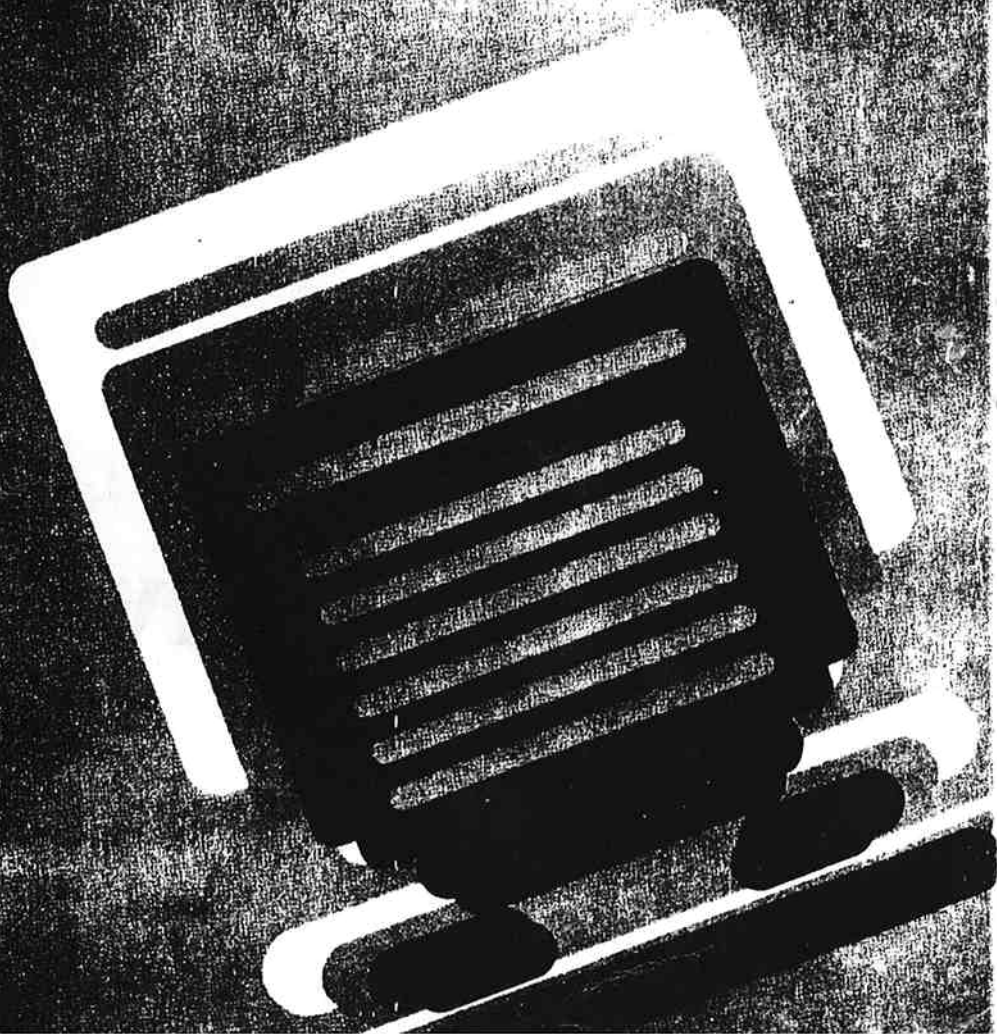


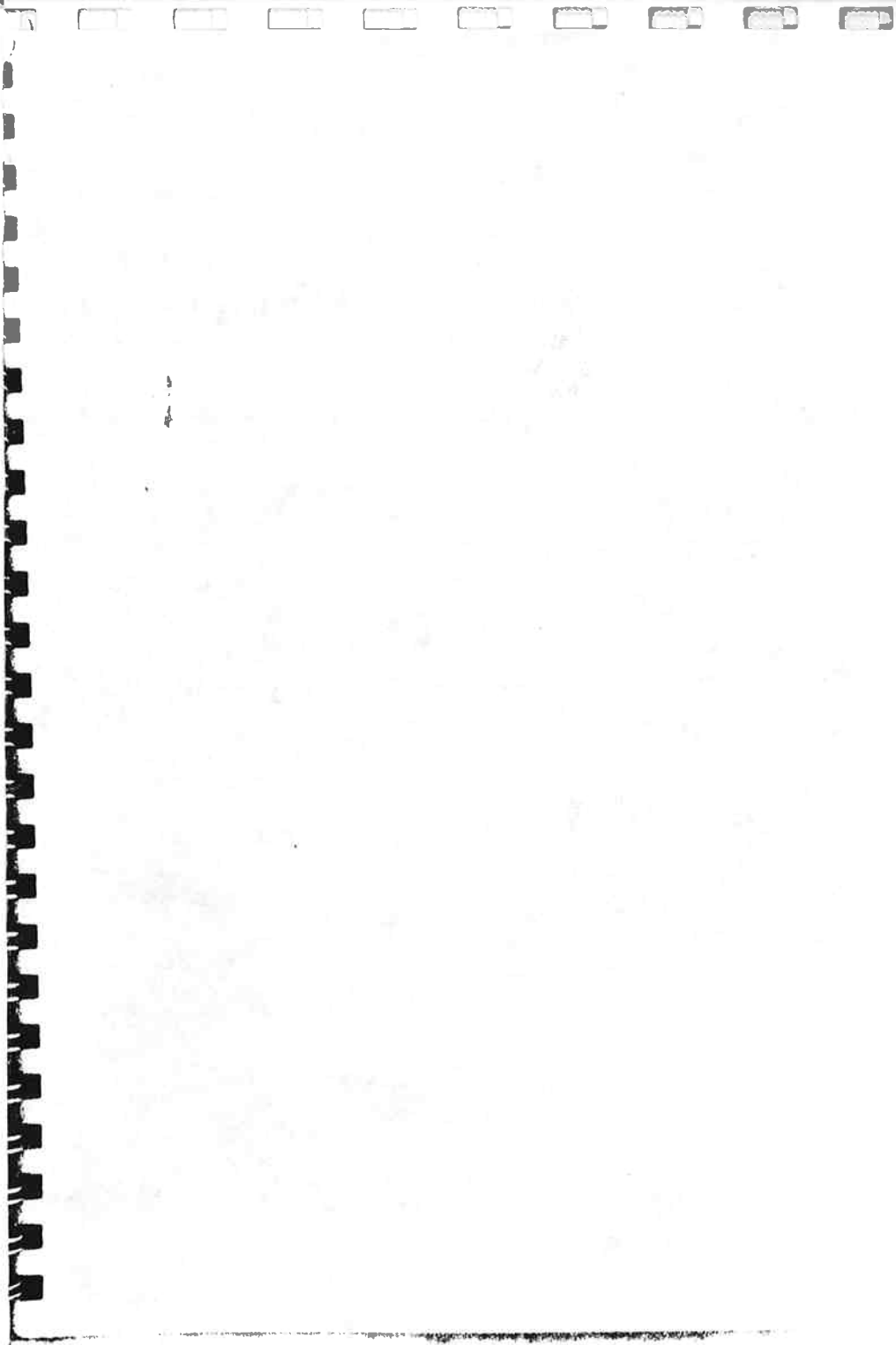


**Personal Computer
Products, Inc.**

APPLI-CARD™

Installation and User's Manual
FOR APPLE II COMPUTERS





APPLI-CARD™ 2.0

Installation and User's Manual

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WARRANTY

Personal Computer Products, Inc. offers a 90 day warranty on the APPLI-CARD. If your APPLI-CARD should fail to operate properly within 90 days from the date of purchase, Personal Computer Products, Inc., will either repair or replace it at no charge. On any request for warranty service, please include the serial number. Please follow these steps in requesting warranty service.

1. Complete the Personal Computer Products, Inc. Warranty Registration Card and return it to Personal Computer Products, Inc. as soon as possible. Once your completed card is received, processing a request for warranty service can be handled promptly.
2. If you believe your APPLI-CARD is defective, you should FIRST call Personal Computer Products, Inc. to obtain a Return Merchandise Authorization (RMA). Merchandise will not be effectively processed without having first obtained an RMA number prior to returning the merchandise.
3. You should then send the APPLI-CARD and its **original** disk, postage prepaid, to Personal Computer Products, Inc. Please be sure your name, return address, and telephone number are enclosed with the APPLI-CARD as well as a complete description of the symptoms observed. Personal Computer Products, Inc. will either repair or replace your APPLI-CARD and disk and return them to you.

