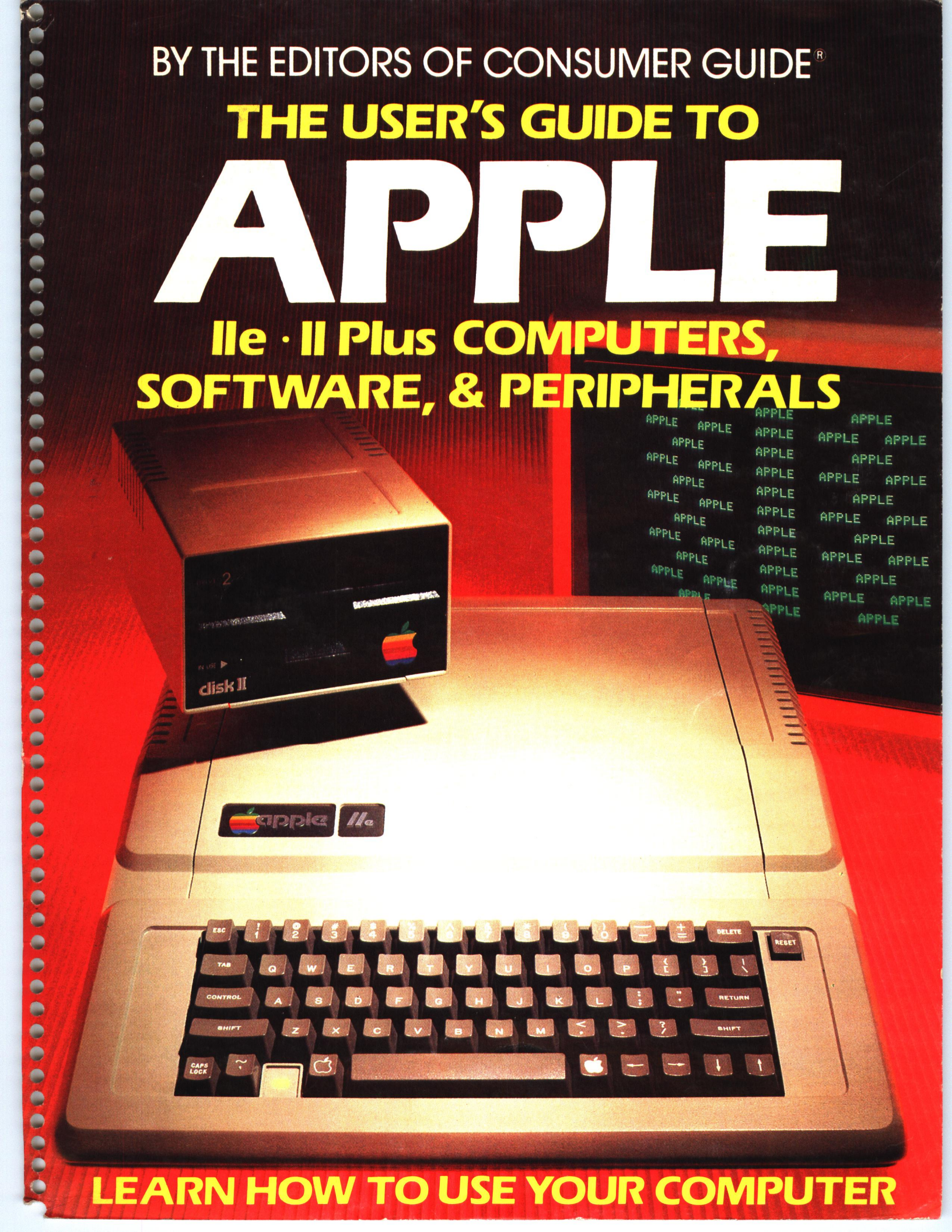
BY THE EDITORS OF CONSUMER GUIDE®

THE USER'S GUIDE TO APPLE

IIe · II Plus COMPUTERS, SOFTWARE, & PERIPHERALS



LEARN HOW TO USE YOUR COMPUTER

BY THE EDITORS OF CONSUMER GUIDE®

THE USER'S GUIDE TO APPLE

IIe · II Plus COMPUTERS, SOFTWARE, & PERIPHERALS

Written by Bill Kling

BEEKMAN HOUSE
New York

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Manufactured in the United States of America
10 9 8 7 6 5 4 3 2 1

Library of Congress Catalog Card Number: 83-62114
ISBN: 0-517-41678-6

This edition published by:
Beekman House
Distributed by Crown Publishers, Inc.
One Park Avenue
New York, New York 10016

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The prices listed in this book were accurate at the time of printing: prices are subject to change.

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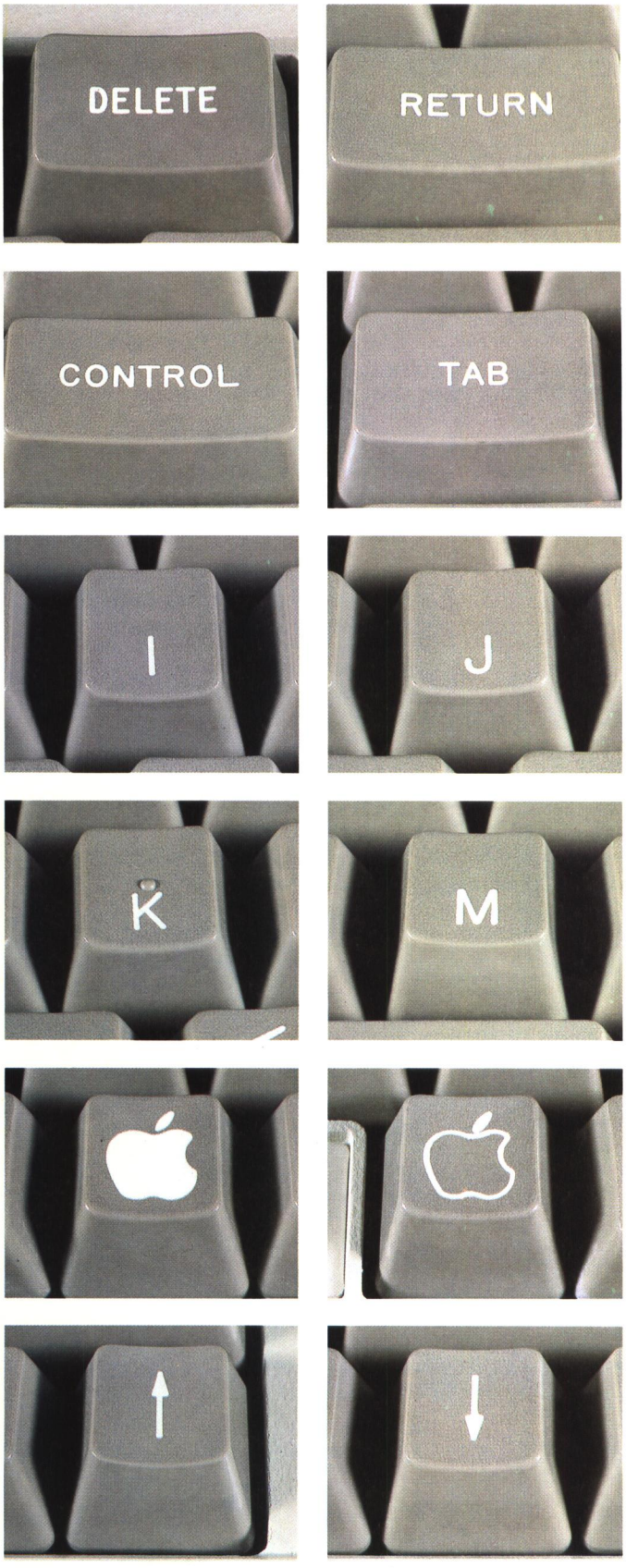


Everywhere you turn, you see people working with computers—bank tellers, travel agents, scientists, stock brokers, police, movie directors, doctors, artists. Chances are good that you know someone personally who uses one. The computer has become a commonplace tool, like a typewriter, a power drill, or a vacuum cleaner.

And that is how you should view your new computer—as a tool that you can master with ease. Believe it or not, that is the truth. With a little time at the keyboard, some help from this book, and a little research (if necessary for your purposes), you'll be using your Apple computer like a pro.

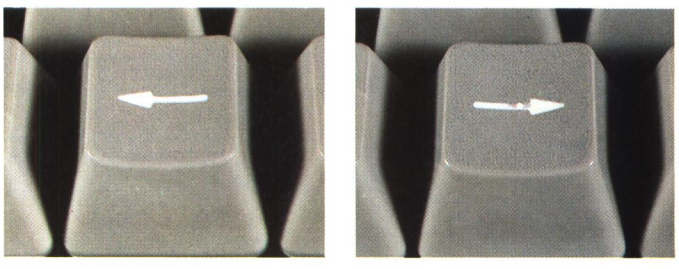
This book will help you become *computer literate*. When you finish the exercises in Chapter 3, "Meet the Keys," you'll feel a basic sense of familiarity with, even mastery over, this tool. If you don't know exactly how to make it perform a particular task, you'll have a good idea of where to look for information and how to proceed. You'll also find yourself gaining an appreciation for what other computers do. But what about your Apple? What do you want from it?

For example, as a businessperson, you may have little interest in the fact that the Apple is a dynamite programming machine right out of the box. Instead, you might want a marketing forecaster—or an accountant, or an inventory control device. Bingo! Your Apple can become any or all of these.

You may be a dentist or a doctor, with medical record-keeping needs. Or maybe you are a manufacturer or you run a small laboratory; you want a computer to guide processes, to do tests and to report results. Perhaps you're a writer who wants a word processor, or a student who wants a language machine with BASIC, Pascal, FORTRAN, FORTH, COBOL, and all the rest. Whoever you are, if you have an Apple, you have just what you need.

YOUR BEST FRIEND IN THE COMPUTER GAME

Your dealer can be a tremendous help to you as you travel through the world of home computing. The dealer need not be the person



who sold you your Apple, but you will need a good dealer. But what do we mean by "good"?

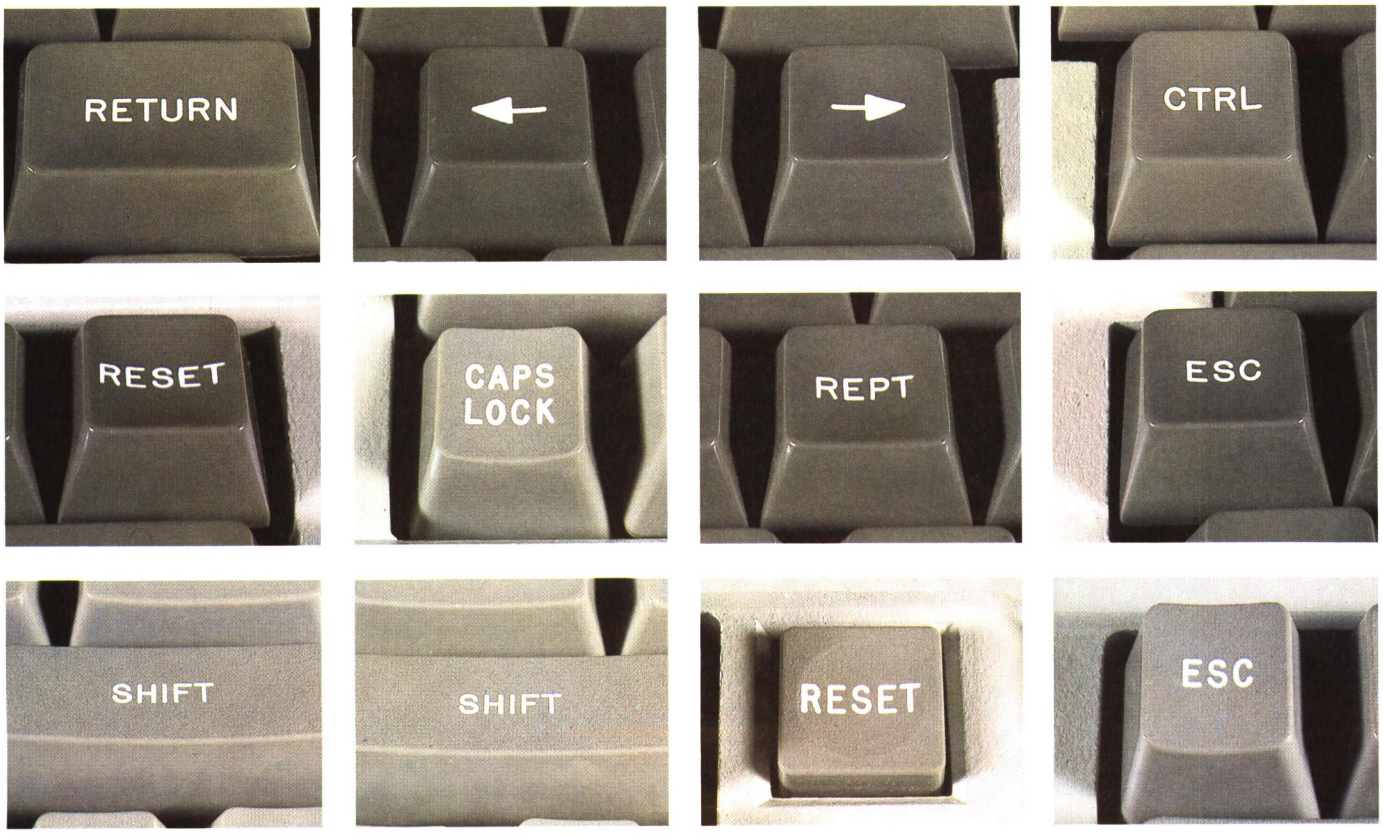
- A good dealer is one to whom you can communicate your needs, not one who insists on doing all the talking (quite possibly in a language you don't understand).
- A good dealer is finicky about the products he or she sells.
- A good dealer will let you try a couple of different software packages (generally on the premises) so that you can see which one is really right for you.
- A good dealer can provide the full range of repair needed to keep your Apple in tip-top shape.
- A good dealer offers classes (from "Starting Out" to "Hands-on Pascal").
- A good dealer has a good reputation with local Apple users.

A good dealer is invaluable. It's worth the time to go out and look for a good dealer before you buy. If you bought your Apple from a dealer who doesn't meet your needs, keep shopping. If you like the dealer you bought from, cultivate the relationship; you'll have a helpful source of advice for years to come.

When you're looking, see if the dealer will, for example, set up a particular combination of software, card, and printer so that you can see that the combination performs well together. (NOTE: Please don't go around asking this as a test procedure, unless you want to buy the combination.)

Some dealers *burn in* your hardware purchase before letting you take it out the door. *Burn-in* is a test that exercises your machine (whether computer or peripheral device). This exercise seeks to discover bad parts, while encouraging weak parts to fail. Flawed chips and circuitry have a tendency to fail very early on in the device's life. This is why burn-in is so valuable. Don't settle for less than four hours of burn-in on your computer. Twenty-four is excellent (though rare).

Now let's get you up and running!



CHAPTER 2 GETTING STARTED

This chapter covers the basics of getting your computer set up. It provides a list of essential equipment and step-by-step instructions on how to put it all together. Don't worry: if you can set up the average stereo, you can set up your Apple.

WHERE TO PUT THE NEW ADDITION: SOME CONSIDERATIONS

The Apple is a robust little computer. Still, you should avoid putting it in an area that is particularly dirty, dusty, damp, extremely hot, or extremely cold. Stay away from areas with leaky pipes (or leaky ceilings). Direct sunlight is also harmful to computers. You should also stay away from areas that tend to generate high amounts of static electricity (unless you want to invest in antistatic floor mats or desk mats).

Make sure your computer work surface is hard, flat, and sturdy—no card tables, please! If you want your computer to be movable, consider one of the sturdy little computer tables with built-in casters.

ELECTRICAL OUTLET REQUIREMENTS

An important consideration in hooking up an Apple computer in the average home is electricity. This is a good time to count your outlet requirements. The Apple and a video monitor each have power cords that need feeding. Did you get a printer? A plotter? A hard disk? A synthesizer keyboard? How about a desk lamp? They add up! If possible, choose the three-pronged type of electrical outlet. If you don't have three-pronged outlets, head for the hardware store and get adapters.

Wait! Before you pull your coat on, think about two things: a power strip and a surge protector. A power strip is particularly handy for rooms with few outlets. It's also very good to use with a surge protector.

Ordinary power lines are okay for running refrigerators, lamps, and blenders. However, they sometimes carry surges of high voltage (often called *transients*). These electrical tidal waves can throw your system out of whack (causing data loss). Worse, a really strong jolt can destroy your circuit board. This is rare, but it happens.

By placing a surge protector on a power strip, you can protect your computer and all your peripheral devices. Technically, it's called a *switching power supply*. The Apple power supply provides a lot of protection against surges, but a friend of ours lost his Apple when a power surge invaded his circuit board through his printer! A power strip with a surge protector could have prevented that.

NOTE: You don't need these items to get started. But think about it for the future. One product fits right on the Apple and provides a fan as well. (See the section on "Miscellaneous Hardware" in Chapter 4, "Peripherals.") If you decide on a power strip, select one with a built-in circuit-breaker.

JUST THE ESSENTIALS: A PARTS LIST

Here's a list of the equipment you'll probably want to have to get started.

- An Apple IIe or Apple II Plus computer
- A video unit—either a TV or a monitor
- A disk drive
- Floppy disks for the disk drive (including the Apple Master Disk)
- An RF modulator—but only if you plan on using a TV
- The Apple power cord and the video cord
- Optionally FOR THE APPLE IIe, either the 80-column text card or the 80-column extended text card

TV, ANYONE?

If you decide to connect a TV to your Apple, you'll need an RF modulator. The modulator converts the Apple's data into a form the TV can meaningfully display. As a general rule, the smaller the TV screen, the sharper the picture.

WARNING: It's okay to use a TV that has a microprocessor to control tuning, as long as you can turn its microprocessor off. Don't try to use a TV in which the microprocessor stays on all the time. Such a condition keeps you from properly tuning the TV to the Apple.

If you want the sharpest possible picture, buy a monitor. A monitor plugs directly into the back of the Apple, next to the cassette ports (connector holes). If you plan to use the computer a lot (in word processing, for example), consider investing in a monitor. Your eyes will appreciate the difference.

Black-and-white (or black-and-green) monitors are fine for most purposes. However, if your needs include a lot of graphics (for games or graphs, perhaps) you may eventually want a color monitor.

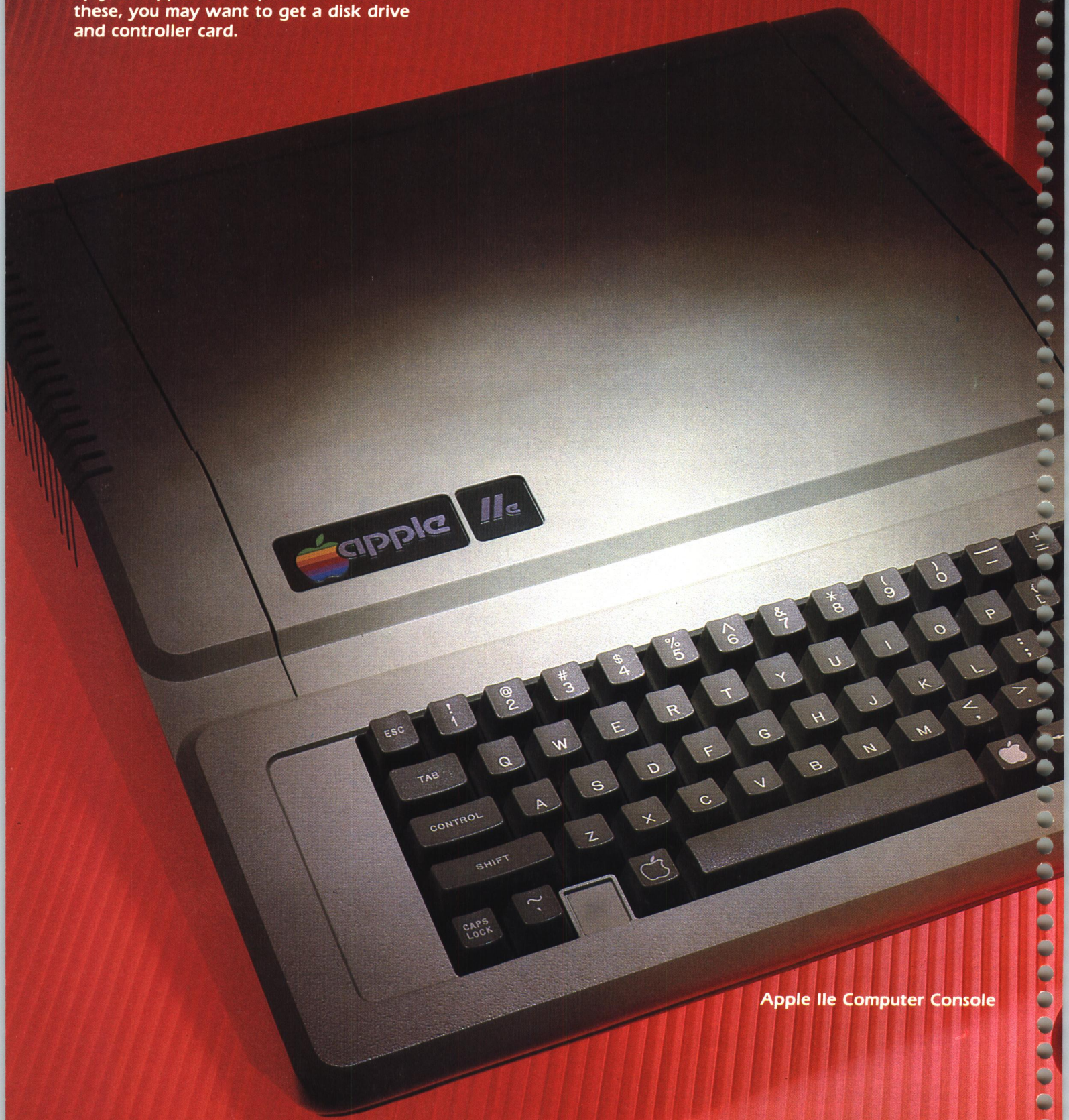
HERE'S WHAT WE'RE GOING TO DO

We'll begin by putting together the components. Then we'll make sure your system runs, before adding any other devices. Putting together a basic Apple system includes these activities:

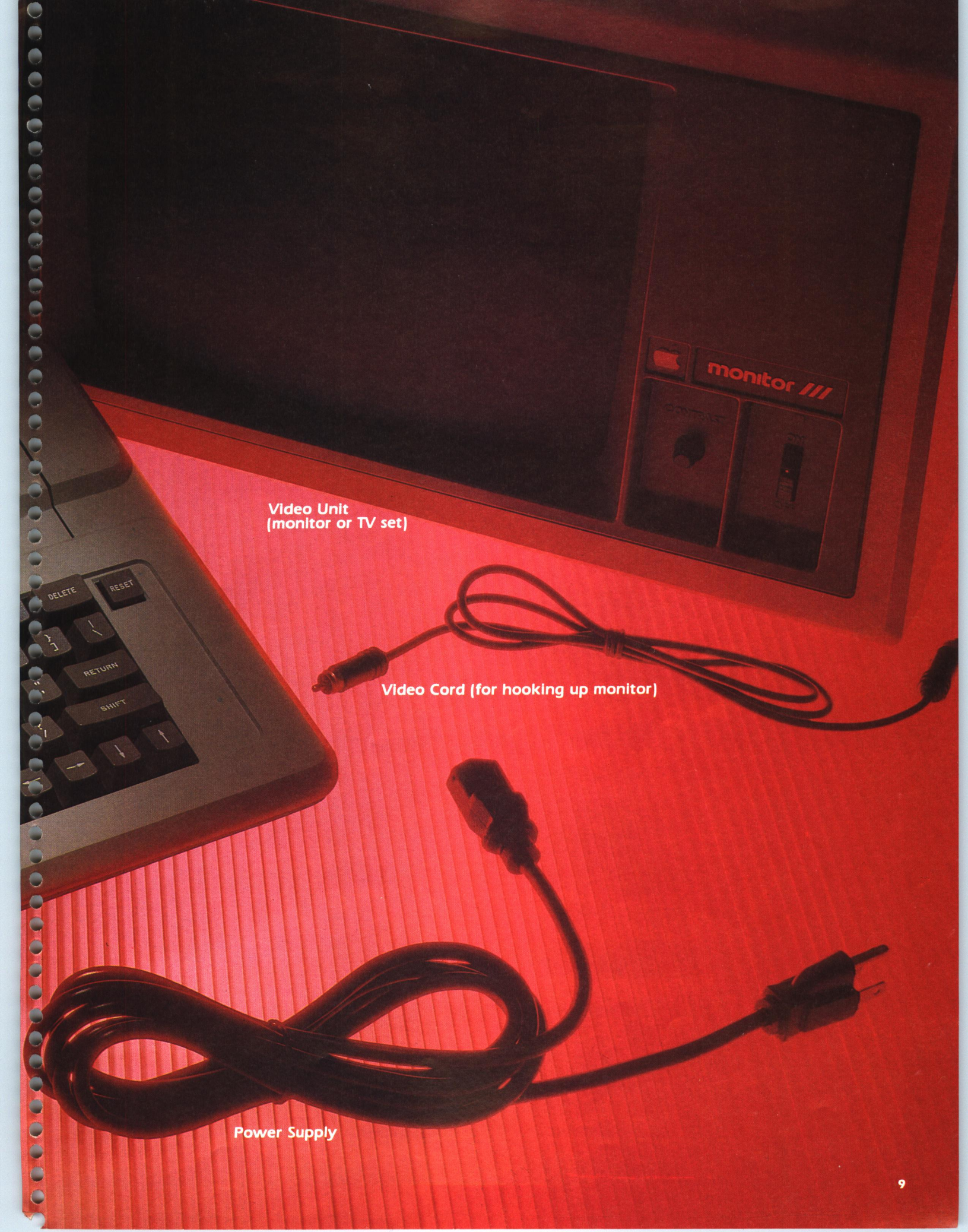
- Opening your Apple and discharging your own static electricity
- Testing the computer console to make sure it's healthy before installing any other equipment
- Hooking up your RF modulator (if you need one)
- Installing your disk drive controller card and drive cable
- Putting in an 80-column text card (FOR THE APPLE IIe), if you have one
- Connecting your video unit
- Connecting power cords
- Putting a disk in the drive and starting the system

HOOKING UP YOUR APPLE IIe

Here are the components you need to set up your Apple IIe computer. In addition to these, you may want to get a disk drive and controller card.



Apple IIe Computer Console



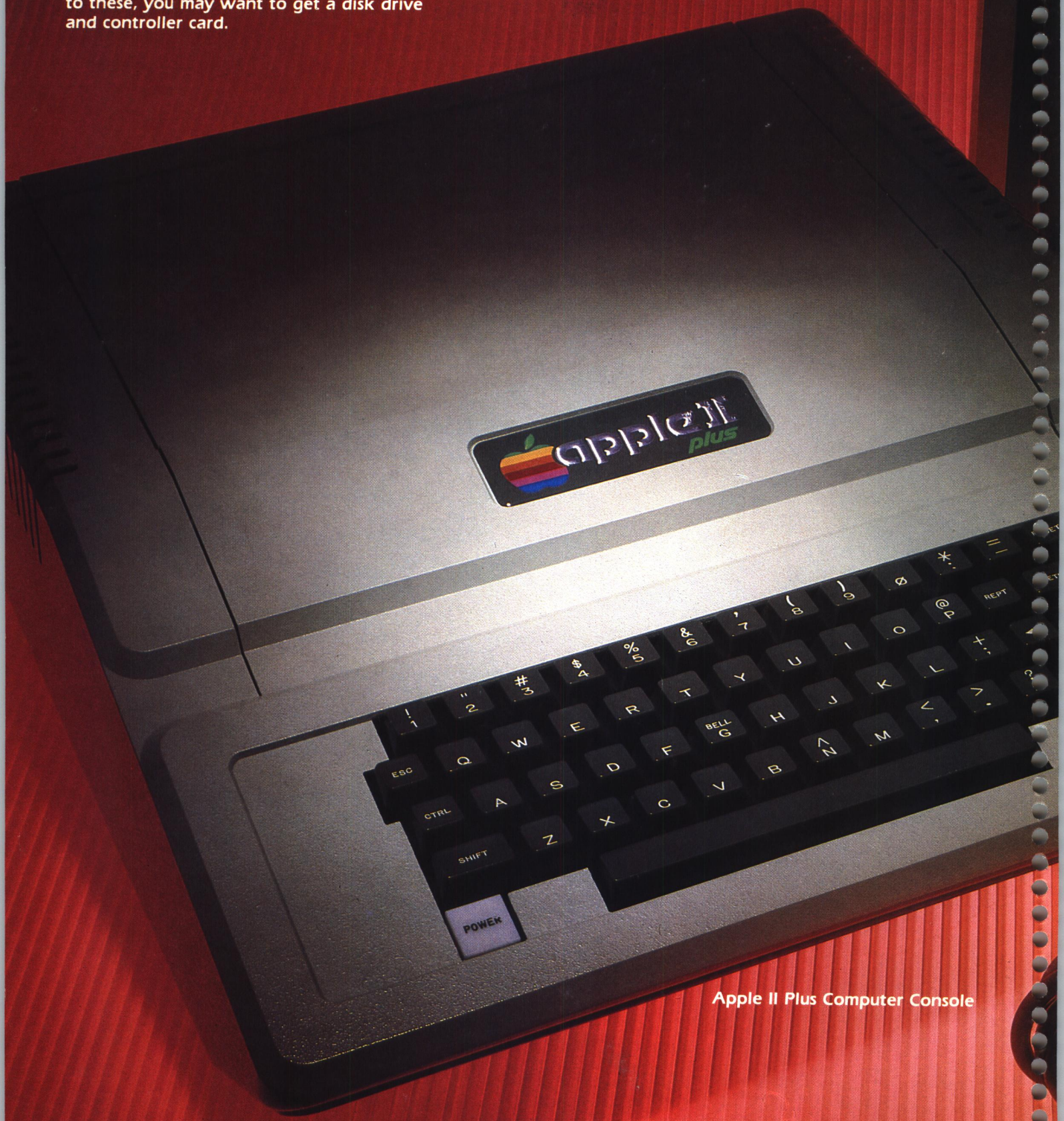
Video Unit
(monitor or TV set)

Video Cord (for hooking up monitor)

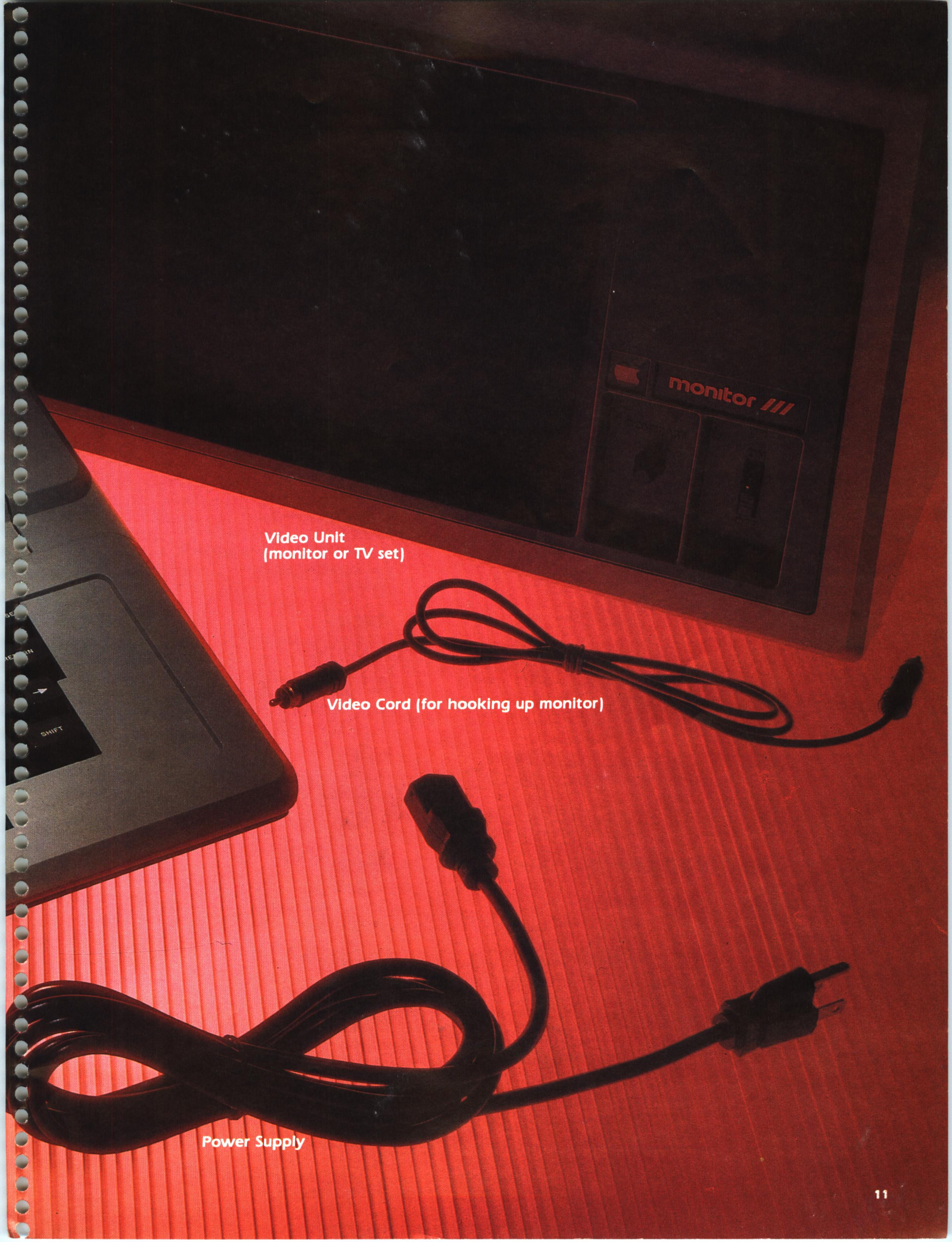
Power Supply

HOOKING UP YOUR APPLE II PLUS

Here are the components you need to set up your Apple II Plus computer. In addition to these, you may want to get a disk drive and controller card.



