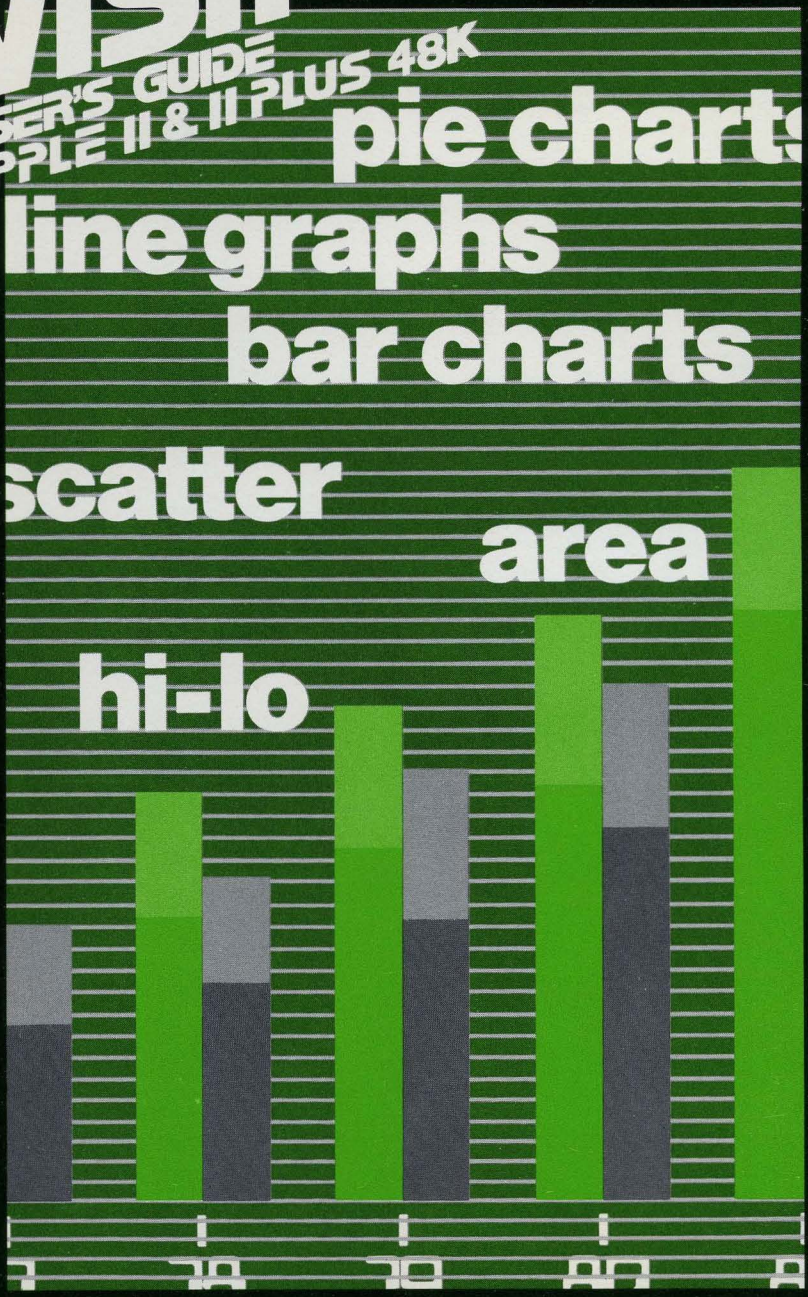
PERSONAL SOFTWARE™

VISIPLOT™

USER'S GUIDE
APPLE II & II PLUS 48K



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VISIPLOT™

USER'S GUIDE

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PREFACE

This manual, which describes the use of the VisiPlot program, is divided into three parts.

The first part is an introduction that describes the VisiPlot program and what it does. It provides the basic information you need to load the program and the use of the keyboard and cursor.

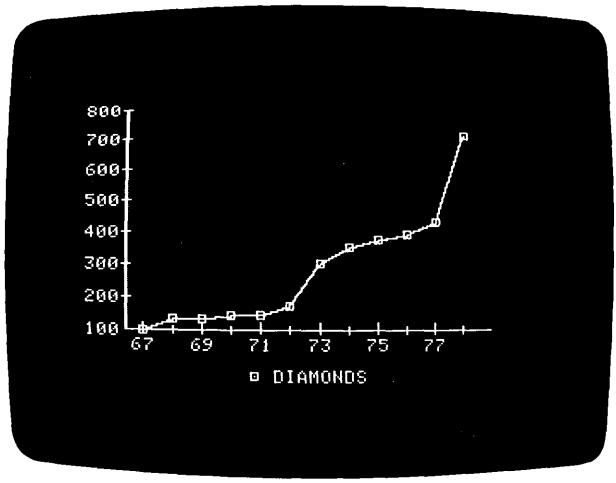
The second part is a series of four lessons that describe the major functions of the program and lead you on a step-by-step tour through their use.

The introduction and lessons should be used while sitting at your computer. You should follow the directions exactly as they are given. This is the fastest way to learn how to use the various parts of the program.

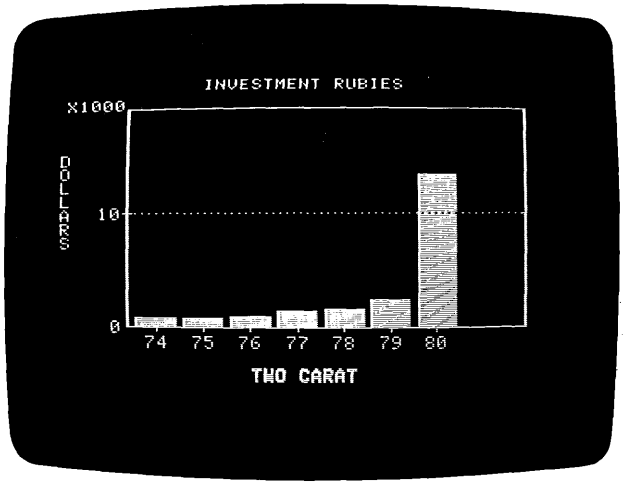
The third part is a reference guide. It provides the information you need when you know how to use the program but have not used a certain function in a while. This guide also provides the information you need to execute those functions that are not covered in the lessons.

INTRODUCTION

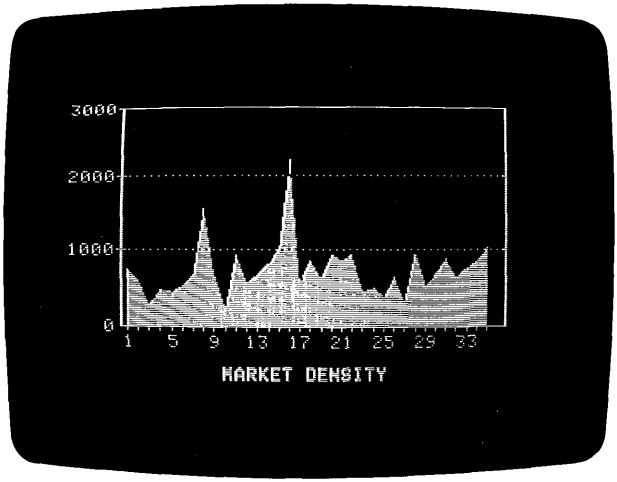
The VisiPlot program turns your Apple II computer into a graph plotting system. With this program you can enter and save chart data, display charts on your screen, print them on your printer, and save a binary representation of the chart for use by another program. The VisiPlot program communicates with the VisiCalc program and all other Personal Software programs that support DIF files. The program generates the types of charts shown in the following photographs.



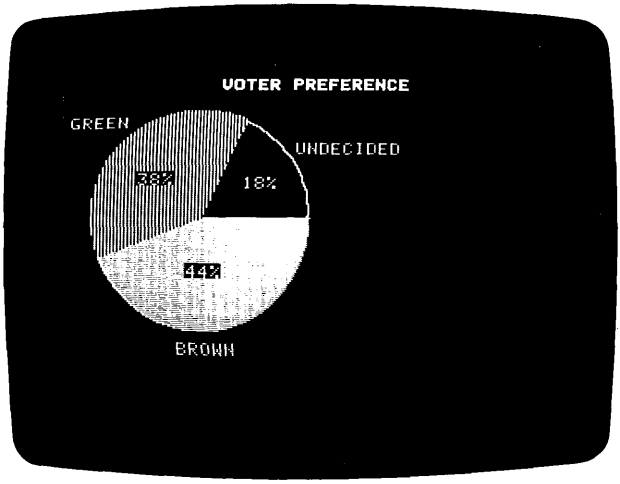
Line Chart



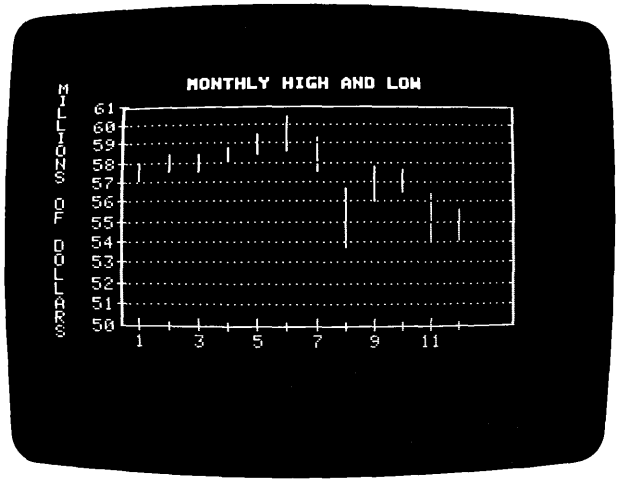
Bar Chart



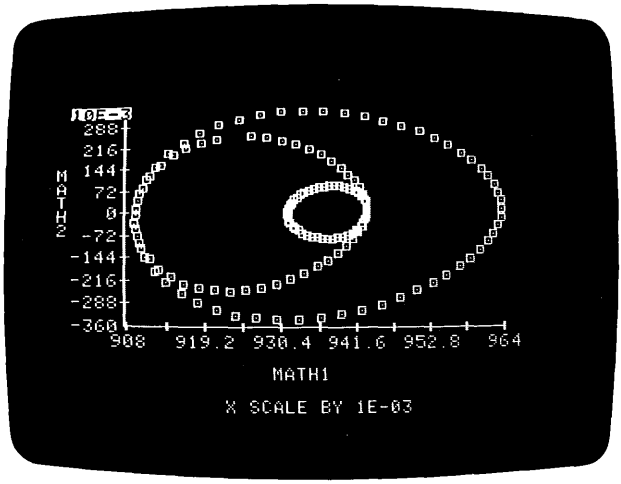
Area Chart



Pie Chart

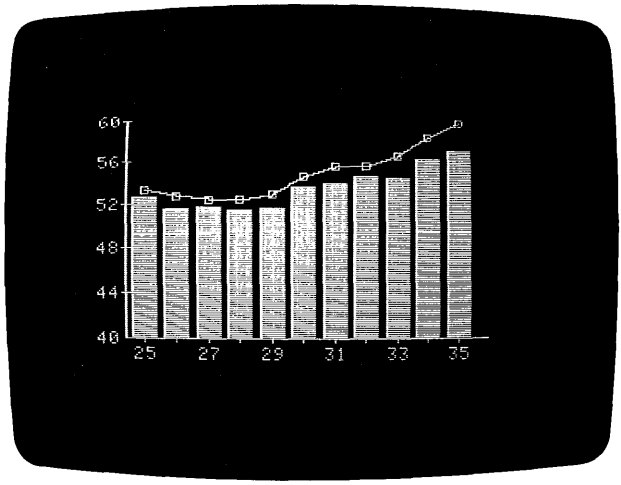


Hi-Lo Chart

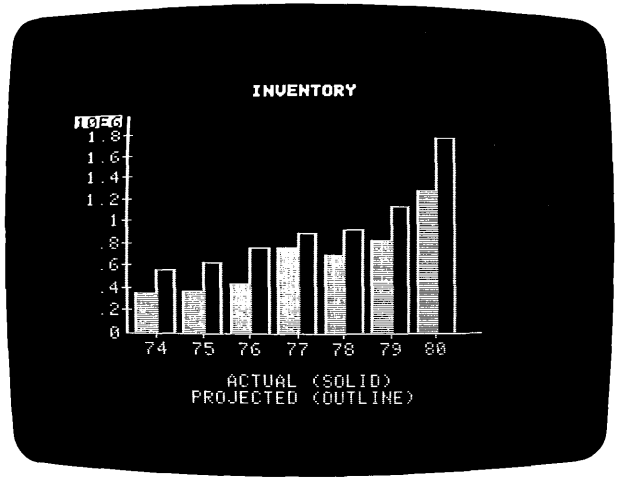


Scatter Chart

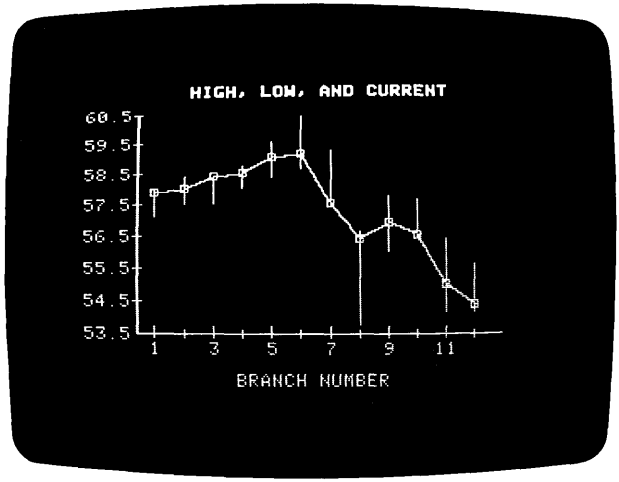
Additionally, with the use of the VisiPlot overlay and window capabilities, combinations of all the formats, except Pie, are possible. (A Pie chart is a unique form that is always handled separately.)



Line and Bar Chart



Comparative Bar Chart



Hi-Lo and Line Chart

THE VISIPLOT FEATURES

The VisiPlot program offers more than just a full repertoire of chart forms.

It can handle 16 data series in memory. A single chart can contain up to 150 data points. A total of 645 data points can be handled in memory. The VisiPlot program analyzes the data in a selected series or multiple selected series and automatically determines the best X-axis and Y-axis value ranges for that chart.

It automatically generates different plotting symbols for charts with multiple data series. It selects different colors the different series in multiple line, bar, and area charts.

The VisiPlot titling features are extensive. A chart can have as many as five fixed title lines. Three at the bottom of the chart, one at the top, and one at the left. There is no limit to the number of moveable title lines you can put into a chart. A moveable title line can be placed anywhere in a chart. Most fixed titles can be displayed in a regular or bold typeface.

The program can output finished charts to several graphic printers: the Apple Silentype, the IDS 440G and 445G Paper Tigers, the Trendcom 200, and the NEC Spinwriter models 5510, 5515, 5520, and 5525. Appendix B of this manual list the features that must be installed in

each of these printers and the required settings of the switches on the printers. The VisiPlot program prints data listing to most printers that can be plugged into the Apple II or Apple II Plus.

The VisiPlot program also provides the means of writing binary chart data to diskette for use by other programs, such as output drivers for other graphic printers or display programs to redisplay the charts on a monitor or TV.

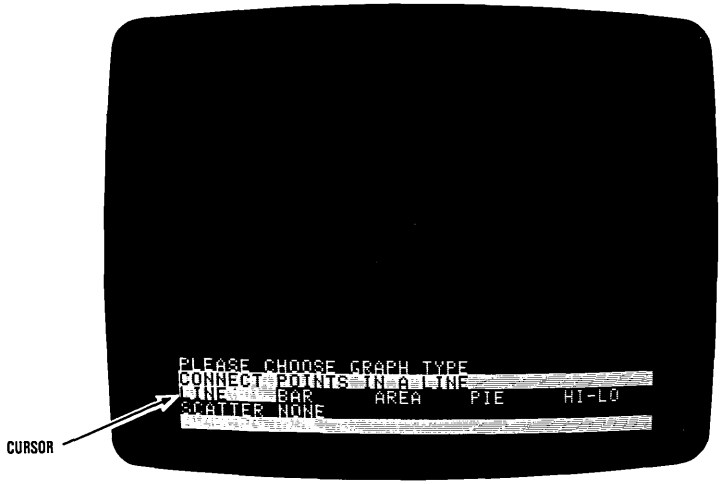
Color display capability is a standard part of the program. You can display your charts in blue, green, orange, violet, black, and white. You have control over the choice of background colors as well as plotting colors. The program provides standard color selections that display well together. On black and white display screens, blue, green, orange, and violet display as a shade of grey easily distinguished from black and white.

Foremost among the VisiPlot features is the support of DIF (Data Interchange Format) files. Through the use of this data format, data from other sources, such as the VisiCalc program, can be loaded and plotted with the VisiPlot program. In a like manner, VisiPlot data can be saved as a DIF file and then loaded by those programs that support DIF files.

USING THE VISIPLOT PROGRAM

The VisiPlot program is easy to use. There is no detailed syntax to learn or look up, no special keyboards to memorize, and no abbreviations to confuse you. The VisiPlot programs are menu-driven. This means that they display a menu of the options from which you can choose. With the very simple technique of pointing to the option with a cursor and pressing a single key, you select an item from the menu.

A cursor is a graphic device that appears on the screen. By pressing keys on the keyboard you can move the cursor to highlight an item in a menu. It is even easier than it sounds. The following picture is a typical VisiPlot menu; the LINE option is highlighted by the cursor.



The VisiPlot program draws the six different kinds of charts that were pictured earlier:

- Line charts, which consist of points plotted against a value axis and a time axis. The points can be connected by a line or can be plotted without the connecting line.
- Bar charts, which consist of vertical bars that show value by their height.
- Area charts, which are line charts with the area between the plotting line and the base line filled in.
- Pie charts, which show percentage of a whole or total with segments of a circle.
- Hi-Lo charts, which show a range of values at a specific time with a vertical line.
- Scatter charts, which show two sets of values plotted against each other.

The VisiPlot software contains two programs, one that handles storage management and data editing and one that does the plotting. The combined programs are too large to fit into the computer memory along with plotting data. You can freely switch between the programs. Plotting data that you have in memory is safely kept in memory when you change programs.

The storage management program loads data from diskette, saves data on diskette, lists the data currently in memory, controls the assignment of disk drives, clears unwanted data from memory, and provides the means of entering new data and modifying the existing data.

The storage management section also provides the means of loading the plotting program. When you initially load the VisiPlot program, operation begins in the storage management section; you have to load data from diskette or create new data before drawing charts.

SOME DEFINITIONS

This manual uses some terms that might be new to you or that you use in a different way. It is important that you and the book always mean the same thing; it will save you time and frustration.

CHART

The output of the plotting program. The graphic representation of one or more data series.

COMMAND

An order given to the computer program. In the VisiPlot program, commands are issued by selecting a menu item.

CURSOR

An area on the screen used to point to items in menus and lists. The cursor is controlled with the right and left arrow keys and the space bar in menus and by the right and left arrow key in lists. The cursor is a white area on the screen. When the cursor is pointing to an item, the item is displayed in dark letters against the white background.

DATA POINT

A numeric value that is associated with a date. The value is plotted against the Y-axis and the date against the X-axis. Data points, along with their associated date, make up a series.

DATE

A value indicating a year or point within a year. A date is associated with every data point.

FILE

A collection of data on a floppy diskette. A file can contain from 1 to 16 series.

FUNCTION

The operation or processing the program does in response to a command.

GRID

Horizontal and vertical lines on a chart used as an aid in determining the value of a point or bars. In the VisiPlot charts, grid lines are series of small dots, light against a dark background and dark against a light background.

LIST

A display that offers a collection of data items, one or more of which are selected with the cursor, the space bar, and the RETURN key.

MENU

A display that offers two or more command choices. The choices in a menu are selected with the cursor and the RETURN key.

PERIOD or PERIODICITY

The frequency at which data points occur within a year. A period of one means the data is shown on a yearly basis. A period of 12 means the data is shown on a monthly basis. This manual uses the word period.

POINT

See Data point

RANGE

The period of time covered by a series or the scope of the series. The range is the beginning date (and period) to the ending date (and period).

SCALE

The scope of values covered by the Y-axis of a chart. A scale usually, but not always, covers the highest and lowest values in a series.

SERIES

A collection of data points. A series is the basic unit of data that the VisiPlot program uses in memory. A series has a name. On diskette, one or more series, to a maximum of 16, are stored in files.

X-AXIS

The horizontal axis of a chart. VisiPlot plots the date on the X-axis (except on scatter charts).

Y-AXIS

The vertical axis of a chart. VisiPlot plots the data point values on the Y-axis.

APPLE COMPUTER REQUIREMENTS

To use the VisiPlot program your computer must have:

- 48K or more of RAM memory.
- A video monitor or a TV set. The video monitor is preferable. The display device can be color or black and white. The color capability is preferable; it lets you make full use of the VisiPlot color capabilities.
- One or more Apple Disk II disk drives. The disk controller must have the 16-sector proms installed. (The 16-sector proms come with the Apple Language System and with the Apple DOS 3.3.) You should have at least one blank diskette to begin with.
- The Apple Language System card or the Applesoft ROM.
- The VisiPlot program diskette. This diskette is in the inside front cover pocket of the binder holding this manual.

SETTING UP YOUR APPLE COMPUTER

If you are using your Apple for the first time, be sure to follow the Apple instructions on how to set up the computer.

The computer power cord should be plugged into the back of the Apple and into a wall socket. Likewise, the video monitor or television power cord should be plugged in.

If you have a video monitor, the dealer should have supplied you with a cable to connect it to your Apple II. The monitor instruction manual or the dealer can supply the information on setting any switches on the unit.

Make sure the cable is plugged into the jack labeled VIDEO OUT on the back of your computer. The input to the monitor is probably labeled VIDEO INPUT or something similar. If you have difficulty identifying the input, see your dealer.

If you use a television set, you need an RF Modulator and cable. This device changes the signal put out by the Apple so that it matches what the television expects. Ask your dealer for an RF Modulator, or see your Apple BASIC or APPLESOFT manual for information on where to obtain one.

Your Disk II drive should be connected by a ribbon cable to the connector labeled Drive 1 on the Disk II controller card. If you have two disk drives, the second should be connected to the connector labeled Drive 2. The controller card should be plugged into the slot numbered 6 at the back of the Apple main circuit board inside the computer. This is a very sensitive step; ask your dealer to show you how to install the drive and controller card properly.

If you have two or more controller cards, they must be plugged into consecutive slot numbers to be used with the VisiPlot program. The Drive 1 connected to the controller card in the highest slot number, must be used to load the program.

Take time now to read Chapter 1, "Installation and Handling" of your Apple **Disk Operating System Instructional and Reference** Manual.

IF YOU HAVE TROUBLE

If you have any trouble at any point in the set up, see your Apple dealer. Don't try to load VisiPlot until the computer is set up and operational.

THE VISIPLOT PROGRAM DISKETTE

Your copy of the VisiPlot program comes on the diskette in the pocket of the VisiPlot binder. This diskette cannot be copied. See the "Warranty Policy for Productivity Series Software" card in the binder replacement information.

CARE OF DISKETTES

Your diskettes are small plastic disks coated with magnetic material on which data can be stored. The diskettes are permanently sealed in a square cover for protection. The cover keeps it clean and yet, allows it to spin freely. This protective cover is never opened.

Never let anything touch the brown or gray surface of the diskette. Handle the diskette only by the plastic cover. When a diskette is not being used, keep it in the paper pocket in which it came. These pockets are treated to minimize static buildup which attracts dust. It is best to store your diskettes in a vertical position, in their box, a diskette holder, or notebook specially designed for them.

Diskettes hold a large amount of information. The information is stored in bits which occupy a very small area of the diskette. An invisible scratch on the surface of the diskette, even a fingerprint, can destroy data. Do not put diskettes on dirty or greasy surfaces; do not let them collect dust.

When writing on a diskette label, use a felt tip pen. Do not press hard. It is best not to write on a label attached to a diskette. Write on the label and then put it on the diskette.

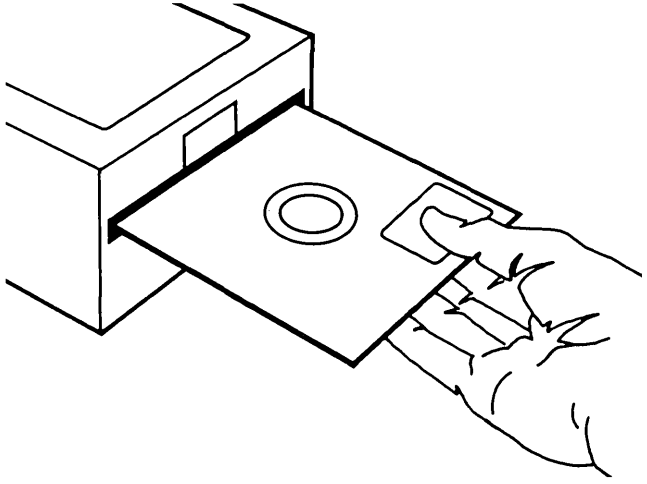
Keep your diskettes away from magnetic fields. This means keep them away from magnets, electric motors, and television sets.

Diskettes are sensitive to temperature extremes. Keep them out of the sun and away from heat sources that can warp them and cause data loss. On hot days, car trunks and dashboards can destroy diskettes. Diskettes operate satisfactorily up to 52 degrees Celsius (approximately 125 degrees Fahrenheit). The first indication of heat damage is a warped or bent plastic cover.

With reasonable care a diskette will give you an average life of 40 hours, which is a long time when you consider the short time it takes to load most programs. But just a little bit of carelessness can destroy its usefulness.

INSERTING AND REMOVING DISKETTES

A disk drive door is opened by pulling outward and upward on the bottom edge of the door. The diskette is slipped into the slot with the label facing upward as shown in the photograph. The edge of the diskette with the oval cutout should enter the drive first; the edge with the label should enter face up and last.



001-001

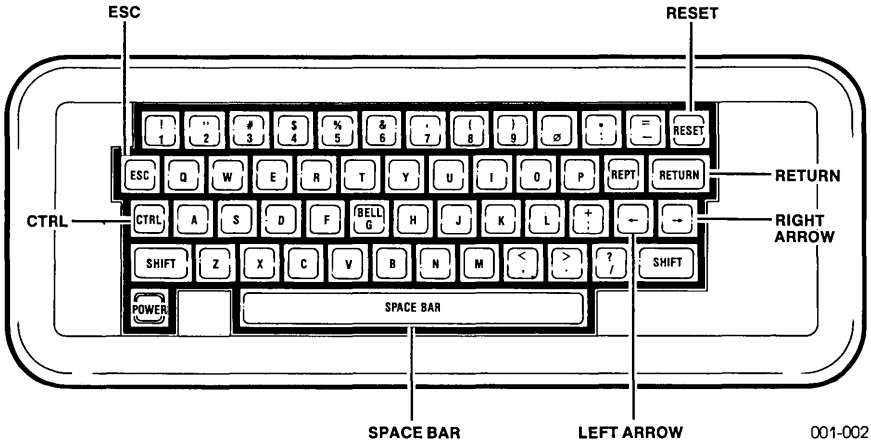
Push the diskette gently into the drive. Do not bend it. When it is totally in the drive, close the drive door by pushing it down. The two metal fingers that can be seen inside the slot as the door is closed should clear the diskette.

To remove a diskette, open the door and pull the diskette straight out of the slot. Opening the drive door lifts the read/write head from the diskette surface. If you leave a diskette in a drive for long periods without use, it is a good idea to open the door so the read/write head does not rest on the diskette.

Never remove a diskette while the IN USE light on the drive is lit. This can permanently damage the diskette and is almost certain to destroy the information on it. You may be able to reuse such a diskette but will not be able to recover the lost data.

THE KEYBOARD

The figure shows the Apple II keyboard. You will use all the keys with the VisiPlot program. There are certain keys that are used very often. They are pointed out in the figure. These keys, with the exception of the RESET key, are explained in the lessons. The RESET key is discussed in the following section. For now it is important that you know their names and locations on the keyboard.



The Reset Key

NEVER PRESS THE RESET KEY.

If you are a beginner to the VisiPlot program, some of the following may not be meaningful to you right now. Please read this section now even if it is not completely meanigful. Because of its location on the keyboard it is easy to press the RESET key accidentally. This section tells you what to do if the program is not able to recover.

The RESET key is very different than the other keys on the keyboard. If you press it accidentally and you have an Autostart ROM installed in your computer, the VisiPlot program almost always recovers, by taking you to the main menu of the program you are currently using. Any action that was in progress, such as drawing a chart, is canceled.

If you press RESET, while saving data to a diskette, you will very likely destroy the file.

If your computer does not have an Autostart ROM installed, pressing RESET will put you in the system monitor. The system monitor displays an asterisk (*) prompt. If this happens, do the following:

1. Type 3D0G and press the RETURN key.
2. If you are in the storage management program, type GOTO 1000 and press the RETURN key. If you are in the plotting program, type GOTO 205 and press the RETURN key. The GOTO statement should be typed when the Applesoft prompt (]) is displayed.
3. If this does not put you back into the correct VisiPlot program, you must reload the program. DO NOT TYPE RUN TO RECOVER WHEN YOU ARE IN BASIC.

