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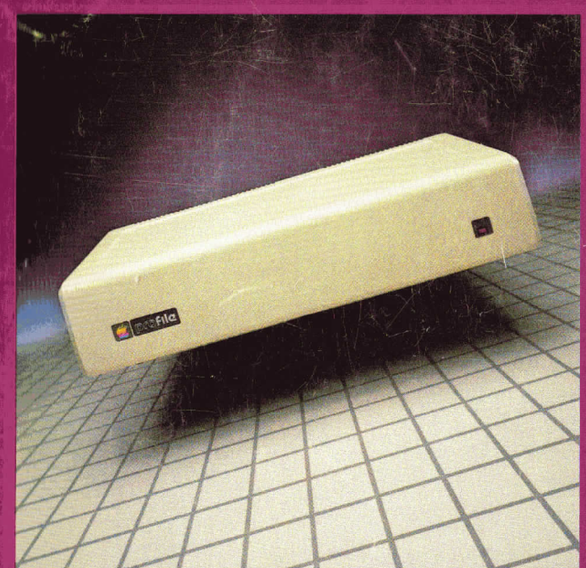
Apple III

profile

Owner's Manual



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Apple III

ProFile™

Owner's Manual

CAUTION

Your ProFile disk drive is a delicate instrument. Handle it with care.

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Preface

Your ProFile disk drive is a valuable addition to your Apple *III*. It is extremely reliable, quiet, and very easy to use. This manual will explain how to unpack, install, operate, and care for your ProFile drive.

Before reading this manual or attempting to use ProFile, first *read your Apple III* Owner's Guide.

This manual contains four chapters and three appendices. Chapter 1 introduces you to the drive and explains how to unpack it. Chapter 2 tells how to connect the drive to the Apple *III*, apply power, and verify that it is operating properly. You should pay particular attention to the paragraph in this chapter entitled *"Powering Up and Checking Out Your Drive"*. Chapter 2 also introduces the ProFile device driver, gives important information on the care and handling of your drive, and provides instructions for backing up your device driver diskette and your ProFile drive. The third chapter describes the device driver software. It explains how to use the System Utilities, Version 1.1 or later, to transfer the ProFile driver to the Apple *III* boot diskettes.

Chapter 4 provides technical information on the structure and operation of the ProFile. This is strictly an informative chapter for those who are more experienced in computers and have a desire to learn more about the internal architecture and functional operations of a disk drive. If you are not really interested in understanding the inside of your drive, you can skip this chapter.

Appendix A provides a list of ProFile's operating specifications. Appendix B describes how to transfer the Pascal system from diskettes to the ProFile drive. This information is recommended for those who use Pascal as their primary programming language. Appendix C provides a quick reference to ProFile configuration block data. An index follows the appendices.

Throughout this Owner's manual you will see three symbols that are used to point out paragraphs of special interest.

This symbol precedes a paragraph that contains especially useful or noteworthy information.

Watch out! This symbol precedes a paragraph that warns you to be careful.

Stop! This symbol precedes a paragraph warning you that you are about to destroy data or harm hardware.

1

Introduction

Getting Familiar

Powerful computers, such as the Apple *III*, need large amounts of data storage in a physically small package. They also require their data storage systems to be highly reliable. Your new ProFile disk drive (Figure 1-1) will more than satisfy these requirements.

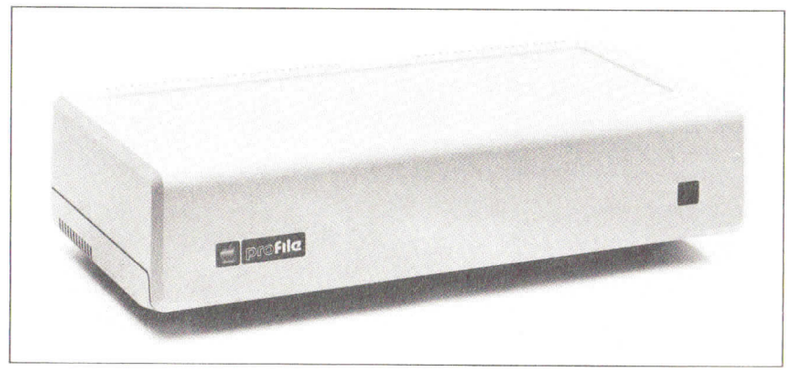

Figure 1-1. ProFile Disk Drive

The ProFile disk storage system consists of a fixed-media, random-access, 5-1/4 inch disk drive and a disk controller card packaged together in a lightweight, compact cabinet. ProFile is a Winchester-type

