

TIMEWORKS
PLATINUM[™]
SERIES

For Apple //e (enhanced),
//c, //c Plus, IIGS, Laser**
and compatible computers

User's Manual

Graph-It!^{*}

*One Keystroke Creates Your Graph to Your
Exact Specifications in Less Than 10 Seconds!*

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Customer Support Plan

Timeworks Telephone Consulting Service is available to all registered users to support your installation and ongoing use of our software. To become eligible for this service, you must complete and return the enclosed Software Registration Card.

If your question involves your printer or computer itself, contact the manufacturer of that equipment—they are the experts on their products.

Most of your questions on this program can be answered by simply re-reading this manual and trying the procedure again.

If you still have questions and need to call us, please help us to help you by using the correct phone number listed below.

Please refer to the Pre-call Checklist, which you will find at the end of this manual before contacting us.

If your question involves:

- The operation of this Timeworks Platinum series program: **PLATINUM SUPPORT HELPLINE (312) 948-9298**
 - The operation of any Timeworks program: **TECHNICAL SUPPORT HELPLINE (312) 948-9208**
-

-
- Any other non-technical information, back-up disks or update information: **CUSTOMER SERVICE**
(312) 948-9206
 - Yes, we have a FAX machine to receive facsimiles:
FAX TRANSMISSIONS (312) 948-7626

These phone numbers may be called during normal business hours—9 a.m. to 5 p.m. Central Time, Monday through Friday.

If you prefer to write to us instead, be sure to include a phone number where you can be reached during the day.

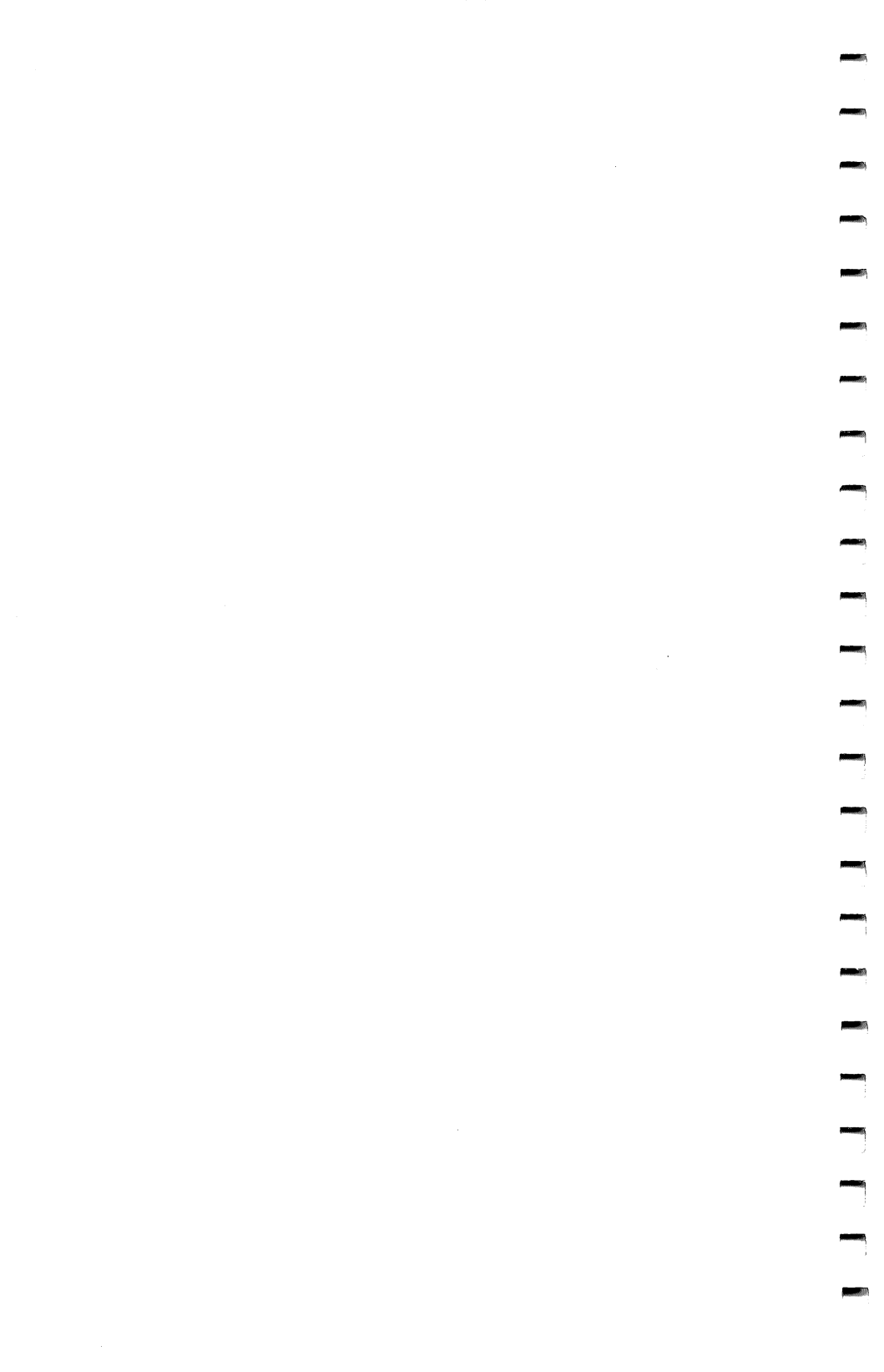


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1 GETTING STARTED

Welcome to GRAPH IT!, the easy-to-use, professional-caliber data charting program. With it you can import data from almost any spreadsheet or data base program that can write an ASCII file or a text file. And, once you've created your graph, you can save it as a desktop publishing file and incorporate it into a report using Timeworks PUBLISH IT! or PUBLISH IT! 2 software.

We've designed GRAPH IT! to place professional data charting capability in your hands. GRAPH IT! is easy to use, yet it gives you complete control over the appearance of your charts. The most frequently used chart features have been pre-selected as "defaults" to make getting started a little quicker. Once you're familiar with GRAPH IT! you can easily custom tailor the appearance of your charts and graphs to suit your own tastes.

We strongly advise that you read through Chapter 3, our Quick-start Mini-manual, before working with the program. This gets you up and running quickly and easily.

What's in the Package

Before going any further, let's make sure that your copy of GRAPH IT! is complete. There should be:

- One 5¼ and/or one 3½-inch Timeworks GRAPHIT! program disk.
- This user's manual.
- A registration card that you must complete and return to receive Timeworks Technical Support Services.
- An update and exchange policy card.

If you are missing any of the above, call our Timeworks Customer Support Department for a replacement.

System Requirements



GRAPH IT! is designed to work on the Apple //c, //c Plus or IIGS computer or the Laser and compatible computers. GRAPH IT! also works on an Apple //e (enhanced) with a minimum of 128K of RAM (memory) and a 100% Apple-compatible, Extended 80-Column Text Card installed.

GRAPH IT! runs under ProDOS so you can use a 3½-inch drive, RAM disk or hard drive. GRAPH IT! should be used only with ProDOS 8, version 1.4 or higher.

GRAPH IT! supports over sixty dot-matrix printers and nearly sixty printer interface cards. For a complete list, see Chapter 7.

How to Use This Manual

Because GRAPH IT! is a menu-driven “point and click” program, you probably won’t need to be as dependent on this manual as you may have been on others. However, you should stick with us at least through the first three chapters. This should take slightly more than an hour. After that, you may either continue along, exploring all the program’s features and options in an organized progression or jump right into the program.

In this manual, keystrokes are contained in rounded-corner boxes to resemble keys, and text which you type in is set in a typeface selected to resemble typewriter type. The up and down arrow keys are shown as , and the right and left arrow keys are represented as .

1: Getting Started

The program functions may be selected either with a mouse or with the keyboard arrow keys. Because most people will use the program with a mouse, these are the directions provided throughout the manual. The keyboard substitutes are detailed in Chapter 2.

Before using this program, please look for a README file on the disk. If there is one, this is where you will learn of any additions or corrections which may have occurred to the program since this manual went to press.

Making a Back-up Copy and Formatting Data Disks

Before going any further, make a back-up copy of the GRAPH IT! program disk using the Apple II Systems Utilities Disk that came with your computer. Throughout the rest of this manual, whenever we say the Program Disk, we mean the copy you make.

Choose the “Duplicate a Disk” option and follow the prompts. Alternatively, you could use the ProDOS-compatible disk-copy program of your choice. GRAPH IT! is not copy-protected and should copy correctly with any disk copy utility.

Use your back-up copy for day-to-day use, placing the original disk in a safe place, at least a foot away from heat, moisture or magnetism.

And, while you're at it, format some blank disks to hold all the graphs you are about to create.

To load GRAPH IT!, just put the disk in your drive and turn on your computer. GRAPH IT! will self-load.

Installing on a Hard Disk or RAM Disk

To install GRAPH IT! on either a hard disk or RAM disk, simply copy all the files (except the ProDOS system file) from the GRAPH IT! program disk to the desired ProDOS volume and sub-directory. You can use any copy program such as the Apple II System Disk or Copy II +*.

To run GRAPH IT! from BASIC:

1. At the BASIC prompt], enter the PREFIX command followed by the ProDOS path that contains the GI.RUN file followed by a **RETURN**. For example, type **PREFIX/VOLUME/SUB-DIRECTORY**. Press **RETURN**.
2. From the next BASIC prompt], type **-GI.RUN**. Press **RETURN**.

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1: Getting Started

NOTE: To run with ProSel, follow Step 1 above for PATH and Step 2 for START-UP FILE.

Configuring GRAPH IT!

When you use your GRAPH IT! disk for the first time, the Configure screen will appear automatically, allowing you to make a few important choices about your Apple, your printer and your interface.

■ Selecting the Interface Type

This selection is highlighted when the Configure screen comes up. Simply use the  arrow keys to scroll up or down the alphabetical list until the interface card installed in your computer is highlighted. There are nearly 60 types of interface cards to choose from. If your interface is not on the list of interfaces in the Configure Program, try the Unlisted Parallel or Unlisted Serial selections at the end of the list.

NOTE: Do not press **RETURN** until all of the highlighted selections match your system.

■ Selecting the Printer Type

Use the **(⇐)** arrow keys to highlight Printer Type. Again, use the **(↑↓)** arrow keys to scroll the alphabetical list until the printer you are using is highlighted. There are more than 60 printers to choose from.

■ Selecting the Printer Slot

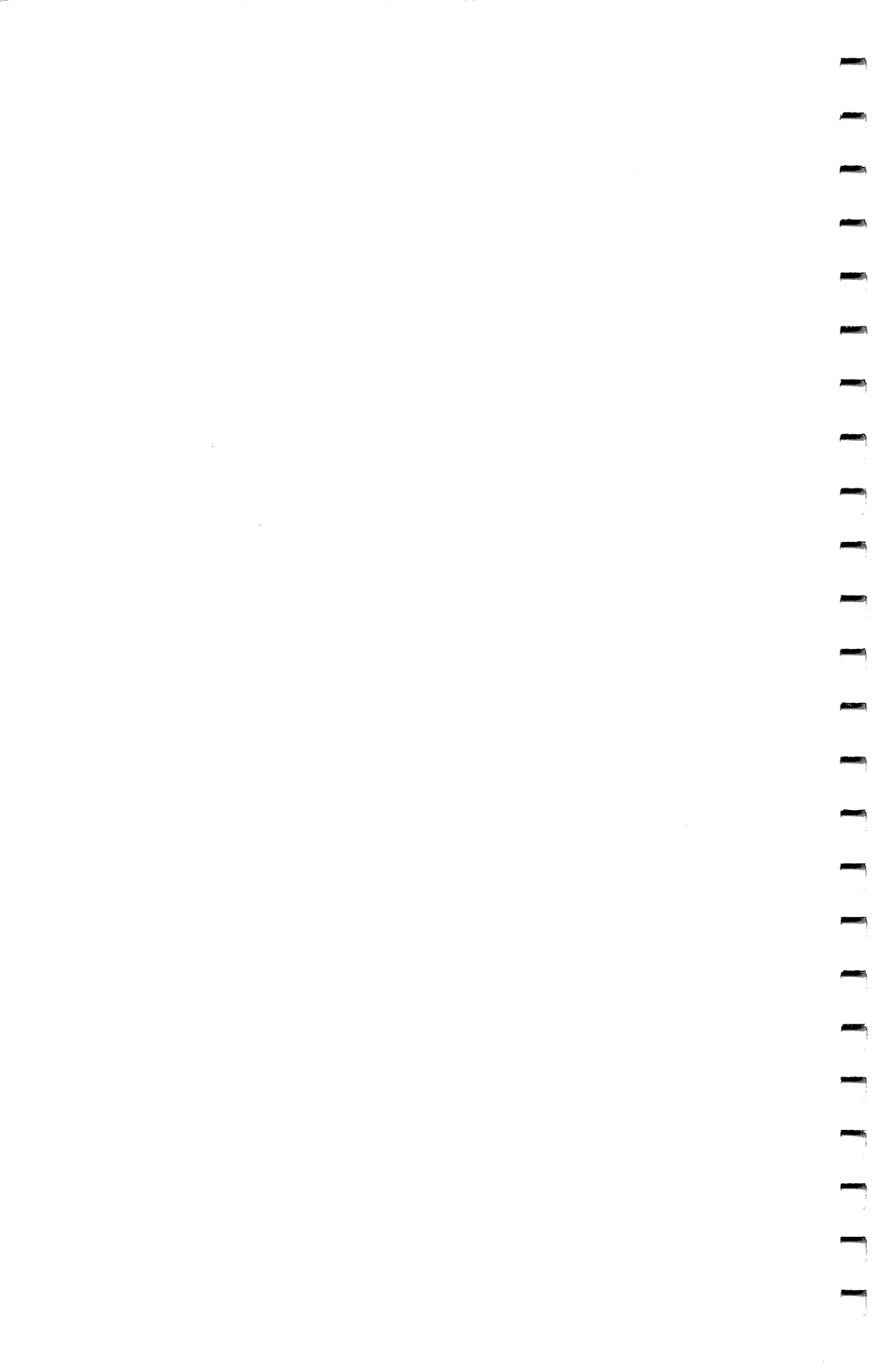
Use the **(⇐)** arrow keys to highlight Printer Slot. Use the **(↑↓)** arrow keys to highlight the printer slot you are using if it is different from the default (Slot 1).

■ Completing the Configuration

When you are satisfied with your choices in all three columns, press **(RETURN)**. Your selections will be permanently saved and will automatically be installed each time you run GRAPH IT! To exit from Configure without changing anything, press **(ESC)** (for ESCape).

To change the configuration whenever you make a hardware change, select Configure... from the Apple Menu.

You should now be at the GRAPH IT! Menu Bar.






2 A PROGRAM OVERVIEW





This chapter will preview many of the ways in which you'll get around in GRAPH IT! Here you'll learn how to use the program either with or without a mouse, how to select the various menus and menu options, how to make menu selections using the Quick Keys and how to access the Help files.

GRAPH IT! is designed in keeping with the standard Apple User Interface, so if you're familiar with other programs designed this way, you've got a head start in learning this program.

Using the Pointer

GRAPH IT! uses a pointer, rather than a cursor, for doing much of the work. Using either the mouse or the    keys, you'll move the pointer to make the various program choices.

2: A Program Overview

WARNING: On newer Apple //s, the  key has been replaced with the Option key. If you have one of these computers, press  along with the   arrow keys to move the pointer.

The pointer will change into a cursor for entering data or text. As soon as you complete that operation, the pointer will reappear.

When GRAPH IT! is busy, the pointer will change to an hourglass symbol. When the hourglass symbol is present on the screen, you will not be able to do any other work with the program. As soon as the pointer reappears, you may begin working with the program again.

If You Have a Mouse . . .

Some of the terms used in this manual tell you to do something with the mouse. If you're new to using a mouse, here is a quick review of mouse terms and actions:

Click—Press and release the mouse button once.

Double-click—Click the mouse button twice quickly.


Drag—Press and hold down the mouse button while you move the pointer. You might use this function to select a range to be graphed or an option from a menu.





Select—Position the pointer where you want it and click on the mouse button.


You can still use the keyboard even if you're using the mouse. Instead of clicking on some of the menu options, for example, you can use the "Quick Key" shortcuts described later in this chapter.





If You Don't Have a Mouse. . .




GRAPH IT! can also be used to its full potential without a mouse. To accomplish the functions described above, using the keyboard instead of a mouse:

Click—Press the  key once.

WARNING: On newer Apple //s, the  key has been replaced with the Option key. If you have one of these computers, press  along with the specified 
 arrow keys to move the pointer.

Double-click—Press the  key twice rapidly.

Drag—Press and hold the  key. Press the   keys to move the pointer. Then, release the  key to complete the drag.

Select—Use the   keys to position the pointer on the option you want and press the  key.

Instructions in this manual are for a mouse. If you're running GRAPH IT! without a mouse, keep the above instructions handy.

Selecting Menus and Menu Options

Below is a picture of the GRAPH IT! screen with the TYPE menu pulled-down.