The CTRL-C Key

The CTRL-C signal is generated by pressing and holding the CTRL key and then pressing the C key. The CTRL-C stops graphic or text printing operations. Do not press the CTRL-C while a disk drive is operating; it may cause an error that could destroy a file or all the data on the diskette.

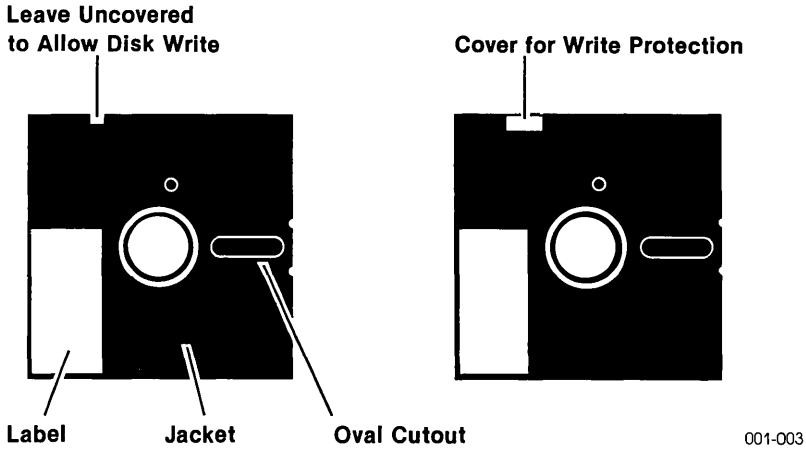
PRINTER SUPPORT

As noted earlier, the VisiPlot program supports several different graphic printers. Appendix B contains a list of the supported printers with the required options and switch settings where applicable. It also contains a list of the graphic printers and interface cards that are not currently supported by the VisiPlot program.

As you received the program diskette, it is configured to print on the Apple Silentype printer. If you use an Apple Silentype printer or do not have a printer connected to the computer, you do not have to make any changes and can skip the remainder of this section and go on to "Loading the VisiPlot Program."

Each printer requires a different driver program to correctly reproduce your charts. These driver programs are on your VisiPlot program diskette. The name of the driver programs that support each printer are listed in Appendix B.

If you have a printer other than the Apple Silentype, you must change the name of two files on your program diskette. Before you can change anything on the diskette, you must remove the write-disable tab. The write-disable tab is on the right upper side of the diskette as shown in the following figure.



Carefully remove this tab. Be very careful not to bend the diskette. If you do not have spare tabs, keep this one; it must be replaced later. Do the following after you remove the tab.

1. Put your Apple DOS 3.3 System Monitor diskette into the disk drive and turn the system on.
2. Put your VisiPlot program diskette into the second disk drive. If you have only one disk drive, remove the DOS 3.3 System Master diskette and put the program diskette in that drive. The remaining steps assume you are using two disk drives. If you are using one drive, enter D1 each time the example shows D2.
3. Issue the following DOS 3.3 command:
   RENAME VISIPLOT.DRIVER, SILENTYPE.D, D2
4. Next rename the driver program for your printer, shown as xxxxx.x, to VISIPLOT.DRIVER:
   RENAME xxxxx.x, VISIPLOT.DRIVER, D2
5. Remove the VisiPlot program diskette from the disk drive and replace the write-disable tab.

LOADING THE VISIPLOT PROGRAM

The procedure to load the VisiPlot program depends on the configuration of your Apple II or Apple II PLUS. Use the procedure for your configuration. The 16-sector proms must be installed in the disk controller card.

Procedure 1 must be used on Apple II PLUS computers with or without the Language System and on Apple II computers with the Applesoft ROM installed. These systems have Applesoft Basic in the system.

Procedure 2 must be used on Apple II computers with the Language System installed but without Applesoft in ROM. Applesoft Basic must first be loaded into these systems.

Procedure 1

1. With the computer power turned off, put the VisiPlot diskette in Drive 1 and close the door. If you have a second drive, it should be empty at this time. If you have multiple disk controller cards, use the Drive 1 that is connected to the controller card that is plugged into the highest numbered slot. This is usually slot number 6.

2. The display unit (monitor or TV set) should already be turned on. Turn the computer power switch (located on the back left of the computer) on. The red IN USE light on the disk drive lights and the drive begins to run. In less than 1 minute you will see the VisiPlot startup display on the screen.

Procedure 2

1. With the computer power turned off, put the DOS 3.3 System Master diskette in Drive 1 and close the door. If you have a second drive, it should be empty at this time. If you have multiple disk controller cards, use the Drive 1 that is connected to the controller card that is plugged into the highest numbered slot. This is usually slot number 6.
2. The display unit (monitor or TV set) should already be turned on. Turn the computer power switch (located on the back left of the computer) on. The red IN USE light on the disk drive lights and the drive begins to run. In a short time, Applesoft Basic will be loaded into the computer and the Integer Basic prompt (>) is displayed.
3. Open the drive door and remove the DOS 3.3 System Master diskette.
4. Insert the VisiPlot program diskette and close the door.
5. Type RUN INIT and press the RETURN key. The red IN USE light on the disk drive lights and the drive begins to run. In less than 1 minute you will see the VisiPlot startup display on the screen.

THE VISIPLOT STARTUP DISPLAY

The photo shows the intitial display after loading the VisiPlot program.

The four lines at the top of the screen—one light, two dark, and one light—are called the status area. The status area gives you information about the computer and program and contains the menus of the commands you can give to the VisiPlot program.

The reverse video lines (the top and bottom lines) supply information or give direction. The normal video lines (the two middle lines) display a menu, messages from the program, or provide a space for data entry.

Below the status area are two lines that contain the version number of the VisiPlot program that you loaded and the copyright notice. If you do not have the version number written down, do it now. You will need it in the event you ever have trouble with the program. The copyright notice shows that the program on this diskette is protected by the United States Copyright laws. Be sure to read the notice inside the front cover about the copyright protection of this program and manual.

Under the copyright there are two lines of directions on how to select an item from the menu.

THE VISIPLOT CURSOR

Look at the menu lines in the status area, notice that one item is shown in reverse video (black on white). If you just loaded the program and have not pressed any keys, that item is LOAD.

Press the right arrow key on the keyboard. The reverse video area moves to the word —>PLOT. The reverse video area in the menu is called the cursor. Pressing the arrow key moves it in the direction indicated. Press the left arrow key and the cursor moves back to LOAD.

As you move the cursor the top line of the status area changes. With the cursor pointing to LOAD, the top line reads LOAD SERIES and with the cursor pointing to —>PLOT, it reads GO TO VISIPLOT. The information in the top line is called the Long Prompt. It gives a longer description of the menu item to which the cursor is pointing.

There are two menu lines. With the right arrow key, move the cursor to the right end of the top line, to <MORE>. Now press the right arrow key once more. The cursor jumps to the left end of the bottom line. This cursor action is called wraparound.

Cursor wraparound works in both directions. Press the left arrow key and the cursor jumps back to the right end of the top line. From the right end of the second line it jumps to the left end of the top line.

It is inconvenient to move the cursor across the whole menu line to reach the other line. With the cursor on LOAD, press the space bar. The cursor moves down, directly to the bottom line, to EDIT. Press the space bar again and the cursor moves back up to the top line.

The use of the space bar and the arrow keys makes cursor movement very easy and convenient.

SELECTING A MENU ITEM

Moving the cursor to a menu item causes no action to take place. To select a menu item, you must move the cursor to the item and then press the RETURN key.

Move the cursor to LOOKUP and press the RETURN key. The message NO ACTIVE SERIES appears in the status area, replacing the menu. As you pressed the RETURN key, there was a beep from the computer signalling that an abnormal situation occurred. In this case, you selected a function that displays a list of the plotting data currently in memory. The program could not do this because there is no plotting data in memory.

However, something more important than an error happened. You lost the menu and cannot do anything. The progam is menu-driven, which means all commands are issued by selection from a menu. You must have a menu on the screen if you are to do anything. When you reach this situation—no menu on the screen—press any key on the keyboard except the RESET key. Pressing keys such as SHIFT and CTRL have no effect because they are always used in conjunction with another key. But pressing any other key erases the message in the status area and redisplays the menu.

It is important to remember: ANYTIME YOU SEEM TO BE AT A DEAD END WITH NO WAY TO CONTINUE, PRESS ANY KEY EXCEPT RESET, SHIFT, AND CTRL.

MORE ABOUT THE STATUS AREA

The bottom line of the status area lists a Slot and Drive number. This is the Slot and Drive address for the diskette that the program uses to load and save plotting data. If you have a single drive system, the line should indicate Slot 6 and Drive 1. (Slot 6 is the normal slot used for a single disk controller.) If you have only one drive, it must be plugged into the Drive 1 connection on the controller board.

If you have more than one drive, you can choose which drive is used for data. This is covered in Lesson Three.

MORE ABOUT THE CURSOR

With the arrow keys and/or space bar move the cursor to LOAD and press the RETURN key. The disk drive starts running and the message READING DIRECTORY... appears in the status area. The drive stops and a list of names is displayed below the status area. This is a list of files on the VisiPlot program diskette containing data that can be plotted. These sample files are supplied as part of the lessons in this manual. The data in these files is fictional; it does not represent any actual condition or circumstance.

All you are going to do with this list now is to learn how the cursor works in a list.

The cursor has moved from the status area to the top item of the list. Press the right arrow key. The cursor moves to the next item down the list. Press the left arrow key and the cursor moves back up to the first item.

Press the right arrow key until the cursor reaches the bottom item which is (NONE). Now press the right arrow key once more. The cursor jumps back to the top of the list. Wraparound works on the list as well as the menu. Now press the left arrow key to see if the cursor wraparound also works from top to bottom. It does.

This is a list you will use in Lesson One to load data from the diskette into the computer memory. For now we don't want any data. To select an item from the list, press the RETURN key with the cursor on the desired item. For now move the cursor to (NONE); and press the RETURN key. The list vanishes and the menu returns to the status area.

SUMMARY

Now you are ready to go on to the VisiPlot lessons. Lesson One is about drawing charts on the screen. Lesson Two covers the Storage Management program except for the Edit functions. The Edit functions are covered in Lesson Three. In Lesson Four, you will return to plotting and learn to do some of the more complex charts.

LESSON ONE

THE BASIC USE OF THE VISIPLOT PROGRAM

If you have not read the Introduction, do so before continuing; it contains the basic information that this lesson assumes you already know. It tells you how to load the VisiPlot program, what the cursor is, how to move the cursor, and more.

This lesson assumes you know:

- How to load the VisiPlot program from diskette.
- How to move the cursor in a menu and in a list.
- How to select an item from a menu and a list.

If you are not sure how to perform any of these functions, reread the sections of the Introduction that describe them.

This lesson introduces some of the major functions you encounter using the VisiPlot program. This lesson deals almost totally with the Plot program. You are given instructions on how to load some plotting data and how to set to the Plot program. There are no explanations of these directions in this lesson; they are explained in Lesson Two.

LOADING THE PROGRAM

Load the VisiPlot program according to the directions in the section "Loading the VisiPlot Program." For the purpose of this lesson, do not put a diskette in Drive 2 if you have a multiple drive system. Leave the Drive 2 door open.

When the program is loaded the display should look like the following photograph. If it does not look like this, go back to the Introduction and start over.

If the bottom line of the status area reads DRIVE: 2 instead of DRIVE: 1, load the program again without a diskette in Drive 2.

The Storage Management program is now loaded; this program is the subject of Lesson Two. For now we want to load some data that can be plotted, load the Plot program, and draw some charts on the screen. Press the following keys in the order listed:

(make sure the cursor is on the word LOAD)

1. RETURN (wait for the disk drive to stop running and make sure the cursor is on SAMPLE 1)
2. RETURN (again wait for the drive to stop, a list of the data series in SAMPLE 1 is displayed)
3. RETURN (the list disappears and the menu returns)
4. Right Arrow (move the cursor to —>PLOT)
5. RETURN

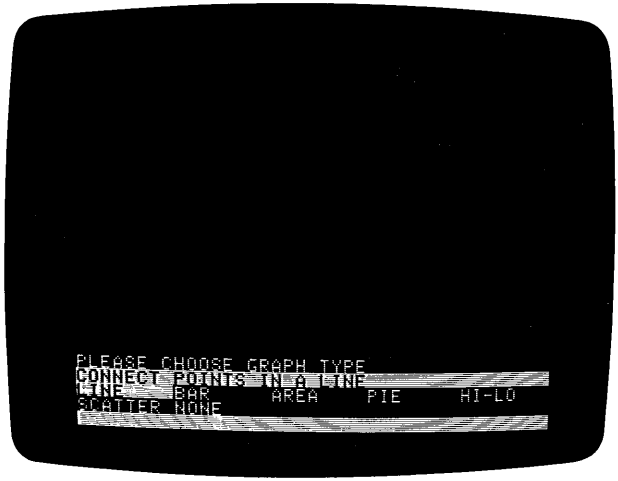
At this point, the message TYPE Y TO CONFIRM should be displayed in the status area. If this message is not displayed, move the cursor to the word LOAD and repeat the preceding sequence. If there is no menu, press any key except RESET.

If you have the correct message, press the Y key on the keyboard. The VisiPlot program gives you this chance to verify that you want to change programs. Pressing any other key cancels the loading of the Plot program.

If you accidentally pressed the wrong key, move the cursor to the word —>PLOT and press the RETURN key again.

After you press the Y key, the disk drive runs for a short while. When it stops, the TYPE Y message is replaced with ONE MOMENT PLEASE... At this point, the program is initializing itself. In a short time the disk drive begins again and the message GETTING PLOT PROGRAM... replaces the request to wait a moment. The disk drive stops and the screen goes blank for a moment.

The line PLEASE CHOOSE GRAPH TYPE appears near the bottom of the screen. A new status area appears under the line. You are now in the Plot program. The screen looks like the following photograph.



In the Plot program, the status area is at the bottom of the screen. This allows a chart to be displayed along with the status area without destroying any of the chart. The status area covers up the bottom titles and the chart legend but you can turn the status area display on and off at will when a chart is displayed. More about this later.

THE SELECT MENU

The menu in the status area is the Select menu. You use it to select the type of chart you want to draw and the series. The menu items indicate the six kinds of VisiPlot charts: LINE, BAR, AREA, PIE, HI-LO, and SCATTER. The last item on the menu, NONE, provides a way to exit from this menu without choosing a chart type. This exit path comes in handy at times, especially after you get to this menu by mistake, which can happen when you become very familiar with the menus and start using them very fast.

Move the cursor around within the menu. Read the long prompts in the top line of the status area. They explain each choice in a little greater detail. For example, when the cursor points to LINE, the long prompt says CONNECT POINTS IN A LINE. The long prompts are an aid if you forget what a menu item does.

Move the cursor to LINE and press **RETURN**. You just elected to draw a line chart.

The menu disappears and is replaced with <—, —>, SPACE OR RETURN. A list of names appear at the top of the screen. This is the same list you saw after loading **SAMPLE 1**. This is a list of the data series that are currently in memory.

The list includes some information about each series. Going across the header line, the informational items are:

NAME: This is the name of the data series. Series names should be descriptive; they should indicate what data they contain. The two series in this list contain some sales data and some history data.

PER: This is the period of the series. Both series in the list have a period of 1. This means there is one data point for each year that the series covers. The period can be any value from 1 to 99. Typical values are 1 (annual), 4 (quarterly), 12 (monthly), and 30 (daily).

START: This is the starting date for the series. The first data item is for the year 1973 in both of the listed series. If the period was something other than 1, the starting date would include the year and the period of the first data point. For example, a starting date of 1980 9 with a period of 12 means the 9th period of 1980 or September, 1980.

END: This is the ending date for the series. Everything mentioned in the description of START applies to END.

#: This is the number of data points in the series. A series can hold a maximum of 150 data points.

You must select a series from this list. You cannot go further in the Plot program unless there is data to plot. Selecting an item from a list is not much different than selecting from a menu. You simply move the cursor to the item and press the RETURN key.

Play with the cursor in this list. Note that the right arrow key moves the cursor down the list and the left arrow key moves it up the list. Also note that the cursor wraps around the list. If you try to go beyond the bottom line of the list, the cursor jumps to the top item. Likewise, attempting to go beyond the top of the list causes it to jump to the bottom. The wrap around feature lets you move around a long list very rapidly.

For the purposes of this lesson, move the cursor to the series named FLOPPY SALES. Press RETURN.

THE MAIN PLOT MENU

The list of series is erased and a new menu appears in the status area at the bottom of the screen. This is the Main Plot menu. Most of your work with the Plot program is done from this menu.

Look at the status area; there are a couple of new items in it. The bottom line, which was blank in the previous menu, now says FLOPPY SALES/LINE on the left side and W1.B1 on the right side.

You probably remember that the items on the left side repeat the selections you made from the last menu and list. You chose to draw a LINE chart and selected the series named FLOPPY SALES.

The meaning of the cryptic notation on the right is quite simple, it specifies the colors in which the chart will be drawn. W1 says the foreground of the chart, the actual data, will be drawn in white. B1 says the background will be black. You can change the colors and will have a chance to do it later. The program always puts a single series chart in black and white. The program does not know if you have a color or black-and-white monitor. Black and white shows up very well in both types of monitors.

The cursor is pointing to the word PLOT and the top line of the status area says PLOT THE CURRENT SERIES. The current series is the last series or group of series chosen from the list. Selecting a series makes that series the current series. You can select more than one series and then they all become the current series. Selecting multiple series is described in Lesson Four.

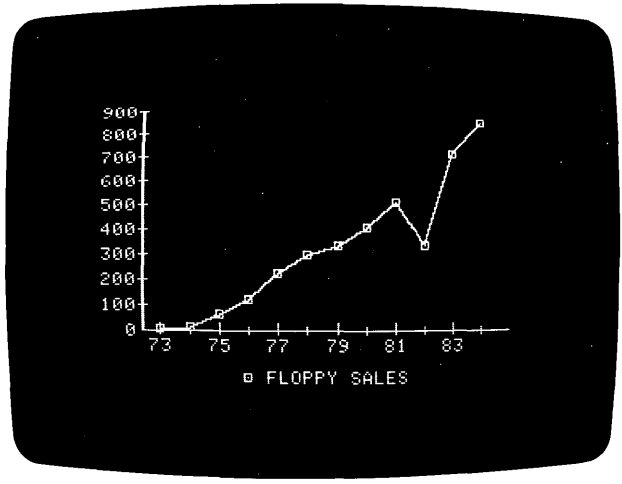
Move the cursor around the menu and read the long prompts for the other items. Don't press RETURN yet. When you are done looking over the Main menu, move the cursor back to the word PLOT.

DRAWING THE CHART

With the cursor on PLOT, press RETURN. As the long prompt says, this function draws a chart of the current series.

When you select PLOT, the menu in the status area is replaced with SCALING... In a few moments SCALING... is replaced with PLEASE WAIT... You also hear a sound from the computer. The beep is just an added indication that the computer got your command and is processing it. There is another beep when it completes the chart.

The Plot program draws the outline of the chart, the Y-axis and the X-axis, and puts the values at the tick marks. At this point the status area disappears and the data is plotted within the chart. Finally, the legend is printed across the bottom and the second beep indicates that the PLOT request is completed. The screen should now look like the following photograph.



Examining the chart. The numbers along the vertical or Y axis are the scale of the chart. The numbers along the horizontal or X axis are the range. Remember that the series listing said this series covered the years 1973 through 1984. The numbers along the X-axis are 73, 75, and so forth. When the range is given in years and there are many plotting points, the Plot program abbreviates the range numbers to fit on the axis.

The line under the X-axis is the legend. The legend contains the name or names of the plotted series and, in the case of line charts, shows what plotting symbol is used for the particular series. In this example, the plotting symbol is a square box with a dot in the center. This symbol is always used when a single series is plotted. Later, when you draw charts with multiple series, you will see the other symbols: the diamond and the pound sign.

The main attraction of the chart is the plotted data. There is a plotting symbol for each of the 12 data points in the series. The points are connected by a line.

HOW TO CONTINUE

Up to this point, there has been a menu on the screen or some directions telling you what you can do. With the menu you always knew you could do something. Now there is nothing but a chart; there isn't even a cursor. Of course you do not want to stop after making a single chart. The VisiPlot programs are menu driven and you cannot do much without a menu. To set the menu back, press any key on the keyboard except RESET.

No matter what you press, the status area reappears and covers the legend. The full chart is still visible above the status area. The status area contains the same menu you used to draw the chart, the Main Plot menu.

If you want to see the chart again without the status area, press the ESC key. The status area is erased and the chart legend reappears. You can switch back and forth as often as you want. Any key brings the status area back and the ESC key erases it. These functions work whenever there is a chart on the screen.

DRAWING A BAR CHART

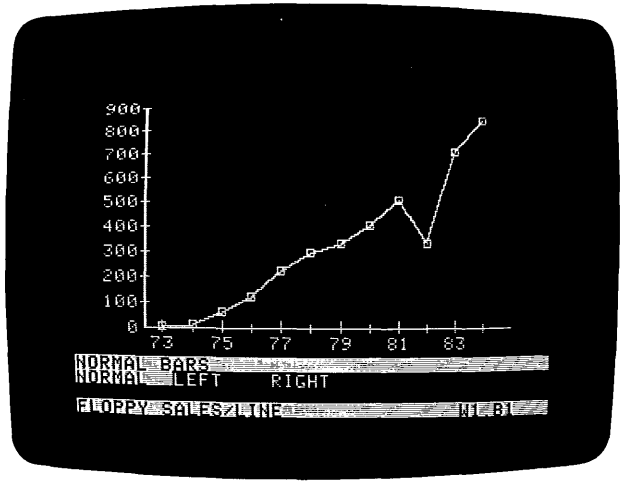
If the status area is not on the screen, display it by pressing any key except RESET. There are many things you can do to the chart with the other functions in the Main Plot menu. You can put titles on it, change the range and scale, put grid lines on it, and much more. Before looking at these features, you should practice what you just learned by drawing a different kind of chart. You are going to start over and repeat what you did to draw the line chart. The difference is that you are going to draw a bar chart.

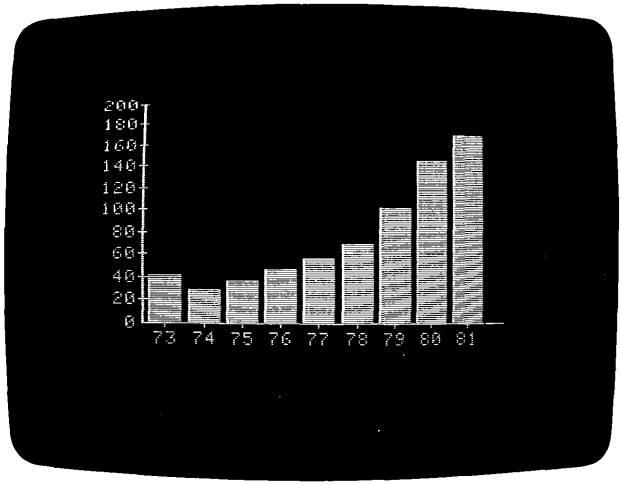
Move the cursor to the word SELECT. The long prompt says SELECT A GRAPH BY TYPE. Press RETURN.

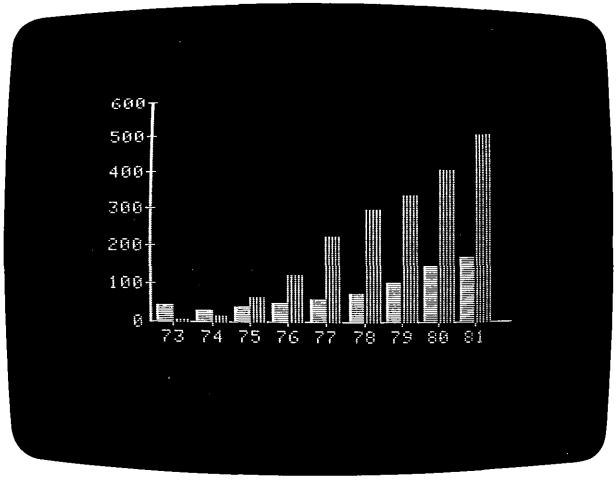
As you probably expected, the status area changed and the Select menu is displayed. The line chart is still on the screen. You can still erase the status area with the ESC key to display the whole chart and legend.

Move the cursor to BAR. The long prompt says DRAW VERTICAL BARS. Press RETURN.

Instead of the list of series, the status area changes and the Bar menu appears. Here you have to select the style of bars with which you want the chart drawn. The choices are NORMAL, LEFT, and RIGHT. LEFT and RIGHT are used for comparison charts. Lesson Four shows their use. The LEFT and RIGHT bars are half the width of the NORMAL bars and appear to the left or right of the tick marks. Make sure the cursor is on NORMAL and press RETURN. The normal, or full-width, bars are centered on the X-axis tick marks. The photographs show the Bar menu and the full- and half-width bars.


900
800
700
600
500
400
300
200
100
0
73 75 77 79 81 83
NORMAL BARS
NORMAL LEFT RIGHT
FLOPPY SALES/LINE


200
180
160
140
120
100
80
60
40
20
0
73 74 75 76 77 78 79 80 81

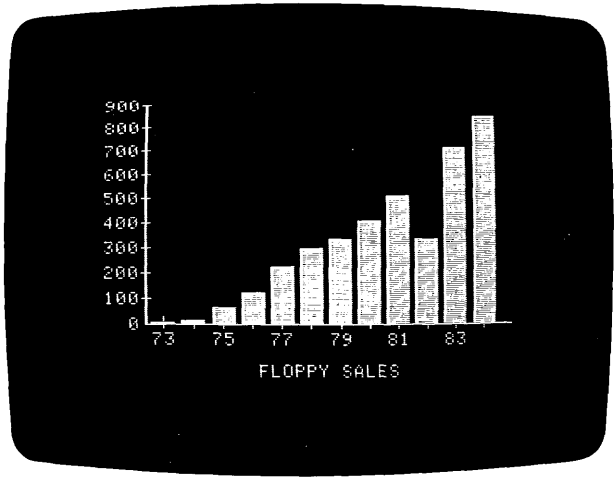


Now the list of data series is displayed. Again select FLOPPY SALES and press RETURN.

As before, the list is erased and the status area changes to the Main Plot menu. The last chart, the line chart of FLOPPY SALES is again displayed. The old chart is kept on the screen until you PLOT the new chart. Look at the bottom line of the status area, you will see that it now reads FLOPPY SALES/BAR.

Make sure the cursor is on PLOT and press RETURN.

The line chart is erased and the sequence you saw earlier is repeated: a sound from the computer, SCALING..., PLEASE WAIT..., the chart is drawn, and finally the sound indicating the chart is completed.

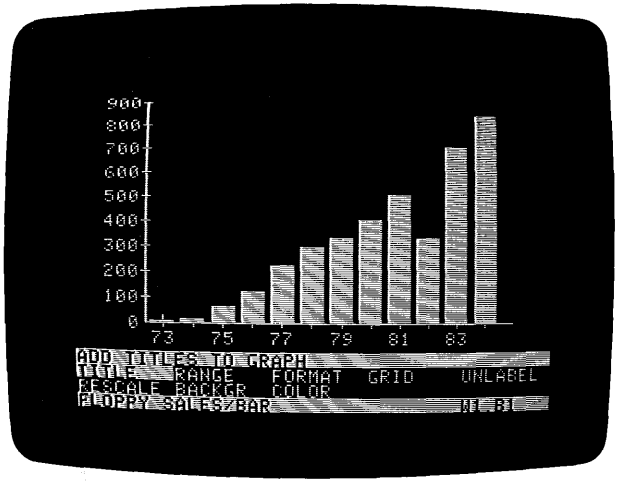


THE PLOTTING OPTIONS

The chart on the screen is quite Spartan. In some instances this chart would be perfect. But for most applications, you will want to include more in the chart. You might want a title that is more descriptive than the legend. You might want to explain the values on the Y-axis. You might want to highlight some detail in the chart or explain some detail such as the drop in sales in 1982.

Press any key to display the status area.

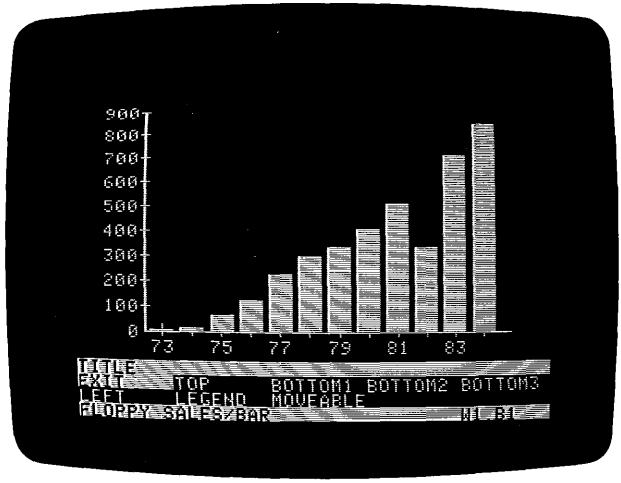
The menu item immediately under PLOT is OPTIONS. Move the cursor to OPTIONS and press RETURN. The menu in the status area changes. This is the Options menu. You are going to use all of these options in this lesson.