Apple II Plus Computer Console



Video Unit
(monitor or TV set)

Video Cord (for hooking up monitor)

Power Supply

UNPACKING AND TESTING

Now let's go through the first steps of setting up. Then you'll run a basic test to see if you have a fundamentally healthy computer. If you don't, there's no point in getting everything else all set up.

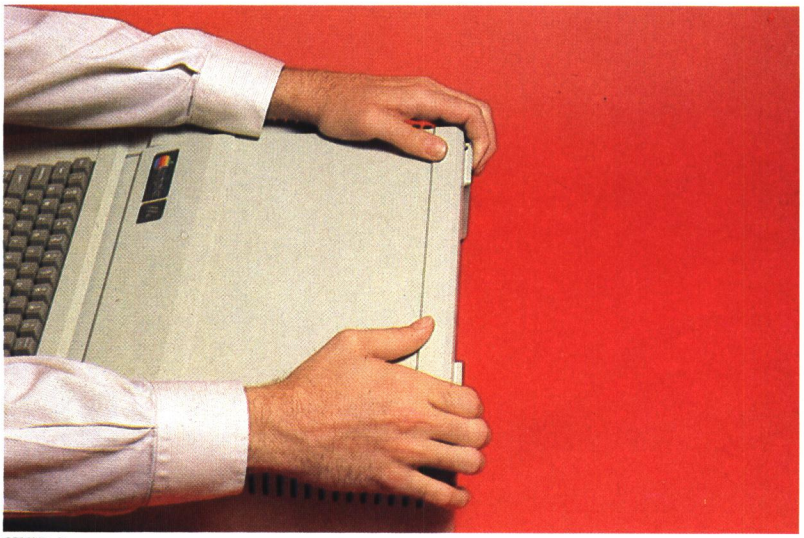
STEP 1

If you plan to install a power connector and/or surge protector, do it now.

STEP 2

Unpack your computer. Be sure to save your Apple equipment boxes and the packing inside! They were designed to give your equipment heavy-duty protection during shipping. They could come in handy if you have to move or have to ship your computer somewhere (such as for heavy servicing).

Also, resist the temptation to charge ahead (just for a moment). Find the packing list that comes with your system and make sure that you have all the books and accessories you're entitled to. While you're at it, fill out the information card. This card allows Apple to contact you in case of upgrades or changes to your system.



STEP 3

STEP 3

Place the Apple directly in front of you with its keyboard facing you. To remove its lid, place your hands on the edges toward the rear of the machine and lift up on the rear of the lid with your fingertips.

STEP 4

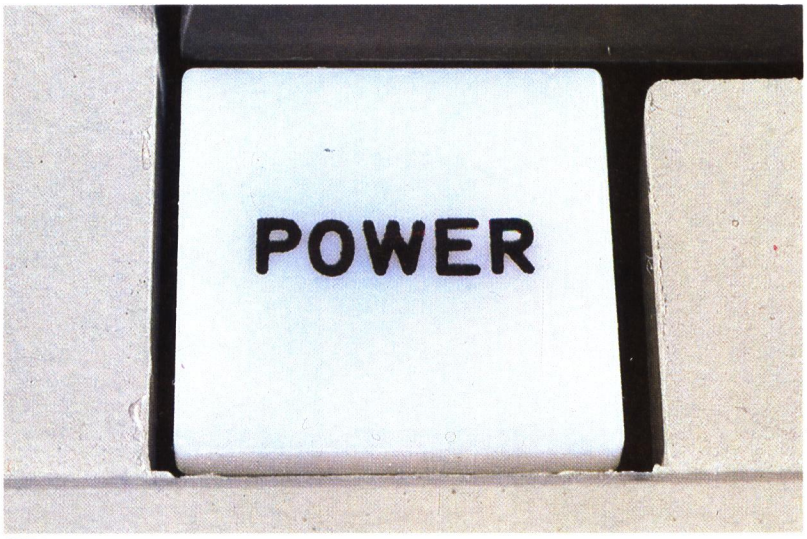
STEP 4

Plug the power cord into the back of the Apple and then into a wall outlet (or power strip).

STEP 5
ON THE APPLE IIe, press the upper portion of the power switch on the rear of the computer so that the Apple turns on. ON THE APPLE II PLUS, press the square, white button on the keyboard marked POWER. You should hear a beep from the Apple.

Look at the keyboard. A light on the lower left side of the keyboard should be on. If you look at the left rear corner (near the power supply) OF THE APPLE IIe, you should see a little red light glowing. The words POWER ON are printed by it.

If you didn't hear the beep or if the lights didn't come on, you may have a sick Apple. See the Troubleshooting Guide at the end of this chapter. Do not panic. The problem can be something as simple as the power to the outlet or the power strip being turned off.



STEP 5

STEP 6
Before continuing, turn the power off. Also, unplug your power cord from the wall outlet and from the computer.

WARNING: Never try to install or remove circuit cards when the power is on. Never touch the main circuit board or any of its parts when the power is on. Always turn the power off before you remove the lid from your Apple.

INSTALLING THE RF MODULATOR—TV ONLY

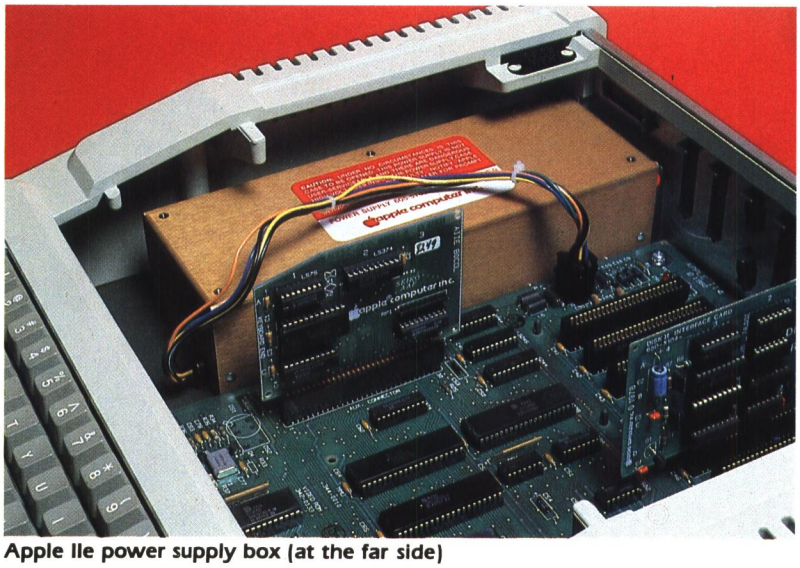
If you plan to use a TV with your computer for a visual display, install your RF modulator now. Follow the instructions that come with the modulator. (Differences among different modulators make it impossible for us to give you directions here.)

Disk II drive

INSTALLING THE DISK SYSTEM

Unpack your Disk II disk drive and its accessories. Take note of the long flat *ribbon cable* that protrudes from the back of the drive and the small plastic connector at its tip. Also unpack the green rectangle with black *chips* mounted on it; this is your Disk II Interface Card.

Remove the two pieces of tape from the cable. The first piece keeps the cable folded up. The second piece of tape, located a couple of inches from the connector at the end of the cable, covers a small metal flap on the cable.



Apple IIe power supply box (at the far side)

The Apple power supply is the box that extends along the inner left side of the computer. Touch it with both hands to discharge any static electricity you might be carrying. Always do this before handling any internal parts of the Apple.

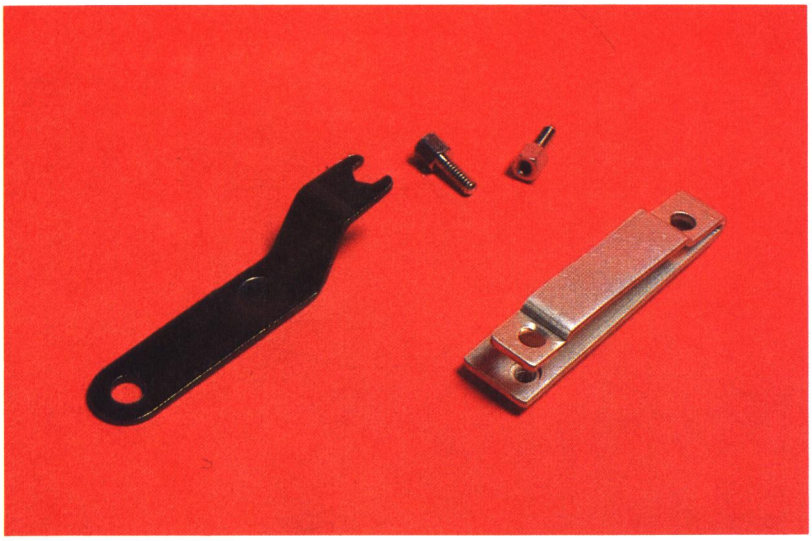
Now we'll show you how to install the disk system.

NOTE: The Apple II Plus and the Apple IIe have slight differences in the way you install the disk system cable(s) and clamp(s). Therefore, we present these steps for each computer separately.

APPLE IIe: INSTALLING THE CLAMP AND CABLE

STEP 1

From the DOS 3.3 System Master Pack (the small box containing your system disk), remove the plastic bag of metal parts. Sort out the parts: U-shaped clamp, two jack screws (the only pair of screws in the package; they have hexagonal heads), and a small wrench.

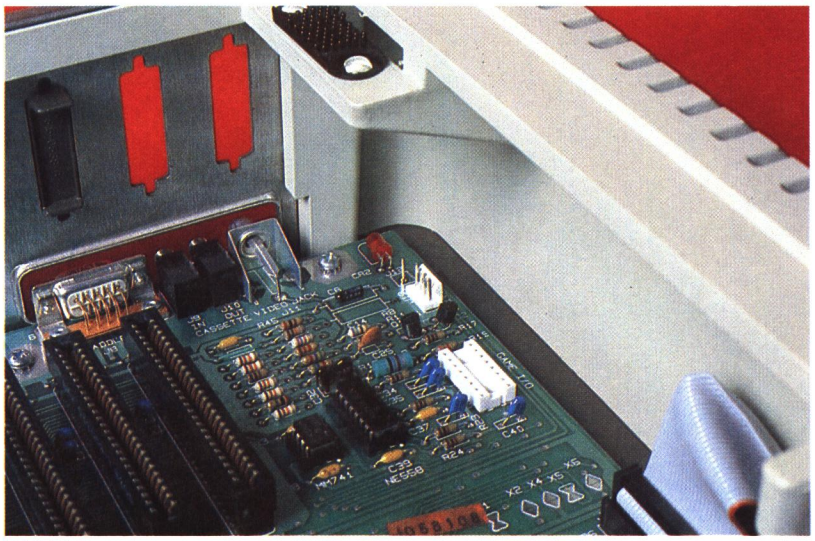


STEP 1

STEP 2

To remove the plastic cover plate marked 1 on the back of the Apple, just press down and then out on the little handle inside.

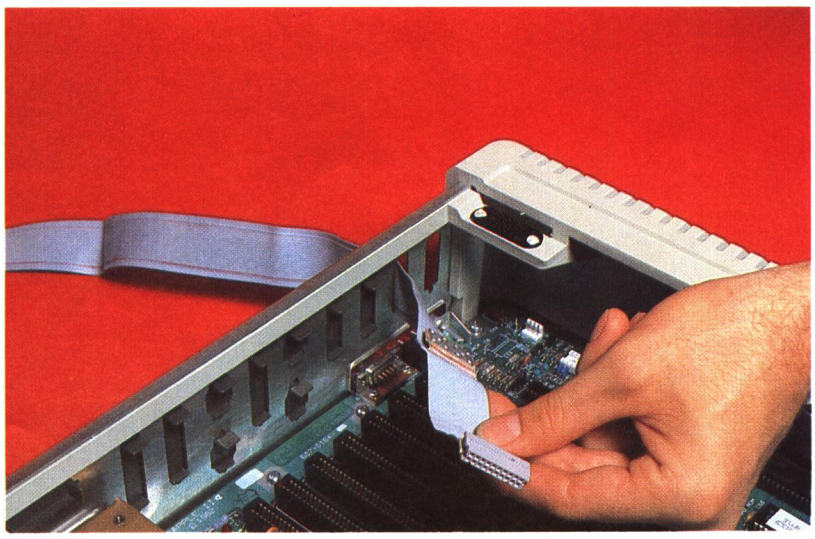
NOTE: In the photographs in this section, the cable is inserted through the second opening so you can better see the procedure in the photos. When you actually insert your cable, you will need to insert the cable through the first opening, the one nearest the corner of the computer.



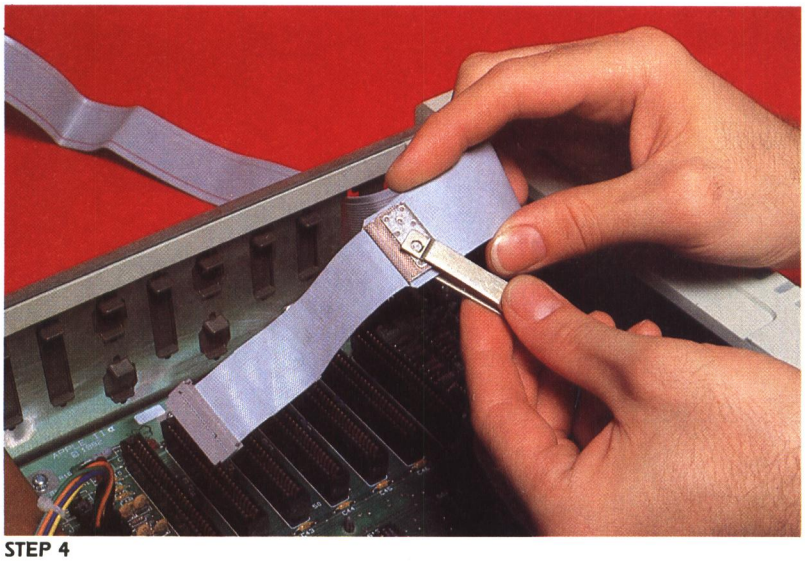
STEP 2

STEP 3

Take the cable, lift the metal flap back, and press it down (so that it points away from the connector end). Work the connector and cable through the opening (from the outside).

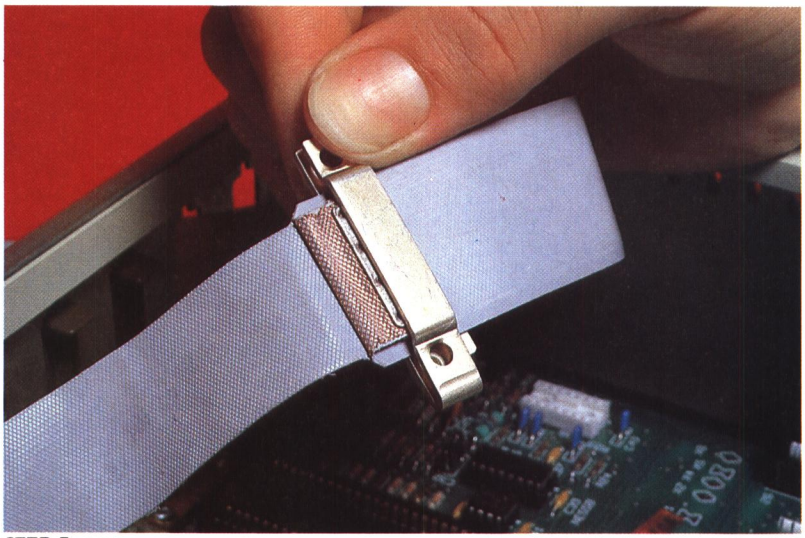


STEP 3



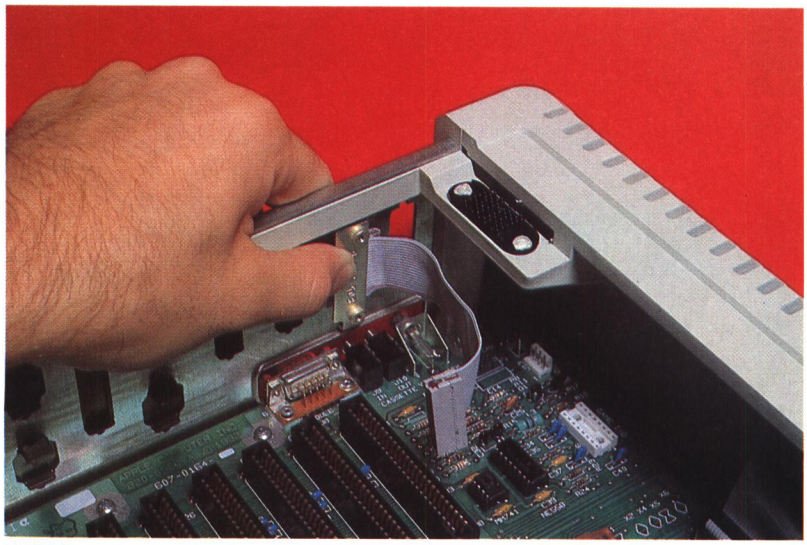
STEP 4

STEP 4
Take the U-shaped clamp in your other hand and hold it with the hump side up, your thumb on the hump. The open end should point outward from your hand.



STEP 5

STEP 5
Slip the clamp over the metal flap, so that the underside of the clamp goes under the cable and the hump side goes over the metal flap. NOTE: If this feels too stiff, spread the sides of the clamp slightly and try it again.



STEP 6

STEP 6
Insert the clamp into the hole through which you inserted the cable into the computer. You can feel the clamp click into place when the two fit successfully. The hump should point outward, filling the opening. Note that the two built-in nuts on the flat side of the clip face inward.

STEP 7
Reach behind the computer and start each jack screw in a hole on the clamp. Once started, finish tightening to a reasonably firm, but not hard, degree.

STEP 8
If you have any more drives, follow the same procedure for each one, feeding the cable for each one through the next opening to your left.

Once you have your clamp(s) and cable(s) installed, go on to the section "Installing the Disk II Interface Card."

APPLE II PLUS: INSTALLING THE CLAMP AND CABLE

STEP 1
From the DOS 3.3 System Master Pack (the small box containing your system disks), remove the plastic bag of metal parts. Sort out the parts: a large rectangular clamp (with the word TOP inscribed on its hinge) and a long, Phillips-head screw (it's different from the other two screws in the package).

STEP 2
Push the screw through the hole at the bottom of the clamp until its tip comes in contact with the built-in nut. Squeeze the clamp a little and turn the screw until its tip becomes flush with the outer portion of the built-in nut.

STEP 3
Slide the connector and its cable through the side of the clamp that holds the screw head and then out through the opening on the other side.

STEP 4
Make the metal flap catch in the lip of the opposite side (the side with the built-in nut).

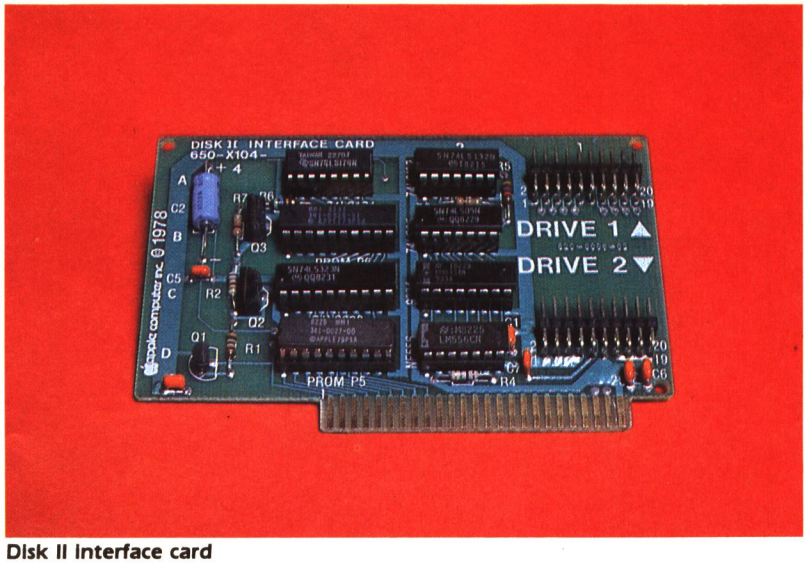
STEP 5
Find the three deep vertical openings in the back of the computer. With the word TOP upside down and on top, slowly slide the clamp over the deep opening farthest to the right. As you do, keep the metal flap between the wall of the computer case and the inside piece of the clamp.

NOTE: For two drives you must draw the other cable through so its metal flap fits into the opposite lip.

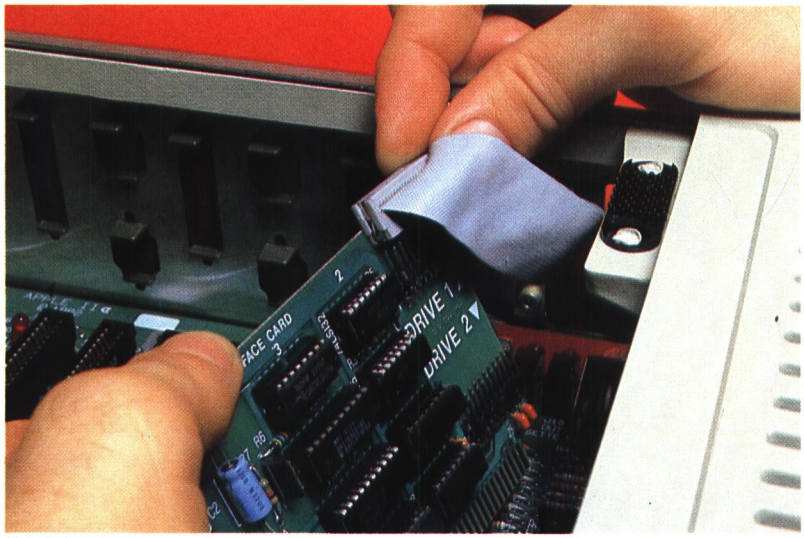
Once you have your clamp(s) and cable(s) installed, continue with the next section, "Installing the Disk II Interface Card."

INSTALLING THE DISK II INTERFACE CARD

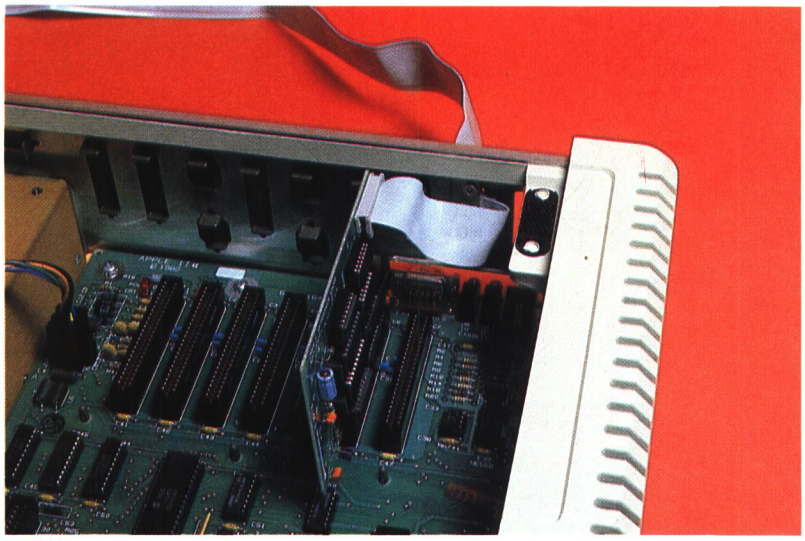
The Disk II Interface Card handles all communications between the computer and the disk drive. Handle it gently. Always hold the card by its corners or edges. Avoid touching the gold-edged connector. Skin oils or dirt can interfere with transmission of data.



Disk II interface card



STEP 1


STEP 2

WARNING: Please read this whole section carefully before you start to install the card. Failure to install the controller card properly can result in damage to the computer and the disk system.

STEP 1
Place the ribbon cable connector gently on the connector pins for Drive 1 on the Disk II Interface Card.

CAUTION: Be sure that the cable coming off the connector flows away from the board. Also, check to see that none of the pins is without a hole in the connector; improper mounting of the connectors can severely damage your equipment.

STEP 2
Press down gently until the ribbon connector covers its pin. If the movement feels jammed, stop immediately and make sure you haven't mispositioned the connector on the pins. If you discover a problem, remove the connector and examine the pins. If any are severely bent or broken, take the card back to your dealer for replacement or repair.

STEP 3
If you have a second drive, follow the same basic procedure for installing its connector into the "Drive 2" connector on the card. Remember, the cable always flows away from the card.

STEP 4
With the cables properly connected, position the controller card in slot 6 inside the computer box. (ON THE APPLE IIe, this slot is called C6.) The end of the card with the ribbon cable(s) should be closer to the back of the computer; the ribbon should be on the right-hand side of the card (as you face the computer keyboard).

STEP 5
To insert the card, put it in at a slight angle, with the low corner closest to you, entering first. Then gently rock the card into place. Give it a firm push downward to make sure that it's properly positioned in its slot.

APPLE IIe AND THE 80-COLUMN TEXT CARD

If you purchased the Apple IIe 80-column text card (or the extended version of this card), you can install it now.

STEP 1

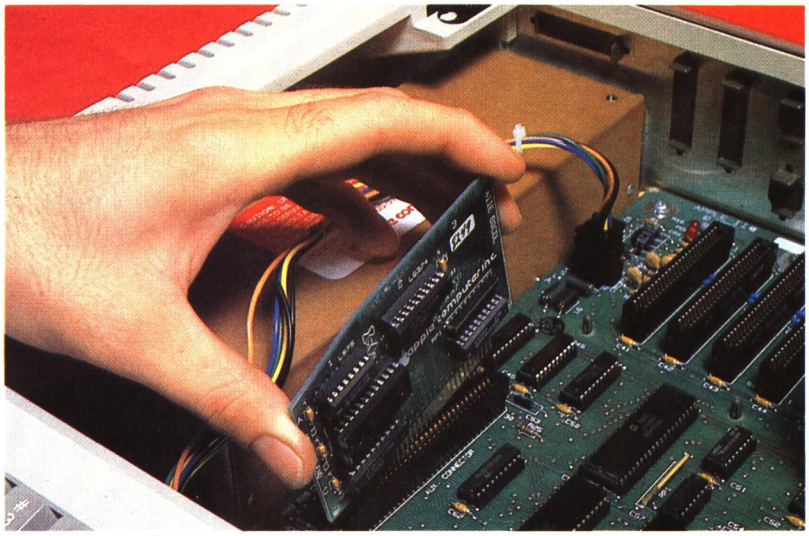
Unpack your 80-column text card from its plastic package. Remember to handle it only by its edges or corners.

STEP 2

Find the auxiliary connector; it's on the left side of the circuit board, near the power supply. The words AUX. CONNECTOR run along its right side. Notice that this connector is a little longer than the seven connectors at the back of the circuit board.

STEP 3

Insert the card at a slight angle to the surface of the circuit board, with the low corner closest to you, entering first. Then gently rock the card into place. Give it a firm push downward to make sure that it's properly positioned in its slot.



80-column card

THE FINISHING TOUCHES

Before we're ready to turn the system on, a few details demand our attention.

STEP 1

Put the lid back on your Apple. The easiest way is to slip the front end in, slightly under the top, then line up the ridges in the computer's top. Press down toward the back, listening for the crunch of the velcro fasteners.

STEP 2

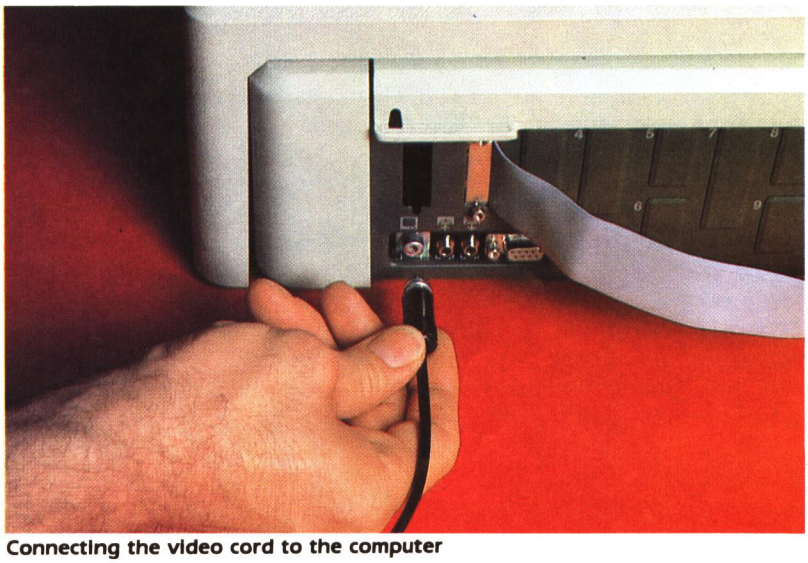
Position the disk drive(s) along whichever side of the machine you find most convenient.

STEP 3

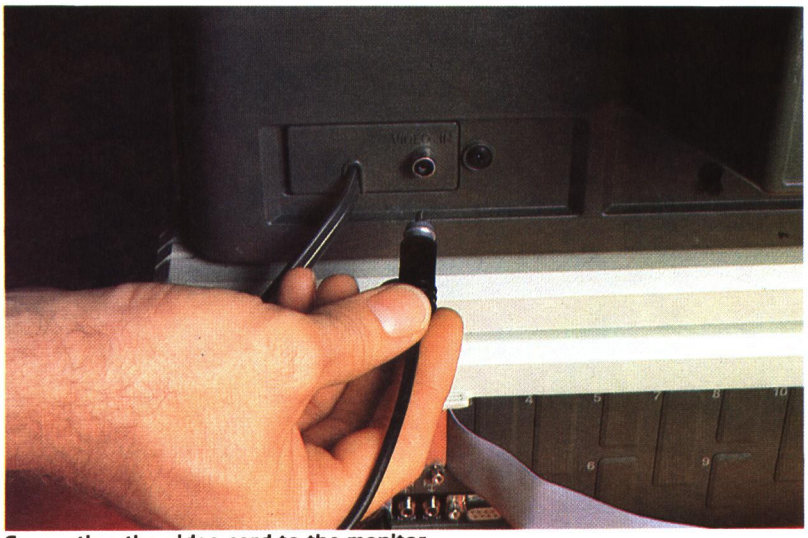
Connect the power cord to its connector at the left rear corner of the machine. NOTE: The third prong fits in the upper portion of the connector.

STEP 4

Place your video display unit on the lid of the computer. If you're using a monitor, connect the video cord to the port in the right rear corner of the computer labeled VIDEO OUT and to the monitor port labeled VIDEO IN. If you're using a TV, connect the TV to your RF modulator according to the modulator's instructions.



Connecting the video cord to the computer console



Connecting the video cord to the monitor

STEP 5
Plug the TV and the Apple into power outlets.

STEP 6
Remove the two disks from the DOS 3.3 System Master Pack.

STEP 7
Lift up on the little door on the front of the disk drive. This opens the drive so you can insert a disk. NOTE: If a paper space holder is in the drive, remove the paper and discard it. Disk drives take only one object at a time.

STEP 8
Take out the disk labeled *Sample Programs.*

CAUTION: Disks are very valuable (especially if you paid several hundred dollars for a program the disk contains). They must be treated gently. See the section on "Disk Care" which follows.

For the moment, here are a few tips: you can touch the disk's outer jacket and the paper envelope it comes in. DO NOT, however, touch the Mylar disk that resides within the jacket.

STEP 9
Hold the disk gently with the label up and closest to you. Present the disk—with the nonlabeled end leading—all the way into the disk drive. You can feel and hear a little click when the disk is all the way in.

STEP 10
Push down on the little door until it clicks shut.

STEP 11
Turn on your video display unit. If this is a TV, adjust the channel selector according to the instructions that came with the RF modulator.

STEP 12
Now reach to the left rear corner of the computer and press the upper portion of the power switch in. Welcome to the world of Apple computing!

The Apple beeps and the light to the left of the SPACEBAR comes on. The drive whirs and the video display shows several messages.

If you have a TV set, tune your TV and modulator for a sharp picture. If you have a color set, get the picture tuned so that it is as sharp as possible, then type

RUN COLOR TEST

and press the key labeled RETURN. (It's on the right edge of the keyboard.) Follow the instructions the program gives to tune in your set's color.

