" OR GRID$="P" OR GRID$="p" THEN GOTO 2710
2700 LINE (XBOTS,YLS)-(XTOPS,YLS)
2710 NEXT IL

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2720 YLAGE=YLAGE*10
2730 NEXT IC
2740 RETURN
2750 REM SUBROUTINE TO PLACE NUMBERS ON A LOG PLOT
2760 IF CTYP$="2" THEN GOTO 2820
2770 YZ=YTOPE
2780 GOSUB 2880 : REM SUBROUTINE TO FORMAT THE LOG NUMBERS
2790 LOCATE 3,2 : PRINT USING PUL2$;"",YTOPE
2800 YZ=YBOTE : GOSUB 2880
2810 LOCATE 22,2 : PRINT USING PUL2$;"",YBOTE
2820 IF CTYP$="3" THEN GOTO 2870
2830 YZ=XBOTE : GOSUB 2880
2840 LOCATE 23,12-BKZN : PRINT USING PUL2$;"",XBOTE
2850 YZ=XTOPE : GOSUB 2880
2860 LOCATE 23,76-BKZN : PRINT USING PUL2$;"",XTOPE
2870 RETURN
2880 REM SUBROUTINE TO FORMAT THE LOG NUMBERS
2890 IF YZ < .01 THEN PUL2$="&    #.###" : BKZN=6.5 : GOTO 2980
2900 IF YZ < .1 THEN PUL2$="&    #.##" : BKZN=7 : GOTO 2980
2910 IF YZ < 1 THEN PUL2$="&    #.#" : BKZN=7.5 : GOTO 2980
2920 IF YZ < 10 THEN PUL2$="&    #." : BKZN=8 : GOTO 2980
2930 IF YZ < 100 THEN PUL2$="&    ##." : BKZN=7.5 : GOTO 2980
2940 IF YZ < 1000 THEN PUL2$="&    ###." : BKZN=7 : GOTO 2980
2950 IF YZ < 10000 THEN PUL2$="&    ####." : BKZN=6.5 : GOTO 2980
2960 IF YZ < 100000 THEN PUL2$="&    #####." : BKZN=6 : GOTO 2980
2970 PUL2$="&    #####." : BKZN=5.5
2980 RETURN
2990 REM SUBROUTINE TO DEFINE THE CHARACTER SET TO BE INVERTED
3000 A$="USER2FD5U3L4R4D3 BR4":AL$(65)=A$
3010 B$="U6R3FDGL3R3FDGL3R3 BR5":AL$(66)=B$
3020 C$="BU U4ER2FHL2GD4FR2EG BR5":AL$(67)=C$
3030 D$="U6R2F2D2G2L2R2 BR6":AL$(68)=D$
3040 E$="U6R4L4D3R3L3D3R4 BR4":AL$(69)=E$
3050 F$="U6R4L4D3R3L3D3 BR8":AL$(70)=F$
3060 G$="BU U4ER2FHL2GD4FR3U3LRD3 BR4":AL$(71)=G$
3070 H$="U6D3R4U3D6 BR4":AL$(72)=H$
3080 I$="R2LU6RL2RD6R BR4":AL$(73)=I$
3090 J$="BR HFREU5LR2LD5 BDBR5":AL$(74)=J$
3100 K$="U6D6U3RE3G3F3 BR4":AL$(75)=K$
3110 L$="U6D6R4 BR4":AL$(76)=L$
3120 M$="U6D6U6F2E2D6 BR4":AL$(77)=M$
3130 N$="U6D6U5F4DU6D6 BR4":AL$(78)=N$
3140 O$="BR R2EU4HL2GD4FR2 BR5":AL$(79)=O$
3150 P$="U6R3FDGL3D3 BR8":AL$(80)=P$
3160 Q$="BR RE2U3HL2GD4FREHF2 BR4":AL$(81)=Q$
3170 R$="U6D6U6R3FDGL3RF3 BR4":AL$(82)=R$
3180 S$="BU FR2EUHL2HUER2F BD5BR4":AL$(83)=S$
3190 T$="BR2 U6L2R5 BD6BR4":AL$(84)=T$
3200 U$="BU6 D5FR2EU5D5 BDBR4":AL$(85)=U$
3210 V$="BU6 D2FDFDUEUEU2 BD6BR4":AL$(86)=V$
3220 W$="BU6 D5FEU2D2FEU5 BD6BR4":AL$(87)=W$

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3230 X\$="UDUE4UDG2H2UDF4D BR4":AL\$(88)=X\$
 3240 Y\$="BR2 UDU3H2UDF2E2U BD6BR4":AL\$(89)=Y\$
 3250 Z\$="R4L4UE4UL4R4 BD6BR4":AL\$(90)=Z\$
 3260 SP\$="BR8":AL\$(32)=SP\$
 3270 LA\$="BUER3UHL2R2FD3L3HFR3 BR4" : AL\$(97)=LA\$
 3280 LB\$="UDU6D2R3FD2GL3 BR8": AL\$(98)=LB\$
 3290 LC\$="BU U2ER2F BD3 BL L2HFR2 BR4": AL\$(99)=LC\$
 3300 LD\$="BU FHU2ER3U2D6L3R3 BR4" :AL\$(100)=LD\$
 3310 LE\$="BU U2ER3FDL5DFR3 BR4": AL\$(101)=LE\$
 3320 LF\$="BR UDU3LR2LU2ERF BD5 BR4" : AL\$(102)=LF\$
 3330 LG\$="EGFR2EHL2R2HL2R2E2L3GFBD2 BR8":AL\$(103)=LG\$
 3340 LH\$="UDU6D2R3FD3 BR4":AL\$(104)=LH\$
 3350 LI\$ = "BRLR2LU4LR BU2 BLR BD6 BR6" :AL\$(105)=LI\$
 3360 LJ\$="FR2EU4BU2BLR BD6 BR4": AL\$(106)=LJ\$
 3370 LK\$="UDU6D4RE2GF2D BR4":AL\$(107)=LK\$
 3380 LL\$="BRRLR2LU6LBD6 BR7":AL\$(108)=LL\$
 3390 LM\$="UDU4RFD3U3EFD3BR4":AL\$(109)=LM\$
 3400 LN\$="UDU4R3FD3BR4":AL\$(110)=LN\$
 3410 LO\$="BRHU2ER2FD2GL2R2 BR5":AL\$(111)=LO\$
 3420 LP\$="DU5R2L2D2FREUHLBR6BD4":AL\$(112)=LP\$
 3430 LQ\$="BR4DU5L2R2D2LGLHUR BR2BD4 BR4":AL\$(113)=LQ\$
 3440 LR\$="UDU4DRERFBD3BR4":AL\$(114)=LR\$
 3450 LS\$="RLR2EHLHER2 BD4 BR5":AL\$(115)=LS\$
 3460 LT\$="BU2DU5D2LR2LD3FREBD4BR4":AL\$(116)=LT\$
 3470 LU\$="BUU3D3FRERU3D4BR4":AL\$(117)=LU\$
 3480 LV\$="BU4D2F2E2U2BD4BR4":AL\$(118)=LV\$
 3490 LW\$="BU4D3FEUDFEU3BD4BR4":AL\$(119)=LW\$
 3500 LX\$="E4G2H2F4BR4":AL\$(120)=LX\$
 3510 LY\$="BU4D2FRERU2D4GL2R2EBR4":AL\$(121)=LY\$
 3520 LZ\$="RLE4L4BD4R4BR4":AL\$(122)=LZ\$
 3530 EXCL\$="BR3LBU2U4BD6BR6":AL\$(33)=EXCL\$
 3540 QUOTE\$="BRBU4U2BR2D2BD4BR5":AL\$(34)=QUOTE\$
 3550 NMBR\$="BRU6BR2D6U2RL4R3U2RL4R4BD4BR4":AL\$(35)=NMBR\$
 3560 DOLLAR\$="BR3U6DR2L3GFR2FGL3BDBR7" :AL\$(36)=DOLLAR\$
 3570 PER\$="BUE4BL3LURDU8D5BR2RDLUD BR5":AL\$(37)=PER\$
 3580 AMP\$="BR2LHUREUHGDFLRF2EG2LREFBR3":AL\$(38)=AMP\$
 3590 APOS\$="BR2BU4E2LDUBD6BR5":AL\$(39)=APOS\$
 3600 LPAREN\$="BR3H2U2E2BD6BR5":AL\$(40)=LPAREN\$
 3610 RPAREN\$="BR2E2U2H2BD6BR6":AL\$(41)=RPAREN\$
 3620 AST\$="BR2BUU4D2LHFGER2EGFHBD3BR5":AL\$(42)=AST\$
 3630 PLUS\$="BR2BUU4D2L2R4BD3BR4":AL\$(43)=PLUS\$
 3640 COMMA\$="BR3GEU2LDRDBR5":AL\$(44)=COMMA\$
 3650 DASH\$="BU3R4BD3BR4":AL\$(45)=DASH\$
 3660 PERIOD\$="BR3RULDBR5":AL\$(46)=PERIOD\$
 3670 SLANT\$="E6BD6BR2":AL\$(47)=SLANT\$
 3680 NO\$="BR2HU4ER2FD4GL2HURE2RBD4BR3" :AL\$(48)=NO\$
 3690 N1\$="BR2R3LU6GBRBD5BR4":AL\$(49)=N1\$
 3700 N2\$="BR5L3E4UHL2GBD5BR6":AL\$(50)=N2\$
 3710 N3\$="BEFR2EUH2E2L4BD6BR7":AL\$(51)=N3\$
 3720 N4\$="BR4U6G3DR4BD2BR3":AL\$(52)=N4\$
 3730 N5\$="BEFR2EU2HL3U2R4BD6BR3":AL\$(53)=N5\$

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3740 N6$="BR5BU6LG2D3FR2EUHL3BD3BR6" :AL$(54)=N6$
3750 N7$="BR2U2E3UL4BD6BR7" :AL$(55)=N7$
3760 N8$="BEBRUERLHUER2FDGLRFDGL2HFBR5" :AL$(56)=N8$
3770 N9$="BR3RE2U3HL2GDFR2BD3BR3" :AL$(57)=N9$
3780 COLON$="BR3BUURDLRBU3ULDLRBD4BR5" :AL$(58)=COLON$
3790 SCOLON$="BR4BGEU2LDRLBU3URDLRBD4BR4" :AL$(59)=SCOLON$
3800 LESS$="BR5H3E3BD6BR3" :AL$(60)=LESS$
3810 EQL$="BR2BU2R3BU2L3BD4BR6" :AL$(61)=EQL$
3820 MORE$="BR2E3H3BD6BR6" :AL$(62)=MORE$
3830 QUEST$="BR4LRBU2E2UHL2GBD5BR6" :AL$(63)=QUEST$
3840 ASSIGN$="BR6L3HU3E2RFD3L2UERBD4BR2" :AL$(64)=ASSIGN$
3850 HAT$="BR2BU4E2F2BD4BR2" :AL$(94)=HAT$
3860 UNDR$="BRR5BR2" :AL$(95)=UNDR$
3870 RETURN
3880 REM SUBROUTINE TO PRINT SIGN-OFF MESSAGE DEPENDANT ON TIME OF DAY
3890 CLS: LOCATE 11,28
3900 PRINT " Have a Nice Day!": GOTO 3910
3910 LOCATE 23,1: END
3920 RETURN
4000 REM SUBROUTINE TO PUT THE RIGHT LINE IN ON A CTYP$=3 PLOT
4001 TFL=0 : ZX=0 : ZY=1 : GOSUB 480 : XTMP0=XX : XTMP5=XTOPS
4005 IF GRID$="T" OR GRID$="t" THEN GOTO 4070
4010 YLAGE=YBOTE
4020 FOR IVT=1 TO 7
4030 IF YLAGE*10 > YTOPE THEN GOTO 4070
4040 FOR I=1 TO 10 : YL=LOG(I*YLAGE): ZY=YL : GOSUB 480 : YLS=YY : PSET (XTMP5,YLS) : DRAW TICKY$ : NEXT I
4050 YLAGE=YLAGE*10
4060 NEXT IVT
4070 IF TFL=1 THEN GOTO 4100
4080 IF XBOT >= 0 OR XTOP <= 0 THEN GOTO 4100
4090 XTMP5=XTMP0 : TFL=1 : GOTO 4010
4100 RETURN
4500 REM SUBROUTINE TO PUT THE TOP LINE IN ON A CTYP$=2 PLOT
4501 TFL=0 : ZY=0 : ZX=1 : GOSUB 480 : YTMP0=YY : YTMP5=YTOPS
4505 IF GRID$="T" OR GRID$="t" THEN GOTO 4570
4510 XLAG=XBOTE
4520 FOR IVT=1 TO 7
4530 IF XLAG*10 > XTOPE THEN GOTO 4570
4540 FOR I=1 TO 10 : XL=LOG(I*XLAG): ZX=XL : GOSUB 480 : XLS=XX : PSET (XLS,YTMP5) : DRAW TICKX$ : NEXT I
4550 XLAG=XLAG*10
4560 NEXT IVT
4570 IF TFL=1 THEN GOTO 4600
4580 IF YBOT >= 0 OR YTOP <= 0 THEN GOTO 4600
4590 YTMP5=YTMP0 : TFL=1 : GOTO 4510
4600 RETURN