Move the cursor around the menu and read the long prompts; they give you a brief idea of what each option does. When you are done examining the menu, move the cursor back to TITLE and press RETURN.

Putting Titles on a Chart

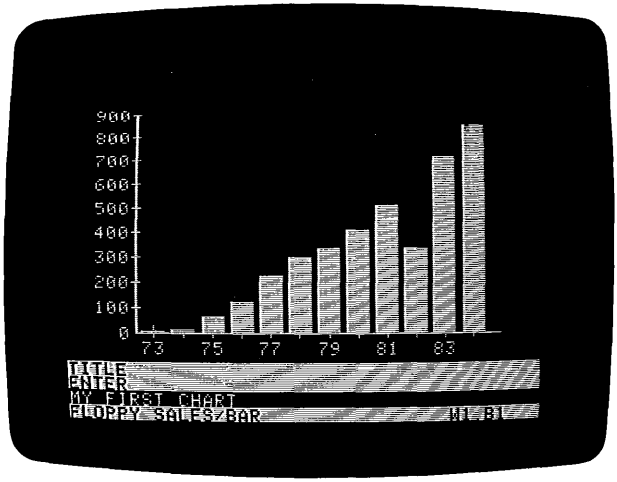
The status area again changes menus. This is the Title menu. This menu does not display long prompts in the top line of the status area. The items are descriptive and you won't have any trouble understanding them.



The first item is EXIT. EXIT provides the means of getting out of this menu. The other items in the Title menu perform their function and then return to the Title menu. EXIT returns you to the Main Plot menu, not to the Options menu. Give it a try. To get back to the Title menu, you must select OPTIONS and then TITLE.

Move the cursor to TOP and press RETURN.

The status area changes. The menu vanishes and the second line contains the word ENTER. The third line is empty. This is a configuration you will see often. It means the VisiPlot program wants you to enter some data at the keyboard. The data you enter at the keyboard appears in the third status area line.

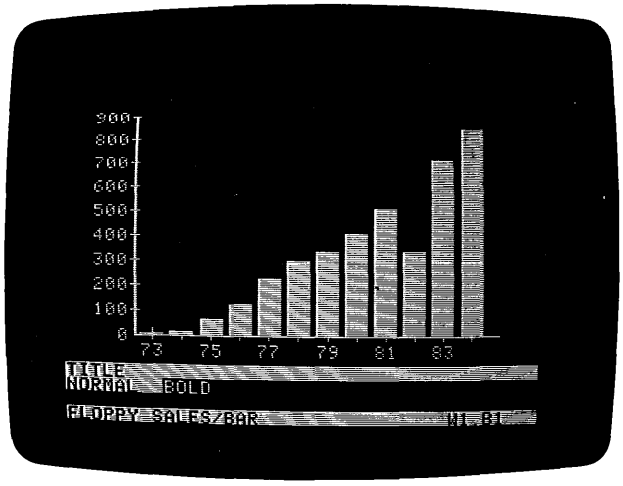


Type MY FIRST CHART. If you make a mistake, press the ESC key. ESC erases the last character on the line. Press ESC. If the last character was a space, you won't see anything happen. Press ESC until you see the erasing action of the ESC key. If you press ESC past the beginning of the data, the program returns to the Title menu.

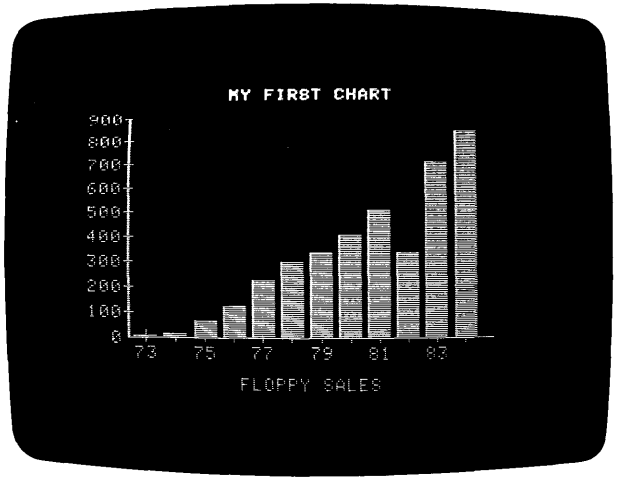
Anytime you have to enter data, the ESC key lets you correct your mistakes or change your mind. If you try to correct the line by pressing the left arrow key, you will hear a beep from the computer indicating that the use of the key is not valid.

When you finish entering the title, press RETURN. A two item menu appears. You have the choice of displaying your title in normal typeface or bold typeface. Everything you have seen written on the screen so far

has been in the normal typeface. Move the cursor to BOLD and press RETURN.



The title appears centered at the top of the chart. Notice that the characters are much bolder than the other characters on the screen which are in the normal typeface.



You can enter a top title as long as 38 characters. If you change your mind and want a new top title, just enter a new one. The new title will replace the old one.

The Title menu reappears at the bottom of the screen after the top title is completed.

Notice that the menu allows you to enter one, two, or three bottom titles. The bottom titles use the same area used by the legend. A bottom title erases the legend line if there is a legend line at the specified location.

Move the cursor to BOTTOM1 and press RETURN. Again you are confronted with the status area configuration that requests alphanumeric data. Bottom titles can also be 38 characters long. Enter the title DISK DRIVE SALES. When you press the RETURN key, the typeface menu again appears. This time select the NORMAL typeface. After you select the typeface, the legend line is overwritten by the title and quickly the status area reappears. Press the ESC key to erase the status area and take a better look at the bottom title. Press any key when you are ready to continue with the lesson.

Move the cursor to LEFT and press RETURN. The Left title can be 18 characters long. Enter UNITS PER OUTLET. When you press RETURN the line is displayed vertically along the left side of the chart, outside the Y-axis scale values. The typeface menu was not displayed. The LEFT title is only available in the normal typeface.

The last item in the Title menu is MOVEABLE. The MOVEABLE function provides the means of entering a title and moving it to any location in the chart. With the MOVEABLE function you can put as many titles as you want anywhere in the chart; there is no limit.

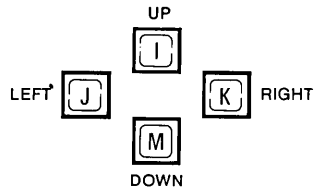
Move the cursor to MOVEABLE and press RETURN.

Enter PLANT FIRE and press RETURN.

The entry appears at the middle left of the plotting area and blinks at a steady rate. This title can now be moved to any location on the screen. It will continue to blink until it is fixed in a permanent location.

Moving a Title

The movement of a title is controlled with the I, J, K, and M keys. Look at these keys on the keyboard and you will notice that their relative locations suggest the four screen directions:



001-004

Press and release the K key and the blinking title slowly moves to the right. You can stop it at any time by pressing the space bar. Try it. To start it moving again, press any direction key. While the title is moving, you can change its direction by pressing a different direction key. There is no need to stop it to change direction. Press the M and let the title move down over the chart bars. Notice that it is white when over a black background and black when over a white background. Let it continue to the bottom of the screen. As it passes over numbers and letters, it is difficult to read. But you can always tell where it is by the blinking.

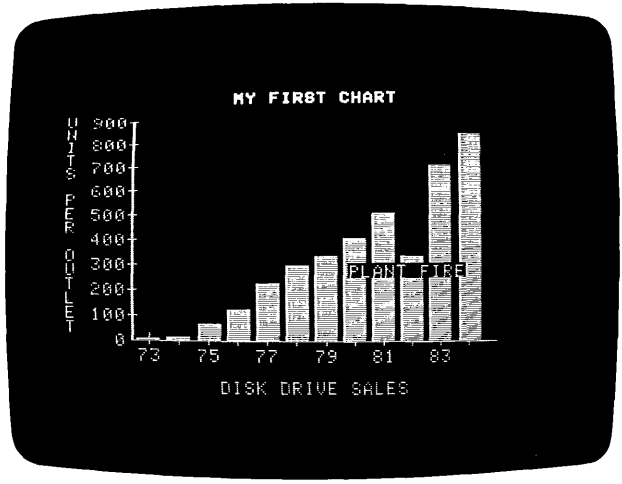
When it reaches the limits of the screen, it keeps trying to move and the computer beeps for each attempted move. The beeping continues until you stop the movement by pressing the space bar or change the direction by pressing another direction key.

You can increase the speed of the title movement with the number keys, 1 through 9. The higher the number the faster the title moves. If you do not choose a speed, it travels at the 1 rate.

Press 9, the fastest speed. The title continues in the direction it was moving but at a faster rate. If it was stopped, it begins moving again, in the direction it was last moving.

With a little practice, you will become adept at moving the title quickly to an area of the screen at high speed and then fine tuning the position at a slower speed.

Move the PLANT FIRE title to the short bar for the year 1982. Center it across the bar about a quarter of an inch from the top. When you have it where you want it, press RETURN to fix it in place.



When you press RETURN, the title stops blinking and appears in reverse video, black letters on a white background. Press the space bar and the title changes, it is now in white letters on a black background. You can continue to switch back and forth between normal and reverse video by pressing the space bar. When you decide on the style you prefer, press RETURN again. The title is now a permanent part of the chart and the Title menu returns to the screen. The only way to change it now is to redraw the chart.

Until you pressed the RETURN key the second time, the MOVEABLE title could have been erased by pressing the ESC key.

You learned several things in this section:

- The I, J, K, and M keys move a moveable title in the direction indicated by their relative location.
- The number keys, 1 through 9, select the speed at which the title moves.
- Pressing the RETURN key once fixes the title in its current location.
- The space bar switches the title between normal and reverse video.
- Pressing the RETURN key the second time makes the title a permanent part of the chart and returns the Title menu.

Erasing Moveable Titles

A MOVEABLE title can be erased at any time by pressing the ESC key before the RETURN key is pressed the second time.

Enter another MOVEABLE title. Move the cursor to MOVEABLE, press RETURN, enter JUNK, and press RETURN again. Move the title to a location over the bars and stop it.

Now press ESC. The title vanishes and no harm is done to the bars that were under it.

You can erase the MOVEABLE title after it is fixed in place but before the second RETURN that makes it a permanent part of the chart. After the title is fixed in place (by the first RETURN), erasing it also destroys whatever is under it. If you had fixed it in place by pressing the RETURN once and then pressed ESC, there would have been a rectangular hole in the bars where the title had been fixed.

After the second RETURN, the title cannot be erased.

Bringing Back the Legend

The only items remaining in the Title menu are BOTTOM2, BOTTOM3, and LEGEND. BOTTOM2 and BOTTOM3 function just like BOTTOM1 except that they put titles on different lines.

LEGEND erases any bottom title lines that cover legend lines and restores the original legend lines. Like bottom titles, there can be a maximum of three legend lines. Only those bottom title lines that covered a legend line are erased, the others remain on the screen. You covered the one line legend with the BOTTOM1 title. Press RETURN while the cursor is on the LEGEND item.

Very quickly the status area vanishes, the bottom title is erased, the legend line is restored, and the status area returns and covers the legend. This happens fast and you might miss it. Press the ESC key to erase the status area. Your bottom title is gone and the original legend is on the screen.

Just as a note now, it should be mentioned that the LEGEND function works differently with pie charts. When you have a pie chart on the screen, the LEGEND function erases the pie chart legend. After the pie chart legend is erased there is no way, short of redrawing the chart, to reconstruct it.

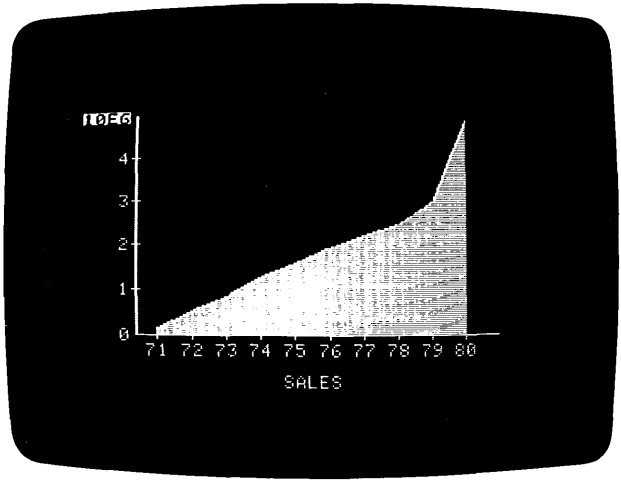
Move the cursor to EXIT and press RETURN to return to the Main Plot menu.

The Scale and the Range

The range of a chart is the time between the starting date and the ending date and is always plotted on the X-axis (except for a scatter chart). The range is stored as part of the data series. The scale is the spread of values plotted along the Y-axis. The program determines the scale each time a series is plotted. It determines a reasonable scale that covers the range of values in the series. It also decides on the number of divisions (tick marks) to display.

In determining a scale, the program attempts to avoid divisions that result in fractional or non-round numbers. When possible, it chooses round numbers. For example, with a series that spans the values 0 through 700, the program divides the Y-axis into seven divisions and labels them 0, 100, 200,..., 700. It wouldn't choose ten divisions because that results in scale labels of 0, 63, 127, 190, 254, and so on.

When the Y-axis values are too large to be displayed, the VisiPlot program scales the values up or down by a power of 10. It then displays the Y-axis scaling factor at the top of the Y-axis in reverse video (black on white). For example, with a scale of 0 through 100,000, the program generates labels of 0, 10, 20, 30, values are multiplied by 10 to the 3rd power or 1000. The following photograph shows a chart with a scale factor.

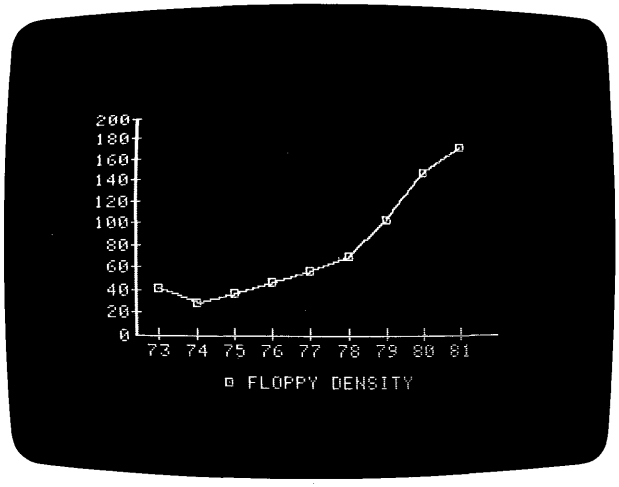


You can change both the range and the scale when you draw a chart. You might want to show only a subset of the range. You might want small variations to show up more or to show up less. The scale and range have a significant effect on how a person perceives the data in a chart.

How to Change the Scale

We will use a different chart for this portion of the lesson. Go back to the Select menu, specify a LINE chart, and select the series **FLOPPY DENSITY**.

If you forgot, SELECT takes you back to the Select menu. LINE specifies a line chart. **FLOPPY DENSITY** is one of the series on the list. When the Main Plot menu returns, select PLOT and draw the new line chart.



Press any key to bring back the status area after the chart is drawn. Select the Options menu again with the OPTIONS item in the menu.

One of the items on the Options menu is RESCALE. Move the cursor to RESCALE and press **RETURN**.

The status area configuration that requests data appears in the status area. The prompt asks for a Y-AXIS MINIMUM. The current minimum used in the chart is 0, change it to −200. Enter −200 and press **RETURN**. Next you are prompted for the Y-AXIS MAXIMUM. The maximum is currently 200, change it to 100. Enter 100 and press **RETURN**. Finally, you are prompted for the #AXIS DIVISIONS (2... 12). You can specify any number of divisions from a minimum of 2 to maximum of 12. The new scale, −200 to 100, divides nicely into 6 divisions. Enter 6 and press **RETURN**. If you do not enter a valid number, the RESCALE operation is canceled.

To determine the number of divisions, subtract the minimum scale value from the maximum value. A good number of divisions is any

number in the range 2 through 12 that evenly divides into the difference. In the above example, 100 minus −200 equals 300. 2, 3, 6, and 12 give divisions of 150, 100, 50, and 25. Others, such as 4 and 5, will work but result in divisions of 75 and 60 which are not as common as chart units as 25, 50, and 100.

The Main Plot menu returns but nothing else happens. The scale did not change.

You didn't do anything wrong. You must select PLOT again to redraw the chart with the new scale. Press **RETURN** with the cursor on PLOT. After the PLEASE WAIT... message, there is a beep from the computer and the message DATA OFF SCALE: Y TO DISPLAY appears in the status area. This message means that there are data points in the series that are outside the scale you specified. This is just a warning that the chart will not contain all the data points in the series. If you press the Y key the program continues and draws the chart. If you press any other key on the keyboard, the PLOT request is canceled.

Press Y to continue. For each data point that the program cannot put on the chart, it sounds a beep. There are two beeps that are sounded while the program draws this chart. The last two points in the series do not fit within the scale.

This situation holds true for line, area, scatter, and hi-lo charts. However, if you attempt to draw a bar chart that goes off the scale, the program stops at the first off-scale bar. The drawing of the chart is terminated with the message CAN'T! PRESS ANY KEY. If you think about it, an off scale bar chart actually gives incorrect information. The person reading the chart doesn't know that certain bars should continue beyond the top of the scale. It is better to rescale and try again than to show incorrect information.

Confusing the VisiPlot Program

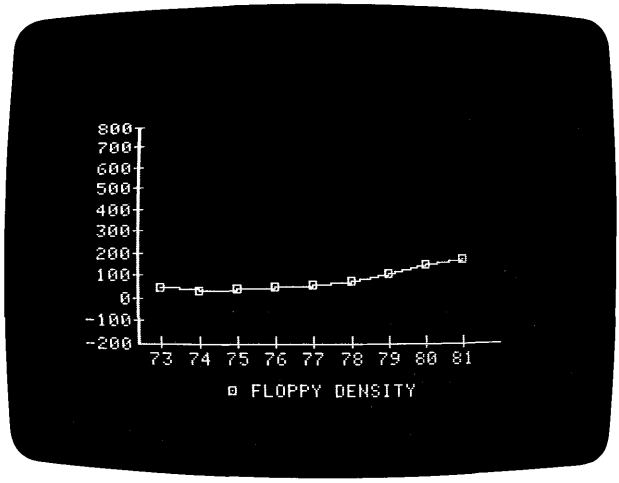
You can try to confuse the program by giving a minimum scale value that is greater than the maximum value. The program assumes that you reversed the values and switches them back. If you give the same value for the minimum and the maximum, the program uses this value as the minimum and sets the maximum approximately 20 percent higher.

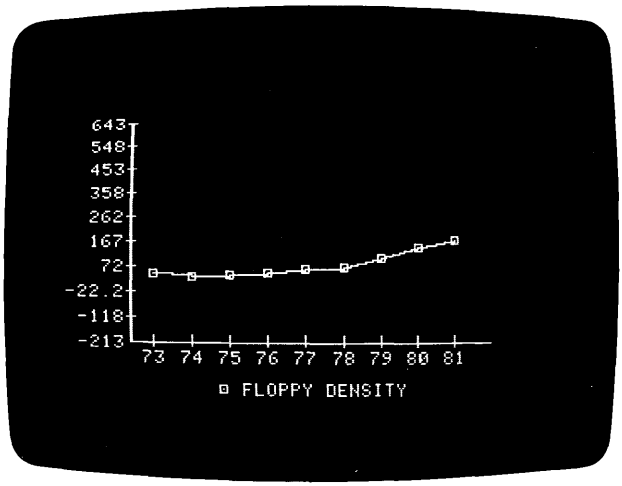
If you give a number of divisions less than 2 or greater than 12, the value is not accepted and a beep is sounded. The program then waits for a valid number. If you don't enter any number, that is, just press the **RETURN** key, the RESCALE request is canceled.

Aesthetic Charts

The VisiPlot program does its best to generate a good scale for your chart. There are times, however, when the values it chooses turn out poorly. When this happens, you should consider rescaling the chart.

When you select a scale, the program takes your request literally and does not try to change it. You will, at times, come up with some odd-looking scales. This is especially true if you select a number of Y-axis divisions that are not an even divisor of the difference between the minimum and maximum scale values. For example, if you set a scale from −200 to 800 with 10 divisions, the labels read −200, −100, 0, 100 and so on. But if you pick a scale from −212.39 to 643.22 with 9 divisions, the chart, while correct, is quite unaesthetic as you can see in the following photographs.

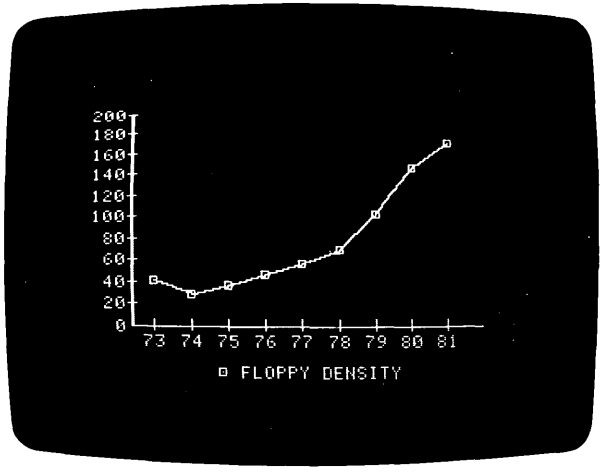




How to Change the Range

Let's start with an unchanged version of the FLOPPY DENSITY series. You can choose whether to go back to the Select menu and get a fresh copy of the series or change the scale back to 0 to 200 with 10 divisions. If you need help with your choice see either "The Select Menu" or "How to Change the Scale."

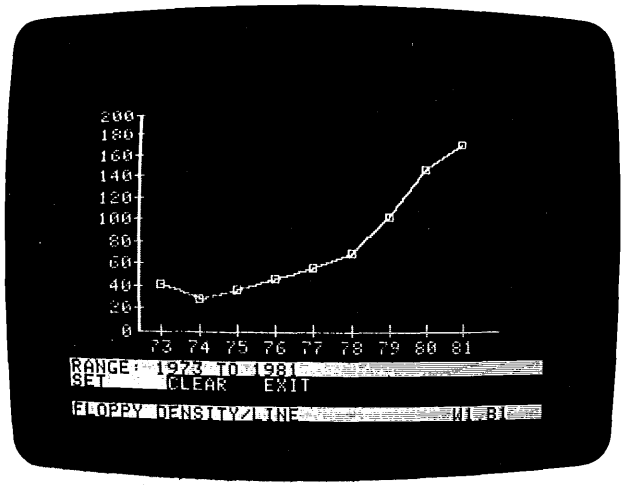
Now you should have a FLOPPY DENSITY line chart on the screen that looks like the following photograph.



Move the cursor to OPTIONS again and press **RETURN**.

Now move the cursor to RANGE and press **RETURN**.

The status area changes. The top line reads RANGE: 1973 TO 1981. The RANGE menu offers three choices: SET, CLEAR, and EXIT.



EXIT returns you to the Main Plot menu.

The SET option specifies that you want to change the range. With the cursor on SET, press **RETURN**. The data input configuration of the status area appears. The prompt asks for the MAJOR START (YEAR). Enter **1974** and press **RETURN**. The program now prompts for the MAJOR END (YEAR). Enter **1990** and press **RETURN**. The Main menu returns and nothing happens to the chart. Just as you did with the RESCALE option, you must select **PLOT** to see the chart with the new range. With the cursor on PLOT, press **RETURN**.

You took a year off the front of the series and added nine years to the end. You can lengthen or shorten a range. As you change the range and take out data points, you might change the scale. If you specify a range that does not coincide with any of the data points, you get the message CAN'T! BAD RANGE. A new range must overlap the range of the series by at least one point. If there is only one point on the chart it is plotted with a single dot and no line.

When the program prompted for start and end dates it did not ask for a period. If the period is other than 1 (annual), the program prompts for the year and the period for both the start and the end dates.

Select the Options menu again and then the RANGE option. This time move the cursor to CLEAR and press **RETURN**. When the Main menu returns, PLOT the chart again. This time it is drawn with the original range.

The CLEAR function removes a user-defined range and returns to the range stored in the series. The CLEAR function does nothing if you have not changed the range.

The Interplay Between Scale and Range

When you change the range of a chart, the scale is automatically recalculated for the data points within the new range. If you change the scale with the RESCALE function before changing the range, the VisiPlot program does not perform any scale recalculation.

More About Ranges

The program calculates the range before it draws a chart. When only one series is selected, the resulting range is the range of that one data series. But if two or more series are selected, the calculated range is either the union or intersection of the ranges of the individual series depending on the type of chart.

The union of ranges means that the earliest starting date and the latest ending date are used. The union of ranges is used with line and area charts. The interaction of ranges means that only those dates that are common to both (or all) series are used for the chart range. The intersection of ranges is used with bar, hi-lo, and scatter charts.

The maximum number of points allowed in a range is 150 and the minimum is 2. If you try to draw a chart from a set of series whose combined range has more than 150 points, you will get the error message CAN'T! BAD RANGE.

Formatting a Chart

Display the Main Plot menu (press any key if the status area is not on the screen) and select NEW. NEW erases the existing chart and clears all options you have set. If you do not select NEW, some options such as COLOR and BACKGR, are held over from chart to chart.

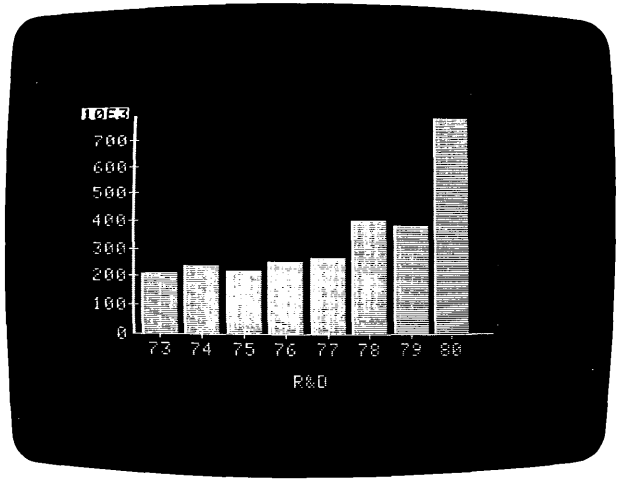
Now select LINE and the **FLOPPY SALES** series. PLOT it. Notice that the program draws a line chart with plotting symbols and lines connecting the symbols.

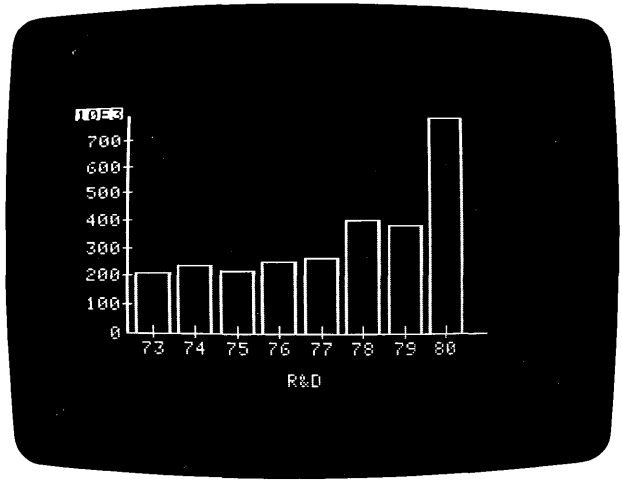
Select OPTIONS. Move the cursor to FORMAT and press **RETURN**. The Format menu is displayed. The choices are SYMBOLS, LINES, and BOTH. All the line charts you have drawn used both symbols and lines.

Move the cursor to LINES and press **RETURN**. The Main menu returns. Now PLOT the chart again. It is redrawn without the plotting symbols—just the lines connect the plotted points.

Go back to the Format menu (select FORMAT from the Options menu) and choose SYMBOLS and redraw the chart again. This time it is drawn with the plotting symbols but no interconnecting lines.

These are the FORMAT options for a LINE chart. The FORMAT option is only valid for LINE, BAR, and SCATTER charts. The BAR chart options let you select solid bars (like the bars used in the chart you did earlier in the lesson), outlined bars, or shaded bars. The SCATTER chart options are to plot with points or symbols. No lines are drawn in a scatter chart. The following photographs show the BAR and SCATTER chart formats.