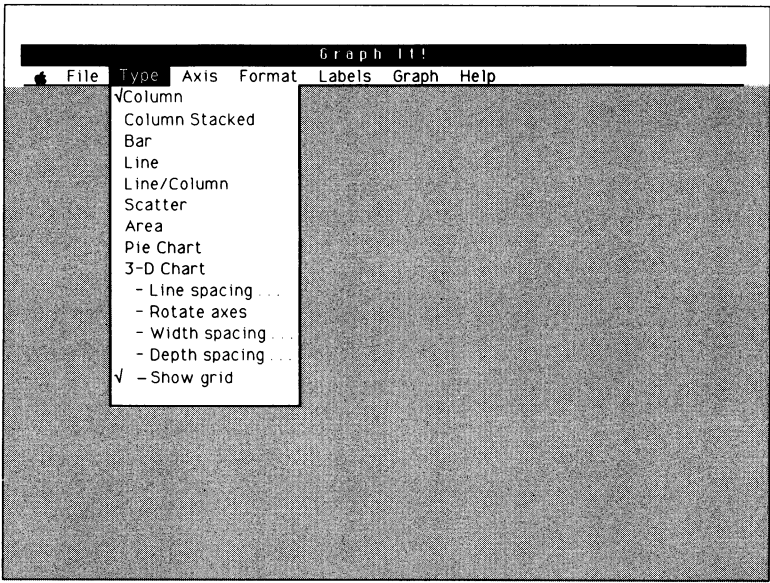








Figure 1

At the top of the screen is the Menu Bar. To open a menu with the mouse, position the pointer on the menu title at the top of the screen. Hold the mouse button down to open the menu and drag the pointer down to highlight the option you want; then release the mouse button. If you're already familiar with the mouse, this will be old hat.

To open a menu without a mouse, use the   keys to position the pointer on the menu title and press the  key. Hold the  key down and use the  key to highlight the option you want; then release the  key.

■ Using Options You Can Toggle On or Off

Some options toggle between ON and OFF. When an option is ON, a check mark (✓) appears to the left of the option as in the TYPE menu in Figure 1, above.

When you first open the TYPE menu, a check mark appears to the left of Column because it is the default selection. If you were to select “Bar” and then reopen the menu, the check mark would be next to Bar.

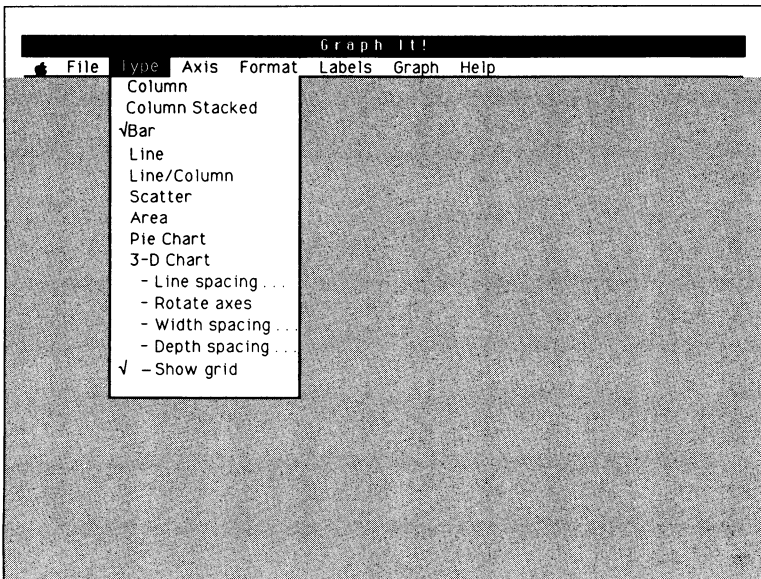


Figure 2

In the TYPE menu, only one option at a time can be turned on. This is because the chart type options are mutually exclusive—you can only graph one kind of chart at a time.

Other menus have multiple options active at the same time. In the LABELS menu Title, X-Axis (Category), Y-Axis (Value), Legend Display and Legend Border can all be on at the same time and can all have check marks.

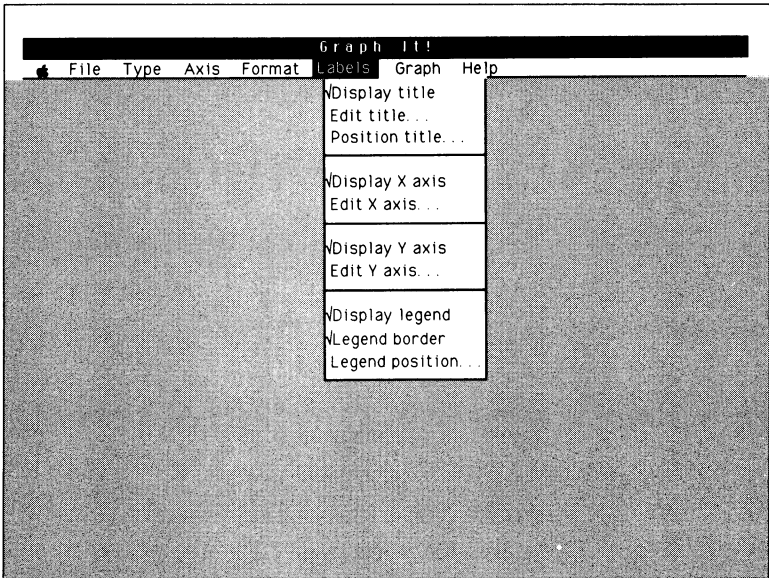


Figure 3

■ Using Options with Sub-menus

Menu options followed by three periods (...) have associated sub-menus. If an option has a sub-menu, it appears after you select it and the pull-down menu has cleared. Figure 4 shows an example of a typical sub-menu, Legend Position.

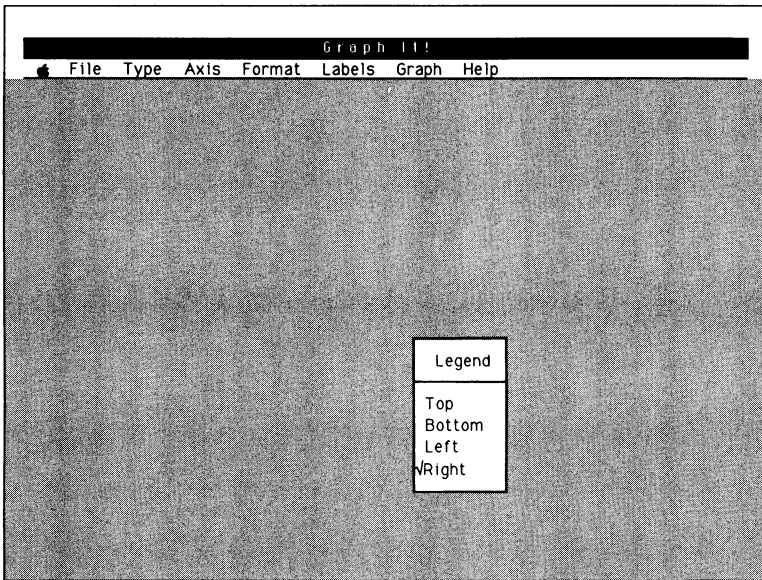


Figure 4

Point and click on the sub-menu option to select it. Just as on the pull-down menus, the currently selected items in the sub-menus have check marks. The sub-menu clears after you click on an option. To escape without making any changes, click outside the sub-menu window.

■ Using Options with Dialog Boxes

There are three types of dialog boxes in GRAPH IT!, each performing a very specific function.

Confirming a Choice

In some instances, GRAPH IT! asks you to confirm a command that permanently affects your data file. For example, you have made some changes to the Data Display Window but have not yet saved them. If you choose Close from the FILE menu, a dialog box appears asking you to confirm whether you want to close without saving, save the revised file then close it or cancel your request. Click on your choice.

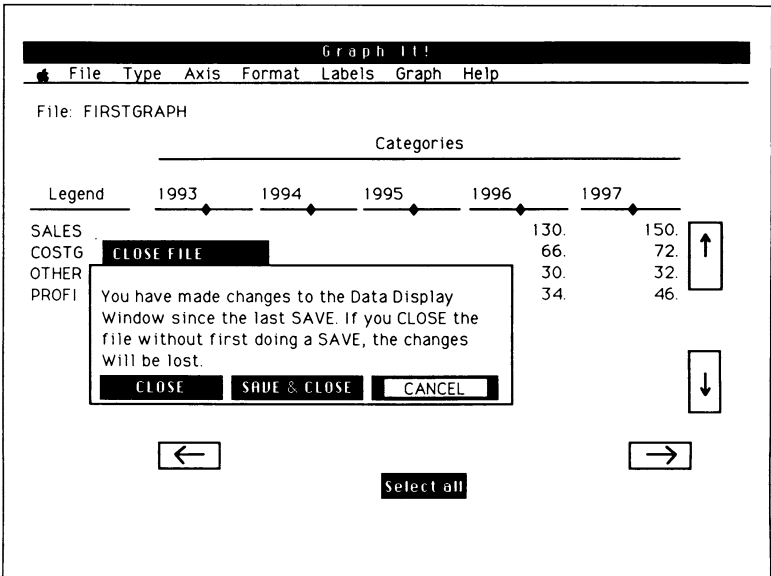


Figure 5

Entering a Label

Choosing any Edit option in the LABELS menu calls up a dialog box requiring text. Enter the label for the graph and press **RETURN**.

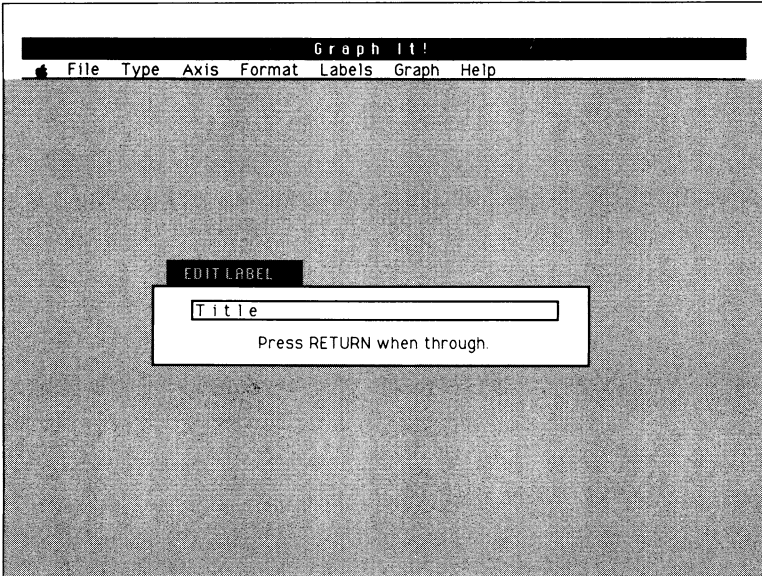


Figure 6

Choosing a File

Some menu options, such as Save Data As... in the FILE menu, bring up a dialog box allowing you to choose from among several existing file names or to create a new file name.

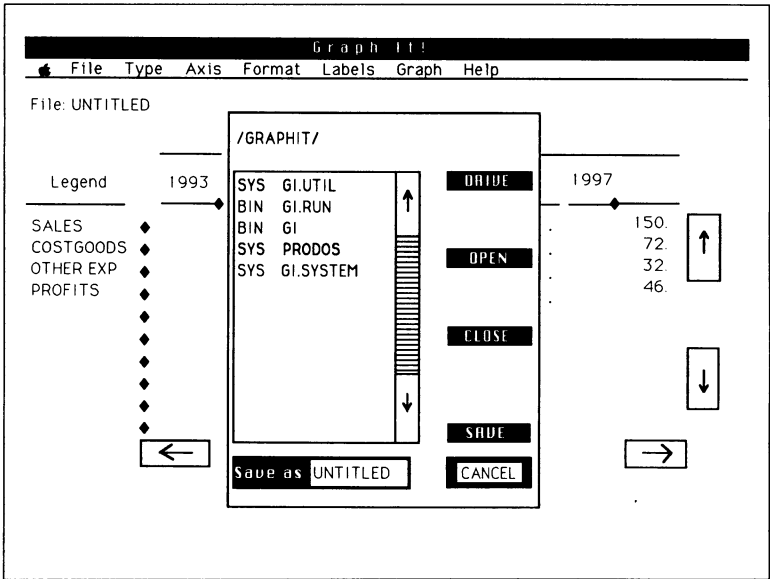







Figure 7

You indicate the action you want by using either the mouse or the   arrow keys to highlight your selection. Then move the pointer and click on the appropriate action button.

To create a new file, click the pointer on the Save As box and type in the new file name at the cursor. Then press **RETURN**. To complete the operation, move the pointer over and click on the Save button.



























How to Use the Quick Keys

GRAPH IT! menus are easy to use. But, there are certain frequently used commands and options in the FILE and GRAPH menus that deserve a shortcut. We call these "Quick Keys." Those menu options that can be accessed through a Quick Key have the keyboard equivalent listed to the right of the function name in the pull-down menu.

To use a Quick Key, press the  key and the specified key at the same time, for example   S to Save Data.

Quick Keys work exactly as if you had pulled down a menu and selected the equivalent option or command.

The Quick Keys are:

Menu	Option	Quick Key Equivalent
File	Close File	  C
	New...	  N
	Open...	  O
	Print	  P
	Quit	  Q
	Save Data	  S
	Save Data As...	  A
Graph	Erase Defaults	  E
	Graph	  G
	Restore Defaults	  R
	View Current Graph	  V
Move one screen in the Data Display Window	   	

Help Is Always There

Your GRAPH IT! call for help is just a click away. Pull down the HELP menu to display a list of Help Topics. Just highlight the topic you'd like help with, release the mouse button, and a Help window will appear.

If you find you need more information than the Help window provides, refer to the Index in this manual.

When you are finished with the Help screen, just click on CONTINUE.



3 THE QUICK-START MINI-MANUAL

Welcome to GRAPH IT!'s Quick-start Mini-manual. We'll introduce you to the workings of GRAPH IT! by taking you step-by-step through the creation of your first graph.

You'll learn how to set up a graph, enter the data, display it, save it and print it. This chapter will serve as your introduction to many of GRAPH IT!'s features. Once you understand the principles, you'll be able to use your own statistical data to make exciting, professional-quality GRAPH IT! graphs.

To begin:

1. Place your copy of the GRAPH IT! Program Disk in the disk drive.
2. Turn on your computer, monitor and printer.
3. GRAPH IT! will self-load, presenting you with a Menu Bar across the top of the screen.

NOTE: If this is the first time you've loaded GRAPH IT!, the Configure Screen will appear instead. Refer to the section on "Configuring GRAPH IT!" in Chapter 1.

Creating a GRAPH IT! File

Let's get started. Position the pointer on the FILE menu heading, press and hold down the mouse button and drag the pointer down until the highlight is on New. . . and then release the mouse button.

The program will ask you to specify the size of your graph—that is, how many rows and columns of data you'll be graphing. We'll explain more about these later. For now, you'll need four rows and six columns for the sample graph you're creating.

Position the pointer in the Rows box and click. You will now see a flashing cursor just to the right of the number. This means that it is ready to accept your information. Press **DELETE** to change it to zero (you may have to press it twice), type in **4** and press **RETURN**. Follow the same procedure for the Columns Box, type in **6** and press **RETURN**.

Move the pointer to the ACCEPT button and click.

The Data Display Window

Let's become familiar with the Data Display Window.

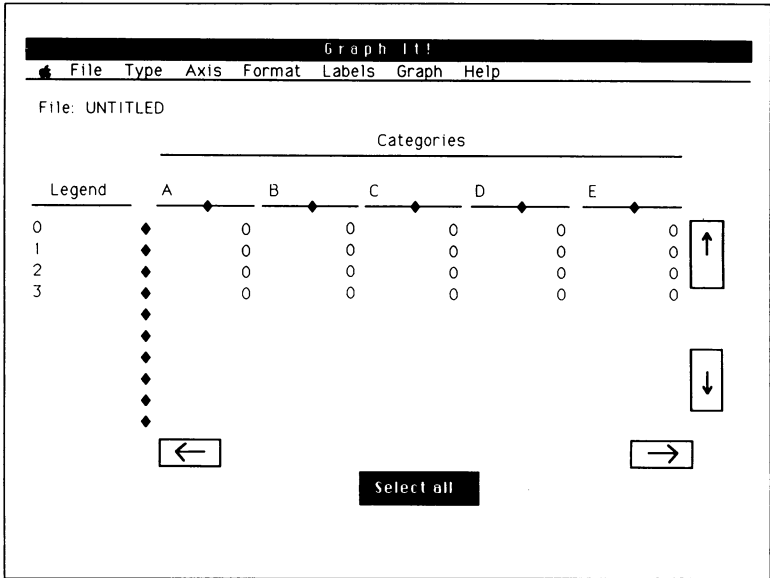



Figure 8

In the upper left hand corner is the name of the file. Since this is a new file, it's named UNTITLED. Centered at the bottom of the screen is a highlighted box that says SELECT ALL. We will discuss the use of this later in this chapter.




Also on the screen are four rows for data across, labeled Legend, and five columns down, labeled Categories. The maximum that can be seen in the window at one time is ten rows and five columns of data.

This is similar to the viewing “window” of a spreadsheet. GRAPH IT! data is organized into rows and columns, just like on a spreadsheet. While the total data file might actually be quite large, you can only view a portion of it at a time. GRAPH IT! can handle up to 400 data points in any combination of rows and columns. More on this later.

■ Moving Around the Data Display Window

You can move around the window by pointing and clicking on the Scroll Arrows located at the bottom and right side of the display window. The Scroll Arrows point up, down, left and right. Each time you point and click on a Scroll Arrow, the viewing window shifts one row or column in the direction selected. Click on  to see the screen shift to view Categories B-F instead of A-E.

NOTE: The Scroll Arrows only work when there is data outside the viewing window.

To move an entire screen at a time, hold down the  key while pressing the   keys or clicking on the Scroll Arrows as described above. The sample graph you're creating isn't big enough to demonstrate this feature. At a later time, load in the SAMPLE file to test it out.

Setting Up Your Graph

Let's start creating the graph. To begin, enter the Legend names of the variables you wish to graph. Position the pointer at the 0 under the Legend title and click. The pointer is replaced by a flashing cursor. Type in **SALES** and press **RETURN**. Repeat these steps for Legend numbers 1 through 3 typing in **COSTGOODS**, **OTHER EXP** and **PROFITS**, respectively.

Now position the pointer at the A under the Categories title and click. Type in **1993** and press **RETURN**. Repeat these steps for Categories B through F, typing in **1994**, **1995**, **1996**, **1997**, and **1998** respectively. If you make a typing error simply press **DELETE** and retype. After entering the last year, use the Scroll Arrows to return the Data Display Window to its initial position.