If all went well, take a moment to read about disks, and then go on to Chapter 3, "Meet the Keys" where you'll learn about your computer's keyboard. If something failed to work, see the Troubleshooting Guide at the end of this chapter.

DISK CARE

Floppy disks are a fact of life for many computer users. They hold the data for everything from programs to files of addresses. You can see the actual disk through the hole in the center (the *spindle hole*), the tiny hole next to the center (the *index hole*), and the loop-shaped hole, called the *head slot* (through which the disk drive sends and receives data).

Disks work very much like magnetic recording tape. Data are recorded by the magnetic rearrangement of an oxide that rides on a surface of Mylar. If you do a little damage to a recording tape, about the worst that will happen will be a *dropout*—mushy or slurred sound. If you slightly damage a disk, possible results include lost files, programs that won't run (or that run incorrectly), and inability to get files. Follow these guidelines to keep your disks in good working condition.

- NEVER place a diskette near magnets or magnetic fields. This includes magnetized office products like a typist's copy holder.
- NEVER leave a disk in direct sunlight or in extreme temperatures (hot or cold).
- ALWAYS replace a disk in its paper envelope when you have finished using it. Then store it in a disk album or disk box.
- DON'T leave disks lying around—it's too easy to stack things on them and get them dusty, dirty, or wet.
- NEVER get a disk wet.

TROUBLESHOOTING GUIDE

On occasion a bad Apple, or at least an Apple with a bad chip or a bad connection, slips through quality control. On other occasions, people neglect to plug their Apples in (really!). For whatever reason, sometimes an Apple won't run. This Troubleshooting Guide takes a look at some common symptoms and common sense solutions.

SYMPTOMS AND SOLUTIONS

No Beep, No Keyboard Power Light

This sounds like electricity isn't getting through to your Apple. Check the following:

- Is the power cord pressed firmly into the Apple connector and a power outlet?
- If you're using a power strip, is it turned on? (Many power strips have their own ON/OFF switches.)
- Is the outlet into which you've connected the computer working? Test it with some small appliance like a lamp or a radio.
- Similarly, is the outlet controlled by a light switch? (If so, this is a bad situation. When anyone accidentally turns off the lights, they can turn off all your data as well. Always plug into an outlet that is independent of switches.)

Keyboard Light On, Screen Dead

- Is the video display connected to the computer? Is it turned on? Is it plugged into an active outlet?
- Check the video contrast and brightness controls.
- Turn the system off and wait for a minute. Then turn it on again. Sometimes rapid ON/OFF switching promotes this problem.

Disk Drive Whirs, IN USE Light On, Nothing Happens

- Is the drive door open?
- Does the drive contain a disk? (Open the drive door and look.) If it doesn't, slip the appropriate disk into the drive and close the door. The drive will begin reading the disk immediately.
- In the case of a multiple drive system, are you booting from Drive 1 or another drive? You must always boot from Drive 1. (NOTE: If you haven't put numbers on your drives, turn off your system, open your computer, and look at the controller card to identify which drive is which. Each cable connection is labeled; the upper connector is for Drive 1, the lower for Drive 2. Now label your drives.)
- Is the disk controller card installed in slot 6? It should be. Also, APPLE IIe OWNERS, if you're running the 80-column card, avoid plugging anything into slot 3.
- Is the disk a 13-sector disk? If so, you must run a utility called BOOT13 from your System Master Disk. NOTE: All Apple IIe computers and most Apple II Plus computers work best with 16-sector disks. See your DOS manual for details on sectors.
- If all else fails, press CONTROL-RESET to stop the drive. (NOTE: Once you've stopped a drive you can always restart it by typing PR#6 and pressing RETURN.)

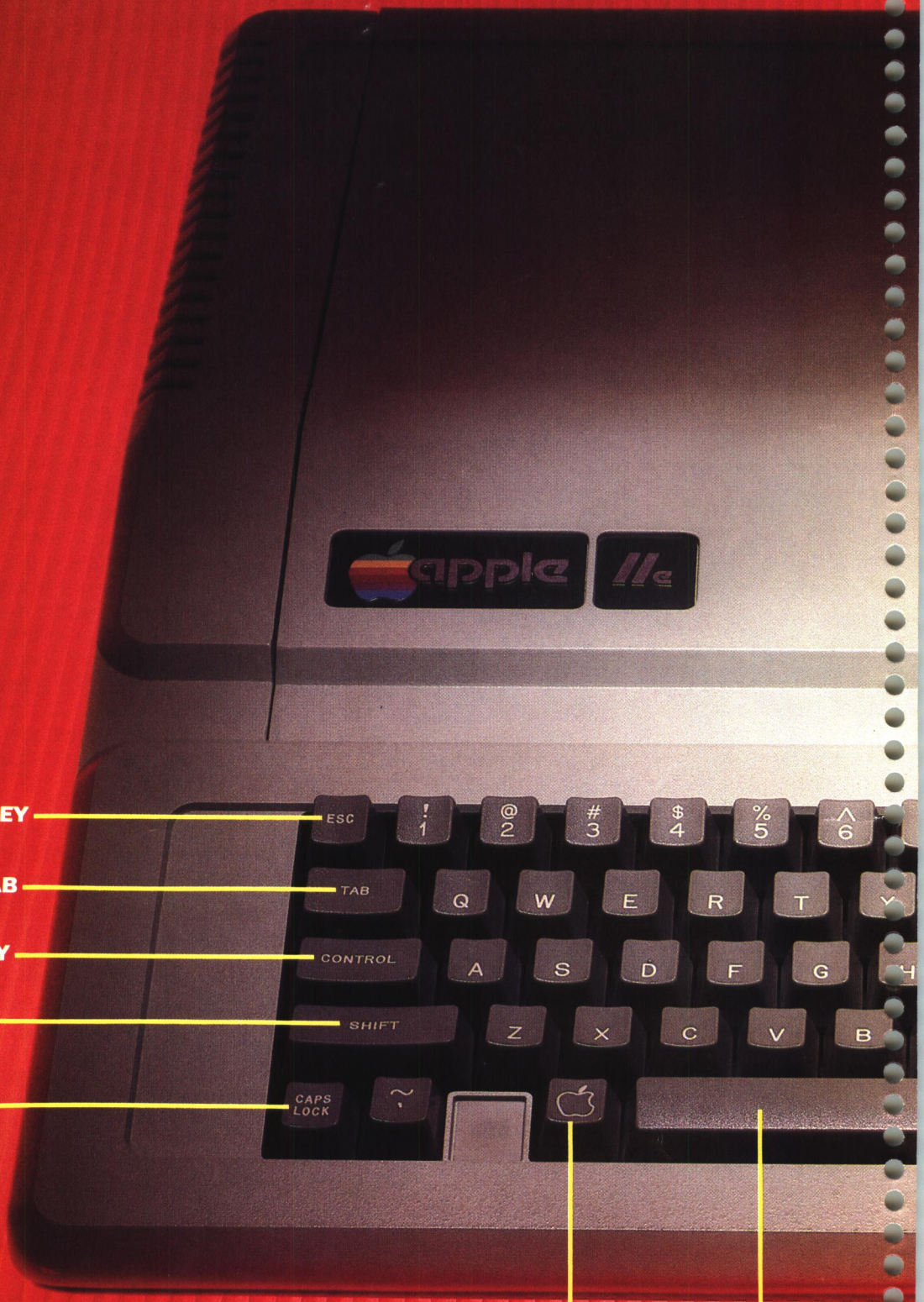
Other Disk Problems

- Is the disk inserted right-side up (with the label showing and the write-protect notch on your left)?
- Did you put in the correct end of the disk first, with the loop-shaped hole leading the center hole?
- Is the disk centered within its jacket? Sometimes drives are sensitive to this. Remove the disk from the drive and gently center the hole in the disk itself with the hole in the disk's jacket. (It's okay to touch the center of the disk, because data are never recorded on it.) Gently reinsert the disk into the drive.
- Every once in a while, a disk will develop physical flaws that can destroy data and files. Don't give up altogether. See your dealer about a utility program for rescuing "lost" data.

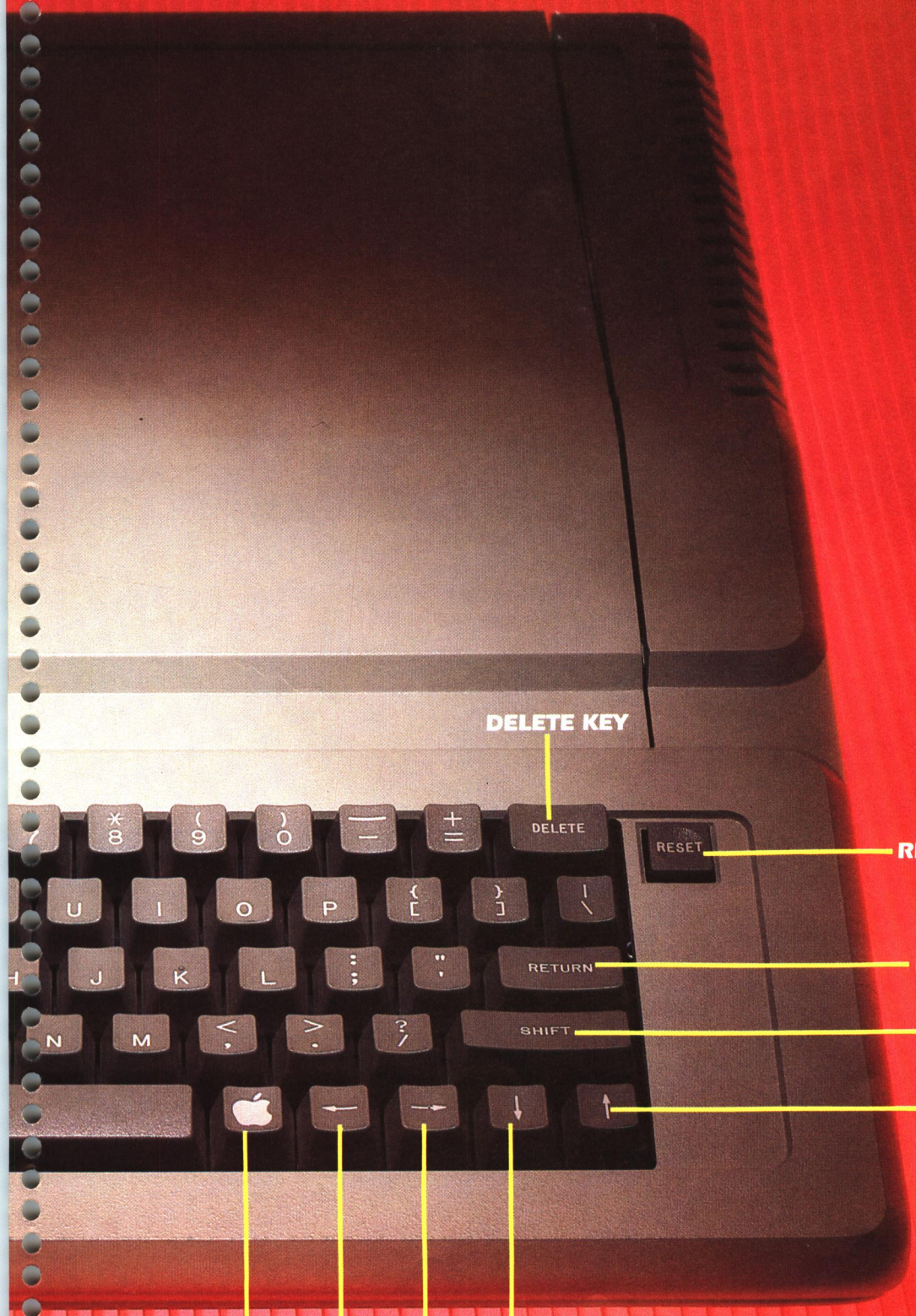
OTHER MAINTENANCE TIPS

- From time to time (perhaps once a month), take the lid off your computer. Be sure the power is off and the system is cool (just before starting up is a good time). Touch the power supply with both hands before pressing on the chips. Then press a finger down on each chip on the circuit board. This presses the chips back into their sockets. With alternating heat and cold (from use and cooling off), the pins that anchor the chips into their sockets start working their way out of their sockets. Pressing them back in can sometimes cure occasional flakiness.
- Do any of your cards have silver on their edge connectors? If so, expect occasional problems from tarnishing. The best way to clean tarnish on a circuit card is to use an ordinary pencil eraser. Carefully erase the tarnish.
- As a general rule, computers would rather be on than off. If for some reason you aren't going to use your computer for a while (perhaps not for months), just turn the computer on overnight once a week or so.

CHAPTER 3 MEET THE KEYS



APPLE IIe



DELETE KEY

RESET KEY

RETURN KEY

SHIFT KEY

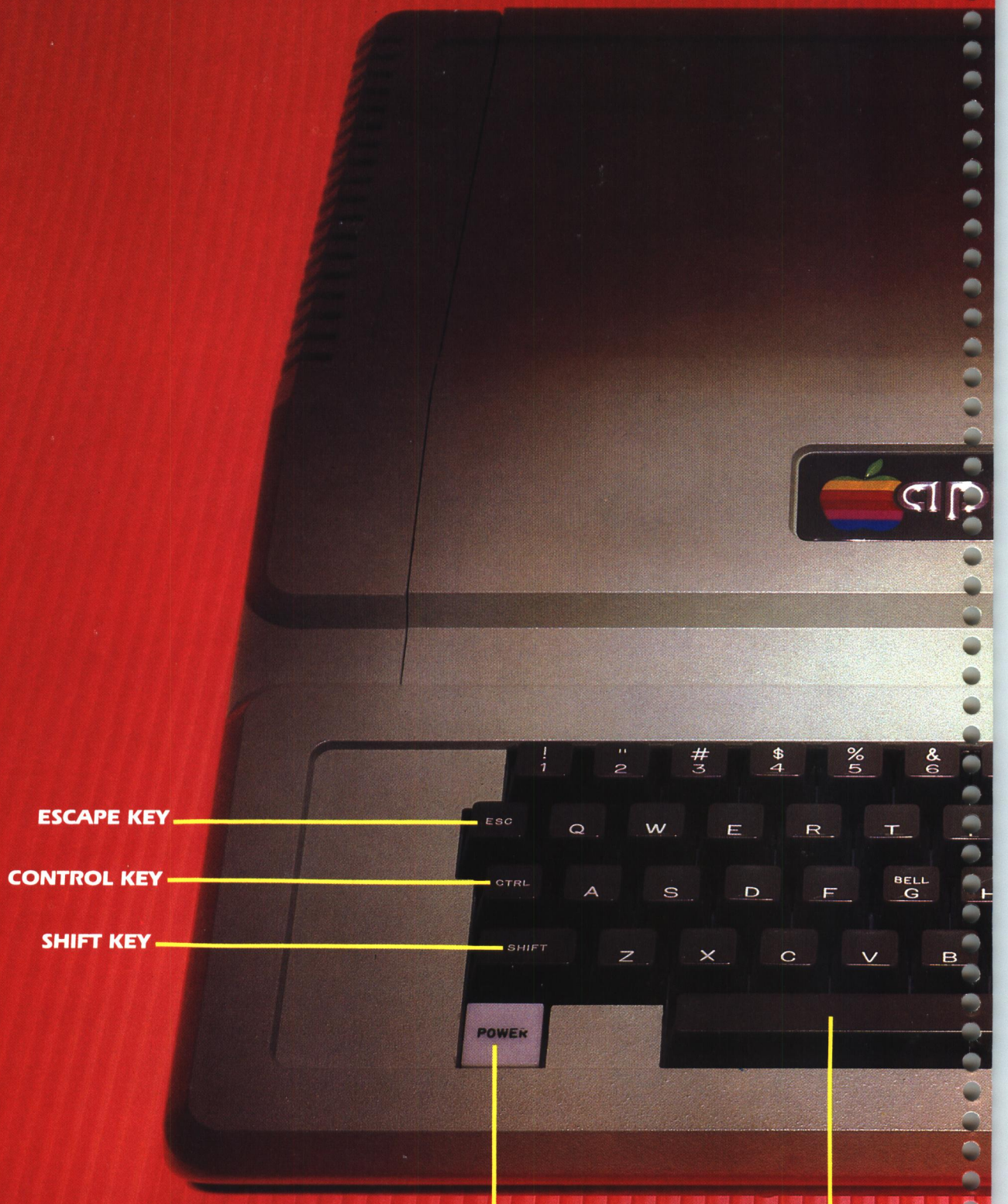
UP ARROW KEY

SOLID APPLE KEY

DOWN ARROW KEY

RIGHT ARROW KEY

LEFT ARROW KEY


ESCAPE KEY
CONTROL KEY
SHIFT KEY
POWER SWITCH
SPACEBAR
ESC
CTRL
SHIFT
POWER
Q
W
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A
S
D
F
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BELL
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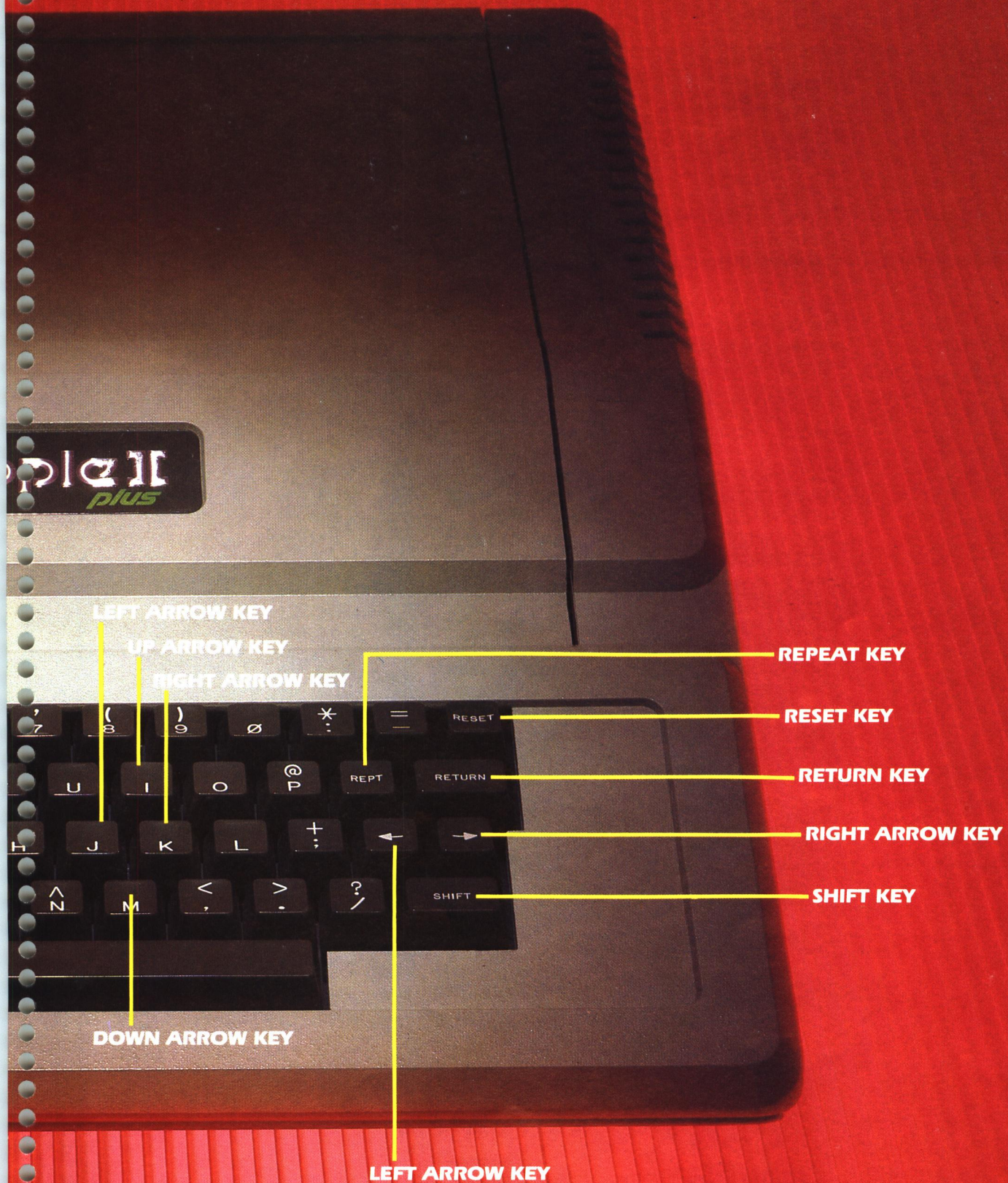
X
C
V
B

APPLE II PLUS



A KEYBOARD REVIEW

We begin this chapter with the assumption that your computer is in good shape and that you can start it up (as we showed you in Chapter 2, "Getting Started"). This chapter will get you typing at your computer keyboard and learning how its keys work.

The exercises in this chapter describe how each of the *function* keys (those keys that aren't letters, numbers, or punctuation marks) works. The letter, number, and punctuation keys are positioned much as they are on a standard typewriter keyboard; you'll get some practice using them. You'll also get a brief introduction to using the BASIC programming language that is built into your computer.

Among the things you will type are *DOS* (Disk Operating System) commands. This gives you the opportunity to learn your keyboard and some of the essential commands for operating your disk drive. You will learn how to get a list (*catalog*) of all the programs on a disk and how to execute (*run*) a program.

THE APPLE IIe AND THE APPLE II PLUS HAVE SIGNIFICANT DIFFERENCES IN THEIR KEYBOARDS, SO IN THIS CHAPTER YOU WILL FIND SOME SECTIONS THAT APPLY TO BOTH AND SOME THAT APPLY TO ONLY ONE OR THE OTHER.

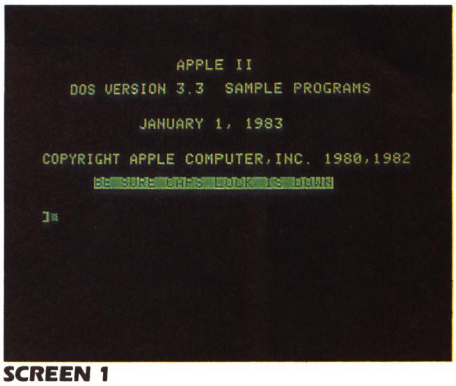
NOTE: This chapter was written without the 80-column card ON THE APPLE IIe. If you want to run your 80-column card, be prepared for occasional differences between what the chapter describes and the way your system behaves.

Several of the exercises require programs on the disk titled *Sample Programs*. The *Sample Programs* disk comes with the disk drive; you'll find it in the DOS 3.3 Master System packet of disks. (If you bought a used machine and do not have the *Sample Programs* disk, an Apple dealer may be able to obtain or make a copy for you. If you cannot obtain a copy of the *Sample Programs* disk, you can still do most of the exercises in this chapter using the DOS 3.3 Master System disk.)

Insert the *Sample Programs* disk in the disk drive. Don't forget to close the little door.

Turn the power OFF, then ON again. Computer users often call starting the computer *booting* or *booting up* (from the phrase "pulling oneself up with one's bootstraps"). Restarting a computer is called *rebooting*. You have just rebooted your computer.

When the disk drive stops (the scraping noises stop and the IN USE light on the drive goes out), the screen will show you the beginning of the *Sample Programs*.
SCREEN 1



SCREEN 1
When the disk drive stops whirring, the beginning of the *Sample Programs* appears.

THE PROMPT AND THE CURSOR

See the right bracket figure (]) on the left side of the screen? That's called the *prompt*. It means your computer is ready for you to enter information or commands.

The little checkered box (which keeps winking at you) next to the prompt is the *cursor*. The cursor always sits where the next character you type will appear.

NOTE: Because the cursor blinks on and off, it may look slightly different in the photographs in this chapter than it looks on your TV or monitor screen.

CAPS LOCK KEY: APPLE IIe ONLY

ON THE APPLE II PLUS, ALL LETTERS APPEAR ON THE SCREEN AS CAPITAL (OR UPPERCASE) LETTERS. IF YOU HAVE AN APPLE II PLUS, SKIP TO THE NEXT SECTION, "THE LETTER KEYS."

IF YOU HAVE AN APPLE IIe, obey the warning on your screen:

BE SURE CAPS LOCK IS DOWN
SCREEN 1

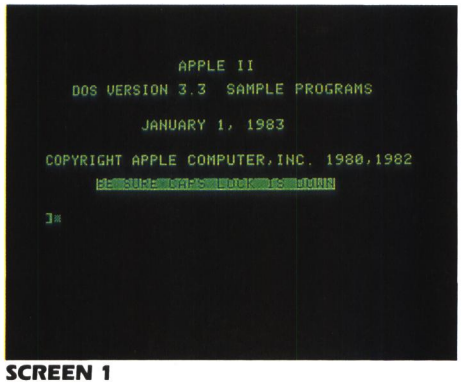
The CAPS LOCK key is at the lower left corner of the keyboard. When the CAPS LOCK key is up, its top is level with the key to its right. Push it down and release it a few times to get its feel.

Let's see how it works. Depress the CAPS LOCK key to lock it down. Now press the C key. See! A capital C appears where the cursor was.
SCREEN 2

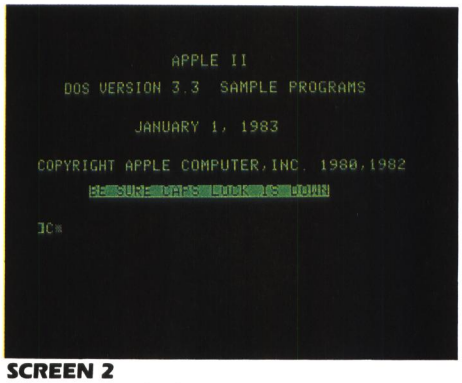
The CAPS LOCK key changes the function of the letter keys only.

The Apple IIe does not respond to commands in lowercase (or small) letters, so for these exercises you will want to leave the CAPS LOCK key locked down. (You can, however, give programs and files lowercase names, like "myfile" or "thisisthecity.")

Now leave the CAPS LOCK key down, in the locked position.



SCREEN 1
Be sure you have the CAPS LOCK key pressed and locked (ON THE APPLE IIe).



SCREEN 2
With the CAPS LOCK key locked down, all letters appear capitalized on the screen.

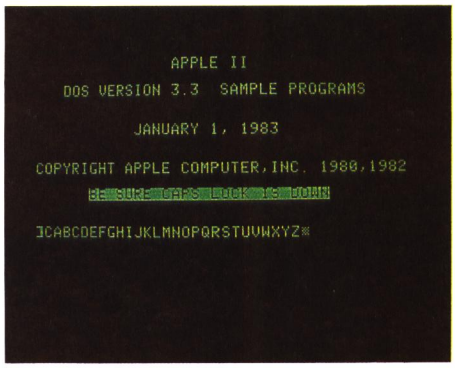
CAPS LOCK key location on IIe

LETTER KEYS

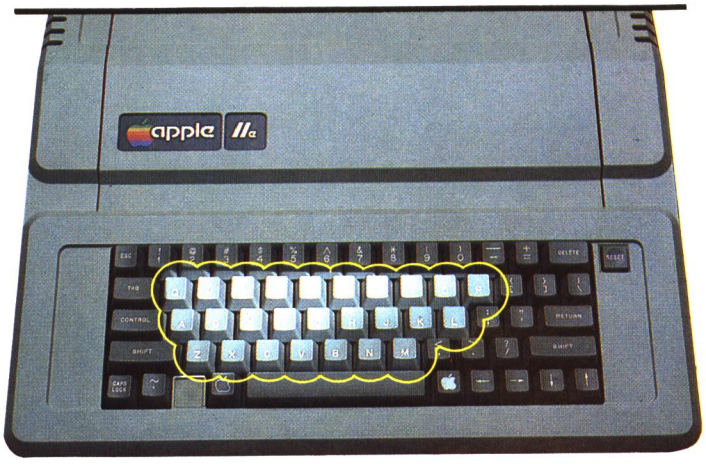
You have undoubtedly noticed by now that the letter keys on your keyboard are not in rows in alphabetical order. They are arranged as they would be on a standard typewriter, in what is called the *QWERTY* pattern (QWERTY for the first six letters in the top row of the letter keys).

If you are not a touch-typist, it may take a while for you to get used to the locations of the keys. To help you learn where each key is located, type all of the letter keys in alphabetical order.

SCREEN 1

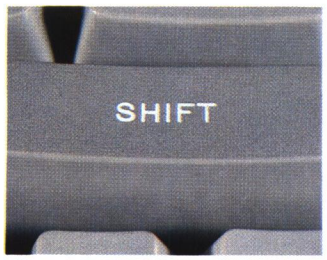


SCREEN 1
Typing the alphabet may take some practice if you aren't a typist.



LETTER keys locations on IIe and II Plus

SHIFT KEYS



The SHIFT keys work just like the shift keys on a typewriter. ON THE APPLE IIe, depressing a SHIFT key while you type letter keys creates capital (uppercase) letters on the screen. ON BOTH THE APPLE IIe AND THE APPLE II PLUS, depressing a SHIFT key while you type number or symbol keys causes the top (upper) figure of any particular key to appear on the screen.

To see how this works, press the 3/# key and then the ,/< key.
SCREEN 1

Now hold down a SHIFT key, and press the 3/# and ,/< keys again.
SCREEN 2

See how it works? Try it with some of the other keys if you want to.

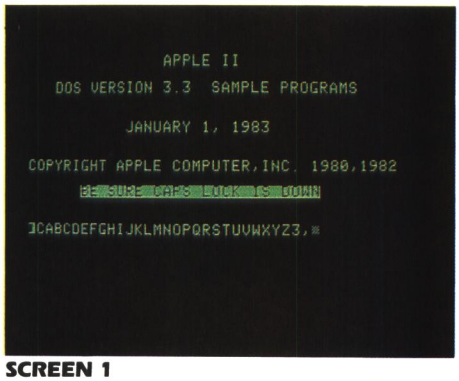
ON THE APPLE IIe, does CAPS LOCK affect how a SHIFT key works? Press CAPS LOCK (so that the key is in the up—unlocked—position) and press the following keys again (without holding SHIFT): the C key, the 3/# key, and the ,/< key.
SCREEN 3

Now hold down a SHIFT key and press the same three keys again.
SCREEN 4

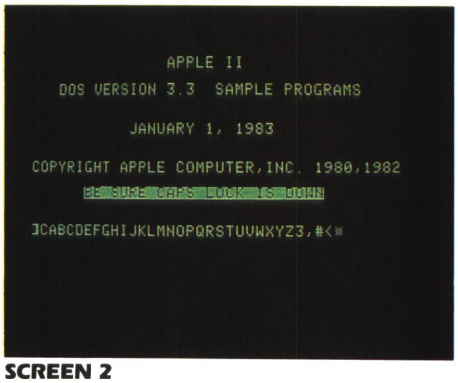
This shows us that CAPS LOCK only affects alphabetic characters, but SHIFT changes all types of character keys—letters, numbers, and symbols.

Press the CAPS LOCK key down again to lock it before we continue.

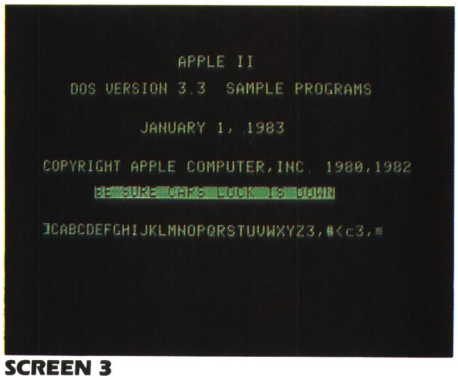
SHIFT keys locations on IIe and II Plus



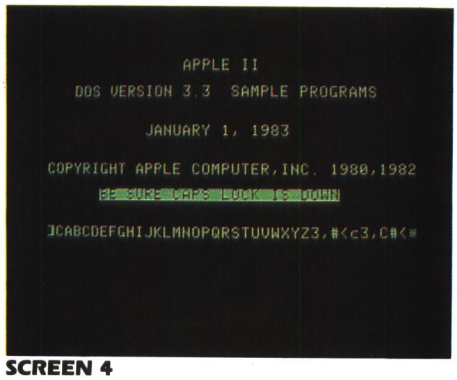
SCREEN 1
Pressing symbol keys without the SHIFT key creates the bottom figure on the key.



SCREEN 2
Pressing symbol keys *with* the SHIFT key creates the top figure on the key.



SCREEN 3
On the IIe, with the CAPS LOCK and SHIFT keys up, you get lowercase letters.



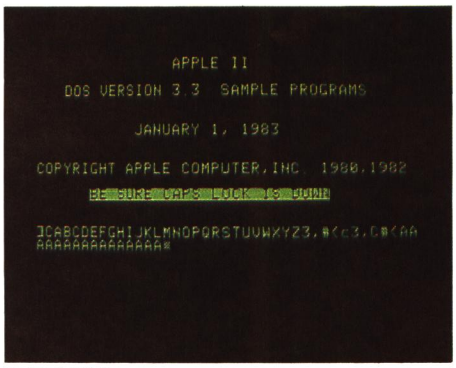
SCREEN 4
On the IIe, hold down the SHIFT key and press a letter key to get a capital letter.