10E3
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500
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300
200
100
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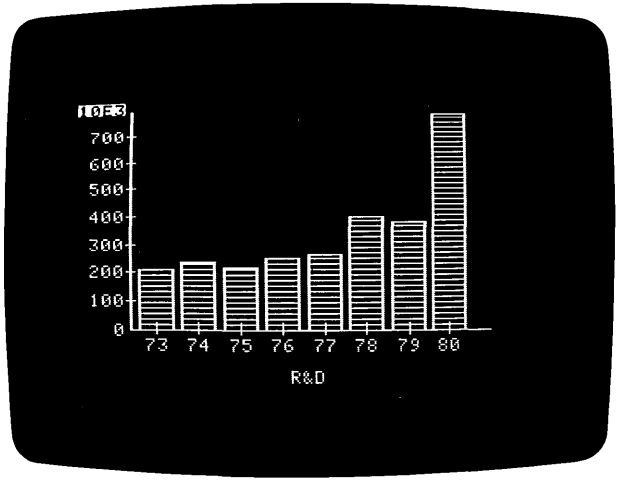
73 74 75 76 77 78 79 80
R&D


10E3
700
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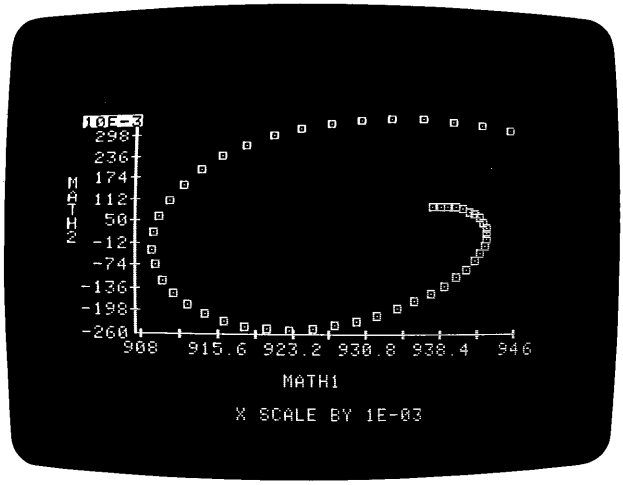
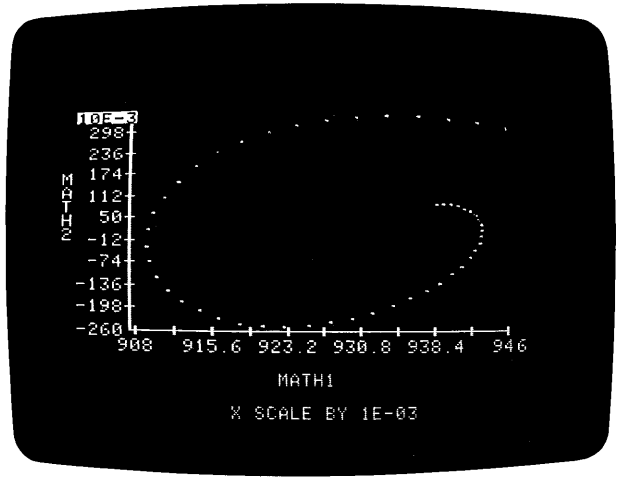
300
200
100
0
73 74 75 76 77 78 79 80
R&D


10E-3
298
236
174
112
50
-12
-74
-136
-198
-260
MATH2
908
915.6
923.2
930.8
938.4
946
MATH1
X SCALE BY 1E-03


10E-3
298
236
174
112
50
-12
-74
-136
-198
-260
MATH2
908
915.6
923.2
930.8
938.4
946
MATH1
X SCALE BY 1E-03

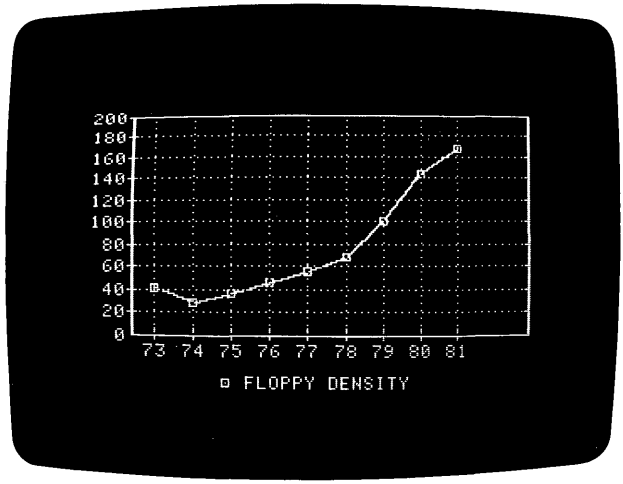
If you try to select the FORMAT option with any kind of chart other than LINE, BAR, or SCATTER, you will get the message CAN'T! NO OPTION HERE.

You might try the FORMAT options with the BAR and SCATTER charts now.

Drawing Grid Lines

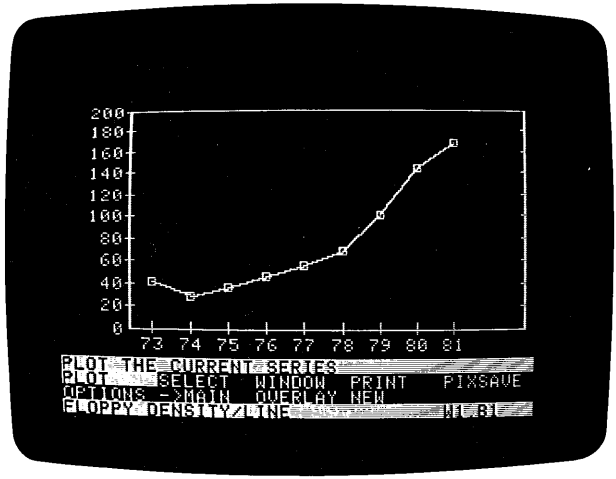
Go to the Select menu by selecting NEW. NEW cancels all options set through the use of the Options menu. Then select LINE, either of the series, and finally PLOT.

Select the OPTIONS item and move the cursor to GRID and press RETURN. The Grid menu appears. This menu offers the options of drawing horizontal, vertical, or both horizontal and vertical grid lines. With the cursor on BOTH press RETURN. The program draws the grid lines for every tick mark that has a label.



PLOT the series again. There is no need to go to the Select menu, just press RETURN with the cursor on PLOT. The program redraws the chart without the grid lines. Go to the Grid menu again and draw only the horizontal grid lines.

Go back to the Grid menu once more and select HORIZ. The program erases the existing grid lines. This feature operates on the horizontal and vertical grid lines. Note that only the grid lines are erased; the added lines on the top and right are not erased.



You do not have to erase grid lines in the same manner that you drew them. You can draw both horizontal and vertical and then erase only one. You can later redraw an erased set of grid lines.

A chart (other than a pie chart) must be displayed when choosing the GRID option. If you select the option when no chart displayed, you get the CAN'T! NO OPTION HERE message.

PRINTING THE CHART

You can print a copy of the chart on a hard copy printer if you have one of the supported printers connected to the computer. Before you can print a chart, you must have initialized the printer driver as described in the section "Printer Support" in the Introduction.

To print a copy of the chart that is on the screen, move the cursor to PRINT and press RETURN. If you have not used the printer during this session (which you haven't if you are following the lesson for the first time) the program prompts for slot number to which the printer is connected. Usually, the printer is connected to slot 1. Enter the slot number and press RETURN. The program immediately proceeds to print the chart on the screen.

THE END OF THE BASICS

You now have enough experience to examine the remainder of the OPTIONS menu. There are three options you haven't used: UNLABEL, BACKGR, and COLOR. These options erase the labels around the chart,

change the background color, and change the plotting color. There are also two options in the Main Plot menu that you have not used: —>MAIN and PIXSAVE. These options reload the Storage Management program and save a binary copy of the screen image in diskette.

UNLABEL must be used with a chart displayed, like the GRID option. Once you erase the labels with this option, you must redraw the chart to get them back.

The BACKGR and COLOR options are most useful if you have a color monitor. See the descriptions of these options in the Reference Section of this manual.

The —>MAIN option prompts with the TYPE Y TO CONFIRM message and reloads the Storage Management program if you press the Y key. Any other key cancels the request. The data series that you have in memory are not lost when you change programs.

The PIXSAVE option save the screen image in a diskette file in binary form. You are prompted to enter a name for the PIXSAVE file. The file is stored under that name with .PIX added to it. This binary file can be printed at a later time with a program you must supply to match your printer. Appendix A contains a sample of such a program.

The next lesson describes the use of the Storage Management program. Following that, Lesson Three covers the Edit functions.

LESSON TWO

USING THE STORAGE MANAGEMENT PROGRAM

This lesson describes the facilities of the Storage Management program, except for the Edit functions which are described in Lesson Three. Lesson Two gives you experience and practice using these functions.

Storage Management is the first program you encounter after booting from the VisiPlot program diskette. Along with creating, loading, and saving VisiPlot data, the Storage Management facilities provide access to DIF data from other Personal Software products, such as the VisiCalc program. With DIF files, you can create and modify data with the VisiPlot facilities and then process that data with other products.

In the last lesson, you used a couple of the Storage Management functions. Depending on your experience with computers, you may or may not have known what you were doing. In this lesson you will do more and also get a full explanation.

IF YOU ARE IN THE PLOT PROGRAM

If you are still in the Plot program from Lesson One, display the Main Plot menu. To get to the Main Plot menu:

- press any key if there is no menu displayed.
- from the Select menu, select NONE.
- from the Options menu, select TITLE and then EXIT.
- from the Title menu, select EXIT.

To return to the Storage Management program, select —>MAIN. You are prompted to press the Y key to verify that you want to change programs.

IF YOU ARE NOT IN THE PLOT PROGRAM

Load the VisiPlot program according to the directions in the "Loading the VisiPlot Program" section in the Introduction.

THE MAIN STORAGE MANAGEMENT MENU

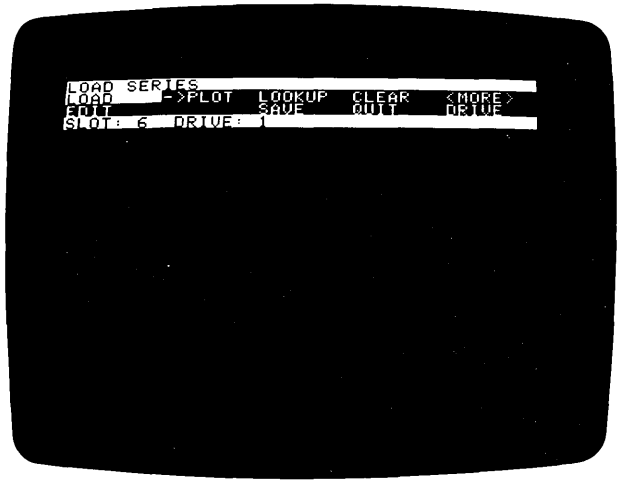
After loading the program, the Main Storage Management status area appears at the top of the screen. The version number of your VisiPlot

diskette, the copyright notice, and some general directions on using the menu follow.

The Main Storage Management menu lists most of the functions available in the Storage Management program. Move the cursor through the menu items and read the long prompts on the top line of the status area.

DATA AND PROGRAM DISKETTES

The bottom line of the Main Storage Management menu lists a slot and drive number. These items specify to which disk drive the program goes when asked to load or save data.



The slot number is the address of the boot slot on the main circuit board (the Apple II mother board) where the disk drive controller is plugged. The drive number is either 1 or 2, identifying one of the two drives that can be connected to the disk drive controller. The diskette in the disk drive identified by these fields is called the data diskette. The diskette on which the program is stored is called the program diskette.

A single diskette can serve both purposes, but it is best to use a separate diskette for your data. To use the program diskette, you must remove the write protect tab. The use of the program diskette for data, increases the possibility of accidentally destroying the VisiPlot program on the diskette. Your VisiPlot program diskette contains the VisiPlot programs and some sample data series for practice. You used one of the files, SAMPLE 1, in Lesson One.

HOW THE DATA DISKETTE DRIVE IS SELECTED

When you load the VisiPlot program, it determines where the data diskette is located. First, it assumes the data diskette is located at the same slot address from which you loaded the program. Normally this is slot number 6.

The specific drive can be number 1 or 2. If you have a single drive system or only one drive connected to the disk controller from which you loaded the system, the data diskette drive is number 1. If you have two drives connected to the controller in the boot slot, the data drive number may be number 1 or 2. When you load the VisiPlot program, part of the program initialization checks if there is a diskette thast is initialized for use with the VisiPlot program in drive 2. If there is, drive 2 is assigned as the data diskette drive. If there is no diskette in drive 2, or if the drive 2 door is open, or the diskette in the drive is not initialized, drive 1 is assigned as the data diskette drive.

For the purpose of this lesson, load the VisiPlot program without a diskette in drive 2. If you have already loaded the program with a diskette in drive 2 and the bottom line of the status area says DRIVE: 2, do the following:

- Move the cursor to DRIVE
- Press RETURN

This is all it takes to change the data diskette drive assignment.

Now double check and make sure the bottom line of the status area reads:

SLOT: 6 DRIVE: 1

The slot number, of course, is whatever slot you load from.

LOADING VISIPLOT DATA

There are two ways to get chart plotting data into the computer. You can create it with the Edit function (which is described in Lesson Three) or you can read it from diskette.

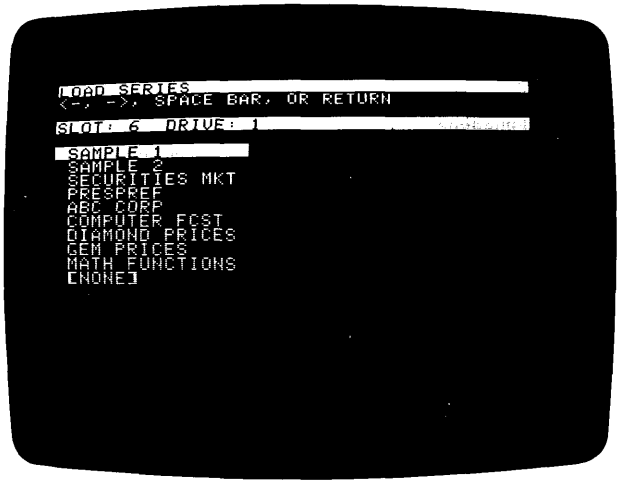
The data on diskette was originally created with the Edit function or transferred from some other program as a DIF file. The use of diskettes is a convenience. With them, you can save the plotting data and use it later. Without them, you would have to recreate the data over and over, each time you load the VisiPlot program.

After you load the VisiPlot program and the Storage Management menu appears, the cursor points to the LOAD function. The long prompt reads LOAD SERIES.

With the cursor on LOAD, press RETURN.

The menu disappears and the message READING DIRECTORY... temporarily appears in the status area. The disk drive motor begins to

run. The message in the status area is replaced with <—,—>, SPACE BAR, OR RETURN, and a list of names appears under the status area. The cursor is no longer in the status area, it is pointing to the top name on the list.



The names on the list are the VisiPlot files on the data diskette. In this example, the data diskette is also the VisiPlot program diskette. This method is used only to supply data for these lessons; you should not put your data on the program diskette. There may be other files on the diskette, but the program only lists text files such as VisiPlot or DIF files. (You may encounter a data diskette that contains other text files such as VisiCalc/SS files. If you try to load a non-VisiPlot of DIF file, you will get the UNABLE TO LOAD: WRONG FORMAT message.) Each VisiPlot file contains from 1 to 16 data series. There will be more about files and series shortly.

You select a file for loading by pressing RETURN or the space bar with the cursor pointing to the file name. As described in the Introduction, the cursor moves up and down the list when you press the left and right arrow keys.

The last item on the list is (NONE). Selecting (NONE) lets you go back to the Main Storage Management menu without loading a file. You may need this when you use the LOAD function simply to look at the file list or when you accidentally select LOAD.

If the whole list of files does not fit on the screen, the last item will be (MORE). Selecting (MORE) displays the next portion of the list. You are at the end of the list when the last item is (NONE) and (MORE) no longer appears on the list.

To start from the top of the list again, select (NONE) and, when the Main Storage Management menu reappears, select LOAD again.

The next sections of this lesson assume that the two series in the file SAMPLE 1 are in memory. If you did not leave the VisiPlot program after finishing Lesson One, these series are still in memory and you should skip to the next section, "Listing the Series in Memory." If you just loaded the program, continue with the next paragraph.

Move the cursor to the name SAMPLE 1 and press RETURN.

The message vanishes from the status area and the disk drive motor runs again. Characters rapidly flash across the third line of the status area. This is the data being loaded from the diskette. After the file is loaded into memory, a list of the series in the file is displayed. You have the option of CONTINUEing, which returns the Main Storage Management menu, or PRINTing, which prints the list on your printer and then returns to the Main Storage Management menu. Select CONTINUE.

You can only load one file at a time. However, you can select LOAD again and read another file into memory. Memory can hold a maximum of 16 data series or 645 data points, whichever is reached first. If your files each hold four series that average less than 40 data points each, you could load four files into memory. If you have a file with one series that contains 645 data points, you could only load the one file.

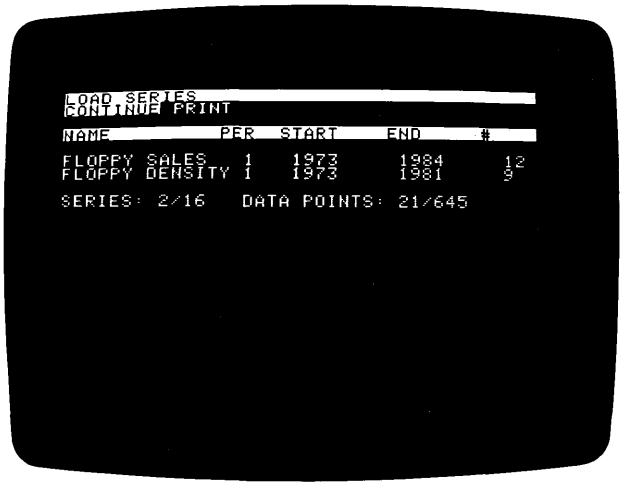
When the memory limit is reached, the message NO MORE ROOM appears on the screen. If the data is in the normal VisiPlot format, a partial load is done, if there is sufficient room in memory. The error message still appears.

LISTING THE SERIES IN MEMORY

You just loaded a file named SAMPLE 1.

Move the cursor to LOOKUP and press RETURN.

The long prompt reads DISPLAY INFO ABOUT SERIES. A list of two items appears under the status area, it is the same list you saw when you loaded the file. Most of the list should look doubly familiar. It is the same list you saw when you selected a series for plotting in the Plot program in Lesson One.



If your screen does not look like the photograph, you either loaded the wrong file or had previously loaded series in memory. If this occurs, select CONTINUE, move the cursor to CLEAR and press RETURN. Move the cursor to (KEEP NONE) and press RETURN. This clears all series from memory. Now go back to the section "Loading VisiPlot Data" continue from that point. If your screen looks like the photograph, continue with the next paragraph.

Just to review, the columns in the list are the names of the series, the period of the data (the frequency of data points per year), the starting date, the ending date, and the number of points in the series.

This list has an additional line at the bottom that was not present in the Plot program list. It reads:

SERIES: 2/16 DATA POINTS: 21/645

This line shows how much room is occupied. Memory holds a maximum of 16 series or 645 data points. You loaded two series from the file SAMPLE 1. That leaves room for 14 more. The two series contain, respectively, 12 and 9 data points for a total of 21. Memory can hold a maximum of 645 data points; there is room for 624 more data points.

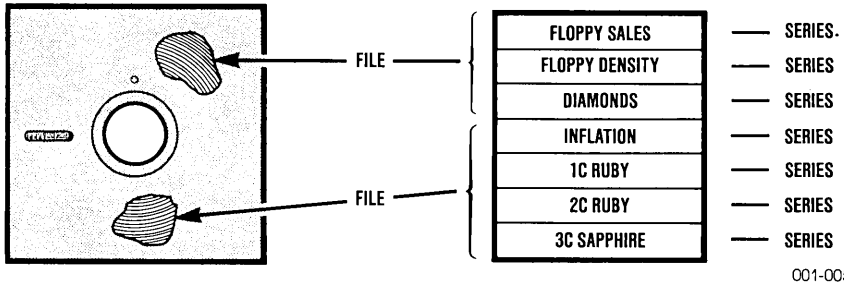
When you are done examining the LOOKUP list, select CONTINUE to return to the Main Storage Management menu. Alternately, you may select PRINT to print a copy of the list before returning to the Main Storage Management menu.

FILES AND SERIES

Some users, especially those who are new to computers, get confused about files and series.

The VisiPlot program uses floppy diskettes as a permanent storage medium. On these diskettes, the program stores data, any kind of data, in units called files. A file is nothing more than a collection of data that is identified by a name called a file name.

When the VisiPlot program processes data in the computer, it uses a unit of data called a series. A series is a collection of data points for a single chart. A series has a name and is identified by that name, just like a file. The figure shows the relationship between files and series.



001-005

After a file is brought into memory, the series in the file have no further connection with the file. They become independent units.

Often there are several series with related data that are used together. For example, for a business you might have series showing sales, costs, gross and net profits. You might have data to shwo the breakdown for a whole year and also yearly or quarterly data to show growth over the past several years.

All this data is related and probably used together. Many of these series would be plotted on the same chart. Rather than store each series as a file, the VisiPlot program provides the means of combining up to 16 series (or series containing up to 645 data points) in the offline storage unit—the floppy diskette file. To access the data for these series, either for updating or plotting, you load a single file instead of many files.

The points to remember are:

- Both files and series have names
- Files are units of storage on diskettes
- Series are units of data in memory
- A file can hold up to 16 series or 645 data points

CHANGING THE DATA DISKETTE ADDRESS

It was mentioned in the beginning of this lesson that the VisiPlot program determines the slot and drive address for the data diskette. Many times you may want to change the address. You may have forgotten to put the data diskette into drive 2 when loading the program. You may have more than two drives and want to use drives not connected to the same slot as the drive from which you loaded. There are many circumstances in which you will have to change the address.

The program lets you change the slot and drive addresses individually.

Changing the Drive Address

To change the data diskette drive address, move the cursor to DRIVE and press RETURN. The drive number in the bottom line of the status area changes. If it was 1 it changes to 2 and if it was 2 it changes to 1.

Remember, the LOAD, SAVE, DELETE, and INIT functions read (load) and write (save) to the data diskette in the specified drive and slot. The PIXSAVE function in the Plot program also uses this drive and slot.

After the change the cursor returns to its initial position at LOAD.

Always check the drive and slot numbers before issuing a function that uses the data diskette slot and drive addresses change them if necessary. If you try to LOAD from a non-existant or empty drive, you get the error message: CAN'T! ERROR: DISK I/O.

Changing the Slot Address

To change the data diskette slot address, move the cursor to <MORE> and press RETURN to display the Main Storage Management menu extension and then to SLOT and press RETURN.

It is only possible to change the slot address if there is more than one disk drive controller in the computer. If there is only one controller, the SLOT function has no effect.

If there are other controllers, they must be in slots immediately adjacent to the boot slot (usually number 6). The SLOT function does not operate with configurations where there is a gap between controller slots such as 6 and 4. With controllers in slots 5 and 6, the SLOT function changes the data diskette slot address to 5 if it is currently 6 and to 6 if it is currently 5.

DISK ERRORS

You should never get a disk error. But they sometimes happen. They are often caused by something you overlooked. You might change the disk drive and forget to put a diskette in the drive. You might leave the drive door open. You might put the wrong diskette—one that is not initialized for VisiPlot use—in the drive. A diskette might get damaged through mishandling, accident, or disk drive malfunction.

In all of these cases, you will get the error message CAN'T! ERROR: DISK I/O. This message is accompanied by a beep. The message remains in the status area until you press any key. The function you requested is not performed.

If you get the CAN'T! ERROR: DISK I/O message make sure:

- The correct slot and drive numbers are set
- The diskette is in the drive
- The diskette has the correct side facing up
- The drive door is closed completely

Then try the operation again. If you still get the error message, try the diskette in a different drive if you have multiple drives. You might also try a different VisiPlot data diskette. Make sure you use a diskette for which you have a backup. It is always a good idea to have backup of your diskettes; it is a necessity when you are having problems.

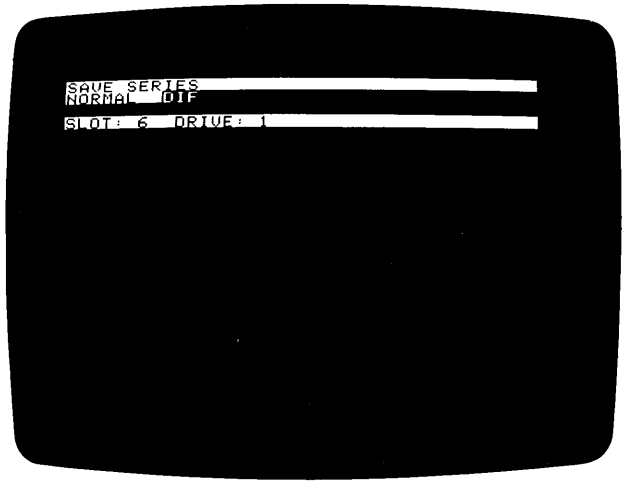
If you continue to get the error, see the troubleshooting guide that came with your computer and disk drives.

SAVING DATA

After you enter new data or modify existing data with the Edit function, you will want to save the data on a diskette for use at a later time. The SAVE function provides the means of doing this.

Move the cursor to SAVE and press **RETURN**.

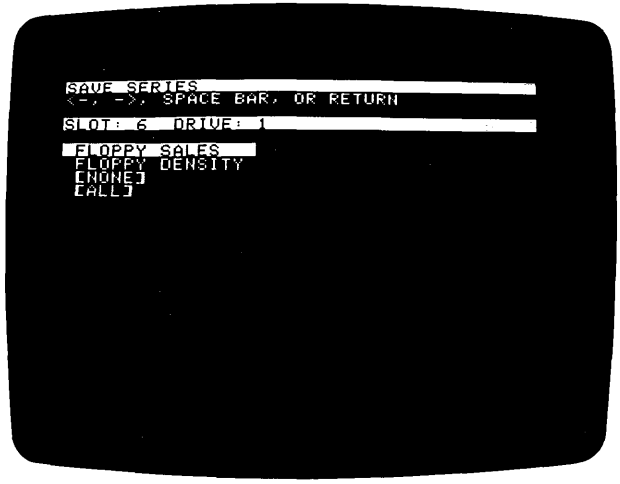
A different menu appears in the status area. The options are NORMAL and DIF. This menu lets you choose the format in which the data will be saved. If the data is to be used only with the VisiPlot program, you will want to save it in the NORMAL format.



The DIF (for Data Interchange Format) option stores data in a format that can be used by other Personal Software programs, such as VisiCalc.

With the cursor on NORMAL, press **RETURN** again.

The menu area contains the directions <—, —>, SPACE BAR, OR RETURN. Below the status area the program displays a list of the series currently in memory. At the bottom of the list are the items (NONE) and (CALL). The series listed should be **FLOPPY SALES** and **FLOPPY DENSITY**, the ones you loaded from the **SAMPLE 1** file.



You can cancel the SAVE operation by moving the cursor to (NONE) and pressing RETURN.

To SAVE data, you have a few choices. You can move the cursor to (ALL) and press RETURN, which writes all the series currently in memory out to the data diskette. But if you only want to save a single series, you can move the cursor to the series name and press RETURN. Finally, you can save some of the series in memory by moving the cursor to the name of the first series to be saved and pressing the space bar. When you press the space bar, an asterisk (*) appears next to the series name. The asterisk means the series is selected to be saved when RETURN is pressed but it is not yet saved.

You can change your mind up to the time you press RETURN. If you don't want to save that series after all, press the space bar again. The asterisk disappears. The series is no longer selected for saving. Pressing the space bar again selects the series again. You can select as many or as few series as you want in this manner.

When you select series in this manner, they are all saved to the data diskette when you press RETURN, including the series to which the cursor is pointing whether or not it has an asterisk next to it. If the cursor is on (ALL) or (NONE), they have precedence regardless of the number of asterisks in the list.

For the purpose of this lesson, move the cursor to (ALL) and press RETURN. The disk drive makes a whirling sound and the status area says READING DIRECTORY... The directory of the files currently on the diskette is listed under the status area. It is the same list you saw when you

LOADed **SAMPLE 1**. But there is a slight difference. In the LOAD list the last item was (NONE) and in this list it is (NEW FILE).

You now have a choice and a responsibility. You must select the file to which the selected series are to be written. It is a responsibility because, if you select an existing file, the data in it is destroyed and the selected series are stored in it. You must be careful not to erase any data you want to keep.

Usually, after you have created a new data series with the Edit function, you will want to put it in a new file. If you have updated information in an existing file, you will probably want to replace the old data with the new. Remember, the selected series replace all the data series in the file, not just those of the same name. For example, if you load a file that contains series A, B, and C, modify series B, and then save series B to the same file, the file will contain only series B because you did not save series A and C.

Also remember that all selected series are saved in the same file regardless of which file they were loaded from.

It is good practice to save all data in new files. If after a period of time you find you don't need the old data, you can erase the old file with the DELETE function which is described later in this lesson.