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PLOTSWTP Listing

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90 '          THIS IS 'PLOTSWTP' -- THE SWEET-P PLOTTING PART OF PLOT
91 '
100 DIM DTA$(6),CNM$(6),NPTS(6),FMT(6),X(6,350),Y(6,350),XMIN(6),XMAX(6),YMIN(6),YMAX(6),DSC(33),LGND$(6),
    PUS$(7),BK(7),LGX(12),LGY(12),AL$(172),XB(5),YB(5),MK$(6),MKZ$(6),SYM(6),LGNDOS(6)
110 COMMON CNM$(),BLANK$,DSC(),DTA$(),NPTS(),FMT(),X(),Y(),XMIN(),XMAX(),YMIN(),YMAX(),MKZ$(),PORT,SPORT,
    XML,XMU,YML,YMU,FFLG,F$,PARFLG
120 COMMON LGND$(),PUS$(),BK$(),LGX$(),LGY$(),NCURVE,XBOT,XBOTE,XTOP,XTOPE,YBOT,YBOTE,YTOP,YTOPE,DXGRID,
    DYGRID,CTYP$,GRID$,TITLE$,TITLEX$,TITLEY$,TXT$,XNDX,YNDX,AL$(),TXTQ$,VERSION$,REVISEFLAG
130 COMMON IBM$,CLR$,TMLP,FG,BG,FG1,EGA$,TXTLOC$,SCALE,PAUZ$,LTYP$,PSIZE$,TITLEO$,TITLEXO$,TITLEYO$,
    TXTO$,LQST$,SYM$(),LGNDOS$(),SCRNFLG,TESTQ$,PRGDIR$,LCC,LASTYPE,RFORM,CLASSPLOT$,FORMALTITLE$,PENFLG,
    PAGEQ$,PAGEN$,LASPORT
155 IF SCALE =.875 THEN SCALE =.85
160 C$="," : CC$=";" : TLNTH=20*SCALE
170 '
180 '      THIS STARTS THE INTERFACE AND COMMANDS LOGIC
190 '
210 GOSUB 480 : REM SUBROUTINE TO INITIATE THE PLOTTER AND SET UP THE SCALES
220 GOSUB 600 : REM SUBROUTINE TO DRAW THE GRID LINES OR TICK MARKS
230 IF CTYP$="1" THEN GOTO 250
240 GOSUB 3130 : REM SUBROUTINE TO DRAW THE LOG GRID LINES OR TICK MARKS
250 GOSUB 1040 : REM SUBROUTINE TO PLACE THE LABELS ON THE GRAPH
280 IF TXTQ$="N" OR TXTQ$="n" THEN GOTO 300
290 GOSUB 2120 : REM SUBROUTINE TO PLACE A TEXT LABEL ON THE GRAPH
300 GOSUB 2210 : REM SUBROUTINE TO PLACE LEGENDS ON THE PLOT
310 GOSUB 920 : REM SUBROUTINE TO DRAW THE CURVES
320 CLS: LOCATE 10,1
322 CLOSE #1
325 COLOR FG1,BG
330 PRINT "          OPTIONS TO CONTINUE FROM SWEET-P PLOT"
335 COLOR FG,BG
336 PRINT : PRINT "  NOTE: Draw the Plot on the Plotter by using SWEETP and calling ";SWEETP$ : PRINT
340 PRINT "          1) Continue"
350 PRINT "          2) QUIT" : PRINT
360 PRINT "          What continuation option is selected? (1 or 2) --- ":A$=INPUT$(1):PRINT ""
370 IF A$="1" THEN SCRNFLG=1 : GOTO 400
380 IF A$="2" THEN GOSUB 6130 : REM SUBROUTINE FOR SIGN-OFF
390 GOTO 360
400 CLS : LOCATE 10,1 : PRINT "          Standby . . . . . "
410 CHAIN PRGDIR$+"PLOTMAIN.EXE"
420 END
430 '
440 REM SUBROUTINE TO SCALE TO THE SWEET-P PLANE FROM ZX AND ZY TO XX AND YY
450 XX=INT((ZX-XBOT)/(XTOP-XBOT)*(XTOPS-XBOTS)+XBOTS)
460 YY=INT((ZY-YBOT)/(YTOP-YBOT)*(YTOPS-YBOTS)+YBOTS)
470 RETURN
480 REM SUBROUTINE TO INITIATE THE PLOTTER AND DRAW THE BORDER
481 CLS : LOCATE 9,1
482 COLOR FG1,BG

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483 INPUT " Drive:Filename for the Sweet-P Data File for this Plot -- ",SWEETP$
484 ON ERROR GOTO 10000
489 OPEN SWEETP$ FOR INPUT AS #1
490 CLOSE #1
491 PRINT SWEETP$;" already exists -- Do you still want to use it? (Y/N) -- "; : Q$=INPUT$(1) : PRINT ""
492 IF Q$="Y" OR Q$="y" THEN OPEN SWEETP$ FOR OUTPUT AS #1 : GOTO 495
493 IF Q$="N" OR Q$="n" THEN GOTO 481
494 GOTO 491
495 GOSUB 5950 : REM SUBROUTINE TO DEFINE BORDER COORDINATES FOR SWEET-P
500 XBOTS=INT(XB(3)+.14*(XB(1)-XB(3)))
510 XTOPS=INT(XB(1)-.04*(XB(1)-XB(3)))
520 YBOTS=INT(YB(3)+.15*(YB(1)-YB(3)))
530 YTOPS=INT(YB(1)-.1*(YB(1)-YB(3)))
540 PRINT #1, "MA ";XB(1);C$;YB(1);";"
545 IF PSIZE$="R" OR PSIZE$="r" THEN GOTO 590
550 FOR I=2 TO 5
560 PRINT #1, "DA ";XB(I);C$;YB(I);";"
570 NEXT I
580 PRINT #1, "PU;"
590 RETURN
600 REM SUBROUTINE TO DRAW THE GRID LINES AND TICK MARKS
610 GOSUB 6180 : REM SUBROUTINE TO ADJUST XTOPS AND YTOPS FOR INTEGER GRID
620 GOSUB 6260 : REM SUB TO DRAW GRID LINES
630 ZX=0 : ZY=0 : GOSUB 440 : ZEROX=XX : ZEROY=YY
640 IF CTYP$="4" THEN GOTO 730
650 IF CTYP$="2" THEN GOTO 700
660 IF XBOT >= 0 OR XTOP <= 0 THEN GOTO 690
670 PRINT #1, "MA ";ZEROX;C$;YBOTS;";"
675 IF CTYP$="3" THEN GOTO 730
680 PRINT #1, "AY ";YTOPS-YBOTS;C$;DYGRIDS;C$;TLNTH;CC$
690 IF CTYP$="3" THEN GOTO 730
700 IF YBOT >= 0 OR YTOP <= 0 THEN GOTO 730
710 PRINT #1, "MA ";XBOTS;C$;ZEROY;";"
715 IF CTYP$="2" THEN GOTO 830
720 PRINT #1, "AX ";XTOPS-XBOTS;C$;DXGRIDS;C$;TLNTH;CC$
730 X=XBOTS-DXGRIDS : Y=YBOTS-DYGRIDS
740 IF CTYP$="4" THEN GOTO 910
750 IF CTYP$="2" THEN GOTO 830
760 FOR I=1 TO 16
770 X=X+DXGRIDS
780 IF X > XTOPS+.00001 THEN GOTO 830
790 IF GRID$="H" OR GRID$="h" OR GRID$="T" OR GRID$="t" OR GRID$="P" OR GRID$="p" THEN GOTO 820
800 PRINT #1, "MA ";X;C$;YBOTS;";"
810 PRINT #1, "DA ";X;C$;YTOPS;";"
820 NEXT I
830 IF CTYP$="3" THEN GOTO 910
840 FOR I=1 TO 16
850 Y=Y+DYGRIDS
860 IF Y < YTOPS-.00001 THEN GOTO 910
870 IF GRID$="V" OR GRID$="v" OR GRID$="T" OR GRID$="t" OR GRID$="P" OR GRID$="p" THEN GOTO 900
880 PRINT #1, "MA ";Y;C$;XBOTS;";"

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890 PRINT #1, "DA ";Y;C$;XTOPS;";"
900 NEXT I
910 RETURN
920 REM SUBROUTINE TO DRAW THE CURVES
930 FOR N=1 TO NCURVE
932 IF LTYP$="P" OR LTYP$="Z" THEN GOTO 934
933 GOTO 938
934 IF SYM(N)=4 OR SYM(N)=5 OR SYM(N)=6 THEN PRINT #1, "CS 1;" : GOTO 938
935 PRINT #1, "CS 2;"
938 IF LTYP$="P" THEN GOTO 950
940 PRINT #1,"SELECT PEN"
950 PRINT "          PLOTTING CURVE ";N
951 FOR II=1 TO NPTS(N)
952 IF X(N,II) >= XML AND X(N,II) <= XMU THEN GOTO 953 ELSE GOTO 954
953 IF Y(N,II) >= YML AND Y(N,II) <= YMU THEN GOTO 956 ELSE GOTO 954
954 NEXT II
955 GOTO 1000
956 FIRST=II+1
960 ZX=X(N,II) : ZY=Y(N,II) : GOSUB 440 : PRINT #1, "MA ";XX;C$;YY;CC$
965 IF LTYP$="P" OR LTYP$="Z" THEN PRINT #1, MKZ$(N)
970 FOR I=FIRST TO NPTS(N)
971 IF X(N,I) >= XML AND X(N,I) <= XMU THEN GOTO 972 ELSE GOTO 990
972 IF Y(N,I) >= YML AND Y(N,I) <= YMU THEN GOTO 975 ELSE GOTO 990
975 IF LTYP$="P" OR LTYP$="Z" THEN GOTO 985
980 ZX=X(N,I) : ZY=Y(N,I) : GOSUB 440 : PRINT #1, "DA ";XX;C$;YY;CC$
984 GOTO 990
985 ZX=X(N,I) : ZY=Y(N,I) : GOSUB 440 : PRINT #1, "MA ";XX;C$;YY;CC$ : PRINT #1, MKZ$(N)
990 NEXT I
1000 PRINT #1, "PU;"
1010 GOSUB 3040 : REM SUBROUTINE TO DRAW THE LEGEND LINE
1020 NEXT N
1025 PRINT #1, "MA 2500,1838;"
1030 RETURN
1040 REM SUBROUTINE TO LABEL THE AXES AND THE TITLE
1050 PUL3$="& #####.##### &"
1060 PUS$(1)="&   .###" : BK(1)=6.5
1070 PUS$(2)="&   .###" : BK(2)=6.5
1080 PUS$(3)="&   .###" : BK(3)=7
1090 PUS$(4)="&   .###" : BK(4)=6.5
1100 PUS$(5)="&   .###" : BK(5)=6
1110 PUS$(6)="&   .###" : BK(6)=5.5
1120 PUS$(7)="&   .###" : BK(7)=5
1130 XTLS=INT((XB(1)-XB(4))/2) : YTLS=YTOPS+INT((YTOPS-YBOTS)*.055)
1140 PRINT #1, "MA ";XTLS;C$;YTLS;CC$
1160 USCS=3 : R$="N"
1164 TEMPTITL$=TITLE$
1165 GOSUB 8000 : REM SUBROUTINE TO ADJUST BACKSPACE LENGTH FOR LOWER CASE LTRS
1166 BACK=INT(LEN(TITLE$)/2-BACKADJ)
1170 FOR ICP=1 TO BACK
1180 GOSUB 4170 : REM BACKSPACE ROUTINE
1190 NEXT ICP

