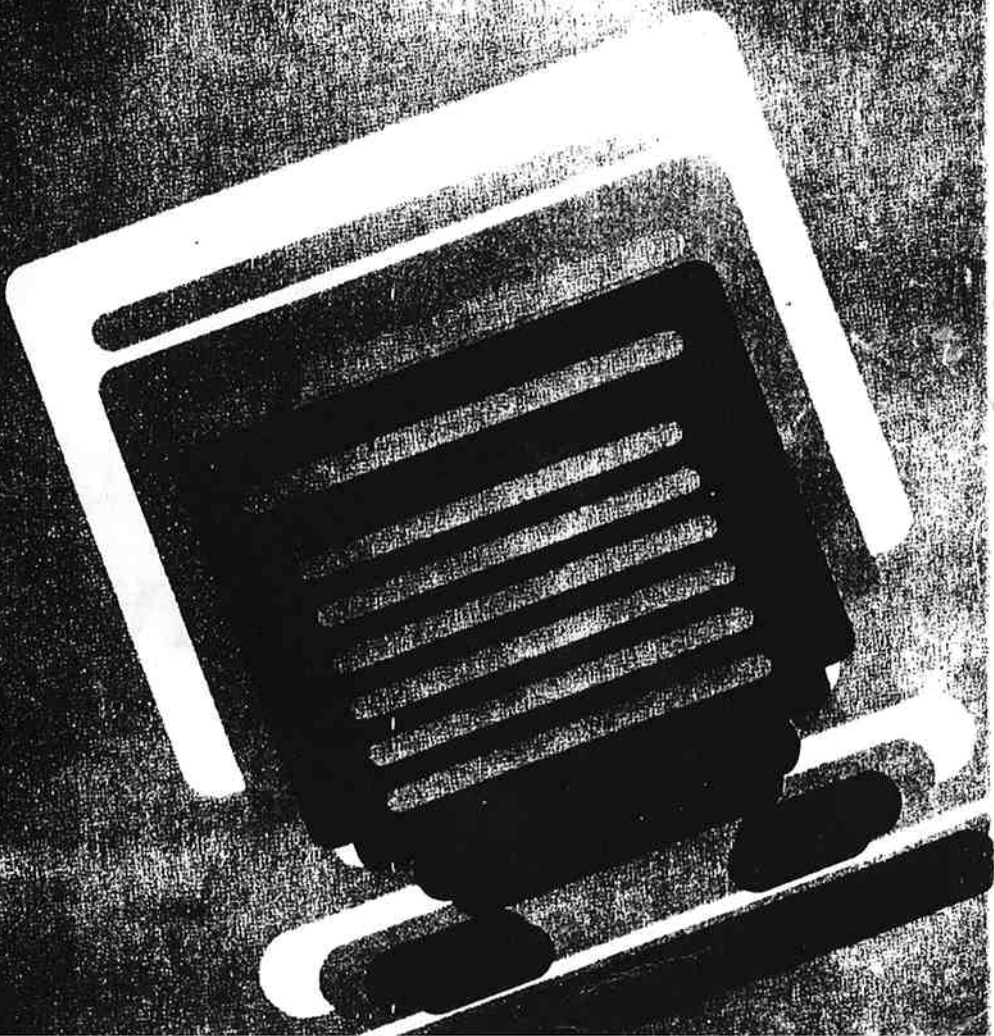
Personal Computer Products, Inc.

APPLI-CARD™

Installation and User's Manual

FOR APPLE II COMPUTERS



APPLI-CARD™ 2.0

Installation and User's Manual

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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TRADEMARKS

DISCLAIMER

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	Utility Disk
ADOSXFER.COM	APLFLPY.DVR
ASM.COM	BUFFER.DVR
CLRPBUF.COM	CONFIGSV.COM
COPYFRMT.COM	DLDRIVER.COM
DDT.COM	DRIVERS
DOSRDSK	ETXBUF.DVR
DRIVERS	FAST2E80.DVR
DUMP.ASM	FUNCTION.COM
DUMP.COM	HIRESIO.DVR
ED.COM	INSTALL.COM
LOAD.COM	SFTVIDEO.DVR
NRDRDSK	PCPICPM
PIP.COM	
STAT.COM	
SUBMIT.COM	
XSUB.COM	

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.

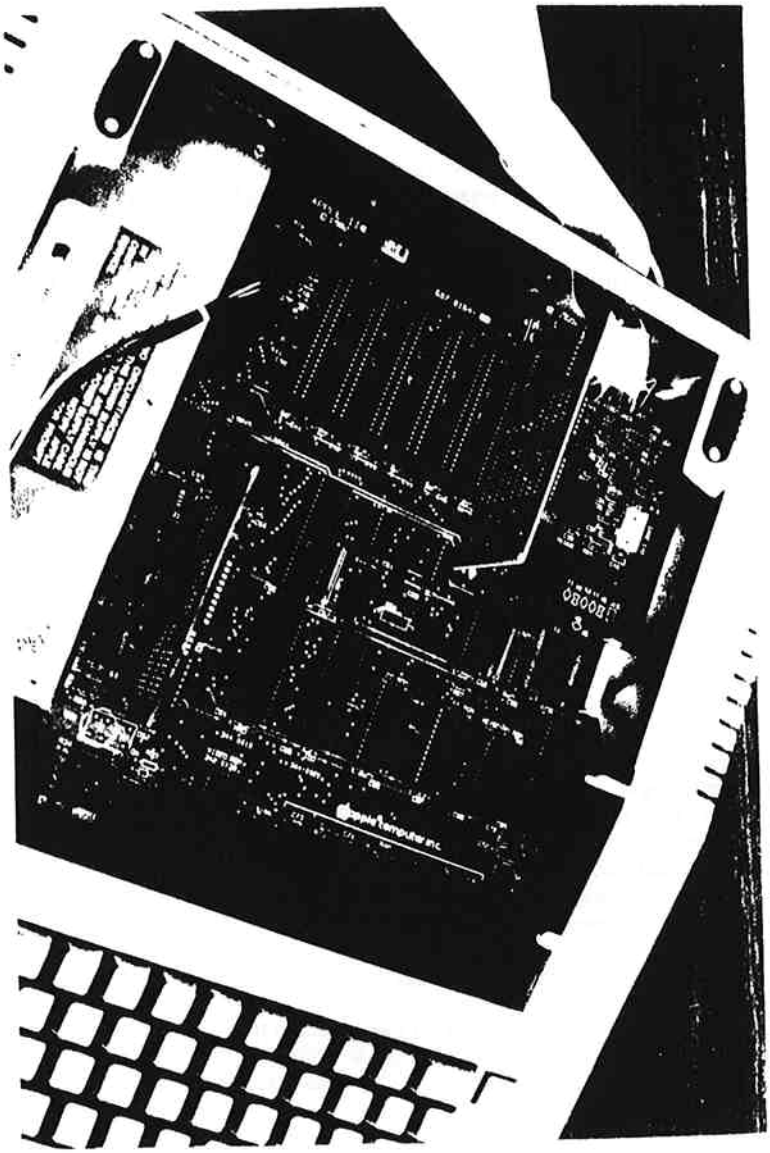


FIGURE 1. APPLE IIE BOARD SLOT LOCATIONS AND THE APPLI-CARD INSTALLATION.

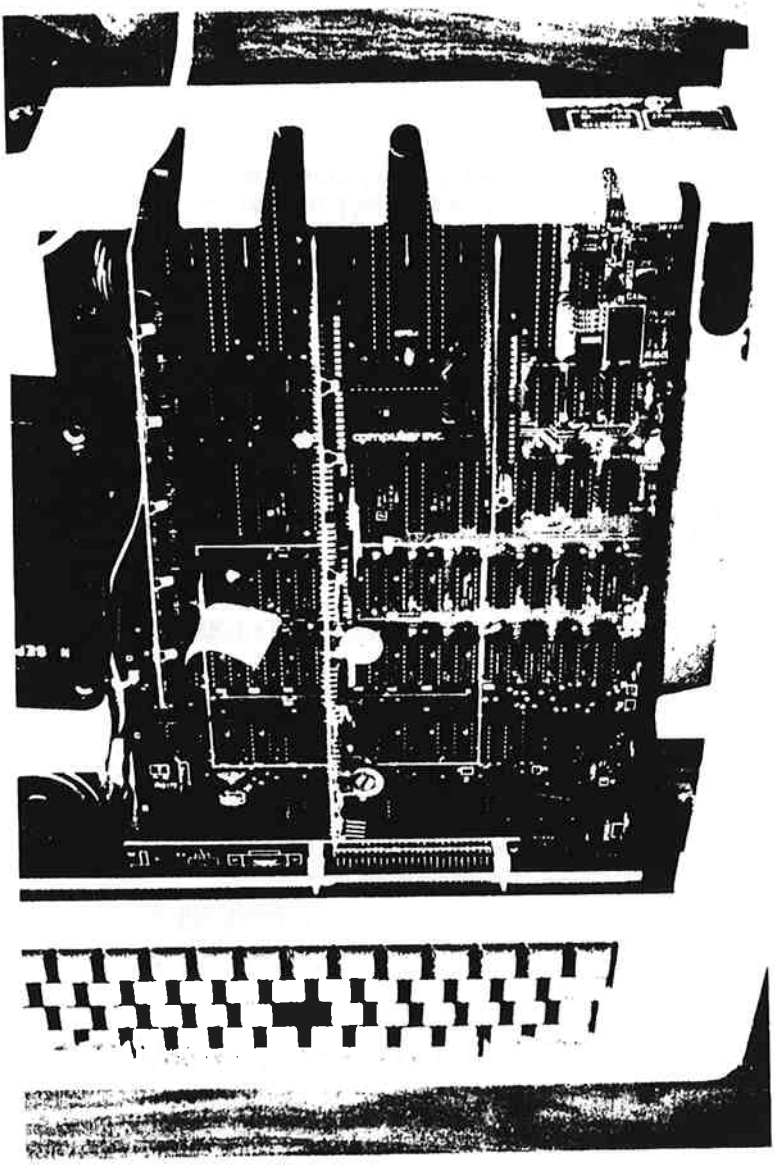


FIGURE 2. APPLE II AND II PLUS BOARD SLOT LOCATIONS AND THE APPLI-CARD INSTALLATION

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.