REPEAT FUNCTION

ON THE APPLE IIe, all of the letter, number, symbol, and punctuation keys have the automatic repeat feature. If you press any of these keys for more than a second, the character will be repeated again and again on the screen, until you release the key. Try this using the A key.
SCREEN 1

ON THE APPLE II PLUS, the REPT key (for REPeaT) causes whatever key is pressed along with it to repeat. Try this using the A key.
SCREEN 1

Notice that when you get to the end of a line, your letters automatically continue at the beginning of the next line. This is called *wraparound*, since the letters seem to wrap around the back of the screen and begin again at the start of the next line.



SCREEN 1
Both the IIe and the II Plus have repeat functions.

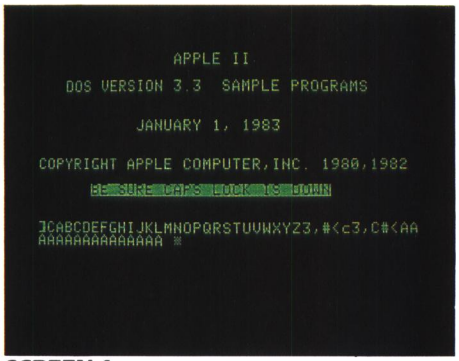
REPEAT key location on II Plus

SPACEBAR

The SPACEBAR is that long key in the bottom row. It works just like the SPACEBAR on a standard typewriter—allowing one blank space on the screen each time you press it. ON THE APPLE IIe it also has an automatic repeat feature. This simply means that if you press it for more than a second, you will get many spaces rather than just one.

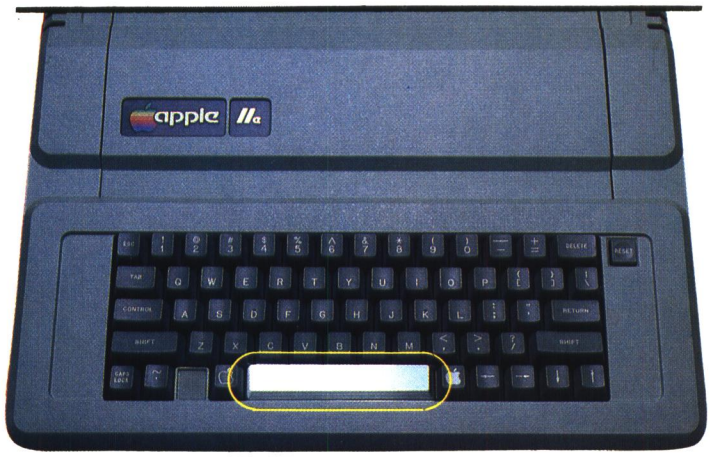
Now press the SPACEBAR once to leave one blank space.
SCREEN 1

Press the SPACEBAR a few times and watch the cursor move across the screen.
SCREEN 2



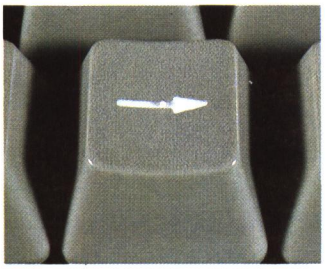
SCREEN 1
Press the SPACEBAR to get the cursor to move across the screen leaving blank space.

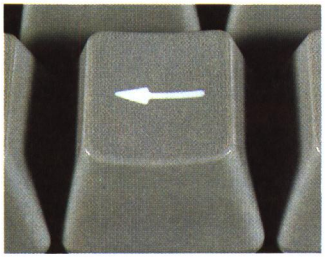
SCREEN 2
On the IIe, the SPACEBAR repeats if you keep it held down.



SPACEBAR location on IIe and II Plus

HORIZONTAL ARROW KEYS





Now it's time to learn to move around the screen. The HORIZONTAL ARROW keys allow you to move the cursor to the left and to the right.

To move the cursor to the left, press the ← key a few times.
SCREEN 1

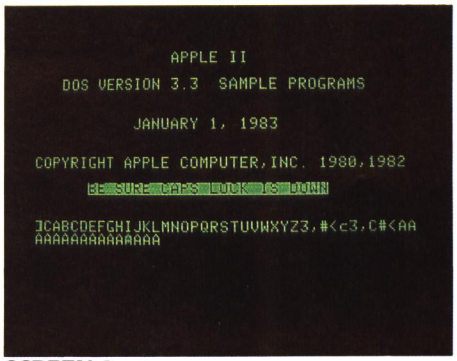
NOTE: When the cursor is moved to the same spot as a letter or number, the cursor and the letter or number blink alternately on your TV or monitor screen. In the photographs in this chapter, you'll see *both* the cursor and the letter or number in the same spot.

Now type your full name. As you type each letter of your name, any character already on the screen at that spot disappears. When you press the SPACEBAR between your first and last names, a space replaces the character that was in that spot.
SCREEN 2

The → key works just like the ← key (only in the other direction). To see how this moves the cursor, press the → key three times.
SCREEN 3

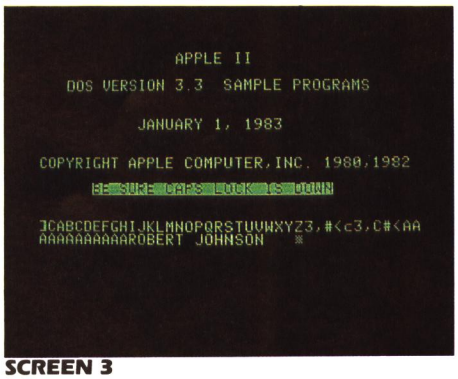
Now press the ← key three times. See? You're back at the end of your name.
SCREEN 4

HORIZONTAL ARROW keys locations on IIe

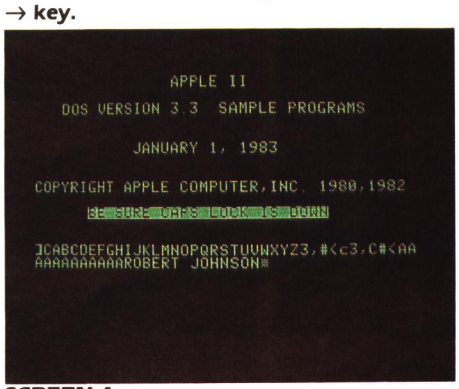


SCREEN 1
Move the cursor to the left with the ← key.

SCREEN 2
When you type over letters, they vanish; your new letters replace them.



SCREEN 3
Move the cursor to the right with the → key.

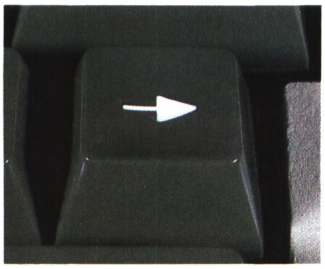


SCREEN 4
Move the cursor back to the end of your name, using the ← key.

The repeat function on both the Apple IIe and the Apple II Plus also works with the HORIZONTAL ARROW keys (←) (→) to make the cursor move rapidly in the direction indicated.

Try this by pressing the → key for a few seconds (or with the REPT key, ON THE APPLE II PLUS). When the cursor gets to the end of the line, it wraps around to the start of the next line.

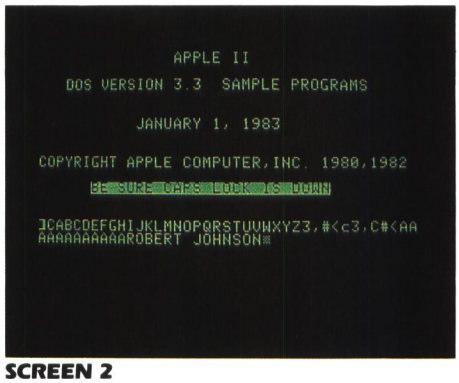
SCREEN 1



Now do the same with the ← key, to get back to the end of your name.

SCREEN 2

SCREEN 1
The repeat function works with the ARROW keys on both the IIe and the II Plus.



SCREEN 2
When you get close to where you want the cursor, you have to slow down.

HORIZONTAL ARROW keys locations on II Plus

NUMBER KEYS

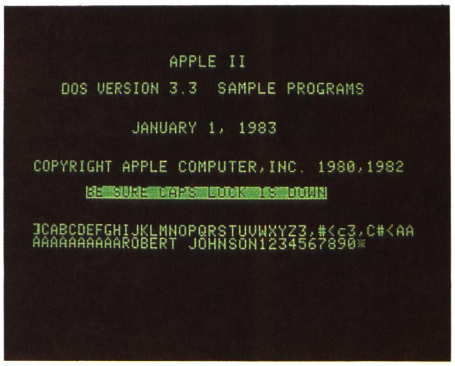
The number keys are located in a single row, above the top row of alphabet keys. They are in numerical order, 1 through 9, with 0 at the far right. Each number key has a symbol printed on it above the number. As you have learned, you can display the symbol on the screen by pressing the SHIFT key and the key whose symbol you want to display at the same time.

Let's try this now with each of the number keys. Going from left to right, press each number key once.
SCREEN 1

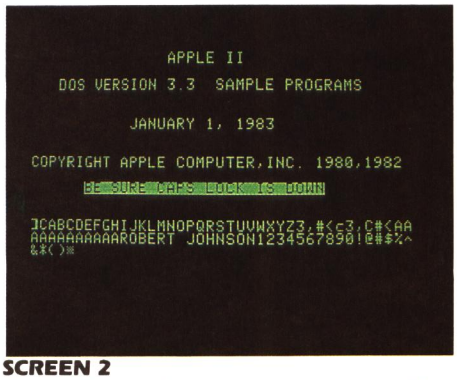
Now hold down the SHIFT key and press each number key again.

ON THE APPLE IIe, SHIFT and the number keys display these symbols.
SCREEN 2

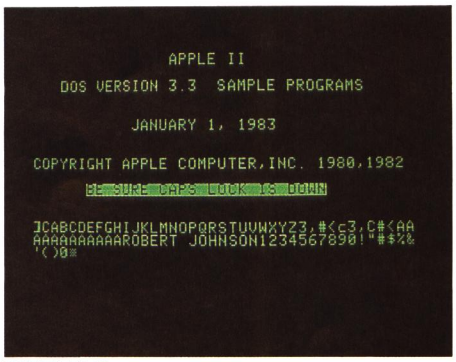
ON THE APPLE II PLUS, SHIFT and the number keys display these symbols.
SCREEN 3



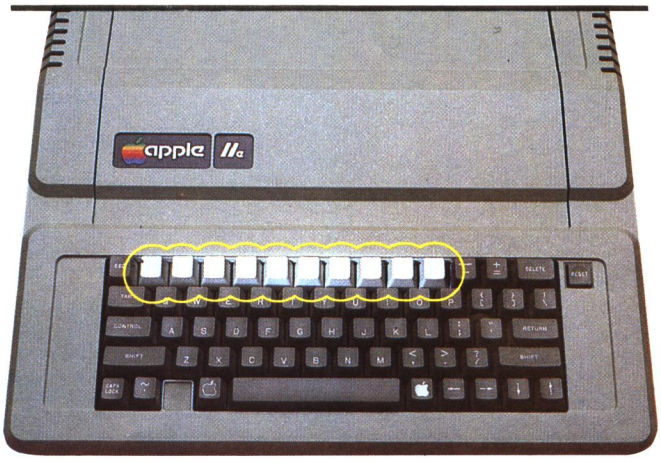
SCREEN 1
The number keys start with 1 at the left and go up to 9, with 0 at the far right.



SCREEN 2
On the IIe, pressing each number key with the SHIFT key held down creates this screen.



SCREEN 3
On the II Plus, pressing each number key with the SHIFT key held creates this screen.



NUMBER keys locations on IIe and II Plus

SYMBOL KEYS: APPLE IIe

IF YOU HAVE AN APPLE II PLUS, SKIP TO THE SECTION, "SYMBOL KEYS: APPLE II PLUS."

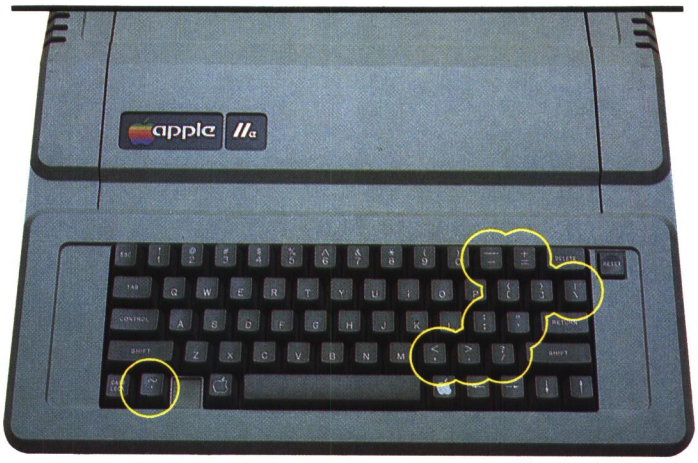
The Apple IIe can display several symbols in addition to the symbols on the number keys. Most of these keys are located on the right side of the keyboard.

In the top row of keys (from left to right), are the HYPHEN/UNDERSCORE (– and _) key and the EQUALS SIGN/PLUS SIGN (= and +) key. Press each of them alone and then with a SHIFT key.
SCREEN 1

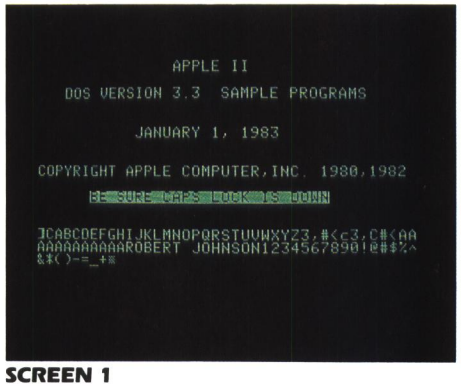
In the second row, are the LEFT SQUARE BRACKET/LEFT BRACE ([and {) key, the RIGHT SQUARE BRACKET/RIGHT BRACE (] and }) key, and the LEFT SLASH/VERTICAL LINE (\ and |) key. Press each of these keys alone and then with a SHIFT key.
SCREEN 2

In the third row, are the SEMICOLON/COLON (; and :) key and the APOSTROPHE/QUOTATION MARK (' and ") key. Press each of these keys alone and then with a SHIFT key.
SCREEN 3

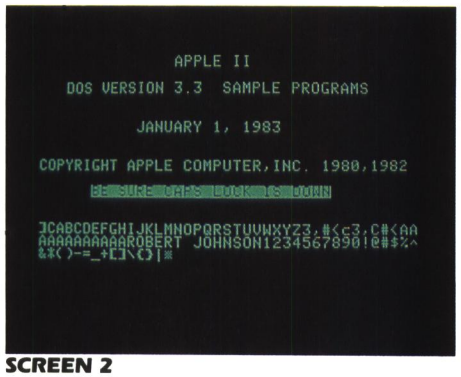
In the fourth row, you'll find the COMMA/LESS THAN (, and <) key, the PERIOD/GREATER THAN (. and >) key, and the SLASH/QUESTION MARK (/ and ?) key. Press each of these keys alone and then with a SHIFT key. Finally, in the bottom row on the left, is the ACCENT MARKS (` and ~) key. Press it alone and then with a SHIFT key.
SCREEN 4



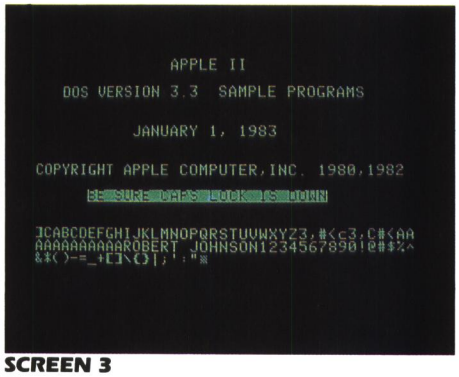
Symbols on IIe



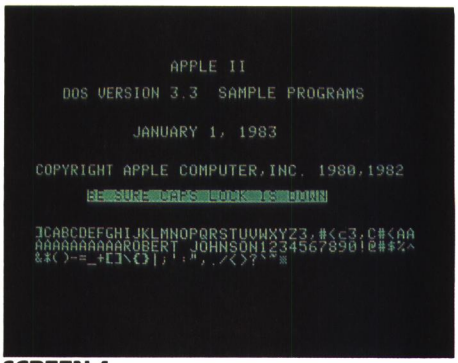
SCREEN 1
Press the –/_ and =/+ keys once by themselves and once with the SHIFT key.



SCREEN 2
The SHIFT key gives access to the upper symbol on these keys.



SCREEN 3
The SHIFT key is also used with the punctuation keys.



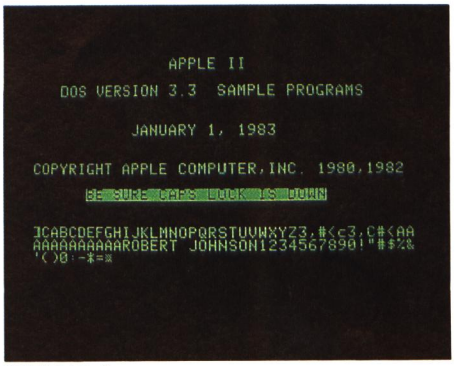
SCREEN 4
And here are some more symbols that require the use of the SHIFT key.

SYMBOL KEYS: APPLE II PLUS

IF YOU HAVE AN APPLE IIe, SKIP TO THE SECTION, "RETURN KEY."

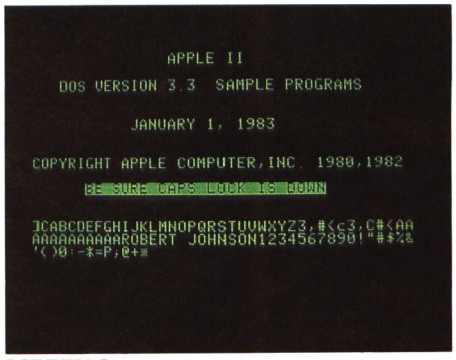
The Apple II Plus has several symbol keys in addition to the symbols on the number keys. Most of these keys are located on the right side of the keyboard.

In the top row of keys (from left to right) are the COLON/ASTERISK (: and *) key and the HYPHEN/EQUALS SIGN (– and =) key. Press each of these keys alone and then with a SHIFT key.
SCREEN 1



SCREEN 1
Press the :/* and the _/= keys with and without the SHIFT key.

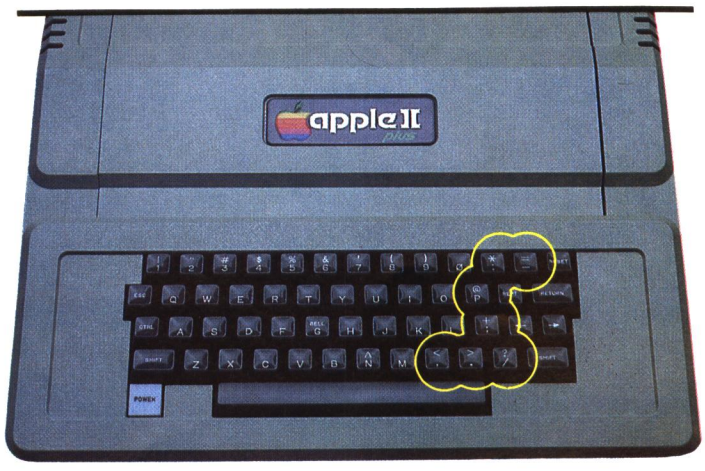
In the second and third rows, you have the P/AT (P and @) key and the SEMICOLON/PLUS SIGN (; and +) key. Press each of these keys alone and then with a SHIFT key.
SCREEN 2



SCREEN 2
Press the P/@ and the ;/+ keys with and without the SHIFT key.

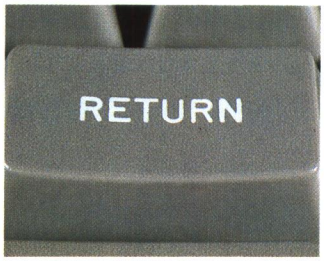
In the fourth row, you have the N/^ key, the COMMA/LESS THAN (, and <) key, the PERIOD/GREATER THAN (. and >) key, and the SLASH/QUESTION MARK (/ and ?) key. Press each of these keys alone and then with a SHIFT key.
SCREEN 3

SCREEN 3
Press the ,/<, the ./>, and the SLASH/? keys with and without the SHIFT key.



Symbols on II Plus

RETURN KEY



Slowly now, use the ← key to place the cursor next to the prompt on the first line. Now type the word

CATALOG

If you make any typing mistakes, just back up with the ← key and fix them by typing the correct letter over your mistake.

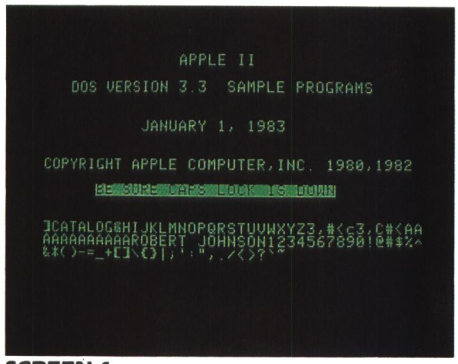
When you finish, there will still be extra letters following the word CATALOG. Don't worry about the extra letters.
SCREEN 1 (IIe)
SCREEN 2 (II Plus)

CATALOG is one of the *commands* you use to give instructions to the computer. You moved the cursor back up next to the prompt to type the CATALOG command for a reason. Commands must be typed right after the prompt. You may wonder why the computer isn't doing anything, since you've given it a command.

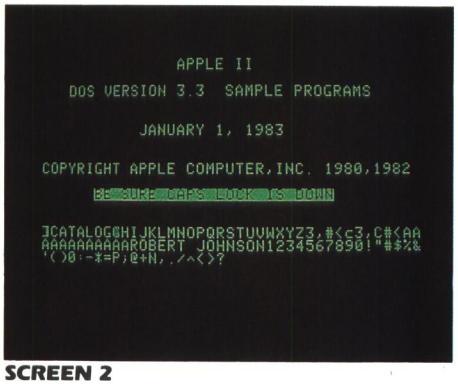
The secret is this: you haven't really told it to do anything. You've merely written it a note and put it in the mailbox. Now you have to get the computer to pick up the note and read it. To do that, press the RETURN key. Watch what happens!
SCREEN 3 (IIe)
SCREEN 4 (II Plus)

The RETURN key got the message through to the computer. And just as the return key on a typewriter causes the carriage (or print head) to return to the left margin, this RETURN key also causes the cursor to return to the left margin of the screen.

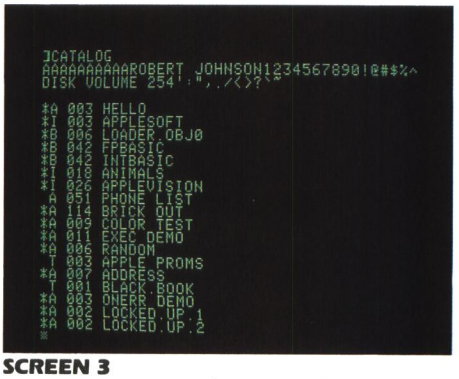
RETURN key location on IIe



SCREEN 1
On the IIe, when you type CATALOG you will have these characters left.



SCREEN 2
On the II Plus, when you type CATALOG you will have these characters.



SCREEN 3
On the IIe, after you press the RETURN key, the catalog will appear on your screen.

SCREEN 4
On the II Plus, after you press the RETURN key, the catalog will appear on your screen.

Notice three things. First, the CATALOG command has caused the computer to display on your screen a list (or *catalog*) of the programs (or *files*) on your disk.

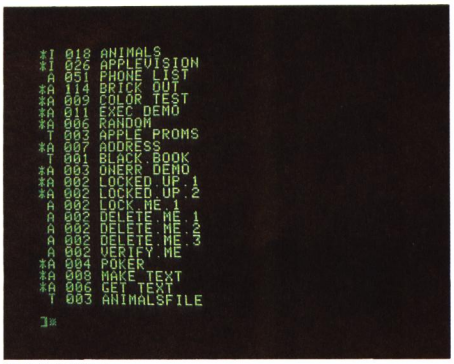
Second, any letters that appeared on the same line with the CATALOG command have disappeared. Your computer only accepts the characters to the left of the cursor as a command.

Third, the cursor is now down at the bottom left corner of the screen, but the prompt is gone. The absence of a prompt means the computer has more to say before it can accept any more commands.

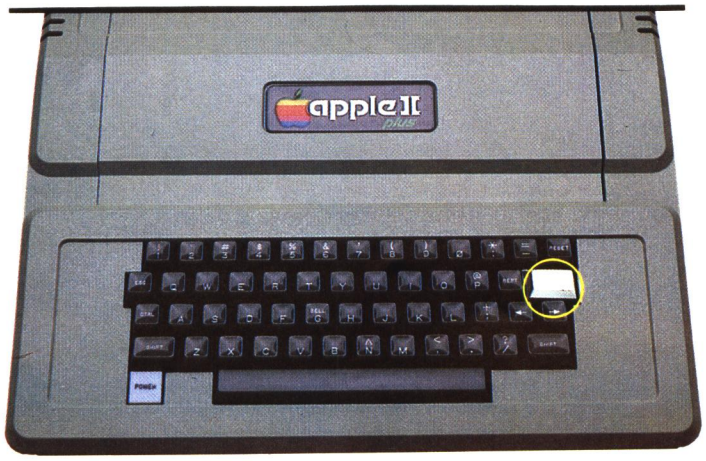
(If the prompt is back, that's okay. From time to time, Apple changes the content of these disks. If your disk has fewer files on it, it will have a shorter listing and you won't need to read the following paragraph.)

If the prompt isn't back, there are more files in the listing than you see on the screen now. Press RETURN again. The rest of the catalog appears on the screen. As it does, the list *scrolls* upward, pushing some of the earlier lines off the screen. (*Scroll* simply means "move," as if the program were printed on a sheet of rolled paper and you were unrolling it to read.) When the prompt reappears, the list is complete. (Your list may not match ours exactly; that's okay.)
SCREEN 1

NOTE: Now that everything you typed in the previous exercises has scrolled up off the screen (and only the catalog remains), the photographs are the same for both the IIe and the II Plus.



SCREEN 1
When you press the RETURN key again, more listings will appear.



RETURN key location on II Plus

COMMANDS AND ERROR MESSAGES

SYNTAX ERROR is one of the Apple's most common *error messages*. It means that the computer thinks you tried to enter a command, but you did a poor job of it. The computer can't tell what you're trying to say.

SYNTAX ERROR can mean that you've misspelled a command name. For an example of this, misspell CATALOG by typing

CATSLOG

Now press RETURN. What happened? The computer beeped at you and displayed the SYNTAX ERROR message.
SCREEN 1

IF YOU HAVE AN APPLE IIe, you may have been asking yourself, "What's the big deal about CAPS LOCK?"

Press the CAPS LOCK key to unlock it. Now type

catalog

Press RETURN. What happened? The computer beeped at you and displayed the SYNTAX ERROR message again.
SCREEN 2

Whenever you get a SYNTAX ERROR message on the screen, look closely at what you typed. You'll usually spot the problem right away.

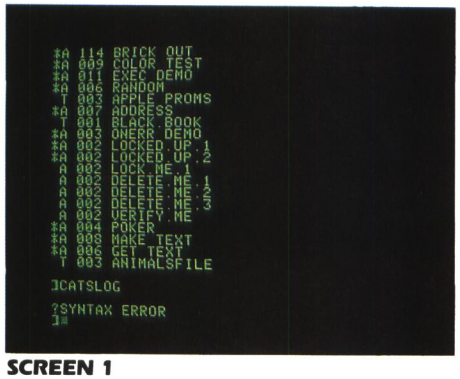
RUN is another DOS (Disk Operating System) command (like CATALOG). RUN tells the computer to execute the program, to make it do whatever it's supposed to do. When you follow RUN with the name of a program, RUN goes to the disk and gets the program. It then loads the program into working memory and executes it.

Before getting back to the keyboard, let's produce one more common error message. (IF YOU HAVE AN APPLE IIe, press the CAPS LOCK key to lock it down.) Now type

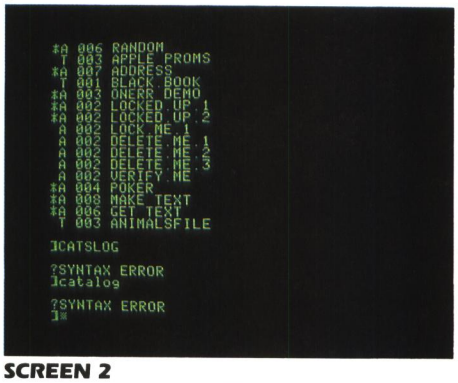
RUN AWAY

Now press RETURN. The drive activates for a moment. Then the computer beeps and displays the message FILE NOT FOUND.
SCREEN 3

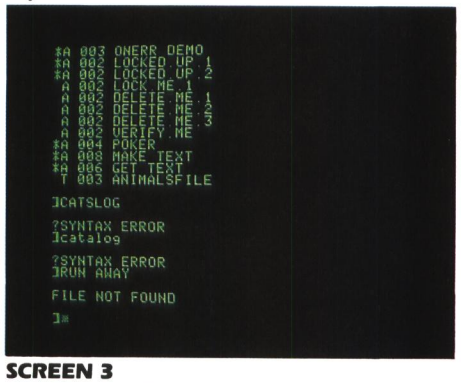
Of course not. Your catalog shows no file by the name of AWAY.



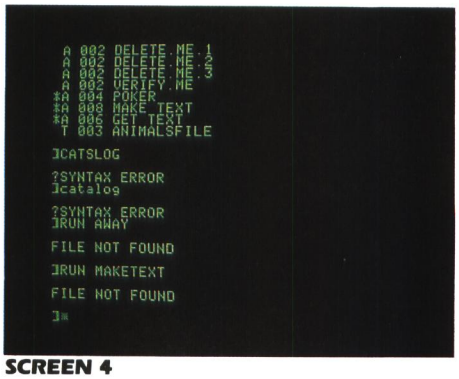
SCREEN 1
The SYNTAX ERROR message tells you that you've made some sort of mistake.



SCREEN 2
On the IIe, remember that you must use capital letters for commands.



SCREEN 3
You can only RUN files listed in the catalog.



SCREEN 4
File names must be typed *exactly* as they appear in the catalog (including spaces).

The computer will also not find the file if you type the file name incorrectly. Type this command now:

RUN MAKETEXT

Then press RETURN. Again you get the FILE NOT FOUND error message.
SCREEN 4

As you can see in the catalog on your screen, the real file name is MAKE TEXT (with a space between the two words). Misspelling a file name will also cause a FILE NOT FOUND error message. You must type the file name exactly as it appears in the catalog.

On some occasions, you don't want to run a program immediately—only to load it into working memory. When this is the case, type the LOAD command. Follow the LOAD command with the name of the program you want.

To show you more function keys, we need to LOAD (not RUN) a program from your *Sample Programs* disk. Type

LOAD EXEC DEMO

The command appears on the screen.
SCREEN 5

Now press RETURN. While the drive whirs, the prompt and cursor disappear. In a couple of moments, the prompt and cursor are back. The program is loaded into memory.
SCREEN 6

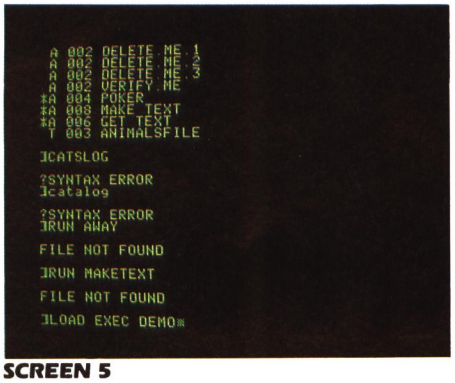
Want to see a BASIC program? Type

LIST

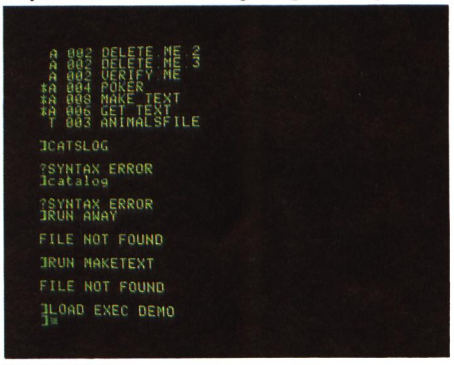
The command is displayed.
SCREEN 7

Now press RETURN. The LIST command causes the computer to print the BASIC program currently in memory. The listing, complete with a few beeps, will scroll upward on the screen.
SCREEN 8

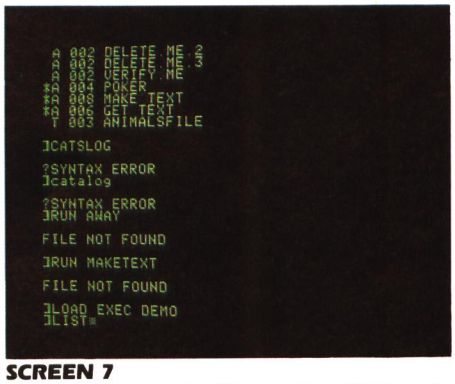
This is a fairly long program and takes a little over six seconds to scroll by. It moves very quickly though—certainly too fast to read. Is there a way to stop the listing from scrolling so you can read the lines in the program? Read on!