For now, select (NEW FILE) and press **RETURN**.

When you choose to create a new file, the program prompts for a file name. Enter a name that is different from all other names on the diskette and press **RETURN**. You will get an error message if a file by that name already exists on the data diskette.

If you have followed the directions, you just tried to write to the program diskette in drive 1 of the boot slot. And you got the error message, CAN'T! ERROR: WRITE PROTECTED. Your diskette is write protected: you cannot write on it. This protects the program diskette from being accidentally destroyed. Press any key except **RESET** to redisplay the menu.

There was no need to save the series you selected because there is already a copy of them in the file named **SAMPLE 1**. You didn't make any changes to them because you have not yet used the Edit function.

Remember to check the data diskette drive assignment before starting a SAVE. The data diskette drive number cannot be changed after you start the SAVE. If you forget to change the drive number, cancel the SAVE.

You can cancel a SAVE function by selecting (NONE) when the list of series is displayed. If you go beyond that point before deciding to cancel, you can select (NEW FILE) from the list of files and enter a RETURN without a name when prompted for a file name. The lone RETURN is an invalid response that cancels the function.

CREATING A DATA DISKETTE

Before you can perform a successful SAVE, you must create a new data diskette. A data diskette is any diskette that is initialized by the VisiPlot INIT function or by the DOS 3.3 INIT (Initialize) command. See The DOS Manual for information on initializing diskettes with DOS 3.3.

To use the VisiPlot INIT function, move the cursor to <MORE> and press RETURN. The remaining Storage Management functions are displayed. Move the cursor to INIT and press RETURN.

You are prompted to put the diskette to be initialized into the data diskette drive. Put the diskette in the drive, close the door, and press RETURN. If the diskette is already initialized, you are given the opportunity to cancel the operation. The INIT function destroys all the data on the previously initialized diskette.

If you try to intitialize the VisiPlot program diskette, the INIT function detects it and automatically cancels the operation without your intervention.

A diskette initialized with the INIT function has Apple DOS 3.3 on it but does not have a HELLO program, therefore, you cannot boot from a VisiPlot program initialized diskette.

When the INIT function is complete, you are returned to the Main Storage Management menu, not to the extension menu from which you selected the INIT function.

After you have created an intitialized diskette, you can repeat the preceding section on saving data and actually SAVE the data. If you have a two drive system, put the initialized data diskette in drive 2 and change the data diskette drive number with the DRIVE function. If you have a one drive system, remove the program diskette and put the data diskette in drive 1. The program diskette does not have to be in Drive 1 until you load the Plot program. When the program diskette is needed but not present, you are prompted to put it into Drive 1.

CLEARING SERIES FROM MEMORY

When you SAVE data on a diskette, the copy of the data in the computer memory is not erased, it remains there. There are times when you will want to eliminate some or all of the series from memory to make room for other series. After you have saved new and modified series on diskette, you may want to load some others. You may have to make room for the new data you want to load.

The CLEAR function erases some or all of the series from memory. Move the cursor to CLEAR and press RETURN. The menu is replaced with the direction SELECT SERIES TO CLEAR. It is important to remember that you must select the series you want to erase, not the ones you want to keep.

Again, a list of the series in memory is displayed under the status area. Along with the series names there are two extra options: (KEEP ALL) and (KEEP NONE). The former erases nothing from memory, in effect, it cancels the CLEAR function. The latter erases everything from memory.

You can erase a single series by moving the cursor to it and pressing RETURN. You can erase two or more series by moving the cursor to the name and pressing the space bar. Just like the SAVE function, the series name is marked with an asterisk (*) indicating the series is to be erased. Pressing the space bar again eliminates the asterisk. You can mark as many series with an asterisk as you wish before pressing RETURN. Remember, the series to which the cursor is pointing is also erased when you press RETURN whether it has an asterisk or not. You should leave the cursor on the last series to be erased.

You are going to clear the series FLOPPY SALES from memory. Remember, this has no effect on the copy of the series that is on diskette in the file SAMPLE 1. Move the cursor to FLOPPY SALES and press RETURN.

After you press RETURN, the program displays a list of the remaining series in memory, just as it does for the LOAD and LOOKUP functions. You can CONTINUE which returns to the Main Storage Management menu or PRINT the list and then return to the Main Storage Management menu.

CALLING THE PLOT PROGRAM

When you are done LOADing and EDITing data, you normally want to go to the Plot program. The —>PLOT option calls the Plot program from the program diskette and reads it into memory, overlaying the Storage Management program.

You have already seen what happens when you call the Plot program. You used this function in Lesson One.

In this lesson we will review the procedure.

Move the cursor to —>PLOT and press RETURN.

The menu disappears and you are given a chance to change your mind. You are prompted to press the Y key to verify that you do in fact want to leave the Storage Management program and load the Plot program. If you press any key except Y, the request is cancelled and the Main Storage Management menu is redisplayed. Press the Y key and the process of loading the Plot program begins.

If you have not LOADed data into memory or created new data series with the EDIT functions, you will get an error message that says NO ACTIVE SERIES. You cannot get into the Plot program unless you have some data to plot. If you get the message, use LOAD to select the series you want.

When the Plot program is loaded, the Select menu is displayed. Move the cursor to NONE and press RETURN, which displays the Main Plot menu. Move the cursor to —>MAIN and press RETURN. Now the process begins in reverse. You are prompted to verify that you want to leave the Plot program and return to the Storage Management program. Press the Y key and after the loading process is completed, the initial Storage Management menu is again displayed.

Keeping Data When Changing Programs

When you call the Plot program, you must have one or more series in memory. This data is preserved in memory when you change programs.

To see for yourself that the data is kept, move the cursor to LOOKUP. Look at the list and remember what is on it. Now load the Plot program and select any chart type from the Select menu. Compare the list of series with the list from the LOOKUP function. They are identical. No data was lost in the transition.

Now go back to the Storage Management program. Do a LOOKUP again and you will find that the list has not changed.

DELETING FILES FROM THE DATA DISKETTE

As you create new data series and modify old ones, your data diskettes will fill up. Some of the data will be old series that contain out of date information and some will be series for which you no longer have any need.

For this part of the lesson, make sure the data diskette you created with the INIT function is in your data diskette drive. This is drive 2 if you have multiple drive system and drive 1 if you have a single drive system.

Also make sure that the correct slot and drive are listed in the bottom line of the status area.

The DELETE function erases these files from your data diskettes. This function is on the Main Storage Management menu extension. Move the cursor to <MORE> and press RETURN. When the menu extension is displayed, move the cursor to DELETE and press RETURN.

The READING DIRECTORY... message is displayed in the status area as the data diskette drive begins running. The list of files on the diskette are listed below the status area. Select a file for deletion in the same manner that you selected a file for loading or saving. Move the cursor to the file name and press RETURN. Because this function permanently erases files, you are prompted to verify that you did, in fact, intend to erase a file. You must press the Y key to continue the DELETE function. If you press any other key, the function is cancelled.

You will get an error message if the data diskette is write protected.

RETURNING TO THE MAIN STORAGE MANAGEMENT MENU

When you go to the extension menu, the functions you have used so far, return you to the Main Storage Management menu. If you call the extension menu and decide not to perform any of the available functions, you can return to the Main Storage Management menu by selecting the MAIN option. This option simply returns you to the Main Storage Management menu.

GETTING OUT OF THE VISIPLOT PROGRAM

There is one remaining option in the extension menu that has not been mentioned, QUIT. This option exits the VisiPlot program and returns control to Applesoft Basic; the] prompt is displayed. You must load the VisiPlot program again if you want to do more VisiPlot work.

LOADING VISICALC DATA

This section describes how to move data between the VisiCalc program and the VisiPlot program. If you do not use both of these products or have no need to transfer data, you should skip this section and go to the section "In Summary."

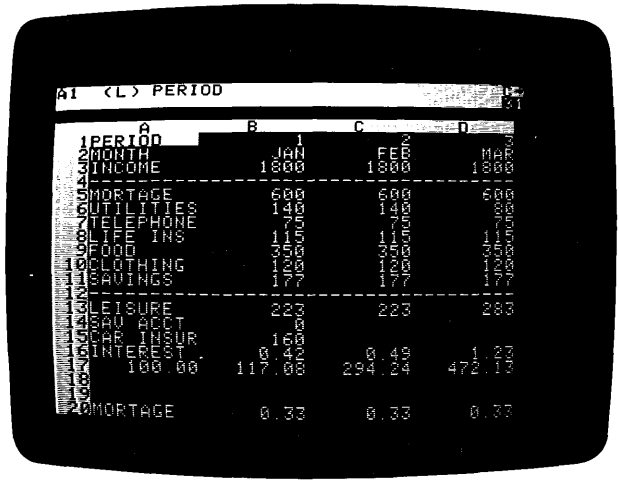
You can load and plot VisiCalc data with the VisiPlot facilities. The VisiCalc data must be saved in a DIF file. This means that interchange between the two products is only possible if you have a copy of the VisiCalc program higher than version number 1.37.

You must save the VisiCalc data that is to be plotted with the /S# command. The stored data should be a sequence of data values that are meaningful to plot. For example, the data items in a single row or column is usually related to each other.

You can use rows or columns of VisiCalc data in VisiPlot charts. Single or multiple rows and columns can be used. Each row or column is treated as an individual data series. Rows of data use the label, if there is one, in the first (left most) field as the series name. Columns use the top field as the series name. If the first field in either form is not a label, the VisiPlot program creates a name for each series in the sequence SERIES0, SERIES1, etc. Label fields occurring later in the sequence are converted to 0.

Data from the VisiCalc program, while in a format acceptable to the VisiPlot program, does not contain all the information the Storage Management program expects. It does not contain a period or a start date. When you load VisiCalc data, you are prompted for the missing items.

The following exercise loads data from the personal budget example in Lesson Three of the Apple II and the Apple II Plus **VisiCalc** manual. If you did the exercise in this lesson, you stored the final sheet on diskette under the name PERSONAL BUDGET. Follow these instructions to create a DIF file of the UTILITIES data in the budget sheet.



1. Move the cursor to A6, the UTILITIES label. Row labels, when included in the DIF file, become series names in the VisiPlot program. If the label spans the VisiCalc columns, only the first column is used, the second column is treated as a zero value. The cursor location marks the upper left corner of the rectangle of data to be saved. The lower right corner is specified later.
2. Enter the /S# command to save the data in the DIF format.
3. Specify SAVE (S).
4. Save the data under the name UTIL.DIF. It is advisable to use suffixes such as DIF, VC, and VP to distinguish the format in which different files are stored.
5. Specify a lower right corner of M6.
6. Enter an R to specify that the data be saved in rows rather than columns.

Load the VisiPlot Storage Management program. Place the VisiCalc data diskette in the VisiPlot data diskette drive. Select the LOAD function.

The file is loaded in the normal manner, just as VisiPlot data files are loaded. One of the files is named UTIL.DIF. Move the cursor to this file and press RETURN.

The loading of the file begins. In a few moments, the disk drive stops and the program prompts for a period for the data series. Enter 12 because the data in this file is on a monthly basis. Next you are prompted for a major start date (year). Enter 1980. Finally, you are prompted for a minor start date (period). Enter 1 for January. The disk drive begins again and the loading of the data is completed.

When the LOAD is completed, the program displays the list of series in memory. The file contained a single data series named UTILITIES. The series name is taken from the label in the VisiCalc row. If you had not saved the label along with the data, the VisiPlot program would have created a name for the series.

You can go to the Plot program and create a chart of the UTILITIES data from your VisiCalc worksheet. You can also modify the data with the VisiPlot Edit functions (described in Lesson 3).

After modifying the data with the Edit functions, you can return to the VisiCalc program and put the data back into the worksheet. Note, however, that data saved in DIF does not contain the formulas, if any, in the worksheet. The row you used in the preceding exercise did not contain formulas, it contained only values. You can load this data and overlay the VisiCalc worksheet with no effect on the function of the sheet.

The VisiPlot series name is not put back into the VisiCalc file as a row label. You must read the data into the value fields, not the label fields. Because the series name is not used, the VisiCalc label will be destroyed.

Formulas are not stored with data written to a DIF file. Therefore, no formulas are put into the worksheet when a DIF file is loaded with the /S# command. If you do this, the worksheet will look correct and values that depend on the new data will be correct. But changes to other values in the worksheet will not affect the newly loaded DIF data, because there are no formulas.

The last point is important enough to repeat. The /S# command does not load or save VisiCalc formulas, only data values.

If you wish to create your own DIF files for use with the VisiPlot program, see the **Programmer's Guide to the Data Interchange Format,** document number SATN-18.

IN SUMMARY

This completes the Storage Management lesson except for the EDIT function which is described in Lesson Three. You have used all the other Storage Management functions. You might want to go back to the LOAD function and look at some of the other files on the program diskette.

If you have any trouble with a function, look it up in the reference section or return to the part of the lesson in which it was described.

The next lesson covers the use of the EDIT function which lets you create and modify data series.

LESSON THREE

USING THE EDIT FUNCTION

The VisiPlot Edit function has two major purposes:

- Creating new data series
- Modifying existing data series

After loading the VisiPlot program, select the EDIT function from the Main Storage Management menu by moving the cursor to EDIT and pressing RETURN. There is no need to LOAD a file, this lesson is devoted to creating a new data series. If you already have some data series in memory, you can leave them there. However, if memory is full, that is, if it has 16 series in it or 645 data points, you will have to CLEAR some of them before continuing with this lesson. The lesson assumes that there are no series loaded from this point.

USING EDIT

After selecting the EDIT function, you are prompted to select a series from the displayed list. The message in the status area, which you have seen before, says you can use the arrow, space bar, and RETURN keys. You did not LOAD a file, so there are no series names in the list, only (NEW SERIES) and (NONE).

(NONE), as it does with other functions, returns you to the Main menu.

In this lesson you are going to enter the data for a series called FIRST. Move the cursor to (NEW SERIES) and press RETURN. The status area changes to the data entry configuration and prompts for a series name.

Type FIRST and then press RETURN. Remember, you can correct typing mistakes with the ESC key. The ESC key backs over the last character and erases it.

Next the program prompts for the period of the new series. The prompt lists the current period that is being used by the program. If you have not done any editing or working with series up to now in this session, the period will be 1. After you have worked with a file, the period from that file is used. For example, if you had just finished working with a file that had a period of 4, the current period would be 4.

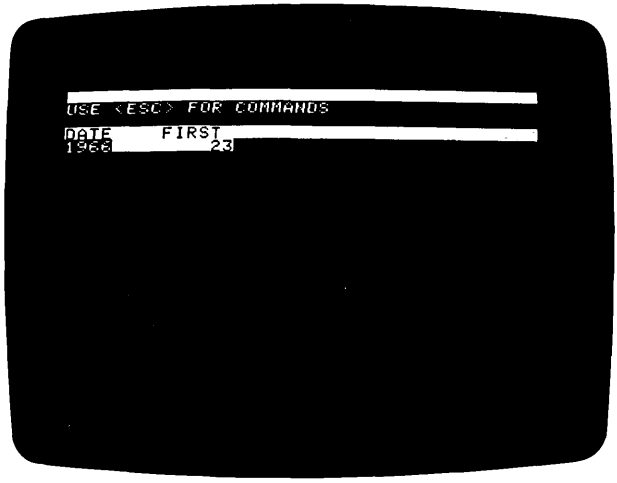
For now select a period of 1 by typing 1 and then pressing RETURN.

Next you are prompted for the starting year of the new series. Enter 1966 and press RETURN. If the period had been other than 1, you would also be prompted for the starting period. A series can begin at any period in its starting year.

If you had not entered a date and had only pressed RETURN, the date 0 would be used. The program makes a choice if it can when you do not enter anything. When it cannot make a choice, it cancels the function or continues to ask for data, whichever is appropriate.

Finally, you are prompted for the first value in the new series. Now the bottom line of the status area contains DATE and FIRST, as column headers. There is a cursor in the column headed by the series name.

The first value for the series is 23. Enter 23 at the keyboard and press RETURN. Note that the value appears in the third line of the status area until RETURN is pressed. In this location, you can correct it with the ESC key. When you have it correct and press RETURN the value moves into the cursor location under FIRST. The starting date appears opposite the value in the DATE column.



The status area changes, it now reads USE <ESC> FOR COMMANDS. This completes the initial sequence when entering a new series. If you had selected an existing series, you would have come immediately to this point in the program. The only difference being that a series, or the first 20 data points of the series, would be displayed on the screen.

At this point you can add more values to the end of the series or call the Edit command menu. For now you should add some more values to the series named FIRST. After the series is complete you can use the Edit commands on it.

Adding Values to the Series

To add a value for the year 1967, press the right arrow key. The date 1967 appears under 1966 and the cursor moves down one line. Type 28. Again the value appears on the third line of the status area. Press RETURN and the value appears in the cursor next to 1967.

Gaps are not allowed in the date sequence. The program automatically adds 1 to the date for each new entry. If the period is 1, the year is incremented by 1. If the period is other than 1, the period is incremented and the year is incremented when the period goes full cycle.

To add the next few values, repeat the preceding process. Press the right arrow key, enter the date, and press RETURN. Enter the values 33, 37 and 41. Note that a solid bar separating the dates from the values appears after you make a couple of entries.

There is a shortcut method for entering new data. Press the right arrow key again to show the date 1971 and enter 44 but do not press RETURN. Instead, press the right arrow key again. The value, 44, moves to the correct place and the cursor moves down a line to the next date.

Add the remaining values in this manner. Press the right arrow key and enter the value. Add 44, 53, 61, 75, 64, 73, 82, and 79 to the series.

After the last value, the cursor is below the list with the date 1980. We don't have a value for 1980, so press the left arrow key. The cursor moves back up to the 1979 value and the 1980 date disappears.

Replacing A Value

You can move the cursor up and down the list with the arrow keys. In this list the cursor does not wrap around. A little later you will use a rapid means of moving the cursor in a large series.

You can replace a value simply by moving the cursor to the value that is to be replaced and entering the new value. The current value at the cursor location is replaced by the new value when you press the RETURN or arrow key.

Move the cursor to the year 1969 which has a value of 37. This value should have been 36.9. Type 36.9 and press the RETURN or either arrow key. The old value is replaced.

THE EDITOR COMMANDS

You have been working at the data entry level of the Edit function. To leave this level and go to the command level, press the ESC key. The Edit command menu appears.

The Edit command menu provides many functions. With it you can:

- JUMP to a specific year (and period) within the series
- INSERT new data points between existing data points
- DELETE existing data points
- FORMAT the manner in which data is displayed
- PRINT the contents of a series
- UNDO (erase) all changes made to a series
- FILL areas of a series with values generated by predefined algorithms
- EXIT to the Storage Management Main menu and save the work you have done
- Change the specifications (SPECS) of a series
- Return to the entry level (EDIT)

Leaving the Edit Function

The EXIT option returns to the Main Storage Management menu. When you exit by this route, the work you created or modified is saved. Move the cursor to EXIT and press **RETURN**. The Main menu replaces the Edit command menu and the listing of the series is erased.

To see that you have created a series, select LOOKUP. The list shows that there is a series named FIRST with a period of 1. It begins in 1966, ends in 1979, and has 14 data points. Press RETURN to continue.

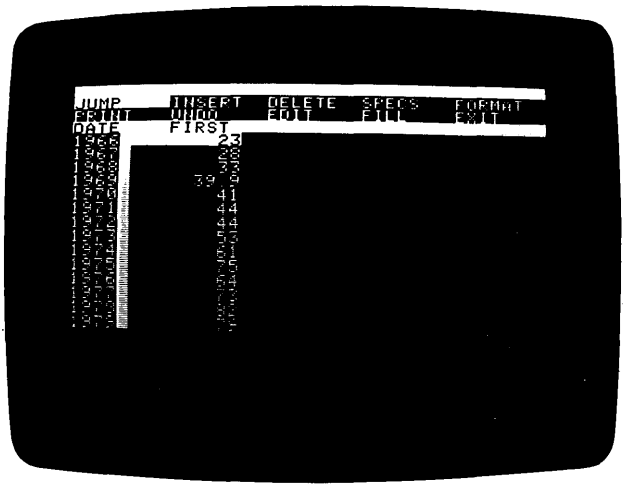
Returning to the Edit Function

Select EDIT again. This time there are three items in the series list, the same entries you saw earlier plus the series you created. Select the new series, FIRST, and press RETURN.

This time you don't have to enter a name, period, or starting date. The contents of the series are listed. The status area contains the USE <ESC> FOR COMMANDS message.

Using the Edit Commands

The following sections show the use of the Edit commands. For each section you will begin in the entry level. The entry level is that part of the function in which you can input initial data to the series. While you are in the entry level, the status area contains the message USE <ESC> FOR COMMANDS. To begin each section, press the ESC key and then move the cursor to the subject function.



In the following section describing the JUMP command, press ESC and then press RETURN. The cursor is located at JUMP when you enter the command menu.

Jump—Moving from Point to Point

The JUMP command lets you move from date to date in the series without repeatedly pressing the arrow keys. Move the cursor to JUMP and press RETURN.

The prompt says <-- TOP, --> BOTTOM, YEAR. If you enter a date, the cursor moves to that date. If the series has a period other than 1, you are prompted for the period also. If the date is currently displayed, the cursor simply jumps to that position. If it is not displayed, the screen is erased and is rewritten with the specified date at the bottom of the screen and the cursor on it.

If the date does not exist in the series, there is a beep and the date is not accepted. At this point, you should enter a valid date.

Pressing the right arrow key moves the cursor to the last entry in the series. The left arrow key jumps to the first entry in the series.

After the jump is completed, you are returned to the EDIT function entry level.

To exit the JUMP function without making a move, press the RETURN key twice.

Insert—Adding An Entry

The INSERT command lets you add a new values at the current cursor location in the series. Insertion with this command works just like adding a value except that it operates anywhere in the series, not just at the end. The command opens up the series at the cursor location. All values at and below the cursor are pushed ahead to the next date.

Type the new data and press RETURN if you are inserting a single value. If you have more than one value to insert, type the new data and press right arrow key. Press RETURN after the last entry. You can correct errors with the ESC key before pressing the RETURN key or the right arrow key. Pressing the RETURN key returns you to the entry level.

Delete—Erasing a Data Point

The DELETE command erases one or more values beginning with the current cursor location. The range to be deleted is listed in the status area. You can abort the DELETE command by pressing the ESC key.

When you select the DELETE command, only one data point, the one at the cursor, is listed for deletion. Moving the cursor, in either direction, broadens the range of values to be removed from the series. As you move

the cursor, the range listed in the status area changes. If you move the cursor beyond the end of the series, the DELETE command is cancelled.

You can DELETE in either direction from the original cursor position. However, the initial cursor location will always be the beginning or end of the range to be erased.

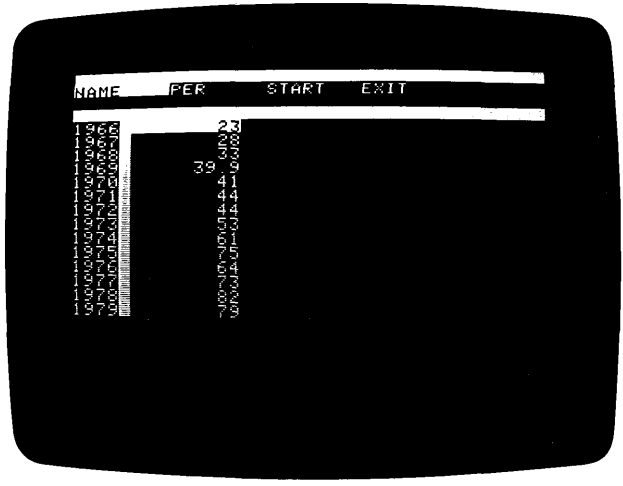
Pressing RETURN when you have defined the correct range removes the selected values from the series. The values below the removed area move up to fill the new empty dates.

You are returned to the entry level.

To exit the DELETE command without making a change to the series, press the ESC key.

Specs—Changing the Series Specifications

The SPECS command provides the means of changing the name, period, or start date of the series. This command displays a new menu. Selecting the menu displays prompts for new data to replace the current series name, start date, or period.



When you change a series specification, the change takes place immediately and is shown on the screen. If you change the name, the new name replaces the old name as the value column header. A new period or starting date causes the date and/or period columns to be changed on the screen. The existing data points do not change, only their date and/or period.

You can respond to the prompts for data by pressing the RETURN key without entering data. When you do this, the program assumes values. For the NAME function, it generates the name SERIESn, where n is a number from 0 through 15. For the PER function, it uses the current period. For the START function it uses the date 0.

Format—Changing the Data Display

The FORMAT command lets you specify how the data values in the series are to be displayed. You can select the fixed format and specify the precision (number of decimal places from 0 to 6) and column width (total number of digits displayed from 6 to 15). You can also specify that values be displayed in the floating format.

The function first prompts for a precision (0 to 6) or the floating point format (−1). Pressing RETURN retains the current format and precision. Next it prompts for the column width which can be from 6 to 15 digits wide. Pressing RETURN retains the current column width.

If the values are displayed as a series of greater than symbols (>>>>>>), either:

- The value is too large for the column width. If this is the case, increase the column width.
- The value is an exponential number (such as 1E-03) and you are in a fixed format. You cannot enter values in the exponential format but values less than .001 and greater than 9 digits to the left of the decimal point are automatically converted to the exponential format.

If you do not choose a display format, the floating format is used.

The FORMAT command does not affect how the values are stored, only how they are displayed in the EDIT function. The format remains in effect until changed or until you exit the EDIT function.

Print—Listing a Series

The PRINT command lets you print a copy of the current screen content on your printer. You are prompted for the slot number to which the printer is attached the first time you use the PRINT command during a session. The program remembers the specified slot number.

The command prints the contents of the current screen without the bold bars and without any blank lines at the bottom of the screen.

PRINT lists the contents of the currently displayed screen and then returns you to the entry level.

You can stop a printing operation by pressing CTRL-C.

Undo—Remove All Changes

The UNDO command cancels all the changes made to the series since you selected the EDIT function. If you UNDO a newly created series, it is completely erased.

Keep in mind that the UNDO command removes all changes made since selecting the series, not just the last change.

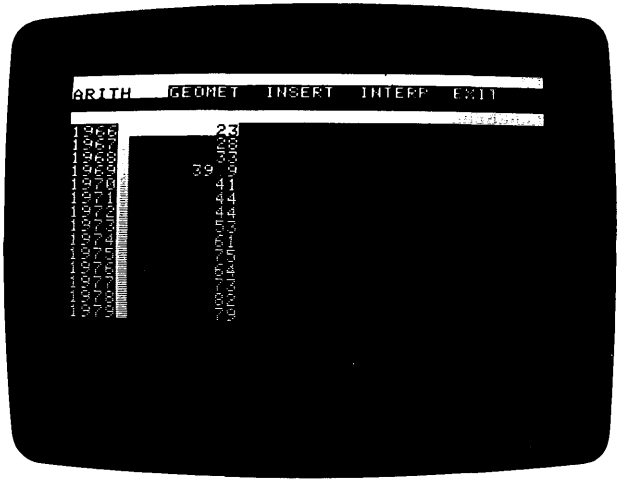
Edit—Returning to the Entry Level

The EDIT command takes you back to the entry level of the EDIT function without executing any of the commands.

Fill—Adding to A Series

The FILL command provides a means of inserting values into the middle of a series and interpolating missing values. You can insert values in an arithmetic or geometric progression from the value at the current cursor location. You can also select a whole series and insert it into the series being edited. You can fill in missing values in a series, interpolating between two known values.

The FILL command displays its own menu.



The ARITH and GEOMET functions both operate in the same manner. They prompt for a number of values to be inserted. The number can be any value that, when added to the existing points in the series, does not exceed the maximum of 150 points in a series or the 645 points in memory. Next the function prompts for a factor to be used in the calculation of the new values. In the ARITH function, the factor is added to the current cursor value and each generated value until the specified number of values have been generated. In the GEOMET function, each successive value is multiplied by the factor.

The INSERT function displays the current list of series in memory. You can select one. It is inserted, in its entirety, into the current series at the cursor location. If you insert a series into itself, the inserted values are those that existed before entering the EDIT function.

The INTERP function performs a linear interpolation of values beginning at the current cursor location and continuing to the first non-zero value. This function fills in missing data values. The missing values must be entered as zeros. There can be one or more missing values.

If the value at the cursor is not zero, an error message is displayed and the function is canceled. If the value is zero, the function looks at the preceding period for a starting point and the next non-zero point for an ending value. It then linearly interpolates all points in between.

Point the cursor to the first zero value in the sequence before invoking the function.

The EXIT command returns to the entry level without performing a FILL command.

SOME EXERCISES WITH THE EDITOR COMMANDS

The following exercises give you some practice using the commonly used Edit functions. To do these exercises you must LOAD the file SAMPLE 2 from the VisiPlot program diskette.