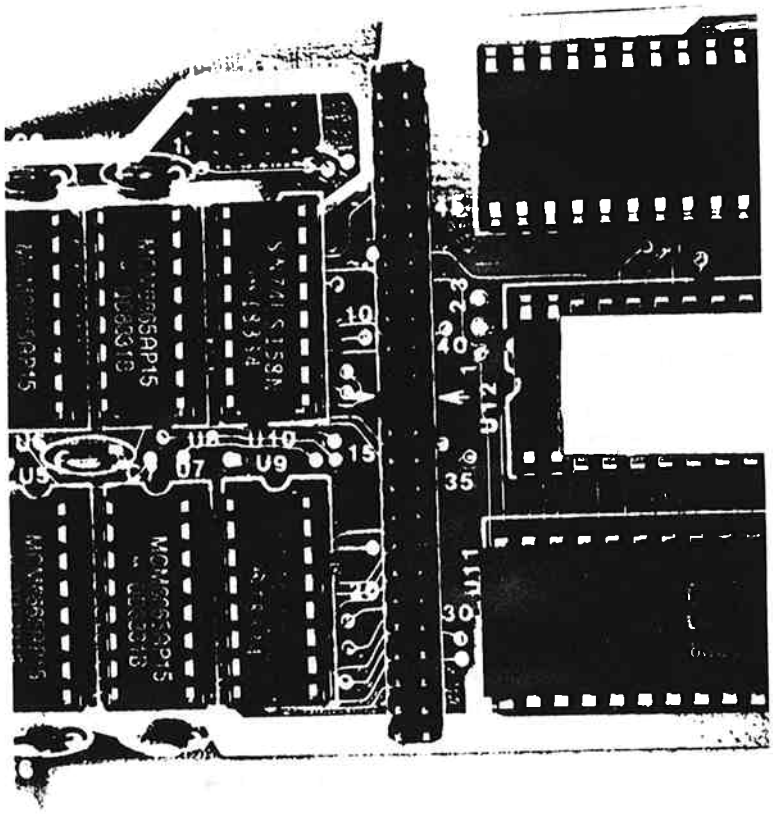


FIGURE 3. EXPANSION BOARD SHOWING LOCATION OF JUMPER

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.

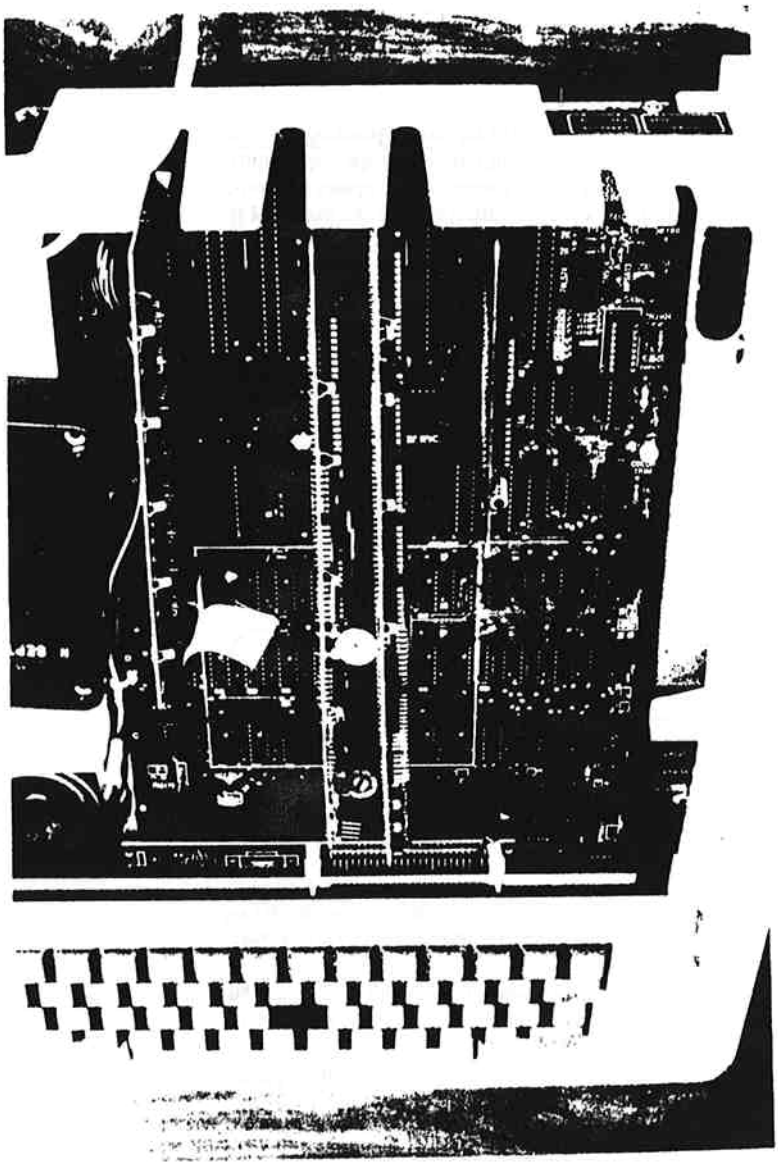


FIGURE 4. KEYBOARD ENCODER CARD SHOWING SMD CONNECTIONS.

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, 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 C

```
Copy CP/M SYSTEM ONLY

Enter SOURCE drive:
```

Step 4 TYPE A

```
Enter DESTINATION drive:
```

Step 5 TYPE B

```
Place 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.
	COPYFRMT	Executes COPYFRMT APPLI-CARD utility.
	CLRPBUF	Executes CLRPBUF APPLI-CARD utility.
Utility Disk	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%.
HIRESIO	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 fuction 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 ^@. To change the setting, press SHIFT ESCape (to enter Escape mode) and then ^R followed by the key you want to use. For example, you type ^R^H if you want ^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 <— (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:

^C<–	Lowers volume
^C–>	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:

^W<–	Reduces screen width
^W–>	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 –> 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.)

If you want to use the printer buffer and have a parallel printer or a serial printer that uses X-ON/X-OFF communications protocol, you do not have to do anything except leave the BUFFER driver in the DRIVERS file. If you need ETXBUF instead of BUFFER, you will have to use the installation program to replace BUFFER with ETXBUF in the DRIVERS file. If you have a hardware printer buffer on your system and you want to use the Apple memory for some other purpose, you can delete the BUFFER driver from the DRIVERS file, using the installation program. c – > Chap 5

INCREASING THE SPEED OF THE APPLE IIE SCREEN

If you have an Apple IIe with an Apple 80-column card, you can increase the speed of screen operations by at least 50% using the APPLI-CARD's FAST2E80 driver. This driver increases the speed of screen updating but does not affect a program's actual execution time. The FAST2E80 driver can't be used with an Apple II or II Plus.

To obtain faster operation of your Apple IIe screen, all you have to do is add FAST2E80.DVR to the DRIVERS file using the APPLI-CARD's installation program. c – > Chap 5

The FAST2E80.DVR driver is not preinstalled in the DRIVERS file because Apple II and II Plus systems will not operate properly if FAST2E80 is installed.

DEFINING FUNCTION KEYS

FUNCTION BUTTONS AND KEYS

Function keys can save you time. Instead of typing an entire command or program name, you simply press two keys at once. One key is the "function button" — the OPEN or SOLID APPLE on the Apple IIe (game paddle 1 or 2 on other Apples). The other is the function key. Suppose you wanted to see your directory. You could press OPEN APPLE and **D** simultaneously instead of typing **DIR**. But first you would have to "define" the D key, that is, assign the directory function to it.

FUNCTION STRING

When you define your function keys, you'll be asked to specify a "function string." In the example above, the string is **DIR**. If you add **^M** (which is the same as **RETURN**) to the string, you can avoid pressing RETURN each time you press **D** to see your directory. (In the following pages, you'll find detailed instructions for defining function keys.)

BUFFERS

When you've defined all the function keys you want, the definitions are stored in buffers.

You may define two sets of functions keys, one in Buffer 1 and one in Buffer 2. Only one set can be active at a time. If you define SOLID APPLE **D** in Buffer 1, it will not work when Buffer 2 is active. It's best to reserve Buffer 1 for function keys to be used within specific application programs and Buffer 2 for function keys to be used with the operating system. Then you can be sure that function keys in the application programs will not interfere with those in use outside the programs.

Each buffer is 256 bytes (128 characters) long. Therefore, you can define a maximum of 128 one-character function keys, one function key 128 characters long, or any combination of function keys of varying lengths that fit into the buffer.

SHORT-TERM FUNCTION KEYS

A short-term function key is only in effect until you turn off your system (or restart it). To define short- term function keys, you use the FUNCTION program which is on the Utility Disk.

LONG-TERM FUNCTION KEYS

A long-term function key stays in effect until you change its definition or delete it from the buffer. You can turn your system off and on or restart it, and all long-term function keys will still be defined.

You use the CONFIGSV program to define long-term function keys. With this method, you save the definitions in the SoftVIDEO driver and install them in the DRIVERS file. Function keys defined in this way will be available each time you turn on your system. For instructions on using the CONFIGSV program, see "Customizing the SoftVIDEO Driver" in this chapter.

USING THE FUNCTION PROGRAM

You can add, change, or delete a function key definition. You can also select the function key buffer that you want to use.

STEP 1 Insert the Utility Disk in drive A (or in the current drive).

STEP 2 PRESS ^C

STEP 3 TYPE **FUNCTION** RETURN

```
FUNCTION KEY MENU
Version 1.5 July 29, 1983

Function Buffer 1
Function button,Function key:Function string
-----------------------------------------------
No function keys are defined
-----------------------------------------------

A = Add or Change a Function Key
B = Delete a Function Key
C = Delete ALL Function Keys
D = Select Function Key Buffer 2

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

The Function Key Menu tells you the number of the current buffer and displays any function keys that are currently defined. You can select one of the four options.