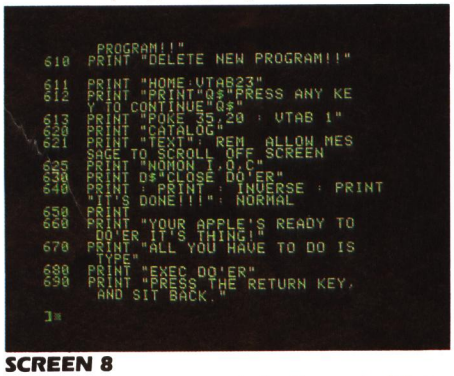
SCREEN 5
Even when you type it correctly, you have to press the RETURN key to get a response.



SCREEN 6
The cursor reappears when the computer has executed the command.



SCREEN 7
The LIST command will get you a display of the entire program you just loaded.



SCREEN 8
When the computer gets to the end of the listing, it stops and the cursor returns.

CONTROL KEY

IIe

II Plus

The CONTROL key (abbreviated ON THE APPLE II PLUS keyboard as CTRL) works in combination with other keys (usually the letter keys) to issue commands to the computer. It works like the SHIFT key, in that you must press CONTROL and hold it down while pressing another key.

Let's use a couple of CONTROL functions. First we'll try CONTROL–S. CONTROL–S means to hold down the CONTROL key while you press the S key.

The CONTROL–S key combination causes a program listing to pause. Pressing the CONTROL–S key combination a second time (or CONTROL and nearly any other key) causes the listing to resume. A programmer (such as yourself!) can use this command to explore a listing one section at a time. Now let's try it. Type

LIST

The LIST command is displayed.
SCREEN 1

Now press RETURN. As soon as the listing appears, press the CONTROL–S key combination. The listing freezes with no prompt or cursor in sight.
SCREEN 2

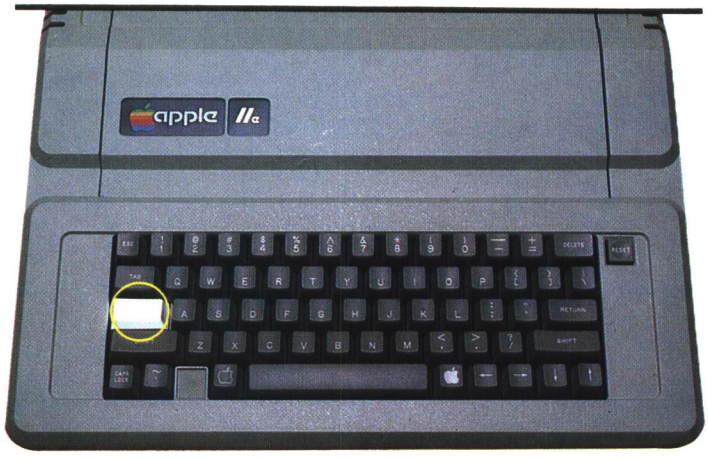
(NOTE: If you didn't find the two keys, CONTROL and S, until the listing had stopped of its own accord, just type LIST, press RETURN, and try again. Doing this will help you learn where things are on the keyboard.)

```
     PROGRAM!!"
610  PRINT "DELETE NEW PROGRAM!!"

611  PRINT "HOME:VTAB23"
612  PRINT "PRINT"D$"PRESS ANY KE
     Y TO CONTINUE"D$"
613  PRINT "POKE 35,20 : VTAB 1"
620  PRINT "CATALOG"
621  PRINT "TEXT": REM  ALLOW MES
     SAGE TO SCROLL OFF SCREEN
625  PRINT "NOMON I,O,C"
630  PRINT D$"CLOSE DO'ER"
640  PRINT : PRINT : INVERSE : PRINT
     "IT'S DONE!!!": NORMAL
650  PRINT
660  PRINT "YOUR APPLE'S READY TO
     DO'ER IT'S THING!"
670  PRINT "ALL YOU HAVE TO DO IS
     TYPE"
680  PRINT "EXEC DO'ER"
690  PRINT "PRESS THE RETURN KEY,
     AND SIT BACK."

]LIST
```

SCREEN 1
Command the computer to LIST the program.

```
     KEY "
288  REM  END INSTRUCTIONS AND W
     AIT FOR KEY TO BE PRESSED.

290  GET A$: IF A$ =  CHR$ (27) THEN
     END : REM  ESC KEY PRESSED
300  IF A$ =  CHR$ (32) THEN 320:
     REM  SPACE BAR PRESSED
310  PRINT  CHR$ (7): GOTO 290: REM
      BEEP AND TRY AGAIN

320  HOME : PRINT : REM   PROGRAM
     STARTS HERE
330  LET D$ =  CHR$ (4): REM CTRL
     -D
340  PRINT D$"MON C,I,O"
350  PRINT D$"OPEN DO'ER"
360  PRINT D$"WRITE DO'ER"
370  PRINT "FP"
380  PRINT "MON C,I,O"
385  PRINT "REM HERE IS A PROGRAM
     "
390  PRINT
```

SCREEN 2
As soon as the listing starts to move, press the CONTROL–S key combination, for a pause.



CONTROL key location on IIe and II Plus

Once you have successfully caused a listing to pause, press the CONTROL–S key combination to start scrolling again. And then press another CONTROL–S key combination to stop it.
SCREEN 3

Do this exercise a few times until you get used to it. Then let it scroll to the end of the program listing before trying the next CONTROL function.

What if you just want to stop the listing altogether? In such a case, you would hold down the CONTROL key while you press the C key. The CONTROL–C key combination is one of the most common operations in computing. Many programs use it to cause a break in action. Let's try it. Type

LIST

Your command appears on the screen.
SCREEN 4

Now press RETURN. Once the screen starts scrolling, press the CONTROL–C key combination. What happens?

The computer beeps; the listing stops. And what else? The word BREAK appears at the point where you issued the CONTROL–C command. The prompt and cursor sit below BREAK. The CONTROL–C command broke off the listing.
SCREEN 5

```
      "
 390  PRINT
 395  PRINT "100 TEXT:HOME:VTAB 5"

 400  PRINT "110 PRINT"Q$"HERE'S A
       NEW PROGRAM"Q$
 410  PRINT "120 END"
 415  PRINT
 420  PRINT "SAVE NEW PROGRAM!!"
 425  PRINT
 430  PRINT "LIST : REM  NEW PROGR
      AM!!"
 435  PRINT "REM PAUSE TO LOOK AT
      LISTING"
 440  PRINT "FOR X=1 TO 1500: NEXT
       X"
 450  PRINT "INT"
 460  PRINT "MON C,I,O"
 470  PRINT "LOAD APPLESOFT"
 480  PRINT "LIST"
 490  PRINT "FP"
 495  PRINT "PRINT"Q$"PAUSE TO LOO
      K AT LISTING"Q$
 500  PRINT "FOR X=1 TO 1500:NEXT
```

SCREEN 3
Pressing CONTROL–S makes the listing resume.

```
      PROGRAM!!"
 610  PRINT "DELETE NEW PROGRAM!!"

 611  PRINT "HOME:VTAB23"
 612  PRINT "PRINT"Q$"PRESS ANY KE
      Y TO CONTINUE"Q$"
 613  PRINT "POKE 35,20 : VTAB 1"
 620  PRINT "CATALOG"
 621  PRINT "TEXT": REM  ALLOW MES
      SAGE TO SCROLL OFF SCREEN
 625  PRINT "NOMON I,O,C"
 630  PRINT D$"CLOSE DO'ER"
 640  PRINT : PRINT : INVERSE : PRINT
      "IT'S DONE!!!": NORMAL
 650  PRINT
 660  PRINT "YOUR APPLE'S READY TO
      DO'ER IT'S THING!"
 670  PRINT "ALL YOU HAVE TO DO IS
      TYPE"
 680  PRINT "EXEC DO'ER"
 690  PRINT "PRESS THE RETURN KEY,
      AND SIT BACK."

]LIST
```

SCREEN 4
Give the LIST command so you can try the CONTROL–C key combination.

```
      BEEP AND TRY AGAIN

 320  HOME : PRINT : REM   PROGRAM
       STARTS HERE
 330  LET D$ = CHR$ (4): REM CTRL
      -D
 340  PRINT D$"MON C,I,O"
 350  PRINT D$"OPEN DO'ER"
 360  PRINT D$"WRITE DO'ER"
 370  PRINT "FP"
 380  PRINT "MON C,I,O"
 385  PRINT "REM HERE IS A PROGRAM
      "
 390  PRINT
 395  PRINT "100 TEXT:HOME:VTAB 5"

 400  PRINT "110 PRINT"Q$"HERE'S A
       NEW PROGRAM"Q$
 410  PRINT "120 END"
 415  PRINT
 420  PRINT "SAVE NEW PROGRAM!!"
 425  PRINT
BREAK
]
```

SCREEN 5
The CONTROL–C key combination causes the listing to break completely.

ESCAPE KEY

The ESC key (for ESCape) normally works somewhat like the CONTROL–C command. You press it to escape from a certain action. Like some of the other function keys, its action really depends on how the program that's running at the moment interprets it.

To see how the ESC key can cause an escape from a program, let's run a program. Since we have a program already loaded into the memory (*Exec Demo*), we'll run it. Type

RUN

The RUN command is displayed.
SCREEN 1

(NOTE: When a program is already loaded, typing RUN is enough to start the program. When you haven't typed LOAD or RUN before, you must type RUN and the program's name.)

Now press RETURN. Immediately you see a screen of text explaining the program. The last line reads, IF YOU WISH TO STOP THIS PROGRAM NOW, YOU MAY PRESS THE ESC KEY.
SCREEN 2

Go ahead, press the ESC key. The prompt reappears with the cursor. You've escaped from the program and could go ahead and type whatever command you wanted next to the prompt.
SCREEN 3

To see another escape function, run *Exec Demo* again by typing RUN and pressing RETURN. The opening screen of *Exec Demo* appears again.
SCREEN 4

ESCAPE key location on IIe

```
        BEEP AND TRY AGAIN
320  HOME : PRINT : REM   PROGRAM
      STARTS HERE
330  LET D$ =  CHR$ (4): REM CTRL
     -D
340  PRINT D$"MON C,I,O"
350  PRINT D$"OPEN DO'ER"
360  PRINT D$"WRITE DO'ER"
370  PRINT "FP"
380  PRINT "MON C,I,O"
385  PRINT "REM HERE IS A PROGRAM
     "
390  PRINT
395  PRINT "100 TEXT:HOME:VTAB 5"
400  PRINT "110 PRINT"Q$"HERE'S A
      NEW PROGRAM"Q$
410  PRINT "120 END"
415  PRINT
420  PRINT "SAVE NEW PROGRAM!!"
425  PRINT
BREAK
]RUN
```

SCREEN 1
Since EXEC DEMO is already loaded, the RUN command now makes it run.

```
EXEC DEMO

THIS PROGRAM CREATES A SEQUENTIAL TEXT
FILE NAMED "DO'ER" CONTAINING SEVERAL
STRINGS, EACH A LEGAL APPLE II COMMAND.

WHEN YOU TYPE
EXEC DO'ER
THEN THE COMMANDS IN FILE DO'ER TAKE
CONTROL OF YOUR COMPUTER. EACH COMMAND
WILL BE EXECUTED JUST AS IF IT HAD BEEN
TYPED AT THE KEYBOARD. THE DOS MANUAL
DESCRIBES THE PROGRAM IN MORE DETAIL.

PRESS THE SPACE BAR TO MAKE THIS
PROGRAM CREATE THE FILE DO'ER.

IF YOU WISH TO STOP THIS PROGRAM NOW,
YOU MAY PRESS THE ESC KEY.
]
```

SCREEN 2
The ESCAPE key usually ends the program.

```
EXEC DEMO

THIS PROGRAM CREATES A SEQUENTIAL TEXT
FILE NAMED "DO'ER" CONTAINING SEVERAL
STRINGS, EACH A LEGAL APPLE II COMMAND.

WHEN YOU TYPE
EXEC DO'ER
THEN THE COMMANDS IN FILE DO'ER TAKE
CONTROL OF YOUR COMPUTER. EACH COMMAND
WILL BE EXECUTED JUST AS IF IT HAD BEEN
TYPED AT THE KEYBOARD. THE DOS MANUAL
DESCRIBES THE PROGRAM IN MORE DETAIL.

PRESS THE SPACE BAR TO MAKE THIS
PROGRAM CREATE THE FILE DO'ER.

IF YOU WISH TO STOP THIS PROGRAM NOW,
YOU MAY PRESS THE ESC KEY.
]
```

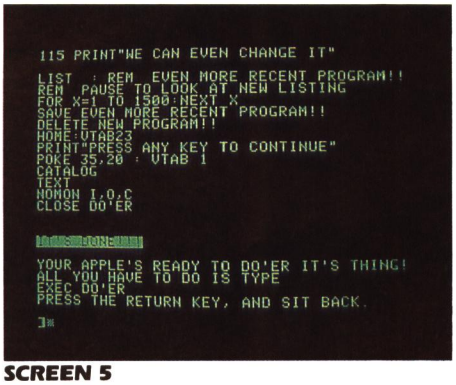
SCREEN 3
Pressing the ESCAPE key here caused the prompt to return to your screen.

```
EXEC DEMO

THIS PROGRAM CREATES A SEQUENTIAL TEXT
FILE NAMED "DO'ER" CONTAINING SEVERAL
STRINGS, EACH A LEGAL APPLE II COMMAND.

WHEN YOU TYPE
EXEC DO'ER
THEN THE COMMANDS IN FILE DO'ER TAKE
CONTROL OF YOUR COMPUTER. EACH COMMAND
WILL BE EXECUTED JUST AS IF IT HAD BEEN
TYPED AT THE KEYBOARD. THE DOS MANUAL
DESCRIBES THE PROGRAM IN MORE DETAIL.

PRESS THE SPACE BAR TO MAKE THIS
PROGRAM CREATE THE FILE DO'ER.

IF YOU WISH TO STOP THIS PROGRAM NOW,
YOU MAY PRESS THE ESC KEY.
]
```

SCREEN 4
This time when EXEC DEMO runs, press the SPACEBAR.

This time, press the SPACEBAR as the program instructs to create the file DO'ER. Don't worry about understanding what the program does. We need the results of the program for our own purposes.

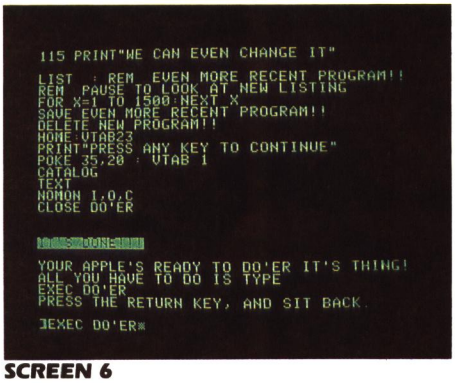
SCREEN 5



SCREEN 5
Follow the directions on the screen.

Now do what the screen tells you to do. First it tells you to type EXEC DO'ER and press RETURN. So go ahead. Type the words EXEC DO'ER.

SCREEN 6



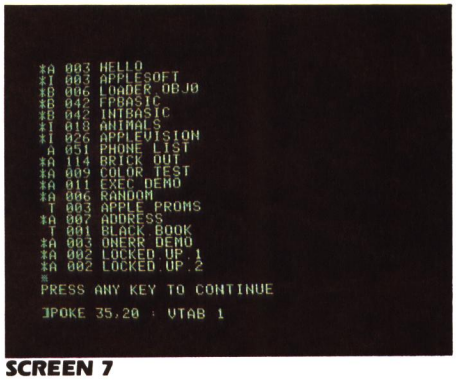
SCREEN 6
Type the words EXEC DO'ER.

Now press RETURN.

SCREEN 7

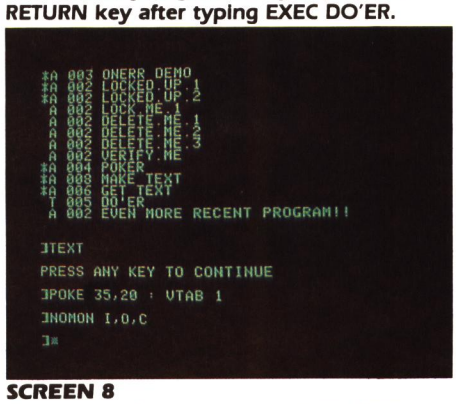
When the program tells you to PRESS ANY KEY TO CONTINUE, press anything but TAB, SHIFT, CONTROL, CAPS LOCK, REPT, either of the APPLE keys (SOLID or OPEN), or RESET. These keys would not have the desired effect at this point. Are the prompt and cursor at the bottom of the screen now? If not, press a key again until the prompt and cursor appear at the bottom.

SCREEN 8



SCREEN 7
This is what you get when you press the RETURN key after typing EXEC DO'ER.

ESCAPE key location on II Plus



SCREEN 8
If the cursor is not on your screen, keep pressing keys until it appears.

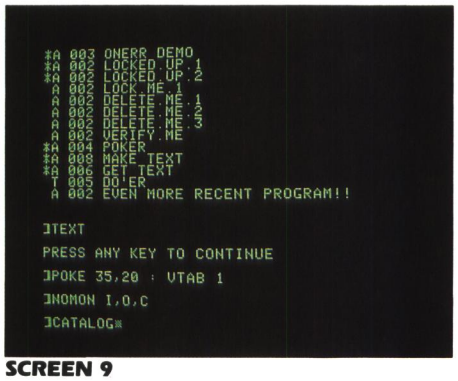
Let's see if *Exec Demo* created the file DO'ER as promised. Type CATALOG.
SCREEN 9

Now press RETURN. If there's no prompt at the bottom, you need to press RETURN again to see the rest of the catalog.

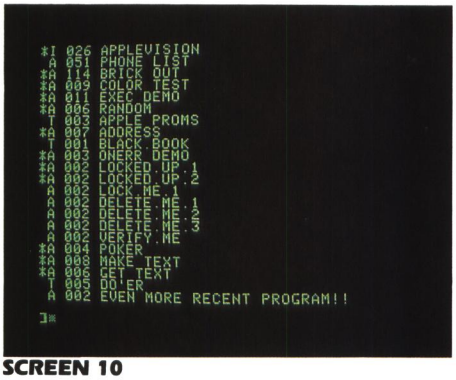
When you get to the bottom of the catalog, you'll see two new file names: DO'ER and EVEN MORE RECENT PROGRAM!!.
SCREEN 10

We don't need these around, so let's delete them. Type

DELETE DO'ER

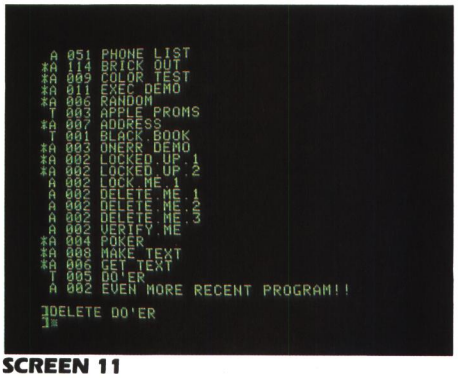


SCREEN 9
Type CATALOG and press the RETURN key, to see if the program created files.



SCREEN 10
The two new programs are listed at the bottom!

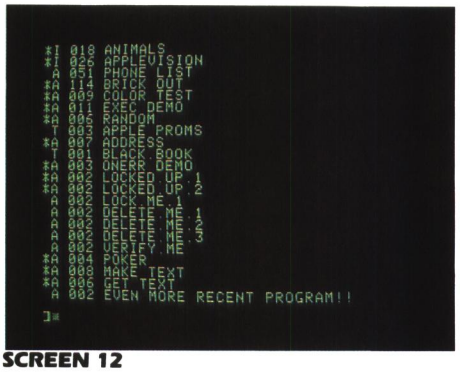
Now press RETURN.
SCREEN 11



SCREEN 11
The drive whirs as the computer deletes the file DO'ER, as instructed.

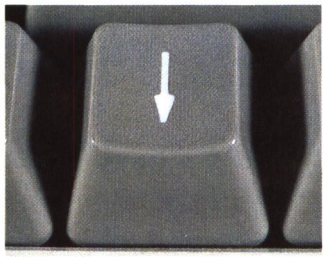
The drive whirred, but did the command do its job? Do another catalog to see if DO'ER is still there. Type CATALOG and press RETURN (as many times as needed) to get to the end of the catalog, with the prompt and cursor at the bottom. DO'ER is gone!
SCREEN 12

Now to delete EVEN MORE RECENT PROGRAM!!, read on.



SCREEN 12
Listing the catalog shows that the DO'ER file has indeed been deleted.

VERTICAL ARROW KEYS: APPLE IIe ONLY



IF YOU HAVE AN APPLE II PLUS, SKIP TO THE NEXT SECTION, "THE SECRET KEYPAD."

The VERTICAL ARROW keys allow you to move the cursor up and down on the screen. This has little meaning at the catalog level. However, to help you understand how the VERTICAL ARROW keys work, the Apple IIe has a small editing program hidden away. We will start that program by pressing the ESC key (but don't do it yet!) and stop it by pressing the SPACEBAR.

What we are about to do is to delete EVEN MORE RECENT PROGRAM!! without having to type in that huge name. Follow the steps below. (NOTE: If you get messed up, just press RETURN and type CATALOG (followed by another RETURN) to get things back the way they were. Then try again. The worst thing you can do is mess up the display, and typing CATALOG followed by RETURN fixes that.)

- Type DELETE.

SCREEN 1

- Press the ESC key.
- Press the ↑ key twice (or until the cursor rests directly on the first E in EVEN).

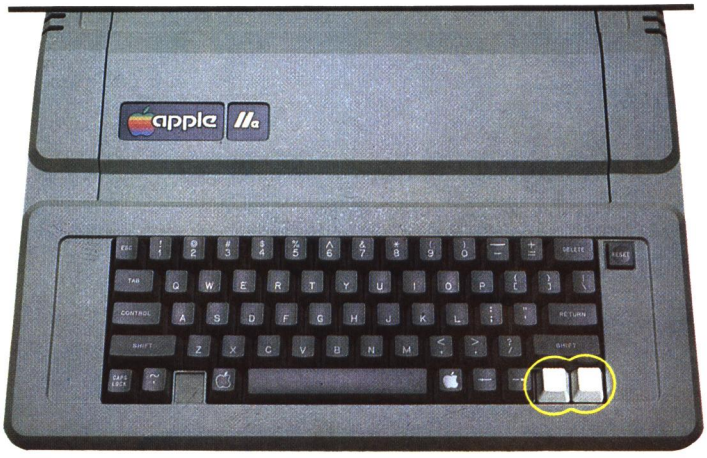
SCREEN 2

- Press the SPACEBAR.
- Press the → key until the cursor rests in the space right after the second exclamation point(!).

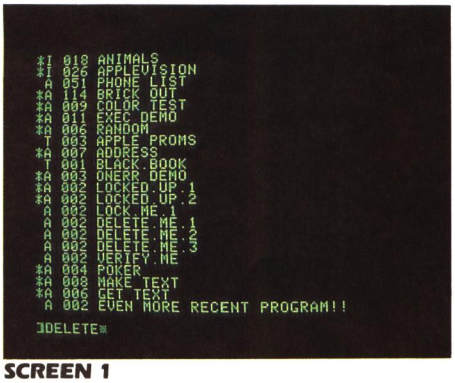
SCREEN 3

- Press the ESC key again.
- Press the ← key until it rests on the first E in EVEN again.

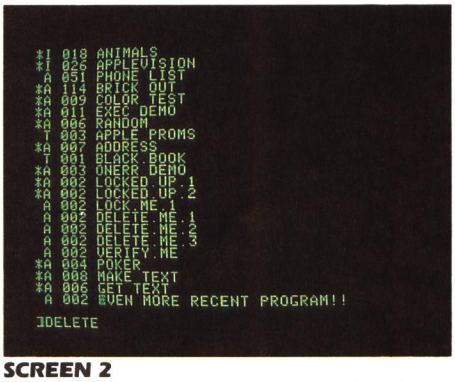
SCREEN 4



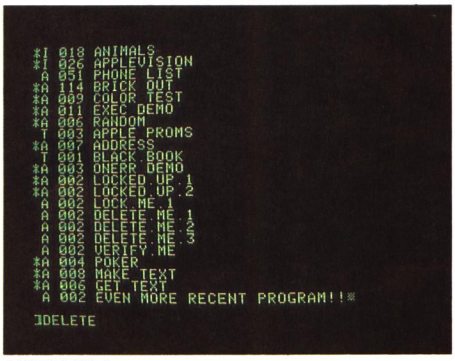
VERTICAL ARROW keys locations on IIe



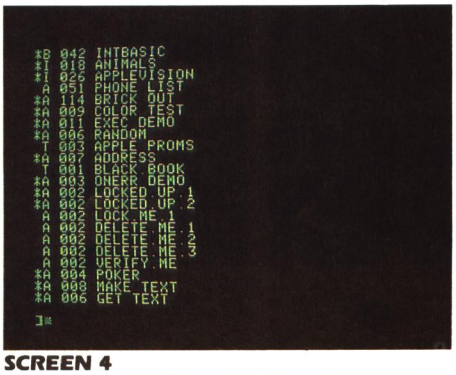
SCREEN 1
Type DELETE.



SCREEN 2
The cursor should rest on the first E in the word EVEN.



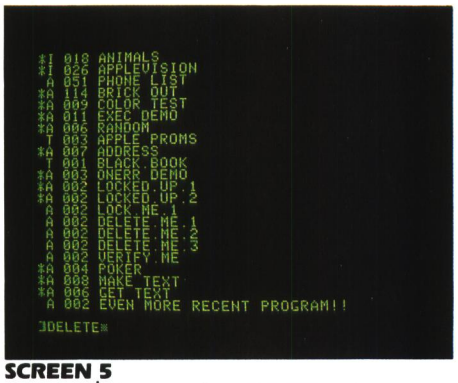
SCREEN 3
Place the cursor after the exclamation points and then press the ESCAPE key.



SCREEN 4
Place the cursor back on the first E in the word EVEN.

- Press the ↓ key twice (or until the cursor rests in the space right after DELETE).

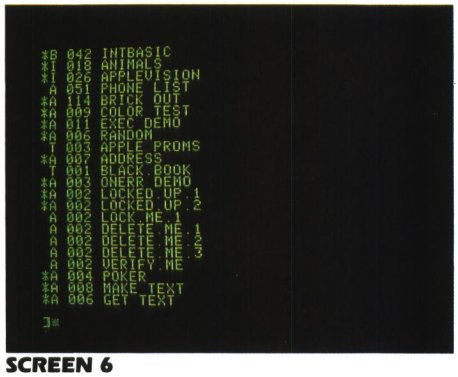
SCREEN 5



SCREEN 5
Use the ↓ key to place the cursor in the space after the word DELETE.

- Press the SPACEBAR.
- Press RETURN. When you do, the drive whirs again erasing the file. Want to see for yourself? Do another catalog: Type CATALOG and press RETURN as many times as needed to get to the bottom of the catalog. EVEN MORE RECENT PROGRAM!! is gone.

SCREEN 6



SCREEN 6
The file EVEN MORE RECENT PROGRAM!! has been deleted from the catalog.

SECRET KEYPAD: APPLE II PLUS ONLY

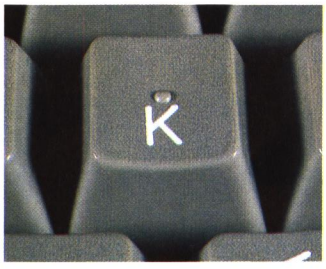
IF YOU HAVE AN APPLE IIe, SKIP TO THE NEXT SECTION, "THOSE OTHER KEYS."

THE APPLE II PLUS lacks VERTICAL ARROW keys, but it has a "secret keypad" that moves the cursor up, down, left, and right. It has a small editing program hidden away to let us use the secret keypad. We will start the program by pressing the ESC key (but don't do it yet!) and stop it by pressing the SPACEBAR.

When the editing program is on, the I, J, K, and M keys become a directional keypad.

```
      ↑
      I
←J    K→
    M
    ↓
```

The I key propels the cursor up on the screen, the J key moves it to the left, the K key moves it to the right, and the M key moves it down.



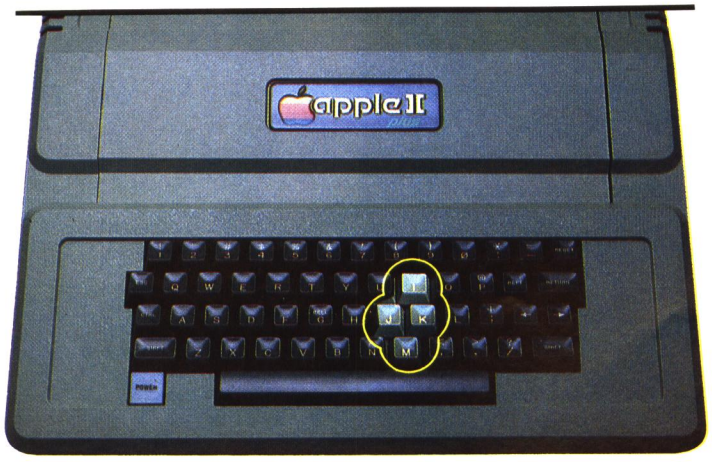
What we are about to do is to delete EVEN MORE RECENT PROGRAM!! without having to type in that huge name. Follow the steps below. (NOTE: If you get messed up, just press RETURN, type CATALOG and press RETURN again, to clean things up. Then try again. You can make the catalog look dreadful, but you can't hurt it.)

- Type DELETE.

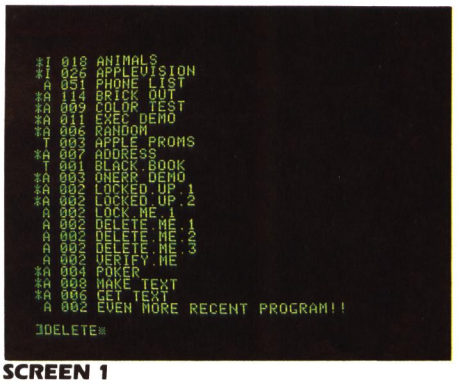
SCREEN 1

- Press the ESC key.
- Press I twice (or until the cursor rests directly on the first E in EVEN).

SCREEN 2

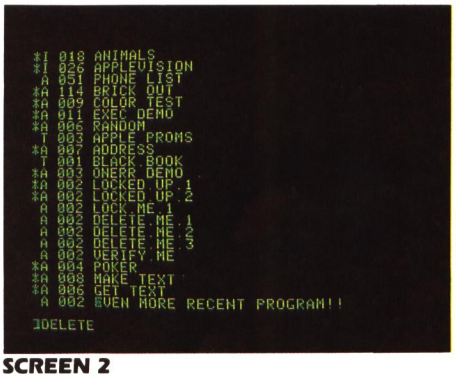


SECRET KEYPAD location on II Plus



```
 *I 018 ANIMALS
 *I 026 APPLEVISION
  A 051 PHONE LIST
 *A 114 BRICK OUT
 *A 009 COLOR TEST
 *A 011 EXEC DEMO
 *A 006 RANDOM
  T 003 APPLE PROMS
 *A 007 ADDRESS
  T 001 BLACK BOOK
 *A 003 ONERR DEMO
 *A 002 LOCKED UP.1
 *A 002 LOCKED UP.2
  A 002 LOCK ME.1
  A 002 DELETE ME.1
  A 002 DELETE ME.2
  A 002 DELETE ME.3
  A 002 VERIFY ME
 *A 004 POKER
 *A 008 MAKE TEXT
 *A 006 GET TEXT
  A 002 EVEN MORE RECENT PROGRAM!!

]DELETE
```

SCREEN 1
Type DELETE.



```
 *I 018 ANIMALS
 *I 026 APPLEVISION
  A 051 PHONE LIST
 *A 114 BRICK OUT
 *A 009 COLOR TEST
 *A 011 EXEC DEMO
 *A 006 RANDOM
  T 003 APPLE PROMS
 *A 007 ADDRESS
  T 001 BLACK BOOK
 *A 003 ONERR DEMO
 *A 002 LOCKED UP.1
 *A 002 LOCKED UP.2
  A 002 LOCK ME.1
  A 002 DELETE ME.1
  A 002 DELETE ME.2
  A 002 DELETE ME.3
  A 002 VERIFY ME
 *A 004 POKER
 *A 008 MAKE TEXT
 *A 006 GET TEXT
  A 002 EVEN MORE RECENT PROGRAM!!

]DELETE
```

SCREEN 2
Press the I key twice, so that the cursor rests on the first E in EVEN.

- Press the SPACEBAR.
- Press the K key until the cursor rests in the space right after the second exclamation point. (NOTE: You can press the REPT key while holding down the K key and the cursor will zip right along.)

SCREEN 3

```
*I 018 ANIMALS
*I 026 APPLEVISION
 A 051 PHONE LIST
*A 114 BRICK OUT
*A 009 COLOR TEST
*A 011 EXEC DEMO
*A 006 RANDOM
 T 003 APPLE PROMS
*A 007 ADDRESS
 T 001 BLACK BOOK
*A 003 ONERR DEMO
*A 002 LOCKED UP 1
*A 002 LOCKED UP 2
 A 002 LOCK ME 1
 A 002 DELETE ME 1
 A 002 DELETE ME 2
 A 002 DELETE ME 3
 A 002 VERIFY ME
*A 004 POKER
*A 008 MAKE TEXT
*A 006 GET TEXT
 A 002 EVEN MORE RECENT PROGRAM!!

]DELETE
```

SCREEN 3
Place the cursor after the exclamation points and then press the ESCAPE key.