Now you're ready to begin entering the data for your graph, manually for this exercise. You can also import data directly from an AppleWorks or other text file, as described in the next chapter.

Position the pointer at the first cell and click. This cell becomes highlighted and ready for you to enter your data. Type in **75** and press **RETURN**. The cell stays highlighted, but **75** has been entered as your first data point.

3: The Quick-Start Mini-Manual

Move the pointer down to the next cell, click on it and then type **40**. This time, instead of pressing **(RETURN)**, move the pointer down to the next cell and click. This highlights the next cell for data entry and automatically enters the previous data point. In the third cell, type in **20**. Move the pointer to the last cell in the first Category, click, and then type **15**. Move to the next category and repeat these steps using the following data:

	1994	1995	1996	1997	1998
SALES	100	120	130	150	175
COSTGOODS	55	60	66	72	77
OTHER EXP	25	28	30	32	35
PROFITS	20	32	34	46	63

■ Saving Your Data File

Take a moment here to practice good computer procedure by saving what you've done so far. Position the pointer on the FILE menu, click on it and hold down the button. Drag down the pointer until Save Data As . . . is highlighted and release the mouse button. A dialog box will appear on your screen:

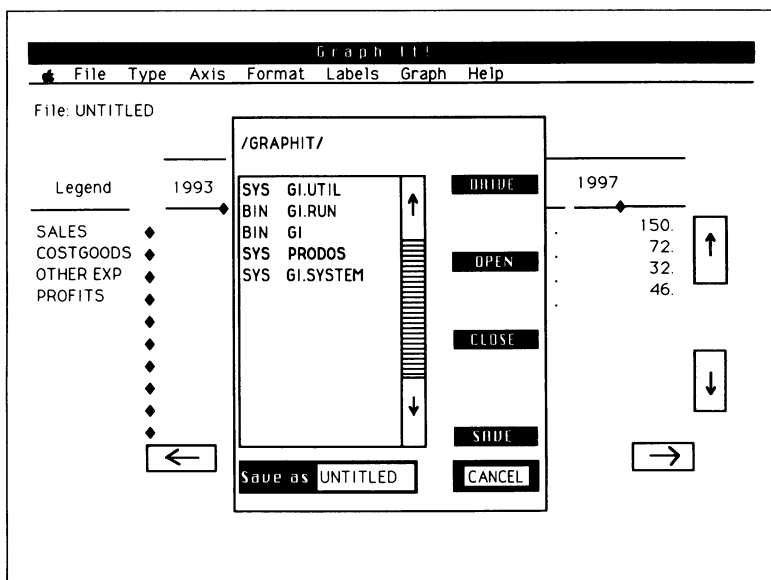


Figure 9

Remove your GRAPH IT! program disk from the drive and insert a blank formatted disk. Click on Drive until it reads the catalog of the current drive. Move the pointer to the Save As box at the bottom of the dialog box and click. Type in **FIRSTGRAPH** and press **RETURN**. Move the pointer over to the Save button and click on it. The pointer changes into the hourglass icon while the program saves your file. Notice that in the upper left hand corner of your Data Display Window the name of your new file is now shown.

Viewing the Graph

Now let's see how the data you've entered looks in graph form. Move the pointer over to the Select All box at the bottom center of the Data Display Window and click. All of the data you've entered becomes highlighted. This tells GRAPH IT! that you want to look at all of the data in your graph. As you'll see in a few minutes, you can also choose to graph only part of the data.

Now, move the pointer to the GRAPH menu. Click and drag until Graph is highlighted and release. In just a few seconds, you'll see your first graph spring to life. Congratulations! Your screen should look like Figure 10:

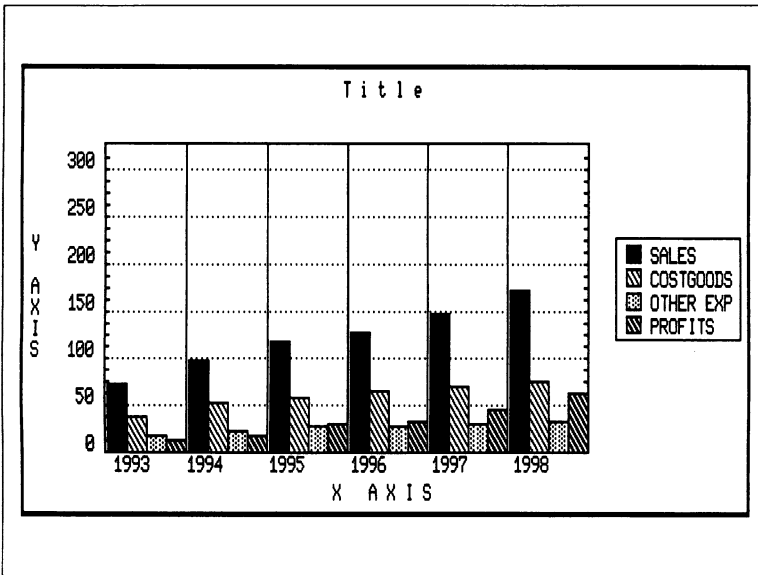


Figure 10

Looks pretty good, doesn't it? But as you can see, it's not quite finished. You need to add some labels to complete the picture.

Adding the Finishing Touches

Click on the mouse button, and you will see the Data Display Window reappear. Move the pointer to the LABELS menu. Click and drag until Edit Title is highlighted; then release the mouse button. Type in **ABC CORPORATION SALES and PROFITS** and then press **RETURN**.

Next, you're going to enter labels for the X- and Y-Axis of your chart. The X-Axis shows Categories while the Y-Axis shows the values of the data being graphed. Again, move the pointer to the LABELS menu and select Edit X-Axis... Type in **YEAR** and press **RETURN**. Then select Edit Y-Axis from the LABELS menu and type **DOLLARS IN THOUSANDS**. Press **RETURN**. Next, go to the GRAPH menu and select Graph to see what your graph looks like with the titles in place. Wow! We have to see this on paper.

Printing Your Graph

First, save the completed file. Click on the mouse button to return to the Data Display Window. Go to the FILE menu and select Save Data. Your updated file will automatically be saved as FIRSTGRAPH.

If you haven't already turned your printer on, do so now. Position the pointer on the FILE menu again, drag it down until Print is highlighted and release the mouse button. Now watch while your graph takes shape on paper. Beautiful!

Checking Out Some Options

You now know most of what you need to know to create first-class graphs. But you've barely touched on the capabilities of GRAPH IT! Let's spend the rest of the time here in the Mini-manual exploring a few of the program's options.

■ Changing Categories and Legends

If you look at the graph you've created, you get a pretty good idea of the growth of sales and profits of ABC Corporation over the last six years. But can you more directly compare each year's growth by each variable? You bet.

Place the pointer on the **AXIS** menu and drag until **Swap Axis** is highlighted and release the mouse button. Now, move the pointer to the **LABELS** menu and drag down until **Display X-Axis** is highlighted.

Notice that there is a check mark just to the left of this menu option. This means that the X-Axis label will be displayed. Releasing the mouse button now will de-select this option, meaning the X-Axis will no longer be displayed. To confirm, place the pointer at the **LABELS** menu and hold down the button. Notice that there is no longer a check mark by the **Display X-Axis** option.

Now, place the pointer at the **GRAPH** menu and select **Graph**. You now have direct yearly comparisons for each variable and can see clearly the year-to-year progress for each. Notice also that with the X-Axis label removed, your graph is somewhat taller. Click on the mouse button to return to the **Data Display Window**.

Let's Slice the Pie

Perhaps you want to look at how expenses and profits relate to one another for only the year 1994. You might decide that it would be best to do this as a pie chart.

Place the pointer at the **AXIS** menu and select **Swap Axis** to return the graphing of the **Legend** and **Categories** data points to their default positions. Now, move the pointer to the **TYPE** menu to select a different type of graph.

At the **TYPE** menu drag the pointer down until **Pie Chart** is highlighted and then release the button. Now, move the pointer to the **COSTGOODS 1994** cell and click. The cell becomes highlighted. Holding down the mouse button, drag down until the **OTHER EXP** and **PROFITS** cells for 1994 are also highlighted and release the button.

You've now chosen to look at just that information for 1994 in pie chart form. Select **Graph** from the **GRAPH** menu and take a look.

The pie chart could use a few minor changes. Go into the **LABELS** menu to edit the **Title** and to de-select the display of the **Y-Axis**. Then go into the **FORMAT** menu, de-select the **Chart Border** (works the same way as de-selecting the **Y-Axis**) and select **Graph** from the **GRAPH** menu again to make sure the chart is how you want it to look. Now select **Print** from the **FILE** menu. Your printed version might look like this:

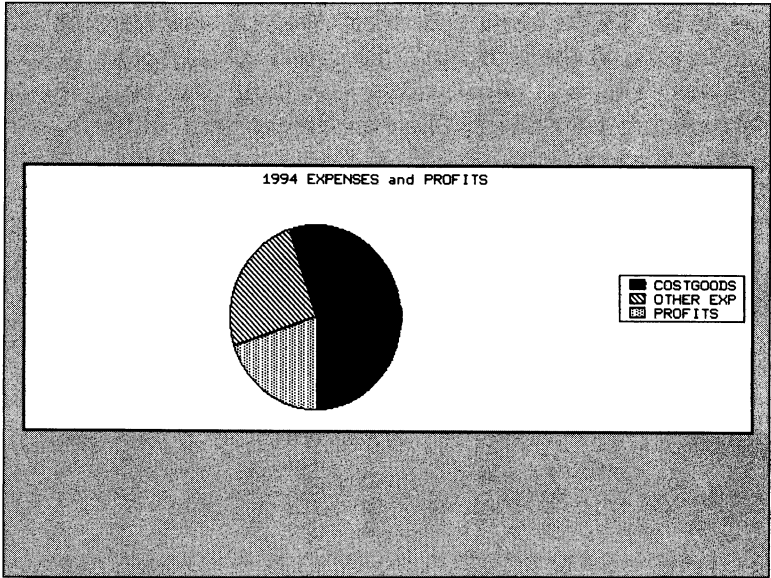


Figure 11

One More for Fun

Let's look at one more view of your sample graph just to explore one or two more of the many features of GRAPH IT! Click on the mouse button to return to the Data Display Window if you have not already done so.

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Go to the TYPE menu and select Area. Now for a new feature: Go to the FORMAT menu and select Border Options. This will allow you to have a different border surrounding your chart. Click on Pattern One. In the LABELS menu, choose Edit X-Axis and type **Dollars 000**. Don't worry about the characters to the right of the cursor. Those are ignored when you press **RETURN**. Next, move the pointer to the Select All Box centered at the bottom of the Data Display Window and click on it.



Now press the Graph Quick Keys **(G) (G)** to look at this new version of your graph. As you can see, GRAPH IT! provides a wide variety of ways in which to look at your data. Do some more exploring of the many powerful features of this program on your own and enjoy.

Getting Help

No Quick Start would be complete without an introduction to the HELP menu, so let's pull that one down next. Click on the topic you have questions about and information will appear.

When you are done with the Help screen, click on CONTINUE and the Data Display Window will reappear.

Closing a File

Okay, now you've got the idea. It's time to relax and celebrate your new-found abilities. Pull down the FILE menu and click on CLOSE. When the Close File Dialog Box appears, click on CLOSE again because you won't want to save the changes you've made since you last saved the file. This way your FIRSTGRAPH file will be there for you anytime you want to review or to experiment more. Finish the session by using the Quick Keys to leave the program:  .



4 CREATING, SAVING AND PRINTING GRAPHS

There are two primary reasons for graphing data. The first is to try and determine just what the data means. The second is to help convey that meaning to others. This chapter will guide you through the many decisions to be made in determining how to best achieve those ends.

Determining the Size of Your File

Before you can begin work you *must* make two basic decisions about your file: What is the size of the file (i.e., how many pieces of information will it contain) and where will the information be coming from.

GRAPH IT! has a capacity of 400 pieces of data which can be arranged in any combination of rows and columns. You can specify data one row deep by 400 columns wide, 10 rows deep by 40 columns wide or any other combination as long as it doesn't exceed 400 total items.

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What you choose depends on the nature of the information you wish to graph. Remember, 400 is the maximum—your file can be much smaller depending on your needs.

One factor in deciding the size of your file is whether you will want to add data at a later date. For example, say that you wish to chart the sales performance of six salesmen over a one-year period. Rather than sizing your file to 6 rows (one for each salesman) and 12 columns (one for each month), you may consider opening up 8 to 10 rows in case you add more salesmen. Or you may open up additional columns in case you decide to track them over a longer period of time.

WARNING: Make your sizing decision carefully. Once you specify a file's size, it cannot be changed.

When you must specify a file's size depends on how you plan to enter the actual data into your file.

Determining the Information Source

GRAPH IT! gives you two ways to enter data in your file. You can enter it manually through the Data Display Window or you can place data directly into your file by opening it with an AppleWorks (or other) text file. Which method you choose is entirely up to you. The only effect either choice has is in determining

1. How you first open or create your file and
2. How much typing you have to do before you can begin graphing your data.

Let's learn how to create a GRAPH IT! file using each data entry method.

Creating a GRAPH IT! File for Manual Data Entry

Move the pointer to the FILE menu, click on it and drag down until New... is highlighted. Release the mouse button. A Specify Size Dialog Box like the one below will appear on your screen.

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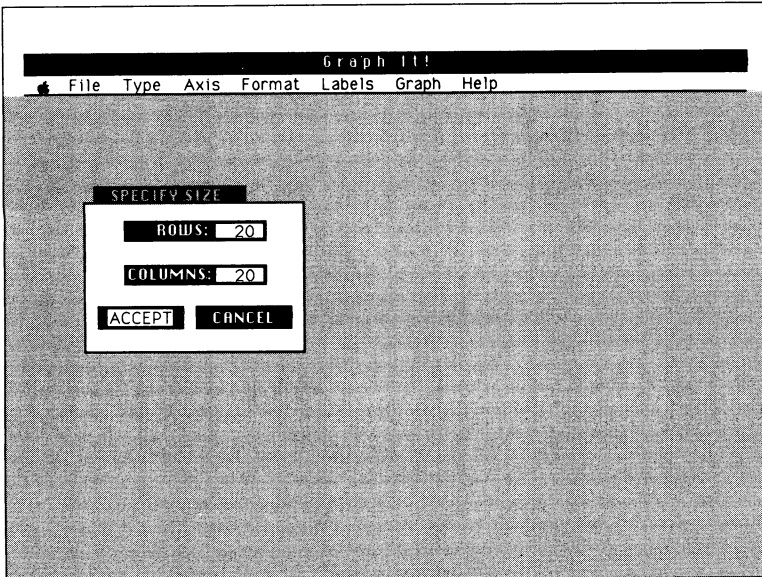


Figure 12

If this is the first time you've created a new file, the box will show the default values of 20 rows and 20 columns. If you've already worked through the Mini-manual, it will show 4 rows and 6 columns.

To enter the number of rows, position the pointer anywhere in the Rows Box and click. A flashing cursor will appear just to the right of the number. Press **DELETE** to change it to zero (you may have to press it twice), type in the number of rows and press **RETURN**. Follow the same procedure for the Columns Box. Move the pointer to the **ACCEPT** button and click on it.

The Data Display Window will appear on your screen, and you are now ready to begin entering the information to graph. Just click on the first cell and enter your data; then click on the next until you're done.

Entering Names and Data

Legend and Category names are limited to a maximum length of nine characters each and can be any combination of letters, numbers and spaces.



When entering data, only four significant digits will be displayed. Therefore, if you enter 123.456, GRAPH IT! will display it as 123.4. Similarly, -456.789 will displayed as - 456.7. As you can see, GRAPH IT! truncates the additional digits and does not round.

Numbers greater than 999 and less than 1 are displayed in what is called exponential notation. Please see Chapter 6 for a complete explanation of how this works.

To enter negative numbers, begin the entry with a minus sign (-).

Creating an AppleWorks* Text File for use in GRAPH IT!

You can use AppleWorks to create a text file which you can then use to create a GRAPH IT! data file. In many instances, you'll be starting with a spreadsheet, but you could also use a data base or even word processing file to create this text file.

AppleWorks allows you to select a range of data and save it to disk in a standard text file using the AppleWorks   command. Your AppleWorks manual gives you details on how to do this.



If you are creating a text file from an AppleWorks spreadsheet, it is very important that you select your range of data in a valid format for GRAPH IT! You must also note exactly how many rows and columns of the data were selected. The easiest way to remember the size is to incorporate it into the text file name, i.e. SALES.15X25 for a file of sales data that is 15 rows deep by 25 columns wide.

Valid AppleWorks Text File Formats

Selecting data from your AppleWorks spreadsheet to print to a text file for use with GRAPH IT! is very simple. Exactly how you select data depends on whether you wish to include Legend and/or Category names along with your numeric data.

For numeric information only: If the very first cell of selected data is a number, then all of the selected cells will be treated as numbers. Any alphabetic characters will be converted to zeros.

To include labels: The very first cell must either have alphabetic contents or be blank. Then you can choose to highlight only row names (which will become Legend names), only column names (which will become Category names) or both. If you choose to include both row and column names, the first row label must also be alphabetic.

NOTE: Blank rows, columns or cells will be treated as zeroes. This can cause blank spots in your graphs. Blank rows and columns in the middle of your file must be included when you specify the size of your file. One way around this is to use the AppleWorks   command to delete a blank row or column. Additionally, any alphabetic (non-numeric) cells in the middle of your data will be treated as zeroes.

Using Other Text Files to Create a GRAPH IT! File

Any properly formatted text file may be used with GRAPH IT! no matter where it came from. This capability gives great flexibility for data entry and editing to the savvy user. Text files are created by many programs, like VisiCalc, MultiPlan, AppleWriter,* etc.