STEP 4 TYPE the letter corresponding to the option you want. The steps you follow to complete each option are shown on the following pages.

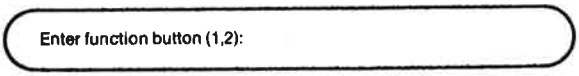
NOTE: At this time, your function key buffer will most likely be empty. Later, if you define long-term function keys using the CONFIGSV program, these keys will be displayed as part of the current buffer content when you use the FUNCTION program.

You can delete long-term keys using FUNCTION, but it will be a temporary deletion. When you start up or restart your system, the long-term keys will reappear. The same thing will happen if you change them in any way. Their original definition will reappear after you turn your system off and on (or restart it).

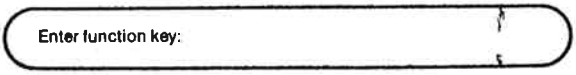
Option A — Add or Change a Function Key

A
FUNCTION
KEY MENU

When you select option A at the Function Key Menu, you see the Add or Change a Function Key screen with the current buffer content displayed at the top. Under the menu is a description of function buttons 1 and 2 and this prompt:



STEP 1 TYPE **1** or **2** (1 = OPEN APPLE or game paddle 1 and 2 = SOLID APPLE or game paddle 2)

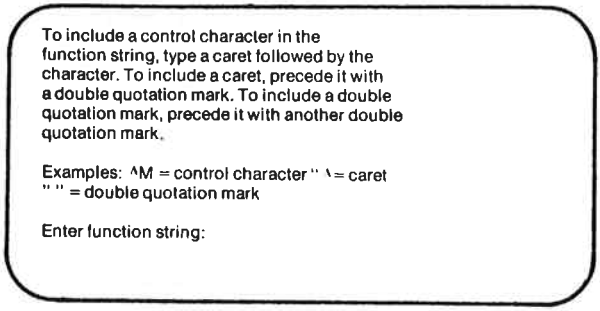


STEP 2 PRESS the key that you want to define. For example, if you want to define OPEN APPLE D, you type **1** in step 1 and **D** in step 2.

REMEMBER

You may use any character except ESCape. Upper and lowercase of the same character are considered equivalent. So, if you specify D as the function key, you can type "D" or "d" when you use the function key later.

STEP 3



TYPE one or more characters to specify the function you want to activate and then press RETURN.

REMEMBER

If you type **COPYFRMT^M**, the COPYFRMT program will be executed when you press the function button and function key specified in steps 1 and 2. If you omit **^M** from the function string, you will have to press RETURN after pressing the function button and function key.

In order to include a control key in the function string, you type a caret symbol followed by a character as shown in the previous example. (The use of a caret symbol is necessary because pressing the control key itself will cause the system to activate the control function.)

To include the caret key itself in the definition you must type "^ (a double quotation mark followed by a caret). To include a double quotation mark in a definition, you must type " " (two double quotation marks).

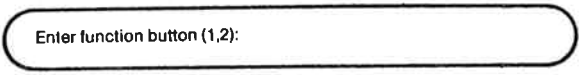
After you complete step 3, you will be returned to the Function Key Menu. Your new function key definition will be displayed as part of the currently active buffer.

NOTE: The steps for changing a function key are exactly the same as those for adding a function key. You type the button number and the key that you want to redefine, and then you type a new function string.

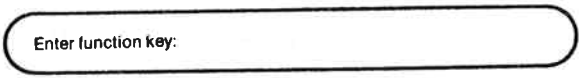
Option B — Deleting a Function Key

B
FUNCTION
KEY MENU

When you select option B at the Function Key Menu, you see the Delete a Function Key screen which contains this prompt:



TYPE the button number of the function key you want to delete



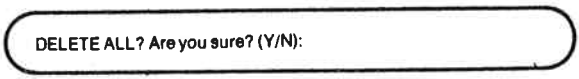
PRESS the function key RETURN

The function key is deleted and you are returned to the Function Key Menu.

Option C — Deleting All Function Keys

C
FUNCTION
KEY MENU

When you select option C at the Function Key Menu, you see the Delete ALL Function Keys screen with the function keys defined in the current buffer displayed at the top. Under the menu is this prompt:



TYPE Y (for Yes) or N (for No)

If you type Y, all the function key definitions will be deleted. In either case, you will be returned to the Function Key Menu.

Option D — Selecting the Current Buffer

D
FUNCTION
KEY MENU

When you select option D at the Function Key Menu, you see the Function Key Menu with a new current buffer. The buffer is changed from Buffer 1 to Buffer 2 or from Buffer 2 to Buffer 1. The function keys that you add, change, or delete are the ones defined in the current buffer. When you exit the FUNCTION program, the set of function keys defined in the current buffer will be active.

DEFINING FUNCTION KEYS IN A TEXT FILE

You can create a text file (using an editor) that contains the definitions of one or more function keys. When you want these definitions to be in effect, type FUNCTION followed by the name of the file containing the definitions.

The commands you use in the text file are as follows:

TEXT FILE COMMANDS	FUNCTION
SELECT 1	Makes the current buffer 1.
SELECT 2	Makes the current buffer 2.
DELETE ALL	Deletes all function keys from the current buffer.
B,K:function string	Defines (or changes) a function key. (B is the button number and K is the key character.) For example: 1,D:DIR ^M

This feature can be useful if you want to have several sets of short-term function keys. When you start up your system or when you want to change the function keys you are using, you can simply type FUNCTION followed by the name of the file containing the function key definitions, and the keys will be defined.

Here is an example of a text file containing function key definitions:

```
SELECT 1
DELETE ALL
1,1:DIR^M
1,P:PIP B:DRIVERS=A:DRIVERS^M
1,3:ERA
2,1:WS^M
2,C:COPYFRMT^M
```

Suppose this text is saved in a file named KY. If you type **FUNCTION KY** after starting your system, five function keys are ready to use. Pressing SOLID APPLE and C, for example, would start the CopyFormat program.

REMEMBER The FUNCTION.COM file has to be on the current disk.

CUSTOMIZING THE SOFTVIDEO DRIVER

Before you follow these steps, read the description of SoftVIDEO in Chapter 3.

REMEMBER After you make the changes you want, you must save the SoftVIDEO driver. Then you must run the installation program to install the revised SoftVIDEO driver in the DRIVERS file.
c — > Chap 5

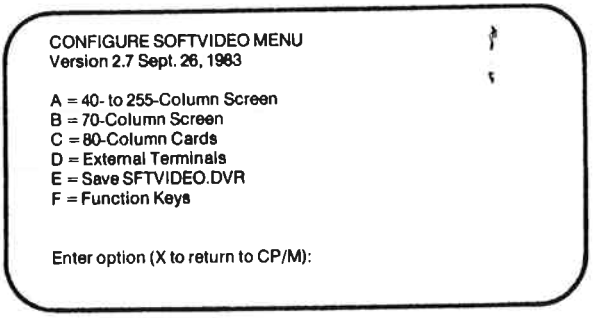
The CONFIGSV program, SFTVIDEO.DVR, and the FUNCTION program are on the Utility Disk. If this is your start- up disk, you can use the CONFIGSV program without changing disks. If your start-up disk is the CP/M Disk, you can do one of the following:

- After starting your system, remove the CP/M Disk, insert the Utility Disk in drive A, and press ^C.
- Insert the Utility Disk in drive B and make it the current disk by typing **B:** in response to the A prompt.

STEP 1 Insert the Utility Disk in the current drive (if it is not already there)

STEP 2 PRESS ^C

STEP 3 TYPE CONFIGSV RETURN



Menu options A through D allow you to change SoftVIDEO characteristics for a particular screen mode. You use option E to save the modified SoftVIDEO driver when you are finished. Option F allows you to define long-term function keys.

The menus that are displayed when you select each option are described in the following pages.

STEP 4 Select the option you want to use by typing the appropriate letter. The next menu will be displayed.

ENTERING VALUES When you define Escape mode or Rubout characters and specify software and hardware definitions, decimal numbers from 0 to 255 must be preceded by a pound sign (#). Examples: #10, #125.

Hexadecimal numbers from 0 to FF must be preceded by a dollar sign ($). Examples: $A0, $8F

Enter control characters by typing a caret (^) followed by a character. The character may be an uppercase letter, @, [, /,], ^, or -.

When you have finished making changes to your SoftVIDEO driver and have returned to the Configure SoftVIDEO Menu, you must choose option E to save your revised SFTVIDEO.DVR file. If you exit the CONFIGSV program without saving this file, you will see the following message:

```
SFTVIDEO.DVR has been modified.
Do you want to save it? (Y or N):
```

TYPE **Y** if you want to save the revised driver.

Option A — 40- to 255-Column Screen

A
CONFIGURE
SoftVIDEO MENU

When you select option A at the Configure SoftVIDEO Menu, you see this menu:

```
40- TO 255-COLUMN SCREEN

A = Shift Lock                          = OFF
B = Uppercase as Inverse                = OFF
C = Shift Modification                  = ON
D = Lowercase Modification              = OFF
E = Auto Scroll                         = ON
F = Escape Mode Indicator               = ON
G = Escape Mode character               = ^[(27,$1B)
H = Rubout character                    = ^@(0,$00)
I = Click Volume                        = 2
J = Screen Width                        = 80

Enter option (X to return to Configure SoftVIDEO Menu):
```

The 40- to 255-column mode allows you to use the standard Apple 40-column screen mode to run programs that require 80 columns for display. To do so, you use the SoftVIDEO features described in Chapter 3. If you want to define long-term settings for SoftVIDEO features, you use this menu.