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1200 MESSAGE$=TITLE$
1210 GOSUB 4000 : REM TEXT PRINTING ROUTINE
1215 IF PSIZE$="R" AND RFORM=2 THEN GOSUB 13500 : ' Place formal title
1220 ' X-AXIS AND Y-AXIS LABELS
1230 '
1240 BACK=INT(LEN(TITLEX$)/2)
1250 XTLXS=INT((XTOPS-XBOTS)/2)+XBOTS : XTLYS=YBOTS-INT((YTOPS-YBOTS)*.088)
1260 YTLXS=XBOTS-INT((XTOPS-XBOTS)*.11) : YTLYS=INT((YTOPS-YBOTS)/2)+YBOTS
1270 PRINT #1, "MA ";XTLXS;C$;XTLYS;CC$
1280 USCS=2 : R$="N"
1290 FOR ICHR=1 TO BACK
1300 GOSUB 4170 : REM BACKSPACE ROUTINE
1310 NEXT ICHR
1320 MESSAGE$=TITLEX$
1330 GOSUB 4000 : REM TEXT PRINTING ROUTINE
1340 BACK=INT(LEN(TITLEY$)/2)
1350 PRINT #1, "MA ";YTLXS;C$;YTLYS;CC$
1360 R$="Y" : USCS=2
1370 FOR ICHR=1 TO BACK
1380 GOSUB 4170 : REM BACKSPACE ROUTINE
1390 NEXT ICHR
1400 MESSAGE$=TITLEY$
1410 GOSUB 4000 : REM TEXT PRINTING ROUTINE
1420 R$="N" : PRINT #1, "RO 0;"
1430 '
1440 ' X-AXIS AND Y-AXIS NUMBERS
1450 '
1460 NT=1
1470 IF XNDX < 8 THEN GOTO 1540
1480 FOR I=15 TO 31 STEP 4
1490 NT=NT+1
1500 IF XNDX > I THEN GOTO 1520
1510 GOTO 1540
1520 NEXT I
1530 NT=NT+1
1540 PUSX$=PUS$(NT)
1550 BAKN=-BK(NT) : XSTRT=XBOT : XSTP=DXGRID
1580 MN=ABS(XTOP-XBOT)/DXGRID : MNT=ABS(XTOP)
1581 IF NT < 3 AND MN > 11 THEN GOTO 1590
1582 IF NT > 2 AND MN > 11 AND MNT > 9999 THEN GOTO 1590
1585 IF NT > 4 THEN GOTO 1590
1586 GOTO 1670
1590 XSTP=DXGRID+DXGRID
1600 IF XBOT >= 0 OR XTOP <= 0 THEN GOTO 1670
1610 Z=XBOT-DXGRID
1620 FOR I=1 TO 15 STEP 2
1630 Z=Z+DXGRID+DXGRID
1640 IF Z > XTOP THEN GOTO 1670
1650 IF Z=0 THEN XSTRT=XBOT+DXGRID : GOTO 1670
1660 NEXT I
1670 NT=1

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1680 IF YNDX < 8 THEN GOTO 1750
1690 FOR I=15 TO 31 STEP 4
1700 NT=NT+1
1710 IF YNDX > I THEN GOTO 1730
1720 GOTO 1750
1730 NEXT I
1740 NT=NT+1
1750 PUSY$=PUS$(NT)
1760 '
1770 ' START PLACING THE Y NUMBERS
1780 '
1785 IF PSIZE$="H" OR PSIZE$="h" THEN BSHF=3
1786 IF PSIZE$="R" OR PSIZE$="r" THEN BSHF=2
1787 IF PSIZE$="F" OR PSIZE$="f" THEN BSHF=0
1790 USCS=1 : PRINT #1, "CS ";USCS;CC$
1800 IF CTYP$="1" OR CTYP$="2" THEN GOTO 1830
1810 GOSUB 6370 : REM SUBROUTINE TO PLACE THE NUMBERS FOR A LOG PLOT
1820 GOTO 1940
1830 FOR Y=YBOT TO YTOP STEP DYGRID
1840 ZY=Y : GOSUB 440 : REM CONVERSION TO PLOT COORDINATES
1850 PRINT #1, "MA ";XBOTS;C$;YY,";"
1860 FOR IB=1 TO 10+BSHF
1870 GOSUB 4170 : REM SUBROUTINE FOR BACKSPACE
1880 NEXT IB
1890 V=.25 : GOSUB 4310 : REM SUBROUTINE FOR VERTICAL MOTION
1900 FF$=PUSY$+"&"
1910 PRINT #1, USING FF$;"TX;";Y;CC$
1920 NEXT Y
1930 '
1940 ' START PLACING THE X NUMBERS
1950 '
1960 IF CTYP$="4" THEN GOTO 2110
1970 IF CTYP$="1" OR CTYP$="3" THEN GOTO 2000
1980 GOSUB 6370 : REM SUBROUTINE TO PLACE THE NUMBERS FOR A LOG PLOT
1990 GOTO 2110
2000 FOR X=XSTRT TO XTOP STEP XSTP
2010 ZX=X : GOSUB 440 : REM CONVERSION TO PLOT COORDINATES
2020 PRINT #1, "MA ";XX;C$;YBOTS;";"
2030 BAKK=INT(-BAKN)
2040 FOR IB=1 TO BAKK+BSHF
2050 GOSUB 4170 : REM SUBROUTINE FOR BACKSPACE
2060 NEXT IB
2070 V=1.75 : GOSUB 4310 : REM SUBROUTINE FOR VERTICAL MOTION
2080 FF$=PUSX$+"&"
2090 PRINT #1, USING FF$;"TX;";X;CC$
2100 NEXT X
2110 RETURN
2120 REM SUBROUTINE TO PLACE A LINE OF TEXT ON THE PLOT
2130 PUL5$="& #####.##### #####.##### &"
2140 USCS=1
2141 IF TXTLOC$="3" THEN GOTO 2155

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2142 IF TXTLOC$="1" THEN GOTO 2156
2150 LONG=LEN(TXT$)+3 : XTL=XTOPS : YTL=YTOPS : GOTO 2160
2155 LONG=1 : XTL=XBOTS+INT((XTOPS-XBOTS)*.037) : YTL=YTOPS : GOTO 2160
2156 LONG=LEN(TXT$)/2 : XTL=INT((XB(1)-XB(4))/2) : YTL=INT(YTOPS+(YTOPS-YBOTS)*.026)
2160 PRINT #1, "MA ";XTL;C$;YTL;CC$
2170 FOR IB=1 TO LONG : GOSUB 4170 : NEXT IB : REM BACKSPACE ROUTINE
2175 IF TXTLOC$="1" THEN GOTO 2190 ELSE V=1.5
2180 GOSUB 4310 : REM DOWNSPACE
2190 MESSAGE$=TXT$ : GOSUB 4000 : REM TEXT TRANSLATOR
2200 RETURN
2210 REM SUBROUTINE TO PLACE THE LEGENDS ON THE PLOT
2220 IF NCURVE=1 THEN GOTO 3030
2230 IF LQST$="N" THEN GOTO 3030
2240 USCS=1
2250 XDIF=XTOPS-XBOTS : YDIF=YTOPS-YBOTS
2260 LLGND=XDIF*15/48
2270 LSPACE=XDIF*2.5/48
2280 LGNY1=YBOTS-YDIF*.137
2290 LGNY2=YBOTS-YDIF*.173
2300 LGNYM=YBOTS-YDIF*.155
2310 LEFT3=XBOTS-XDIF*4.25/48
2320 LEFT2=XBOTS+XDIF*4.5/48
2330 ON NCURVE GOTO 3030,2370,2450,2570,2690,2830
2340 '
2350 ' LEGEND LOCATION FOR 2 CURVES
2360 '
2370 LGX(1)=LEFT2 : LGY(1)=LGNYM
2380 LGX(7)=LGX(1)+LLGND : LGY(7)=LGNYM
2390 LGX(2)=LGX(1)+LLGND+LSPACE : LGY(2)=LGNYM
2400 LGX(8)=LGX(2)+LLGND : LGY(8)=LGNYM
2410 GOTO 2950
2420 '
2430 ' LEGEND LOCATION FOR 3 CURVES
2440 '
2450 LGX(1)=LEFT3 : LGY(1)=LGNYM
2460 LGX(7)=LGX(1)+LLGND : LGY(7)=LGNYM
2470 FOR I=2 TO 3
2480 LGX(I)=LGX(I-1)+LLGND+LSPACE
2490 LGY(I)=LGY(I-1)
2500 LGX(I+6)=LGX(I+5)+LLGND+LSPACE
2510 LGY(I+6)=LGY(I)
2520 NEXT I
2530 GOTO 2950
2540 '
2550 ' LEGEND LOCATION FOR 4 CURVES
2560 '
2570 LGX(1)=LEFT2 : LGY(1)=LGNY1
2580 LGX(7)=LGX(1)+LLGND : LGY(7)=LGNY1
2590 LGX(2)=LGX(1)+LLGND+LSPACE : LGY(2)=LGNY1
2600 LGX(8)=LGX(2)+LLGND : LGY(8)=LGNY1
2610 FOR I=3 TO 4