*Registered trademarks of their respective companies.

The data in a text file is properly formatted for GRAPH IT! if there is only one item of data per line. Therefore, you can use virtually any word processor that accepts standard text files to create and edit data files. To give you a feeling for how this works, load the supplied text file into your word processor and look at how the row and column names are organized with respect to the items of numeric data.

Creating a GRAPH IT! File with a Text File

Move the pointer to the FILE menu, click on it and drag down until Open . . . is highlighted. Release the mouse button. A sub-menu will appear asking whether you want to open a GRAPH IT! Data File or an AppleWorks Text File. Move the pointer to highlight the AppleWorks Text File and click on it.

The File Selector Dialog Box will appear as shown below. If you are familiar with the Macintosh or the IIGS Quick Launcher, then you already know how to operate the File Selector Dialog Box.

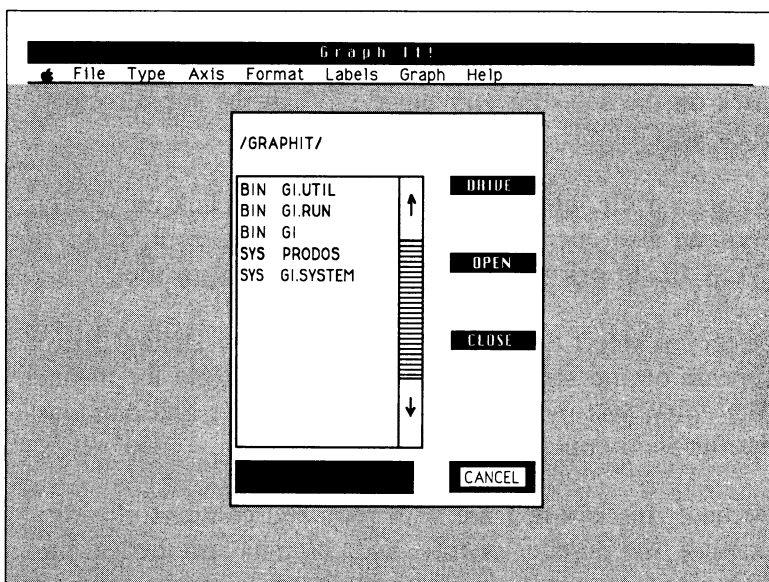


Figure 13

At the top of this box is the Prefix Line. The first item is the Volume Name. It is followed by the sub-directory, if one exists.

Directly beneath the Prefix is a window with the files contained in the currently displayed Volume or sub-directory. If there are more than thirteen files, they will not fit in the window. Click on the Scroll Bar Arrows to page through the files one window at a time.

Click on DRIVE to read the directory of another drive. You may have to click on the button more than once to read the drive that you want since it will cycle through the devices in sequence. The Prefix Line will display what device is currently being read.

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To view the files in a sub-directory, click on the sub-directory to select it and then click on OPEN, or double click on the sub-directory name. To exit the sub-directory, click on CLOSE.

To open a file, click on the file name and click on OPEN. You can also open a file by double clicking on it. Click on CANCEL to exit this option without opening a file.

Once you select a text file, the Specify Size Dialog Box appears on the screen. Just as in opening a file for manual data entry, you must specify how many rows and columns the file is to contain.

Because this is a text file with rows and columns already existing, the number of rows and columns specified in the dialog box *must exactly* match the number of rows and columns in the text file. Otherwise, you will see an error message, and the operation will stop. Click on CONTINUE to acknowledge the error message, and you will return to the opening screen format.

After you indicate the number of rows and columns correctly, move the pointer to ACCEPT and click. The Data Display Window returns to your screen.

If you included Legend and Category names as part of your text file, you are ready to begin graphing your data. If not, click on those lines and enter the names.

Choosing a Graph Type

The most appropriate graph type for a given set of data is decided by a number of factors. Basically, these are in the nature of the selected data itself: Tightly packed vs. widely spread numbers, single range vs. multiple ranges and large number of cells selected vs. a small number of cells selected are some considerations.

Each type of graph lends itself to certain characteristics in the data. Frequently, the same data may be effectively charted with any one of several graph types. Of course, your own personal preference, based upon your experience and tastes, is essential.

■ The Nature of Your Data

Data is simply a group of numbers that you wish to graphically represent. The nature of your data (or “type” of data) is simply the numeric characteristics of the data. The chart below provides general guidelines as to which types of charts lend themselves to which types of data. Keep in mind that these are rules of thumb. Don’t be afraid to experiment!

4: Creating, Saving and Printing Graphs

Type of Chart \ Type of Data	Advancing or Declining	Scattered	Tightly Packed (Normalized)	Single or Few Ranges	Many Ranges	Relative Comparison	Trend Analysis
Column	X	X	X	X	X	X	X
Stacked Column	X	X	X	X		X	X
Bar	X	X	X	X		X	
Line	X		X	X			X
Line/Column	X		X	X			
Scatter		X		X			X
Area	X			X		X	
3-D	X		X	X	X	X	X
Pie	X	X	X	X		X	

Figure 14

Here are brief descriptions of the different types of data:

Advancing or Declining Data—Many types of data tend to increase or decrease with time. Examples of this would be cumulative totals, the price of bread or a declining loan balance. A chart of this type of data is useful in visually seeing what the rate of change is. If the slope or steepness of the graph is great, then the data is changing quickly.

Scattered Data—Scattered data is random in nature, like a series of dice throws or a list of measurements that vary over a wide range of values. Scattered data doesn't lend itself to easily recognizable trends. For large amounts of scattered data, however, a "clustering" effect (due to the laws of probability) may be apparent.

Tightly Packed Data—Any data may be tightly “packed.” This simply means that the difference between the minimum and maximum values is quite small. Examples of this type of data would be human body temperatures, the difference in the measurements of precision-made parts and values changing very slowly with time (like plant growth per minute).

Tightly packed data must be “normalized” to recognize trends. Normalizing data means treating the minimum value as zero and subtracting the minimum value from all other data values. This causes the minimum to maximum spread of the data to be graphed with full resolution. If the length of a hair was recorded each hour for 24 hours, a graph of the data would look quite flat and unrevealing. After normalizing, however, the graph would clearly show variations in the growth rate from hour to hour.

Single or Few Versus Many Data Ranges—There are really two aspects to this data type. One is simply a few data points versus a lot of data points. The other is how many ranges of data there are.

If you had quarterly sales for one salesman, you would have one range of four values—not much data. If you had 25 years worth of quarterly sales data, however, you would have 100 values. You would still only have one range of data, but 100 is a significant amount of data.

4: Creating, Saving and Printing Graphs

If, on the other hand, you had quarterly sales data for ten salesmen for one year, you would have ten ranges of four values for a total of forty data values. Track those salesmen for ten years, and you'd have ten ranges of forty values for a total of 400 values—a significant number of ranges as well as a large number of total values.

Relative Comparison vs. Trend Analysis—Sometimes you'll be more interested in the relative size or magnitude of adjacent data values rather than in the trend of a large amount of data.

An example of this is our salesman. A graph of one year's worth of data would show clearly the relative difference between sales in the third and fourth quarters due to Christmas buying. You would have to plot several years' worth of data, however, to recognize consistent long-term trends.

The Appendix contains a complete listing of all GRAPH IT! types available along with a picture of each.

Choosing the Display Characteristics of Your Graph

GRAPH IT! gives you almost complete control over how your graph looks. You can add titles, move them around, vary the display of category groupings, alter the scaling of data and more. To give you an idea of just how much control you have, load SAMPLE.DATA from your program disk.

Now, put the pointer on the GRAPH menu, click on it and drag down until Erase Defaults is highlighted. Release the mouse button. Move to the GRAPH menu again and select Graph. In a few seconds your data will be graphed, but that's all that will appear. This graph doesn't tell you much, does it?

To put all the missing elements back, select Restore Defaults at the bottom of the GRAPH menu. You can do this using the Quick Keys **(Q) (R)**. Select Graph again from the GRAPH menu (Quick Keys **(Q) (G)**), and you'll see a much more complete picture. A listing of GRAPH IT!'s default settings is shown in Chapter 5 in the Restore Defaults option of the GRAPH menu. Now let's spend a little time learning how to customize your graph.

■ Working with Labels

Four key elements to your graph are all controlled through the LABELS menu. They are: The title of your graph, the X- and Y-axis labels and the Legend display. These elements are the ones which really tell someone viewing a graph what they're looking at.

Title: This is where you describe what the graph is about, whether it's the Sales and Profit History of Mycompany, Average Annual Rainfall in Arizona or The Smith Family Portfolio. By selecting the Edit Title . . . option from the LABELS menu, you can enter any combination of letters, numbers and spaces up to a maximum of 42 characters. After entering the title, press **RETURN**. If you are making changes from a previously entered title, any characters to the right of the cursor are ignored.

You also have the option of displaying your title at the top or bottom of your graph, centered or left justified. You make these choices by selecting Position Title . . . in the LABELS menu and clicking on the appropriate choice in the sub-menu which appears. You can even choose not to display the title at all. Just select Display Title from the LABELS menu to toggle the option off.

X- and Y-Axis: These labels describe the information in the graph. The X-Axis label describes the information on the horizontal plane of the graph. Unless you choose Swap Axis from the AXIS menu, this will be the Categories of your data; most often these will be measures of time, whether monthly, quarterly or yearly.

The Y-Axis of your graph always represents the numerical scale, so the label should describe or define the units of measure, whether it's in Thousands of Dollars, Hundreds of Bushels, Number of Inches or whatever. To enter the X- or Y-Axis title, simply select the appropriate option from the LABELS menu, type in the information, up to twenty characters maximum, and press **RETURN**. As with the title, you can also choose not to display one or both of the Axis labels by clicking on Display X-Axis or Display Y-Axis in the LABELS menu.

Legend: GRAPH IT! gives you three options regarding the display of legend information—you can choose to exclude it, you can choose whether or not you want to have a border around it and you can position it top, bottom, right or left in your graph. To change the position of the Legend display, select Legend Position . . . in the LABELS menu and click on your choice in the sub-menu.

■ Providing Visual Reference Points

Several options in both the FORMAT and AXIS menus help you guide the eye of someone viewing your graph. They can also help keep your graph from becoming too “cluttered.” Here is a brief introduction to the various options. Experiment on your own to fully explore them.

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Borders, Spacing and Depth: Within the **FORMAT** menu, you can put a border around the entire screen, around the chart or both. In **GRAPH IT!**'s default settings both options are "on." You can toggle one or both off; doing so will increase the size of your graph.

Also within the **FORMAT** menu are options that give you extra control over the display of graph elements for Column and Bar graphs. For example, **Bar/Column Spacing . . .** brings up a sub-menu allowing you to choose how much separation is between individual columns or bars within a **Category**. By clicking on the appropriate choice you can have 0, 2, 4 or 8 pixels between each element. Similarly, you choose how much separation exists between **Category** groupings with the **Group Spacing . . .** option.

Column Depth . . . on the **FORMAT** menu adds three-dimensional depth to column charts. Selecting **Column Depth** treats any negative numbers in your data as zeroes.

Finally, within the **AXIS** menus, you can tell **GRAPH IT!** to draw horizontal lines on your graph to clearly separate groups of data by **Category**. This option is particularly useful when **Group Spacing . . .** is set to none.

NOTE: Choosing a column depth other than 0 will automatically cancel the display of category lines.

Working with the Y-Axis: You have four options within the **AXIS** menu that control how the Y-Axis will look—**Show Axis**, **Show Major Marks**, which has an associated **Style...** sub-menu, and **Show Minor Marks**. **Show Axis** allows you to display the Y-Axis on both the left and right-hand sides of your graph. Toggling this option off removes the Y-Axis.

Show Major Marks displays horizontal hash marks along the scale of the Y-Axis. It also has an associated **Style...** sub-menu which allows you to control their appearance. You can choose to display the major marks the same as minor marks or to have them drawn slightly longer than minor marks. You can also draw major marks completely across your graph as solid or dotted lines. Simply click on your choice when the sub-menu is on your screen.

Show Minor Marks displays the small hash marks between each major mark. If you toggle this option off, there are no hash marks shown between the numbered major divisions on the scale.

NOTE: If **Show Major Marks** is off and **Show Minor Marks** is on, then small hash marks will still show at the major numbered divisions on the scale.

■ Further Refinements

We have not yet exhausted all of the options GRAPH IT! gives you for controlling how your graph will look. You can also determine how your graph will be scaled, the size of data points and whether scale values and Category names are displayed.

Controlling scaling: The GRAPH menu gives you two options for controlling the scaling of your graph—Auto Scaling and Normalize Scale. Auto Scaling causes the numbers along the Y-axis to be forced into multiples of 1, 2 or 5. The actual units selected are determined by a combination of the following chart attributes:

- The available screen area for the graph (turning off the chart title or moving the legend from the top to the side gives the graph more vertical space, for example).
- The number of major divisions drawn as determined by the combination of Minors per Major and Pixels per Minor specified in the AXIS menu. See the explanation of these options below.

When Auto Scale is not selected, the largest data value is scaled so as to take up the entire available plotting height. This optimizes resolution, but you may end up with some odd units on the value axis.

NOTE: While Auto Scaling provides even units, the largest data value may plot in as little as 50% of the available plotting height. If this occurs, try different layouts (turning labels off, repositioning the legend) or changing the Minors per Major or Pixels per Minor to improve the appearance of the chart.

Normalize Scale causes the smallest data value to be plotted as a zero value and subtracted from all other data values. Normalize does not work if any negative numbered data is selected.

The “offset” to be added to the value numbers is displayed at the top of the chart. This is useful when data is so tightly packed that the relative difference from point to point is negligible. The sample data file TEMPS.DATA on the GRAPH IT! disk illustrates data of this type. Let’s see how this option works.

Open the TEMPS.DATA file. Use the pointer to highlight a number of cells and then use the Quick Keys **ⓐ** **ⓑ** to graph the data. As you can see, it’s hard to tell anything from this data.

Press any key to return to the Data Display Window and then select Normalize Scale from the GRAPH menu. Now regraph the same data. The variation among the ranges is visibly clearer. The number in the upper left hand corner of the graph, +95.6, is the offset which would be added back into the numbers displayed to obtain their original value.

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Another way to partially control the scaling of your data is in **Minors per Major...** and **Pixels per Minor...** from the **AXIS** menu. **Minors per Major...** has a sub-menu which allows you to determine the number of hash marks drawn between each major division. You might think of this as a way to decide whether to use a ruler measured in halves, quarters or eighths.

The more **Minors per Major** you select, the fewer major divisions **GRAPH IT!** draws, and the distance between major divisions becomes greater. The **Pixels per Minor...** option has a similar effect on the number of major divisions by controlling the spacing between minor division hash marks. A pixel is the space allotted to an individual dot drawn on the screen.

NOTE: Choosing too few **Minors per Major** or **Pixels per Minor** may cause the **Y-Axis** numbers to overlap. Simply increase either option to get the spacing you want.

Data point size: The **FORMAT** menu option **Data Point Size...** allows you to control the size of data points used in **Line** and **Scatter** charts. Click on your choice in the sub-menu to choose a plot size of between one and nine pixels. You won't be able to see the legend pattern for sizes smaller than three pixels.

The last two options for controlling display characteristics are found within the GRAPH menu. Show Values controls whether to display the numerical values along the Y-Axis of your graph. Show Category Names toggles the display of Category names along the X-Axis. If you've previously chosen Swap Axis in the AXIS menu, choosing this option affects the display of Legend names along the X-Axis.

■ Working with 3-D Graphs

One of the more visually interesting options that GRAPH IT! offers is the three-dimensional graph. This can be very dramatic in appearance, but its practicality is determined by the nature of the data being charted. See the Appendix for a description of the 3-D graph.

In general, data that tends to increase in magnitude from left to right and from top to bottom, starting in the upper left cell, looks the best in 3-D. If a smaller value follows a larger value, it is hidden behind the 3-D columns in front of it.

For a large amount of data, the plotting of random values yields a "contour" effect. Heat loss distribution over a surface, rainfall, pollution readings, and topographical information are types of measurements that are typically displayed in three dimensions.

4: Creating, Saving and Printing Graphs

The 3-D graph has several options available to help enhance its appearance and readability. These are shown on the TYPE menu as sub-menus of the 3-D graph. You access these by selecting them from the menu.

Line Spacing. . .—Specifies the number of scale lines to be drawn along the Y-axis. You can select from 5 to 11 lines by clicking on your choice. More lines make it easier to determine the value of plotted points. Too many lines cause the scale numbers to run together. Minor divisions are not available in the 3-D graph mode.

Rotate Axes—Large data in the front hides small data in the back of a 3-D chart. Click on Rotate Axes to turn the 3-D graph 90 degrees so that it can viewed from a different angle. This can be quite useful depending upon the nature of the data being charted.

Width Spacing. . .—Specifies the space or “room” between 3-D columns side-to-side. If you choose None, the bars touch side-to-side. If you choose Remove Width, the bars appear as thin wafers standing on edge with the large face to the side.

Depth Spacing. . .—This option works the same as Width Spacing, except that it specifies the space between 3-D columns front-to-back. If you choose None, the bars touch front-to-back. If you choose Remove Depth, the bars appear as thin wafers standing on edge with the large face to the front.

NOTE: Selecting both Remove Depth and Remove Width at the same time creates a graph where the columns resemble spikes. This simulates what is known as a “pin cushion graph” and can be interesting when very large amounts of data are selected.

Show Grid—Toggles the drawing of the grid background of the 3-D chart on and off. Turning the grid off gives your 3-D graph an appearance of “floating in space”.

It's often worthwhile to try the Rotate Axes option to see if a superior view of the data results. Due to the effect of parallax between the 3-D columns and the graph scale, reading values from a 3-D chart is less practical than with two-dimensional graphs.