Your request for warranty service may be delayed if you do not complete the Warranty Registration Card or if you send your APPLI-CARD directly back to Personal Computer Products, Inc. without having first obtained a Return Merchandise Authorization.

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All screens illustrated in this manual are meant to be representations, not exact duplicates.

The files on your disk are described in more detail in Chapter 2.

YOUR MANUAL

This manual tells you how to install the APPLI-CARD and how to take advantage of its advanced features. It also describes the basic CP/M skills that are required to run the CP/M software.

YOUR PRIMER

If you want to use the additional CP/M features you now have available, you can learn about them by reading the CP/M Primer Provided as part of your APPLI-CARD package.

**YOUR SHIFT
MODIFICATION
DEVICE**

Unless your Apple can produce upper- and lowercase characters, you need to install this connector to use the SHIFT key on your Apple keyboard. If you have an Apple II or II Plus, the SMD or an equivalent device must be installed, or you will not be able to use all of the APPLI-CARD's software.

WHAT YOU NEED

In order to take full advantage of the features of your APPLI-CARD, you need the following:

- an Apple II, II Plus, or IIe (not an Apple III)
- two disk drives
- a video monitor

HOW TO USE THIS MANUAL

This manual was designed to be read selectively; You Decide what to read, depending on your needs. The chapters and appendices contain the following information:

- Chapter 1, "Installing APPLI-CARD," provides the instructions you need to install your APPLI-CARD and to get started using your APPLI-CARD.
- Chapter 2, "Overview of CP/M," describes a few important aspects of the CP/M operating system and tells you where you can get more information.
- Chapter 3, "Additional Features for Apple II and II Plus Owners," explains some features that make it possible for you to use the APPLI-CARD without an 80- column card.
- Chapter 4, "Advanced Features: Customizing the APPLI-CARD," defines and describes how to use the Apple function keys, Apple memory as a printer buffer, and the SoftVIDEO driver.
- Chapter 5, "Advanced Features: Modifying Drivers with Your APPLI-CARD," describes the APPLI-CARD drivers and offers instructions for tailoring them to your needs.
- Chapter 6, "Using APPLI-CARD with Apple DOS," explains how to use your APPLI-CARD to transfer files between CP/M and Apple DOS and how to use your APPLI-CARD as a RAM disk for additional memory.
- Appendix A, "Soldering to Activate Your Shift Key," gives additional instructions to Apple II owners who do not have a Keyboard Encoder card. This appendix does not apply to the Apple IIe or most Apple II Plus models.

INTRODUCING APPLI-CARD

PCPI's APPLI-CARD greatly expands the capabilities of your Apple microcomputer. When you install the APPLI-CARD, your Apple becomes two computers. Not only can you continue to use your Apple just as you always have, but you can also run the CP/M operating system. Through your APPLI-CARD and CP/M, you can use the thousands of CP/M-based programs.

Your Apple is versatile; you can add many different types of peripherals to it. Among these, the APPLI-CARD is one of the most powerful additions you can make. Although the APPLI-CARD is designed to be compatible with many peripherals, it does not work with all of them. You should ask your dealer whether the particular combination of devices you have will work with the APPLI-CARD.

WHAT YOU HAVE

You have received a package containing the APPLI-CARD, a disk, an installation manual, a textbook on CP/M, and a shift modification device (SMD).

YOUR APPLI-CARD The APPLI-CARD is a printed circuit board that contains a 6 MHz Z-80B microprocessor and 64K of Random Access Memory (RAM). The APPLI-CARD uses the Apple as an input/output processor only, borrowing the Apple keyboard, monitor (video display), disk drives, and various ports. The APPLI-CARD works with the Apple II, II Plus, and IIe, but not with the Apple III.

YOUR DISK The disk with your APPLI-CARD has files on both sides and is actually two disks in one: one side is labeled **CP/M Disk**, the other side is labeled **Utility Disk**. The "two disks" contain the following files:

CP/M Disk

ADOSXFER.COM
ASM.COM
CLRPBUF.COM
COPYFRMT.COM
DDT.COM
DOSRDSK
DRIVERS
DUMP.ASM
DUMP.COM
ED.COM
LOAD.COM
NRDRDSK
PIP.COM
STAT.COM
SUBMIT.COM
XSUB.COM

Utility Disk

APLFLPY.DVR
BUFFER.DVR
CONFIGSV.COM
DLDRIVER.COM
DRIVERS
ETXBUF.DVR
FAST2E80.DVR
FUNCTION.COM
HIRESIO.DVR
INSTALL.COM
SFTVIDEO.DVR
PCPICPM

Although it is not listed, the CP/M operating system (version 2.2) is written on both sides of the disk. Notice that each side (or disk) also contains a DRIVERS file used by CP/M to communicate with the devices on your Apple. To start up (boot) your system, use the CP/M Disk for 80- or 40-column screen mode and the Utility Disk for 70-column screen mode. You would only want to use the 70-column mode if your Apple does not have an 80-column card.

- Appendix B, "TroubleShooting Guide," provides answers to the most common questions you may have while performing the tasks described in this manual.
- Appendix C, "Technical Information," contains technical information about the hardware and CP/M operating system. It is intended for the experienced computer user.
- Appendix D, "ASCII Conversion Chart".

Everyone should begin with the installation instructions in Chapter 1 and then read Chapter 2 to learn more about CP/M. If you are using an Apple II or II Plus (or an Apple IIe without an 80-column card), you must also read Chapter 3. (Skip this chapter if you use an Apple IIe with an 80-column card.) Chapters 4, 5, and 6 are optional; read them if you are technically proficient and want to use some of the APPLI-CARD's advanced features.

REFERENCE AIDS

The Table of Contents, Index, and cross references provide easy access to the information you need.

The following symbols and conventions have been used throughout this manual:

c - > n

Refer to this chapter (n) in this manual.

c - > CP/M

Refer to the *CP/M Primer*.

CAUTION

Caution.

REMEMBER

Remember.

RETURN

Press the Return Key.

^

The control key (CTRL) on your keyboard, unless specifically referred to as a caret.

TYPE PIP

This bold text indicates what you should type.

CHAPTER 1: INSTALLATION

INSTALLING APPLI-CARD

This chapter gives complete instructions for installing your APPLI-CARD. Regardless of the Apple model you own, you should read this chapter completely. It describes the following tasks:

- Installing the APPLI-CARD in its slot
- Installing the Shift Modification Device (SMD)
- Reassembling your Apple
- Starting up your system
- Making backup copies of your disk(s)
- Making start-up (boot) disks

TASK 1 - INSTALLING THE APPLI-CARD IN ITS SLOT

CAUTION

Turn off the power to your Apple before installation to avoid damaging the APPLI-CARD and your Apple. Also, turn off the power to all external devices, such as monitors and printers.

- Step 1** Remove all cables from the back of the Apple, including the power cord and all removable peripheral cables.
- Step 2** Remove the cover from the Apple. Check the peripheral cards to see if they match the arrangement of cards for the Apple IIe illustrated in Figure 1 or the arrangement for other Apple models illustrated in Figure 2. Rearrange the cards if necessary. See the table on page 1-4 for a detailed description of the slot assignments in your Apple.