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2620 LGX(I)=LGX(I-2)           :   LGY(I)=LGNY2
2630 LGX(I+6)=LGX(I+4)         :   LGY(I+6)=LGNY2
2640 NEXT I
2650 GOTO 2950
2660 '
2670 '  LEGEND LOCATION FOR 5 CURVES
2680 '
2690 LGX(1)=LEFT3               :   LGY(1)=LGNY1
2700 LGX(7)=LGX(1)+LLGND        :   LGY(7)=LGNY1
2710 FOR I=2 TO 3
2720 LGX(I)=LGX(I-1)+LLGND+LSPACE:   LGY(I)=LGNY1
2730 LGX(I+6)=LGX(I+5)+LLGND+LSPACE:   LGY(I+6)=LGNY1
2740 NEXT I
2750 LGX(4)=LEFT2               :   LGY(4)=LGNY2
2760 LGX(10)=LGX(4)+LLGND        :   LGY(10)=LGNY2
2770 LGX(5)=LGX(4)+LLGND+LSPACE :   LGY(5)=LGNY2
2780 LGX(11)=LGX(5)+LLGND+LSPACE :   LGY(11)=LGNY2
2790 GOTO 2950
2800 '
2810 '  LEGEND LOCATION FOR 6 CURVES
2820 '
2830 LGX(1)=LEFT3               :   LGY(1)=LGNY1
2840 LGX(7)=LGX(1)+LLGND        :   LGY(7)=LGNY1
2850 FOR I=2 TO 3
2860 LGX(I)=LGX(I-1)+LLGND+LSPACE:   LGY(I)=LGNY1
2870 LGX(I+6)=LGX(I+5)+LLGND+LSPACE:   LGY(I+6)=LGNY1
2880 NEXT I
2890 LGX(4)=LEFT3               :   LGY(4)=LGNY2
2900 LGX(10)=LGX(4)+LLGND        :   LGY(10)=LGNY2
2910 FOR I=5 TO 6
2920 LGX(I)=LGX(I-1)+LLGND+LSPACE:   LGY(I)=LGNY2
2930 LGX(I+6)=LGX(I+5)+LLGND+LSPACE:   LGY(I+6)=LGNY2
2940 NEXT I
2950 FOR ILG=1 TO 12
2960 LGX(ILG)=INT(LGX(ILG))
2970 LGY(ILG)=INT(LGY(ILG))
2980 NEXT ILG
2990 FOR ILG=1 TO NCURVE
3000 PRINT #1, "MA ";LGX(ILG);C$;LGY(ILG);CC$ : V=.25 : GOSUB 4310 : REM DOWNMOVE
3010 MESSAGE$=LGND$(ILG) : GOSUB 4000 : REM TEXT TRANSLATOR
3020 NEXT ILG
3030 RETURN
3040 REM SUBROUTINE TO INSTALL LEGEND LINES
3050 IF NCURVE=1 THEN GOTO 3120
3060 IF LQST$="N" THEN GOTO 3120
3070 LONG=LEN(LGND$(N))+1
3080 PRINT #1, "MA ";LGX(N);C$;LGY(N);CC$
3090 FOR IB=1 TO LONG : GOSUB 4240 : NEXT IB : REM FWDSPACE ROUTINE
3100 LGX(N+6)=INT(LGX(N+6)) : LGY(N+6)=INT(LGY(N+6))
3105 IF LTYP$="P" OR LTYP$="Z" THEN GOSUB 4240 : PRINT #1, MKZ$(N) : GOTO 3120
3110 PRINT #1, "DA ";LGX(N+6);C$;LGY(N+6);CC$ : PRINT #1, "PU;"

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3120 RETURN
3130 REM SUBROUTINE TO LOCATE AND DRAW LOG GRIDS OR TICKS
3140 IF CTYP$="3" THEN GOSUB 17800 : GOTO 3450
3150 XLAGE=XBOTE
3160 FOR IC=1 TO 7
3170 XL=LOG(XLAGE)
3180 ZX=XL : GOSUB 440 : XLS=XX
3190 PRINT #1, "MA ";XLS;C$;YBOTS;CC$
3200 PRINT #1, "DA ";XLS;C$;YTOPS;CC$
3210 IF GRID$="B" OR GRID$="b" OR GRID$="H" OR GRID$="h" THEN GOTO 3360
3220 IF CTYP$="2" THEN GOTO 3300
3230 YLAGE=YBOTE
3240 FOR IVT=1 TO 7
3250 IF YLAGE*10 > YTOPE THEN GOTO 3360
3260 FOR I=1 TO 10 : YL=LOG(I*YLAGE): ZY=YL : GOSUB 440 : YLS=YY : PRINT #1, "MA ";XLS;C$;YLS;CC$ : PRINT
#1, "DR ";TLNTH;"0;": NEXT I
3270 YLAGE=YLAGE*10
3280 NEXT IVT
3290 GOTO 3360
3300 FOR I=0 TO 16
3310 YL=YBOT+I*DYGRID
3320 YLS=YBOTS+I*DYGRIDS
3330 IF YL > YTOP THEN GOTO 3360
3340 PRINT #1, "MA ";XLS;C$;YLS;CC$ : PRINT #1, "DR ";TLNTH;"0;":
3350 NEXT I
3355 IF CTYP$="3" THEN GOTO 3450
3360 IF XLAGE*10 > XTOPE THEN GOTO 3450
3370 FOR IL=2 TO 10
3380 XL=LOG(IL*XLAGE)
3390 ZX=XL : GOSUB 440 : XLS=XX : PRINT #1, "MA ";XLS;C$;YBOTS;CC$ : PRINT #1, "DR 0;";TLNTH;CC$
3400 IF GRID$="H" OR GRID$="h" OR GRID$="T" OR GRID$="t" THEN GOTO 3420
3410 PRINT #1, "MA ";XLS;C$;YBOTS;CC$ : PRINT #1, "DA ";XLS;C$;YTOPS;CC$
3420 NEXT IL
3430 XLAGE=XLAGE*10
3440 NEXT IC
3450 IF CTYP$="2" THEN GOSUB 18000 : GOTO 3750
3460 YLAGE=YBOTE
3470 FOR IC=1 TO 7
3480 YL=LOG(YLAGE)
3490 ZY=YL : GOSUB 440 : YLS=YY
3500 PRINT #1, "MA ";XBOTS;C$;YLS;CC$ : PRINT #1, "DA ";XTOPS;C$;YLS;CC$
3510 IF GRID$="B" OR GRID$="b" OR GRID$="V" OR GRID$="v" THEN GOTO 3660
3520 IF CTYP$="3" THEN GOTO 3600
3530 XLAGE=XBOTE
3540 FOR IVT=1 TO 7
3550 IF XLAGE*10 > XTOPE THEN GOTO 3660
3560 FOR I=1 TO 10 : XL=LOG(I*XLAGE): ZX=XL : GOSUB 440 : XLS=XX : PRINT #1, "MA ";XLS;C$;YLS;CC$ : PRINT
#1, "DR 0;";TLNTH;CC$ : NEXT I
3570 XLAGE=XLAGE*10
3580 NEXT IVT
3590 GOTO 3660

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3600 FOR I=0 TO 16
3610 XL=XBOT+I*DXGRID
3620 XLS=XBOTS+I*DXGRIDS
3630 IF XL > XTOP THEN GOTO 3660
3640 PRINT #1, "MA ";XLS;C$;YLS;CC$ : PRINT #1, "DR 0,";TLNTH;CC$
3650 NEXT I
3660 IF YLAGE*10 > YTOPE THEN GOTO 3750
3670 FOR IL=2 TO 10
3680 YL=LOG(IL*YLAGE)
3690 ZY=YL : GOSUB 440 : YLS=YY : PRINT #1, "MA ";XBOTS;C$;YLS;CC$ : PRINT #1, "DR ";TLNTH;"0;"
3700 IF GRID$="V" OR GRID$="v" OR GRID$="T" OR GRID$="t" THEN GOTO 3720
3710 PRINT #1, "MA ";XBOTS;C$;YLS;CC$ : PRINT #1, "DA ";XTOPS;C$;YLS;CC$
3720 NEXT IL
3730 YLAGE=YLAGE*10
3740 NEXT IC
3750 RETURN
4000 REM THIS IS THE TEXT TRANSLATOR FOR THE SWEET-P PLOTTER
4010 '
4020 ' PLACE THE TEXT IN MESSAGE$ AND THE SCALE IN UCSC AND THE ROTATION IN R$
4030 ' AFTER PUTTING THE PEN IN THE START POSITION AND STAND ASIDE
4035 USCSTXT=INT(USCS*SCALE)
4036 IF USCSTXT < 1 THEN USCSTXT=1
4040 PRINT #1, "CS ";USCSTXT;" "
4050 SC=INT(3*USCS*SCALE)
4060 IF SC < 1 THEN SC=1
4070 NCHR=LEN(MESSAGE$)
4080 IF R$="Y" OR R$="y" THEN R$="Y" : PRINT #1, "RO 90;" : ELSE PRINT #1, "RO 0;"
4085 IF R$="U" OR R$="u" THEN R$="U" : PRINT #1, "RO 270;" : ' page numbers only
4090 FOR I=1 TO NCHR
4100 CR$=MID$(MESSAGE$,I,1)
4110 CRDEC=ASC(CR$)
4120 IF CRDEC < 97 OR CRDEC > 122 THEN PRINT #1, "TX";CR$;" " : GOTO 4150
4130 NSUB=CRDEC-96
4140 ON NSUB GOSUB
4370,4430,4490,4550,4610,4670,4730,4810,4870,4930,4990,5050,5110,5170,5230,5290,5350,5410,5470,5530,5590,5650,5710,5770,5
4150 NEXT I
4160 RETURN
4170 REM SUBROUTINE FOR BACKSPACE
4180 VX=INT(3*USCS*SCALE*7)
4190 IF SC < 1 THEN SC=1
4200 IF R$="Y" THEN GOTO 4220
4210 PRINT #1, "MR ":-VX;C$;0;CC$ : GOTO 4230
4220 PRINT #1, "MR 0,":-VX;CC$
4230 RETURN
4240 REM SUBROUTINE FOR FWDSPACE
4250 VX=INT(3*USCS*SCALE*7)
4260 IF SC < 1 THEN SC=1
4270 IF R$="Y" THEN GOTO 4290
4280 PRINT #1, "MR " : VX;C$;0;CC$ : GOTO 4300
4290 PRINT #1, "MR 0," : VX;CC$
4300 RETURN