EXIT to the Main Storage Management menu, CLEAR memory, and LOAD the file named SAMPLE 2 which contains a series with the same name. You used the CLEAR function in the last lesson. It prompts you to decide what to keep and what to clear. This time, erase everything in memory by selecting the (KEEP NONE) option. Now select LOAD and SAMPLE 2 from the directory listing.

Large Series Displays

Select EDIT and then select the series Sample 2. This series has 133 data points and a period of 12 (monthly). Its start date is 1977 1, the first period of 1977 or January 1977.

The screen fills with numbers when you select the series. The date is in the left margin of the screen. For each date there are 12 periods; for each period there is a value. The dates are to the left of the vertical bar. The period is the first number to the right of the vertical bar. The value is to the right of the period.

Moving the Cursor and Scrolling the Screen

SAMPLE 2 contains 133 data points but the screen can only display 20 of them at a time. To see the values beyond the first 20, move the cursor to the bottom of the screen with the right arrow key. Continue pressing the key when the cursor reaches the bottom. New dates and values appear at the bottom and old ones disappear off the top. This is scrolling; it is one means of moving to any point in the series.

Press the left arrow key until you reach the top of the screen. Continue pressing the key. New values appear at the top and others disappear off the bottom. If you keep pressing the key until you reach the top of the series, there is a beep indicating that you can't go any further.

Moving With the Jump Command

If you wanted to add more values to the end of this series, you would have to press the right arrow key 133 times to reach the end. You can save time and effort by using the JUMP command. Press ESC to display the Edit command menu. Press RETURN with the cursor on JUMP.

The JUMP prompt says that you can enter a date or press one of the arrow keys. If you specify a date, the portion of the series containing that date is displayed.

Enter 1981 and press RETURN. You are asked for the period because this series has a period other than 1. Enter 1 and press RETURN. The data on the screen is erased and new data appears. The cursor appears at the bottom of the screen on the first period of 1981. If you specified the same date and period from a point below it in the series, the target date would appear at the top of the screen. The location of the target depends on the direction the cursor must move.

You can also use the arrow keys with the JUMP command. Press ESC again. Select JUMP. The right arrow key moves to the bottom of the series and the left arrow key to the top. Press the right arrow key. The display changes; the new display shows the end of the series.

Formatting the Data

The values in this series are displayed with different numbers of decimal places, to different precisions. This is the floating point data format. This format gives a cluttered appearance to the screen and, at times, makes the values difficult to read.

With the help of the FORMAT command you can display the values in a manner that is neater and more readable.

Go to the Edit command menu and select FORMAT. The top line of the status area indicates that the data is currently in the floating format. The second line tells you to enter a value of 0 through 6 to set a fixed precision. The number indicates the number of decimal places to which each number is to be displayed. It also says that you can enter −1 to specify floating format, which is the format in which the data is currently displayed. The last item in the prompt says to press RETURN alone to cancel the function.

Enter the number 2 to specify the fixed point format with two places of precision. Press RETURN. You are prompted for the column width. The width is the total number of digits that can be displayed in the column including the decimal point. This can range from 6 through 15. If you press RETURN without entering a value, the current column width is kept. For now, just press RETURN.

The series on the screen is redisplayed with the decimal points lined up and two digits to the right of the decimal point.

Printing the Data on the Screen

If you have a printer attached to your computer, you can print the contents of the current screen. Press ESC and select the PRINT function. If you have not yet used the printer since loading the VisiPlot program the program prompts for the slot number to which it is attached. If the printer is connected to slot 1, enter the number 1 and press RETURN.

The printer begins printing the screen contents. You can let the whole screenful print or can stop it by pressing CTRL-C.

Inserting Data Into the Middle of a Series

Display the beginning of the series and move the cursor to the first period of 1978. Press ESC and select the INSERT command.

Note that the value that was in this location has moved down one place in the series. Also, the values that followed the value have each moved down one place. The dates did not change, however, one new period was added to the end of the series.

You can now insert a new value at this point in the series. Type 999 and press RETURN. The value 999 is inserted into the 1978 period 1 location.

To insert multiple values, press the right arrow key after typing the value. The value is placed in the current open space and a new space is opened following the new value. To terminate the insertion, press RETURN. Press ESC, select INSERT again and enter two more values of 999 using the right arrow key. After you enter the second value, press RETURN.

After RETURN is pressed, the editor returns to the entry level.

Deleting Data from A Series

If you decide you don't want the three 999 values in the series, you can delete them with the DELETE command.

Move the cursor to the first 999 and call the Edit command menu by pressing the ESC key. Select DELETE. The status area says you are currently set to delete from 1978 1 to 1978 1, or one point in the series. The status area also says that you can press the ESC key to abort the deletion.

Press the right arrow key several times and watch the status area each time you press the key. The TO date changes as the cursor moves from value to value. Move the cursor back to the third 999 value at 1978 3. Press RETURN. The display is erased and rewritten. The three 999 values are removed and the series is back to its original conditions.

CONTINUING WITH THE EDIT FUNCTIONS

The remaining Edit functions should be easy to use with the experience you now have. If you have any problems with any of them, look them up in the reference section.

LESSON FOUR

MORE ABOUT PLOTTING

This lesson is a series of step by step examples showing how to make different kinds of VisiPlot charts. The data series that are used in these examples are stored on the VisiPlot program diskette under the names GEM PRICES, PRESPREF, and MATH FUNCTIONS.

The GEM PRICES file contains series of the prices of 1 and 2 carat rubies for the years 1974 through 1980, the price of 3 carat sapphires over the same period, the price of a 1 carat investment quality diamonds for the years 1967 through 1978, and the Consumer Price Index for the years 1967 through 1978.

The PRESPREF file contains series of political poll data taken at random times during a mythical election campaign.

The MATH FUNCTIONS file contains two series of values for two math functions.

This lesson assumes you have read and used the functions described in Lesson One and Lesson Two covering the Plot and Storage Management programs.

GETTING STARTED

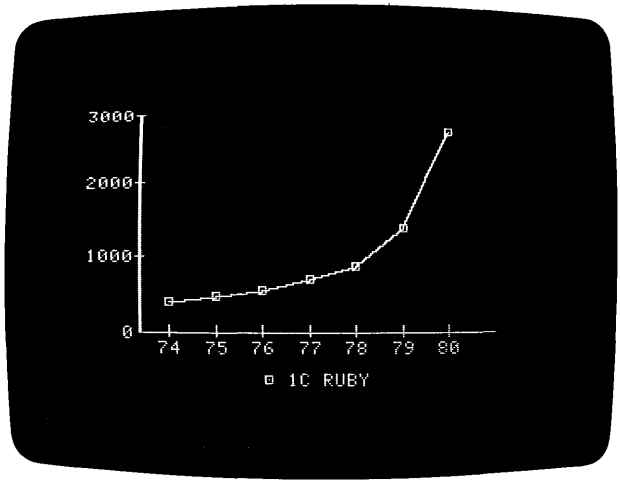
Load the VisiPlot program and then LOAD the GEM PRICES, PRESPREF, and MATH FUNCTIONS files from the program diskette. Call the Plot program. If you have trouble with any of these operations, review Lesson Two.

This lesson shows how to generate many different charts and how to combine charts. The sections begin with a picture of the chart that is to be generated. The picture is followed by a list of the keys you must press to generate the chart. A key name preceded by a word or phrase enclosed within parenthesis indicates a cursor position you must move to before pressing the indicated key. A word or phrase in quotation marks preceded by the word Enter indicates that the word or phrase must be typed. For example:

- SPACE BAR—means press the space bar
- RETURN—means press the RETURN key
- (LINE) RETURN—means move the cursor to LINE and press the RETURN key

- Enter "PERCENT OR TOTAL" RETURN—means enter the phrase at the keyboard and press the RETURN key

SINGLE LINE CHART



Beginning in the Select menu:

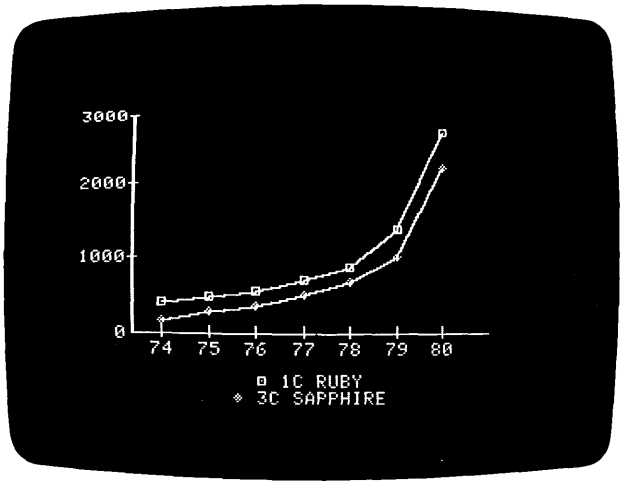
(LINE) RETURN

(1C RUBY) RETURN

(PLOT) RETURN

There is nothing new in this chart except the data. You generated several single line charts like this one in Lesson One.

TWO LINE CHART



(NEW) RETURN

(LINE) RETURN

(1C RUBY) SPACE BAR

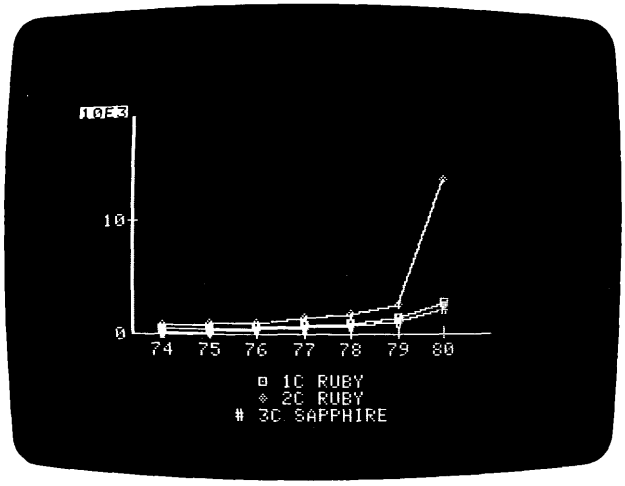
(3C SAPPHIRE) RETURN

(PLOT) RETURN

There are a couple of new things in this chart. First the chart contains two lines instead of one. The two lines are plotted with different symbols—the square box which you saw in Lesson One and a diamond shaped symbol. The legend at the bottom of the chart lists both series and shows what plotting symbol was used for each. The bottom line of the status area lists the last series selected and now contains an ellipsis following the type of chart. The Ellipsis indicates that multiple series were selected.

Note that both series were selected before the plot was drawn.

THREE LINE CHART



(NEW) **RETURN**

(LINE) **RETURN**

(1C RUBY) **SPACE BAR**

(3C RUBY) **SPACE BAR**

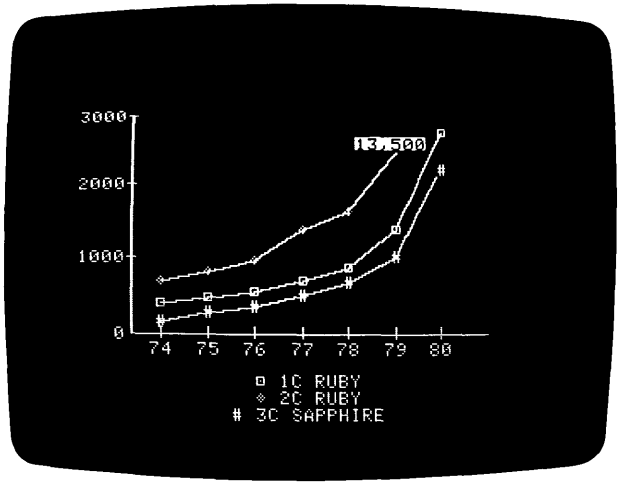
(3C SAPPHIRE) **RETURN**

(PLOT) **RETURN**

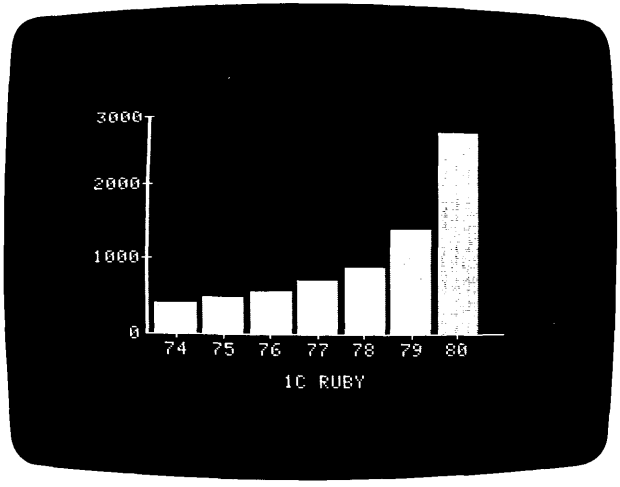
The new feature of this chart is the use of the pound sign (#) as the plotting symbol of the third series. Note that the Y-axis scale has a factor of 10E3 (or 1000) at the top, indicating that Y-axis labels must be multiplied by 1000.

This chart is difficult to read. The information for the years 1974 through 1979 is crammed together in a small space. The only thing that shows up well is the 1980 price of 2 carat rubies. This chart may be satisfactory if its purpose is to show what happened to the price of 2 carat rubies in 1980. However, if the other information is equally important, it might be a good idea to change the range to 1974 through 1979 and handle the 1980, 2 carat ruby price in some other manner.

Another approach is to change the scale to show the earlier data clearly and let 1980, 2 carat ruby price go off the chart and show its value with a moveable title. This is the approach used in the following photograph.



SINGLE BAR CHART



(NEW) **RETURN**

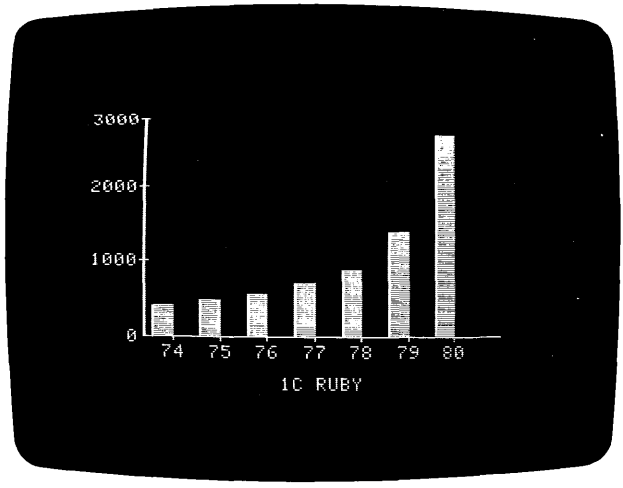
(BAR) **RETURN**

(NORMAL) **RETURN**

(1C RUBY) **RETURN**

(PLOT) **RETURN**

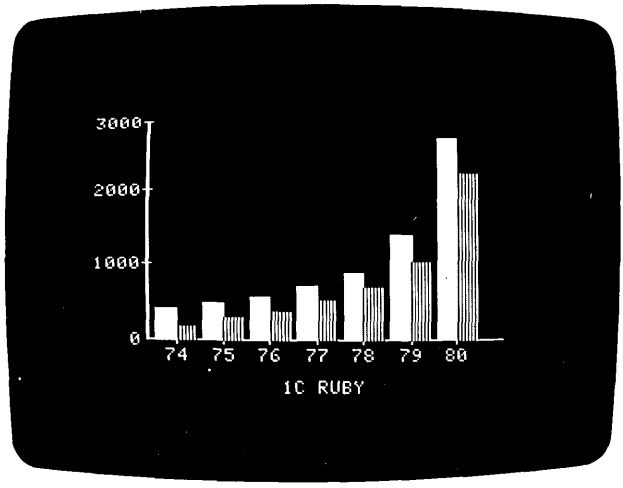
Again, this chart is no different than the bar charts you did in Lesson One. It can be made different by selecting half-width bars. Repeat the sequence and select LEFT instead of NORMAL when the Bar menu is displayed.



The only differences in the chart are the width of the bars and the bottom line of the status area which says BAR-LEFT where it said BAR on the chart with full-width bars.

The half-width bars are used for comparative charts as shown in the next example.

COMPARATIVE BAR CHART



(NEW) **RETURN**

(BAR) **RETURN**

(LEFT) **RETURN**

(1C RUBY) **RETURN**

(PLOT) **RETURN**

(SELECT) **RETURN**

(BAR) **RETURN**

(RIGHT) **RETURN**

(3C SAPPHIRE) **RETURN**

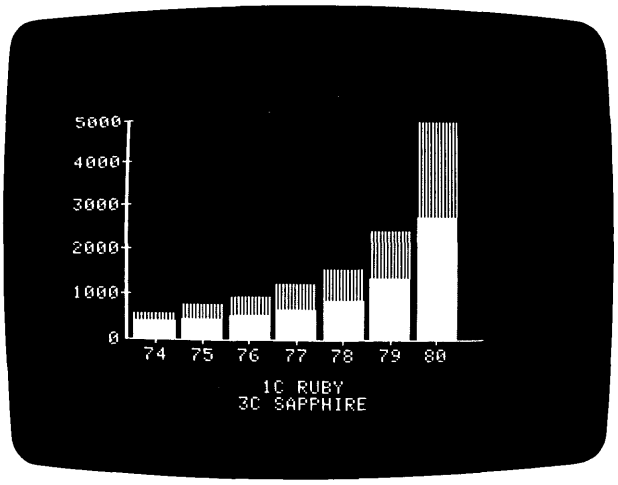
(OPTIONS) **RETURN**

(COLOR) **RETURN**

(GREEN) **RETURN**

(OVERLAY) **RETURN**

There are many differences in the appearance of this chart and in the making of it. First, instead of choosing both series and plotting them as was done with multiple line charts, you selected each series on a separate pass through the Select menu. If you had chosen the two series at the same time (as you did for the two line chart), you would get a different chart. When the series are chosen on the same pass through the Select menu, the chart shows the series stacked on top of each other as shown in the following photograph.

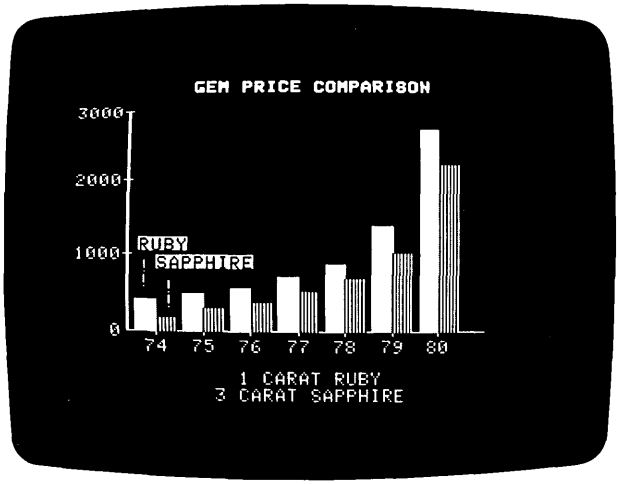


Generating the chart in this way, the two values are added. You sill use this style of bar chart when you are interested in the sum of the two series.

To add the second series to the first chart, you used the OVERLAY function rather then the PLOT function. OVERLAY draws the new chart on top of the existing chart. It uses the same range and scale as the existing chart.

You also changed the color of the second set of bars. If you had not, both sets of bars would have been the same color and wouldn't have shown up as clearly. Instead of changing the color you could have changed the format of the second bars to outlined or shaded.

Overlaying a chart does not put a legend at the bottom. You must add that yourself with the TITLE options. You should put in the names of both series and specify which is which as shown in the following picture.



Note that the horizontal grid lines make the values at the right side of the chart easier to read.

You may see a slight overlay between the bars in a comparative bar chart. You may also see a slight offset between the upper and lower bars of a stacked bar chart. Both of these conditions are caused by the Apple II color techniques.

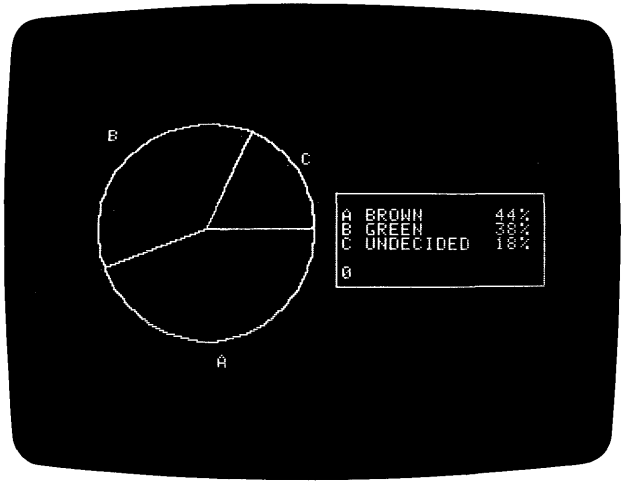
THE PIE CHART DATA

In the following sections you are going to draw pie charts. The data is from the file named PRESPREF that you loaded at the beginning of this lesson. The charts use four series, the ones named BROWN, GREEN, WHITE, and UNDECIDED. Each series has two data points. The first data point in each series represents the percent preference for each candidate in a 2-way Brown-Green race (the White value is 0). The second data point in each series represents the percent preference in a 3-way race of all candidates.

The data used in pie charts does not have to represent a time series. The value of the zero data point represents one set of circumstances and the value of the 1st data point represents another. In this case the dates represent data items that are not necessarily related by time.

A pie chart shows a single point in time and not a comparison of different points in time as our other charts have. The VisiPlot program requires that the different values used in pie charts be from different series. All the values must be at the same date or reference number. The plotting fails if any of the series do not have the specified date.

A PIE CHART



(NEW) RETURN

(PIE) RETURN

(BROWN) SPACE BAR

(GREEN) SPACE BAR

(UNDECIDED) RETURN

Enter "0" RETURN

Note that the WHITE series was not included. It wasn't needed because point 0 has a value of 0. If you had included the WHITE series, it would have been listed in the legend with a 0 percentage and would not have a segment of the pie.

Each segment of the pie is labeled with a letter. The letter refers to the items in the legend. This order of the series around the pie and in the legend is significant, it is the order in which you selected them. If you had selected them in the opposite order, they would be listed in the opposite order and would have different relative positions on the pie. The first series always begins at the 3 o'clock position and extends in a clockwise direction.

The bottom line of the legend contains a zero. This is the date or reference number of the selected data.

Shading and Titling A Pie Chart

The generation of a pie chart follows a fixed series of events. After drawing the chart you are sent directly to the Title menu. Following the Title menu, you are given a chance to shade the chart. Then you have another chance at the Title menu. There are two phases at the Title menu because it is possible to cover a title with shading. When you exit the Title menu the second time, you have finished. There is no way back to the Title or shading functions. If you made a mistake, you must start over from the beginning.

When the chart is finished, you have a screen with the picture and legend. Press RETURN and the Title menu appears. For now, select EXIT and proceed to the Shading function.

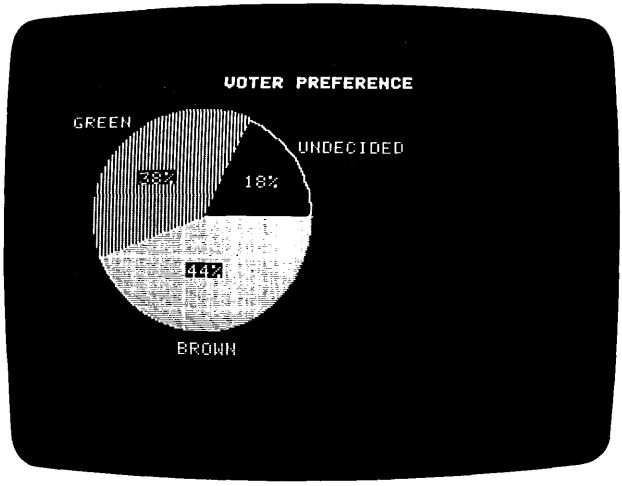
The Shading function asks you to enter a letter or RETURN. It is asking for a letter indicating a segment of the pie. You can specify the labels in any order; you can skip any you don't want shaded. If you change your mind, you can change the color of a segment you have already shaded.

Enter A and press RETURN. The Color menu is displayed. If you have a color display unit, you can choose any color. If you have a black and white display unit, you should limit your selections to black, white, and one other color. All other colors look the same in black and white. For now, select WHITE1 and press RETURN. Segment A is filled in.

You are asked for another letter. Enter B and press RETURN. This time select GREEN and press RETURN. The B segment is filled in. Leave the C segment as it is—black. Press RETURN. You are asked to confirm that you want to leave the shading function. This confirmation is necessary because you have only one chance to shade the chart. Once you leave this function you cannot get back to it without starting the chart over from scratch.

Enter Y and the Title menu reappears.

With one exception to be covered later, the Title functions operate exactly as they did when you titled a chart in Lesson One. Use that experience and put in the titles to make the chart look like the following picture.



The legend doesn't add much to the chart with all of the legend information on the chart itself. With a pie chart, the LEGEND function erases the legend. Whereas the LEGEND function returned the legend in other charts, it erases the legend in pie charts. Select LEGEND and press RETURN. You should remove the legend before locating titles anywhere to the right of the left side of the legend. That entire side of the screen is erased to eliminate the legend.

To try your hand at another pie chart, use the same three series plus the WHITE series and use data point 1.

DISPLAYING TWO CHARTS AT ONCE

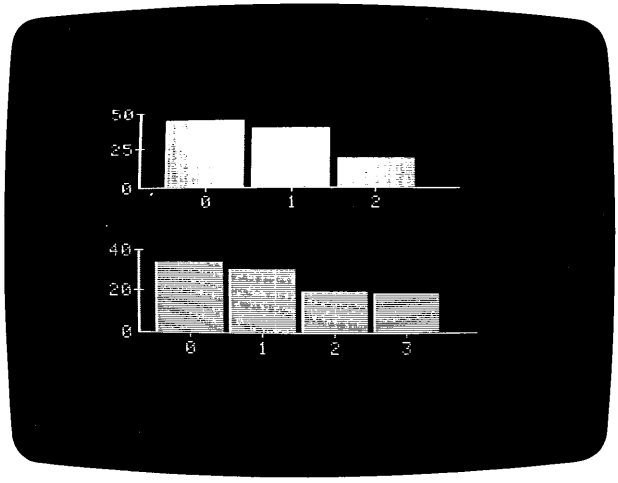
The same data you used for the pie charts is also available in a different form in the series 2 MAN RACE and 3 MAN RACE. All the 0 points are in 2 MAN RACE and the 1 points are in 3 MAN RACE. It is often desirable to show the different forms of data at the same time, in two different charts.

The WINDOW function in the Main Plot menu provides this capability. It divides the screen into two parts. You can draw different charts in each window. You can put any kind of chart into the windows except the pie chart. A pie chart requires the whole screen.

The WINDOW menu gives you the choice of dividing the screen into side by side or top and bottom sections. This example uses top and bottom sections. The WINDOW menu also lets you switch between the windows and provides a means to return to single window operation.

When you enter the WINDOW function, the active window is the top one if you chose HORIZ windows and the left window if you chose VERT windows.

When you switch between windows, you lose the current active series and option data for the window you are leaving. When you return to the window, you must start over if you want to change an option and rePLOT the chart.



The following series of commands assume that you are beginning from the Select menu.

(NONE) **RETURN**

(WINDOW) **RETURN**

(HORIZ) **RETURN**

(BAR) **RETURN**

(NORMAL) **RETURN**

(2 MAN RACE) **RETURN**

(PLOT) **RETURN**

RETURN

(WINDOW) **RETURN**

(SWITCH) **RETURN**

(SELECT) **RETURN**

(BAR) **RETURN**

(NORMAL) **RETURN**

(3 MAN RACE) **RETURN**

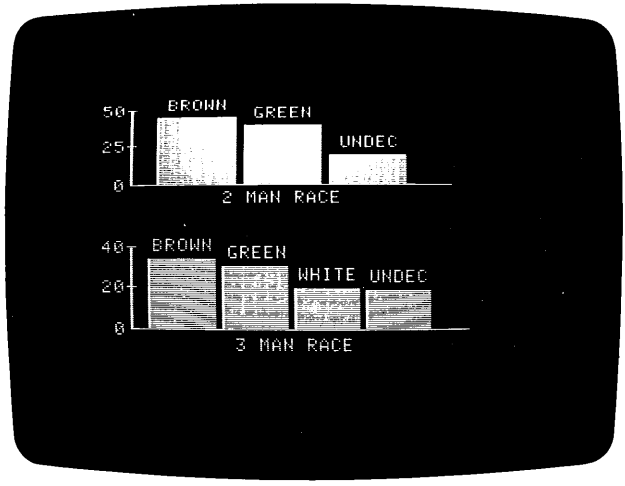
(PLOT) **RETURN**

There are several things to note in the creation of these charts. When you are working in one of the windows, the window is indicated by a code in the extreme right hand end of the bottom status line. The code begins with W for window and T for top or B for bottom. If you use side by side windows, the codes are R for right and L for left.