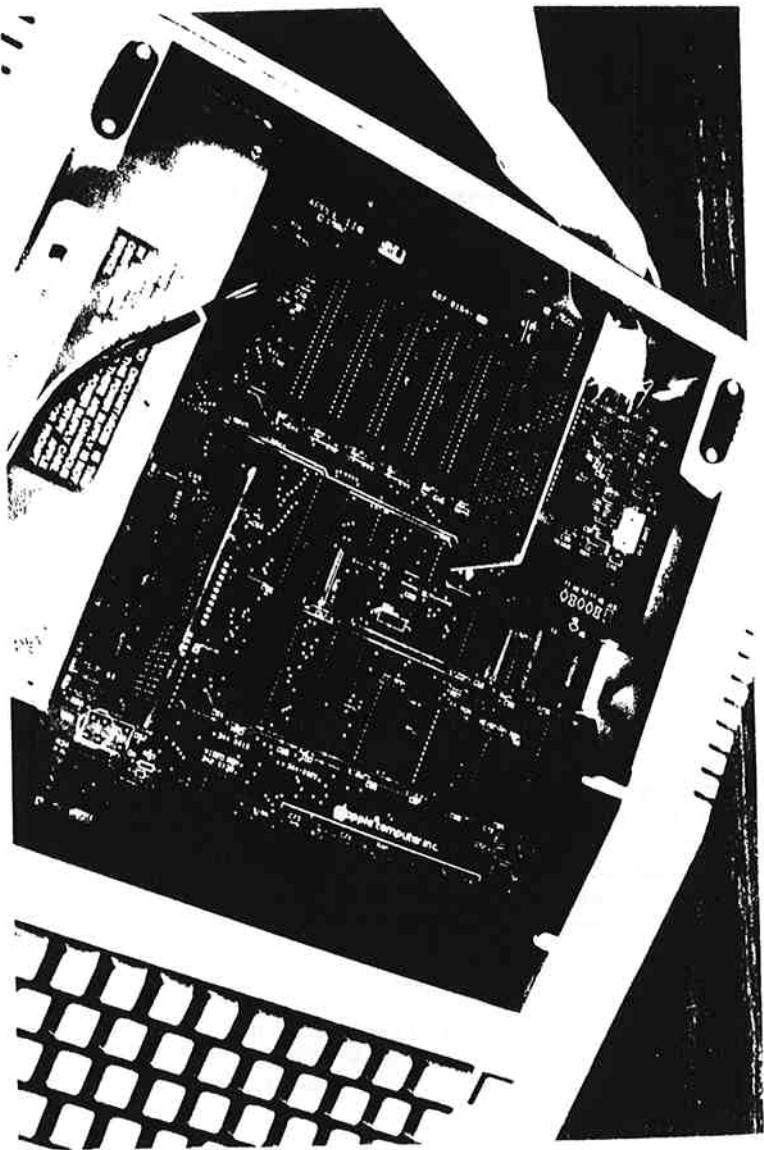


FIGURE 1. APPLE IIe BOARD SLOT LOCATIONS AND THE APPLI-CARD INSTALLATION.

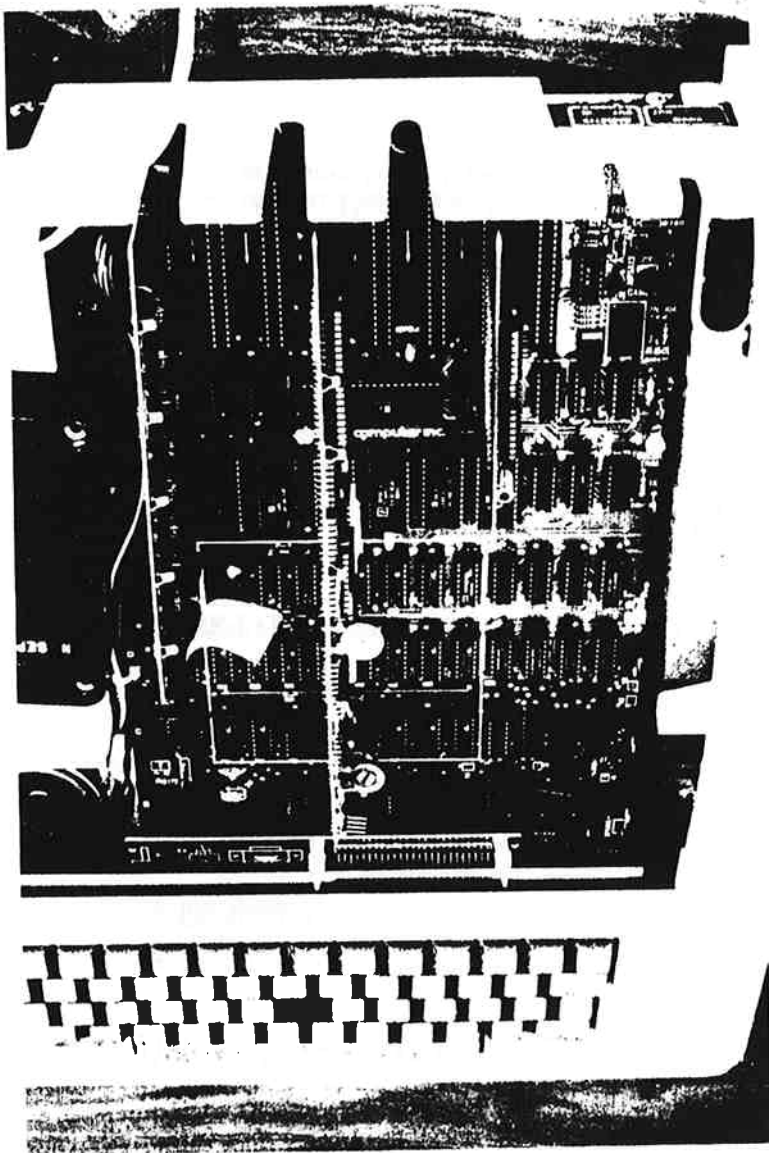


FIGURE 2. APPLE II AND II PLUS BOARD SLOT LOCATIONS AND THE APPLI-CARD INSTALLATION

Step 3 Check that the jumper is properly preinstalled on your APPLI-CARD. It should be connected to the 13th pair of pins from the top of the expansion interface connector, as indicated in Figure 3.

Step 4 Install the APPLI-CARD as shown in Figure 1 or Figure 2 (depending on which type of Apple you have).

Although slot 4 is recommended (with slots 5 and 7 as alternate suggestions), you can install the APPLI-CARD in any slot except 0 and 6.

To make sure the card is firmly in position, gently rock it back and forth as you push it into the slot. The tab located at the front of the card should rest on the main circuit board inside the Apple.

CAUTION

Improper installation of the APPLI-CARD can cause extensive damage to both the APPLI-CARD and your Apple.

SLOT ASSIGNMENTS AND ASSOCIATED CP/M DEVICE NAMES

SLOT	DEVICE NAME	FUNCTION
Auxiliary	ROM/RAM	Reserved for Apple IIe 80-column card. (Apple II and II Plus computers do not contain this slot.)
0	ROM/RAM	Reserved for additional memory cards for the Apple. (The Apple IIe does not contain this slot.)
1	PRINTER	Reserved for the CP/M list device or line printer output (CP/M LST: device). APPLI-CARD CP/M manages this slot as an output-only device.
2	I/O	Reserved for general purpose I/O usage and normally used to communicate with peripheral devices (CP/M RDR: and PUN: devices). It is both an input and an output port. An RS-232C interface, typically used with a telephone modem, would be placed here.

CAUTION

Your APPLI-CARD includes a preinstalled "jumper," which is inserted on the APPLI-CARD's expansion interface connector. The jumper must be in place if your APPLI-CARD is to work properly. If it is not in place you risk damaging your computer. It should be removed only when a RAM Extender board or any other board designed to plug into the expansion interface connector is inserted. The RAM EXTENDER BOARD is available with either 64K or 128K of memory.