The relative size of 3-D columns, however, can be very informative. Experiment freely with the width and depth spacing to see the visual difference of the bars touching each other or standing alone as free standing columns. One disadvantage of this graph type is that it is difficult to read values accurately if the bars are not touching.


Refer to the sample charts in Chapter 8 to get ideas on how varying the depth and width of the 3-D columns can create striking visual effects.

Saving Your Graphs

Once you've opened a GRAPH IT! file, entered your data and determined the characteristics of your graph, you need to save it in order to be able to work with it at another session. GRAPH IT! gives you four options for saving your work.

■ Saving a GRAPH IT! Data File

When you save a file for the first time, choose Save Data As... from the FILE menu. The File Selector Dialog Box will appear. This is the same as the Open Dialog Box except that it includes a Save As window. You can also access this dialog box by using the Quick Keys  .

To enter a new file name, click on the Save As window and type in the name of your file. It can be any combination of letters and numbers up to fifteen characters maximum. Please note, however, that your file name cannot contain any spaces. Once you've entered the file name, press  and click on SAVE.

To save as an existing file name, click on the file name in the File Selector Window and then click on Save. You may also double click on the file name.

If you select the name of an existing file, the Replace File Dialog Box appears. It warns you that your choice will replace the existing file and asks you to confirm your decision by clicking on either REPLACE or CANCEL.

You can use Save Data As... to make copies of files with different names using the same data but specifying different graphing parameters.

To save the current version of a previously saved file, select Save Data from the FILE menu or use the Quick Keys **(C) (S)**. This will automatically overwrite any previous version of the file.

■ Saving a File for Use in PUBLISH IT!

Choosing Save Chart or Save Chart As... from the FILE menu allows you to save your GRAPH IT! chart as a PUBLISH IT! or PUBLISH IT! 2 compatible graphic file. The graphic file may then be incorporated into desktop publishing documents, and can even be altered with Timeworks PUBLISH IT! or PUBLISH IT! 2 programs. For more information on this, see Chapter 5 of the PUBLISH IT! or PUBLISH IT! 2 manual.

We recommend that you use Save Chart As... so that you can give your graphic file a different name from your data file. If you select Save Chart you will be asked whether you want to replace your data file completely with the graphic file. Choosing this option permanently erases your data file!

Printing Your File

Most of the time, you will want to create a print-out of your work, especially if you want to provide information to a business associate or someone else who has an interest in your work. GRAPH IT!'s Print command gives you several options for creating permanent versions of your work.

NOTE: While the printer is printing, the **ESC** key will cancel printing.

After you choose Print, a window appears which says, "Printing. . ." In a few seconds an hourglass appears. If printing does not start, check to see that your printer is plugged in, turned on and on-line (the "select" light is on). You must also have the correct printer, interface card and slot selected with the Configure option (see Chapter 2).

■ Standard Printing Procedures

Choose the Print option from the FILE menu to print out the current chart at 2 $\frac{3}{8}$ " high by 7 $\frac{3}{4}$ " wide. A full-size print-out would appear stretched since the ratio of screen height to screen width is different from that of the printer. This is most evident with Pie charts.

NOTE: All printers are treated as having an 8½-inch paper width.

In its default setting, GRAPH IT! prints the charts at half size to avoid this stretched look and to provide better detail and lettering quality. If you wish to print out your chart at full height, make sure the Double Height option in the FILE menu is toggled on before selecting Print.



Other printing options available:

- **DOUBLE STRIKE**—Each line is struck twice, increasing printing time, but greatly enhancing the print contrast and quality.
- **ROTATE**—Since a sheet of paper is longer than it is wide and the computer screen is wider than it is high, rotating the chart at printing time produces a better proportioned and bigger print-out. As in most enlarged printing, the disadvantage of the larger print-out is that “stair-casing” in curves, diagonal lines and lettering is more noticeable.
- **DOUBLE WIDTH**—When continuous form paper is used (as opposed to single sheets), print-outs may be much wider since they can print across multiple pages.

NOTE: Rotate combined with Double Width and Double Height produces an impressive wall-sized chart up to 7½ x 15 inches in size! Double Strike is also effective.

Experiment with the Print options. You're sure to find a combination that's just right for your charts. The Print options Double Height, Double Strike and Rotate may be selected in any combination. Double Width is only effective when Rotate is also selected.

■ Special Printing Options

Color Printing—GRAPH IT! supports color printing on the ImageWriter II. To take advantage of this option, first select Color Display from the GRAPH menu; this automatically activates color printing. Then proceed to the FILE menu and select Print (or use the Quick Keys  ). If you want to take advantage of any of the other options, such as Double Height, select them before selecting the Print command.



Remember this about color printing:

- You must have a color ribbon installed in the printer. Give the printer time to make two passes. The first pass will print black, the second will add color. Make sure you select more than one data set. The first set will always print black.
- When in the color mode, all the legend and chart elements will be displayed in color on a color monitor, but the text may be blurry. IIGS users can select monochrome display from their Control Panel: the text will be clear, and the colors will display as black and white patterns. In either case, the print-outs will be just fine.

Note that after color printing you must once again select Graph from the GRAPH menu to redraw your chart for correct display on the screen. (The printing process only leaves the color elements displayed.)

Laser Printing—While GRAPH IT! does not directly support this option, you can get a laser print-out of your graph through PUBLISH IT! or PUBLISH IT! 2. Simply save your graph as a graphics file as described above, and then import it into a PUBLISH IT! or PUBLISH IT! 2 document. See Chapter 5 of the PUBLISH IT! or PUBLISH IT! 2 manual for more information.

Quitting GRAPH IT!

When you are finished working with GRAPH IT!, select the Quit option from the FILE menu to leave the program and run another application. You can also exit the program using the Quick Keys  .



5 FEATURES AND FUNCTIONS

This chapter provides Facts at Your Fingertips for GRAPH IT!'s Data Display Window, menus and Quick Keys. Each menu is shown, followed by brief explanations of each menu option.

To review how to make menu selections using the mouse or keyboard, refer to Chapter 2. To open any menu, just click and hold on its name in the Menu Bar.

The Data Display Window

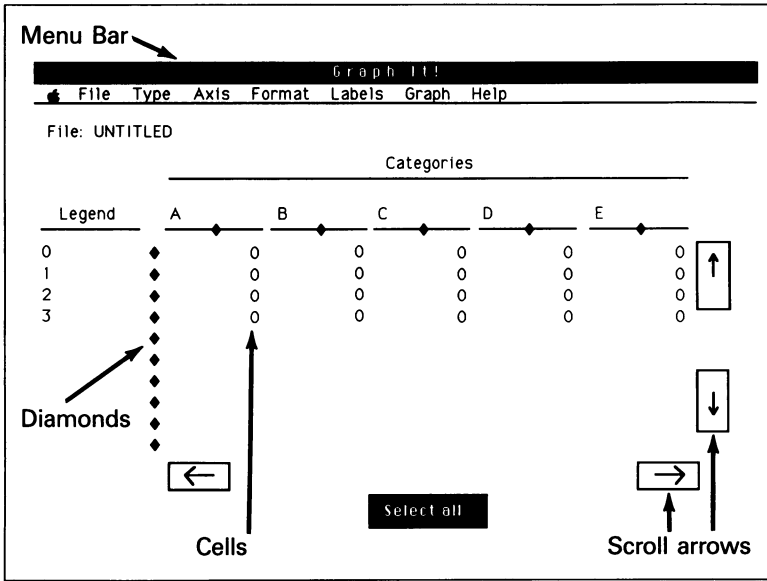


Figure 15

Menu Bar—For selecting pull-down menus.

File—Shows the name of the current working file. UNTITLED appears if working with a new file that has not previously been saved.

Categories—Category names are entered in these lettered areas.

Legends—Legend names are entered in these numbered areas.

Cells—For data entry.

Scroll arrows—For moving around the Data Display Window.

Select All button—To select all data in the file for graphing.

Diamonds—For selecting either rows or columns of data for graphing.

The GRAPH IT! Menus

■ The APPLE Menu

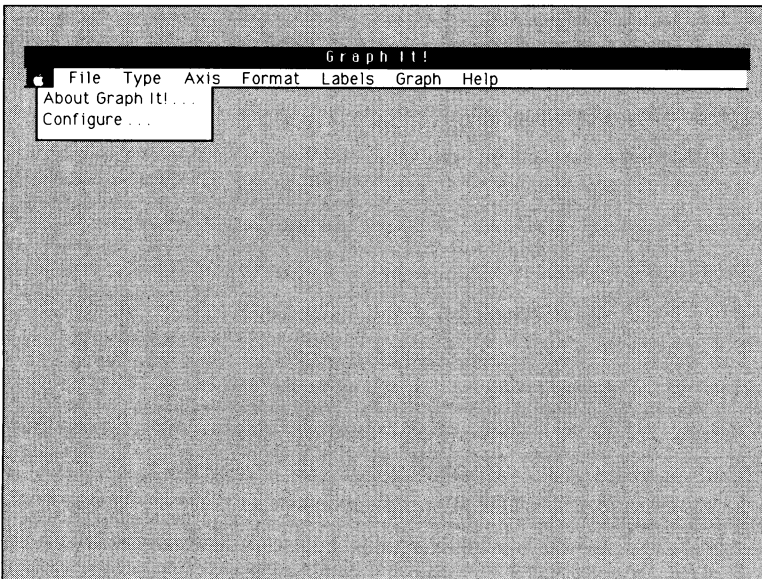


Figure 16

About GRAPH IT!—Select this option to see which version number of GRAPH IT! you are using. You'll need this if you ever have to contact Timeworks Technical Support department. Click on CONTINUE to return to the program.

Configure—Choose this to specify your printer, printer interface card and printer slot. GRAPH IT! currently supports over sixty printers and nearly sixty interface cards. For detailed information on the Configure option, see Chapter 1.

■ The FILE Menu

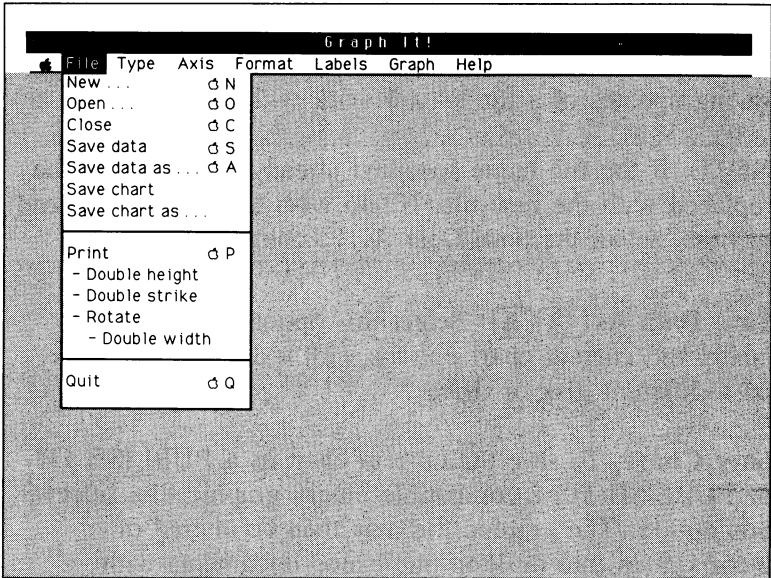









Figure 17



New...  **N**—To open a new Data Display Window, select New... from the FILE menu. See Chapters 3 and 4 for information on specifying the size of your file.

Open...  —To display a previously created data file, select this option. A sub-menu will ask you to specify whether the file is a GRAPH IT! file or an AppleWorks file. Click on the correct file type and then select the file name from the File Selector Dialog Box that appears.

Close  —Select this to clear the current Data Display Window before creating a new window using the New... or Open... commands.

Save Data  —Use this option to save the data, labels and current chart options in effect to a GRAPH IT! data file under the current file name. This saves you time in saving updates of a file as you work with it.


NOTE: If the file name specified already exists, it will be replaced with the new file. If you wish to be warned ahead of time, select the Save Data As... command.

Save Data As  —Select this option to save data, labels and current chart options with a different name or on a different disk or drive.


Save Chart—To save the current chart as a PUBLISH IT! or PUBLISH IT! 2 compatible binary graphic file, select this option. The graphic file may then be altered or incorporated into desktop publishing documents with Timeworks PUBLISH IT! or PUBLISH IT! 2 program.

Save Chart As...—Select this option to save the current chart with a different name or on a different disk or drive.

NOTE: Charts may only be saved to binary (type BIN) files that are 33 blocks in length. GRAPH IT! does not save a chart to an existing file that is not a binary file or is not of the correct length for a graphic file.

Print  **P**—Select Print to send the current chart in memory to the printer as specified by any of the following print options:

- **Double Height**—With this option on, your graph will print 5¼" high by 7¾" wide rather than to the default settings of 2⅝" high by 7¾" wide.
- **Double Strike**—Select this for dark, clean print-outs. Each line is struck twice.
- **Rotate**—With this option on, your graph prints sideways.
- **Double Width**—When continuous form paper is used (as opposed to single sheets), select this option and print-outs may be much wider since they can print across multiple pages.

Quit  **Q**—To quit the program and run another application.

■ The TYPE Menu

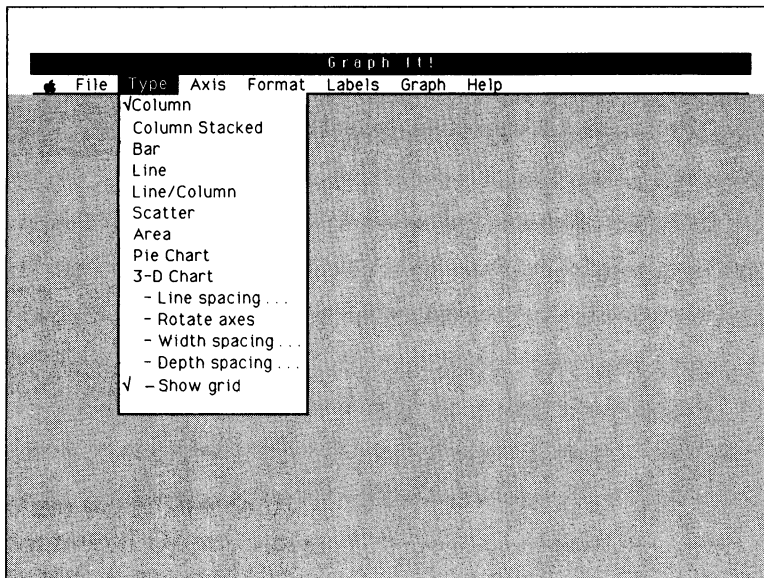


Figure 18

NOTE: See Chapter 8 for a description and sample of each graph type. Try each of them with sample data.

The 3-D options available are:

- **Line Spacing...**—To specify the number of lines drawn along the Y-Axis.
- **Rotate Axes**—To view a chart from a different angle, select this option and rotate the 3-D graph 90 degrees.

- **Width Spacing...** – Select this to specify the space or “room” between 3-D columns from side to side.
- **Depth Spacing...** – Choose this option to specify the space between 3-D columns from front to back.
- **Show Grid** – Select this to turn the grid background of the 3-D chart on or off. This is separate from the **AXIS** grid background options.

■ The **AXIS** Menu

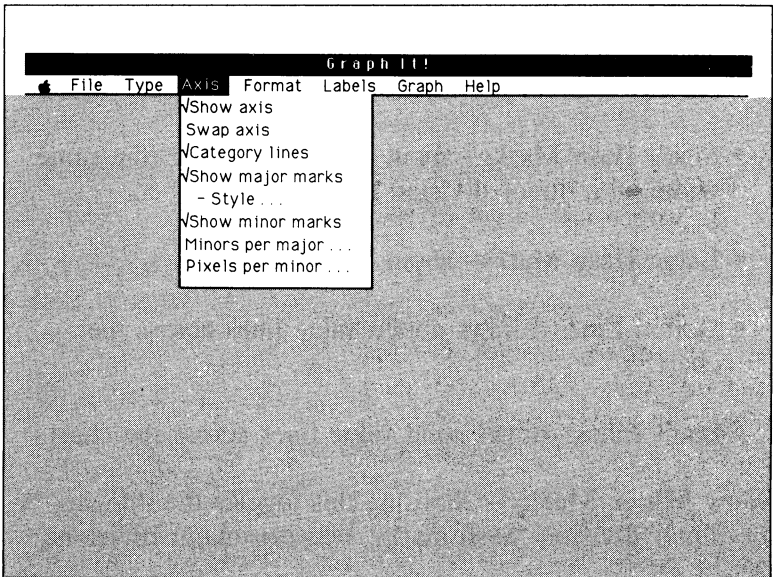


Figure 19

5: Features and Functions

Show Axis—Select this option to toggle the Y-Axis lines ON or OFF.

Swap Axis—When you select this, the orientation of the Category and Legend names will be exchanged.

Category Lines—To turn the drawing of lines between categories (or groups of categories) of data ON or OFF, select this option.

Show Major Marks—Choosing this toggles the drawing of lines or “hash marks” on the Y-Axis as specified by Major Mark Style. . . either ON or OFF.

Major Mark Style—Select the markings that will denote the major division locations along the value axis with this option. The choices are:

- **Small Hash Marks**—about 1/16th-inch wide (the same width as a minor division mark).
- **Large Hash Marks**—about 1/8th-inch wide.
- **Dotted Lines**—draws dotted value lines across the chart.
- **Solid Lines**—draws solid value lines across the chart.

Show Minor Marks—Choosing this toggles the drawing of the minor division “hash marks” between major divisions ON or OFF.

Minors per Major. . .—Select the number of minor division hash marks drawn between major divisions with this option.

Pixels per Minor. . .—To select the spacing in “pixels” between minor division marks, choose this. A pixel is the space allotted to an individual “dot” drawn on the screen.

NOTE: See Chapter 4 for a complete discussion of these features.