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4310 REM SUBROUTINE FOR VERTICAL CHARACTER SPACE (DOWNWARD)
4320 VY=INT(3*V*USCS*SCALE*8)
4330 IF R$="Y" THEN GOTO 4350
4340 PRINT #1, "MR 0,";-VY;CC$ : GOTO 4360
4350 PRINT #1, "MR ";VY;"0;"
4360 RETURN
4370 REM SUBROUTINE FOR THE LOWER CASE A
4380 IF R$="Y" THEN GOTO 4410
4390 PRINT #1, "MR ";SC*2;C$;SC*4;"DR ";SC*2;C$;0;"DR ";SC*1;C$;SC*-1;"DR ";0;C$;SC*-3;"DR";SC*-
3;C$;0;"DR";SC*-1;C$;SC*1;"DR ";SC*1;C$;SC*1;"DR";SC*3;C$;0;"MR";SC*2;C$;SC*-2;" : REM LOWER CASE a
4400 GOTO 4420
4410 PRINT #1, "MR ";SC*-4;C$;SC*2;"DR ";SC*0;C$;SC*2;"DR ";SC*1;C$;SC*1;"DR
";SC*3;C$;SC*0;"DR";SC*0;C$;SC*-3;"DR";SC*-1;C$;SC*-1;"DR ";SC*-
1;C$;SC*1;"DR";SC*0;C$;SC*3;"MR";SC*2;C$;SC*2;" : REM ROTATED LOWER CASE a
4420 RETURN
4430 REM SUBROUTINE FOR THE LOWER CASE B
4440 IF R$="Y" THEN GOTO 4470
4450 PRINT #1, "MR ";SC*1;C$;SC*6;"DR ";0;C$;SC*-6;"DR ";SC*3;C$;0;"DR
";SC*1;C$;SC*1;"DR";0;C$;SC*2;"DR";SC*-1;C$;SC*1;"DR ";SC*-3;C$;0;"MR";SC*6;C$;SC*-4;" : REM LOWER
CASE b
4460 GOTO 4480
4470 PRINT #1, "MR ";SC*-6;C$;SC*1;"DR ";SC*6;C$;SC*0;"DR ";SC*0;C$;SC*3;"DR ";SC*-1;C$;SC*1;"DR";SC*-
2;C$;SC*0;"DR";SC*-1;C$;SC*-1;"DR ";SC*0;C$;SC*-3;"MR";SC*4;C$;SC*6;" : REM ROTATED LOWER CASE b
4480 RETURN
4490 REM SUBROUTINE FOR LOWER CASE C
4500 IF R$="Y" THEN GOTO 4530
4510 PRINT #1, "MR ";SC*4;C$;0;"DR ";SC*-2;C$;0;"DR ";SC*-1;C$;SC*1;"DR
";0;C$;SC*2;"DR";SC*1;C$;SC*1;"DR";SC*2;C$;0;"DR ";SC*1;C$;SC*-1;"MR";SC*2;C$;SC*-3;" : REM LOWER
CASE c
4520 GOTO 4540
4530 PRINT #1, "MR ";SC*0;C$;SC*4;"DR ";SC*0;C$;SC*-2;"DR ";SC*-1;C$;SC*-1;"DR ";SC*-2;C$;SC*0;"DR";SC*-
1;C$;SC*1;"DR";SC*0;C$;SC*2;"DR ";SC*1;C$;SC*1;"MR";SC*3;C$;SC*2;" : REM ROTATED LOWER CASE c
4540 RETURN
4550 REM SUBROUTINE FOR LOWER CASE D
4560 IF R$="Y" THEN GOTO 4590
4570 PRINT #1, "MR ";SC*5;C$;SC*6;"DR ";0;C$;SC*-6;"DR ";SC*-3;C$;0;"DR ";SC*-
1;C$;SC*1;"DR";SC*0;C$;SC*2;"DR";SC*1;C$;SC*1;"DR ";SC*3;C$;SC*0;"MR";SC*2;C$;SC*-4;" : REM LOWER
CASE d
4580 GOTO 4600
4590 PRINT #1, "MR ";SC*-6;C$;SC*5;"DR ";SC*6;C$;SC*0;"DR ";SC*0;C$;SC*-3;"DR ";SC*-1;C$;SC*-1;"DR";SC*-
2;C$;SC*0;"DR";SC*-1;C$;SC*1;"DR ";SC*0;C$;SC*3;"MR";SC*4;C$;SC*2;" : REM ROTATED LOWER CASE d
4600 RETURN
4610 REM SUBROUTINE FOR LOWER CASE E
4620 IF R$="Y" THEN GOTO 4650
4630 PRINT #1, "MR ";SC*4;C$;SC*0;"DR ";SC*-2;C$;SC*0;"DR ";SC*-1;C$;SC*1;"DR
";SC*0;C$;SC*2;"DR";SC*1;C$;SC*1;"DR";SC*2;C$;SC*0;"DR ";SC*1;C$;SC*-1;"DR ";SC*0;C$;SC*-1;"DR ";SC*-
4;C$;SC*0;"MR";SC*6;C$;SC*-2;" : REM LOWER CASE e
4640 GOTO 4660
4650 PRINT #1, "MR ";SC*0;C$;SC*4;"DR ";SC*0;C$;SC*-2;"DR ";SC*-1;C$;SC*-1;"DR ";SC*-2;C$;SC*0;"DR";SC*-
1;C$;SC*1;"DR";SC*0;C$;SC*2;"DR ";SC*1;C$;SC*1;"DR ";SC*1;C$;SC*0;"DR ";SC*0;C$;SC*-
4;"MR";SC*2;C$;SC*6;" : REM ROTATED LOWER CASE e

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4660 RETURN
4670 REM SUBROUTINE FOR LOWER CASE F
4680 IF R$="Y" THEN GOTO 4710
4690 PRINT #1, "MR ";SC*5;C$;SC*5;" ;DR ";SC*-1;C$;SC*1;" ;DR ";SC*-1;C$;SC*0;" ;DR ";SC*-1;C$;SC*-
1;" ;DR ";SC*0;C$;SC*-2;" ;DR ";SC*1;C$;SC*0;" ;DR ";SC*-2;C$;SC*0;" ;DR ";SC*1;C$;SC*0;" ;DR ";SC*0;C$;SC*-
3;" ;MR ";SC*5;C$;SC*0;" ;" : REM LOWER CASE f
4700 GOTO 4720
4710 PRINT #1, "MR ";SC*-5;C$;SC*5;" ;DR ";SC*-1;C$;SC*-1;" ;DR ";SC*0;C$;SC*-1;" ;DR ";SC*1;C$;SC*-
1;" ;DR ";SC*2;C$;SC*0;" ;DR ";SC*0;C$;SC*1;" ;DR ";SC*0;C$;SC*-2;" ;DR ";SC*0;C$;SC*1;" ;DR
";SC*3;C$;SC*0;" ;MR ";SC*0;C$;SC*5;" ;" : REM ROTATED LOWER CASE f
4720 RETURN
4730 REM SUBROUTINE FOR LOWER CASE G
4740 IF R$="Y" THEN GOTO 4780
4750 PRINT #1, "MR ";SC*2;C$;SC*1;" ;DR ";SC*-1;" ;0;DR ";0;C$;SC*2;" ;DR ";SC*1;C$;SC*1;" ;DR ";SC*3;C$;0;" ;DR
0;" ;SC*-1;" ;DR ";SC*-2;C$;SC*-2;" ;DR ";SC*-1;C$;0;" ;DR ";0;C$;-1;" ;DR ";SC*2;C$;0;" ;DR ";SC*1;C$;SC*-1;" ;DR
";SC*-1;C$;SC*-1;" ;DR ";SC*-2;C$;0;" ;"
4760 PRINT #1, "DR ";SC*-1;C$;SC*1;" ;DR ";SC*1;C$;SC*1;" ;MR ";SC*5;C$;SC*-1+1;" ;" : REM LOWER CASE g
4770 GOTO 4800
4780 PRINT #1, "MR ";SC*-1;C$;SC*2;" ;DR 0;" ;SC*-1;" ;DR ";SC*-2;" ;0;DR ";SC*-1;C$;SC*1;" ;DR ";0;C$;SC*3;" ;DR
";SC*1;" ;0;DR ";SC*2;C$;SC*-2;" ;DR ";0;C$;SC*-1;" ;DR 1;0;DR ";0;C$;SC*2;" ;DR ";SC*1;C$;SC*1;" ;DR
";SC*1;C$;SC*-1;" ;DR ";0;C$;SC*-2;" ;"
4790 PRINT #1, "DR ";SC*-1;C$;SC*-1;" ;DR ";SC*-1;C$;SC*1;" ;MR ";SC*1-1;C$;SC*5;" ;" : REM ROTATED LOWER CASE
g
4800 RETURN
4810 REM SUBROUTINE FOR LOWER CASE H
4820 IF R$="Y" THEN GOTO 4850
4830 PRINT #1, "MR ";SC*1;C$;SC*0;" ;DR ";SC*0;C$;SC*6;" ;DR ";SC*0;C$;SC*-2;" ;DR
";SC*3;C$;SC*0;" ;DR ";SC*1;C$;SC*-1;" ;DR ";SC*0;C$;SC*-3;" ;MR ";SC*2;C$;SC*0;" ;" : REM LOWER CASE h
4840 GOTO 4860
4850 PRINT #1, "MR ";SC*0;C$;SC*1;" ;DR ";SC*-6;C$;SC*0;" ;DR ";SC*2;C$;SC*0;" ;DR
";SC*0;C$;SC*3;" ;DR ";SC*1;C$;SC*1;" ;DR ";SC*3;C$;SC*0;" ;MR ";SC*0;C$;SC*2;" ;" : REM ROTATED LOWER CASE h
4860 RETURN
4870 REM SUBROUTINE FOR LOWER CASE I
4880 IF R$="Y" THEN GOTO 4910
4890 PRINT #1, "MR ";SC*1;C$;SC*0;" ;DR ";SC*2;C$;SC*0;" ;DR ";SC*-1;C$;SC*0;" ;DR ";SC*0;C$;SC*4;" ;DR ";SC*-
1;C$;SC*0;" ;MR ";SC*1;C$;SC*2;" ;PD;PU;MR ";SC*3;C$;SC*-6;" ;" : REM LOWER CASE i
4900 GOTO 4920
4910 PRINT #1, "MR ";SC*0;C$;SC*1;" ;DR ";SC*0;C$;SC*2;" ;DR ";SC*0;C$;SC*-1;" ;DR ";SC*-
4;C$;SC*0;" ;DR ";SC*0;C$;SC*-1;" ;MR ";SC*-2;C$;SC*1;" ;PD;PU;MR ";SC*6;C$;SC*3;" ;" : REM ROTATED LOWER CASE i
4920 RETURN
4930 REM SUBROUTINE FOR LOWER CASE J
4940 IF R$="Y" THEN GOTO 4970
4950 PRINT #1, "MR ";SC*1;C$;SC*0;" ;DR ";SC*1;C$;SC*-1;" ;DR ";SC*2;C$;SC*0;" ;DR
";SC*1;C$;SC*1;" ;DR ";SC*0;C$;SC*4;" ;MR ";SC*0;C$;SC*2;" ;PD;PU;MR ";SC*2;C$;SC*-6;" ;" : REM LOWER CASE j
4960 GOTO 4980
4970 PRINT #1, "MR ";SC*0;C$;SC*1;" ;DR ";SC*1;C$;SC*1;" ;DR ";SC*0;C$;SC*2;" ;DR ";SC*-1;C$;SC*1;" ;DR ";SC*-
4;C$;SC*0;" ;MR ";SC*-2;C$;SC*0;" ;PD;PU;MR ";SC*6;C$;SC*2;" ;" : REM ROTATED LOWER CASE j
4980 RETURN
4990 REM SUBROUTINE FOR LOWER CASE K
5000 IF R$="Y" THEN GOTO 5030
5010 PRINT #1, "MR ";SC*1;C$;SC*6;" ;DR ";SC*0;C$;SC*-6;" ;DR ";SC*0;C$;SC*2;" ;DR ";1;C$;0;" ;DR