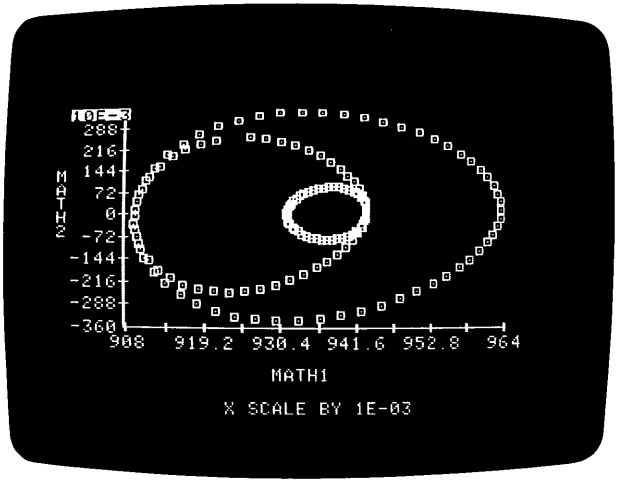
Legends are not included in charts drawn with the WINDOW function. You must create any required legends with the TITLE functions. Also, note that the range for these charts is not very meaningful. You can inlcude the meaning of the numbers in the legend or replace them with the names, or at least, a meaningful code, such as B, G, W, and U for Brown, Green, White, and Undecided.

There are two ways to leave the WINDOW function. You can select NEW from the Main menu or NONE from the WINDOW menu.

The following picture shows one of the ways the charts could be used.



A SCATTER CHART



(NEW) RETURN

(SCATTER) RETURN

(MATH1) RETURN

(MATH2) RETURN

(PLOT) RETURN

This chart does not have a time axis. The Y-axis contains the scale for the MATH1 series and the X-axis contains the scale for the MATH2 series. No lines are drawn in a Scatter chart, only points.

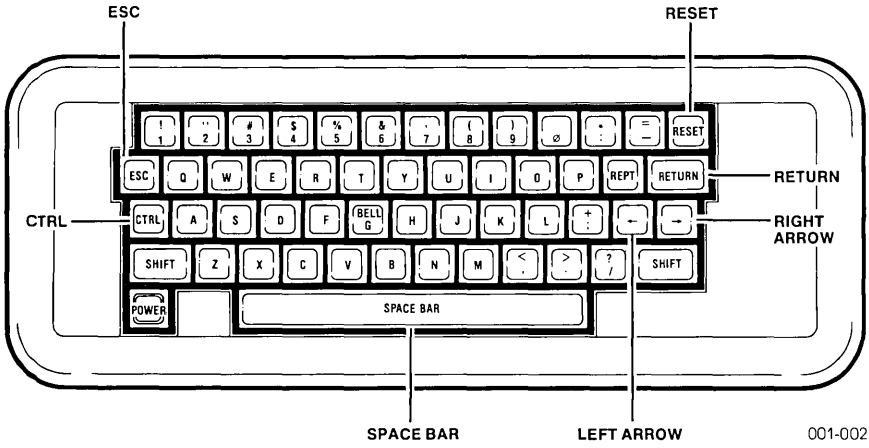
The plotted values are points from the two series with matching dates. The first point plotted is the time 1 value from each series, the second point is the time 2 value, and so on. The normal use of the scatter chart is to determine if there is a relationship between the two series. For example, a straight line scatter chart shows direct relationship between the two series. An analysis of the scatter patterns is beyond the scope of this manual.

REFERENCE

This chapter is the VisiPlot Reference. It describes the menu functions, error messages, and general VisiPlot concepts.

There are sections on Range, Scale, and general usage as well as menu function descriptions and error messages.

KEYBOARD USAGE



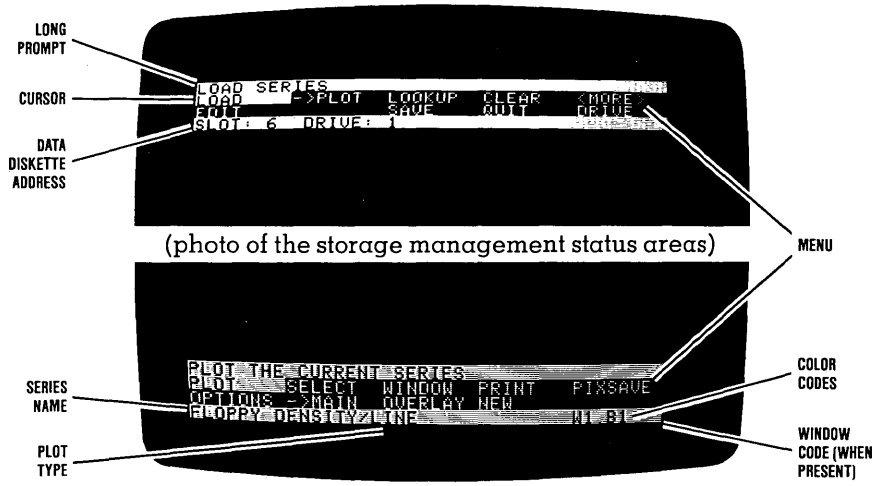
With the VisiPlot programs, the indicated keys have the following usage:

- The RETURN key issues the command indicated by the cursor in a menu, selects a list item indicated by the cursor, or enters data entered at the keyboard.
- The Space Bar marks (and unmarks) list items when multiple selection is allowed. When multiple selection is not allowed, the Space Bar performs the same function as the RETURN key.
- The Right Arrow key moves the cursor to the right in a menu and down in a list.
- The Left Arrow key moves the cursor to the left in a menu and up in a list.
- The ESC key corrects errors during data entry by erasing the last displayed character. This key also erases the status area when a chart is displayed.
- The Y key is an affirmative response to the prompts to verify your request when changing programs, deleting files, and exiting the PIE chart shading function.

- The CTRL-C key combination interrupts the printing of a chart or list. CTRL-C should not be pressed except to interrupt a printing operation.
- The RESET key should never be pressed. If it is accidentally pressed, the operation in progress is terminated and you are usually returned to the Main menu in the program currently executing—the Main Storage Management menu or Main Plot menu.

THE STATUS AREAS

The following photographs show the Storage Management and the Plot status areas and their components.



(photo of the storage management status areas)

- The Long Prompt gives a longer description of the function to which the cursor is pointing.
- The Cursor indicates a menu item. The indicated item is selected if the RETURN key is pressed.
- The Data Diskette Address indicates the disk drive to which LOAD, SAVE, INIT, and DELETE operations are directed.
- The Plot Type indicates the type of chart that was last selected.
- The Series Name indicates the selected series or the first of multiple series selected.
- The Color Codes indicate the plotting color in use (left) and the background color in use (right). When multiple series are selected, only the first plotting color is shown in the status area.
- The Window Code indicates that the window mode is active and which window is selected: top (WT), bottom (WB), left (WL), or right (WR).

RANGE AND HOW IT IS USED

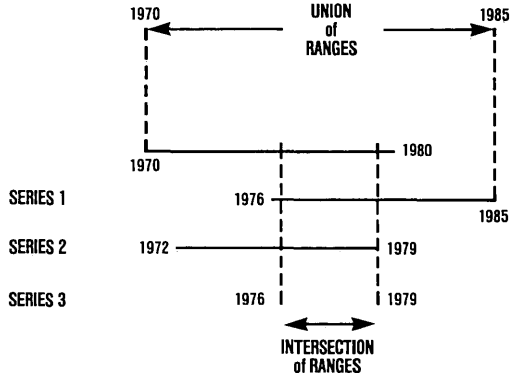
Range is the period of time covered by the chart. The VisiPlot program plots range against the X-axis (the horizontal axis). The range does not have to be measured in units of time, although it usually is. The range can be a reference number assigned to items. The VisiPlot documentation treats the range as time bounds because most ranges are measured in time: daily, weekly, monthly, quarterly, or yearly.

The range has two parts, the major range which is usually expressed as years and the minor range or the period. The period divides the range into subparts. You can divide the range into any number of parts from 1 (no division) to 99. Normal uses of the period are to divide the year into months, quarters, or weeks. The use of both the major and minor range is up to you. The major range can be days or weeks or months; it does not have to represent years. Likewise, the period can represent anything you want it to represent.

How the Range is Calculated

The range is calculated before each PLOT from the date information in the selected series. The range for a single series is the period from the start date to the end date.

The calculated range for multiple series depends on the type of chart being plotted. Line and area charts use the union of the individual ranges. That is, the start date for the chart is the earliest start date in the selected series and the end date is the latest end date in the selected series. Hi-lo, bar, and scatter charts use the intersection of the individual ranges. That is, the earliest and latest dates common to all selected series are used as the range.



Union and Intersection of Ranges 001-006

The maximum number of points in any range is 150 and the minimum is 2. The maximum and minimum apply to all resultant ranges of all selected series.

The pie chart is a special case. A pie chart is a comparison of different items at a single point in time rather than a comparison of the same item at different points in time.

Changing the Range

The VisiPlot program always determines a range for whatever series are being plotted. There are circumstances where you may want to expand or limit that range. The range you specify must have at least two data points and no more than 150 data points. It must also have at least two data points in common with the selected series.

The RANGE function in the Options menu provides the means of changing the program calculated range.

SCALE AND HOW IT IS USED

Scale is the scope of values plotted against the Y-axis (vertical axis). The scale is totally dependent on the data being plotted. It may be positive, negative, or span the zero point. Its incremental units may be a fraction of a single unit or millions or more.

How the Scale is Calculated

The program selects a range of values that encompass the highest and lowest values in the series. This range is rounded up or down to values that are round and even. It then sets a number of divisions that result in round and even labels when possible. The number of divisions is usually 10 but other appropriate numbers will occur.

The VisiPlot program usually does a satisfactory job of figuring out a good scale for your data. There may be times when the values on the scale come out unrounded and generally unaesthetic. When this happens you should use the RESCALE function in the Options menu to obtain more pleasing or meaningful Y-axis labels.

You must enter data in decimal notation. The program converts large and small numbers to exponential notation for display purposes and specifies a scaling factor at the top of the Y-axis.

Changing the Scale

The VisiPlot program always determines a scale for whatever series are being plotted. There are circumstances where you may want to expand or limit that scale.

The RESCALE function in the Options menu provides the means of changing the program calculated scale and the number of divisions.

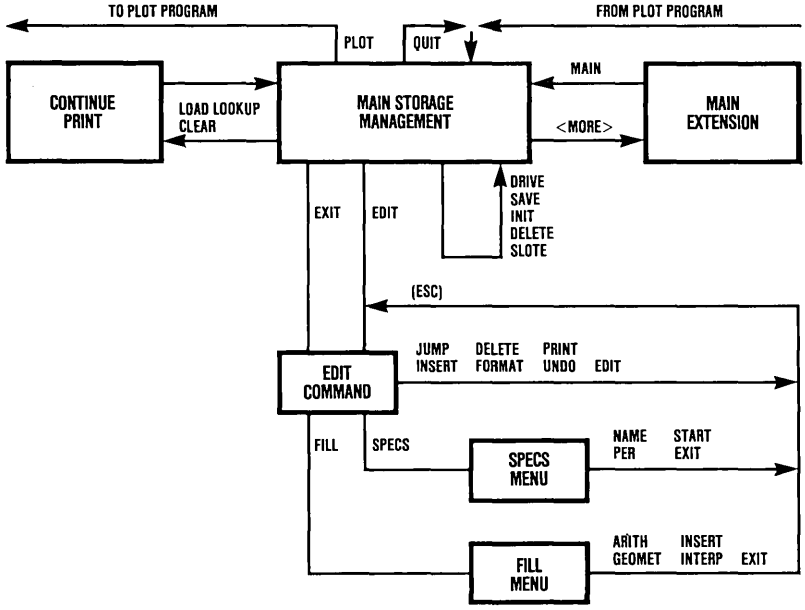
When choosing the number of divisions, subtract the low end of the scale from the upper value and pick a number of divisions that divide evenly into that value.

THE VISIPLOT MENU FUNCTIONS

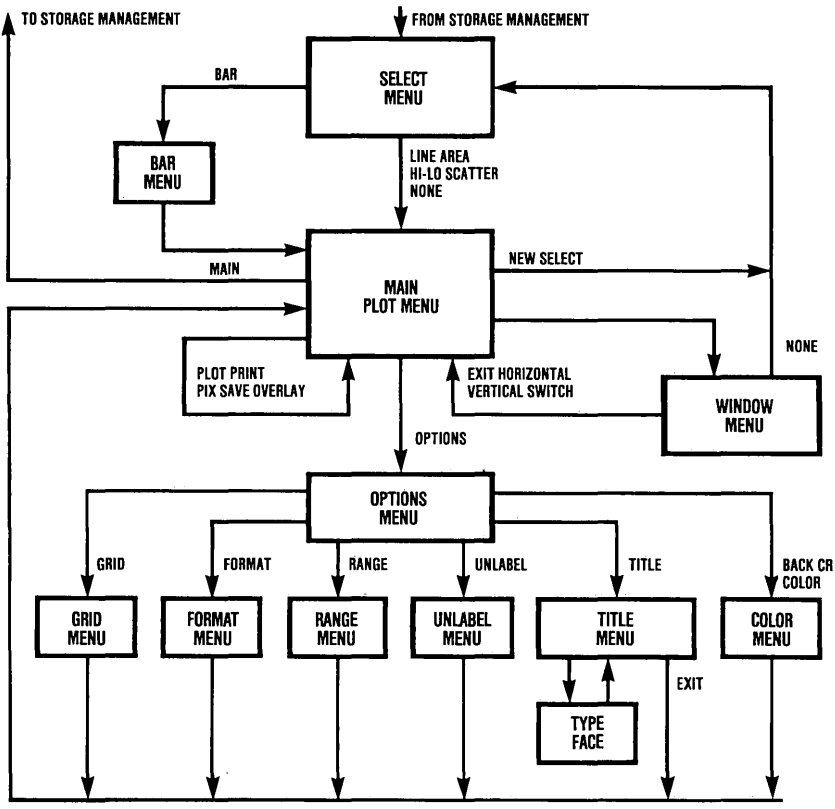
This section describes the VisiPlot menu functions in alphabetical order. Along with the menu item descriptions, it lists the program in which the function is used and the menu in which it is found.

The menu flow charts show how to get to the various menus in each program.

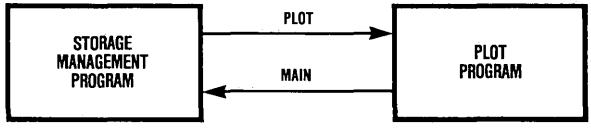
Flow between the program is always via —>PLOT in the Edit program and —>MAIN in the Plot program.



Storage Management Flowchart 001-007



Plot Program Flowchart 001-008



Interprogram Flowchart 001-009

ARITH (Storage Management program—Fill menu)

The ARITH function inserts new data into the current series beginning at the location of the cursor. The new data is an arithmetic progression. You are prompted for the number of points to be inserted and the factor by which the preceding point is to be increased or decreased. The new data points are inserted immediately following the data point currently indicated by the cursor.

AREA (Plot program—Select menu)

The AREA function specifies that an area chart is to be drawn. You must choose one or more series. When choosing multiple series, all series must have the same period. When multiple series are plotted, each series overdraws the previous series. You should select the series with the largest values first, then the next largest, etc. If the series have mixed values, you will not get full detail for either series. In this situation, use the OVERLAY function to draw a line graph of one of the series. All area charts are plotted from the base line; they are not stacked.

BACKGR (Plot program—Options menu)

The BACKGR function sets the background color of the plot. BACKGR can only be used with LINE, BAR, and AREA charts; it cannot be used with PIE, HI-LO, and SCATTER charts. This function displays the color menu, offering a selection of eight colors. With black and white display monitors, only three backgrounds are available; all non-white and non-black colors produce the same halftone on the black-and-white screen.

The program displays the code for the color in the lower right corner of the status area. Two colors are listed; the first is the plotting color and second is the background color.

The BACKGR color is retained until it is explicitly changed with the BACKGR function or until it is reset with the NEW function.

When you change the background color, the VisiPlot program changes the plotting color to avoid using the same color for background and plotting and to provide a clear, readable plot. You can change the plotting color after changing the background color, if you desire.

The following table lists the plotting colors the program uses for the various background colors. The following plotting colors apply if the background color was last selected. The series2 colors apply only when multiple series are selected. If a single series is selected and overlayed,

the series1 color is used. The plotting colors for one and two current series are listed. If more than two series are selected, the colors are repeated, that is, the third series is plotted in the same color as the first series.

NOTE: If you want three different colors for multiple series charts, you must select the first plotting color with the COLOR option. See COLOR for the colors used.

Table 3-1. Plotting Colors Generated by BACKGR

SELECTED BACKGROUND COLOR	LINE		AREA AND BAR*	
	FIRST COLOR (and 3rd)	SECOND COLOR (and 4th)	FIRST COLOR (and 3rd)	SECOND COLOR (and 4th)
Black1	White	White	White	Green
Green	Black	White	White	Black
Violet	Black	White	White	Black
White1	Black	Black	Black	Green
Black2	White	Orange	White	Blue
Orange	Black	White	White	Black
Blue	Black	White	White	Black
White2	Black	Blue	Black	Blue

*Stacked bar charts may be slightly offset from one series to the next due to the manner in which the Apple II handles color display.

BAR (Plot program—Select menu)

The BAR function specifies that a bar chart is to be drawn. You must choose one or more series. When choosing multiple series, all series must have the same period. When multiple bar charts are plotted, the bars for the various series are stacked on top of each other. That is, the first series is plotted on the base line and subsequent series are plotted from the top of the existing bars. The series are plotted in the order in which they are chosen.

When selecting a bar chart, you have the choice of full-width bars centered on the tick marks or half-width bars located to the left or right of the tick marks. The half-width bars are normally used to draw comparison charts. A comparison chart requires two selections—the first is PLOTed and the second is OVERLAYed. There may be very slight overlay between the left and right bars of a comparative chart. There may also be a slight offset at the divisions of stacked bar charts.

No zero line is drawn for bar charts with negative values.

Bar chart bars are displayed in one of three formats: solid, outlined, and shaded (outline plus horizontal stripes) bars.

BOTH (Plot program—Format, Grid, and Unlabel menu)

The BOTH function specifies that both of the subject items are to be used or deleted. In the Format menu BOTH means that plotting symbols and lines are used for line charts. In the Grid menu BOTH means that horizontal and vertical grid lines are to be drawn on the chart. In the Unlabel menu BOTH means that horizontal and vertical labels be erased from the chart.

BOTTOMn (Plot program—Title menu)

The BOTTOMn functions specify the titles at the bottom of the chart. n is a digit—1, 2, or 3—specifying the first, second, or third bottom title line. The bottom titles are limited to 38 characters each. The titles are centered across the bottom of the chart. You must choose between bold and normal type face in the titles. The bottom titles cover the legend lines. BOTTOM1 is uppermost and BOTTOM3 is the lowest.

BOLD (Plot program—Title menu)

The BOLD function specifies that the subject title be displayed in bold characters. The alternative to bold titles is normal titles. All fixed titles except LEFT can be displayed in the bold typeface.

CLEAR (Storage Management program—Main menu)
(Plot program—Options menu)

In the Storage Management program, the CLEAR function specifies that the selected series be erased from the computer memory. You are prompted to select all, none, or specific series to be erased. This function does not affect the files stored on diskette.

In the Plot program, the CLEAR function specifies that the range values you defined are to be disregarded and the range values stored with the series are to be used. This function has no effect if you did not define a range.

COLOR (Plot program—Options menu)

The COLOR function changes the plotting color used to draw a chart. This function displays the color menu, offering a selection of eight colors. With black-and-white monitors, only three colors are available; all non-white and non-black colors produce the same halftone on the black-and-white screen.

The program displays the code for the color in the lower right corner of the status area. Two colors are listed; the first is the plotting color and the second is the background color.

The plotting color is changed when the background color is changed. See BACKGR for a listing of the plotting colors generated when BACKGR is used. The following table lists the colors used for second and third selected series when the first plotting color is selected with the COLOR option. Note that only two plotting colors are available when BACKGR is used to allow the program to select the plotting colors and three plotting colors are available when you select the first plotting color with the COLOR option. COLOR must be used after BACKGR. Multiple plotting colors only apply to multiple selections plotted or overlayed at the same time. The sequence is not carried between plotting and overlaying, that is, when a series is overlayed, the color sequence starts over with the first color regardless of the number of series already plotted.

Table 3-2. Plotting Colors Generated by COLOR

SELECTED COLOR (and 4th color)	SECOND COLOR (and 5th color)	THIRD COLOR (and 6th color)
Black1	Green	Violet
Green	Violet	White
Violet	Green	White
White1	Violet	Green
Black2	Orange	Blue
Orange	Blue	White
Blue	Orange	White
White2	Blue	Orange

CONTINUE (Storage Management program—various menus)

The CONTINUE function is used in several functions that display data on the screen. If there is more data to be displayed, the CONTINUE function displays the next screenfull. When the last screen is displayed, CONTINUE exits the function and displays the next menu.

When used with the PRINT function, CONTINUE means return to the next menu without printing the screen contents.

DEFAULT (Plot program—Color menu)

The DEFAULT option returns the background and plotting color to the initial program selected colors, black1 and white1 (B1.W1). If you have not changed the colors, this option has no effect. When used with the

BACKGR function, DEFAULT changes both the background and the plotting color. Used with COLOR, it changes only the plotting color.

DELETE (Storage Management program—Edit commands menu) (Storage Management program—Main menu extension)

In the Edit command menu, the DELETE function deletes selected data points from the current series. The deletion begins at the item indicated by the cursor when the function is invoked. Moving the cursor to the last item specifies the other end of the range to be deleted. The cursor can be moved up or down on the list. If you move the cursor beyond the end of the list, the DELETE function is canceled.

In the Main Storage Management menu extension, the DELETE function deletes selected files from the data diskette. You select the file to be erased from the listing of the file directory. Before the file is erased, you are asked to confirm that you want to permanently erase the file.

DIF (Storage Management program—Main menu)

The DIF function specifies that the series being saved is to be stored in a DIF file. Data in this format can be used with other Personal Software programs, such as the VisiCalc program. The alternative is the NORMAL format, which is only usable by the VisiPlot program.

The DIF format is described in **Programmer's Guide to the Data Interchange Format,** document number SATN-18, which is available from the DIF Clearinghouse, P.O. Box 527, Cambridge, MA 02139.

DRIVE (Storage Management program—Main menu)

The DRIVE function changes the drive number assigned as the data diskette drive. If drive 1 is currently assigned, the DRIVE function changes the assignment to drive 2 and vice versa. The DRIVE function, along with the SLOT function, specifies where the data diskette resides.

EDIT (Storage Management program—Main menu)

The EDIT function invokes the Edit facilities. You are prompted to select a series from those currently in memory or to create a new series. When creating a new series, you are prompted for the name, period, starting date, and first data point. See DELETE, EDIT, EXIT, FILL, FORMAT, INSERT, JUMP, and SPECS.

EXIT (Plot program—various menus)
(Storage Management program—various menus)

The EXIT function leaves the current menu without performing a function. Usually, the EXIT function returns to preceding menu.

FILL (Storage Management program—Edit commands menu)

The FILL function generates data to be placed in the current series. The data can be an arithmetic series, a geometric series, or a series currently in memory. You are prompted for the number of values and factor for the first two and a series name for the last. In all cases the new data is inserted following the item currently indicated by the cursor. FILL also provides a linear interpolation function to approximate missing data points. See ARITH, GEOMET, INSERT, and INTERP.

FORMAT (Storage Management program—Edit command menu)

The FORMAT Edit command specifies how the data is displayed on the screen. Unless otherwise specified data is displayed in the floating point format. In the fixed format, you can specify the number of decimal places (the precision) and the column width (the total number of digits). The precision can be 0 to 6 digits and the column width 6 to 15 digits. Numbers that are too large for the column size and numbers in the exponential format (3E-3 for example) when the fixed format is specified are displayed as a series of greater than symbols (>). You cannot enter values in the exponential format, the program converts numbers less than .001 and greater than 9 digits to the left of the decimal point to the exponential format.

FORMAT (Plot program—Options menu)

The PLOT program FORMAT function specifies how a line, bar, or scatter chart is to be displayed. This function is not available for area, pie, and hi-lo charts. It displays a different menu for the different supported charts. When the function is chosen for an unsupported chart, the message CAN'T! NO OPTION HERE is displayed.

The line chart FORMAT menu allows the choice of plotting with both lines and symbols, lines only, or symbols only.

The bar chart FORMAT menu allows the choice of plotting with solid, shaded, or outlined bars.

The scatter chart FORMAT menu allows the choice of plotting with symbols or points.

The chart format is retained until changed by another FORMAT function, until a different type of chart is selected, or until reset by the NEW function.

GEOMET (Storage Management program—Edit commands menu)

The GEOMET function specifies that new data is to be inserted into the current series in a geometric progression. You are prompted for the number of data points to be generated and for the factor by which each preceding point is to be multiplied. The data points are inserted immediately following the data point currently indicated by the cursor.

GRID (Plot program—Options menu)

The GRID function draws grid lines on the currently displayed chart. The function is valid for all charts except pie charts. It offers the choice of vertical, horizontal, or both vertical and horizontal grid lines. You can erase grid lines by selecting them for a second time. For example, by selecting horizontal grid lines while horizontal grid lines are displayed erases the lines. You can erase horizontal, vertical or both. You cannot invoke this option until a chart is displayed.

HI-LO (Plot program—Select menu)

The HI-LO function specifies that a HI-LO chart is to be drawn. You must select two series. You are prompted to select the high series and the low series. You can select the series in either order, the program distinguishes between the high and low values. You cannot generate HI-LO charts with multiple sets of series, but you can overlay the charts. A HI-LO chart is displayed as a series of vertical lines connections the high and low values. The vertical lines are not connected from time period to time period.

If you OVERLAY a HI-LO chart with a line chart, the line chart is plotted with points only. The points appear slightly to the right of the vertical lines. This feature makes it easy to generate stock charts showing high, low, and close. If you want to overlay a line chart with lines and/or symbols, you must select the format option.

HORIZ (Plot program—Grid, Unlabel, and Window menus)

The action of the HORIZ function depends on the menu from which it is invoked.

In the GRID function it specifies that horizontal grid lines are to be drawn. If horizontal grid lines already exist, this function erases them.

In the UNLABEL function it specifies that the horizontal range labels (X-axis) are to be erased.

In the WINDOW function it specifies that the screen is to be divided into top and bottom windows as opposed to side by side windows.

INSERT (Storage Management program—Edit command menu)
(Storage Management program—Edit Fill menu)

In the Edit command menu, the INSERT function inserts a new data point anywhere within the selected series. The new point is inserted immediately preceding the data point at the current cursor location. The points that follow this point are pushed ahead to the next year and/or period. The last point in the series is given a new end date one period beyond the old last point.

In the Fill menu, the INSERT function inserts a selected series from memory into the currently displayed series. The new data immediately precedes the data point at the current cursor location. The new data is given the date of the current cursor location. The points that follow are pushed ahead and given new dates and/or periods as appropriate.

JUMP (Storage Management program—Edit command menu)

The JUMP function moves the cursor to a specific date in the currently displayed series. You are prompted for the date. With the arrow keys you can move the cursor to the beginning or end of the series. The right arrow key specifies the end of the series and the left arrow key specifies the beginning.

LEFT (Plot program—Title menu)
(Plot program—Bar Chart menu)

In the Title menu, LEFT specifies that a title is to be placed to the left of the Y-axis. The left title is written vertically from top to bottom. It is centered to the left of the chart. The left title is limited to 18 characters. The UNLABEL function erases the left title. If you have created left and right windows, you can put a different LEFT title in each. In the window mode, a single LEFT title is drawn when top/bottom charts are displayed and separate LEFT titles are drawn when left/right charts are displayed.

In the Bar Chart menu, LEFT specifies that half-width bars are to be drawn and placed to the left of the tick marks. LEFT, along with RIGHT, is usually used for comparative bar charts.

LEGEND (Plot program—Title menu)

The LEGEND function redisplays the chart legend after it has been erased by a bottom title. If you OVERLAY a chart after entering the bottom titles, the LEGEND function displays the legend for the overlaid chart, not the original legend. This function erases all bottom title lines that covered

legend lines. Any bottom title lines that didn't cover a legend line are not erased. With a pie chart, LEGEND erases the pie chart legend. Once the pie chart legend is erased, it cannot be redisplayed.

LINE (Plot program—Select menu)

The LINE function specifies that a line chart is to be drawn. You must choose one or more series. When selecting multiple series, all must have the same period. When multiple series are selected, the progam draws each with a different symbol. The first uses the square box, the second uses a diamond, and the third uses the pound sign. If more than three series are selected, the three symbols are reused. The legend lists the names of the first three plotted series and the symbol used for each. Only the first three selected series are listed in the legend.

LINES (Plot program—Format menu)

The LINES function specifies that the line chart being drawn is to be drawn with interconnecting lines and without symbols. This function is only valid for the line chart.

LOAD (Storage Management program—Main menu)

The LOAD function loads a file from diskette. Files contain one or more series. You are prompted to select a file name from the directory of the current data diskette. The SLOT and DRIVE functions are used to change the disk drive used for the data diskette.