TYPE the letter of the feature you want to change

The following chart indicates what you see when you select a particular feature. It also indicates what you type (if the message displayed for the feature does not give you that information). Note that the current setting of a feature will depend on what you set last. The defaults set when you receive your APPLI-CARD are shown here.

OPTION	ACTION
A	SEE Current Shift Lock = OFF Enter 0 = OFF and 1 = ON <RET>:
B	SEE Current Uppercase as Inverse = OFF Enter 0 = OFF and 1 = ON <RET>:
C	SEE Current Shift Modification = ON Enter 0 = OFF and 1 = ON <RET>:
D	SEE Current Lowercase Modification = OFF Enter 0 = OFF and 1 = ON <RET>:
E	SEE Current Auto Scroll = ON Enter 0 = OFF and 1 = ON <RET>
F	SEE Current Escape Mode Indicator = ON Enter 0 = OFF and 1 = ON <RET>
G	SEE Characters may be entered as: space to tilde for printable characters ^@ to ^_ for control characters #0 to #255 for decimal $0 to $FF for hexadecimal Current Escape Mode character = ^[(27,$1B) A value above 127 ($7F) will turn off Escape mode. Enter a character <RET>:
	TYPE the character you want to use to enter Escape mode. Use a caret followed by the desired key to define a control character as the Escape mode character.

OPTION		ACTION
H	SEE	Characters may be entered as: space to tilde for printable characters ^@ to ^_ for control characters #0 to #255 for decimal $0 to $FF for hexadecimal Current Rubout character = ^@ (0,$00) A value above 127 ($7F) will turn off Escape mode. Enter a character <RET>:
	TYPE	the character you want to use as the Rubout character. Use a caret followed by the desired key to define a control character as the Rubout character.
I	SEE	Current Click Volume = 2 Enter volume 0 to 10:
	TYPE	a number from 0 (for silent) to 10 (for loud)
J	SEE	Current Width = 80 Enter 40,80,132,180,220,255:
	TYPE	the number indicating the maximum width of the screen you want. The default is 80.

The message "space to tilde" that is displayed for features G and H means that you can use any printable character in between space ($20) and tilde ($7E) in the ASCII character sequence. Appendix D contains an ASCII conversion chart that shows the ASCII character sequence.

The message "^@ to ^_ " means that you type a caret followed by a character between @ ($40) and _ ($5F) in the ASCII character sequence to include a control character in your definition.

The message "$0 to $FF" means that you may use a hexadecimal number to define the key if you precede it with a dollar sign.

To return to the Configure SoftVIDEO Menu, type **X** and press RETURN.

B
CONFIGURE
SoftVIDEO MENU

Option B — 70-Column Screen

When you select option B at the Configure SoftVIDEO Menu, you see this menu:

```
70-COLUMN SCREEN MENU

To incorporate the 70-Column Screen into your system configure the
SFTVIDEO.DVR items listed below. Then, when you are installing
SFTVIDEO.DVR, which must be driver number 1, also install
HIRESIO.DVR as driver number 2. HIRESIO.DVR must be the second
driver because it uses Apple memory from locations $2000 through
$7000+.

A = Shift Lock                  = OFF
B = Shift Modification          = ON
C = Escape Mode Character       = ^[(27,$1B)
D = Rubout Character            = ^@(0,$00)
E = Click Volume                = 2

Enter option (X to return to Configure SoftVIDEO Menu):
```

Use the 70-Column Screen Menu to define long-term SoftVIDEO features that are applicable to the 70-column high-resolution graphics mode.

The following table indicates what you see if you select a particular feature:

OPTION	ACTION
A	SEE Current Shift Lock = OFF Enter 0 = OFF and 1 = ON <RET>:
B	SEE Current Shift Modification = ON Enter 0 = OFF and 1 = ON <RET>:
C	SEE Characters may be entered as: space to tilde for printable characters ^@ to ^— for control characters #0 to #255 for decimal $0 to $FF for hexadecimal Current Escape Mode character = ^[(27,$1B) A value above 127 ($7F) will turn off Escape mode. Enter a character <RET>:
D	SEE Characters may be entered as: space to tilde for printable characters ^@ to ^_ for control characters #0 to #255 for decimal $0 to $FF for hexadecimal Current Rubout character = ^@(0,$00) A value above 127 ($7F) will turn off Rubout translation Enter a character <RET>:
E	SEE Current Click Volume = 2 Enter volume 0 to 10: TYPE a number from 0 (for silent) to 10 (for loud)

To return to the Configure SoftVIDEO Menu, type **X** and press **RETURN**.

C
SoftVIDEO
MENU

Option C — 80-Column Cards

This option does not apply if you are using an Apple IIe with an Apple 80-column card.

When you select option C at the Configure SoftVIDEO Menu, you see this menu:

```
80-COLUMN CARD MENU

When using 80-column cards, configure the SFTVIDEO.DVR items
listed below. Items A through E define how the keyboard will be used.
The Software Definitions (F) should be SOROC or TELEVIDEO, and the
Hardware Definitions (G) should be 80-column cards or 80-column
cards with inverse or Apple IIe with 80-column card.

A = Shift Lock              = OFF
B = Shift Modification      = ON
C = Alter Mode character    = ^[(27,$1B)
D = Rubout character        = ^@(0,$00)
E = Click Volume            = 2
F = Software Definitions    = TeleVideo 920/950
G = Hardware Definitions    = Apple IIe with an 80-column card

Enter option (X to return to Configure SoftVIDEO Menu):
```

Use this menu to define long-term settings for a few SoftVIDEO features and to modify the software and hardware definitions to work with the 80-column card you are using.

The 80-column mode is for Apples equipped with an 80- column card. APPLI-CARD CP/M, like Apple Pascal, automatically switches the video display to any card in Slot 3 of the Apple. You can use CONFIGSV to configure CP/M to work with nearly any 80-column card. The software will communicate with a terminal by translating screen control codes.

The default configuration for 80-column mode (as it comes with your APPLI-CARD package) is valid for all 80- column cards that follow either the VIDEX or SUP'R'TERM protocols. If your 80-column card doesn't follow one of these protocols, you must select the hardware definitions option (G), and set up SoftVIDEO for your card. c — > 4-22

Options A through E are the same as options A through E on the 70-Column Screen Menu described previously. Refer to that description.

Select option F to specify the correct set of software definitions for your type of 80-column card. Select option G to specify the correct hardware definitions.

Select option F to specify the correct set of software definitions for your type of 80-column card. Select option G to specify the correct hardware definitions.

The default software definition is TeleVideo 920/950. The default hardware definition is Apple IIe with an 80- column card.

- Software definitions refer to the software commands used to clear the screen, position the cursor, and set various display modes.

- Hardware definitions refer to how the APPLI-CARD CP/M system tells the hardware to clear the screen, position the cursor, and set various display modes.

Since the software and hardware definitions usually differ, the control codes are remapped to convert the software definitions to the appropriate hardware definitions. These control codes are sent to the display device.

The Terminal Software Definitions and Terminal Hardware Definitions Menus are described on the following pages.

When you have finished configuring your 80-column card, type X and press RETURN to return to the Configure SoftVIDEO Menu.

TERMINAL SOFTWARE DEFINITIONS

When you choose option F at the 80-Column Card Menu, you see this menu:

```
TERMINAL SOFTWARE DEFINITIONS MENU

A = 80-column cards
B = 80-column cards with inverse
C = Soroc 120/140
D = TeleVideo 920/950
E = Hazeltine 1500
F = VT-52
G = ADDS Viewpoint
H = Apple IIe with 80-column card
I = OTHER

Software Definitions = TeleVideo 920/950

Enter option (X to return to 80-Column Card Menu):
```

The message "Software Definitions" indicates the current definition. You can change it by selecting one of the options.

Options A through H refer to a preset series of control code definitions for a specific type of terminal. If you select one of these options, the menu is redisplayed and the option you have selected is displayed as the current definition.

If you are using an external terminal or your software program expects a different terminal, select option I to configure SoftVIDEO for that terminal. (NOTE: The SoftVIDEO driver handles popular terminal types but not all terminals.)

When you select I from the Terminal Software Definitions Menu, you see this menu:

```
OTHER SOFTWARE DEFINITIONS MENU
 A = Goto XY                  = ^[27,$1B), =(61,$3D),YX,+32
 B = Cursor left              = ^H(8,$08)
 C = Cursor right             = ^L(12,$0C)
 D = Cursor down              = ^J(10,$0A)
 E = Cursor up                = ^K(11,$0B)
 F = Cursor home              = ^^(30,$1E)
 G = Clear screen             = ^[27,$1B), *(42,$2A)
 H = Clear line               = UNDEFINED
 I = Clear to end of page     = ^[27,$1B), Y(89,$59)
 J = Clear to end of line     = ^[27,$1B), T(84,$54)
 K = Start half intensity     = ^[27,$1B), )(41,$29)
 L = Stop half intensity      = ^[27,$1B), ((40,$28)
 M = Start inverse            = ^[27,$1B), j(106,$6A)
 N = Stop inverse             = ^[27,$1B), k(107,$6B)
 O = Start blink              = ^[27,$1B), ^(94,$5E)
 P = Stop blink               = ^[27,$1B), q(113,$71)
 Q = Insert character         = ^[27,$1B), Q(81,$51)
 R = Delete character         = ^[27,$1B), W(87,$57)
 S = Insert line              = ^[27,$1B), E(69,$45)
 T = Delete line              = ^[27,$1B), R(82,$52)
 U = Leading character        = ^[27,$1B)

Enter option (X to return to Terminal Software Definitions Menu):
```

You may define a single character with an optional leading character. Each option relates to a particular character except U, which defines the default leading character. The name of the character is listed following the option letter. The current definition of the character is given in the right column of the menu in three forms: the character itself, the decimal equivalent, and the hexadecimal equivalent. You may define the character using the same three forms. Decimal numbers must be preceded by a pound sign (#) and hexadecimal numbers by a dollar sign ($). To define a control character, type a caret (^) followed by the character.