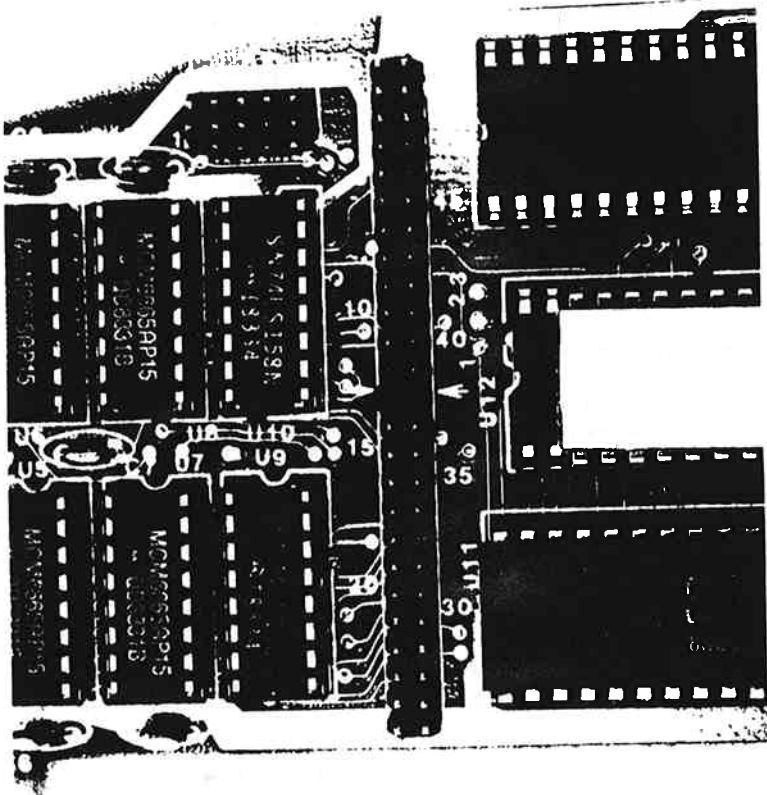


FIGURE 3. EXPANSION BOARD SHOWING LOCATION OF JUMPER

Continued

SLOT ASSIGNMENTS AND ASSOCIATED CP/M DEVICE NAMES

SLOT	DEVICE NAME	FUNCTION
3	CONSOLE	Reserved for an 80-column card or external terminal I/O card. APPLI-CARD CP/M normally uses the Apple screen for video output unless there is a card in slot 3. If there is an 80-column card, APPLI-CARD CP/M manages the Apple monitor in 80-column screen mode. If there is an external terminal card, APPLI-CARD CP/M manages the external terminal that replaces the Apple monitor and keyboard. Refer to your Apple II documentation for more information about 80-column cards.
4,5	DISK/ APPLI-CARD	Reserved for disk drive controller cards (although these slots can be used with other types of peripheral cards). The recommended slot for your APPLI-CARD is either 4 or 5, if these slots are not already in use.
6	BOOT DISK	Reserved for the start-up (boot) disk drive controller card; this card must be in place to run the APPLI-CARD.
7	Unassigned	Has an undefined function and is also suitable for the APPLI-CARD placement. However, the cables from the start-up disk controller card in slot 6 may physically interfere with the placing of the APPLI-CARD in slot 7.

TASK 2 - INSTALLING THE SHIFT MODIFICATION DEVICE (SMD)

REMEMBER

If you have an Apple IIe or if you have already installed a SMD in your Apple II or II Plus, skip this task.

By installing the SMD, you activate the SHIFT key on your Apple. The SHIFT key lets you use all APPLI-CARD software. If you have an older Apple II model that does not have a Keyboard Encoder card, turn to Appendix A for special instructions for installing the SMD.

CAUTION

Be sure the power to your Apple is OFF.

Refer to Figure 4 and follow these steps:

- Step 1** Turn your Apple around so the keyboard is facing away from you. Remove the cover.
- Step 2** Locate the Keyboard Encoder card. It is mounted underneath the keyboard circuit board on the left side as you view the Apple from the rear.
- Step 3** Connect the push-pin hook of the SMD to pin 24 (second pin on the left) of the Keyboard Encoder card.
- Step 4** Plug the other end of the SMD into the Game I/O socket. (Refer to your Apple manual if you have trouble locating the Keyboard Encoder card or the Game I/O socket.) Make sure the colored dot on the connector is facing towards the front of the Apple.

The plug for the game paddles can be attached to the top of the SMD connector.

TASK 3 - REASSEMBLING YOUR APPLE

To complete the physical installation, follow these steps:

- Step 1** Replace the cover.
- Step 2** Reinstall all cables.

CAUTION

Make sure the power switch is still OFF before reinstalling the power cable to the Apple.

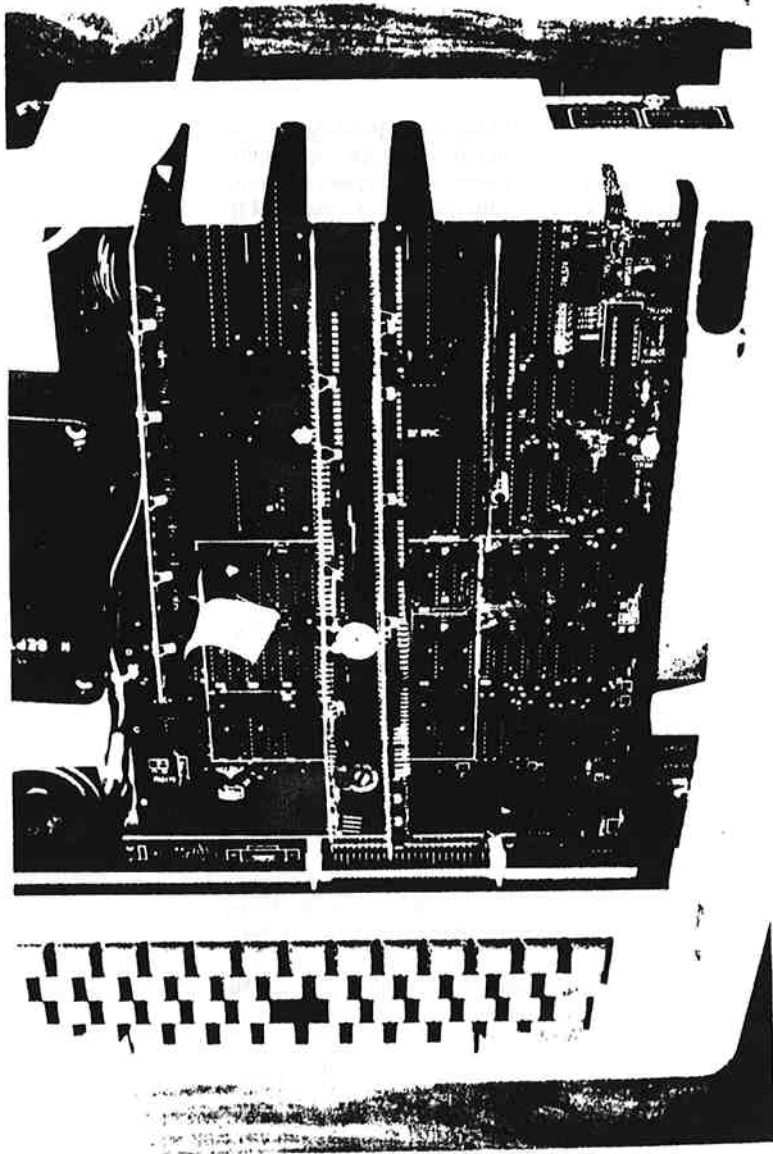


FIGURE 4. KEYBOARD ENCODER CARD SHOWING SMD CONNECTIONS.

TASK 4 - STARTING UP YOUR SYSTEM

Now it's time to use your APPLI-CARD system.

Step 1 Insert your APPLI-CARD disk into drive A. (This is the disk provided with your APPLI-CARD package.)

If you have an 80-column card, insert the CP/M Disk facing up.

If you do not have an 80-column card, insert the Utility Disk facing up.

CP/M refers to a disk drive by a letter instead of a slot drive number. Drive A corresponds to Apple Drive 6,1.

Step 2 Turn your Apple on. The APPLI-CARD CP/M system will automatically load.

Step 1 If you have an older Apple II that doesn't load automatically, type **6** in response to the monitor prompt. Then press **^P** (that is, hold down the CTRL key while you type P) and then press RETURN.

The disk drive will make the normal booting sounds. SEE LOAD DRIVERS followed by this screen:

```
35.5K Printer Buffer In Use
```

```
CP/M Ver 2.2
```

```
(C) Digital Research, Inc.
```

```
PCPI Ver 2.0
```

```
(C) Personal Computer Products, Inc.
```

```
A >
```

The **A** prompt (**A>**) indicates that the APPLI-CARD CP/M system is ready to accept a command. The **A** in the prompt tells you that all operations will occur on drive **A** unless you tell the system otherwise. (Chapter 2 provides more information about CP/M prompts and disk drives.)