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";SC*2;C$;SC*2;";DR";SC*-1;C$;SC*-1;";DR";SC*2;C$;SC*-2;";DR ";SC*0;C$;SC*-1;";MR";SC*2-1;C$;SC*0;";" :
REM LOWER CASE k
5020 GOTO 5040
5030 PRINT #1, "MR ";SC*-6;C$;SC*1;";DR ";SC*6;C$;SC*0;";DR ";SC*-2;C$;SC*0;";DR ";0;C$;1;";DR ";SC*-
2;C$;SC*2;";DR";SC*1;C$;SC*-1;";DR";SC*2;C$;SC*2;";DR ";SC*1;C$;SC*0;";MR";SC*0;C$;SC*2-1;";" : REM
ROTATED LOWER CASE k
5040 RETURN
5050 REM SUBROUTINE FOR LOWER CASE L
5060 IF R$="Y" THEN GOTO 5090
5070 PRINT #1, "MR ";SC*1;C$;SC*0;";DR ";SC*2;C$;SC*0;";DR ";SC*-1;C$;SC*0;";DR ";SC*0;C$;SC*6;";DR";SC*-
1;C$;SC*0;";MR";SC*4;C$;SC*-6;";" : REM LOWER CASE l
5080 GOTO 5100
5090 PRINT #1, "MR ";SC*0;C$;SC*1;";DR ";SC*0;C$;SC*2;";DR ";SC*0;C$;SC*-1;";DR ";SC*-
6;C$;SC*0;";DR";SC*0;C$;SC*-1;";MR";SC*6;C$;SC*4;";" : REM ROTATED LOWER CASE l
5100 RETURN
5110 REM SUBROUTINE FOR LOWER CASE M
5120 IF R$="Y" THEN GOTO 5150
5130 PRINT #1, "MR ";SC*1;C$;SC*0;";DR ";SC*0;C$;SC*4;";DR ";SC*1;C$;SC*0;";DR ";SC*1;C$;SC*-
1;";DR";SC*0;C$;SC*-3;";DR";SC*0;C$;SC*3;";DR ";SC*1;C$;SC*1;";DR ";SC*1;C$;SC*-1;";DR ";SC*0;C$;SC*-
3;";MR";SC*2;C$;SC*0;";" : REM LOWER CASE m
5140 GOTO 5160
5150 PRINT #1, "MR ";SC*0;C$;SC*1;";DR ";SC*-4;C$;SC*0;";DR ";SC*0;C$;SC*1;";DR
";SC*1;C$;SC*1;";DR";SC*3;C$;SC*0;";DR";SC*-3;C$;SC*0;";DR ";SC*-1;C$;SC*1;";DR ";SC*1;C$;SC*1;";DR
";SC*3;C$;SC*0;";MR";SC*0;C$;SC*2;";" : REM ROTATED LOWER CASE m
5160 RETURN
5170 REM SUBROUTINE FOR LOWER CASE N
5180 IF R$="Y" THEN GOTO 5210
5190 PRINT #1, "MR ";SC*1;C$;SC*0;";DR ";SC*0;C$;SC*4;";DR 0;";SC*-1;";DR ";SC*1;C$;SC*1;";DR
";SC*2;C$;SC*0;";DR ";SC*1;C$;SC*-1;";DR";SC*0;C$;SC*-3;";MR";SC*2;C$;SC*0;";" : REM LOWER CASE n
5200 GOTO 5220
5210 PRINT #1, "MR ";SC*0;C$;SC*1;";DR ";SC*-4;C$;SC*0;";DR ";SC*1;";0;DR ";SC*-1;C$;SC*1;";DR
";SC*0;C$;SC*2;";DR ";SC*1;C$;SC*1;";DR";SC*3;C$;SC*0;";MR";SC*0;C$;SC*2;";" : REM ROTATED LOWER CASE n
5220 RETURN
5230 REM SUBROUTINE FOR LOWER CASE O
5240 IF R$="Y" THEN GOTO 5270
5250 PRINT #1, "MR ";SC*2;C$;SC*0;";DR ";SC*-1;C$;SC*1;";DR ";SC*0;C$;SC*2;";DR
";SC*1;C$;SC*1;";DR";SC*2;C$;SC*0;";DR";SC*1;C$;SC*-1;";DR ";SC*0;C$;SC*-2;";DR ";SC*-1;C$;SC*-1;";DR ";SC*-
2;C$;SC*0;";MR";SC*5;C$;SC*0;";" : REM LOWER CASE o
5260 GOTO 5280
5270 PRINT #1, "MR ";SC*0;C$;SC*2;";DR ";SC*-1;C$;SC*-1;";DR ";SC*-2;C$;SC*0;";DR ";SC*-
1;C$;SC*1;";DR";SC*0;C$;SC*2;";DR";SC*1;C$;SC*1;";DR ";SC*2;C$;SC*0;";DR ";SC*1;C$;SC*-1;";DR ";SC*0;C$;SC*-
2;";MR";SC*0;C$;SC*5;";" : REM ROTATED LOWER CASE o
5280 RETURN
5290 REM SUBROUTINE FOR LOWER CASE P
5300 IF R$="Y" THEN GOTO 5330
5310 PRINT #1, "MR ";SC*1;C$;SC*-1;";DR ";0;C$;SC*5;";DR ";SC*0;C$;SC*-2;";DR";SC*1;C$;SC*-
1;";DR";SC*2;C$;0;";DR ";SC*1;C$;SC*1;";DR ";0;C$;SC*1;";DR ";SC*-1;C$;SC*1;";DR";SC*-2;C$;0;";DR ";SC*-
1;C$;SC*-1;";MR";SC*6;C$;SC*-3;";" : REM p
5320 GOTO 5340
5330 PRINT #1, "MR ";SC*1;C$;SC*1;";DR ";SC*-5;C$;0;";DR
";SC*2;C$;SC*0;";DR";SC*1;C$;SC*1;";DR";0;C$;SC*2;";DR ";SC*-1;C$;SC*1;";DR ";SC*-1;C$;0;";DR

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";SC*-1;C$;SC*-1;";DR";0;C$;SC*-2;";DR ";SC*1;C$;SC*-1;";MR";SC*3;C$;SC*6;";": REM R p
5340 RETURN
5350 REM SUBROUTINE FOR LOWER CASE Q
5360 IF R$="Y" THEN GOTO 5390
5370 PRINT #1, "MR ";SC*5;C$;SC*-1;";DR ";0;C$;SC*5;";DR ";SC*0;C$;SC*-2;";DR";SC*-1;C$;SC*-1;";DR";SC*-
2;C$;0;";DR ";SC*-1;C$;SC*1;";DR ";0;C$;SC*1;";DR ";SC*1;C$;SC*1;";DR";SC*2;C$;0;";DR ";SC*1;C$;SC*-
1;";MR";SC*2;C$;SC*-3;";": REM q
5380 GOTO 5400
5390 PRINT #1, "MR ";SC*1;C$;SC*5;";DR ";SC*-5;C$;0;";DR ";SC*2;C$;SC*0;";DR";SC*1;C$;SC*-1;";DR";0;C$;SC*-
2;";DR ";SC*-1;C$;SC*-1;";DR ";SC*-1;C$;0;";DR ";SC*-1;C$;SC*1;";DR";0;C$;SC*2;";DR
";SC*1;C$;SC*1;";MR";SC*3;C$;SC*2;";": REM R q
5400 RETURN
5410 REM SUBROUTINE FOR LOWER CASE R
5420 IF R$="Y" THEN GOTO 5450
5430 PRINT #1, "MR ";SC*1;C$;SC*0;";DR ";SC*0;C$;SC*4;";DR ";SC*0;C$;SC*-1;";DR ";1;C$;0;";DR
";SC*1;C$;SC*1;";DR ";SC*1;C$;SC*0;";DR";SC*1;C$;SC*-1;";MR";SC*2-1;C$;SC*-3;";" : REM LOWER CASE r
5440 GOTO 5460
5450 PRINT #1, "MR ";SC*0;C$;SC*1;";DR ";SC*-4;C$;SC*0;";DR ";SC*1;C$;SC*0;";DR ";0;C$;1;";DR ";SC*-
1;C$;SC*1;";DR ";SC*0;C$;SC*1;";DR";SC*1;C$;SC*1;";MR";SC*3;C$;SC*2-1;";" : REM ROTATED LOWER CASE r
5460 RETURN
5470 REM SUBROUTINE FOR LOWER CASE S
5480 IF R$="Y" THEN GOTO 5510
5490 PRINT #1, "MR ";SC*2;C$;SC*0;";DR ";SC*2;C$;SC*0;";DR ";SC*1;C$;SC*1;";DR ";SC*-1;C$;SC*1;";DR";SC*-
2;C$;SC*0;";DR";SC*-1;C$;SC*1;";DR ";SC*1;C$;SC*1;";DR ";SC*2;C$;SC*0;";MR";SC*3;C$;SC*-4;";" : REM LOWER
CASE s
5500 GOTO 5520
5510 PRINT #1, "MR ";SC*0;C$;SC*2;";DR ";SC*0;C$;SC*2;";DR ";SC*-1;C$;SC*1;";DR ";SC*-1;C$;SC*-
1;";DR";SC*0;C$;SC*-2;";DR";SC*-1;C$;SC*-1;";DR ";SC*-1;C$;SC*1;";DR ";SC*0;C$;SC*2;";MR";SC*4;C$;SC*3;";"
: REM ROTATED LOWER CASE s
5520 RETURN
5530 REM SUBROUTINE FOR LOWER CASE T
5540 IF R$="Y" THEN GOTO 5570
5550 PRINT #1, "MR ";SC*5;C$;SC*1;";DR ";SC*-1;C$;SC*-1;";DR ";SC*-1;C$;SC*0;";DR ";SC*-
1;C$;SC*1;";DR";SC*0;C$;SC*5;";DR";SC*0;C$;SC*-2;";DR ";SC*-1;C$;SC*0;";DR ";SC*2;C$;SC*0;";MR";SC*4;C$;SC*-
4;";" : REM LOWER CASE t
5560 GOTO 5580
5570 PRINT #1, "MR ";SC*-1;C$;SC*5;";DR ";SC*1;C$;SC*-1;";DR ";SC*0;C$;SC*-1;";DR
";SC*-1;C$;SC*-1;";DR";SC*-5;C$;SC*0;";DR";SC*2;C$;SC*0;";DR ";SC*0;C$;SC*-1;";DR
";SC*0;C$;SC*2;";MR";SC*4;C$;SC*4;";" : REM ROTATED LOWER CASE t
5580 RETURN
5590 REM SUBROUTINE FOR LOWER CASE U
5600 IF R$="Y" THEN GOTO 5630
5610 PRINT #1, "MR ";SC*1;C$;SC*4;";DR ";SC*0;C$;SC*-3;";DR ";SC*1;C$;SC*-1;";DR
";SC*1;C$;SC*0;";DR";SC*2;C$;SC*2;";DR";SC*0;C$;SC*2;";DR ";SC*0;C$;SC*-4;";MR";SC*2;C$;SC*0;";" : REM
LOWER CASE u
5620 GOTO 5640
5630 PRINT #1, "MR ";SC*-4;C$;SC*1;";DR ";SC*3;C$;SC*0;";DR ";SC*1;C$;SC*1;";DR ";SC*0;C$;SC*1;";DR";SC*-
2;C$;SC*2;";DR";SC*-2;C$;SC*0;";DR ";SC*4;C$;SC*0;";MR";SC*0;C$;SC*2;";" : REM ROTATED LOWER CASE u
5640 RETURN
5650 REM SUBROUTINE FOR LOWER CASE V
5660 IF R$="Y" THEN GOTO 5690