■ The FORMAT Menu

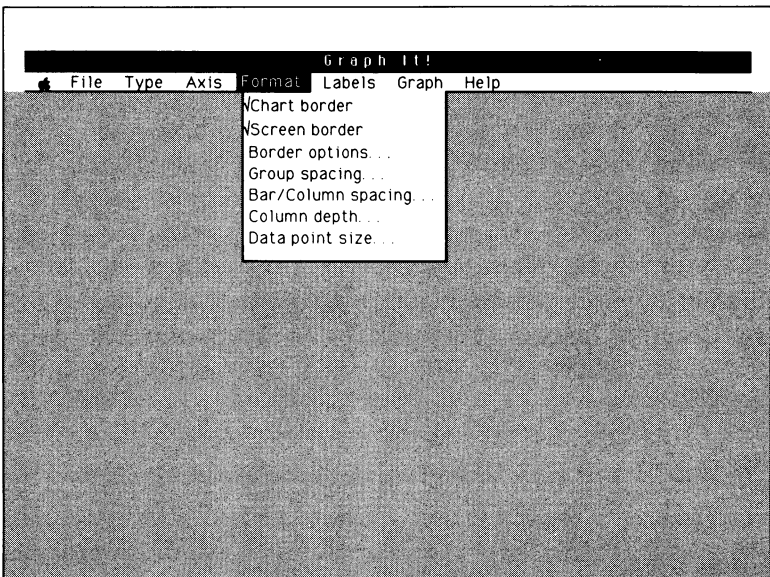


Figure 20

Chart Border—Draws a border around the graph.

Screen Border—Draws a border around the entire screen.

Border Options. . .—Selecting this option produces a sub-menu that allows you to choose one of four screen borders:

- Thin Line
- Thick Line
- Pattern 1
- Pattern 2

Group Spacing. . .—To select the number of pixels between adjacent groups of charted data, choose this. Group Spacing applies only to Column and Bar graphs. Multiple Legend items selected at the same time are grouped by the selected Categories. The default spacing is two pixels.

Bar/Column Spacing. . .—Select this option to select the number of pixels between adjacent bars or columns. Bar/Column Spacing only applies to Column and Bar graphs. Select None, 2, 4 or 8 pixels when the sub-menu appears.

Column Depth. . .—To add third dimensional depth to column charts, choose this. If Column Depth is selected, negative numbers will be treated as zeroes. The Column Depth default is zero.

Data Point Size...—Specify the size of the data points used in Line and Scatter charts with this option. You won't be able to see the legend pattern at sizes smaller than three pixels.

■ The LABELS Menu

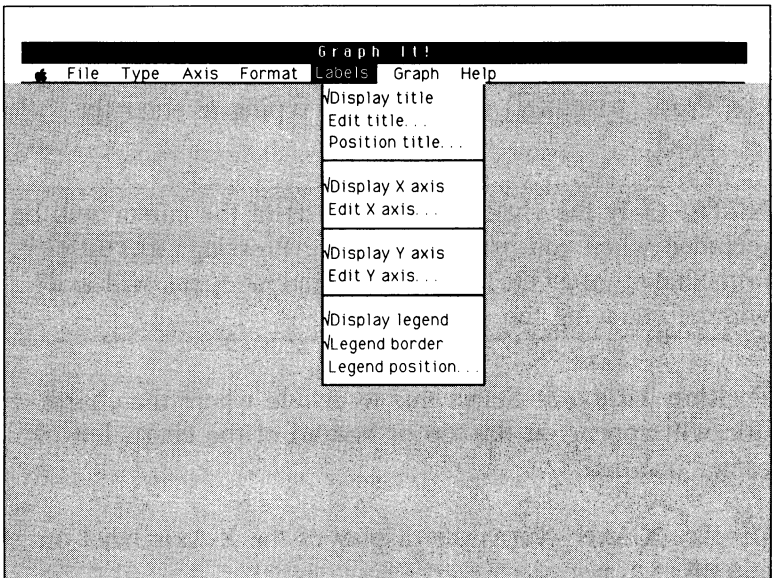


Figure 21

Display Title—Toggles the display of the chart title on or off.

5: Features and Functions

Edit Title. . .—Select this to open the Edit Label window, in the Edit mode. The guidelines for editing a label are as follows:

- The cursor will be to the left of the current label.
- Typing over existing characters replaces the characters.
- Use the key to include existing characters.
- The **DELETE** key deletes to the left.
- Press **RETURN** when finished typing to enter the label.

NOTE: Only the characters to the left of the cursor will be included when you press **RETURN**. Pressing **RETURN** immediately after the Edit Label window opens will exit without changing the existing label.

Position Title. . .—Select this to decide where the chart's title will appear: at the top or bottom of the chart, left or center justified.

Display X-Axis—Turns the display of the X-Axis label on and off.

Edit X-Axis. . .—This option works the same way as Edit Title, but on the X-Axis label.

Display Y-Axis—Toggles the display of the Y-Axis label ON or OFF.

Edit Y-Axis . . .—This option works the same way as Edit Title, but on the Y-Axis label.

Display Legend—Select this to turn the Legend ON or OFF. GRAPH IT! automatically sizes the legend up to a maximum of twenty names. The more legend items selected, the more space will be taken up on the screen by the Legend.

Legend Border—Toggles the legend border ON or OFF.

Legend Position . . .—Select this to open the Legend Position window. This option allows you to select where the legend will appear—at the top, bottom, left or right of the chart.

■ The GRAPH Menu

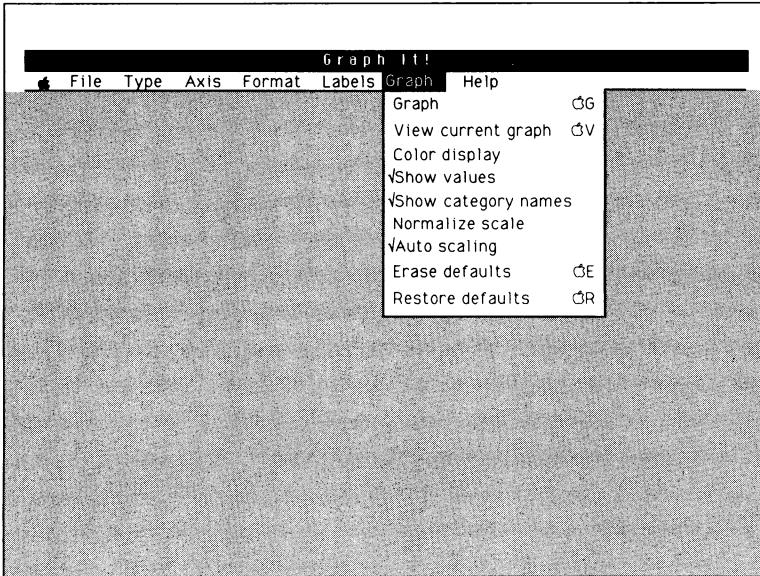


Figure 22

Graph (⌘) (G) – Select this to draw the current chart on the double high resolution screen while you are viewing it.

View Current Graph (⌘) (V) – To view the graph currently in memory without re-drawing it, select this option. Any changes made in the selection of various graph or drawing options since the graph was drawn will not be displayed.

Color Display—If you want to print your graphs in color with an ImageWriter II, you must select this option. The Legend patterns will change to solid colors. Composite color monitors or color TV sets may not clearly display text. Refer to Chapter 4 for complete instructions.

Show Values—To toggle the display of numbers along the Y-Axis ON or OFF, select this.

Show Category Names—Toggles the drawing of Category names along the category axis ON or OFF.

Normalize Scale—Select this to plot the smallest data value as a zero value and subtract that amount from all other data values. Normalize will not work if any negative numbered data has been selected. The “offset” to be added to the value numbers is displayed at the top of the chart.

Auto Scaling—Choose this to force the numbers along the value axis into even whole multiple units of 1, 2 or 5.

Erase Defaults **E**—Toggles OFF all currently selected options.

Restore Defaults **R**—To clear any existing selections and then re-install the standard options in place when you first run GRAPH IT!, select this option. The default options are:

5: Features and Functions

Type Menu:

Column Show Grid

Axis Menu:

Show Axis

Category Lines

Show Major Marks

Major Marks Style = Dotted lines across screen

Show Minor Marks

Minor per Major Divisions = 4

Pixels per Minor Divisions = 5

Format Menu:

Chart Border

Screen Border = Thin Line

Group Spacing = 2

Bar/Column Spacing = None

Column Depth = None

Data Point Size = 3 pixels

Labels Menu:

Display Title = Top, Centered

Display X-Axis

Display Y-Axis

Display Legend

Legend Border

Legend Position = Right

Graph Menu:

Show Values

Show Category Names

Auto Scaling

■ The HELP Menu

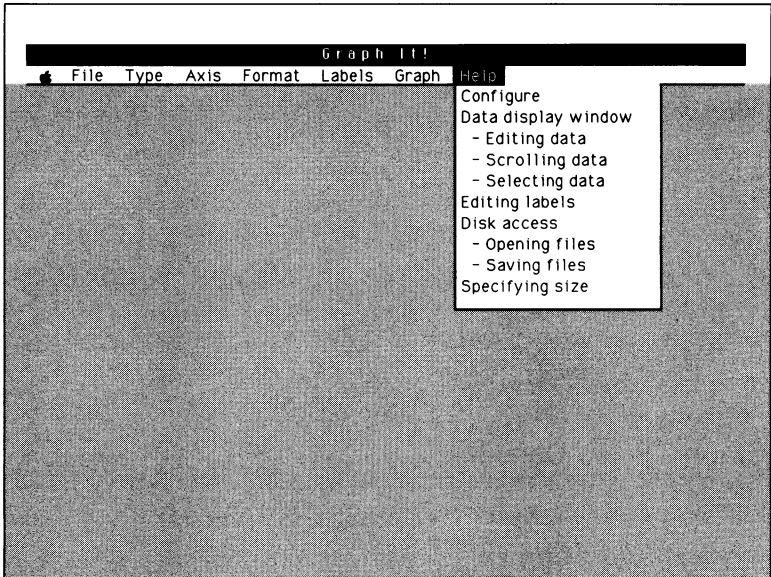

















Figure 23

Choose an option from the HELP menu to view information on that subject. Click on CONTINUE to return to the Data Display Window.

The Quick Keys

Menu	Option	Quick Key Equivalent
File	Close File	 C
	New...	 N
	Open...	 O
	Print	 P
	Quit	 Q
	Save Data	 S
	Save Data As...	 A
Graph	Erase Defaults	 E
	Graph	 G
	Restore Defaults	 R
	View Current Graph	 V
Move one screen in Data Display Window	   	

6 GETTING THE MOST FROM GRAPH IT!

Even though GRAPH IT! makes charting your data easy, there are some “tricks of the trade” when it comes to graphing that can make the task easier. In this chapter you will find tips and hints to help save you time and effort.

Handling Large Amounts of Data

GRAPH IT! has the ability to handle a great deal of data. But there is a practical limit on the amount of data that can be graphed—the size of the charting area used on the Apple screen. The larger the graphing area, the more items of data that will fit and still be usefully visible. If you have so much data that your chart is too packed together, here are a couple of ways to improve the situation:

- **Resize the Graph**—GRAPH IT! automatically resizes the area of the screen used for the graph depending upon the options you have selected.

6: Getting the Most From GRAPH IT!

Carefully review your graph and eliminate any elements that aren't really needed to make your graph clear. Eliminating the screen border, for example, will give you additional vertical and horizontal space. In a similar fashion, turning off the Title and Category Names will give some additional vertical head room for a bar chart.

There are some other changes you can make to gain graphing space. For example, when making Column charts with a large number of columns, try positioning the Legend at the top or bottom. This gains horizontal space for the graph. You can also turn off the Y-Axis label to gain horizontal plotting area.

- **Reformat the Spacing**—Another handy technique to pack in more bars in a graph is to reduce the Bar and Group Spacing to a minimum. You can make the bars and groups actually touch each other. Then you can display Category Lines, which take up no graphing space, to make the separation between Category groups clear. Remember, though, Category Lines will only display if the Column Depth is set to None.

Using Very Small or Very Large Numbers

GRAPH IT! displays numbers larger than 999 or smaller than 1 in exponential notation. This is an arithmetic shorthand used to handle very big and very small numbers with as few digits as possible.

For example:

When you enter . . .	GRAPH IT! displays . . .
1230	1.23e3
1234567	1.235e6
-456789	-456.7e3
.0001234	123.4e-6
.999	999.e-3

The exponent (the number after the “e”) is the number of places to shift the decimal point left or right. For example, $1.23e3$ means “Move the decimal to the right three places” so the number really is 1230. A positive exponent means shifting the decimal point to the right.

A negative exponent denotes a fraction so you need to shift the decimal point left to get back to the original number. For example, $1.23e-3$ represents .00123. Another way to look at this is that a positive exponent acts as a multiplier and a negative exponent acts as a divider.

6: Getting the Most From GRAPH IT!

NOTE: GRAPH IT! will display .9999 as 1.

As you can see, exponential notation really saves handling a lot of zeros! When graphing data that is in exponential notation, the number the Y-Axis scale needs to be multiplied by is displayed in the upper left hand corner of the graph.

For another way of handling very large numbers, see the section below on pre-scaling data that all falls in the same range.

Pre-Scaling Data

Charting pros use a technique called “pre-scaling” for data that falls within the same specific range. If, for example, your data is all in the millions, enter it as multiples of a million rounded off to the second decimal place. So 32,750,000 would become 32.75. Then you can use the Y-Axis title to indicate the true value of the numbers; for example, Thousands of Dollars or Dollars 000. Just remember:

- Pre-scaling must be consistently applied to all the data within a group.
- Pre-scaling is only practical when your data falls within the same general range; thousands, ten thousands, millions.

If your data falls over too large of a range to make pre-scaling practical, you don't need to enter more than four significant digits of a number unless you plan to normalize the data. See Chapter 4 for instructions on normalizing. Round off to the third digit and enter trailing zeroes. Therefore, 101,746 becomes 102,000 and 345,768,377 becomes 346,000,000. In each case, GRAPH IT! converts the number to exponential notation and uses only the first three digits for charting purposes.

Creating High-Low Graphs

High-Low graphs are a variation of a line graph where the minimum and maximum values of a group of data are plotted as high and low plot points. A typical use for a high-low graph is to display the daily high and low values of a given stock traded on one of the exchanges.

High-low charts are also useful in many statistical quality control applications where the "spread" of data over time can be readily displayed. You can make a very nice looking high-low chart by arranging your data in the data display properly.

For example, you could track the daily range of a number of stocks. Often, a stock graph includes the daily closing price of the stock as well so we'll do that with this graph.

6: Getting the Most From GRAPH IT!

1. Edit the Category names at the top of each column to show each day you have data for.
2. Pick out the high, low and close values for each day for each stock. Stock values are actually published this way so this is no problem.
3. Enter the high values for the first stock in the first row of the data display, the closing values in the second row and the low values in the third row.
4. Enter the high, close and low values for the second stock in the third, fourth and fifth rows. Keep entering data for each stock in this manner.
5. Edit each trio of Legend names at the left of each row to reflect the stock names. If, for example, you are tracking the stock of Apple Computer, the Legend names might read APPLE HI, APPLE CLS and APPLE LOW, respectively.
6. From the LABELS menu, turn Display Legend OFF and select Line from the TYPE menu. Alternatively, you could try putting the Legend display at the bottom of your graph.
7. Select the data to be charted in row trios (by stock). To see the Apple values, select Rows 1, 2 and 3 to plot. Rows 4, 5 and 6 would chart the next stock, and so on.
8. Select Graph from the GRAPH menu to see your chart.

You can also try plotting the high-low ranges using the Stacked Column, Line and Column or Area type charts. You may find that one of these types of charts presents a clearer presentation of the data.

Working with the Sample Files

A few sample files are included on your GRAPH IT! disk. A good way to get a better feel for GRAPH IT!'s full potential is to play around with these sample files.

View these files using the Open option from the FILE menu, select some data and select a graph from the TYPE menu. Then select Graph from the GRAPH menu to see the results. Here's a list of the files:

GRAPH IT! data files:

TEMPS.DATA

SAMPLE.DATA

AppleWorks text file:

PRODUCT.11X5



7 TROUBLESHOOTING

Monitors

If your screen display is hard to read, select monochrome display from the Control Panel.

If your //e does not have MouseText, your screen display will look strange. Everything will work correctly, but we recommend that you visit your local Apple dealer and update your machine to the current video ROMs.

Plotting Problems

If your data file will no longer plot, check to see if there are any spaces between data items that can be eliminated. Additionally, you can reduce the number of pixels between bars and groups in your chart. See Chapter 4 for complete instructions.

Printing Problems

If you have trouble printing on an Apple IIGS, it may be because you modified the factory setting for printer buffering in the Control Panel. To remedy this, turn buffering off and try to print again.

For color printing problems—If you get off-color lines in your color areas, try one or more of the following:

- Adjust the paper thickness lever.
- Adjust the ribbon adjustment assembly.

If the paper jams—

- Try using heavier weight stock. Although the ImageWriter II is designed for bi-directional paper feeding, 18-pound or lighter stock (most paper is 20 pounds or higher) may jam-up.
- Select tractor feed over friction feed (make sure the pinch roller is disengaged).
- Try cleaning your printer if the paper consistently jams. Printers like the ImageWriter that use a “push/pull” paper feed to achieve bi-directional capability are more prone to jamming up as dirt accumulates on the platen and other paper path contact points.

Printers and Interfaces Supported

GRAPH IT! is compatible with nearly 60 printer interfaces and does not depend upon any special interface features unique to a given brand. Select your particular printer interface as described in Chapter 1, "Configuring GRAPH IT!" The default slot is 1 and in most cases it will not need to be changed. If your interface is not listed in the Configure Program, try the Unlisted Parallel or Unlisted Serial interface selections at the end of the interface list.