Select the desired option.

```
Leading character (Y or N):
```

TYPE Y if you want to use a leading character
N if you don't want to use a leading character

```
Characters may be entered as:
space to tilde for printable characters ^@ to ^_
for control characters
#0 to #255 for decimal
$0 to $FF for hexadecimal
UNDEFINED if none
```

For an explanation of this message see the description of the 40- to 255-Column Screen Menu (option G). You can delete a definition by typing UNDEFINED. Because upper- and lowercase characters are interpreted differently, you must be careful when entering alphabetic characters.

```
Cursor Right currently = ^L(12,$0C)
Enter character <RET>:
```

The text above will appear if you select option C, the cursor right key. If you select some other key, its name and definition will appear in the message.

TYPE the new definition

You can type the character or its decimal or hexadecimal equivalent.

The Other Software Definitions Menu is displayed again with the new definition shown. If you requested a leading character, it will be displayed before the character you defined.

Note that option A, the GOTO XY character, is different and requires a leading character (^[), the goto xy identifier (=), the order of x and y values (xy), and the 0 offset of xy values (+32).

To return to the Terminal Software Definitions Menu, type X. Type another X to return to the 80-Column Card Menu.

TERMINAL HARDWARE DEFINITIONS

When you select option G from the 80-Column Card Menu, you see this menu.

```
TERMINAL HARDWARE DEFINITIONS MENU

 A = 80-column cards
 B = 80-column cards with inverse
 C = Soroc 120/140
 D = TeleVideo 920/950
 E = Hazeltine 1500
 F = VT-52
 G = ADDS Viewpoint
 H = Apple IIe with 80-column card
 I = OTHER

Hardware Definitions     = Apple IIe with 80-column card

Enter option (X to return to 80-Column Card Menu):
```

REMEMBER

If you are using an 80-column card, you should always select option A, B, or H on this menu.

The options on this menu are the same as those on the Terminal Software Definitions Menu. (See the instructions for details.) Option I, however, operates differently.

When you select option I to specify the hardware definitions of an external terminal, you see the Other Hardware Definitions Menu. The options on this menu are the same as options A through T of the Other Software Definitions Menu.

Select the option for the character you want to define. Option C, cursor right, is used in the following example:

```
Enter up to 4 characters separated by <RET>. If
there are less than 4, press <RET> after the last
character. The only character not allowed is a 0.

Characters may be entered as:
space to tilde for printable characters
^@ to ^_ for control characters
#0 to #255 for decimal
$0 to $FF for hexadecimal
UNDEFINED if none

Cursor right currently = ^/(28,$1C)
Enter character 1 <RET>:
```

The help message is the same as the one displayed on the Other Software Definitions Menu.

TYPE the first character of your definition

```
Enter character 2 <RET>:
```

If your definition consists of only one character, press RETURN. If it consists of more, type the second character. The program prompts you for at most four characters. You are then returned to the Other Hardware Definitions Menu.

Option D — External Terminals

D
CONFIGURE
SoftVIDEO MENU

When you select option D at the Configure SoftVIDEO Menu, you see this menu:

```
EXTERNAL TERMINALS MENU

The following rules apply to configuring for external terminals.

1. If an external terminal is SOROC compatible, no translation is
   necessary. Set device translation to 255.

2. If an external terminal is not SOROC compatible, device translation
   should be set to 3, the Software Definitions should be set to SOROC
   or TELEVIDEO, and the hardware definitions should be set to be the
   same as your terminal. If your terminal is not on the list, use the
   OTHER command in Hardware Definitions.

A = Device Translation          = 255
B = Software Definitions        = TeleVideo 920/950
C = Hardware Definitions        = Apple IIe with 80-column card

Enter option (X to return to Configure SoftVIDEO Menu):
```

You should select this option when you are using an external terminal in place of your Apple monitor and keyboard. You must have an RS-232C card in Slot 3 of the Apple as well as an external terminal. You can use SoftVIDEO to translate screen control codes so that CP/M will work with any terminal — even if the software is designed for another type of terminal.

Select option A to specify the device number. If you do not want characters translated, specify device number 255. Otherwise, specify the slot number in which your terminal is installed (normally, 3) as the device number.

Select option B to specify the correct set of software definitions for your type of terminal.

Select option C to specify the correct hardware definitions.

The method for specifying software and hardware definitions is the same as the one described for option C, "80-Column Cards." c — > 4-17 through 4-23

When you have finished configuring your external terminal, type X and press RETURN to return to the Configure SoftVIDEO Menu.

Option E — Save SFTVIDEO.DVR

E
Configure SoftVIDEO Menu

When you choose option E, the SFTVIDEO.DVR file, as you have modified it, will be saved and you will be returned to the Configure SoftVIDEO Menu.

Option F — Function Keys

F
CONFIGURE SoftVIDEO MENU

Select option F to define long-term unction keys and follow the same steps as you do when using the FUNCTION program to define short-term function keys. c — > 4-6 through 4-9

Note that the FUNCTION.COM file must be on the disk in the current drive when using this option.

After you finish defining, changing, or deleting function keys, save the SoftVIDEO driver in order to save your definitions. Then you must run the installation program to install the revised version of SFTVIDEO.DVR.

CAUTION

When you use option F of the Configure SoftVIDEO Menu, the definitions you specify affect the short-term function keys because CONFIGSV uses the FUNCTION program to define the keys.

If you don't save the SoftVIDEO driver, your definitions will be short-term only. In other words, it will be as if you had used FUNCTION program rather than the CONFIGSV program.

CHAPTER 5
ADVANCED FEATURES: MODIFYING DRIVERS WITH YOUR APPLI-CARD

The APPLI-CARD's installation program (INSTALL) allows you to install device drivers and reconfigure your CP/M system. Device drivers are used by CP/M to communicate with the peripheral devices on your Apple. In this chapter, you will find instructions for using the installation program to carry out the following tasks:

- Add, delete, and move drivers in the DRIVERS file
- Create a new start-up disk using the modified DRIVERS file
- Modify the starting address of CCP and the top of memory, set a CCP auto load string and change the AUTOST.COM drive

When you receive your APPLI-CARD package, the DRIVERS file is already configured on each side of the disk. c — > Chap 2

PERIPHERAL DEVICES

Any peripheral device that you want to use in conjunction with the APPLI-CARD must have its own driver. Drivers that can be used with the APPLI-CARD are available for many, but not all, hardware peripheral devices. Before you purchase a device, check with your dealer to be sure the device has drivers that work with the APPLI-CARD. These drivers are either included with your purchase of the device or can be requested from the original equipment manufacturer. You must have the driver you want to install on a disk while running INSTALL.

REMEMBER

The APPLI-CARD drivers must be in the following positions in the DRIVERS file if they are included in the DRIVERS file:

Driver 1	SFTVIDEO.DVR
Driver 2	HIRESIO.DVR
Last Driver	BUFFER.DVR or ETXBUF.DVR

The HIRESIO driver is necessary only if you are using the APPLI-CARD's 70-column mode.

The PCPICPM and DLDRIVER.COM files must be on the same disk as the INSTALL.COM file.

To ensure that you have enough disk space to save your modified DRIVERS file, you should format a disk and then copy the following files to it:

INSTALL.COM
PCPICPM
DLDRIVER.COM

Then you should copy to the same disk any of the following driver files that you want to install:

SFTVIDEO.DVR
APLFLPY.DVR
BUFFER.DVR or ETXBUF.DVR (but not both)
HIRESIO.DVR
FAST2E80.DVR

Do not copy the CONFIGSV.COM, FUNCTION.COM, or DRIVERS files.

To format the disk, follow the instructions for "Formatting a Disk" in Chapter 1. To copy the files, follow these steps:

STEP 1 Insert the CP/M disk in drive A.

PRESS ^C.

STEP 2 Insert the formatted disk in drive B.

PRESS ^C

(You must insert this disk before doing the next step.)

STEP 3 TYPE **PIP** RETURN

STEP 4 Remove the CP/M disk from drive A and then insert the Utility disk. (Do not press ^C.)

STEP 5 TYPE **B:INSTALL.COM** RETURN

STEP 6 TYPE **B:PCPICPM** RETURN

STEP 7 TYPE **B:DLDRIVER.COM** RETURN

STEP 8 To copy all the driver files you plan to use, continue using the PIP command shown in steps 5, 6, and 7. For example: TYPE **B:SFTVIDEO.DVR** RETURN

STEP 9 When you have copied all the drivers you want, exit PIP by pressing RETURN.

Use the disk containing the copied files (now called the installation work disk in the instructions) to run the installation program.

To run the installation program follow these steps:

STEP 1 Insert the installation work disk in drive A.