The display mode of your screen should be 80-column if you have an 80-column card and 40-column if you do not.

You can test whether your APPLI-CARD is properly installed by typing **DIR** to request a directory of the files on the disk you have inserted.

TYPE DIR RETURN

The directory display will contain several lines like the following one:

```
A:SUMIT COM : ASM   COM : PIP   COM : XSUB  COM :  
A>
```

The actual files listed and the format of the listing will vary depending on the display mode of your screen and the disk you have inserted. However, as long as you see a directory listing, your installation is successful.

NOTE: If you do not have an 80-column card, you may choose to use the CP/M Disk to start up your system. If you do, you will be in 40-column screen mode.

REMEMBER

For best operations of CP/M programs, use an 80-column card.

Problems?

If you have a problem starting your system, refer to the Trouble Shooting Guide in Appendix B. If the problem persists, contact your dealer, who will either help you solve the problem or contact Personal Computer Products, Inc., for further information.

TASK 5 - MAKING DISK BACKUP COPIES

It's advisable to make at least one — preferably several — backup copies of important disks. Use the copies for everyday operations and store the originals in a safe place.

To make backup copies of your APPLI-CARD disk, you will need at least two blank disks — one for the CP/M Disk and one for the Utility Disk. You should format additional disks to make backup copies for your CP/M programs and to make start-up disks.

First you must prepare (format) your blank disks.

FORMATTING

Step 1 Insert the APPLI-CARD disk (CP/M side up) in drive A. (The disk should already be in drive A if you are using an Apple with an 80-column card.)

Step 2 TYPE COPYFRMT RETURN

COPY AND FORMAT MENU
Version 2.6 Sept. 26, 1983

A = Format a disk
B = Copy an entire disk
C = Copy CP/M system only

Enter option (X to return to CP/M):

Step 3 TYPE A

FORMAT A DISK

Enter drive:

Step 4 TYPE B

Insert disk into drive B:
Press SPACE when ready:
(any other key aborts)

Step 5 Insert disk in drive B (Apple drive 6,2).

Step 6 PRESS SPACE (or to start over, press any other key)

Formatting ...
Verifying ...

Format complete
Press any key to continue:

Step 7 PRESS any key

You'll be returned to the Copy and Format Menu.

Repeat steps 3 and 4 until you have formatted enough disks to make as many backup copies as you want. Also, format the disks you want to prepare as start-up disks (see Task 6).

COPYING

Now that you have several formatted disks, you can copy the files your APPLI-CARD disk and make backup disks. The following instructions assume that the COPYFRMT program is still running (that is, the Copy and Format Menu is on your screen). If it is not, you must type COPYFRMT again in response to the CP/M A prompt.

Step 1 TYPE B

COPY AN ENTIRE DISK
Enter SOURCE drive:

Step 2 TYPE A (the drive you are copying from)

Enter DESTINATION drive:

Step 3 TYPE B (the drive you are copying to)

Place SOURCE disk in drive A:
 Place DESTINATION disk in drive B:
 Press SPACE when ready:
 (any other key aborts)

Step 4 Insert the APPLI-CARD disk (CP/M Disk side up) in drive A (if it's not already there).

Step 5 Insert a formatted disk in drive B.

CAUTION

To avoid writing over data on a disk you want to save, be sure you insert a blank, formatted disk in drive B.

Step 6 PRESS SPACE

Reading track	n	[0-34]
Writing track	n	[0-34]
Re-reading track	n	[0-34]

These messages appear as the APPLI-CARD system copies groups of tracks.

Copy complete
 Press any key to continue:

Step 7 PRESS any key to return to the Copy and Format Menu

Step 8 Remove the disk from drive B. Label it appropriately.

If you want to make more copies of the APPLI-CARD CP/M Disk, repeat steps 1-8.

When you are ready to copy the Utility Disk, repeat steps 1-8 with the Utility Disk facing up in drive A.

You have now used options A and B of the COPYFRMT utility program provided with your APPLI-CARD. To exit the COPYFRMT program, type X.

TESTING BACKUP DISK COPIES

Now you may want to test your backup disks by using them to start up (boot) the system.

Step 9 Insert a start-up disk in drive A. (If you have an 80-column card, use the backup of the CP/M Disk. Otherwise, use the backup of the Utility Disk.)

Now you have to restart your system. You can do this in two ways. You can turn the power to your system off and then on or you can press the Control (CTRL) and RESET keys simultaneously and then R.

By pressing CTRL RESET R, you can restart your system without turning your Apple off and on again.

After your system restarts, you should follow the same procedures and see the same messages as described in Task 4. If your system will **not** restart using a backup disk, repeat this task with other disks until it does.

TASK 6 - MAKING START-UP (BOOT) DISKS

Any disk that has the CP/M system tracks (also called the "boot image") and the DRIVERS file can be used to start up your system. The first three tracks of all disks are reserved for the boot image. You can use option C of the COPYFRMT program to copy the boot image from one of your backup disks to a blank (but formatted) disk. Then you can use the CP/M PIP program to copy the DRIVERS file to this disk. This disk can then be used to start up your system.

REMEMBER

If you want to operate in 70-column mode, you'll copy the tracks from the Utility Disk. Otherwise, you'll copy them from the CP/M Disk.

Step 1 Start your system if it is not already operating. (See Task 4)

**COPYING BOOT
TRACKS****Step 2** Insert the CP/M Disk in drive A.

TYPE COPYFRMT RETURN

COPY AND FORMAT MENU
Version 2.6 Sept. 26, 1983A = Format a disk
B = Copy an entire disk
C = Copy CP/M system only

Enter option (X to return to CP/M):

Step 3 TYPE C

Copy CP/M SYSTEM ONLY

Enter SOURCE drive:

Step 4 TYPE A

Enter DESTINATION drive:

Step 5 TYPE BPlace SOURCE disk in drive A:
Place DESTINATION disk in drive B:
Press SPACE when ready:
(any other key aborts)**Step 6** Insert a start-up disk in drive A. (If it is CP/M, it is already in the drive.)

Step 7 Insert the formatted disk that you want to make into a start-up disk in drive B. The disk you insert **must** be formatted. Use one of the disks you formatted earlier. Make sure you have the correct disk in each drive:

Step 8 PRESS SPACE

Tracks 0-2 will be copied to drive B.

Copy complete
Press any key to continue:

Step 9 PRESS any key to return to the Copy and Format Menu

Step 10 TYPE X

COPYING DRIVERS FILE

Now you must copy the DRIVERS file.

The CP/M Disk must be in drive A to run the PIP program. If your start-up disk is the Utility Disk, remove it, insert the CP/M Disk, and hold down the CTRL key while you type C (^C). (The use of control keys is described in Chapter 2.)

Step 11 TYPE PIP RETURN

*

Make sure your start-up disk is in drive A. (Insert the Utility Disk, if necessary.)

Step 12 TYPE B:DRIVERS=DRIVERS RETURN

You will again see the PIP prompt, *.
(See page 43 in the *CP/M Primer*.)

Step 13 PRESS RETURN

A >

The DRIVERS file has been copied to drive B, and you have been returned to CP/M.