Interface Types	Printer Types
Apple/Centronics	Apple DMP
Apple/Comm. Card	Apple Imagewriter
Apple/IIC Port	Apple Imagewriter Wide
Apple/IICPlus Port	Apple Imagewriter II
Apple/IIGS Port	Apple Imagewriter LQ
Apple/Parallel	Apple Scribe
Apple/Serial	C. Itoh 8510 A
Apple/Super Serial	C. Itoh 1550B
Applied Engineering/SerialPro	Citizens MSP-10
AST/Multi I/O	Epson AP-80
CCS/7710A Serial	Epson EX-800
CCS/7720 Parallel	Epson EX-1000
CCS/7728 Parallel	Epson FX-80
Dispatcher	Epson FX-80 +
Dual-Comm Plus	Epson FX-85
Dumpling 64	Epson FX-86
Dumpling GX	Epson FX-100
Epson/Apl	Epson FX-100 +
K-T/Parallel	Epson FX-185
Laser 128/Parallel	Epson FX-286

7: Troubleshooting

Interface Types	Printer Types
Laser 128/Serial	Epson HS-80
Micromax/Graphmax	Epson JX-80
Micromax/Printmax	Epson LQ-800
Microtek/RV-611C	Epson LQ-1500
Microtek/SV-622C	Epson LQ 2500
Mountain/Parallel	Epson LX-80
Orange/Grappler	Epson LX-86
Orange/Grappler +	Epson LX-800
Orange/Grappler/Serial	Epson MX-80
PC Ware/Parallel	Epson MX-100
PC Ware/Serial	Epson RX-80
PKASO	Epson RX-80 +
PKASO/U	Epson RX-100
Practical/Graphicard	Epson SQ-2000
Practical/Printerface	IBM Compatible
Practical/Microbuffer	NEC PC 8023A
Practical/Seriall	Okidata 84
Printermate	Okidata 92A
SSM/AIO Parallel	Okidata 93A
SSM/AIO Serial	Okidata 182
SSM/APIO	Okidata 183
SSM/ASIO	Okidata 192
Star/Grafstar	Okidata 193
Star/Grafstar II	Okidata 192/Apple
Thirdware/Fingerprint	Okidata 193/Apple
Thirdware/Fingerprint + PA	Okidata 182/IBM
Thirdware/Fingerprint + SE	Okidata 183/IBM
Tymac	Okidata 192/IBM
Versacard/Parallel	Okidata 193/IBM
Versacard/Serial	Star Delta 10
Videx/Uniprint	Star Delta 15
Videx/PSIO/Parallel	Star Gemini 10
Videx/PSIO/Serial	Star Gemini 15
Wizard/BPO	Star Gemini 10X
Wizard/IPI	Star Gemini 15X
Unlisted Parallel	Star Radix 10
Unlisted Serial	Star Radix 15
	Star NB24-15
	Star NR-15

Printer Types

Star NX-15
Star SD-10
Star SC-15
Star SG-10
Star SG-15
Star SR-10
Star SR-15

Pre-call Checklist

Please consult this Pre-Call Checklist before calling the Timeworks Customer Support Help Line: (312) 948-9208.

1. Have you investigated your manual (Troubleshooting and the Index) and the README file (if there is one) thoroughly for the answer to your question?
2. Has the problem ever appeared before? What procedure did you use to produce the problem, and can you reproduce the situation? Have you tried reproducing the problem with hardware other than your own?
3. Are you using any additional equipment with your system, such as a light pen or memory-resident software? If so, disconnect the additional hardware/software and try to repeat the problem. If not, did you change your hardware or software configurations before you first experienced the problem?

7: Troubleshooting

4. If the problem is related to printing, have you checked your printer manual or contacted your printer manufacturer for the answer? Have you read your interface manual or contacted your interface manufacturer?
5. Have you returned your Registration Card to Timeworks?

If You Call . . .

1. Which Timeworks product are you calling about, and what is the version number? (For example, GRAPH IT!, version 1.1) You will find the version number when you view the directory of your program disk or by selecting About GRAPH IT! from the APPLE menu.
2. What system are you using? (For example, Apple //e enhanced.)
3. Have your user's manual with you when you call, and keep your manual and any other pertinent materials by the phone in case we need to call you back.

If You Write . . .

Include a phone number where you can be reached during the day.

8 APPENDIX

Choices of Graph Types

This appendix contains a complete listing of all of the graph types available in GRAPH IT!. Each graph type is described in the order in which it appears in the TYPE menu.

A picture of each graph type is also included. All graphs except the pie chart are shown Double Height. The pie chart is printed in standard height so that the pie will be circular rather than oval.

For considerations in choosing a specific graph type, see Chapter 4.

■ Column

This is GRAPH IT!'s default graph type. This and the Stacked Column graph are perhaps the most useful of the graph types.

This graph uses vertical columns to show the difference in the magnitude of data values (the relative height of the columns). Because each Legend entry is represented by one column, this graph type easily handles multiple Categories and multiple ranges within Categories. It can also handle large enough amounts of data to clearly show trends.

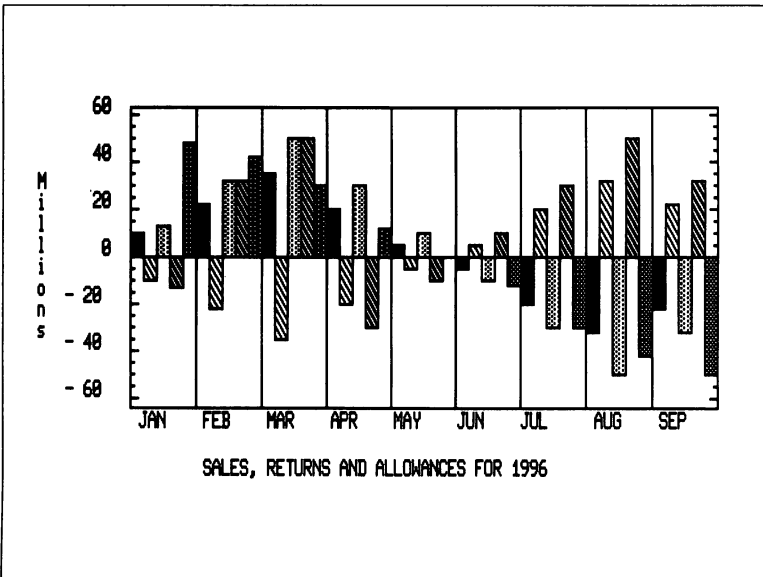


Figure 24

■ Stacked Column

The Stacked Column graph uses vertical columns to show the relative share of each item in a Category group keyed to the Legend. Multiple ranges of data add up on top of each other to show how each item contributes to the total.

This is similar in effect to a pie chart. The advantage of a Stacked Column graph over a pie chart is that multiple Categories may be plotted at once. This graph treats negative numbers as zeroes.

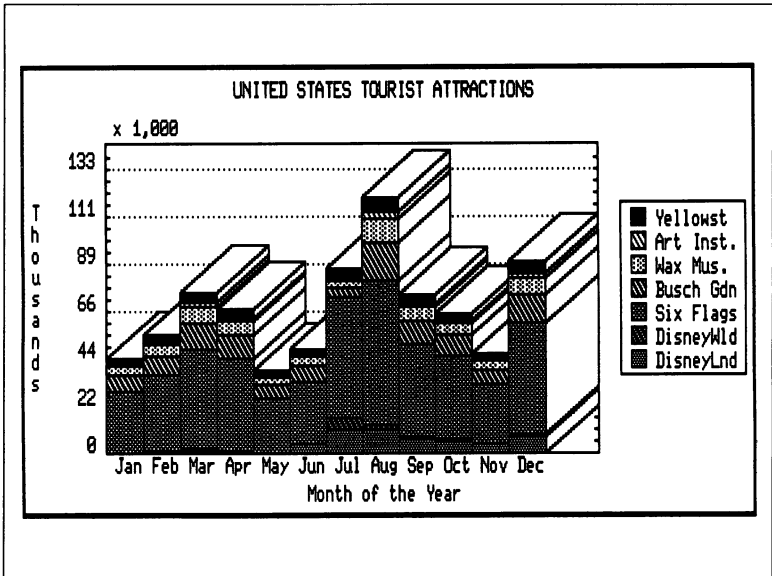


Figure 25

■ Bar

The Bar graph is simply a horizontal column graph. In general, a Bar graph lends itself to the same types of data as the column graph. However, due to the horizontal shape of the computer screen, you don't have as much height available to clearly graph a large number of Categories or Category groups. Therefore, from a practical standpoint, Bar graphs will be most useful for relatively small numbers of ranges of data.

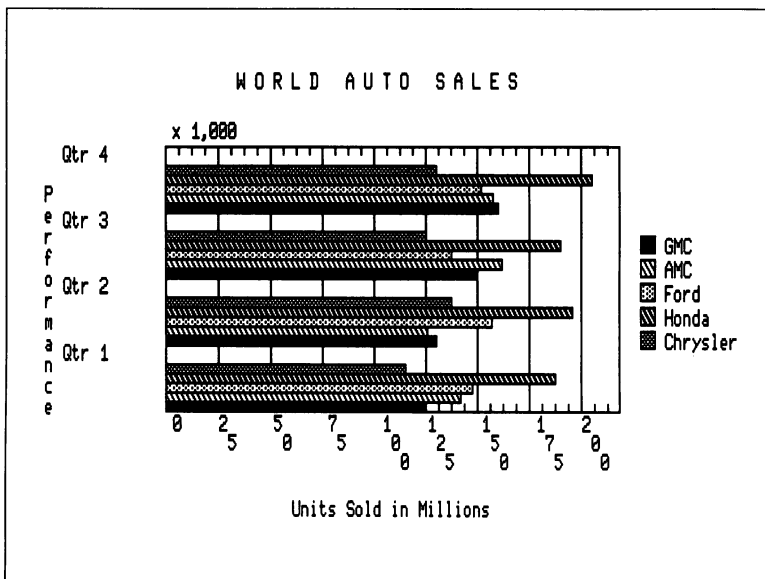


Figure 26

■ Line

A Line graph is a very basic “connect the dots” type of graph in which each Legend entry is plotted separately and connected between Categories by a solid line. Line graphs are excellent for trend analysis.

If you are plotting a small amount of data that varies over a wide range, the Line graph will have a jagged zig-zag appearance. Very large amounts of data that changes cyclically (varies in a regular fashion) will appear smoother.

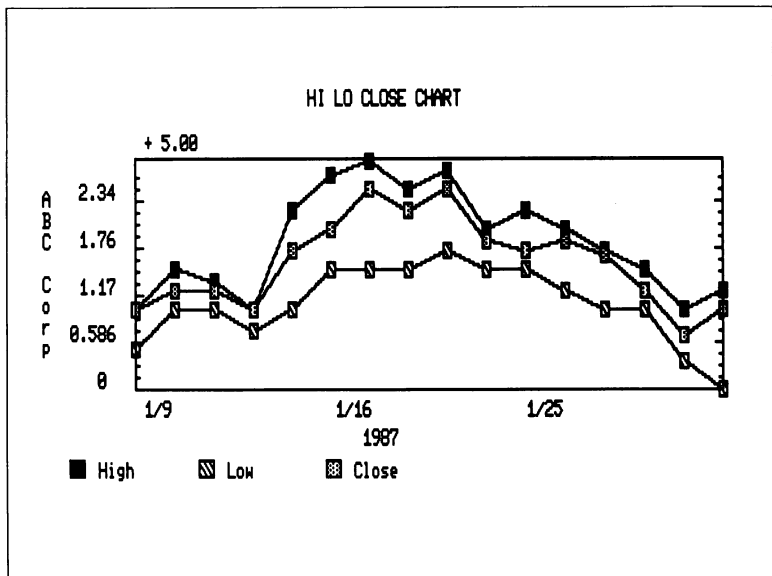


Figure 27

■ Line and Column

The Line and Column graph is a combination of the column and line graph overlaid on top of each other. The line connects the mid-points of the tops of each column.

When the data is appropriate, the Line and Column graph combines the column graph's relative size between columns ability with the line graph's trend-revealing talent. The lines can help you follow the trends of multiple Legend entries over time.

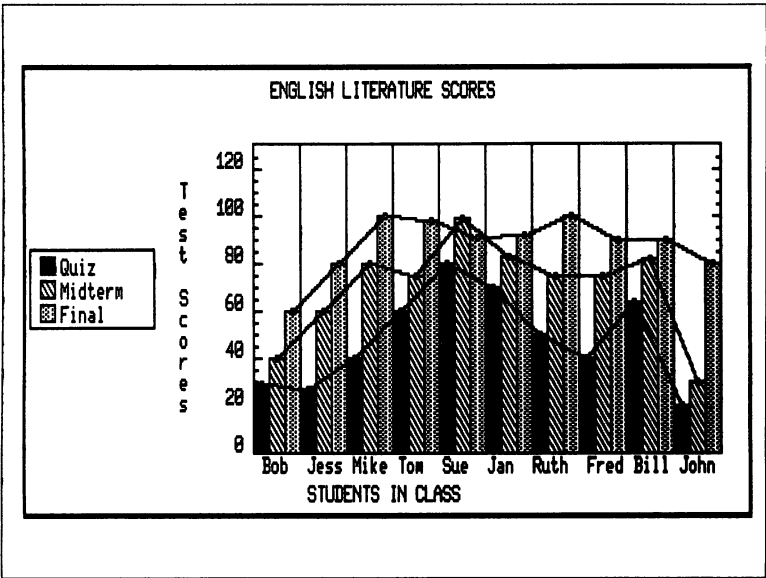


Figure 28

■ Scatter

A Scatter graph is a line graph with the connecting lines removed. It is best suited for large amounts of data where you are looking for the "clustering" of data points. This graph is primarily used for statistical types of analyses.

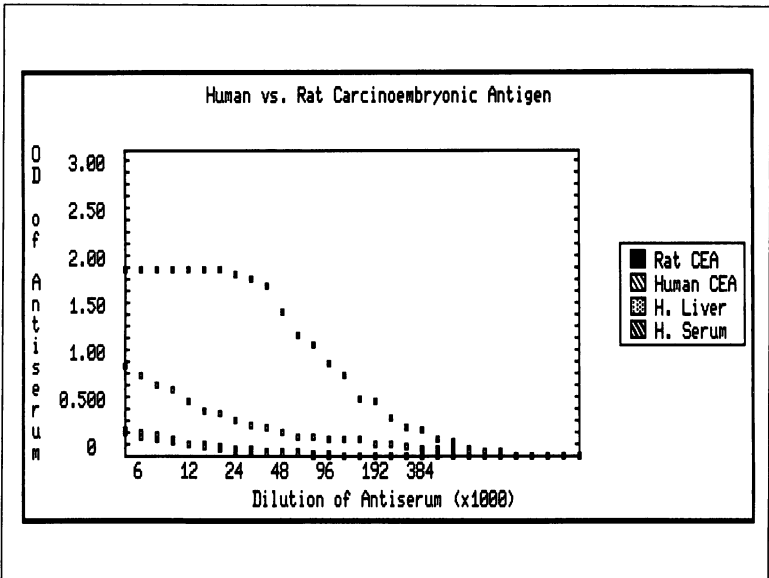


Figure 29

■ Area

An Area graph is like a line graph with the space between the lines filled in with the legend pattern. As in a stacked column graph, multiple ranges of data will add up on top of each other to show how each item contributes to the total. The Area graph dramatically shows the contours of the data. Negative numbers are treated as zeros as they are in stacked column graphs and pie charts.

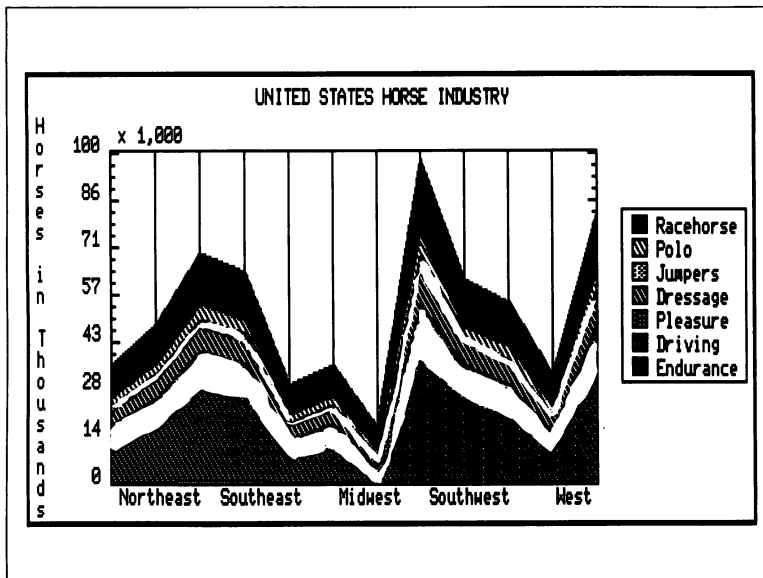


Figure 30

■ Pie

The Pie chart shows the relative share of the parts (the slices) that make up a whole (the pie). The slices represent the relative share of each item in a Category group keyed to the Legend.

The Pie chart's disadvantage is that it can show only one Category group at a time (contrast this to the stacked column chart which can show multiple Categories). It is also limited as to the number and spread of values it can handle in order to avoid having the individual slices becoming too small to be visible.

Negative numbers will be treated as zeros. Note that the Pie graph appears to be oval. The program does this intentionally so that a correct circle will be created when printed.