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5670 PRINT #1, "MR ";SC*1;C$;SC*4;" ;DR ";SC*0;C$;SC*-2;" ;DR ";SC*2;C$;SC*-2;" ;DR
";SC*2;C$;SC*2;" ;DR";SC*0;C$;SC*2;" ;MR";SC*2;C$;SC*-4;" : REM LOWER CASE v
5680 GOTO 5700
5690 PRINT #1, "MR ";SC*-4;C$;SC*1;" ;DR ";SC*2;C$;SC*0;" ;DR ";SC*2;C$;SC*2;" ;DR ";SC*-2;C$;SC*2;" ;DR";SC*-
2;C$;SC*0;" ;MR";SC*4;C$;SC*2;" : REM ROTATED LOWER CASE v
5700 RETURN
5710 REM SUBROUTINE FOR LOWER CASE W
5720 IF R$="Y" THEN GOTO 5750
5730 PRINT #1, "MR ";SC*1;C$;SC*4;" ;DR ";SC*0;C$;SC*-3;" ;DR ";SC*1;C$;SC*-1;" ;DR
";SC*1;C$;SC*1;" ;DR";SC*0;C$;SC*1;" ;DR";SC*0;C$;SC*-1;" ;DR ";SC*1;C$;SC*-1;" ;DR ";SC*1;C$;SC*1;" ;DR
";SC*0;C$;SC*3;" ;MR";SC*2;C$;SC*-4;" : REM LOWER CASE w
5740 GOTO 5760
5750 PRINT #1, "MR ";SC*-4;C$;SC*1;" ;DR ";SC*3;C$;SC*0;" ;DR ";SC*1;C$;SC*1;" ;DR ";SC*-1;C$;SC*1;" ;DR";SC*-
1;C$;SC*0;" ;DR";SC*1;C$;SC*0;" ;DR ";SC*1;C$;SC*1;" ;DR ";SC*-1;C$;SC*1;" ;DR ";SC*-
3;C$;SC*0;" ;MR";SC*4;C$;SC*2;" : REM ROTATED LOWER CASE w
5760 RETURN
5770 REM SUBROUTINE FOR LOWER CASE X
5780 IF R$="Y" THEN GOTO 5810
5790 PRINT #1, "MR ";SC*1;C$;SC*0;" ;DR ";SC*4;C$;SC*4;" ;DR ";SC*-2;C$;SC*-2;" ;DR ";SC*-
2;C$;SC*2;" ;DR";SC*4;C$;SC*-4;" ;MR";SC*2;C$;SC*0;" : REM LOWER CASE x
5800 GOTO 5820
5810 PRINT #1, "MR ";SC*0;C$;SC*1;" ;DR ";SC*-4;C$;SC*4;" ;DR ";SC*2;C$;SC*-2;" ;DR ";SC*-2;C$;SC*-
2;" ;DR";SC*4;C$;SC*4;" ;MR";SC*0;C$;SC*2;" : REM ROTATED LOWER CASE x
5820 RETURN
5830 REM SUBROUTINE FOR LOWER CASE Y
5840 IF R$="Y" THEN GOTO 5870
5850 PRINT #1, "MR ";SC*2;C$;SC*-1;" ;DR ";SC*2;C$;SC*0;" ;DR ";SC*1;C$;SC*1;" ;DR
";SC*0;C$;SC*4;" ;DR";SC*0;C$;SC*-1;" ;DR";SC*-2;C$;SC*-2;" ;DR ";SC*-1;C$;SC*0;" ;DR ";SC*-1;C$;SC*1;" ;DR
";SC*0;C$;SC*2;" ;MR";SC*6;C$;SC*-4;" : REM LOWER CASE y
5860 GOTO 5880
5870 PRINT #1, "MR ";SC*1;C$;SC*2;" ;DR ";SC*0;C$;SC*2;" ;DR ";SC*-1;C$;SC*1;" ;DR ";SC*-
4;C$;SC*0;" ;DR";SC*1;C$;SC*0;" ;DR";SC*2;C$;SC*-2;" ;DR ";SC*0;C$;SC*-1;" ;DR ";SC*-1;C$;SC*-1;" ;DR ";SC*-
2;C$;SC*0;" ;MR";SC*4;C$;SC*6;" : REM ROTATED LOWER CASE y
5880 RETURN
5890 REM SUBROUTINE FOR LOWER CASE Z
5900 IF R$="Y" THEN GOTO 5930
5910 PRINT #1, "MR ";SC*1;C$;SC*4;" ;DR ";SC*4;C$;SC*0;" ;DR ";SC*-4;C$;SC*-4;" ;DR
";SC*4;C$;SC*0;" ;MR";SC*2;C$;SC*0;" : REM LOWER CASE z
5920 GOTO 5940
5930 PRINT #1, "MR ";SC*-4;C$;SC*1;" ;DR ";SC*0;C$;SC*4;" ;DR ";SC*4;C$;SC*-4;" ;DR
";SC*0;C$;SC*4;" ;MR";SC*0;C$;SC*2;" : REM ROTATED LOWER CASE z
5940 RETURN
5950 REM SUBROUTINE TO INITIATE THE PLOTTER AND SET UP THE SCALES
5960 IF PSIZE$="H" OR PSIZE$="h" THEN GOTO 6000
5970 IF PSIZE$="Q" OR PSIZE$="q" THEN GOTO 6020
5975 IF PSIZE$="R" OR PSIZE$="r" THEN GOTO 5995
5980 X0=0 :Y0=30 :X1=2450 :Y1=1830
5990 GOTO 6100
5995 X0=168 :Y0=144 :X1=2313 :Y1=1724
5996 GOTO 6100
6000 X0=0 :Y0=30 :X1=1839 :Y1=1195

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6010 GOTO 6100
6020 ON LCC GOTO 6030,6050,6070,6090
6030 X0=0 : Y0=930 : X1=1200 : Y1=1830
6040 GOTO 6100
6050 X0=1250 : Y0=930 : X1=2450 : Y1=1830
6060 GOTO 6100
6070 X0=0 : Y0=30 : X1=1200 : Y1=890
6080 GOTO 6100
6090 X0=1250 : Y0=30 : X1=2450 : Y1=890
6100 XB(1)=X1 : XB(2)=X1 : XB(3)=X0 : XB(4)=X0 : XB(5)=XB(1)
6110 YB(1)=Y1 : YB(2)=Y0 : YB(3)=Y0 : YB(4)=Y1 : YB(5)=YB(1)
6120 RETURN
6130 REM SUBROUTINE TO PRINT SIGN-OFF MESSAGE DEPENDANT ON TIME OF DAY
6140 CLS: LOCATE 11,28
6150 PRINT " Have a Nice Day!": GOTO 6160
6160 LOCATE 23,1: END
6170 RETURN
6180 REM SUBROUTINE TO ADJUST XTOPS AND YTOPS FOR INTEGER GRID
6185 IF CTYP$="4" THEN GOTO 6250
6186 IF CTYP$="3" THEN GOTO 6195
6190 DYGRIDS=INT(DYGRID/(YTOP-YBOT)*(YTOPS-YBOTS)+.0001)
6191 NYGRID=INT((YTOP-YBOT+.001)/DYGRID)
6192 YTOPS=YBOTS+NYGRID*DYGRIDS
6195 IF CTYP$="2" THEN GOTO 6250
6200 DXGRIDS=INT(DXGRID/(XTOP-XBOT)*(XTOPS-XBOTS)+.0001)
6201 NXGRID=INT((XTOP-XBOT+.001)/DXGRID)
6202 XTOPS=XBOTS+NXGRID*DXGRIDS
6250 RETURN
6260 REM ROUTINE TO DRAW THE LINEAR GRID LINE AT XBTGR AND YBTGR
6270 TLNTH=20*SCALE
6280 IF CTYP$="4" THEN GOTO 6360
6290 PRINT #1, "MA ";XBOTS;C$;YBOTS;";"
6300 IF CTYP$="2" THEN GOTO 6340
6310 PRINT #1, "AX ";XTOPS-XBOTS;C$;DXGRIDS;C$;TLNTH;CC$
6315 IF GRID$="P" OR GRID$="p" THEN GOTO 6316 ELSE GOTO 6320
6316 PRINT #1,"MA ";XBOTS;C$;YTOPS;";"
6317 PRINT #1,"AX ";XTOPS-XBOTS;C$;DXGRIDS;C$;TLNTH;CC$
6320 IF CTYP$="3" THEN GOTO 6360
6330 PRINT #1, "MA ";XBOTS;C$;YBOTS;CC$
6340 PRINT #1, "AY ";YTOPS-YBOTS;C$;DYGRIDS;C$;TLNTH;CC$
6345 IF GRID$="P" OR GRID$="p" THEN GOTO 6346 ELSE GOTO 6350
6346 PRINT #1,"MA ";XTOPS;C$;YBOTS;CC$
6347 PRINT #1,"AY ";YTOPS-YBOTS;C$;DYGRIDS;C$;TLNTH;CC$
6350 PRINT #1, "PU;"
6360 RETURN
6370 REM SUBROUTINE TO PLACE THE NUMBERS FOR A LOG PLOT
6380 IF CTYP$="2" THEN GOTO 6530
6390 YE=YBOTE
6400 FOR IC=1 TO 7
6410 Y=LOG(YE)
6420 ZY=Y : GOSUB 440 : REM SUBROUTINE TO CONVERT TO PLOTTER COORDINATES

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6430 PRINT #1, "MA ";XBOTS;C$;YY;CC$
6440 USCS=1 : PRINT #1, "CS ";USCS;CC$
6450 FOR IB=1 TO 10+BSHF : GOSUB 4170 : NEXT IB : REM SUBROUTINE TO BACKSPACE
6460 V=.25 : GOSUB 4310 : REM SUBROUTINE TO VERTICAL DOWNSPACE
6470 YZ=YE : GOSUB 6700 : REM SUBROUTINE TO FORMAT THE LOG NUMBERS
6480 FF$=PUL2$+"&"
6490 PRINT #1, USING FF$;"TX;";YE;CC$
6500 YE=YE*10
6510 IF YE > YTOPE THEN GOTO 6530
6520 NEXT IC
6530 IF CTYP$="3" THEN GOTO 6690
6540 XE=XBOTE
6550 FOR IC=1 TO 7
6560 X=LOG(XE)
6570 ZX=X : GOSUB 440 : REM SUBROUTINE TO CONVERT TO PLOTTER UNITS
6580 PRINT #1, "MA ";XX;C$;YBOTS;CC$
6590 YZ=XE : GOSUB 6700 : REM SUBROUTINE TO FORMAT THE LOG NUMBERS
6600 BAKN=-BKZN
6610 USCS=1 : PRINT #1, "CS ";USCS;CC$
6620 FOR IB=1 TO BKZN+BSHF : GOSUB 4170 : NEXT IB : REM SUBROUTINE TO BACKSPACE
6630 V=1.75 : GOSUB 4310 : REM SUBROUTINE TO DOWNSPACE
6640 FF$=PUL2$+"&"
6650 PRINT #1, USING FF$;"TX;";XE;";"
6660 XE=XE*10
6670 IF XE > XTOPE THEN GOTO 6690
6680 NEXT IC
6690 RETURN
6700 REM SUBROUTINE TO FORMAT THE LOG NUMBERS
6710 IF YZ < .01 THEN PUL2$="&    #.###" : BKZN=6.5 : GOTO 6800
6720 IF YZ < .1 THEN PUL2$="&    #.##" : BKZN=71 : GOTO 6800
6730 IF YZ < 1 THEN PUL2$="&    #.#" : BKZN=7.5 : GOTO 6800
6740 IF YZ < 10 THEN PUL2$="&    #." : BKZN=81 : GOTO 6800
6750 IF YZ < 100 THEN PUL2$="&    ##." : BKZN=7.5 : GOTO 6800
6760 IF YZ < 1000 THEN PUL2$="&    ###." : BKZN=71 : GOTO 6800
6770 IF YZ < 10000 THEN PUL2$="&    ####." : BKZN=6.5 : GOTO 6800
6780 IF YZ < 100000 THEN PUL2$="&    #####." : BKZN=61 : GOTO 6800
6790 PUL2$="&    #####." : BKZN=5.5 : GOTO 6800
6800 RETURN
8000 REM SUBROUTINE TO ADJUST BACKSPACE LENGTH FOR LOWER CASE LETTERS
8005 NLCSE=0 : NUCSE=0
8010 NCHR=LEN(TEMPTITL$)
8020 FOR ICASE=1 TO NCHR
8030 CR$=MID$(TEMPTITL$,I,1)
8040 CRDEC=ASC(CR$)
8050 IF CRDEC < 97 OR CRDEC > 122 THEN NUCSE=NUCSE+1 : GOTO 8070
8060 NLCSE=NLCSE+1
8070 NEXT ICASE
8080 BACKADJ=.05*NLCSE
8090 RETURN
10000 IF ERR=53 AND ERL=489 THEN OPEN SWEETP$ FOR OUTPUT AS #1 : RESUME 495
10010 PRINT " NON-STANDARD ERROR ";ERR;" AT LINE ";ERL : END