NOTE: The format of a copy command in PIP is **DESTINATION=SOURCE**. If your start-up disk is CP/M, you can perform steps 11 and 12 together by typing the following in response to the A prompt:

PIP B:DRIVERS=DRIVERS RETURN

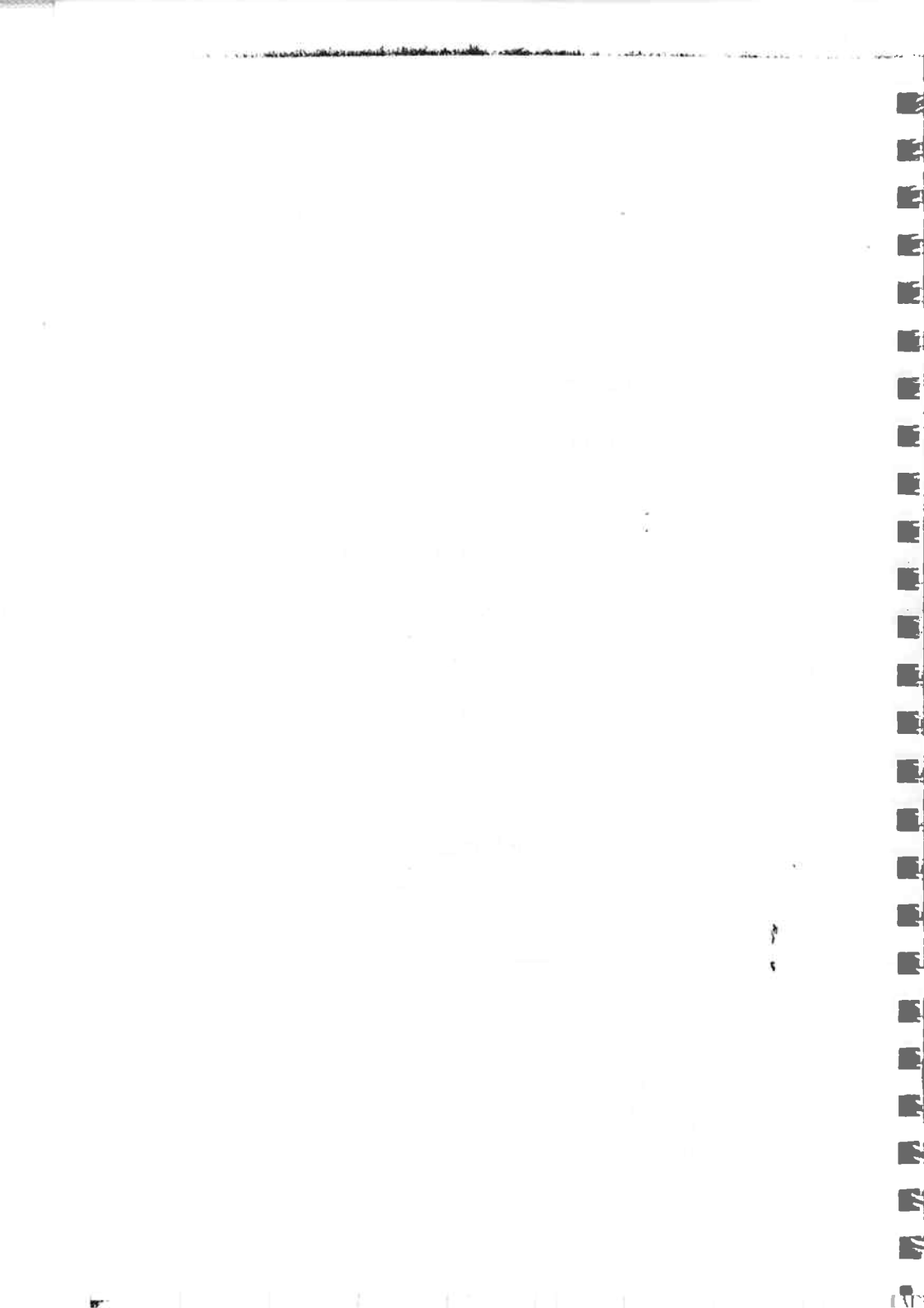
Since you don't need to change the disk in drive A, you can type the command all at once.

Remove your new start-up disk from drive B and the old start-up disk from drive A. The new start-up disk you have just made contains only the CP/M system and the DRIVERS file. Unlike your original start-up disk which has many files on it, your new one has plenty of space (about 110K) for other files.

You can test your new start-up disk by performing Task 4 to start your system. For this test, insert your new start-up disk (instead of the APPLI-CARD disk) in drive A. Then, follow the instructions in Task 4. If your system does not perform in the same manner as it does with your original start-up disk, repeat this task with other disks until it does.

FINISHING UP

The rest of this manual contains background information about the APPLI-CARD and instructions for other ways to use it. You should read the next chapter which describes some basic features of the CP/M operating system. If you are using an Apple II or II Plus, you should read Chapter 3 as well to learn how to type and interpret the display of special characters. You may also want to read about the special function commands for scrolling if you are operating in 40-column mode on an Apple II or II Plus. (Chapter 3 does not apply to the Apple IIe.) Regardless of what type of Apple you are using, you may find some of the techniques described in Chapters 4, 5, and 6 useful.



CHAPTER 2 OVERVIEW OF CP/M

The CP/M operating system, provided with your APPLI-CARD, allows you to run CP/M programs. This chapter describes some of the basic features of CP/M that you should know. If you want information about CP/M that goes beyond the scope of this chapter, read the *CP/M Primer* included in your APPLI-CARD package. For a detailed explanation of the CP/M operating system features, read Chapters 3, 5, and 9 of the *CP/M Primer*. If you want more technical information, read Chapters 1 and 2, and if you want to write assembly language programs, read Chapters 7 and 8 as well.

Because the CP/M operating system on your APPLI-CARD has its own method for initializing the system and copying disks, you don't need to use the programs described in Chapter 4 of the *CP/M Primer*. The APPLI-CARD's COPYFRMT program, which you've already used, replaces the CP/M FORMAT and SYSGEN programs, and the APPLI-CARD's INSTALL program performs the same functions as CP/M's MOVCPM.

USING CP/M

To use CP/M, you must know how to identify the disk drives, start up your system, recognize CP/M prompts, name files, and use various commands.

DISK DRIVE NAMES

CP/M refers to a disk drive by a letter followed by a colon instead of a slot-drive number. The CP/M drive that corresponds to each Apple drive is shown below:

CP/M Drive	Apple Drive
A:	6,1
B:	6,2
C:	5,1
D:	5,2
E:	4,1
F:	4,2

In this manual, a disk drive is identified by the letter only (for example, drive A).

START UP

You've already learned how to start up your system (Task 4 in Chapter 1). Drive A is always the start-up disk drive. You can use any disk that you have made into a start-up disk.

PROMPTS

CP/M displays a prompt that indicates you are conversing with the operating system. When the system first starts up (boots), you see this prompt:

```
A>
```

The A prompt indicates that the APPLI-CARD CP/M system is ready to accept a command and that all operations will occur on drive A unless you tell the system otherwise. In other words, A is the current (sometimes called currently active or default) disk drive. You can change the current drive by typing the letter of another drive on your system. For example, to make drive B the current drive, type B: RETURN.

If you type a command that CP/M can't execute, you'll see the command displayed on the next line followed by a question mark. For example, if you type PIP after the A prompt and the PIP program is not on the disk in drive A, you'll see this message:

```
PIP?
```

FILE NAMES

A CP/M file name may consist of one to eight characters. To ask for a file that is on a drive other than the current drive, precede the name with the drive letter and a colon (for example, B:INSTALL). A file name often includes a three-character extension indicating the file type. For example, COPYFRMT.COM is a COMMAND file, and HIRESIO.DVR is a DRIVER file. (Driver files are described at the end of this chapter.)

COMMANDS

CP/M has two types of commands: resident and transient. A resident command is part of the CP/M operating system and is always available for use. Here is a list of these commands and their functions.

RESIDENT COMMAND	FUNCTION
DIR	Displays a list of the files in the DIRectory of the currently logged disk drive.
TYPE	Displays the contents of an ASCII text file.
REN	RENames a file on a disk.
ERA	ERAses a file or files from a disk.
SAVE	SAVEs an image of memory on a disk.

See your *CP/M Primer* for detailed descriptions of these resident CP/M commands.

A transient command is read from a disk, executed, and then discarded. A utility program, for example, is executed by typing its name as a transient command. For more information about using the APPLI-CARD utilities, see Chapter 4 in this manual.