- Press the ESC key again.
- Press the J key until the cursor rests on the first E in EVEN again.

SCREEN 4

```
*I 018 ANIMALS
*I 026 APPLEVISION
 A 051 PHONE LIST
*A 114 BRICK OUT
*A 009 COLOR TEST
*A 011 EXEC DEMO
*A 006 RANDOM
 T 003 APPLE PROMS
*A 007 ADDRESS
 T 001 BLACK BOOK
*A 003 ONERR DEMO
*A 002 LOCKED UP 1
*A 002 LOCKED UP 2
 A 002 LOCK ME 1
 A 002 DELETE ME 1
 A 002 DELETE ME 2
 A 002 DELETE ME 3
 A 002 VERIFY ME
*A 004 POKER
*A 008 MAKE TEXT
*A 006 GET TEXT
 A 002 EVEN MORE RECENT PROGRAM!!

]DELETE
```

SCREEN 4
Use the J key to place the cursor back on the first E in EVEN.

- Press the M key twice (or until the cursor rests in the space right after DELETE).

SCREEN 5

```
*I 018 ANIMALS
*I 026 APPLEVISION
 A 051 PHONE LIST
*A 114 BRICK OUT
*A 009 COLOR TEST
*A 011 EXEC DEMO
*A 006 RANDOM
 T 003 APPLE PROMS
*A 007 ADDRESS
 T 001 BLACK BOOK
*A 003 ONERR DEMO
*A 002 LOCKED UP 1
*A 002 LOCKED UP 2
 A 002 LOCK ME 1
 A 002 DELETE ME 1
 A 002 DELETE ME 2
 A 002 DELETE ME 3
 A 002 VERIFY ME
*A 004 POKER
*A 008 MAKE TEXT
*A 006 GET TEXT
 A 002 EVEN MORE RECENT PROGRAM!!

]DELETE
```

SCREEN 5
Use the M key to place the cursor in the space after the word DELETE.

- Press the SPACEBAR.
- Press RETURN. When you do, the drive whirs again erasing the file. Want to see for yourself? Do another catalog: Type CATALOG and press RETURN as many times as needed to get to the bottom of the catalog. EVEN MORE RECENT PROGRAM!! is gone.

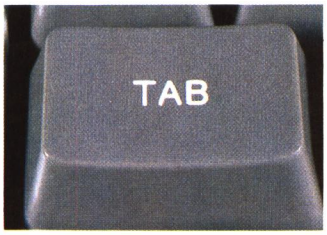
SCREEN 6

```
*B 042 INTBASIC
*I 018 ANIMALS
*I 026 APPLEVISION
 A 051 PHONE LIST
*A 114 BRICK OUT
*A 009 COLOR TEST
*A 011 EXEC DEMO
*A 006 RANDOM
 T 003 APPLE PROMS
*A 007 ADDRESS
 T 001 BLACK BOOK
*A 003 ONERR DEMO
*A 002 LOCKED UP 1
*A 002 LOCKED UP 2
 A 002 LOCK ME 1
 A 002 DELETE ME 1
 A 002 DELETE ME 2
 A 002 DELETE ME 3
 A 002 VERIFY ME
*A 004 POKER
*A 008 MAKE TEXT
*A 006 GET TEXT

]
```

SCREEN 6
The file EVEN MORE RECENT PROGRAM!! has been deleted from the catalog.

You can use the ESC key and your secret keypad to move the cursor anywhere on the screen you want to go. Combine your keypad arrows (the I, J, K, and M keys) with the REPT key for additional speed.

THOSE OTHER KEYS



So far, we've had little to say about the following keys:

- TAB (APPLE IIe ONLY)
- DELETE (APPLE IIe ONLY)
- RESET (APPLE IIe AND APPLE II PLUS)
- The two APPLE keys: OPEN and SOLID (APPLE IIe ONLY)

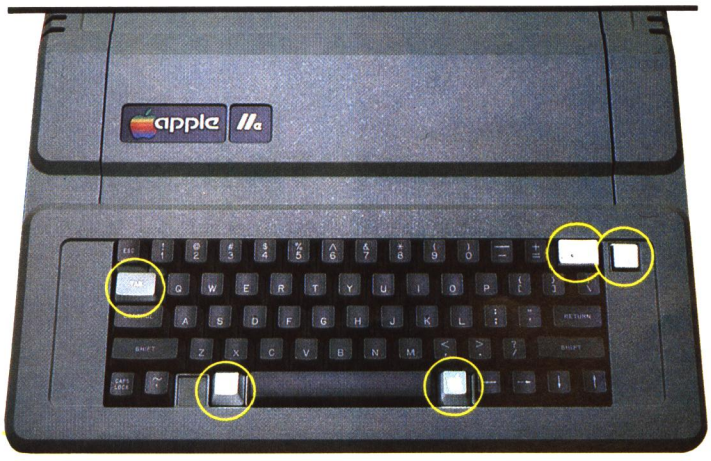
The reason is that although Apple has assigned certain functions to these keys, these functions depend on the program you are running at any given moment.

Right now, the TAB key, which is great in word processing, and the two APPLE keys (SOLID and OPEN) don't do anything.

The DELETE key, which is extremely handy in data communications and word processing, only draws a checkered box.

The RESET key works only with the CONTROL key, but if you press the CONTROL–RESET key combination at this point, not much happens. A beep! When you are working with software programs, the CONTROL–RESET key combination can reboot the whole system or cause everything to freeze.

The two APPLE keys (SOLID and OPEN) can act like buttons on game paddles and are used in testing the system. As you buy software written specifically FOR THE APPLE IIe, you'll find a variety of functions assigned to these two.



SOLID APPLE, OPEN APPLE, TAB, DELETE, and RESET keys locations on IIe

IF YOU HAVE AN APPLE IIe, let's test the system now.

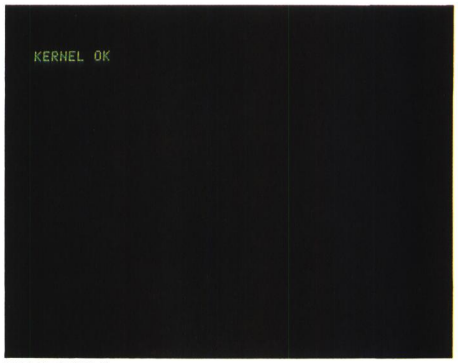
IF YOU HAVE AN APPLE II PLUS, SKIP TO THE NEXT SECTION, "USING THE BASIC LANGUAGE."

Testing the Apple IIe system takes three keys at once. Hold down the CONTROL key and the SOLID APPLE key (the white one at the right of the SPACEBAR), and then press the RESET key.

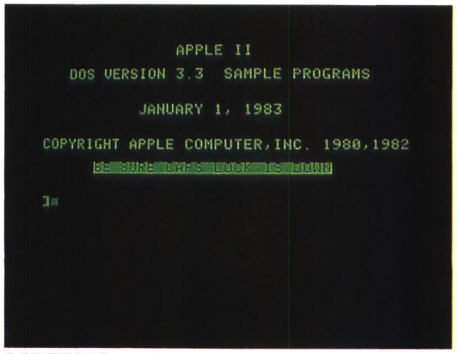
The screen will redraw itself several times. Finally, the words KERNEL OK appear in the upper left corner of the screen—exactly the words you want to see.
SCREEN 1

But try the keyboard. Dead. The test *crashed* the system. People also refer to this as the system *hanging*. Every once in a while a program will cause the system to hang. But you have an easy out—a *warm* boot.

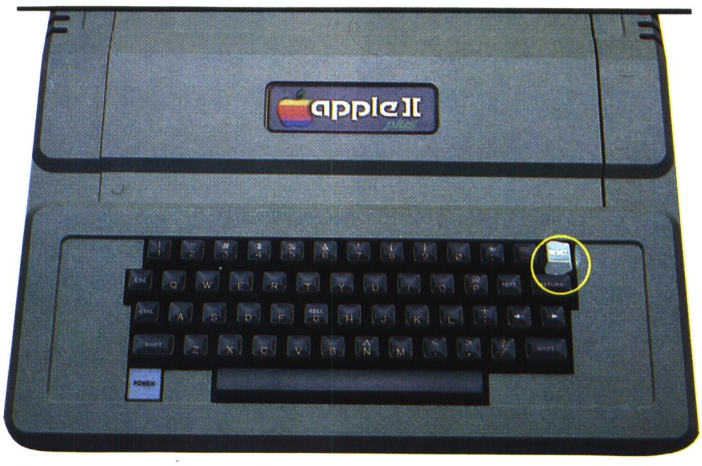
Press the CONTROL–RESET key combination. The computer beeps and springs to life. We call this boot procedure *warm*, because your computer is already on and physically warm.
SCREEN 2



SCREEN 1
The KERNEL OK message tells you that your system is working just fine.



SCREEN 2
After the warm boot, the beginning of *Sample Programs* appears.



RESET key location on II Plus

USING THE BASIC LANGUAGE

In this section, we'll take advantage of Applesoft BASIC, the programming language contained in your computer. You'll enter and use a program that will let you use your Apple computer as a big calculator.

So far, you've seen listings for programs written by other people (like EXEC DEMO). Now let's type in a simple BASIC program. This program will make your computer act like a simple adding machine. First, type

NEW

The NEW command is displayed on your screen.
SCREEN 1

Now to make the computer follow the command, press the RETURN key. The NEW command completely clears the computer's working memory (not its ROM or your disks) of any BASIC programs.
SCREEN 2

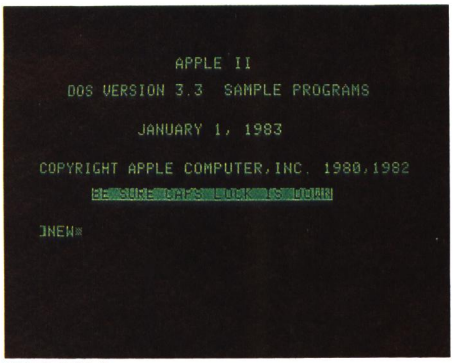
Use the NEW command before you begin typing in any program. Otherwise, you may find pieces of older programs mixed in with your latest efforts. The results can be quite unpredictable!

Type in the following listing, just as it appears. Type every number, letter, and punctuation mark exactly where it is shown. Be sure to leave spaces where they are shown. Be sure to type the number 1 (not the lowercase letter L) and the number zero (not capital letter O) when typing numbers in this program. Don't worry about what the statements mean right now. When you finish each line, press the RETURN key to enter the line into the computer's memory. Then type the next line number and statement.

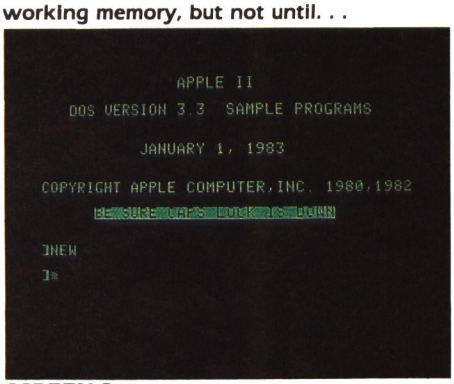
```
10 PRINT "BASIC ADDING MACHINE":PRINT
20 LET X=0
30 INPUT "NUMBER    ";Y
40 LET X=X+Y
50 PRINT "SUM       ";X
60 GOTO 30
70 END
```

When you finish typing the program (don't forget to press the RETURN key after END), check your screen to be sure you have typed the program correctly.
SCREEN 3

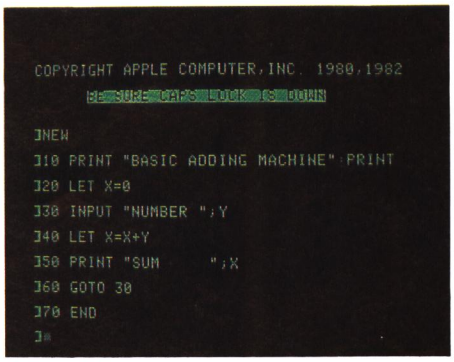
Now type LIST
SCREEN 4



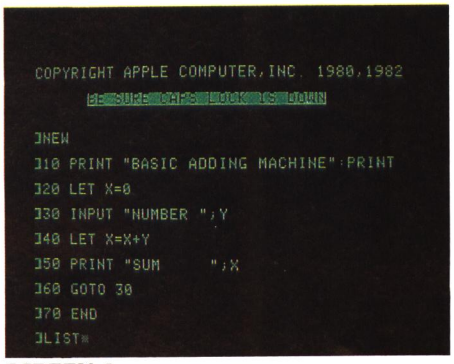
SCREEN 1
The NEW command clears the computer's working memory, but not until. . .



SCREEN 2
. . . you press the RETURN key.



SCREEN 3
The program you typed should look just like this.



SCREEN 4
Type the LIST command.

Now press the RETURN key. Your new program will appear, crisply formatted by the Apple.
SCREEN 5

Now type

RUN

```
]20 LET X=0
]30 INPUT "NUMBER ";Y
]40 LET X=X+Y
]50 PRINT "SUM     ";X
]60 GOTO 30
]70 END
]LIST
10  PRINT "BASIC ADDING MACHINE"
    PRINT
20  LET X = 0
30  INPUT "NUMBER ";Y
40  LET X = X + Y
50  PRINT "SUM     ";X
60  GOTO 30
70  END
]
```

SCREEN 5
The computer will LIST the program just as it has recorded it in its memory.

The RUN command is displayed.
SCREEN 6

```
]20 LET X=0
]30 INPUT "NUMBER ";Y
]40 LET X=X+Y
]50 PRINT "SUM     ";X
]60 GOTO 30
]70 END
]LIST
10  PRINT "BASIC ADDING MACHINE"
    PRINT
20  LET X = 0
30  INPUT "NUMBER ";Y
40  LET X = X + Y
50  PRINT "SUM     ";X
60  GOTO 30
70  END
]RUN
```

SCREEN 6
RUN tells the computer to execute the program lines, but not until. . .

Now press the RETURN key and the program begins to run.
SCREEN 7

In response to the computer's request for a number, type in any number (decimal or integer, positive or negative) and press the RETURN key.

```
]40 LET X=X+Y
]50 PRINT "SUM     ";X
]60 GOTO 30
]70 END
]LIST
10  PRINT "BASIC ADDING MACHINE"
    PRINT
20  LET X = 0
30  INPUT "NUMBER ";Y
40  LET X = X + Y
50  PRINT "SUM     ";X
60  GOTO 30
70  END

]RUN
BASIC ADDING MACHINE

NUMBER
```

SCREEN 7
. . . you press the RETURN key. Then the program begins to run.

The answer will appear immediately along with an invitation to give the adding machine another number.
SCREEN 8

```
]50 PRINT "SUM     ";X
]60 GOTO 30
]70 END
]LIST
10  PRINT "BASIC ADDING MACHINE"
    PRINT
20  LET X = 0
30  INPUT "NUMBER ";Y
40  LET X = X + Y
50  PRINT "SUM     ";X
60  GOTO 30
70  END

]RUN
BASIC ADDING MACHINE

NUMBER 7
SUM
     7
NUMBER
```

SCREEN 8
The computer added 7 to 0, since there was nothing for it to add 7 to.

Give the computer another number, and press RETURN. The computer adds in the new number and gives a new total.
SCREEN 9

You can keep giving the computer as many numbers as you want. Each time you type in a new number and press RETURN, the computer adds that number to the total.

Your results should look something like those in the photograph.
SCREEN 10

NOTE: If you type very large or small numbers, you may get some funny-looking results, like 9.999E+09. In such a case, the result you are looking at is the computer's rendering of an exponential number. Off a computer screen, this number appears as 9.999×10^9 or 9,999,999,999.

When we added in an extremely large number, we got the exponential number 1E + 16.
SCREEN 11

Off the computer screen, that number is 1×10^{16} or 10 quadrillion. With a number so exceptionally large, the computer rounded our answer off.

Notice that the computer does not insert commas in numbers to show place value, the way you would ordinarily (such as in a number like 5,782,138). When you type such numbers into the computer, do not use commas. The computer does not know how to interpret commas placed within numbers.

How do you stop this endless arithmetic? Press the CONTROL–C key combination and press RETURN to break off the program.
SCREEN 12

The calculator program you just created was a very simple one, with limited functions. It does, however, give you some idea of how a BASIC program works. Of course, programs can be and are written to perform much more complicated and useful functions. If you decide you want to learn more about BASIC programming, you'll be amazed at the many useful tasks you can program your computer to perform.

```
]60 GOTO 30

]70 END

]LIST

10  PRINT "BASIC ADDING MACHINE":
    PRINT
20  LET X = 0
30  INPUT "NUMBER ";Y
40  LET X = X + Y
50  PRINT "SUM    ";X
60  GOTO 30
70  END

]RUN
BASIC ADDING MACHINE

NUMBER 7
SUM     7
NUMBER 3
SUM     10
NUMBER %
```

SCREEN 9
This time it added 3 to 7 (the original sum) to give you the answer of 10.

```
    PRINT
20  LET X = 0
30  INPUT "NUMBER ";Y
40  LET X = X + Y
50  PRINT "SUM    ";X
60  GOTO 30
70  END

]RUN
BASIC ADDING MACHINE

NUMBER 7
SUM     7
NUMBER 3
SUM     10
NUMBER 453
SUM     463
NUMBER 89
SUM     552
NUMBER 76
SUM     628
NUMBER 32
SUM     660
NUMBER %
```

SCREEN 10
Your results should look something like this.

```
30  INPUT "NUMBER ";Y
40  LET X = X + Y
50  PRINT "SUM    ";X
60  GOTO 30
70  END

]RUN
BASIC ADDING MACHINE

NUMBER 7
SUM     7
NUMBER 3
SUM     10
NUMBER 453
SUM     463
NUMBER 89
SUM     552
NUMBER 76
SUM     628
NUMBER 32
SUM     660
NUMBER 9999999999999999
SUM     1E+16
NUMBER %
```

SCREEN 11
When the number gets too large, the computer displays an exponential number.

```
60  GOTO 30
70  END

]RUN
BASIC ADDING MACHINE

NUMBER 7
SUM     7
NUMBER 3
SUM     10
NUMBER 453
SUM     463
NUMBER 89
SUM     552
NUMBER 76
SUM     628
NUMBER 32
SUM     660
NUMBER 9999999999999999
SUM     1E+16
NUMBER

BREAK IN 30
]%
```

SCREEN 12
The CONTROL–C key combination breaks off the program.

This program (or any other program you create) will stay in your computer's working memory until you either turn the computer off, type the NEW command, or store the program on a disk. Type

LIST

to see that the program is still in memory.
SCREEN 13

Now press RETURN and you will see that the program is still around.
SCREEN 14

It would be possible to save this program on a disk; however, you cannot save this program on the *Sample Programs* disk that you are using now. The *Sample Programs* disk is *write-protected,* which means that you cannot add your own programs to the ones already on the disk. If you wanted to save the program, you would need to insert an initialized disk (that is not write-protected) in your disk drive. Then all you would have to do is type SAVE CALC and press the RETURN key. (CALC is just a name we've chosen for the program. You could, however, assign any name you wanted to the program.) Then even if you turned the computer off or typed the NEW command, the program would be safe on disk, ready for you to give the RUN CALC command whenever you wanted to use it again.

Since we haven't saved this program on a disk, it is still in your computer's working memory. If you wanted to erase this program now to write a new program, you would use the NEW command. Let's erase the program. Type

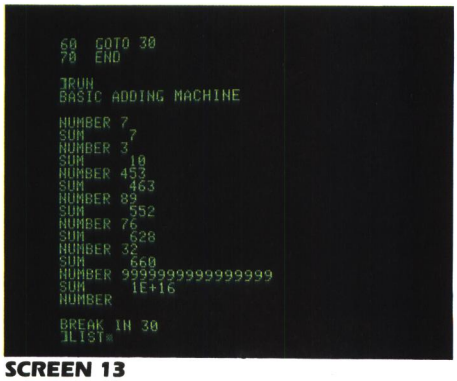
NEW

and press RETURN.
SCREEN 15

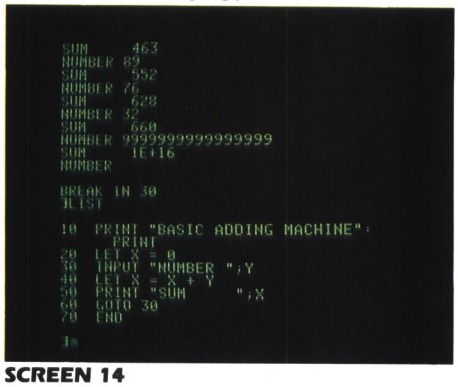
Was the program erased? To find out, type

LIST

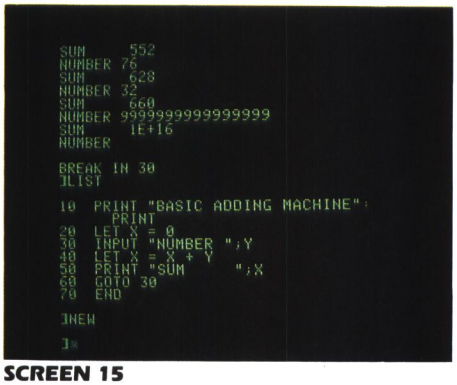
and press RETURN. Since no program is listed, you know that the program is now erased from the computer's memory.
SCREEN 16



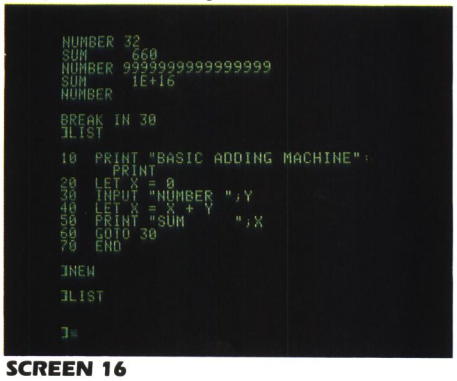
SCREEN 13
To see if the program is still in the computer's memory, type LIST.



SCREEN 14
There it is!



SCREEN 15
The NEW command wipes out your program. To see for yourself. . .



SCREEN 16
. . . type LIST and press the RETURN key. No program comes on the screen!

ON-SCREEN CALCULATOR

There is some simple arithmetic that you can do without writing a calculator program. To do this, you use BASIC commands without the line numbers.

For example, the PRINT command causes the computer to print information on the screen. Thus, if you type PRINT and follow that with an arithmetic problem (and then press the RETURN key), the computer will display the correct answer on the screen.

You use the PLUS SIGN key to do addition problems. Let's try one. Type

PRINT 5+3

and press the RETURN key. Presto! There's the answer on your screen.
SCREEN 1

Does it work for subtraction, too? Use the HYPHEN key for the minus sign in subtraction problems. Type

PRINT 20-5

and press the RETURN key. It works!
SCREEN 2

The ASTERISK key is used to tell the computer to multiply numbers. In everyday writing, we use the letter x to represent multiplication. Humans, therefore, understand the statement 4 x 2 = 8. But to the computer the letter x is just that—a letter x. The computer can't tell whether we want x to represent the letter x, or whether we want x to represent multiplication. So the computer uses the asterisk for multiplication instead. Let's try multiplication. Type

PRINT 5*3

and press the RETURN key. It did it again!
SCREEN 3

Use the SLASH key to tell the computer to perform division. Type

PRINT 12/4

and press the RETURN key. Look at that. It works every time!
SCREEN 4

```
 SUM      1E+16
 NUMBER

 BREAK IN 30
]LIST

 10  PRINT "BASIC ADDING MACHINE":
     PRINT
 20  LET X = 0
 30  INPUT "NUMBER ";Y
 40  LET X = X + Y
 50  PRINT "SUM      ";X
 60  GOTO 30
 70  END

]NEW

]LIST


]PRINT 5+3
 8

]
```

SCREEN 1
Using the PRINT command, your computer will add. . .

```
 BREAK IN 30
]LIST

 10  PRINT "BASIC ADDING MACHINE":
     PRINT
 20  LET X = 0
 30  INPUT "NUMBER ";Y
 40  LET X = X + Y
 50  PRINT "SUM      ";X
 60  GOTO 30
 70  END

]NEW

]LIST


]PRINT 5+3
 8

]PRINT 20-5
 15

]
```

SCREEN 2
. . .subtract. . .

```
 10  PRINT "BASIC ADDING MACHINE"
     PRINT
 20  LET X = 0
 30  INPUT "NUMBER ";Y
 40  LET X = X + Y
 50  PRINT "SUM      ";X
 60  GOTO 30
 70  END

]NEW

]LIST


]PRINT 5+3
 8

]PRINT 20-5
 15

]PRINT 5*3
 15

]
```

SCREEN 3
. . .multiply. . .

```
 30  INPUT "NUMBER ";Y
 40  LET X = X + Y
 50  PRINT "SUM      ";X
 60  GOTO 30
 70  END

]NEW

]LIST


]PRINT 5+3
 8

]PRINT 20-5
 15

]PRINT 5*3
 15

]PRINT 12/4
 3

]
```

SCREEN 4
. . .and divide!

Now let's try something a little different. Type

PRINT X

and press the RETURN key.
SCREEN 5

Then type

PRINT Y+3

and press the RETURN key.
SCREEN 6

Why did the computer display 0 as the answer to PRINT X and 3 as the answer to PRINT Y+3? Because you have not assigned any values to the letters X and Y.

Letters used in this way are called *numeric variables* in BASIC. They contain the numbers you assign to them. When you assign no value to a letter, the computer reads its value as zero.

This is true of combinations of letters used after a PRINT command also. For example, type

PRINT DOG

and press the RETURN key. The computer displays a zero on the screen (because you have not assigned DOG a value).
SCREEN 7

With the PRINT command, however, you can get the computer to display *character strings* (any combination of letters, numbers, symbols, and spaces) just as you type them, by enclosing them in quotation marks. For example, type

PRINT "DOG"

and press the RETURN key. The computer displays the word DOG.
SCREEN 8

If you look back at the calculator program, you'll see that some words were placed within quotation marks when you typed in the program listing. Then when you ran the program, the computer displayed whatever you had typed within quotation marks. You can use this method if you write your own BASIC programs.

```
60  GOTO 30
70  END
]NEW
]LIST

]PRINT 5+3
8
]PRINT 20-5
15
]PRINT 5*3
15
]PRINT 12/4
3
]PRINT X
0
]
```

SCREEN 5
The computer reads letters by themselves after a PRINT command as zeros. . .

```
]NEW
]LIST

]PRINT 5+3
8
]PRINT 20-5
15
]PRINT 5*3
15
]PRINT 12/4
3
]PRINT X
0
]PRINT Y+3
3
]
```

SCREEN 6
. . .because letters can be assigned numeric values, and no assignment equals zero.

```
]PRINT 5+3
8
]PRINT 20-5
15
]PRINT 5*3
15
]PRINT 12/4
3
]PRINT X
0
]PRINT Y+3
3
]PRINT DOG
0
]
```

SCREEN 7
Words not assigned values are also read as zeros. . .

```
8
]PRINT 20-5
15
]PRINT 5*3
15
]PRINT 12/4
3
]PRINT X
0
]PRINT Y+3
3
]PRINT DOG
0
]PRINT "DOG"
DOG
]
```

SCREEN 8
. . .unless they are enclosed in quotation marks.

CHAPTER 4 PERIPHERALS— EXPANDING YOUR SYSTEM

Peripherals are pieces of equipment that enhance your Apple's performance and capabilities. For example, a disk drive enhances your Apple's ability to store information. A memory expansion card gives the Apple more working memory (*RAM*). With a printer, you can make printouts of information—data from your data base, a home budget from a worksheet, a term paper, or listings from a program.

This chapter shows you how to evaluate your needs for such extra devices. We'll discuss general categories of equipment and give you some tips on good types and brands to buy.

EVALUATING YOUR NEEDS

You can spend a lot of money very quickly in the world of personal computers. Though a few users are wealthy and can afford every new geegaw that comes along, most of us need to exercise a bit of restraint when walking through the doors of our dealer's store. (Thumbing through computer magazines and going to computer fairs also present definite temptations.)

Let's start with a general rule: *Don't buy anything unless you've got a specific use for it.*

With computers, you don't simply need a peripheral. You need a peripheral to perform a specific task. For example, if you're like most Apple owners, you've probably started with just one disk drive. Why would you want a second drive?

One good reason would be that you had determined that a particular piece of software requires two disks. But why choose the software package that demands two drives? Because it does all the things you want a particular piece of software to do and does them in a way that you can understand and work with easily.

A second rule applies mainly to business uses: *Will this device pay for itself (and if so, how long will that take)?*

For example, a printer is a must for business computing. But if you don't send and receive information back and forth from another computer, you don't need a device called a modem.

Finally, if you don't have an unlimited budget, just remember that every time you buy one thing, you have denied yourself something else. So ask yourself questions like "What will be more useful to me NOW, a color monitor or a second disk drive?"

BUYING PERIPHERALS

When buying a peripheral device, you have several things to consider:

- Does this peripheral work with my particular Apple model?
- Who made it? (Is Apple always better?)
- Where do I look for the best buy?

Let's look at these questions in order.

Interfacing: Does It Work with My Computer?

Some peripherals are very easy to buy, like disk drives. You buy an Apple Disk II with a Disk II controller card, hook the two together, pop the card into slot 6, and you're up and running (as we showed you in Chapter 2, "Getting Started"). Likewise, a joystick or a game paddle only requires that you plug it in.

In the world of computers, the connecting of one device to another is called *interfacing*. A good interface lets devices communicate data without altering the data in any way. A bad interface may not work at all; for example, the printer simply won't operate. A bad interface may also send information incorrectly to a peripheral; in this case, the printer may turn your term paper into alphabet salad.

The two ways to avoid a catastrophe are (1) befriend a highly competent engineer or (2) find a reliable dealer. Let's assume you choose the second alternative. Before buying a peripheral, ask your dealer to let you see the peripheral run with your configuration.

A *configuration* is the particular combination of elements that make up your computer system. For example, the two systems below are two different configurations.

Configuration #1	**Configuration #2**
Apple II Plus	Apple IIe
Apple Super Serial card	Apple Parallel card
NEC Spinwriter printer	Epson printer

Thus, if you ask to see your configuration, you want to see your model of Apple (a II Plus or a IIe) with the interface card and printer combination you intend to buy. (NOTE: Don't let them install a different card. The card is vital.)

If you want to be extra cautious, you may also ask to run your primary software package(s) to make sure that the software works with this hardware combination. If everything runs smoothly, go ahead and buy. If not, try a different combination of card and printer.

As a final word of caution, stay away from oddball buys, like rebuilt office printers. They may have been great in an office environment, but unless you know what you're doing, they can present the new user with a heartbreaking experience.

Who Makes It?

As an Apple computer owner, you have probably discovered that the Apple company offers a lot of peripheral equipment—from game paddles to printers. Are these better than another company's products?

Not necessarily. Apple has generally provided good quality equipment to go with its computers, but the major benefit in buying Apple equipment is that you know it will work with your computer. Further, your Apple dealer is sworn to provide support for it.

However, Apple's major business is computers, not peripherals. This is why they buy a lot of their peripherals from other companies. Other companies can concentrate on making better equipment (or software). For this reason, the major question for you as a buyer should not be, "Is it from Apple?", but rather, "How does it suit me?"

Forget that the Apple logo is on a piece of equipment and judge it impartially against your needs and its competition. Here are some questions you should ask about any product:

- Does it have all the features I want?
- Are extra features important to me?
- How does it compare to the competition on a strictly price basis?
- Does the manufacturer have a reputation for quality?
- What kind of guarantee does the product carry?
- And most importantly, what kind of support can I expect?

What is support? *Support* includes everything from repair and supplying factory upgrades to general assistance and advice. It's very important to consider when you go shopping.

ONE WORD OF CAUTION: whether you're buying software or hardware, resist the temptation to buy the first release of anything. Though most companies test their products as thoroughly as possible, the first buyers still constitute the biggest test. They detect the problems (often called *bugs*) that the second-release and third-release purchasers don't have to deal with.

Shopping for the Best Buy

Anytime you go shopping for computer products—whether hardware or software—you run into a particular pair of trade-offs: support vs. price.

The best prices are available through mail order houses. However, support for such purchases is zero. This is pretty much okay if you're an experienced user and in no rush. We say "pretty much" because even a good mail order house can ship a "bad apple." After all, they don't open boxes and test each product before shipping it. If you get a faulty product, you'll have to repack it, ship it back to the mail order house, and wait a few more weeks.

The other thing that mail order can't do is let you try a product before you buy it. Though most will swap for a faulty product, many will charge you a restocking fee for returning something you just didn't like.

In between the helpful dealer and the mail order house is the *discount dealer.* He's local, he has good prices, and he'll let you try out products before buying, but his answer to problems is, "Ship it back to Apple" (or whoever made it). As in all things, shop around but let the buyer beware.

CHOOSING PERIPHERALS

This section looks at major categories of peripherals:

- Cassette drives
- Disk drives
- Controllers
- Monitors
- Printers
- Modems
- Memory expansion cards

We'll talk about uses, costs, and recommendations. (NOTE: The Apple is an extremely popular computer, and a lot of people are building

good products for it. Every month, new peripherals appear on the market. It was a great temptation for us to include everything we saw. That would've been great, but we weren't planning a 1000-page book!)