If the out of room condition occurs, a partial load is performed if possible. As many series from the file as can be put into memory are loaded. The partial load only occurs with files stored in the normal VisiPlot storage format. Partial loads are not done with files in the DIF format.

LOOKUP (Storage Management program—Main menu)

The LOOKUP function lists the data series that are currently in memory. The display includes the series name, period, start date, end date, and number of data points in the series. Presents any key returns to the Main Storage Management menu. The program displays the LOOKUP list after each LOAD and CLEAR.

—>MAIN (Plot program—Main Plot menu)

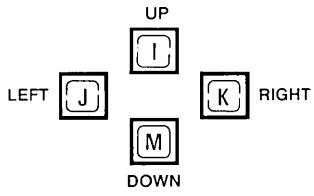
The —>MAIN function exits the Plot program and returns to the Storage Management program. You must verify that you want to change programs by responding to the prompt with Y.

MOVEABLE (Plot program—Title menu)

The MOVEABLE function places titles anywhere on the chart. A moveable title is limited to 32 characters.

This title is initially displayed at the left center of the chart. When first displayed, the title blinks; it continues to blink until it is fixed in place by pressing the RETURN key.

As the name implies, the title can be moved to any location on the screen. Movement is controlled by the I, J, K, and M keys and the space bar. The location of these keys indicates the direction they move the title:



001-004

The space bar stops the movement.

When you press a motion key, the title begins moving in the indicated direction until another motion key is pressed, the space bar is pressed, or the title runs into the outside limits of the chart. When the outside limit is reached, a beep is repeated until the motion is stopped or reversed. The number key, 1 through 9, control the speed; 1 is the slowest speed and 9 is the fastest. You can change speed during movement. Pressing a speed key starts motion again, in the last direction. If you don't choose a speed, 2 is used.

You can delete the moveable title at any time by pressing the ESC key. Before a moveable title is fixed in place, its deletion does not affect what is under it. After it is fixed in place it can still be erased but anything under it is also erased.

When the title is fixed, it is displayed in reverse video. Pressing the space bar changes it to normal video. Subsequent pressing of the space bar changes it back and forth. When you press RETURN the second time, the title is permanently fixed in either normal or reverse video. After the second RETURN, it can no longer be deleted. The second RETURN also returns you to the Title menu.

There is no limit to the number of moveable titles that can be put on a chart.

NAME (Storage Management program—Edit Specs menu)

The NAME function changes the name of the series being edited.

NEW (Plot program—Main Plot menu)

The NEW function clears the screen and deletes the currently active series. It also deletes any options you have set. NEW resets the default plotting and background colors. It returns to single window operation if two windows are set. The NEW function also calls the Select menu.

NONE (Plot program—various menus)

The NONE function exits from a menu without making a selection. NONE usually returns to the menu that called the current menu.

NORMAL (Plot program—Title menu)

(Plot program—Bar menu)

(Storage Management program—Save menu)

In the Title menu, NORMAL specifies that the subject title is to be displayed in the normal, as opposed to bold, typeface.

In the Bar menu, NORMAL specifies that the chart be drawn with full-width bars centered on the tick marks.

In the Save menu, NORMAL specifies that a series is to be stored in the normal VisiPlot storage format, as opposed to the DIF format. In the normal format, the data can only be used with the VisiPlot program. The VisiPlot storage format is described in Appendix C.

OPTIONS (Plot program—Main Plot menu)

The OPTIONS function calls the Options menu, which provides the means of changing certain plotting and formatting values such as range, scale, color, background, and format. It also provides the facilities to add titles to a chart. For more information see TITLE, RANGE, FORMAT, GRID, UNLABEL, RESCALE, BACKGR, and COLOR.

OVERLAY (Plot program—Main Plot menu)

The OVERLAY function draws a chart on top of an existing chart, unlike the PLOT function which erased the existing chart before drawing a new one. OVERLAY does not compute range or scale values, it uses the existing values of the current chart. If the chart to be overlaid does not fit in the existing range and scale, an error message is issued.

No legend is displayed for the overlaid chart.

A chart must be displayed before OVERLAY can be used.

The chart being overlaid must have the same period as the existing chart. You cannot change the RANGE, SCALE, or BACKGR between a PLOT and an OVERLAY.

If you follow an OVERLAY function with a PLOT function, only the last selected series is or are drawn, that is, the series selected for the OVERLAY, not for the original PLOT or previous OVERLAY.

All types of charts except pie charts can be overlaid. Chart types—with the exception of pie charts—can be mixed with the OVERLAY function.

PER (Storage Management program—Edit Specs menu)

The PER function changes the period of an existing chart. The function shows what the current period is and prompts for a new one. The valid periods are 1 through 99. If you don't enter a new period, the existing one is used. If you specify a new period, the currently displayed series is erased and redisplayed with the new period. The current beginning date is retained.

PIE (Plot program—Select menu)

The PIE function specifies that a pie chart is to be drawn. A pie chart consists of a circle that is divided into segments. The size of each segment is proportional to the ratio of the segment data value to the sum total of all the data values.

An individual pie chart compares the values at a specified date or reference number of two to eight series. It does not compare the different values in a single series. It is possible to do a pie chart for a single series but resulting chart is a circle and the single series has a percentage of 100%.

In a pie chart the segments are drawn in a clockwise direction beginning at the 3 o'clock position. You are prompted for the date or reference number of the data. Each selected series must have a value for the specified date. If some series have very small relative values that result in small percentages, the legend letters around the chart may overlap. If this occurs, change the order in which the series are selected so that small segments are not side by side.

The pie chart is drawn with a letter outside the segments that corresponds to a line in the legend. The legend is in a box to the right of the chart that contains the series name and its relative percent of the total. The date or reference number of the data is displayed at the bottom of the legend. Because of rounding, the percentages listed in the legend may not add up to 100%.

The shading and titling prompts are displayed. You may title, shade, and title again. This sequence is fixed and once you have finished the second title phase, you cannot alter the pie chart. All the usual titling capabilities apply. You can erase the legend with the LEGEND function of the Title menu. This use of the LEGEND function applies only to pie charts.

PIXSAVE (Plot program—Main Plot menu)

The PIXSAVE function saves the screen image on a diskette file. The PIXSAVE file cannot be reloaded into the VisiPlot program. It can be used with user-supplied programs, such as screen dumps for graphic printers. You are prompted to put a data diskette in the data diskette drive. The PIXSAVE file does not show up on the VisiPlot directory; it will, however, show up on the DOS 3.3 CATALOG command. Appendix A contains a listing of a simple program that prints a PIXSAVE file.

PLOT (Plot program—Main Plot menu)

The PLOT function specifies that the currently selected data series is to be plotted according to the current options. The PLOT function erases an existing chart. The error message PLEASE SELECT FIRST is displayed if no series is selected. After the chart is drawn, pressing any key returns the Main Plot menu to the screen.

—>PLOT (Storage Management program—Main menu)

The —>PLOT function specifies that the Plot program is to be loaded. You must verify that you want to change programs by pressing the Y key in response to the message TYPE Y TO CONFIRM. If you press any other key, the request to change programs is cancelled.

PRINT (Plot program—Main Plot menu)

(Storage Management program—various menus)

The PRINT function reproduces the screen image on the supported printer. The printer controller can be plugged into any slot (slot 1 is recommended). This function prompts for the slot number. CTRL-C interrupts the function and returns to the menu from which PRINT was issued. If the printer is not recognized in the specified slot, an unrecoverable error occurs and you must re-load the program and begin again.

To print graphs on printers that are not supported by the VisiPlot program, see PIXSAVE.

QUIT (Storage Management program—Main Menu)

The QUIT function returns control to Applesoft Basic. The Applesoft prompt (]) is displayed. To return to VisiPlot program you must enter the command: RUN INIT. All files you have in memory when you select QUIT are erased, you must LOAD them again after reloading the VisiPlot program.

RANGE (Plot program—Options menu)

The RANGE function calls the Range menu. The Range menu displays the current series range. The RANGE menu lets you SET a new range or CLEAR a range you have previously SET. When SET is chosen, it prompts for new starting and ending dates. The chart is not redrawn until the PLOT function is executed. You also have the option to CLEAR a user—set range. CLEAR has no effect on the range if you have not changed it with the SET option. You also have the option of exiting the function. See the description of range for a description of how the VisiPlot program sets ranges for different chart types.

RESCALE (Plot program—Options menu)

The RESCALE function changes the Y-axis scale established by the program. The function prompts for a new minimum and a new maximum value. It also requests the number of divisions into which the Y-axis is to be divided (tick marks). For a scatter chart, it also prompts for maximum, minimum, and number of divisions for the X-axis.

If you specify a minimum that is greater than the maximum, the VisiPlot program reverses the values. If you specify the same value for the minimum and maximum, the program uses the specified value as the minimum and sets a maximum that is approximately 20 percent higher.

See the Scale section for a description of how the VisiPlot program sets scales for the charts.

RIGHT (Plot program—Bar menu)

The RIGHT function specifies that a bar chart is to be drawn with half-width bars located to the right of the tick marks. This function, along with the LEFT function, is used to draw comparative bar charts.

SAVE (Storage Management program—Main menu)

The SAVE function writes one or more series to a diskette file for permanent storage. You must choose whether the data is to be saved in the normal VisiPlot format or the DIF format. After you select a format, the function displays a list of the series currently in memory and requests that you select those to be saved. It then displays a list of the files currently on the data diskette. You can choose to store the selected series in an existing file or create a new file. If you choose an existing file, the data that is currently in that file is erased and replaced by the new series. If you choose to store the series in a new file, you are prompted to name the file. If you do not specify a name, the SAVE request is cancelled.

SCATTER (Plot program—Select menu)

The SCATTER function specifies that a scatter chart is to be drawn. You are asked to select the series to be plotted along the X-axis and the Y-axis. The X-axis is scaled to the minimum and maximum for the X-axis series and the Y-axis is scaled correspondingly for the Y-axis series. The range of a scatter chart is the intersection of the two series and is not explicitly shown in the chart. You can change the range.

A scatter chart can be drawn with points or plotting symbols. If you don't make a choice with the FORMAT function, plotting symbols are used.

When you RESCALE a scatter chart, you are asked for new scale values for both the X- and Y-axis.

The X-axis scale factor, when required, is displayed below the X-axis.

SELECT (Plot program—Main Plot menu)

The SELECT function calls the Plot program Select menu from which you can select the type of chart to be drawn. The SELECT function does not eliminate the current active series until a new chart is selected and it does not change the current options in effect. You can keep the currently active series by choosing NONE and returning to the Main menu. To eliminate the current active series and the current options you have set, use the NEW function to call the Select menu.

The selected series name is displayed in the bottom line of the Main Plot status area. If you select multiple series, the name of the last one selected is displayed in the status area. When you select multiple series, the chart type in the Main Plot status area is followed by an ellipsis (...).

SET (Plot program—Range menu)

The SET function sets a new range for the series. You are prompted to enter new start and end dates for the new range. The range you set can be eliminated with the Range menu CLEAR function.

SLOT (Storage Management program—Main menu)

The SLOT function changes the currently assigned slot number for the data diskette drive. After the program is loaded, the slot from which the program was loaded is used as the data diskette slot number. When the SLOT function is selected, the slot number is changed to the next lower consecutive slot if it contains a disk drive controller. If there is no controller in the next lower slot number, the SLOT function is ignored.

If you have disk drive controllers in slots 5 and 6 the SLOT function switches between them. If you have controllers in slots 4, 5, and 6, the function switches from 6 to 5 to 4 to 6 and so on. If you have controllers in slots 4 and 6, the function is ignored.

The VisiPlot program is loaded from the controller plugged into the highest slot number.

SPECS (Storage Management program—Edit commands menu)

The SPECS function changes the specifications of the current series. The specifications that can be changed are the name of the series, the period, and the start date. For further information see NAME, PER, and START.

START (Storage Management program—Edit Specs menu)

The START function changes the starting date of the current series. The series dates are changed immediately and shown in the display.

SWITCH (Plot program—Window menu)

The SWITCH function switches from one window to the other when the program is in two-window mode. This function does not affect the chart displayed in the current window. The current window designation, which is in the lower right corner of the status area, is changed to show the window that is being used.

When you switch windows, the chart in the window you leave is frozen. You cannot return to the window and make changes to it; you must return to the window and start over with the selection process.

SYMBOLS (Plot program—Format menu)

The SYMBOLS function specifies that a chart is to be drawn with plotting symbols alone (no interconnecting lines). This function is used in the Format menu for line and scatter charts.

TITLE (Plot program—Options menu)

The TITLE function calls the Title menu, which contains the functions to add top, bottom, left, and moveable titles to the currently displayed chart. For more information see TOP, BOTTOM, LEFT, LEGEND, and MOVEABLE.

TOP (Plot program—Title menu)

The TOP function centers a title over the displayed chart. The top title is limited to 38 characters. You are prompted to enter the title and then asked if it should be displayed in normal or bold typeface. You return to the Title menu from the TOP function.

UNDO (Storage Management program—Edit commands menu)

The UNDO function discards all changes made to a series during an editing session. This function restores the series to the condition it was in when it was selected for editing. When you UNDO a newly created series, it is deleted.

UNLABEL (Plot program—Options menu)

The UNLABEL function erases the X- and/or Y-axis labels. The function displays the Unlabel menu which offers the choice of erasing horizontal (X-axis) labels, vertical (Y-axis) labels, or both. You can also exit the function without erasing either. When the vertical labels are erased, a left title is also erased if it is present. If no chart is displayed, this function immediately returns to the Main menu.

VERT (Plot program—Grid, Unlabel, and Window menus)

The VERT function specifies that the currently selected function is to be performed in a vertical manner.

In the Grid menu, VERT draws vertical grid lines on the current chart.

In the Unlabel menu, VERT erases the current vertical labels.

In the Window menu, VERT divides the screen into side by side windows.

WINDOW (Plot program—Main Plot menu)

The WINDOW function divides the screen into two windows, switches between the windows, and changes back to a single, full screen window format. This function divides the screen into a horizontal configuration with top and bottom windows or a vertical configuration with side by side windows.

The chart legends are not displayed in the window mode.

The window mode is displayed in the extreme lower right corner of the status area. If the area is blank, the screen is not divided into two windows. When the screen is divided, the codes WT, WB, WL, or WR are displayed, indicating that the current window is the top, bottom, left or right window.

The two-window mode is cancelled by selecting NONE from the Window menu. It is also cancelled by the NEW function from the Main Plot menu and when a pie chart is selected.

ERROR MESSAGES

The following are the error messages issued by the VisiPlot program. The messages are in alphabetical order by the first word of the message. The error descriptions include suggestions on further action whenever possible. If an error message with a number appears, see **The DOS Manual**, Apple product number #A2L0036.

(beep)

A beep is sounded whenever inappropriate data is entered or an illegal operation is attempted. When inappropriate data is entered, no message is displayed, only the beep is sounded. When you encounter this, try your entry again. You probably pressed the wrong key by mistake, such as pressing a letter key when the program was looking for numeric data.

CAN'T! BAD PERIODICITIES

You selected series that have different periods. All series used in a chart, whether a multiple series chart or an overlay of two or more charts, must have the same period.

CAN'T! BAD RANGE

Several conditions can cause this message to be issued:

- There is no data in the range you specified with the RANGE function.
- There are more than 150 points in the range. For example, you tried to plot two series and the combined ranges of the two series exceeds 150 points.
- You attempted to draw a scatter chart with two series that have no common values at any date.
- You attempted to draw a pie chart with one or more series that have no data at the date specified for the pie chart.

CAN'T! ERROR: DISK I/O or DISK ERROR

This error can be caused by disk problems such as having the drive door open, no diskette in the drive, and a full diskette.

CAN'T! ERROR: WRITE PROTECTED

You attempted to save some series in a file on a write-protected diskette. Either replace the data diskette with one that is not write-protected or remove the write disable tab from the diskette. You should determine why the diskette was write-protected before removing the write disable tab.

CAN'T! NO OPTION HERE

Certain options are not applicable in all instances. When you see this error message, you tried to apply a function that is not legal in the current circumstances. Usually, an option can be applied wherever it is meaningful and useful. Some of the invalid uses of options are:

- Specifying GRID when no chart is displayed on the screen.
- Specifying the FORMAT option after selecting the COLOR or BACKGR options. (Plotting symbols do not appear properly in color or against colored backgrounds.
- Specifying BACKGR or COLOR for a pie, scatter, or hi-lo chart. Pressing any key except RESET returns to the main menu.

CAN'T! NO OVERLAY HERE

You attempted to use the OVERLAY function when there was no chart displayed. Or you specified COLOR or BACKGR and then immediately tried to overlay. You can select COLOR or BACKGR, then PLOT, and then OVERLAY another series.

CAN'T! PLEASE SELECT FIRST

You attempted to select the OPTIONS functions without first selecting a series. Select a series and then return to the OPTIONS function.

CAN'T! PRESS ANY KEY

You are drawing a bar chart that has an off-scale data point. This message occurs when the first off-scale bar is encountered. The VisiPlot program does not draw bar charts with off-scale data. This error also occurs if you press CTRL-C or RESET while drawing a graph.

DATA OFF SCALE: Y TO DISPLAY

You rescaled the chart and in the new scale, some data points fall outside the specified scale. Pressing Y causes a partial plot to be drawn. Each time an off-scale value is encountered, the beep sounds. Pressing any other key aborts the drawing of the chart. If the chart is a bar chart, the plot is aborted when the first off-scale data point is encountered.

NO ACTIVE SERIES

You attempted to invoke a function that cannot be invoked until a series is selected through the Select menu. You may have switched windows and forgotten to select a series for the new window. You must select a series after switching windows, even if you want to plot the same series.

NO MORE ROOM

You tried to LOAD a file when there was not enough room in memory to hold all the series in the file. You must CLEAR enough series out of memory to make room for the series in the file.

It is possible to get this error message if a non-VisiPlot file, that because of its format is mistaken for a VisiPlot file, is loaded.

PUT IN PROGRAM DISKETTE, PRESS ANY KEY

You tried to change programs when the VisiPlot program diskette was not in the boot slot. Insert the VisiPlot program diskette and press any key except RESET to continue.

PLEASE SELECT FIRST

You selected the PLOT or OPTIONS function when there was no current series to be plotted. You may have switched windows; you must use the SELECT function to select a series after switching windows, even if you want to plot the same series.

UNABLE TO LOAD: WRONG FORMAT

You attempted to load a file that is not in the VisiPlot data format or the DIF format

WON'T! THIS IS THE PROGRAM DISKETTE

You selected the INIT function and the drive that the program found in the data diskette drive is the VisiPlot program diskette. Initializing a diskette destroys everything on it. You cannot continue because you would destroy your program diskette.

APPENDIX A:

SAMPLE PRINT PIXSAVE PROGRAM

The following program prints a chart that was saved on diskette in binary format with the PIXSAVE function in the Plot program. This program assumes:

- The VisiPlot program diskette is in Drive 1 and contains the printer driver program under the name VISIPLOT.DRIVER.
- The data diskette is in Drive 2 and contains the PIXSAVE file that is to be printed. The sample program uses the name PLOT.PIX; change this to the name of your file.
- The printer interface card is plugged into Slot 1. The slot number is defined in the SLOT = 1 statement. If your printer is plugged into slot 5, you would enter the statement as SLOT = 5.

To create a program and save it on the program or any other diskette, enter the following:

```
NEW
1  REM DEFERRED MODE EXAMPLE
10 D$ = CHR$(4)
20 SLOT = 1
30 PRINT D$;"BLOAD VISIPLOT.DRIVER,D1,A$987C3"
40 HGR
50 PRINT D$;"BLOAD PLOT.PIX,D2,A$2000"
60 POKE 39118,SLOT
70 PRINT D$;"PR#";SLOT
80 CALL 39125
90 TEXT
100 PRINT D$;"PR#0"
110 END
SAVE —name
```

See **The DOS Manual** for details on saving a program on diskette and the **Applesoft Basic Programming Reference** manual for details on entering a program in deferred mode.

You can also enter a series of commands in immediate mode and have them executed as you enter them. This series of commands must be entered each time you want to print a chart.

```
D$ = CHR$(4)
SLOT = 1
HGR
BLOAD PLOT.PIX,D2,A$2000
POKE 39118,SLOT
PRINT D$,"PR#";SLOT
CALL 39125
PRINT D$;"PR#0"
TEXT
```

NOTE: When you enter statements in immediate mode, the statements may not appear on the screen after typing HGR. This is a normal condition, not an error. TEXT restores the screen to normal (non-graphics) mode.

See the **Applesoft Basic Programming Reference** manual for details about entering commands in immediate mode.

APPENDIX B:

SUPPORTED GRAPHIC PRINTERS

The VisiPlot program supports the following graphic printers:

- Apple Silentype
- IDS Paper Tiger 440 and 445 (with graphics option installed)
- NEC Spinwriter 5510, 5515, 5520, and 5525 (with NEC-graphics option installed)
- Trendcom 200

Any printer and model not specifically mentioned is not supported.

In support of these printers, the VisiPlot program diskette contains several driver programs. The program uses only one printer driver that must be named VISIPLOT.DRIVER. To use a different printer you must RENAME one of the supplied drivers on the program diskette to VISIPLOT.DRIVER.

The program comes with the driver for the Apple Silentype stored as VISIPLOT.DRIVER. If you use a different printer, first rename VISIPLOT.DRIVER to SILENTYPE.D and then rename the driver for your printer to VISIPLOT.DRIVER. It is advisable to write down the name of the driver that you rename VISIPLOT.DRIVER. Use the same names if you change drivers, this could save you considerable trouble if you change printers often. To change the names you must use the DOS 3.3 RENAME command. Be sure to remove the write disable tab before attempting to RENAME a driver file. Also be sure to replace the write disable tab after changing the names.

When using the printer drivers, it is your responsibility to position the paper in the printer before you request the printing of listings or charts. No automatic form feeds, top of form, and so forth are provided.

Table B-1 lists the driver names for the various configurations of the supported printers. The references to double width graphics and auto linefeeds are software functions, not hardware options. You need no extra equipment to use them. Auto linefeed means that the printer driver automatically supplies a linefeed after each carriage return. If your printing comes out double spaced and you are using an auto linefeed driver, use the corresponding non-auto linefeed driver. If your printing comes out all on the same line and you are not using an auto linefeed driver, use the corresponding auto linefeed driver.

TABLE B-1. Drivers for the Supported Printers

PRINTER	DRIVER NAME	DESCRIPTION
Apple Silentype	SILENTYPE.D	Apple Silentype Printer/ Interface
	SILENTYPE-DW.D	Apple Silentype w/double width graphics
IDS Paper Tiger	IDS-44X-S.D	IDS 440G/445G w/ Apple Serial Interface
	IDS-44X-S-LF.D	IDS 440G/445G w/ Apple Serial Interface w/auto linefeed
	IDS-44X-P.D	IDS 440G/445G w/ Apple Parallel Interface
	IDS-44X-P-LF.D	IDS 440G/445G w/ Apple Parallel Interface w/auto linefeed
NEC Spinwriter	NEC-SPINW-S.D	NEC Spinwriter w/ Apple Serial Interface
	NEC-SPINW-S.LF.D	NEC Spinwriter w/ Apple Serial Interface w/auto linefeed
	NEC-SPINW-P.D	NEC Spinwriter w/ Apple Parallel Interface
	NEC-SPINW-P-LF.D	NEC Spinwriter w/ Apple Parallel Interface w/auto linefeed
Trendcom	TRENDCOM.D	Trendcom 200 printer/interface
	TRENDCOM-DW.D	Trendcom 200 w/ double width graphics

PRINTER SUPPORT FOR NON-GRAPHIC PRINTERS

If you have a printer other than the supported graphic printers, you can print listings but not charts. Textual printing is supported for specific interfaces as opposed to specific interface/printer pairs. There are four printer drivers for the Apple parallel and serial interfaces with and without automatic linefeed. The drives are listed in Table B-2.

TABLE B-2. Drivers for the Text-only Interfaces

INTERFACE	DRIVER NAME	DESCRIPTION
Parallel	TEXT-P.D	Apple Parallel, w/o auto linefeed
	TEXT-P-LF.D	Apple Parallel, w/ auto linefeed
Serial	TEXT-S.D	Apple Serial, w/o auto linefeed
	TEXT-S-LF.D	Apple Serial, w/ auto linefeed

IDS PAPER TIGER 440/445

You must have the graphics option to print VisiPlot charts. The graphics option is denoted by a G in the model number i.e. 440G and 445G. Without the graphic option, you can print only listings, not charts.

Serial Operation

For operation with the Apple Serial Interface card, the P8 PROM, not the P8A PROM, must be installed in the interface card.

The Baud rate limit is 1200.

The DIP switch settings for use with the VisiPlot program and a serial interface card are:

DIPS4 SW1,2 —character density—user choice
SW3 —lines per inch—user choice
SW4 —auto page ship—user choice
SW5 —auto linefeed—user choice (select correct driver to match setting)
SW6 —remote printer control deselect—Off
SW7 —power source—Off is 60 Hz.

DIPS5 SW1,2,3—page size—user choice
SW4,5 —must match serial card baud rate selection
SW6 —graphics print capability enable—On (switch is meaningless if no graphic option)
SW7 —serial EIA interface selection—On

You must use a cable that directly connects pins 2, 3, and 7 directly between the male and female ends. The lines connecting pins 2 and 3 must not be swapped.

The switches on the Apple Serial Interface card should be set as follows:

1,2,3—baud rate, up to 1200 baud maximum
4 —off—carriage return delay enabled
5,6 —according to paper size (must not be set to on/on)
7 —on—auto linefeed disabled (preferred) the setting does not matter; it is overridden by the driver

Parallel Operation

To use the Apple Parallel Interface card use the following DIP switch settings on the printer:

DIPS4 SW1,2 —character density—user choice
SW3 —lines per inch—user choice
SW4 —auto page ship—user choice
SW5 —auto linefeed—user choice (select correct driver to match setting)
SW6 —remote printer control deselect—Off
SW7 —power source—Off is 60 Hz.
DIPS5 SW1,2,3—page size—user choice
SW4,5 —not used with parallel operation; applies only to serial operation
SW6 —graphics print capability enable—On (switch is meaningless if no graphic option)
SW7 —parallel TTL interface selection—Off

NEC SPINWRITER 5510, 5515, 5520, and 5525

The NEC Spinwriters require the NEC-compatible graphics option. They will not operate correctly with the VisiPlot program if the Diablo-compatible graphics option is installed.

The switches on your Spinwriter should be set at the following:
SPEED—same as speed set on interface card
PARITY—same as parity set on interface card
DUPLEX—not applicable
LOCAL LF—off
LF—6
SP—10
FORM LENGTH—as appropriate for paper in use
REMOTE/LOCAL—remote (if present)

If your Apple Serial Interface card has the P8 PROM, the serial operation speed cannot exceed 300 baud. If the P8A PROM is installed, the speed cannot exceed 1200 baud.

The Spinwriter may beep and not start printing when you first attempt to print after the Apple II is powered-on. To clear this, press the RETURN key on the Apple keyboard.

APPLE SILENTYPE

No set-up is required. Use the printer driver that matches your configuration.

TRENDCOM 200

No set-up is required. Use the printer driver that matches your configuration.

APPENDIX C:

THE VISIPLOT INTERNAL DATA FORMAT

VisiPlot data series can be stored in either of two formats: the VisiPlot data format and the DIF format. Data is stored in the VisiPlot data format when you select NORMAL from the SAVE format menu. It is stored in the DIF format when you select DIF. Data in the DIF format can be used by other Personal Software programs.

The VisiPlot data format is described in this appendix. The DIF format is described in the document Programmer's Guide to the Data Interchange Format, number SATN-18 which is available from the DIF Clearinghouse, P.O. Box 527, Cambridge, MA 02139.

A VisiPlot data file is an Apple Sequential Text File which is described in The DOS Manual, Apple number A2L0036. The fields are variable length and each field is terminated with a RETURN. The following list contains a description of the contents and, in parentheses, the limitations on and expected contents of the fields.

The fields of a data file are:

Number of series (1–16)
Series name (string—up to 14 characters)
Number of data points (1–150)
Periodicity (1–99)
Start year (0–2499)
Start period (1–periodicity)
End year (must be consistent with the start year and period, the
End period periodicity, and number of points)
Data point 1
Data point 2
•
•
•
Data point n
•
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The following is the listing of a sample file containing two series, named FIRST and SECOND. FIRST has a period of 1 and contains five data points beginning at date 1. The values of the data points are 100, 200, 300, 400, and 500. Second has a period 1 and contains 3 data points beginning at date 1980. The values of the data points are 1111, 2222, and 3333.

2	number of series in file	
FIRST	series name	first series
5	periodicity	
1	start date	
1	start period	
5	end date	
1	end period	
100		
200		
300	data points	
400		
500		
SECOND		second series
3		
1		
1980		
1		
1982		
1		
1111		
2222		
3333		

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