Here is a list of the transient commands on your disks and a brief description of their functions:

DISK	TRANSIENT COMMAND	FUNCTION
CP/M Disk	ASM	Executes the CP/M 8080 ASSEMBler.
	DDT	Executes the CP/M Dynamic Debugging Tool.
	DUMP	Displays the contents of a file in hexadecimal format.
	ED	Executes the CP/M File EDITor.
	LOAD	Executes the CP/M Relocating LOADER.
	PIP	Executes the CP/M Peripheral Interchange Program. (Use PIP to copy files from one disk to another.)
	STAT	Executes CP/M STATISTICS program.
	SUBMIT	Executes CP/M commands from a file.
	XSUB	Used in a SUBMIT file.
	ADOSXFER	Executes ADOSXFER APPLI-CARD utility.
Utility Disk	COPYFRMT	Executes COPYFRMT APPLI-CARD utility.
	CLRPBUF	Executes CLRPBUF APPLI-CARD utility.
	CONFIGSV	Executes CONFIGSV APPLI-CARD utility.
	DLDRIVER	Used by the APPLI-CARD's INSTALL program.*
	INSTALL	Executes INSTALL APPLI-CARD utility
	FUNCTION	Executes FUNCTION APPLI-CARD utility.

*The APPLI-CARD uses DLDRIVER.COM to load the drivers from the DRIVERS file. You cannot use this command directly.

See your *CP/M Primer* for detailed descriptions of these transient CP/M commands.

CONTROL KEYS

You can communicate directly with CP/M by using the standard CP/M control keys. Here is a brief description of their functions.

CONTROL KEY	FUNCTION
^C	1. Interrupts the current program. (Depending on how the program is designed, you may return to another part of the program or to CP/M.) 2. Logs in a newly inserted disk.
^E	Moves the cursor to the next line. Useful when typing a long command.
^H	Backspaces (same as back arrow <-).
^J	Inserts line. Can be used to terminate a command (same as RETURN).
^M	Causes a RETURN.
^P	Directs the screen content to the printer. A second ^P discontinues output to the printer.
^R	Retypes the current command line.
^S	Causes the video display to pause. A second ^S resumes the display.
^U	Deletes the current line. The cursor appears on the next line down.
^X	Deletes the current line. The cursor moves to the beginning of the current line.
^Z	Ends input. Used by some of the CP/M transient commands.

See your *CP/M Primer* for more detailed descriptions of these control keys.

You must use **either** DOSRDSK or NRDRDSK to use the APPLI-CARD as a RAM disk under Apple DOS. Your choice will depend on the requirements of the programs you are running under Apple DOS.

The PCPICPM file contains the CP/M operating system software. It is used by the installation program. You will never use it directly.

The DUMP.ASM file contains an example of a CP/M assembly language program. If you intend to write programs, you may want to list the DUMP.ASM file using the TYPE command of CP/M.

CHAPTER 3 ADDITIONAL FEATURES FOR APPLE II AND II PLUS OWNERS

If you have installed the APPLI-CARD in an Apple II, Apple II Plus, or any Apple that is not equipped with an 80-column card, you must know about the SoftVIDEO features of the APPLI-CARD explained in this chapter.

SoftVIDEO is a APPLI-CARD driver that controls the functions of your Apple monitor and keyboard.

If you have an Apple IIe with an 80-column card, you cannot use SoftVIDEO, and you should skip this chapter. If, however, you have an Apple IIe without an 80-column card, you should read this chapter.

The SoftVIDEO driver (hereafter called simply SoftVIDEO) performs the following functions:

- Provides a method for you to type (and see displayed) printable characters that are not normally available on the Apple. In this manual, these are called the SoftVIDEO special characters.
- Allows you to scroll the Apple's 40-column screen horizontally so you can look at a "window" of text or data that may be up to 255 columns wide. The scrolling can be automatic (following the cursor) or manually controlled. With this feature, you can type long commands or lines of text and display them. You can also use software that requires more than 40 columns without an 80-column card.

RESET OPERATIONS

By typing specific characters immediately after pressing CTRL (^) and RESET simultaneously, you can perform the following functions:

- ^ RESET C Clears the printer buffer. (Refer to Chapter 4 of this manual.)
- ^ RESET M Passes control to the current Apple Monitor program. An asterisk (*) prompt is displayed. (See your Apple documentation for a description of the Monitor program.)
- ^ RESET R Restarts (reboots) the system.

DRIVERS

A driver is a program CP/M uses to control a device such as your terminal or disk drive. The APPLI-CARD includes the following drivers:

- APLFLPY The APpLe FLopPY driver which is needed to control your Apple floppy disk drives.
- BUFFER A printer buffer driver that allows you to use part of your Apple memory as a buffer for your printer. You should use BUFFER if you have a parallel printer or a serial printer that uses X-ON/X-OFF protocol.
- ETXBUF A printer buffer driver that allows you to use part of your Apple memory as a buffer for your printer. You should use ETXBUF if you have a serial printer that uses the ETX/ACK protocol.
- FAST2E80 A driver (for the Apple IIe only) that increases the speed of screen updating by more than 50%.
- HIREGIO The HIgh RESolution I/O Mode driver that controls 70-column screen mode.
- SFTVIDEO The SOFTVIDEO driver described in Chapter 3 of this manual.

DRIVERS FILE

Both the CP/M and Utility Disks have a DRIVERS file. The file initially contains the following drivers:

DRIVERS on CP/M Disk	APLFLPY.DVR BUFFER.DVR SFTVIDEO.DVR
----------------------	---

DRIVERS on Utility Disk	APLFLPY.DVR BUFFER.DVR HIRESIO.DVR SFTVIDEO.DVR
-------------------------	--

The HIRESIO driver on the Utility Disk is used to start up your system in 70-column mode. In this mode, the screen is 70 columns by 24 lines.

You can use the INSTALL utility program to delete the drivers you do not need or to add a driver for a device such as a hard disk drive. If you have an Apple IIe, you should add the FAST2E80 driver to your DRIVERS file. If you are using a serial printer that uses ETX/ACK protocol, you should delete BUFFER from the DRIVERS file and add ETXBUF. The procedure for modifying the DRIVERS file is described in Chapter 4 of this manual.

OTHER CP/M AND UTILITY DISK FILES

When you list a directory of your CP/M and Utility Disks, you'll see four more files: DOSRDSK, NRDRDSK, PCPICPM, and DUMP.ASM.

The DOSRDSK file on the CP/M disk is a program that allows you to use the 64K of RAM on your APPLI-CARD as a RAM disk under Apple DOS. You can execute DOSRDSK **only** when you are operating under control of the Apple DOS system. The DOSRDSK program relocates itself between the DOS 3.3 buffers and DOS 3.3. (For more information about how DOS uses memory, refer to your Apple DOS manual.) c--> Chap 4

The NRDRDSK file is another version of the DOSRDSK program that does not relocate itself when it is loaded into memory. It is placed in the DOS 3.3 area overlaying the INIT command program.

SPECIAL CHARACTERS

Your Apple has 96 printable characters, some of which do not appear on your keyboard. You can print these special characters by pressing SHIFT and ESCape simultaneously and then another key. The following chart lists the special characters, the keys that produce them, and the characters that are displayed on the screen if you are using 40-column mode. (In 70- or 80-column mode, the special characters appear in their normal form.)

TO CREATE THIS CHARACTER ON PRINTER:	PRESS SHIFT ESCAPE FOLLOWED BY THIS KEY:	40-COLUMN MODE WILL DISPLAY THIS CHARACTER:
{	8 or ((
}	9 or))
[< or ,	[
]	> or .]
	! or 1	!
~	" or 2	"
_	-	_
\	/	\
.	,	.
@	SHIFT P	@
^	SHIFT N	^

Forty-column mode displays the parentheses, exclamation point, and single and double quotation marks in inverse video.

NOTE: These special characters work only on Apples with a Shift Modification Device.

That's all there is to know about these characters. You do not have to configure them, and you can't change them.

SOFTVIDEO FUNCTIONS

To perform a SoftVIDEO function, you must be in the **Escape mode** of SoftVIDEO. If you have an Apple II or II Plus, you enter the Escape mode by pressing **SHIFT ESCape** and exit by pressing **^X**. If you have an Apple IIe without an 80-column card, you enter Escape mode by holding down the **OPEN APPLE** key while you press **ESCape**.

REMEMBER

If you have an Apple IIe with an 80-column card, you cannot use SoftVIDEO, and you should skip this chapter.