The products recommended here are of good quality and value, but they aren't the only ones available. For that reason, you may want to treat this section as a list of guidelines. Where we discuss specific products, order of listing is generally alphabetical and does not reflect order of preference.

Cassette Drives

If you plan to use a cassette recorder for storing programs and data, ask your dealer to recommend a model that will work well with your Apple. Usually a simple unit in the $40 to $60 range is better than a more expensive (and more sensitive) player. We do recommend that you buy good quality tape, preferably the type that is certified for computer use. You will also need a special cassette connector cord (available from your dealer).

Although a cassette recorder is much cheaper than a disk drive, it has three negative features:

- A cassette recorder transfers data much more slowly than a disk drive.
- A cassette recorder is not as dependable as a disk drive for recording data and programs.
- Very little serious software is available on cassette anymore; the disk drives have taken over.

Some high-speed cassette units are available, but their speed is still not that of a floppy disk drive. You can use a cassette recorder to record and store your own data and programs; however, you won't be able to share or buy much software, because very little software for the Apple is distributed on cassettes.

Disk Drives

The term *disk drive* refers both to floppy disk drives and to hard disks. Both are available for Apple computers.

The floppy disk and the Disk II drive that takes the disk have become the standard for data storage and distribution. That is because they make data access quick, efficient, and reliable. Software publishers distribute all serious programs (and most games) on disk. With one or more disk drives, you can copy data or programs you've written yourself and exchange them with other Apple users.

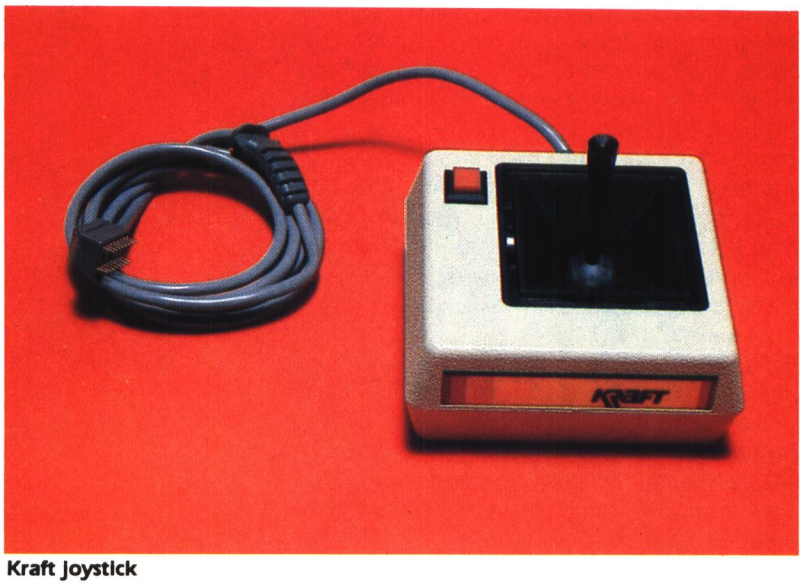
Though several manufacturers make compatible drives for Apple computers, Apple's own drives have proven to be highly reliable and durable. We would certainly recommend talking to your dealer or someone else who knows this equipment before purchasing another brand. If you don't have a Disk II, make it your first priority purchase. A Disk II with controller card lists for about $550; a second drive (without the card) goes for about $400.

A NOTE ON FLOPPY DISKS: buy good quality ones. Cheap disks can result in hours of work lost because the medium breaks down. You can count on Verbatim, Dysan, Memorex, 3M, and other major names. List prices run about $5 and up, though sometimes you can get them on sale for a lot less.

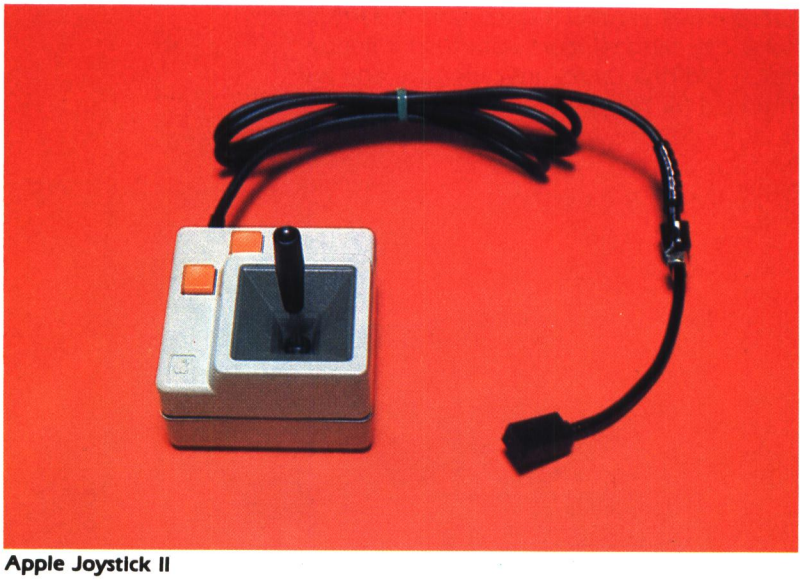
Several manufacturers offer hard disk drives. These drives are much faster, and a hard disk holds a great deal more data than a floppy disk. Hard disk drives are expensive and are intended for heavy-duty business uses.

Disk II drive with controller card

Corvus Systems hard drive



Kraft joystick



Apple Joystick II

Kraft paddles

One of the first manufacturers in the field was Corvus Systems. Their drives are available in 6, 12, and 18 megabyte capacities. (A *megabyte* is over one million characters.)

Controllers: Joysticks, Paddles, and Trackballs

The main purpose of controllers is to play action computer games—arcade-type games. You may find an occasional business application that lets you draw a graph with a joystick or a paddle, however. All of the products listed here are loaded with features.

Apple itself sells the Joystick II (about $60) and Hand Controller II (about $35). Other controller manufacturers include Kraft and TG Products. Kraft offers a dual mode action joystick (about $65) and paddles (about $50 per pair). TG Products sells a joystick (about $60), paddles (about $40), and a trackball (about $65)—a ball you roll with your hand to control on-screen movement.

Monitors

The purpose of a monitor is to give you a crisp, clear view of your computer's output—whether that output is a business letter, a game, or a pie chart. Monitors have a cleaner, more stable picture than ordinary TVs. The differences become even more evident when you look at a color monitor. Colors are sharper and images are better defined.

You can choose from two types of monitors: two-color (white on black or green on black) or full color. For black-and-white, try the Sanyo (either 9" or 12"). For green phosphor on a black screen, take a look at Apple's own Monitor III (about $250). The Amdek V-300 green phosphor monitor sells for about $200. Both have controls for contrast and brightness.

For color, start with the Amdek Color I (about $400) with built-in audio and front panel controls. For truly amazing color, try the Amdek Color II 13" RBG (for red, blue, green) monitor (about $800) with a Digital Video Multiplexor (DVM) card to deliver the signal. The card costs an additional $200.

Printers and Plotters (and Interface Cards)

Unless you plan only to play games, you'll probably need a printer. Whether it's program listings, mailing labels, a business letter, or your home budget, you'll usually end up wanting *hard copy* (as printouts are sometimes called). You can choose from several good quality, low-price units.

First a word about *interface cards.* As we discussed earlier in this chapter, printers and computers don't talk to each other without an intermediary—a translator. That is the job of the interface card.

To make things just a tad more hectic, there are essentially two ways that peripherals send or receive information—in *parallel* form or *serial* form. Without going into the details behind that statement, you should be aware that peripherals (including printers) are either parallel or serial. You must get a *serial card* for serial devices and a *parallel card* for parallel devices. As a rule of thumb, parallel devices are faster than serial ones.

Recent developments have also produced the *buffer card.* In computer talk, a buffer is a holding area in memory, where you can store data until the computer (or printer) processes it. These cards carry their own memory, so they can handle a lot of data.

For example, the Microbuffer II lets you get back to the keyboard while it takes over a printing job. The card with 16K of memory costs about $260. Such cards are expandable up to a total of 256K and are available in either parallel or serial models.

(NOTE: *K* stands for *kilobyte*, meaning a thousand bytes—actually 1024 bytes. For practical purposes, think of a byte as one character like A or & or 3. We'll look at memory in more detail in the section "Memory Expansion.")

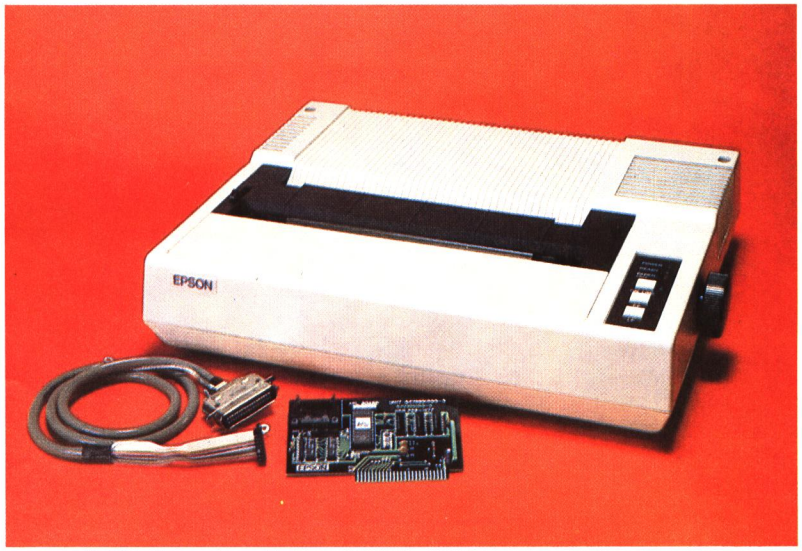
Here are some of the higher-quality printers available. Less expensive printers for the Apple are also available. Check with your dealer.

The Apple DMP (Dot Matrix Printer) costs about $700 and takes either fan-fold paper (computer paper) or single sheets. It's fast—160 *cps* (characters per second)—and has an easy-to-change cartridge ribbon. It interfaces through either an Apple parallel card or an Epson parallel card. Both cards cost about $150. If you intend to print a lot of graphics, consider the Grappler Plus interface card (about $200).

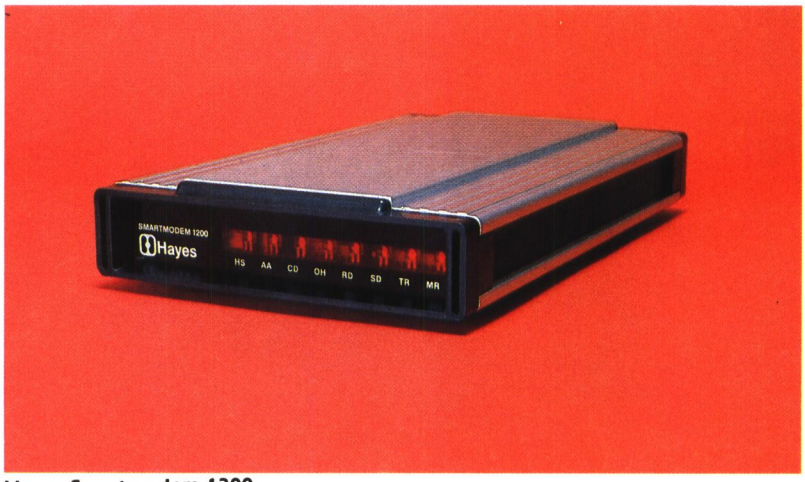
The Epson FX-80 (about $750) is a fast, reliable dot-matrix printer that produces a crisp, sharp image. Both of these units find a tough competitor in the Okidata 92. Like the Apple DMP, it prints at 160 characters per second. It also boasts a *correspondence mode* that can be mistaken for the work of a letter-quality printer.

Apple Monitor III

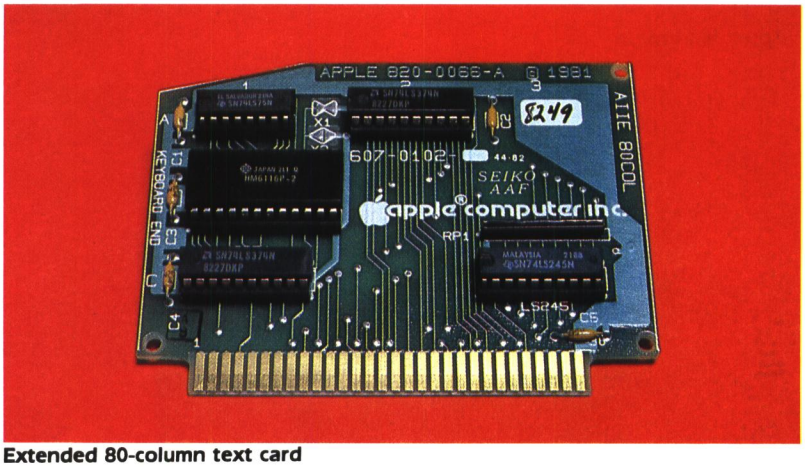
Amdek Color I Monitor



Epson FX-80 printer, interface card, and parallel cable



Hayes Smartmodem 1200



Extended 80-column text card

The NEC Spinwriter 7710 (about $3080) is probably the best letter-quality printer available for the money. It has earned a reputation for high quality and durability. It connects through the Apple Super Serial card (about $200). A *forms tractor* to handle fan-fold paper costs about $250 more.

The Sweet Pea plotter (about $700) produces good quality graphics at a reasonable price. It takes a parallel interface card.

Modems

Computers need devices called *modems* (for MOdulate/DEModulate) to transmit data over telephone lines. A modem at the sending computer translates its computer's data into a form that ordinary telephone lines can transmit. A modem on the receiving end retranslates the information into a form its computer can understand. Most modems can perform both forms of translation (from a computer form to a telephone form and back again).

Modems come in handy for a variety of activities. These include hobbyist bulletin boards, public information services (like The Source), getting economic or other data, sharing files with friends or business associates, and using electronic mail. (Chapter 6, "Your Computer's Network," discusses networks, bulletin boards, and other services.)

The most popular modems are those manufactured by Hayes: the Micromodem II (about $380), the Smartmodem 300 (about $290), and the Smartmodem 1200 (about $700). The Micromodem is a reliable, proven instrument that fits most beginner's needs. The Smartmodem 1200 is programmable and has a higher data transmission rate (which means that it works faster). It even includes a small speaker so you can hear what's happening on the telephone lines. Both Smartmodems require an Apple Super Serial card (about $200).

If you live in an area that has not converted to touch-type telephone dialing or if you need voice contact to get a telephone line or to get to the computer you want to send data to, ask your dealer about an *acoustic coupler*. To send data through a coupler, you must put your telephone handset earpiece and mouthpiece directly into two special cups on the coupler. Acoustic couplers do not provide the degree of purity that a direct-connect modem does.

Memory Expansion

The kind of memory we're talking about here is *RAM (Random Access Memory)*. RAM constitutes the actual work space that your computer has available. When you load a program or a file into your computer, you actually load it into RAM. We measure RAM in *kilobytes* or *K*. The Apple II Plus comes with 48K of RAM, and the Apple IIe comes with 64K.

Do you need more memory? That depends on the size of the programs and files you intend to work with. For example, if you intend to use large programs (those demanding at least 48K) and you have large files to work on (like a big data base or worksheet), you will probably want to expand the amount of available RAM.

FOR THE APPLE II PLUS, a number of good expansion cards are available—including Apple's own 16K card (about $200) and the Microsoft 16K card (about $100). IF YOU HAVE AN APPLE IIe, buying the Extended 80-Column Text Card will get you your 80-column display and an additional 64K of RAM (for a grand total of 128K).

CHAPTER 5 SOFTWARE

This chapter covers the basics of software—what it is, how to use it, how to choose it, and how to buy it. We also make some recommendations concerning some of the better *packages* (software is often said to come in packages or pieces) you can buy.

PREPACKAGED SOFTWARE

A piece of software is simply a program, a set of instructions for the computer to follow. It is like a food recipe because it is a series of sequential steps that are followed to yield the desired product. When the Apple executes a set of instructions, you may see the latest video game on your screen, a mailing list, a spreadsheet or any number of things (depending on which package you buy). Software can make all those things happen. As the Apple and other personal computers have become more popular, prepackaged software has improved—in its variety, power, and user-friendliness.

Variety

For example, in 1979, only one electronic spreadsheet existed. Now the number of such programs edges away from the half-dozen mark.

Power

With time and demand from customers, the capability of most software packages has increased. You can see this increase in such things as the number of new commands a particular program uses.

User-Friendliness

In the late 1970s, a lot of software was written by programmers for programmers. The attitude in the industry was generally one of "Who needs civilians?" The end of this software macho attitude is clearly in sight. Now software programs are being written so that they are simple for everyone to understand and use.

What's using a piece of prepackaged software like? Pretty simple, really. First you load it into your Apple from a floppy disk or a cassette tape. Disks and tapes house magnetically recorded programs for repeated playback (like tapes and LPs hold recorded music).

The process of loading from a disk may be as simple as putting the disk in the drive and turning the Apple on. Or you may have to type a command like RUN MARATHON, where MARATHON is the name of the program.

After some grinding and whirring, the program makes an appearance on your screen. You might see a fancy, animated graphic title page, a blank screen waiting for you to enter text or figures, or a menu of choices.

Menus are an increasingly popular way to prompt the user. Menus are lists. You choose one thing (a file or an activity) from the list on the screen and the computer executes that choice.

DO-IT-YOURSELF SOFTWARE: PROGRAMMING

You don't have to learn to program to enjoy and benefit from your Apple, because you can buy software that will do almost anything you want. However, you can learn any of the computer languages that run on the Apple and then write your own programs. It's not difficult, and it's a great way to get a better feel for how your computer works—whether you write games, business programs, or scientific software.

Programming can be enjoyable and even profitable. You can buy (or find at your library) books to help you learn to program. You can also check with local colleges to see what beginner's programming courses are being offered.

Your Apple comes with the Applesoft programming language, a version of BASIC, built in. Applesoft is a fairly standard version of floating point BASIC, with plenty of Apple's own graphics commands included. *Floating point* means that you can do decimal calculations in your programs; you can write financial and scientific programs. Applesoft can work with up to 16 places after the decimal point.

USING SOFTWARE

Prepackaged software most frequently comes on floppy disks. You buy the program on a disk (whether a financial analysis program or a chess game) and load it into your computer from that disk. When you write your own programs, you save them on a disk and retrieve them from the disk. You also store data on and retrieve it from a disk. For the sake of simplicity, this chapter won't discuss cassettes as a computer storage medium (since most Apple owners use diskettes rather than cassettes).

Loading and Running Software

You load and run individual programs in different ways. For example, most professionally

packaged, user-oriented programs (word processing, personal finance spreadsheets, games, etc.) require only that you put the program disk in drive 1 before turning on the computer. The start-up routine automatically loads the program into RAM memory and begins executing it.

Your own programs (or those your friends have written) probably require you to put the disk in the drive of the computer and type RUN followed by the program's name. RUN both loads the program and begins executing it.

Some programs are called *utilities*. They act directly on the computer or disk. With these, you must sometimes type LOAD followed by the program's name. Then you RUN a different program (on another disk, in a second disk drive) that takes advantage of the other program's presence.

The best advice for loading and running software is to follow the instructions that came with your program—whether they came in a nice binder, on a single sheet of paper, or from a friend.

Caring for Your Software

Your software is as vulnerable as the medium on which it resides. If you scratch the disk with a knife, you scratch your software. If you hold a magnet to your disk, the magnetic field will alter whatever is on the disk. Therefore, be sure to follow the rules for disk care given in Chapter 2, "Getting Started." For important programs, consider putting an aluminum tab (they come with blank disks) over the disk's write-protect notch. This will protect your programs from accidental erasure and from being overwritten by another program.

MAKING BACKUP COPIES

Accidents do happen, even to the most careful people. Therefore, you should make copies of your purchased software whenever possible. NOTE: Professional programmers often protect their software from duplication with elaborate protection schemes that defy copying by normal means such as your Apple COPY program. In such cases, you can do nothing but be very careful with the program disk. Some software companies will let you buy a backup diskette for a nominal fee—a good idea.

You should also make backup copies of the programs that you write and the data that you create using other programs. It's no fun to type an entire mailing list into your computer only to lose your data when somebody mistakes the disk for a coaster!

Saving Data

As you type data into RAM memory, do a backup operation by occasionally (every 10 to 15 minutes or so) copying the current data to a disk. That way, if the computer undergoes power loss when your area suffers a power failure or someone simply trips on the cord, your work is safe on the disk.

You can make a second copy of that data as you go by removing your current data disk from the drive and slipping a second disk in. Then use whatever means the program has to copy your current data to the new disk. When copying is complete, switch the disk again to continue adding data. In the case of extremely valuable data, some people make third and fourth copies and store these at some location away from the computer—insurance against theft, fire, or other destruction.

Copying a Disk

You can copy the contents of an entire disk, whether you have just one drive or you have two or more. To do this, place your System Master disk in Drive 1. Type

```
RUN COPY
```

and press RETURN. The program will prompt you to REMOVE DISKETTE, meaning the System Master disk. After you have removed the System Master disk, the computer will ask you to specify *original* slot and drive. *Original* means the disk you want to copy. *Slot* is the slot where you have your controller card (usually Slot 6, the default slot). Likewise, Drive 1 is the default drive. (*Default* simply means that if you don't tell the computer otherwise, it will assume that those are the settings you want.) If you want to keep the Slot 6, Drive 1 setting as where the original disk will be, simply press RETURN when the computer asks you these questions. Otherwise, type the number of the slot and drive where you plan to put the original.

Follow a similar pattern for the *duplicate* slot and drive. Normally, you will copy from Slot 6, Drive 1 to Slot 6, Drive 2. But if you are using only one drive, you must set both the original and duplicate disks to be in Slot 6, Drive 1.

The computer will then prompt you to insert disks and will report its activities during the copying process. If you use a single drive, the computer will ask you to swap your original

and duplicate disks throughout the copying process. (This is called "making several passes.") If you have two drives, copying is a one-step process. When copying is completed, the computer will ask DO YOU WISH TO MAKE ANOTHER COPY? Type

Y

(and press RETURN) if you want to make another copy. Type

N

(and press RETURN) if you don't.

CHOOSING SOFTWARE

It's okay to buy a game on the spur of the moment. But anyone who tries to buy more serious, task-oriented software on that basis is begging for trouble. Instead of guessing, sit down and think carefully about your needs.

Ask yourself the question, "What do I want my Apple to do for me?" The answer should lead you to your software. If you want to catalog your record collection, look for a data base. If you want to do the family budget, look for a home finance package. Once you figure out your goal, you'll have plenty of prepackaged software from which to choose.

Always remember this rule of thumb when buying software: figure, as closely as you can, how much computing power you want a particular piece of software to have. For example, if all you want to do is a Christmas list and a record catalog, don't buy a data base with the power to keep a complete inventory for a small business. Why not?

First, the business-oriented package will probably cost a lot more. Second, to handle all the needs of a business with thousands of numbers, parts, descriptions, etc., such a data base will have more features and commands than you need to learn. You'll probably spend more time figuring out how to use the software than actually using it productively.

Don't commit the opposite error, either, by buying less than you need. If you try to run a business on a small, home-oriented data base, you will find yourself continually frustrated by its lack of capacity, speed, and features.

Software Sources

There are four main sources of software for your Apple computer:

- Apple Computer, Inc.
- Software publishing houses
- Magazines and books
- Users' groups and friends

You can get software from the first three sources either through computer and software stores or by mail order. What we said earlier still goes: unless you know what you're doing, depend on your dealer (and even at that, think about it carefully).

The fact that Apple makes a software program does not guarantee perfection. The truth of the matter is, however, that Apple has produced some very good software, including word processing software, games, and utilities. The best thing to do is examine whatever products interest you at your dealer's store and then decide what suits you best.

Magazines and books can be a cheap source of software. Magazines like *Nibble* publish games, record management programs, interface software, and more. All you have to do with those programs is type the program listing into your computer.

You can buy complete books of games, business programs, scientific software, or almost anything you want. Just type them in and they're yours! Though most of these programs are written in Applesoft, some are written in Apple's U.C.S.D. Pascal, or even 6502 assembly language. Make sure your Apple has the particular language the programs are written in. Don't buy Pascal games if you don't have Pascal. You're generally safe if the book says the program will run on your Apple without modification. But be very careful of programs in BASIC written for other computers.

Software available from users' groups may be programs written by group members or other public domain software.

Public domain programs are those that are not copyrighted; they are available to the public without obtaining permission from the writer of the program. Anyone can use, copy, sell, or otherwise take advantage of such programs. Public domain software is often free (like the programs printed in books and magazines). Public domain software that is already on cassette or diskette is usually available for a small charge (for the cost of copying the program on cassette or diskette), either through a users' group or from a commercial company that has copied and packaged it. This software is usually inexpensive—perhaps $5 per program.

BUYING SOFTWARE

Here are five questions for you to ask when selecting software:

- Is the software written for the Apple IIe or II Plus? It may be a great program for a TRS-80, but unless it's written for your computer, you may not be able to run it.
- Does your computer have enough RAM memory to run the program? Even if you have the required amount, would you do better to have additional memory for handling data?
- Does the program have a required language (and does your Apple have that language)? If the language requirement is Applesoft, you're okay; if not, you'll need an additional disk with that language on it (and, in some cases, a second drive so that you can run both disks at the same time).
- Does the program require any peripherals that you don't have? Sometimes a program doesn't require a second drive, but you'll make your life miserable trying to get by with just one.
- How much does it cost? And how does this cost compare with similar packages? What about other costs—like peripherals? For example, one word processing program may require an 80-column card and another may not.

SOFTWARE RECOMMENDATIONS

This section gives thumbnail sketches of some of the best software packages available at this time in various categories. A catalog of software written for Apple computers fills very thick books. These recommendations are simply a glimpse of many good products.

Recommended Games and Entertainment Programs

Many arcade-style games, as well as adapted board games and sports, are available for Apple computers. None of the programs below require more than 48K or more than one drive.

Adventure from Microsoft and **Zork** from Infocom are classic text-oriented adventure games.

Choplifter from Broderbund makes you the pilot in an armed helicopter rescue mission. Joystick required.

Rasterblaster by Bill Budge is the most realistic pinball game available today. Paddles required. Want to build your own? Budge also sells the **Pinball Construction Set**.

Sargon II from Hayden Software is one of the toughest chess opponents you'll probably ever come up against.

Temple of Aphshai from Epyx/Automated Simulations gives you high-resolution pictures of your hero's adventures as he searches and fights.

Wizardry from Sir-tech is an adventure game with text and graphics. Characters grow in their abilities as they penetrate the 3–D maze.

See your dealer for checkers, poker, backgammon, crossword puzzles, and war games, plus most arcade games.

Recommended Educational/ Instructional Programs

For young children, fun drill-style games teach basic skills. All of the educational programs listed here require only one drive and 48K.

Counterpoint Software produces **Nine Learning Games** and **Music Games** for preschoolers.

The Learning Company has a number of fine products for preschool and early elementary school children, including **Gertrude's Secrets** and **Rocky's Boots**. *Gertrude's Secrets* teaches color and shape recognition through puzzles. *Rocky's Boots* gets kids into logical thinking and computer workings through music and sound effects.

Micro Mother Goose from Software Productions is also for preschool and early elementary school children. The program goes through nine rhymes with color and music. It includes books, a poster, and stickers.

For school-age children, you can find software that teaches spelling, vocabulary, fractions, algebra, and programming. Edu-ware has a number of programs in this area, including **Algebra**, **Fractions**, and **Spelling Bee Games**.

Harcourt Brace Jovanovich's **Computer SAT** helps high-school students get ready to take the SAT college admission test. It creates a step-by-step preparation process and comes with a 470-page textbook and user's manual.

Typing Tutor from Microsoft teaches touch typing through exercises.

Recommended Word Processing Programs

Word processing software allows you to type letters and reports, easily correcting errors and making changes before you print them. All the word processing programs listed below take 48K and one drive, unless otherwise noted.

Pie Writer from Hayden takes two disk drives. Master disks can be copied, so you can put this software on a hard disk for multiple users to share. You can use 40- or 80-column screens.

Apple Writer II from Apple Computer, Inc., has an Apple II Plus version and an Apple IIe version. The Apple IIe version takes full advantage of the computer's new features.

Bank Street Writer from Broderbund is the family word processor that's easy to learn and fulfills most people's needs for letters and school papers.

Zardax from Computer Solutions combines simplicity of use with powerful word processing features. It also has an extra modem program that makes sending text easy.

See your dealer for spelling correction programs that work well with the word processing program you choose.

Recommended Home Finance Programs

Home finance programs help you manage your money effectively. All the financial packages listed here take 48K and one drive, unless otherwise noted.

Dow Jones Market Analyzer from Dow Jones & Co. lets the serious investor input data by keyboard or directly from a modem. The software updates your securities portfolio; it also analyzes the portfolio and draws graphs. Two drives preferred.

Home Accountant from Continental Software can keep track of 100 budget categories, five checking accounts, and all of your credit cards. It also does graphs and trend line analyses.

The Incredible Jack from Business Solutions gives you four business programs in one. Jack's trades include word processing, a data base, a spreadsheet, and mailing label print and sort.

Multiplan from Microsoft is a powerful spreadsheet for doing everything from your own checkbook to budgets and market forecasts at work. The program provides excellent on-line helps, and it takes advantage of the Apple IIe's 80 columns (if you have the 80-column card) and additional memory.

Tax Manager from Micro Lab organizes your data, reminds you to take all deductions, selects the method of computation that saves you the most money, and more. Extended warranty available.

Tax Mini-Miser from Sunrise Software computes six strategies for one year or one strategy for six years. It includes a module for California state taxes.

VisiCalc from VisiCorp was the first spreadsheet. It is still as powerful and useful as many newer worksheets. It is adaptable to various businesses and business problems. Compare it to *Multiplan* before you buy.

Recommended Data Base Programs

A *data base* is a program that stores data (like an address list) in a special order. It then lets you manipulate data into different orders and pull out particular elements for whatever use you have in mind. For example, a data base with your mailing list lets you print out all the names that begin with the letters H through M and/or all residents in the zip code beginning with the numbers 95—like 95101.

We recommend two drives for the data base software listed here, even though not all of these programs require two. In general, data bases are easier to work with when you have two disk drives.

PFS from Software Publishing Corporation is easy for beginners to use, because it offers menus and uses plain English commands. It has good forms and reports. It only allows one file (or data base) to a disk, however. *PFS* also has separate *Report* and *Graph* programs that can use its data. Requires Pascal.

Quick-File from Apple Computer, Inc., is easy to use, but limited in its formatting and calculation abilities. Memory is limited to that in your computer (not to the disk).

VisiDex from VisiCorp is a free-form data base program. You don't have to create any forms before using it. Just type in the data you want to save and assign at least one keyword.

If you're looking at data bases for business purposes, you'll want bigger, more powerful software, such as Stoneware's *DB Master*, VisiCorp's *VisiFile*, or *dBase II* from Ashton-Tate, which requires CP/M, 80-column display, and some experience with programming and data bases.

COMPUTER LANGUAGES

Just as human languages allow people to communicate with each other, computer languages allow people to communicate with their computers. Some languages do some things better than other languages. For example, COBOL is a business language, and FORTRAN is a scientific language. BASIC and Pascal, though different from one another, are general purpose languages. Pilot and Logo are educational languages.

Applesoft Compiler from Microsoft is Applesoft, but it is designed to run much faster than regular Applesoft.

Apple FORTRAN requires 64K, Pascal, and two drives.

COBOL from C.I.S. meets the ANSI 1974 standard. Requires 64K and two drives.

GraForth from Insoft is a version of FORTH designed to do graphics—color, plotting, text, images, 3-D, etc.

FORTH from Cap'n Software follows the FIG (FORTH Interest Group) model with special enhancements for the Apple. Needs only one drive.

Apple Logo is customized to work with turtle graphics. It teaches analytical thinking. Books are aimed at kids.

Microsoft BASIC is the industry standard for BASIC. It is more powerful than Applesoft and has an excellent editor. Microsoft includes CP/M and BASIC with the Z-80 Softcard.

Apple PILOT and **Super PILOT** are other educational computer languages.

Apple Pascal is a version of the popular U.C.S.D. Pascal. It is an excellent language for anyone from budding computer scientists to professional programmers. Needs 64K; works best with two drives.

Miscellaneous Software

Whatever task you want to accomplish, whatever game you want to play, or whatever study you want to engage in, someone has written software for it. For example, packages exist for all areas of accounting (including professional packages), real estate, and taxes. There are flight simulators, graphics packages, terminal emulators, astrologers, and agricultural packages (*HerdStar*).

You can also select from a huge group of programs called *utilities*. These programs create type faces, put your CATALOG in alphabetical order, give you friendlier error messages, enhance graphics routines, sharpen up your BASIC listings, etc.

As a beginning computer user, you probably don't need utilities. However, when that time comes, start with Apple's own *DOS Tool Kit*. It includes an assembler (for writing machine language programs) and requires one drive.

If you become a utilities nut, you'll probably want to get in touch with Beagle Bros. for goodies like their *DOS Boss* or *Utility City*.