STEP 2 PRESS ^C

STEP 3 TYPE **INSTALL** RETURN

```
INSTALLATION MENU
Version 2.6 Sept. 26, 1983

Dvr  Device name  Dev Num Ver |  Dvr  Device name  Dev Num Ver
num               num dev num |  num               num dev num
-- NO DRIVERS --

A = Get a Driver File                F = Move a Driver
B = Save DRIVERS and Write CP/M      G = Change Device Number
C = Save DRIVERS                     H = Change Number of Devices
D = Write CP/M to Boot Tracks        I = Configure CP/M
E = Delete a Driver

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

The INSTALL has a "work area" to show you the current drivers. The current content of the work area is displayed at the top of each installation menu. At first, you see the message NO DRIVERS.

As you select each option, a different screen appears. These subsequent screens are explained in the following pages.

Here is the normal sequence of operation:

GENERAL INSTALLATION PROCEDURE

STEP 1 Get all of the drivers you want in your system using option A.

STEP 2 Use options E through H to make any changes. If you want to change CP/M characteristics, use option I.

STEP 3 Save the drivers in the DRIVERS file and write CP/M to the boot tracks using option B.

STEP 4 Select additional options as desired, read the description of the menu, and take the necessary actions (explained in more detail on the following pages).

STEP 5 Return to CP/M, by typing **X**.

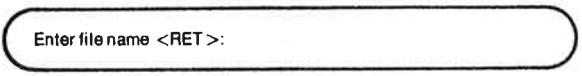
STEP 6 Turn your system off. Then start it up again using the new DRIVERS file and boot tracks.

STEP 7 Save the work disk and use it when you want to make another disk into a start-up disk. To do so, insert the work disk in drive A, insert the disk you want to make into a start-up disk in drive B, and run INSTALL. Get the DRIVERS file using option A and then use option B to save it and the operating system onto drive B.

OPTION A —GET A DRIVER FILE

A INSTALLATION MENU

When you select option A from the Installation Menu, you see the current drivers displayed at the top of the screen.



TYPE the name of the driver you want to get
RETURN

Make sure that the driver you name is on your work disk.

After you type the file name and press RETURN, you will be returned to the Installation Menu. You can then type A again to select additional drivers if necessary.

If you are running the installation program using a work disk that already contains a DRIVERS file and you want all the drivers currently in this file, specify the file name DRIVERS.

When you select a driver, it is put into the work area, and the next available driver number is assigned to it. The driver number (Dvr num), device name, device number (Dev num), and version number (Ver num) are displayed in the work area at the top of the menu.

A driver-file name usually ends in the extension .DVR, indicating that it is a APPLI-CARD driver. The extension is optional. You must also enter a drive specification if the driver is not on the current disk (for example, B:SFTVIDEO.DVR).

B — SAVE DRIVERS AND WRITE CP/M

B INSTALLATION MENU

Option B combines options C and D. This option can be used to create a new start-up disk using the drivers currently displayed in the work area.

```
Enter drive:
```

TYPE the letter of the drive on which you want to write the DRIVERS file and CP/M system tracks. This disk will be your new start-up disk.

If you change your mind and don't want to take this step yet, press RETURN in response to the prompt.

If you wish to make the disk in drive A your new start- up disk, type **A**. Type **B** if you want the disk in drive B to be the new start-up disk.

```
Creating DRIVERS
writing SOFTVIDEO
writing HIRES 70 COLUMN
writing PRINTER BUFFER
Reading PCPICPM

Relocating  CCP to DF00
            BDOS to E700 for a 57 .50K TPA
            BIOS to F500
            End of BIOS to FF44
            Buffers to FF80
            Top of memory is FF80
            Writing to boot tracks

Saving A:DRIVERS and Writing CP/M complete
Press any key to continue:
```

These messages may vary, depending upon which drivers you install.

Press any key to return to the Installation Menu.

OPTION C — SAVE DRIVERS

C
INSTALLATION
MENU

When you choose this option, only the DRIVERS file is written to the disk.

```
Enter DRIVERS file name (normally DRIVERS):
```

TYPE **DRIVERS** or **B:DRIVERS** RETURN

If you want to save the drivers temporarily in another file, you can specify another name. However, before the CP/M system can use the drivers at start-up time, you must rename the file DRIVERS.

```
writing SOFTVIDEO
writing HIRES 70 COLUMN

Saving DRIVERS file complete
Press any key to continue:
```

These messages may vary, depending upon which drivers you install.

You can press RETURN in response to the file-name prompt to return to the Installation Menu without writing the DRIVERS file.

CAUTION

If you modify the drivers in the DRIVERS file (add, delete, change position) and save those changes in the DRIVERS file **without** writing CP/M to the boot tracks, you will have difficulties the next time you start up your system. Your new DRIVERS file may not have certain drivers or may not have them in the locations that CP/M is expecting. If you change the DRIVERS file, you must also write CP/M to the boot tracks in order for your system to operate properly.

OPTION D — WRITE CP/M TO BOOT TRACKS

D INSTALLATION MENU

The D option reads the PCPICPM file and creates the proper image for the new configuration based on the drivers shown in the work area of the Installation Menu. It then writes the image to the CP/M boot tracks.

```
Enter drive:
```

TYPE the letter of the drive on which you want the CP/M image written.

```
Reading PCPICPM
Relocating   CCP to DD00
             BDOS to E500 for a 57 .0K TPA
             BIOS to F300
             End of BIOS to FD44
             BUFFERS to FDD8
             Top of memory is FF80
             Writing to boot tracks

Writing CP/M complete
Press any key to continue:
```

These messages vary, depending upon which drivers you install.

Press any key to return to the Installation Menu.

CAUTION

If you create new CP/M image based on changes made in the DRIVERS file, you must save the DRIVERS file. If you do not save it, you will have difficulties the next time you start up the system.

OPTION E — DELETE A DRIVER

E
INSTALLATION MENU

Use this option to delete any unwanted drivers. You must also delete an old driver before installing a new version of it (for example, when you are replacing SFTVIDEO.DVR).

```
Enter driver to delete (1 to n <RET>):
```

TYPE the driver number for the driver you want to delete RETURN

```
Are you sure? (Y or N):
```

TYPE **Y** (if you want to delete the driver)

After you answer the question, you are returned to the Installation Menu.

OPTION F — MOVE A DRIVER

F
INSTALLATION MENU

Use this option to change the order of the drivers in the work area.

```
number of driver to move (1 or n <RET>):
```

TYPE the current number of the driver RETURN

```
Enter number of destination driver
(1 to n <RET>):
```

TYPE the number you want for the driver RETURN

The prompts will vary depending on the number of drivers (n).

CAUTION

The order of drivers is important. SFTVIDEO must always be the first driver. If you use one of the printer buffer drivers, BUFFER OR ETXBUF, it must always be the last driver.

OPTION G — CHANGE DEVICE NUMBER

G
INSTALLATION
MENU

Use option G to change the number of the device a driver will handle. This option is useful for reassigning a mass storage device to another device.

```
Caution change with care:
device number 0 to 15 = drive A: to P:
device number 16 to 31 = character drivers

Enter number of driver to change
(1 to n <RET>):
```

TYPE the number of the driver you want to change
RETURN

```
Current device number = n
Enter device number <RET>:
```

TYPE the new device number RETURN

You'll see the new device number displayed in the work area of the menu.

OPTION H — CHANGE NUMBER OF DEVICES

H INSTALLATION MENU

Use option H to specify the number of mass storage devices a driver will control. For example, the default number of Apple drives on the system is a maximum of 6. Changing the value to 2 saves space for allocation and check vectors in CP/M and gives you more room for program development. (Allocation and check vectors are buffers used to keep track of disks and space used on disks.)

CAUTION

Do not allow the number of devices to exceed the number of devices the driver can manage; you may cause the system to malfunction.

```
Caution: The number of devices should not
exceed the number of devices that this
driver supports. Refer to the documentation
on the driver.

Enter number of driver to change
(1 to n <RET>):
```

TYPE the number of the driver that should have a different number of devices RETURN

```
Current number of devices = n
Enter new number of devices <RET>:
```

TYPE the new number of devices you want for the driver RETURN

You'll see the new number of devices that this driver will control in the work area of the menu.

CHAPTER 6
USING THE APPLI-CARD WITH APPLE DOS

This chapter describes how you can use your APPLI-CARD with Apple DOS.

- You can use the ADOSXFER program to transfer files between Apple DOS and the APPLI-CARD CP/M operating system. This program allows you to transfer TEXT, BINARY, APPLESOFT, and INTEGER files. (The last two are not likely to be used in CP/M, however.)

You must have two disk drives to run ADOSXFER, one for the Apple DOS files and one for the CP/M files.

- You can use the 64K of RAM on your APPLI-CARD as a RAM disk under Apple DOS. The RAM disk operates up to ten times faster than the standard Apple disk drive. To use the APPLI-CARD as a RAM disk, you must have two disk drives to transfer the necessary files from CP/M to Apple DOS.

TRANSFERRING FILES BETWEEN DOS AND CP/M

Follow these steps to use the ADOSXFER program to transfer files between Apple DOS and the APPLI-CARD CP/M operating system:

STEP 1 Insert a disk containing the ADOSXFER program into drive A.

OPTION I — CONFIGURE CP/M

I
INSTALLATION MENU

When you type I at the Installation Menu, you see this menu:

```
CONFIGURE CP/M MENU

A = Set starting address of CCP      = Dynamically defined
B = Set address of top of memory     = Dynamically defined
C = Set CCP auto load string         = no auto load string
D = Change drive of AUTOST.COM       = A:

Enter option (X to return to Installation program):
```

This menu has four options. You can change the starting address of the CCP, change the address of the top of memory, define a character string to be executed at the time you start up your system, or specify which drive contains a disk with an AUTOST.COM file.

The following chart indicates what you see when you choose one of the menu items.

OPTION	ACTION
A	Opens up unused space between the end of the BIOS and the beginning of the BUFFERS. SEE Enter Starting address of CCP: TYPE the address in decimal or hexadecimal
B	Opens up unused space between the BUFFERS and $FF80. SEE Enter top of memory address: TYPE the address in decimal or hexadecimal
C	Lets you input a string of characters that you want executed at cold start-up. SEE Enter CCP auto start string: TYPE any string of characters
D	Changes the drive where the system will look for an AUTOST.COM file at cold start-up. When you select this option, the drive is changed from its previous setting to the alternate drive. If it was drive A, it becomes drive B and vice versa. The Configure CP/M Menu will reappear with the new setting.

Select the option you want to use. Addresses should be entered in decimal or hexadecimal.

You can enter decimal numbers directly or precede them by a pound sign (#). You must use a $ before a hexadecimal number. The range of addresses allowed is $0001 to $FFFF.

If you press RETURN or type **0** in response to the prompt for option A or B, the default "Dynamically defined" is set.

Note: The auto-load string for CCP is not the same as the AUTOST.COM feature. c — > Appendix C

TYPE **ADOSXFER RETURN**

```
CP/M AND APPLE DOS 3.3 TRANSFER MENU
Version 2.5 Sept. 26, 1983

A = Transfer CP/M to Apple DOS 3.3
B = Transfer Apple DOS 3.3 to CP/M
C = Display Apple DOS 3.3 directory

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

TYPE the option you want to use

The menus and the instructions accompanying each option are presented in the following pages.