Once you are in Escape mode, you may perform the following functions:

- horizontal scrolling
- setting various toggle switches that control the display characteristics
- changing the Escape mode character, the rubout character, the click volume, or the screen width. **NOTE:** If you are operating in 40-column mode, 70-column mode, and in some cases, 80-column mode, you can press **^D** to display a help screen. This screen lists the keys you press to activate SoftVIDEO functions.

Scrolling

The scrolling keys are available exclusively in the standard Apple 40-column mode. They are not available in 70- or 80-column mode. Here is a list of the scrolling keys:

SCROLLING KEYS

KEYS	FUNCTION
^B	Scrolls to the first column
<-	Scrolls to the left (back arrow)
->	Scrolls to the right (forward arrow)
^A	Scrolls to the previous 40 columns
^F	Scrolls to the next 40 columns

The Toggle Functions

The six toggle functions enable you to alter some of the operating characteristics of the display. Each toggle function has a preset (default) setting that is in effect when you start your APPLI-CARD system.

In Escape mode, you can make a short-term change of a toggle switch setting (that is, a change that stays in effect until your system is turned off or restarted).

The following table lists the toggle functions and the keys you use to activate them. The default settings provided with your APPLI-CARD initially are also listed. To change the setting back to its previous value, press the same key combination.

REMEMBER

You must be in Escape mode (press SHIFT ESCape) to activate a toggle function.

TOGGLE SWITCH
KEYS

KEYS	FUNCTION	DEFAULT
^L	Turns Shift Lock on or off	OFF
^V	Turns Uppercase as Inverse on or off	OFF
^Z	Turns Auto Scroll on or off	ON
^I	Turns Shift Modification on or off	ON
^O	Turns Lowercase Modification on or off	OFF
^Q	Turns Escape Mode Indicator on or off	ON

Only Shift Lock (^L) and Shift Modification (^I) are applicable in 70- and 80-column modes.

SHIFT LOCK

To type both upper and lowercase letters, Shift Lock must be OFF. When it is OFF, every character you type will be in lowercase unless you deliberately type an uppercase character by pressing the SHIFT key and the character key at the same time.

You can also type uppercase characters by pressing SHIFT ^L to turn Shift Lock ON. This action produces the same result as pressing SHIFT ESCape (to enter Escape mode) followed by ^L and then pressing ^X (to exit Escape mode). The first method is provided as a convenience so you don't have to enter and exit Escape mode.

UPPERCASE AS INVERSE

If Uppercase as Inverse is ON, the uppercase letters are displayed in inverse video (dark letters on a light background). All letters still appear in uppercase, but true capitals are highlighted in inverse video.

AUTO SCROLL

The Auto Scroll function controls automatic horizontal scrolling. If it is ON, the display will scroll automatically when the cursor moves beyond the left or right edge of the screen. If it is OFF, you must manually scroll, using the scroll function keys.

SHIFT MODIFICATION

The Shift Modification function activates or deactivates the Shift Modification Device you installed earlier. It is ON by default. You would turn it OFF only if you have an early model of Apple that requires soldering a shift modification device and you choose not to do so.

LOWERCASE MODIFICATION

The Lowercase Modification function should be ON if you already have hardware that permits upper-and lowercase letters to be displayed through Read Only Memory (ROM)

ESCAPE MODE INDICATOR

This Indicator appears as an inverse video box near the lower right-hand corner of the display when you are in Escape mode. If you don't want it displayed, turn this function OFF.

Altering Other SoftVIDEO Characteristics

You can change four other elements in Escape mode: the Escape mode character, the rubout character, the click volume, and the screen width.

ESCAPE MODE CHARACTER

You usually enter Escape mode by pressing SHIFT ESCape. You can assign a different key to perform this function by pressing SHIFT ESCape (to enter the Escape mode) and then ^E followed by the key you want to use to replace SHIFT ESCape. For example, you can press ^E+. The next time you want to be in Escape mode, you simply type +.

CAUTION

Do not select a sequence that includes the ESCape key.

RUBOUT CHARACTER

The default setting for the rubout (back delete) key is $\wedge @$. To change the setting, press SHIFT ESCape (to enter Escape mode) and then $\wedge R$ followed by the key you want to use. For example, you type $\wedge R \wedge H$ if you want $\wedge H$ to delete the previous character.

NOTE: When Shift Modification is ON and you have the single-wire hardware shift key modification installed, you do not have to enter Escape mode to generate a rubout. You can press H or SHIFT \leftarrow (back arrow) instead.

CLICK VOLUME

The APPLI-CARD system generates a key-click to give you audible feedback while you type. If you want to change the volume, press SHIFT ESCape (to enter Escape mode) and then one of the following keys:

$\wedge C \leftarrow$ Lowers volume

$\wedge C \rightarrow$ Raises volume

The volume level is adjustable from 0 (silent) to 10 (loud). The default setting is 2. The help screen displays the current setting each time you modify the click volume.

SCREEN WIDTH

Even though an Apple without an 80-column card displays only 40 columns at a time, the true screen width (viewed by scrolling) may be greater than 40 columns. To change the default screen width, which is 40, press SHIFT ESCape (to enter Escape mode) and then one of the following keys:

$\wedge W \leftarrow$ Reduces screen width

$\wedge W \rightarrow$ Increases screen width

The possible screen sizes are 40, 80, 132, 180, 220, and 255 columns. The help screen displays the current setting each time you modify the screen size.

NOTE: You can use the CONFIGSV program to make a long-term change to some of these SoftVIDEO features, that is, to make a change that will still be in effect the next time you turn your system on. c \rightarrow Chap 4

CHAPTER 4 ADVANCED FEATURES: CUSTOMIZING THE APPLI-CARD

The APPLI-CARD's software allows you to customize your computer for your particular needs. In this chapter you'll find instructions for performing a variety of tasks:

- Using part of your Apple memory as a printer buffer
- Increasing the speed of screen operations on the Apple IIe
- Assigning functions to function keys
- Customizing (configuring) the SoftVIDEO driver to your particular Apple system

You may wish to read the additional technical information in Appendix D before tailoring the APPLI-CARD operation to your own specifications.

USING APPLE MEMORY AS A PRINTER BUFFER

Your APPLI-CARD has two drivers which allow you to use your Apple's memory as a printer buffer. If you print a file that is smaller than the printer buffer, you can then run other programs without having to wait for the printing to finish. The use of a printer buffer can save you time.

The two printer buffer drivers with your APPLI-CARD are BUFFER and ETXBUF. You only need one of these. Use BUFFER if you have a parallel printer or a serial printer that requires X-ON/X-OFF communications protocol. Use ETXBUF if you have a serial printer that requires ETX/ACK communications protocol. (You should consult your printer manual to determine what type of printer you have.) Since the BUFFER driver is applicable to more printers (all parallel and some serial printers), it is preinstalled in the DRIVERS file for you.

BUFFER SIZE

The printer buffer driver (either BUFFER or ETXBUF) must be the last driver in the DRIVERS file. Any memory space that is not taken up by the drivers themselves is available for use as a printer buffer. Therefore, depending on what other drivers are installed in your system, the printer buffer may have as few as 16K bytes. If you have installed only the drivers supplied with the APPLI-CARD, the approximate printer buffer size will be as follows:

- 16K bytes in an Apple II or II Plus without a Language Card
- 32K bytes in an Apple II or II Plus with a Language Card or in an Apple IIe
- 80K bytes in an Apple IIe with an Extended Memory 80-Column Card

Note: These are approximate sizes. The exact size of the printer buffer for your particular configuration is shown when you first start up your system.

CLEARING THE BUFFER

If you are running a program and you wish to clear the buffer while printing (in order to stop printing the information stored there), you should press OPEN APPLE and SOLID APPLE (or game paddle 1 and 2) simultaneously. This procedure will not affect the operation of any program you are running at the time. There are two additional ways to clear the printer buffer if you are in CP/M (that is, if you see the A > or B >). You can either press CTRL and RESET simultaneously followed immediately by the letter C or you can type CLRPBUF followed by RETURN. (The CLRPBUF command file must be on the current disk.)