CHAPTER 6 YOUR COMPUTER'S NETWORK

Can computing be a social activity? This chapter explores the many advantages of getting together with other Apple owners (electronically or in person). We'll also show you some resources that you can tap to broaden and deepen your knowledge and enjoyment of your computer.

LOCAL USERS' GROUPS AND CLUBS

Why join a computer club? Club members share information and enjoy the company of people with similar interests. That shared information can be in the form of programs, tips on how to make something run better and faster, or advice on how to cure a problem. You will also find club members to be a storehouse of information on which products (and dealers) are good, which are poor, and why.

Depending on the size of your community, you may find general-purpose computer users' clubs, but no Apple users' clubs. Such general computer users' groups are worth joining; besides getting a wider view of the computing world, chances are good that you'll also meet other Apple users.

Beyond general-purpose users' groups, a number of special-interest Apple users' groups have come on the scene. Farmers, lawyers, doctors, and other professionals are discovering the joys of sharing information. (*Apple* magazine, Vol. 2., No. 2, has an excellent article on these special-interest users' groups.)

To give you a start, this chapter includes a list of Apple users' groups, compliments of the International Apple Core (a worldwide federation of Apple users' groups). New clubs seem to appear every month, however, and club addresses and phone numbers may change. For the most current information on users' groups in your area, write the International Apple Core, 908 George Street, Santa Clara, CA 95050; or call them at (408) 727-7652. You might also check with computer stores in your area.

ALABAMA

Apple Corps of Birmingham	P.O. Box 3321-A	Birmingham, AL 35255	205/942-7006
Newton's Tree Apple User Group	3714 Lakewood Circle	Huntsville, AL 35811	205/852-0537
West Alabama Users	1009 W. Jackson St.	Demopolis, AL 36732	205/289-0439
Quad Cities Apple Byters	129 E. Oak Hill Drive	Florence, AL 35630	unavailable

ARIZONA

Apple C.A.R.T.	P.O. Box 2361	Page, AZ 86040	602/645-2141
Mountain View Apple Users Group	1923 Violas Drive	Sierra Vista, AZ 85635	602/458-2332
Tucson Apple Users Group	Pima College, 2202 W. Anklam Rd.	Tucson, AZ 85709	602/884-6000
Adam-II	P.O. Box 34056	Phoenix, AZ 85206	602/991-8393
Gila Valley Apple Growers Association	P.O. Box 1077	Thatcher, AZ 85552	602/428-4073

ARKANSAS

Little Rock Apple Addicts	P.O. Box 55215, Hillcrest Station	Little Rock, AR 72205	501/374-1770

CALIFORNIA

HFEA Apple Computer Users Group	417 Meadowbrook Place	Anaheim, CA 92801	714/776-6384
Apple Bug	4509 Millbrook Way	Bakersfield, CA 93309	805/831-7723
Apple Tree	781 W. Hamilton Ave.	Campbell, CA 95008	unavailable
Placer County Educational Film Center	1228 High Street	Auburn, CA 95603	unavailable
LERC Aces	P.O. Box 551	Burbank, CA 91520	213/847-3013
Tri-Network Apple Users Group	8041 Sadring	Canoga Park, CA 91304	213/992-4993
Aerospace Apple User Group	28901 Lotusgarden Dr.	Canyon Country, CA 91351	805/251-1516

Abacus User Group	2850 Jennifer Drive	Castro Valley, CA 94546	415/538-2431
Apple Peelers	1650 Pine, Apt. N-1	Concord, CA 94520	unavailable
Apple/Valley Computer Club	4900 Newcastle	Encino, CA 91316	213/345-8507
North County Computer Club	274 Morro Hills Rd.	Fallbrook, CA 92028	714/728-7809
North Orange Computer Club	11121 Binedale	Garden Grove, CA 92641	714/539-1829
Hi Desert Apple Computer Club	P.O. Box 2702	Lancaster, CA 93539	805/277-5584
L.A. Apple Users Group	9513 Hindry Pl.	Los Angeles, CA 90045	213/649-1428
S.P.A.C.E.	P.O. Box 7495	Menlo Park, CA 94025	unavailable
Orange Apple Computer Club	23767 Calle Azorin	Mission Viejo, CA 92692	714/770-8843
Hesea Apple Computer Club	21111 Dolores, #146	Carson, CA 90745	213/549-9664
Apple For The Teacher	2331 Rainbow Ave.	Sacramento, CA 95821	unavailable
East Valley Apple Club	2267 Pine Valley Ave.	Ontario, CA 91761	714/947-0270
Apple Sac	P.O. Box 874	Fair Oaks, CA 95628	916/671-0230
McDonnell Douglas Astro Apple Group	16681 Mt. Darwin Circle	Fountain Valley, CA 92708	714/896-4717
Ridgecrest Apple Group	Star Rt. Box 109E	Inyokern, CA 93527	unavailable
Original Apple Core	P.O. Box 91182	Los Angeles, CA 90009	213/676-3531
UCLA Apple Users Group	7533 Lexington Ave., #301	Los Angeles, CA 90009	unavailable
JPL Computer/Apple Club	24575 Spartan St.	Mission Viejo, CA 92691	213/354-6119
CSUN Apple Users	Computer Science Dept., 1811 Nordhoff St.	Northridge, CA 91330	213/885-2799
TRWAUG	One Space Park, 92/1318	Redondo Beach, CA 90278	213/535-4521
Apple Corps of San Diego	P.O. Box 23128	San Diego, CA 92123	714/571-2981
San Francisco Apple Core	1515 Sloat Blvd.	San Francisco, CA 94132	415/556-2342
Santa Barbara Apple Users Group	2007 State St.	Santa Barbara, CA 93105	805/963-1325
Santa Cruz Apple Group	P.O. Box 1428	Santa Cruz, CA 95061	408/335-8750
Apple-SMUG	34 Villanova Ct.	Seaside, CA 93955	408/394-2648
South Bay Apples Computer Club	P.O. Box 5201	Torrance, CA 90510	213/539-1200
S.M.A.L. Apple	1114 Cypress	Vandenberg AFB, CA 93437	805/925-6675
Apple Creek	1815 Ygnacio Valley Rd.	Walnut Creek, CA 94598	415/935-6502
Apple Jacks	P.O. Box 2022-A	San Bernardino, CA 92406	unavailable
San Diego Medical Apple Users Group	7920 Frost St., Suite 405	San Diego, CA 92123	714/279-5253
Blossom Valley Apple Club	5821 Cottle Road	San Jose, CA 95123	408/578-2815
Apple P.I.E.	337 Montclair	Santa Clara, CA 95051	408/247-6470
Source Apple Users Group	2525 Beverly Ave., #9	Santa Monica, CA 90405	213/396-8668
Apple PI	171 E. Thousand Oaks Blvd., Suite 104	Thousand Oaks, CA 91360	805/495-3554
Midway Computer Club	131 Highland Ave.	Vacaville, CA 95688	707/446-3175
Appleholics Anonymous	155 Morse Ave.	Ventura, CA 93003	805/647-8945
Apple Mug	280 Hospital Circle, #202	Westminster, CA 92683	unavailable

COLORADO

Apple PI Users Group	P.O. Box 17467	Denver, CO 80217	303/429-4436
Rocky Apple Core	141 E. Elkhorn Ave.	Estes Park, CO 80517	303/586-5737
South Colorado Apple Users	1635 S. Prairie	Pueblo, CO 81005	303/564-3545

CONNECTICUT

Applefield Users Group	1700 Post Road	Fairfield, CT 06430	203/255-3650
Applelist	50 Ida Lane	West Haven, CT 06516	203/397-1407
Apple Mugs	345 Main St.	Norwalk, CT 06851	203/846-4198
Appleshare	1439 Post Road East	Westport, CT 06880	203/227-6854

DELAWARE

G R A P E	P.O. Box 8904	Newark, DE 19711	302/738-6365

D.C.

Hobby Computer Information Exchange	2300 41st St. N.W., #203	Washington, DC 20007	202/338-7964

FLORIDA

Capeapple	1661 Crooked Arrow Ct.	Cape Coral, FL 33904	813/542-5645
A.C.E.S.	P.O. Box 9222	Coral Springs, FL 33065	305/941-7252
Apple Jax	1021 King St.	Jacksonville, FL 32204	unavailable
Apple Users Core	307 Tarpon Rd.	Mary Esther, FL 32569	305/581-0002
Miami Apple Users Group	P.O. Box 161240	Miami, FL 33116	305/595-8728
Space Coast Apple User Group	P.O. Box 4332	Patrick AFB, FL 32925	unavailable
S C A T	P.O. Box 7488	Clearwater, FL 33518	813/961-5705
SW Florida Apple Users	5673 S. Tamiami Trail	Fort Myers, FL 33907	813/332-2140
Apple Tree of Central Florida	530 Wind Meadow	Altamont Springs, FL 32701	unavailable
Apple PI of Brevard	P.O. Box 327	Melbourne, FL 32901	305/725-4328
S M A U G	10201 Fontainebleu Blvd., #206	Miami, FL 33172	305/551-1000
Sun Coast Tampa Apple	22 Chinook Ct.	MacDill AFB, FL 33621	unavailable
Baudhaus	P.O. Box 597	Tallahassee, FL 32307	unavailable
Venice Apple	P.O. Box 421	Venice, FL 33595	unavailable

GEORGIA

Atlanta Society of Professional Apple Users	6600 Powers Ferry Rd., Suite 220	Atlanta, GA 30339	404/955-2663
S E A	3258 Powers Ferry Rd.	Marietta, GA 30067	404/977-8600
Augusta Apple Users Group	1224 Johns Rd.	Augusta, GA 30904	404/733-3562

HAWAII

M A U I	37 Makalani Pl.	Makawao, HI 96768	808/879-7957
H.A.U.S.	720 Elm Drive	Pearl City, HI 96782	808/456-4068

IDAHO

A.B.U.G.	2213 Targee, #5	Boise, ID 83705	208/336-1534
P.I.N.E. Apples	1855 Jean St.	Pocatello, ID 83201	unavailable

ILLINOIS

Crab-Apples	P.O. Box 437	DeSoto, IL 62924	unavailable

Apple Users—NU	Mathematics Dept., Northwestern University	Evanston, IL 60201	312/492-5571
D.A.T.A.	5048 Pebble Creek Trail	Loves Park, IL 61111	815/633-1569
Central Illinois Apple	P.O. Box 1462	Peoria, IL 61604	309/444-9705
Plato Center Apple Users Group	Rt. 2, Box 189	Elgin, IL 60120	312/464-5893
Dupage County Apple Users	1241 Citation Lane	Hanover Park, IL 60103	312/837-9259
N I A U G	P.O. Box 787	Palatine, IL 60067	312/593-2709
Champaign-Urbana Apple Users Group	2203 Anderson	Urbana, IL 61801	217/333-4150
Apple PI Computer Club	11630 S. Nagle Ave.	Worth, IL 60482	312/448-6548

INDIANA

Indianapplus	221 W. Dodds St.	Bloomington, IN 47401	unavailable
Fort Wayne Apple Computer User Group	3833 Foresthill Ave.	Fort Wayne, IN 46805	219/485-3388
Apple Tech	1755 Linden Ave.	Mishawaka, IN 46544	unavailable
C A U G	2805 Chestnut Ct.	Columbus, IN 47201	unavailable
The Apple Pickers, Inc.	P.O. Box 20136	Indianapolis, IN 46220	317/357-8781
Wabash Valley Apple Byters	RR 21, Box 191	Terre Haute, IN 47802	unavailable

IOWA

Ames Apple Users Group	213 Lincoln Way	Ames, IA 50010	515/292-9318
Cedar Rapids Apple Users Group	417 Third Ave.	Cedar Rapids, IA 52404	319/366-6327
Iowa City Apple Users Group	134 Ravencrest Dr.	Iowa City, IA 52240	319/353-3170
Agri-Cursrs	c/o Sac City State Bank, 500 Audubon	Sac City, IA 50583	712/662-4721
The Green Apples	4417 N. Zircon Ln., Lot 129	Cedar Falls, IA 50613	319/268-0572
Tri-State Microcomputer	2866 Brueck Rd.	Dubuque, IA 52001	319/583-9502
Iowa City Apple Group	844 10th N.E.	Mason City, IA 50401	unavailable
Sioux-Apple	28 W. Kings Highway	Sioux City, IA 51104	unavailable

KANSAS

Apple Bits	6140 Glenwood	Mission, KS 66202	913/236-8679
Topeka Apple Users Club	911A SW 37th St.	Topeka, KS 66611	913/267-6530
Applebutter	10049 Santa Fe Dr.	Overland Park, KS 66212	913/884-8529
Plane Apple Club	P.O. Box 12013	Wichita, KS 67277	316/522-8410

KENTUCKY

Apple-Siders	27 Crystal Lake Dr.	Covington, KY 41017	606/356-7185
L.A.U.G.H.S.	8207 Pipilo	Louisville, KY 40222	502/426-3815

LOUISIANA

Crescent City Apple Core	72 Old Hickory Ave.	Chalmette, LA 70043	504/246-8438

MARYLAND

Maryland Apple Corps	6711 Greenspring Ave.	Baltimore, MD 21209	301/486-2580
Maryland Crabapples	Chatham Mall	Ellicott City, MD 21043	301/242-0658

APL Apple Users Group	Johns Hopkins Applied Physics	Laurel, MD 20707	301/953-7100 x3704
Washington Apple PI	P.O. Box 34511	Bethesda, MD 20817	202/332-9102
Pencom	222 Key Highway	Frederick, MD 21701	301/662-1997

MASSACHUSETTS

Apple/Boston	3 Center Plaza	Boston, MA 02108	617/367-8080
Newton Apple Kids	50 Court St.	Newtonville, MA 02160	617/965-0033
North Shore Apple Group	P.O. Box 59	Rockport, MA 01966	617/546-7869
Apple Guild	P.O. Box 371	Weymouth, MA 02188	617/335-3701
Applesauce	118 Brookhaven Dr.	East Longmeadow, MA 01028	unavailable
Apple Core of Berkshire County	32 Deborah Ave.	Pittsfield, MA 01201	413/442-4759
Appleseed	4 Cranebrook	Shrewsbury, MA 01545	617/842-7198
N.E.A.T.	P.O. Box 2652	Woburn, MA 02155	617/767-1722

MICHIGAN

Ann Arbor Apple	P.O. Box 2386	Ann Arbor, MI 48106	unavailable
K.A.C.U.S.	517 Oak	Kalamazoo, MI 49007	unavailable
APPLE L.U.G.	5411 Marsh Rd.	Haslett, MI 48840	517/349-4671
Apple Core Examiners	4691 S. Elm Dr.	Bay City, MI 48706	517/684-9189
Grand Rapids Apple	3268 Coach Lane, #2A	Grand Rapids, MI 49508	unavailable
Michigan Apple Computer Club	P.O. Box 551	Madison Heights, MI 48071	313/353-7648

MINNESOTA

Mini'App'les	13516 Grand Ave. S.	Burnsville, MN 55337	612/890-5051
Personal Computer Interest Group	3602 Hwy. 52 North	Rochester, MN 55901	507/289-4323
Mayo Apple Users Group	Mayo Clinic, S & P	Rochester, MN 55901	507/289-4323

MISSOURI

A.M.M.P.L.E.	333 E. Winter	Columbia, MO 65201	314/443-0689
Joplin Apple Users Group	1903 E. 36th	Joplin, MO 64801	417/781-6433
Apple Jacks	11145 Suntree Rd., Apt. D	St. Louis, MO 63138	314/869-9050
Apple Squires of the Ozarks	1904 E. Meadowmere	Springfield, MO 65804	417/862-6500
Apple Eye	1094 Brooktrail Ct.	Creve Coeur, MO 63141	314/569-2762
Personal Computer Club of St. Louis	274 Brightfield Dr.	St. Louis, MO 63011	314/647-1465
Comstat	11610 Page Service Rd.	St. Louis, MO 63141	314/432-7019

MONTANA

Apple Addicts	P.O. Box 489	Broadus, MT 59317	406/784-2280

NEBRASKA

Compusers	P.O. Box 2064	Hastings, NE 68901	402/463-6661
Omaha Apple Sauce	1915 S. 44 St., #112	Omaha, NE 68105	402/558-8943
Big Red Apple Club	1301 N. 19th	Norfolk, NE 68701	402/379-3531

NEVADA

Apple Corps of S. Nevada	6325 Portola Rd.	Las Vegas, NV 89108	702/647-6502

NEW HAMPSHIRE

Suffolk Apple Computer Society	226 Boston Post Road	Amherst, NH 03031	603/673-7376
Big Green Apple	45 Lyme Rd.	Hanover, NH 03755	603/643-5666
Southern N.H. Apple Core	Warner Hill Rd., RFD #5	Derry, NH 03038	unavailable
Labcom Users Group	Mary Hitchcock Memorial Hospital	Hanover, NH 03755	603/643-4000

NEW JERSEY

Southern NJ Apple Users Group	106 Ashbrook Rd.	Cherry Hill, NJ 08034	609/428-4429
Apple Synapse II	1050 George St., 5-0	New Brunswick, NJ 08901	201/249-6186
Princeton Apple Users Group	P.O. Box 412	Rocky Hill, NJ 08553	unavailable
Monmouth Apple Corps	193 Stillwells Corner Rd.	Freehold, NJ 07728	unavailable
Apple Group—NJ	1411 Greenwood Dr.	Piscataway, NJ 08854	201/968-7498
Short Hills Apple Pits	29 Clive Hills Rd.	Short Hills, NJ 07078	201/376-8966

NEW MEXICO

Applequerque Computer Club	6609 Orphelia Ave. NE	Albuquerque, NM 87109	505/821-7418

NEW YORK

C A M S — Apple Users Group	1694 Central Ave.	Albany, NY 12205	716/832-6002
Apple Power	21 Ridgedale Ave.	Farmingville, NY 11738	516/248-8080
U.A.U.G. c/o Upstate Com.	629 French Rd.	New Hartford, NY 13413	315/399-1139
Staten Island Apple	P.O. Box 141	New York, NY 10305	212/727-1291
Mid-Hudson Micro Users	Imperial Plaza, 118 Rt. 9	Wappingers Falls, NY 12590	914/297-1223
Apple Byters Corps, Inc.	171 Treehaven Dr.	Buffalo, NY 14215	716/832-6002
Southern Tier Apple Core	82 New York Ave.	Johnson City, NY 13790	607/754-7636
Big Apple Users Group	P.O. Box 490, Bowling Green Station	New York, NY 10274	914/636-3417
Apple C.I.D.E.R.	1435 Tudor Way	Victor, NY 14564	716/924-7705
West Hempstead Apple	300 Nassau Blvd.	West Hempstead, NY 11552	914/353-0673

NORTH CAROLINA

UNC-CH Apple Users Group	7 Smith Bldg., 128A	Chapel Hill, NC 27514	919/966-4241
Hillsborough Orchard Surveyors	Rt. 1, Box 242E	Hillsborough, NC 27622	919/732-4757
NC State Apple Users	P.O. Box 5995	Raleigh, NC 27650	919/737-2345
Green Apples	218 N. Elm St.	Greensboro, NC 27401	919/275-2983
Carolina Apple Core	P.O. Box 31424	Raleigh, NC 27622	919/781-3755

NORTH DAKOTA

G.F. Apple S.A.U.C.E.	2500 B South Columbia Rd.	Grand Forks, ND 58201	701/746-0491
Apple Polishers	1112 Glacial Dr.	Minot, ND 58701	701/838-6444

OHIO

Rubber Apple Users Group	1870 Brookfield Dr.	Akron, OH 44313	216/867-7444
Apple-Dayton	4819 Leafburrow Dr.	Dayton, OH 45424	unavailable

Toledo Apple Users	1417 Bernath Pkwy.	Toledo, OH 43615	419/476-8463
Akron Apple Association	1871 Redwood Ave.	Akron, OH 44301	216/724-2332
Central Ohio Apple Computer Hobby	1357 Bernhard Rd.	Columbus,OH 43227	614/890-1316
Neo-Apple Core	7047 E. Jefferson Dr.	Mentor,OH 44060	216/942-7086

OKLAHOMA

Edmond Apple Users	12708 Teakwood	Edmond, OK 73034	405/771-3455
Big Red Apple Group	200 N. University Blvd.	Norman, OK 73112	405/947-3961
Midwest City Hospital Apple Users	2825 Parklawn Dr.	Midwest City, OK 73110	405/732-6682
Tulsa Computer Society Apple Users	P.O. Box 1133	Tulsa, OK 74101	918/835-3926

OREGON

Corvallis Apple Club	101 NW 23rd	Corvallis, OR 97330	503/757-7496
Appleugene	1430 E. 27th St.	Eugene, OR 97403	503/484-4618
Professionals Apple Club	7511 Twin Fir Ln. S.	Salem, OR 97303	503/362-6288
Apple Blossom	P.O. Box 266	Dillard, OR 97431	503/863-4420
Salem Area Computer Club	P.O. Box 7715	Salem, OR 97303	503/581-2687

PENNSYLVANIA

Apple Pittsburgh	744 Wheatland Cir.	Bridgeville, PA 15017	412/221-5969
Apple Users Group of North Hills	c/o Computerland, Route 8	Gibsonia, PA 15044	412/963-9910 x14
Keystone Apple Core	4644 Carlisle Pike	Mechanicsburg, PA 17055	unavailable
Berks Apple Club	1753 York Rd.	Reading, PA 19610	215/678-5661
Erie Apple Crunchers	P.O. Box 1575	Erie, PA 16507	814/455-1505
A R G	16 Laurel Lane	Glen Riddle, PA 19037	unavailable
Apple User of Pennsylvania	LaSalle College	Philadelphia, PA 19141	215/678-5661
Central Penn. Apple International Group	240 Calder Way	State College, PA 16801	814/234-2926

SOUTH CAROLINA

Lowcountry Apple Corps	313 Hawthorne St.	Mt. Pleasant, SC 29464	unavailable
C S C Apple Core	P.O. Box 405	Shaw AFB, SC 29152	803/359-7054

SOUTH DAKOTA

Rapid City Apple Users	3016 Glenwood	Rapid City, SD 57701	605/343-2949

TENNESSEE

Music City Apple Core	765 McMurray Dr., Apt. 4	Nashville, TN 37211	615/331-2287

TEXAS

Abilene Apple Club	925 N. Judge Ely Blvd.	Abilene, TX 79601	915/673-6708
Fort Worth Apple User Group	1401 Hillcrest Dr.	Arlington, TX 76010	817/461-1981
A.I.D.E.	P.O. Box 30878	Amarillo, TX 79120	806/376-5890
River City Apple Corps	P.O. Box 26529	Austin, TX 78755	512/258-5486
Apple Corpus	5817 Crestmore	Corpus Christi, TX 78415	512/852-8102
Franklin Mountain Apple Orchard	Drawer G	El Paso, TX 79951	915/877-2383
HISD/BASIC Curriculum Development	3830 Richmond Ave.	Houston, TX 77027	unavailable

Lubbock Computer Club	5420 23rd St.	Lubbock, TX 79407	806/797-3931
Apple Corps of Dallas	P.O. Box 5537	Richardson, TX 75080	241/324-2050
H.O.T. Apple P.I.E.	3400 Austin Ave.	Waco, TX 76710	817/666-3690
Micro Apple Core	3920 Caruth Blvd.	Dallas, TX 75225	214/361-5656
Apple Synamics	P.O. Box 748, MZ2212	Fort Worth, TX 76101	817/732-4811
H.A.A.U.G.	6046 Warm Springs	Houston, TX 77035	unavailable
Apple Pi Of The Permian Basin	415 E. 43rd St.	Odessa, TX 79762	915/333-3430
Appleseed	P.O. Box 12455	San Antonio, TX 78212	512/737-0213

UTAH

Ogden Apple Club	2345 Wall Ave.	Ogden, UT 84401	801/392-1992
Apple Slice	P.O. Box 11246	Salt Lake City, UT 84147	801/292-4555

VERMONT

Green Mountain Apple Club	Box 79A, RD #2	Vergennes, VT 05491	802/877-2484

VIRGINIA

Peninsula Apple Core	1419 Todds Lane	Hampton, VA 23666	804/827-0041
Apple T.A.R.T.	1706 Hanover Ave.	Richmond, VA 23220	804/320-2260
Tidewater Apple Worms	3025 Vendome Terr.	Norfolk, VA 23509	804/623-0395
Novapple	8108 Adair Lane	Springfield, VA 22151	703/321-9593

WASHINGTON

Kitsap Apple Users Group	7265 Thasos Ave. NE	Bremerton, WA 98310	206/692-1080
Apple Cobblers	600 Slater Kinney Dr. NE	Lacey, WA 98506	206/491-7018
A.U.	12816 E. Desmet	Spokane, WA 99216	509/922-1435
The G.R.A.P.E.	P.O. Box 576	Keyport, WA 98345	206/779-5275
A.P.P.L.E. Washington	14109 S.E. 168th St.	Renton, WA 98055	206/244-9360
Wenatchee Valley Apple	535 Highland Dr.	Wenatchee, WA 98801	509/662-7317

WISCONSIN

Chi-Hi Computer Club	Colemna & Terrill Sts.	Chippewa Falls, WI 54729	715/723-8271
Adam & Eve Apple Group	11 S. Hancock St.	Madison, WI 53703	608/256-5306
Wisconsin Apple Users	P.O. Box 11463	Milwaukee, WI 53211	414/964-6645
R.A.M.	1821 Aspen Ln.	Green Bay, WI 54303	414/468-0204
Menomin-Apples	802 12th Ave. E.	Menominee, WI 54751	715/235-3126
Fox Valley Crab-Apples	University of Wisconsin	Oshkosh, WI 54901	414/424-1362

WYOMING

The Apple Net	2203 Park Ave., Orchard Valley	Cheyenne, WY 82001	307/632-4934

CANADA

Apple British Columbia	8055 Anderson Rd., #316	Richmond, B.C., Canada V6Y 1S2	604/273-1277
Board of Education — Hamilton	P.O. Box 558	Hamilton, Ontario, Canada	416/527-5092
Scarborough Educational Computer Society	Program Dept., 140 Borough Dr.	Scarborough, Ontario, Canada M1P 4N6	unavailable

Bishop Strachan School	298 Lonsdale Rd.	Toronto, Ontario, Canada M4V 1X2	unavailable
Apple-Can	P.O. Box 696, Station B	Willowdale, Ontario, Canada M2K 2P9	416/223-0599
Club Apple De La Mauricie	400 Tourigny	Trois-Rivieres, Quebec, Canada G9A 3E4	unavailable
Bolo/UB Apple Club	1208 Patenaude #3	Laval, Quebec, Canada H76 3H2	514/663-2771
Club Apple De Montreal	32 Avenue Des Erables	St. Therese, Quebec, Canada J7E 3T4	514/435-3204
Club De Micro-Ordinateur St. Jean	P.O. Box 21	St. Jean, Quebec, Canada J3B 6Z1	unavailable
College Park School	3440 Harrington St.	Saskatoon, Saskatchewan, Canada S7J 1V6	unavailable
Sask-Apple Research Group	P.O. Box 291, Sub P.O. #6	Saskatoon, Saskatchewan, Canada S7N 0W0	unavailable

MAGAZINES FOR THE APPLE OWNER

The great popularity of Apple computers has spawned eight major publications that cater to Apple users only. All are good; each has its specialties. Many Apple owners read magazines as much for their advertisements as for their articles. Periodicals are a great way to keep up with all the innovations available for your computer.

Here are thumbnail sketches of a number of magazines for Apple users. Read these sketches, then go out and buy a couple of issues, particularly those issues with articles you personally find interesting. Sampling magazines for a couple of months will give you a good feeling for which ones you might want to see every month.

Apple: The Personal Computer Magazine is the glossy, informative publication from Apple Computer, Inc. The articles are informative and generally slanted toward interesting uses for the Apple—art, music, education, etc. Available from Apple or your dealer.

A typical issue of *Apple Orchard*, a sharply produced magazine published by the International Apple Core, included an extensive article on the Apple IIe, diagnosing and repairing common Apple problems, part of a continuing series on how to get more out of *VisiCalc*, a game paddle program, and lots of detailed software reviews. This magazine is also a good source for finding Apple clubs. Available from your dealer.

Located in Seattle, *Call-A.P.P.L.E.*, one of the oldest and largest Apple clubs, broke new ground with its extensive software library. *Call-A.P.P.L.E.* magazine is another outgrowth of this group's energy. It includes reviews but features practical programming, from simple programs in Applesoft, to complex assembly language utilities that can relocate programs in memory, to programs that log onto time-sharing services and automatically obtain information for you. Available from your dealer.

In Cider is a combination of reviews, articles, and software. A recent issue had activities in assembly language, Applesoft, Logo, and Pascal, plus articles on puzzles created by Blaise Pascal, a comparison of the Apple with the Franklin Ace, and an article on the CP/M operating system.

Think of *Nibble* magazine as software on paper. Since its inception in early 1980, *Nibble* has published programs—including games, file systems, disk and graphics utilities, and printer drivers, to name only a few. Copies of *Nibble* are a good investment if you don't have a lot of money to throw around on software (and don't mind typing in listings). *Nibble* also corrects bugs in its programs.

Peelings II magazine is 90% reviews and most of those are software reviews. The reviews are extensive and cover a variety of packages—accounting, data management, utilities, code generators, and education. An accurate review can save you a lot of money (and wasted effort).

INFORMATION NETWORKS

If you have a telephone modem, you can connect your computer to a number of national information services (sometimes called *networks*). These networks are huge data banks that provide all sorts of information and a variety of services (even software programs).

The three most popular information services are Dow Jones News/Retrieval Service (a business-oriented network), The Source, and

CompuServe (accessible only in evening and nighttime hours). The last two are general-purpose networks, offering everything from news and electronic mail to games and discount buying services.

If you subscribe to one of the public information services or networks, you can join electronic users' groups—groups that put you in touch with other Apple users all over the country.

The Source has its own Apple users' group that includes a roster of club members (including their computing interests) and "mailings" of Apple news through The Source's electronic mail system.

To gain access to most information services, you must pay a hookup fee and then hourly charges (based on the time of day and the baud rate at which you communicate). A minimum monthly fee is common. See your dealer for details about subscribing to these and other information networks.

PRIVATE ELECTRONIC BULLETIN BOARDS

Another way to get information via your computer and modem is through private (free!) electronic bulletin board systems. Electronic bulletin boards have been set up in most large cities across the U.S. You dial the phone number of the bulletin board, and your computer screen shows messages that other people have entered. You can also type in your own messages to be posted. Messages may be like short letters or questions addressed either to a specific person or to anyone who wants to answer. Some bulletin boards also display ads for people selling hardware or software. The person who runs the bulletin board system is called the *System Operator*, or *SYSOP*. The SYSOP will try to answer questions and keep the bulletin board running smoothly. The only cost of calling a bulletin board is the cost of the telephone call.

Many communities have found themselves blessed with private, often cost-free networks that offer everything from community news to electronic mail. Membership includes a wide range of computers and interests. Ask dealers or users' club members to see if any private bulletin boards are available in your area.

ADDING A MODEM TO YOUR SYSTEM

A world of communications is available to you by connecting your computer to other computers by telephone. The features that networks and bulletin boards offer are truly exciting, but you'll need to keep in mind the actual hardware and software necessary to make the connection to the outside world.

To make the link, you need a modem. There are two basic kinds of modems: acoustic couplers and direct-connect modems. For most people, a direct-connect modem is the best bet. Direct-connect modems are on their own interface cards (like the Hayes Micromodem II). All you have to do is place the modem in the appropriate slot inside the computer box and connect the modular end of your telephone cord to it.

If you do not have modular plugs on your telephone (this would be true only if you have an old installation), you need an acoustic coupler modem. An acoustic coupler is a device that lets you connect to the telephone using a standard telephone handset. Talk to your dealer about what type of modem best fits your needs.

In addition to the modem, you need software that allows your computer to communicate with other computers. You can buy special software called *terminal packages* for this purpose, ranging from the very simple to the very elaborate. You probably won't need to buy separate software, however, because most modems come with the software you'll need to get started using them—either in the form of a disk or in the form of a program that you can type in from their manuals.

USING A MODEM

When you have your modem and software set up, you're ready to make the connection. If you have an acoustic coupler, simply dial the number of the other computer that you want to connect to, and when that computer answers, you'll hear a high-pitched tone from the telephone's earpiece. After you hear the tone, connect your telephone to your modem (following the instructions that were supplied with your modem). Then press the computer's RETURN key. If you have a direct-connect modem, all of this will be done automatically.

The other computer will respond, usually with some type of welcoming message. From this point on, you can follow instructions and messages received from the other computer.

When you call any information network or bulletin board, it will ask you to identify yourself, often with some kind of password or access code. When you subscribe to a network, you will receive a booklet that gives you complete log-on instructions.

This User's Guide will lead you step by step through all phases of learning how to use your new computer: from setting it up, to learning what each key does, to expanding your system with peripherals. Specific exercises are included for each key on your computer's keyboard, plus easy-to-understand instructions and clear, colorful photographs. It also provides software buying recommendations and a guide to users' groups.

BEEKMAN HOUSE
Distributed by Crown Publishers, Inc.
One Park Avenue
New York, New York 10016

0-517-41678-6