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13500 ' Subroutine to place a formal title
13510 USCS=1 : R$="N"
13520 XTLS=INT((XB(1)-XB(4))/2) : YTLS=YTOPS-INT((YTOPS-YBOTS)*.25)
13530 PRINT #1, "MA ";XTLS;C$;YTLS;CC$
13540 TEMPTITL$=FORMALTITLE$
13550 GOSUB 8000 : REM SUBROUTINE TO ADJUST BACKSPACE LENGTH FOR LOWER CASE LTRS
13560 BACK=INT(LEN(FORMALTITLE$)/2-BACKADJ)
13570 FOR ICP=1 TO BACK
13580 GOSUB 4170 : REM BACKSPACE ROUTINE
13590 NEXT ICP
13600 MESSAGE$=FORMALTITLE$
13610 GOSUB 4000 : REM TEXT PRINTING ROUTINE
13620 GOSUB 14000 : ' Place classification labels
13630 GOSUB 15000 : ' page number
13999 RETURN
14000 ' Subroutine to place classification labels
14010 USCS=1 : R$="N"
14020 XTLS=XTOPS : YTLS=YTOPS+INT((YTOPS-YBOTS)*.001)
14030 PRINT #1, "MA ";XTLS;C$;YTLS;CC$
14040 TEMPTITL$=CLASSPLOT$
14050 GOSUB 8000 : REM SUBROUTINE TO ADJUST BACKSPACE LENGTH FOR LOWER CASE LTRS
14060 BACK=LEN(FORMALTITLE$)-BACKADJ
14070 FOR ICP=1 TO BACK
14080 GOSUB 4170 : REM BACKSPACE ROUTINE
14090 NEXT ICP
14100 MESSAGE$=CLASSPLOT$
14110 GOSUB 4000 : REM TEXT PRINTING ROUTINE
14999 RETURN
15000 ' page number
15010 IF PAGEQ$="N" THEN GOTO 15090
15020 BACK=-INT(LEN(PAGEN$)/2)
15025 XTLS=45 : YTLS=915
15030 PRINT #1, "MA ";XTLS;C$;YTLS;CC$
15040 R$="Y" : USCS=1
15050 FOR ICHR=1 TO BACK
15060 GOSUB 4170 : REM BACKSPACE ROUTINE
15070 NEXT ICHR
15075 R$="U"
15080 MESSAGE$=PAGEN$
15081 GOSUB 4000 : REM TEXT PRINTING ROUTINE
15082 R$="N" : PRINT #1, "RO 0;"
15090 RETURN
17800 REM SUBROUTINE TO PUT THE RIGHT LINE IN ON A CTYP$=3 PLOT
17805 TFL=0 : ZX=0 : ZY=0 : GOSUB 440 : XTMP0=XX : YTMP0=YY : XTMP5=XTOPS
17810 IF GRID$="T" OR GRID$="t" THEN GOTO 17880
17820 YLAGE=YBOTE
17830 FOR IVT=1 TO 7
17840 IF YLAGE*10 > YTOPE THEN GOTO 17880
17850 FOR I=1 TO 10 : YL=LOG(I*YLAGE): ZY=YL : GOSUB 440 : YLS=YY : PRINT #1, "MA ";XTMP5;C$;YLS;CC$ : PRINT
#1, "DR ";TLNTH;"",0;" : NEXT I
17860 YLAGE=YLAGE*10

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17870 NEXT IVT
17880 IF TFL=1 THEN GOTO 17890
17885 IF XBOT >= 0 OR XTOP <= 0 THEN GOTO 17890
17886 TFL=1 : XTMP=XTMPO : GOTO 17820
17890 RETURN
18000 REM SUBROUTINE TO PUT THE TOP LINE IN ON A CTYP$=2 PLOT
18005 TFL=0 : ZX=0 : ZY=0 : GOSUB 440 : XTMP=XX : YTMP=YY : YTMPS=YTOPS
18010 IF GRID$="T" OR GRID$="t" THEN GOTO 18080
18020 XLAG=XBOTE
18030 FOR IVT=1 TO 7
18040 IF XLAG*10 > XTOPE THEN GOTO 18080
18050 FOR I=1 TO 10 : XL=LOG(I*XLAGE): ZX=XL : GOSUB 440 : XLS=XX : PRINT #1, "MA ";XLS;C$;YTMPS;CC$ : PRINT
#1, "DR 0,";TLNTH;CC$ : NEXT I
18060 XLAG=XLAGE*10
18070 NEXT IVT
18080 IF TFL=1 THEN GOTO 18090
18085 IF YBOT >= 0 OR YTOP <= 0 THEN GOTO 18090
18086 TFL=1 : YTMPS=YTMP0 : GOTO 18020
18090 RETURN

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INDEX

- Abscissa, 8, 9
- Acceptable, 2, 4
- Accepted, 4, 9
- Acknowledged, 14
- Add, 5, 16, 18, 19
- Added, 1, 2, 3, 5, 19
- ADDING, 5, 19
- ADD-a-Curve, 2, 5
- Amplitude, 10
- Amplitudes, 9
- Appealing, 16
- Appear, 8, 12, 16
- Appearance, 16
- Appendix, 3, 2, 20
- Asterisk, 7
- Automatic, 15
- Automatically, 11, 14
- Axes, 10, 15
- Axis, 1, 2, 15, 17

- Background, 2, 1
- Bar, 4
- BASIC, 1
- Bastard, 2
- Blank, 10, 17
- Border, 11, 12, 15
- Bounded, 15
- Bugs, 2

- Centered, 17
- CFG, 3
- CGA, 3
- Change, 3, 18
- Changed, 14, 18
- Changes, 9, 10, 14, 18
- Changing, 14
- Classification, 2, 1, 12, 13
- Color, 3, 11, 13, 14, 17
- Colors, 13, 14
- COM, 3
- Complaints, 19
- Computer, 1, 2, 3
- Computers, 13
- Confidential, 13
- Configuration, 3, 4
- Connected, 3
- Constant, 8, 9
- Constrained, 17
- Constraint, 7, 9
- CONTENTS, 2
- Continuation, 3, 5, 10, 16, 18
- Continuing, 16
- Contract, 9
- Contraction, 2, 9, 18
- Coordinate, 6
- Counted, 7
- Counts, 7
- Curve, 1, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 18
- Curves, 1, 2, 5, 6, 7, 9, 11, 13, 14, 17, 18, 19
- Cycle, 15, 18
- Cycles, 15

- Dashed, 13
- Dashes, 13
- Data, 1, 2, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 16, 17, 18
- DataFile, 3, 5, 6, 16, 18, 19
- Datafiles, 18
- Default, 3, 4, 6
- Delete, 18
- Deleted, 19
- Deleting, 3, 19
- Delta, 8
- Delta-X, 8
- Destination, 4, 5, 10, 11, 12, 16, 17, 18
- Destinations, 5, 11, 13, 14
- Device, 2, 3, 4, 12, 13, 16, 18
- Devices, 4, 9
- Difficulties, 3, 19
- Directory, 3
- Disk, 2, 3
- Dots, 13
- Drive, 3, 4, 6
- Drives, 6

- Edge, 15
- Edited, 18
- Editing, 17
- EGA, 3, 7
- End, 9, 19
- Error, 2, 5, 6, 7, 17
- Example, 7, 9, 11, 15, 17, 18
- EXE, 3

- Executable, 2
- Execution, 1, 3, 9, 16, 19
- Expand, 9
- Expansion, 2, 9, 18
- Extent, 5, 7, 8, 9, 10, 15, 18
- Extents, 9

- Feature, 2, 9, 17, 18, 19
- Features, 2, 17, 19
- File, 2, 1, 3, 4, 6, 7, 8, 16, 17, 18, 19
- Filename, 7
- Files, 2, 3, 6, 7, 17, 19
- Floppy, 2, 3
- Font, 16
- Formal, 2, 1, 12
- Format, 2, 1, 7, 8, 18
- Formats, 2, 1, 6, 7, 8

- Graphic, 2
- Graphical, 2
- Graphtec, 4
- Grid, 1, 2, 9, 10, 15
- Grids, 9

- Half, 11, 12
- Hardware, 2, 3
- Horizontal, 10, 15
- HP, 4
- HPGL, 4
- HP-Color, 4

- IBM-compatible, 1
- Importing, 1
- Increments, 2, 9, 10
- Input, 2, 5, 6
- Installation, 2, 3, 19
- Installing, 3

- KBytes, 3
- Key, 4, 7, 9, 10, 11, 16, 17
- Keystrokes, 4
- Kyocera, 3

- LABEL, 10, 11, 12, 17
- Labeling, 2, 12
- Labels, 2, 1, 5, 10, 11, 12, 16, 17, 18

Landscape, 11, 12
 Laser, 1, 3, 1, 3, 5, 11, 12, 13, 15, 16, 17
 Layup, 1, 12
 Legend, 10, 11
 Legends, 2, 1, 2, 5, 10, 11, 17, 18
 Line, 2, 3, 1, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17
 Linear, 1, 6, 16, 18
 Lines, 2, 7, 9, 13, 15
 Log, 1, 2, 6, 15
 Log-log, 1, 15, 16
 Lower, 9, 12, 15
 LPT, 3

 Machine-readable, 2, 19
 Maintaining, 2
 Maintenance, 2
 Memory, 2, 8
 Menu, 3, 4, 5, 8, 9, 10, 14, 15, 16, 18, 19
 Multiple, 1
 Multi-curve, 10

 Negative, 6, 15
 NEW, 2, 3, 5, 10, 16, 17, 18, 19
 Notification, 2

 Order, 6
 Ordinate, 2, 8, 9
 Orientation, 11, 12
 Origin, 6
 Output, 2, 4
 Overwrite, 17
 Ownership, 2

 Page, 12, 13
 Paper, 5, 16
 Parallel, 3, 4
 Path, 3, 4
 Patterns, 13
 Pause, 14
 PC, 1
 Peak, 7
 Peaks, 7
 Pen, 1, 3, 1, 3, 4, 5, 9, 11, 12, 13, 14, 15, 16
 Pens, 14, 16
 Pen-Plotted, 16
 Plotters, 1, 3, 1, 5, 12, 13, 14,

15
 Plot-save, 18
 Points, 7, 8, 9
 Port, 3
 Portrait, 12
 Printer, 1, 3, 5, 11, 12, 13, 15, 16, 17
 Printers, 1, 3
 Printing, 1, 12
 Problems, 19
 Prompt, 4, 5, 6, 9, 10, 11, 12

 Quarter, 11, 12
 Quit, 8, 9, 16

 Range, 2, 1, 4, 6, 9, 18
 Read, 7, 8
 RECALL, 2, 5, 7, 17
 Revise, 10, 15, 16, 18
 Revised, 10, 18, 19
 Revisions, 18, 19
 Re-Draw, 16, 17, 18
 Re-Drawing, 3, 17
 Redrawn, 18

 Save, 4, 5, 16, 17
 Saving, 3, 17
 Scale, 6, 8
 Scaled, 9
 Scales, 2, 5
 Scaling, 2, 1, 8, 9, 16, 17
 Screen, 1, 4, 5, 7, 8, 10, 11, 12, 13, 14, 16, 17, 18
 Secret, 13
 Semi-Log, 1, 2, 15, 16, 18
 Serial, 3, 4
 Shift, 8
 Shifted, 9
 Size, 2, 1, 11, 12, 17
 Sizes, 1, 11
 Source, 2
 Spacing, 15
 Speed, 3
 Start, 3, 9, 16
 Style, 3, 14, 15, 17
 Subdirectories, 6
 Subdirectory, 3, 4, 6
 Sub-title, 11
 Suggestions, 3, 2, 19
 Summary, 8, 9
 SWEET-P, 4

Symbol, 11, 14, 15
 Symbols, 3, 1, 13, 14, 15

 Terminates, 16
 Termination, 9
 Text, 2, 1, 11, 16, 17, 18
 Thickness, 13, 15
 Tick, 9, 15
 Title, 2, 1, 10, 11, 12, 13, 17, 18
 Titles, 2, 5, 10, 16, 17
 Truncation, 7

 Unclassified, 13
 Updated, 3
 Updates, 2, 19
 Upper, 11, 12
 Upper-right, 11, 18

 Values, 4, 6, 8
 Vertical, 10, 15
 Video, 3, 13

 Warning, 16
 Width, 11, 13

 X-Axis, 10, 11
 X-increment, 8
 X-value, 9
 X-values, 8, 9
 X-y, 1

 Y-amplitudes, 8
 Y-Axis, 10

 Zero, 6, 9, 15