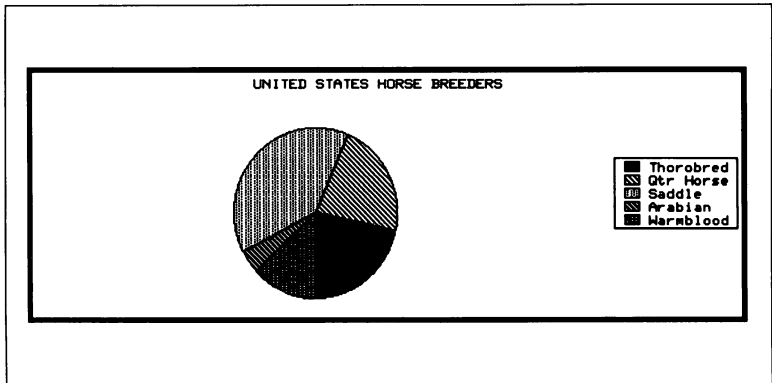


Figure 31

■ **3-D**

A “3-D” (for three-dimensional) graph has a third dimension, depth, added to it. This third axis (typically referred to as the Z-Axis) appears to come out of the screen in perspective, giving the appearance of a solid object. 3-D graphs can be quite dramatic in their presentation of your data.

The 3-D graph and the column graph have similar abilities with the exception that values can get “lost” in a 3-D graph when smaller values are plotted behind larger ones. The 3-D Rotate Axes option (as explained in Chapter 4) helps to minimize this. The 3-D graph treats negative numbers as zero.

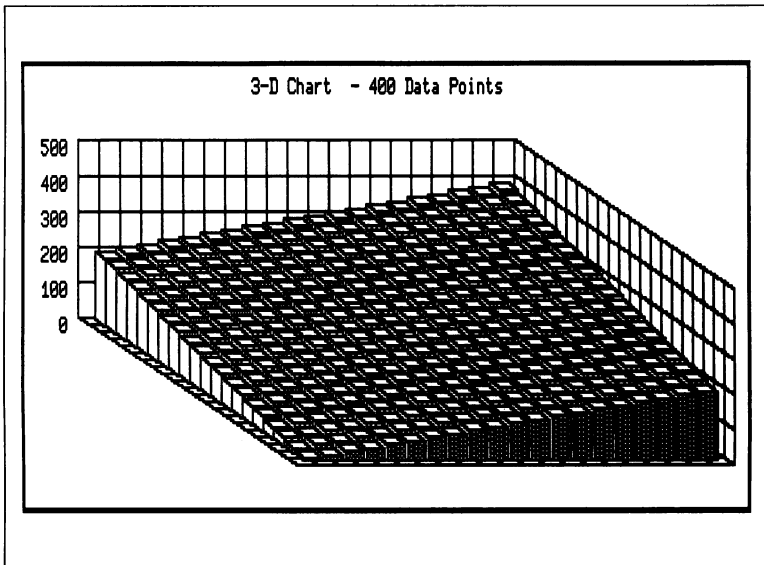


Figure 32

The 3-D Graph has several options available to help enhance its appearance and readability. Refer to Chapter 4 for complete information on these options.

- **Line Spacing. . .**—Specifies the number of scale lines which will be drawn along the Y-axis.
- **Rotate Axes**—This option rotates the 3-D graph 90 degrees so that it can viewed from a different angle.
- **Width Spacing. . .**—Specifies the space or “room” between 3-D columns side-to-side.
- **Depth Spacing. . .**—Specifies the space between 3-D columns front-to-back.
- **Show Grid**—Enables the drawing of the grid background of the 3-D chart. This is separate from the Axis options.

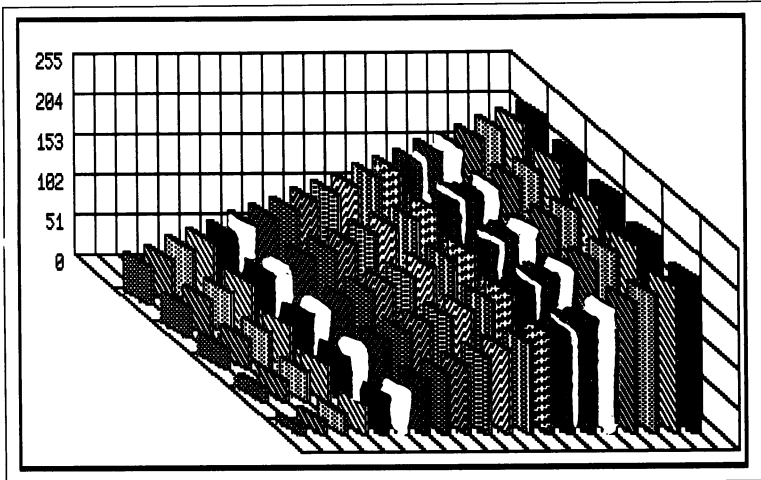


Figure 33

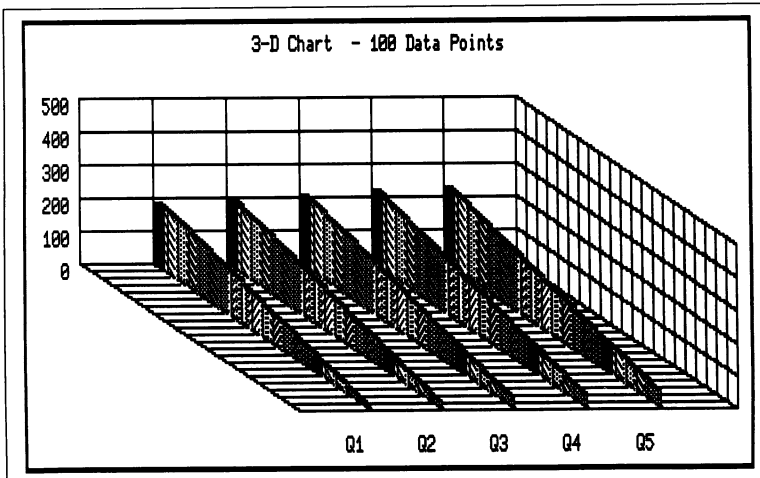


Figure 34

Glossary of Terms

Back up—Making a copy of a program or data in case of malfunction or loss of data.

Button—A small enclosed area within a Dialog Box that may be pointed to and clicked on to perform the indicated action.

Catalog—The area of a diskette containing the names of all other files on the diskette.

Categories—The point or points at which a Legend item is measured (e.g. months or regions).

Cell—A space in the Data Display Window for entering one data point where a Legend item intersects with one Category.

Check Mark—The indicator that a menu option is currently active.

Click—A press and release of the mouse button which executes a function.

Data—The numerical information to be graphed.

Data Point—A single piece of data; one number.

Default Setting—A pre-programmed value or setting that is assumed when no other value or setting is given by the user.

Dialog Box—An on-screen framed area in which the program asks you either for information or to make a decision.

Double Click—To click twice in rapid succession on the mouse button. This action usually is a short-cut method of making a selection and invoking a function, such as opening a file.

Drag—To highlight portions of the screen. To drag: position the pointer on the object or menu heading you wish to access or at the beginning of the cells you wish to highlight. Press and hold the mouse button while you move the mouse. When you are ready to make your selection or the desired area of the screen is highlighted, release the mouse button.

Edit—To enter, modify or delete information.

Exponential Notation—An arithmetic shorthand used for representing very large or very small numbers with as few digits as possible. For example, 1,234,567 in exponential notation is $1.235e6$. The exponent (the number after the “e”) is the number of places to shift the decimal point right or left.

Legend—A quantity that can assume any of a given set of values (e.g. sales, widgets produced, wheat shipped, etc.). Same as Variable.



Menu Bar—Extends across the top of the screen with topic headings. To access functions under each heading, simply pull down the menu by dragging.




Mouse—A hand-held device that is used to guide the pointer to different areas on the screen. Clicking on the mouse button activates a function.

Parallax—The change or amount of change in the direction in which something is seen, caused by a change in position.

Pixel—The space allotted to an individual dot drawn on the screen.

Plotting—Placing data points on a graph.

Pointer—A small arrow which is moved by either the mouse or the   arrow keys to different points on the screen to either access a command or an option or to initiate some screen action.

Quick Keys—A combination of the  key and another key. These two keys, pressed together, perform the same function as pulling down and selecting certain menu options. For example, you could drag down the FILE menu and select the Print option, or you could press  .

Scale—The numbers along the Y-Axis of your graph indicating the numerical value of the information being graphed (e.g. thousands of dollars, hundreds of bushels, degrees Fahrenheit).

Scroll Arrows—Located in the corners of the screen. Used to move cells in the Data Display Window up, down, right and left in order to bring unseen cells into view.

Select—To point to an option or item and click or drag the mouse button.

Truncate—To remove the ending elements of a series of numbers or letters.

WYSIWYG—What You See Is What You Get. The ability to view on screen what your printed output will look like.

X-Axis—The horizontal axis of a graph.

Y-Axis—The vertical axis of a graph.

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Personal Computer Software

Timeworks has put the **personal** in Personal Computer Software.

We have pooled creativity, technical knowledge, manufacturing expertise, and conscientious quality control to bring to you the versatility and reliability demanded by the computer generation.

We have dedicated ourselves to the development of programs which meet the personal productivity needs of the computer user. Each program is designed and tested with the user's needs foremost in our minds.

Timeworks programs utilize maximum computer capacity. Our manuals are user-friendly, written in plain easy-to-follow language, then carefully edited to provide continuity and correlation with the program.

If superior design, maximum capability, effective graphics and dependable performance are important to you, look into Timeworks **personal** computer software.

You'll be amazed at the difference a **personal** commitment can make.

For other Timeworks software see your local Timeworks dealer, or contact Timeworks, Inc., for a list of our latest software.

Timeworks, Inc.
444 Lake Cook Rd.
Deerfield, IL 6001-4919
(708) 948-9202

Register Today For Our Valuable Customer Technical Support Services

- **Free Technical Support:**

You get *60 days of FREE Technical Support*—for each program you buy—beginning with your first phone call, letter, or fax. Our full staff of phone technicians will be ready to assist with your questions Monday through Friday, from 9:00 a.m. to 5:00 p.m. (Central Standard Time).

- **Extended Technical Support Services:**

After 60 days of free support, you'll get *unlimited phone support for one year* for an annual fee of \$100.

Plus, you'll receive a number of other benefits as well:

- You'll have unlimited access to our Preferred Customer Toll-Free 800 number
- You'll get substantial discounts on all major upgrades and new releases
- You'll automatically receive Product Information Updates, as they are issued by Timeworks.

Each fee covers *all* Timeworks programs purchased by you *in the same hardware format*. (New hardware formats will require a new fee.)



**Important Customer Support
Phone Numbers Inside**

\$5

IMPORTANT NOTICE!

\$5

To qualify for **FREE** technical support and update information on this program, you **MUST** mail us your Registration Card.

Returning the Registration Card included in this package is the *only* way we are able to locate and inform you of future updates and special sales. You'll also receive the following important benefits:

1. **60 days of FREE TECHNICAL SUPPORT.**
2. **Update Information** - All Registered Users are notified first about the latest updates and upgrades.
3. **A \$5 credit on any Timeworks update** - Keep the coupon below, and return it to us when you purchase your next update. Be sure to subtract \$5 off your regular update price!
4. **Timeworks F.Y.I. Newsletter** - As a Registered User, you'll receive our "Preferred Customer Newsletter", which includes update information, product reviews, and *very special prices* on popular Timeworks programs.

DETACH HERE

\$5 Savings Certificate

This coupon is valid *only if you are a Registered User*. For use with *any program update purchased from Timeworks*.

YES! I am a Registered User. This coupon entitles me to deduct \$5 from my next update purchase.

Name of program update _____
(Hardware)

Your Name _____

Address _____

City/State/Zip _____

Daytime Phone _____

Save and return this coupon to Timeworks in the postage-paid order envelope you'll find included with your next update notice. Limit one coupon per update.

98DN

Important: To become eligible for Timeworks
Free 60-Day Technical Support, you must complete
and mail the attached, postage-paid
Registration Form on your right.

P N^o 137749

Keep these important Timeworks phone numbers on file

- Technical Support Helpline:
Call: 1-708-948-9298
 - For Updates and Upgrades; Replacement Disks;
Extended Technical Support Information; General Information:
Call: 1-708-948-9206
 - For information on dealers, Corporate Service Contracts, and Site
License Agreements:
Call: 1-708-948-9202
 - Timeworks Fax Number:
Call: 1-708-948-7626
-

No Matter which Technical Support Plan you choose, you'll also get Timeworks Money Back Guarantees:

If you purchased through a retail store:

If you can find *anything* that works better for you, simply send us your Timeworks *program*, your paid *receipt*, and the *name of the program you want*—along with your check or credit card information for *any* retail price difference. If it's available, Timeworks will buy it for you!*

If you purchased your program *directly* from Timeworks:

you'll receive a full money-back refund if you're not completely satisfied - for any reason.

Timeworks, Inc.
444 Lake Cook Road
Deerfield, IL 60015-4919
708-948-9200

*Offer expires 90 days after date of original purchase

TIMEWORKS EXCLUSIVE EXCHANGE POLICY

(See the UPDATE policy on reverse side.)

Timeworks programs never become obsolete:

So, you're thinking about buying a bigger, more powerful computer system, but you have a lot of software programs that you will no longer be able to use. Since you've invested in Timeworks programs, you won't have that problem.

We'll take back your current Timeworks program and send you, in the correct format, any other program we publish.

Here's how:

1. Call or write us for a current price list of software for your new computer. Choose which program you'd like to exchange.
2. Send us your old program complete: disk, manual, case. Tell us which program you are exchanging for, and include your check or credit card number to cover any suggested retail price difference between the two, plus \$4.70 for shipping and handling.
3. NOTE: If you are exchanging for a program of the same or lesser suggested retail price than your original, send \$14.70.

Only Timeworks programs may be exchanged for other Timeworks programs.

Send to: **Timeworks, Inc., Customer Service Dept.**
444 Lake Cook Road, Deerfield, IL 60015
(708) 948-9206



TIMEWORKS EXCLUSIVE UPDATE POLICY

(See the EXCHANGE policy on reverse side.)

Timeworks programs never become obsolete:

From time to time we discover ways to incorporate even more features into our programs or to make them easier to use. Since you're investing in Timeworks programs, you won't have to miss out on these improvements.

When we **UPDATE** a program, we'll take back your original Timeworks program and replace it with the updated version.

Here's how:

1. Call or write us for an Update Price List. If you're a registered user, you'll receive update information automatically.
2. Send us:
 - Your old program disk(s). (If your registration card is on file with us, you can send us your old disk after you receive the new update.)
 - The front cover or the title page of your present manual.
 - Your check or credit card number (plus its expiration date) for the correct amount.
3. Note that update prices will vary according to the program, the development time, and the number of features added.

Send to: **Timeworks, Inc., Customer Service Dept.**
444 Lake Cook Road, Deerfield, IL 60015-4919
(708) 948-9206

YOU MUST RETURN YOUR REGISTRATION CARD TO RECEIVE THESE IMPORTANT BENEFITS:

1. Timeworks Technical Support - **FREE** for 60 days. (You cannot receive this service unless your Registration Card is on file.)
2. You can return your old disk and manual **AFTER** you receive your new updated program — if your card is on file with us. (We trust you.)
3. You'll automatically receive our **F.Y.I.** newsletter covering the latest updates on all Timeworks programs, along with other information which we think is important to you.

It's our commitment to you!



HOW TO OBTAIN A BACKUP DISK

If you are a Registered User, you may obtain Backup Disks* (3½" or 5¼" format) for this program by returning (1) this card with the information below, plus (2) your credit card number or check for \$5.00 for each disk (3½" or 5¼") plus \$3.70 for shipping and handling to:

TIMEWORKS, INC. 444 Lake Cook Road, Deerfield, Illinois 60015-491926

Name _____

Address _____

City _____ State _____ Zip _____

Name of Program _____ Catalog # _____ Version #** _____

Hardware: IBM Apple MAC C-64 C-128 Atari ST

Disk Size: 5¼" 3½" (not available for C-64 and 128)

Enclosed is my check money order

VISA Master Charge American Express

Credit Card # _____ Expires _____

Signature _____

• *Please remember, your software registration card, which is included in this package, must be on file with us in order to obtain this service.*

• This offer does not apply to PARTNER 64 and 128.

* Illinois residents add 5%.

** This version is the "V" number located on your disk directory.

P N^o 137749

Timeworks Premium Technical Support Plan

- Yes! I want to subscribe to Timeworks' Unlimited Toll-Free Technical Support. My annual fee of \$100 is enclosed.

Name of program _____

Type of Computer: IBM (or compatible) Macintosh Apple
 Atari St C128 C64

Name _____

Address _____

City _____ State _____ Zip _____

Daytime Phone _____ Date _____

- Enclosed is my check for \$100 - made payable to Timeworks, Inc.
 Please charge to my: Visa Mastercard American Express

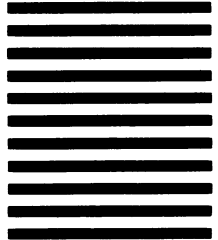
Card Number _____

Exp. Date _____

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FIRST CLASS PERMIT NO. 75 DEERFIELD, IL 60015

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444 LAKE COOK ROAD
DEERFIELD, IL 60015-9842

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1009V1
P.N. 0000-009-001



Friendly Reminder!

TIMEWORKS
PLATINUM.
S E R I E S

Making the most of Timeworks Helpline:

In order for us to deal with your technical questions more efficiently, please remember to do the following before you make your call:

- **Have your registration number ready.**
- **Have access to your computer.**
- **Know which version of the software you are using.**
- **Run through the process that causes the problem and confirm that it re-occurs.**
- **Check the manual — the answer may be there!**



Dear Timeworks Customer:

THANK YOU for buying *Timeworks software!* Please keep this handy card on file in case you have any questions regarding this program or any other Timeworks program.



- **PLATINUM SERIES HELPLINE**

Call: **1-708-948-9298** or **1-708-948-9208**

- **UPDATE OR REPLACEMENT INFORMATION**

Call: **1-708-948-9206**

- **TO PLACE AN ORDER**

Call: **1-708-948-9202**

- **TIMEWORKS FAX NUMBER: 1-708-948-7626**

Or write to: Timeworks, Inc., 444 Lake Cook Rd., Deerfield, IL 60015-4919