NOTE: The ADOSXFER program works only with 5 1/4 inch disks. If you select option A, the destination disk must first be formatted under Apple DOS. Refer to your Apple manual for instructions on formatting a DOS disk. If you select option B, the destination disk must first be formatted using the COPYFRMT program. c — > 1-10

Option A — Transfer CP/M to Apple DOS 3.3

A
ADOSXFER
MENU

To transfer files from CP/M to Apple DOS 3.3, the CP/M source file disk and the Apple DOS disk must be on separate disks in different drives. When you respond to the ADOSXFER program prompts, include a drive specification at the beginning of the file name if the file is not on the disk in the current drive. (For example, if the current drive is A and the source file is on drive B, your response should be B:SOURCE.)

Select option A and then follow these instructions:

```
Enter CP/M source file <RET>:
```

TYPE the name of the source file in standard CP/M format RETURN

The CP/M source file may be on the disk with the ADOSXFER program or on a separate disk.

```
Enter Apple DOS destination file <RET>:
```

TYPE the name of the file to be created RETURN

If the Apple DOS destination file is to be written to a drive other than the current drive, you must include a drive specification at the beginning of the file name (for example, A:DESTIN). Also, the disk drive for the Apple DOS destination file cannot be the same as the disk drive for the CP/M source file and it must be a 5 1/4 inch disk drive.

```
A = Applesoft BASIC
B = Binary
T = Text
I = Integer BASIC

Enter type of file:
```

TYPE the character representing the type of file you are transferring

NOTE: Options A and I move just the file without any parameters. It is unlikely that you would use options A or I because these file types apply only to Apple-based BASIC files. It would be unusual (and not recommended) to write these files under CP/M and then transfer them to Apple DOS.

Follow these instructions for options B and T:

OPTION		ACTION
B	SEE	Enter the starting address <RET>:
	TYPE	the starting address for the DOS binary file as a decimal value (for example, 1279) or a hexadecimal value preceded by a dollar sign (for example, $800)
T	SEE	Should bit 7 be 0, 1, OR Unchanged (0,1,U): [normally 1]
	TYPE	the option you want
	SEE	Do you want to remove line feeds (Y or N): [normally Y]
	TYPE	Y or N

NOTE: You must refer to your Applesoft BASIC and Apple DOS manuals for assistance in determining an appropriate starting address and value for bit 7.

```
Place the disks into the drives
Press SPACE when ready:
(any other key aborts)
```

Make sure that the disks you are using for the transfer are inserted in the correct drives (that is, the drive you specified as part of the file name in steps 1 and 2).

PRESS SPACE

After the file is transferred, you are returned to the CP/M and Apple DOS 3.3 Transfer Menu.

CAUTION

You must take care when changing disks. You can ruin your data if you insert a CP/M disk when ADOSXFER expects an Apple DOS disk and vice versa. In addition, if a file already exists, the program will ask you if you want to delete the old version. Be particularly careful; you can destroy data accidentally this way.

Option B — Apple DOS 3.3 to CP/M

B
ADOSXFER
MENU

To transfer files from Apple DOS 3.3 to CP/M, the Apple DOS file and the CP/M file must be on separate disks in different drives. Select option B and follow these instructions:

```
Enter Apple DOS source file <RET>:
```

TYPE the name of the Apple file RETURN

Use the CP/M drive specification instead of the slot number, as with Apple DOS (for example, B:DOSFILE).

```
Enter CP/M destination file <RET>:
```

TYPE the filename using the standard CP/M file specification RETURN

If the file is a text file, the program asks the same questions as in step 3 of the option A menu (CP/M to Apple DOS 3.3). Under CP/M, the high bit (bit 7) is usually set to 0. CP/M also requires line feeds after each carriage return.

If the file is binary, the length and starting address are displayed in both decimal and hexadecimal.

NOTE: Options A and 1 move just the file without any parameters. Because these file types apply only to Apple-based BASIC files, transferring these files to CP/M will not be useful. You can't use these files under CP/M.

Option C — Display Apple DOS 3.3 Directory

C
ADOSXFER
MENU

Choose this option to display the directory or catalog of a DOS 3.3 disk. This feature allows you to determine which files are required and to see if space is available without exiting CP/M and starting up the DOS 3.3 system.

```
Enter drive letter (A..F):
```

TYPE the letter of the drive containing the disk

```
Place Apple DOS disk into drive X:
Press SPACE when ready:
(any other key aborts)
```

X represents the drive you specified in step 1.

PRESS SPACE

The catalog is displayed with a pause after 23 lines. Press SPACE to continue viewing the catalog. A message is displayed when you reach the end of the directory. Press any other key to return to the ADOSXFER Menu.

USING THE APPLI-CARD AS A RAM DISK

DOSRDSK and NRDRDSK are programs that allow you to use the APPLI-CARD as a RAM disk under Apple DOS. DOSRDSK relocates itself between the DOS 3.3 buffers and DOS 3.3. Most Apple DOS programs will operate properly with DOSRDSK. However, some programs will not operate properly in this environment. If this is the case, you can use NRDRDSK in place of DOSRDSK, because it is a non-relocatable version that is placed into DOS 3.3, overlaying the INIT command.

To use the APPLI-CARD as a RAM disk, you must perform two tasks:

1. Transfer the DOSRDSK (or NRDRDSK) program to an Apple DOS disk using the ADOSXFER program. It is best to use a start-up Apple DOS disk that contains the FID program.

2. Initialize the RAM disk for Apple DOS.

You'll find step-by-step procedures for these tasks in the following two sections.

Task 1 Transfer Program File

STEP 1 Insert a disk containing the ADOSXFER program and either the DOSRDSK or NRDRDSK program in drive A. (These files are normally on your CP/M disk.)

Insert a disk formatted under Apple DOS in drive B. To simplify the procedure, use a start-up disk with the FID program on it.

STEP 2 TYPE **ADOSXFER** RETURN

STEP 3 TYPE **A**

```
Enter CP/M source file <RET>:
```

STEP 4 TYPE **DOSRDSK** or **NRDRDSK** RETURN

```
Enter Apple DOS destination file <RET>:
```

STEP 5 TYPE **B:DOSRDSK** or **B:NRDRDSK** RETURN

```
A = Applesoft BASIC
B = Binary
T = Text
I = Integer BASIC

Enter type of file:
```

STEP 6 TYPE **B**

```
Enter the starting address <RET>:
```

STEP 7 TYPE **4096** RETURN

```
Place disks into the drives
Press SPACE when ready:
(any other key aborts)
```

STEP 8 Insert the disks in the correct drives SPACE

If your disk already contains the file you are transferring, you will be asked to delete it. If you wish to do so, type **Y**.

Task 2 Initializing the RAM Disk for Apple DOS

STEP 1 Remove both disks and turn your Apple OFF.

STEP 2 Insert an Apple DOS start-up disk and turn your Apple ON again.

STEP 3 If the DOSRDSK (or NRDRDSK) program is not on the Apple DOS disk, remove it and insert the disk with the recently transferred DOSRDSK (or NRDRDSK) program into Apple drive 1.

TYPE **BRUN DOSRDSK** or **BRUN NRDRDSK**
RETURN

```
WELCOME TO THE APPLI-CARD SOFTWARE PROGRAM. IF
YOU HAVE JUST POWERED UP, YOU MUST FIRST INITIALIZE
THE DISK. WHEN INITIALIZING THE DISK, ALL PREVIOUS
INFORMATION STORED WILL BE LOST.

DO YOU WANT TO INITIALIZE THE DISK (Y/N)?
```

STEP 4 TYPE **Y**

```
The Z80 RAM Disk is in SLOT 4
```

The RAM disk is now initialized. To transfer files to the RAM disk, you must execute the Apple DOS utility BRUN FID. This utility should be on your Apple DOS disk.

APPENDIX A
SOLDERING TO ACTIVATE YOUR SHIFT KEY

Minor soldering is required to activate the SHIFT key on some early Apple II computers. This procedure is **not** necessary for Apple II Plus or IIe models.

CAUTION

The shift key modification described in this appendix permanently voids any remaining warranty you may have on your Apple II. If you have any hesitation about making this modification, you should have a qualified electronics technician perform the work.

If your Apple does not have a Keyboard Encoder card, the modification described here will activate your SHIFT key so that you can type both upper- and lowercase characters.

To activate the SHIFT key, refer to these steps:

STEP 1 Turn off the power to your Apple and to all of the peripherals attached to it. Remove the cover to your Apple.

STEP 2 Remove the left SHIFT key cap. If necessary, remove adjoining key caps.

STEP 3 Cut a 3-foot wire. Strip one end of it.

STEP 4 Insert the stripped end of the wire in pin 4 (SW2) of the Game I/O port socket.

STEP 5 Run the wire along the right-hand side of the board and along the front just behind the keyboard to the left SHIFT key.

STEP 6 Cut off excess wire and strip the end.

STEP 7 Locate the P. C. board feed-through pad just to the right of the SHIFT key. Tin this pad.

STEP 8 Solder the wire to the tinned pad. Be sure you do not touch the plastic.

STEP 9 Replace the SHIFT key cap and any other caps you have removed.

STEP 10 Replace the cover to your Apple.

STEP 5 If the DOSRDSK or NRDRDSK file is not on your Apple DOS start-up disk, remove the disk with DOSRDSK or NRDRDSK from your Apple drive and insert your Apple DOS disk.

STEP 6 TYPE **BRUN FID** RETURN

Select choice 1 and transfer any of the appropriate files from the mechanical Apple disk drive to the APPLI-CARD RAM disk. Refer to your Apple DOS manual for full instructions on how to use the FID program.

After initializing the APPLI-CARD as a RAM disk, you must refer to it by its slot and drive number. If the APPLI-CARD is installed in Slot 4 as recommended in Chapter 1, then, under Apple DOS, you must refer to the RAM disk as S4,D1:

TYPE **CATALOG S4,D1** RETURN

SEE a list of all files that are now on the APPLI-CARD RAM disk

CAUTION

Remember to transfer any data from the RAM disk to a floppy or hard disk for later use. Otherwise, all data on the APPLI-CARD RAM disk will be lost when you turn off your system.

APPENDIX B
TROUBLESHOOTING GUIDE

The various problems that can arise when you use your APPLI-CARD are addressed here. If, after reading this guide, you are still unable to resolve your problem, recheck your installation of the APPLI-CARD. If your problem persists, contact your dealer. Your dealer will either provide the necessary information or contact Personal Computer Products, Inc. for futher help.

HARDWARE PROBLEM

1) **Problem.** CP/M won't start up; disk drive starts and stops by itself.

   Solution. Make sure the APPLI-CARD is seated properly in its slot.

2) **Problem.** To install my APPLI-CARD, I have taken out my 16K RAM card, installed the APPLI-CARD, and found that the system doesn't work.

   Solution. Make sure you have replaced the original chip that was removed when you installed the 16K RAM card.

3) **Problem.** When I turn on my computer with the APPLI-CARD installed nothing happens.

   Solution. The APPLI-CARD may not work when other "co- processor" boards are installed. Remove these boards and test your system again.

4) **Problem.** The SHIFT key doesn't generate upper and lowercase characters.

   Solution. Check to see that the hardware Shift Modification Device is properly installed (painted edge closest to keyboard and wire clip on pin 24).

5) **Problem.** The APPLI-CARD doesn't seem to be working with my 80-column board.

Solution. Try starting up with the CP/M disk. The APPLI-CARD Utility Disk, which starts up in 70-column mode, can conflict with the 80-column display.

SOFTWARE PROBLEM

1) **Problem.** My system will not start up (boot).

Solution. The CP/M operating system needs to be placed on the disk you wish to use as a start-up disk. (See "Task 6: Making Start-Up (Boot) Disks" in Chapter 1.)

---

2) **Problem.** The 70-column high-resolution display is working, but I can't get lowercase letters.

Solution. Enter the Escape mode of SoftVIDEO and make sure the Shift Lock is OFF and the Shift Mode is ON.

---

3) **Problem.** I have reconfigured the SoftVIDEO driver, but the Escape mode menu displays old defaults.

Solution. Be sure you have saved the SoftVIDEO driver and installed it using the installation program.

---

4) **Problem.** I get a BDOS R/O error when I change disks or try to save a file.

Solution. You probably changed disks in a drive while communicating with CP/M and forgot to press ^C.

5) **Problem.** The following message was displayed on my monitor:

Rd BIOS Err=01 D=B: T=0003 S=00

Solution. This is a Basic Input/Output System error. The error may be caused by any of the following conditions:

- There may be no disk in the drive you specified. Insert a disk and then press SPACE to retry.
- The drive door may still be open. Close the door and then press SPACE to retry.
- The disk may be improperly inserted into the drive. Reinsert the disk and then press SPACE to retry.
- The disk may be damaged or bad. Try a new disk.
- The disk drive selected may not exist. Select a valid drive.
- If none of the above solve the problem, press **^C twice to return to CP/M.**

APPENDIX C
TECHNICAL INFORMATION

This appendix contains technical information about the APPLI-CARD and is intended for the experienced computer user. It also provides brief descriptions of some advanced features. You need to supplement this appendix with information from other CP/M and Apple documentation.

Hardware

The APPLI-CARD is a Z-80B printed circuit board designed for the Apple II, II Plus, and IIe computer models. It contains the following hardware:

- Z-80B microprocessor running at 6 MHz
- 64K RAM
- Parallel port for communicating with the Apple microprocessor
- 2K ROM
- Port decoding circuitry
- Expansion interface connector

The Z-80B in the APPLI-CARD and the 6502 in the Apple run simultaneously at their full-rated speeds and communicate through a parallel port. This design provides high-speed data transfer between the two microprocessors. No time is wasted in switching from one processor to the other as in other Z-80 cards. The APPLI-CARD uses the CP/M operating system and provides you with approximately 57K of RAM for the execution of application programs.

Autostart

There are two ways you can use the CP/M autostart feature with your APPLI-CARD. First, you can specify a string of characters to be executed at a cold start up. You can specify this string using option I of the INSTALL program described in Chapter 6.

Second, when you start up the system, if your start-up disk contains a file named AUTOST.COM, the command stored in the file will be executed before control is passed to the CCP (Console Command Processor). You might also use this feature to augment the BIOS by executing a program to initialize the buffers and then naming the program AUTOST.COM.

BIOS Use of I/O Status Byte

The I/O status byte of the BIOS (Basic Input/Output System) is located at address 0003h. You can change it by using the STAT program or directly in your application program. You should note that, although the I/O byte keeps track of only five different devices, the command structure allows access to a total of 16 devices. The extra devices are available only by directly calling the Apple I/O processor. The relationships between logical devices (CON:, RDR:, PUN:, and LST:) and the physical device names are as follows:

I/O Status Byte Bits 0 1 2 3 4 5 6 7
CON: RDR: PUN: LST:

CON: (Console) Bits 0,1 value indicates:

0 TTY: for input and output (character device 0)
1 CRT: for input and output (character device 3)
2 BAT: for batch mode use CRT: for input and output (character device 3); also use LST: for output
3 UCI: for input and output (character device 1)

RDR: (Reader) Bits 2,3 value indicates:

0 TTY: as input (character device 0)
1 PTR: as input (character device 2)
2 URI: as input (character device 1)
3 UR2: as input (character device 4)

PUN: (Punch) Bits 4,5 value indicates:

0 TTY: as output (character device 0)
1 PTP: as output (character device 2)
2 UPI: as output (character device 1)
3 PU2: as output (character device 4)

LST: (Printer) Bits 6,7 value indicates:

0 TTY: for input and output (character device 0)
1 CRT: for input and output (character device 3)
2 LPT: for input and output (character device 1)
3 ULI: for input and output (character device 4)

APPENDIX D
ASCII CONVERSION CHART

ASCII	DECIMAL	HEXA-DECIMAL	ASCII	DECIMAL	HEXA-DECIMAL
^@ NUL	00	00	&	38	26
^A SOH	01	01	'	39	27
^B STX	02	02	(	40	28
^C ETX	03	03	)	41	29
^D EOT	04	04	*	42	2A
^E ENQ	05	05	+	43	2B
^F ACK	06	06	,	44	2C
^G BEL	07	07	-	45	2D
^H BS	08	08	.	46	2E
^I HT	09	09	/	47	2F
^J LF	10	0A			
^K VT	11	0B	0	48	30
^L FF	12	0C	1	49	31
^M CR	13	0D	2	50	32
^N SO	14	0E	3	51	33
^O SI	15	0F	4	52	34
			5	53	35
^P DLE	16	10	6	54	36
^Q DC1	17	11	7	55	37
^R DC2	18	12	8	56	38
^S DC3	19	13	9	57	39
^T DC4	20	14	:	58	3A
^U NAK	21	15	;	59	3B
^V SYN	22	16	<	60	3C
^W ETB	23	17	=	61	3D
^X CAN	24	18	>	62	3E
^Y EM	25	19	?	63	3F
^Z SUB	26	1A			
^[ESC	27	1B	@	64	40
^\ FS	28	1C	A	65	41
^] GS	29	1D	B	66	42
^^ RS	30	1E	C	67	43
^-- US	31	1F	D	68	44
			E	69	45
SPACE	32	20	F	70	46
!	33	21	G	71	47
"	34	22	H	72	48
#	35	23	I	73	49
$	36	24	J	74	4A
%	37	25	K	75	4B

-continued-

-continued-

ASCII	DECIMAL	HEXA-DECIMAL	ASCII	DECIMAL	HEXA-DECIMAL
L	76	4C	e	101	65
M	77	4D	f	102	66
N	78	4E	g	103	67
O	79	4F	h	104	68
			i	105	69
P	80	50	j	106	6A
Q	81	51	k	107	6B
R	82	52	l	108	6C
S	83	53	m	109	6D
T	84	54	n	110	6E
U	85	55	o	111	6F
V	86	56			
W	87	57	p	112	70
X	88	58	q	113	71
Y	89	59	r	114	72
Z	90	5A	s	115	73
[	91	5B	t	116	74
\	92	5C	u	117	75
]	93	5D	v	118	76
^	94	5E	w	119	77
_	95	5F	x	120	78
			y	121	79
`	96	60	z	122	7A
a	97	61	{	123	7B
b	98	62	¦	124	7C
c	99	63	}	125	7D
d	100	64	~	126	7E
			DEL	127	7F

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