device, meaning that the read/write heads, the disks, and the actuator mechanism are all part of a unitized assembly enclosed in a sealed, protective, non-removable housing. Your ProFile drive is portable. If you handle your ProFile with care, you can easily move it from one location to another. You may stack your ProFile on top of the Apple *III* or on a desktop close to your computer.

Never, under any circumstances, place the ProFile drive on a thick carpet or any other surface that might obstruct the air vents on the bottom of the unit.

As a general rule, you should place the unit on a hard surface where it is convenient to operate and air flow is not restricted.

ProFile differs from a "floppy" disk drive in that the ProFile media, consisting of rigid disks rather than flexible diskettes, cannot be interchanged. The main advantages ProFile has over a "floppy" drive are much greater data storage capacity (ProFile can store nearly 5,000,000 bytes), higher reliability, and improved performance. Since the ProFile disks are protected by a sealed, non-removable housing, they cannot be damaged or lost as "floppy" diskettes can.

ProFile is controlled by the Apple *III*'s Sophisticated Operating System, usually called "SOS". The SOS automatically keeps track of files, saves and retrieves information, and does a multitude of other housekeeping tasks. The few special commands needed to manipulate files and use the drive are described in the reference manual for the particular product or programming language being used, for example Apple *III* Business Basic.

Unpacking Your Drive

Your ProFile drive is packed in a cardboard shipping carton and is protected by thick foam material. When you open the carton, the first thing you find is a small cardboard box identified by the words "OPEN ME FIRST". This box is the ProFile Interface Kit. It contains this manual, the peripheral interface card, the power and interface cables, the driver and demonstration program diskettes, the packing list, and other important documents. As you unpack the drive, check your packing list to make sure you have received all items listed.

Your ProFile drive is a delicate instrument. Be very careful when you remove it from the shipping carton. Extensive damage may result if the unit is accidently jarred, bumped, dropped, or handled roughly.

The following unpacking instructions are similar to the step-by-step procedure outlined in your unpacking instruction sheet. They are a backup in case you lose the instruction sheet.

These instructions assume you have already opened the carton and removed the Interface Kit. To remove the drive, first lift off the thick foam lid that protects the top of the drive. Notice that the drive is packaged in a cardboard container with hand cutouts on each side. Reach down with both hands, grasp the container by the hand cutouts, and carefully pull it straight upward and out of the carton. Open the container and remove the entire assembly, consisting of the drive with protective foam end caps strapped in place. Place the assembly on a desk, or any other flat surface, in the area where you intend to operate the drive.

As an added precaution against possible damage, you should leave the foam end caps strapped to your drive until you have initially applied power and checked out the unit as described in Chapter 2 of this manual. Then, you can remove the foam end caps and set the drive on its feet. Be sure to save both the end caps and the carrying container.

If you have to move your drive a short distance, for example, from one building to another, you should first attach the end caps to the drive and carry it in the cardboard carrying container.

Save the carton and packing material in case you wish to ship your drive. If your shipping carton becomes damaged or lost, request a new one from your dealer. Remember, if you attempt to transport the drive without proper packing, serious damage may result.

2

Preparing To Use Your Drive

Getting Started

Now that your drive is unpacked, you are probably getting anxious to see how it works. First, however, you must do some simple tasks to prepare the drive for operation. If you have not already done so, move the drive to a convenient location, close to the computer.

The ProFile chassis sits on six rubber feet which raise it sufficiently to allow cooling air to circulate through the bottom of the unit. Be careful not to set the drive on a thick carpet or any other surface which might obstruct air flow to the unit.

Next, you will have to install the peripheral interface card in the Apple ///. The interface card is nothing more than a device that exchanges address, data, and control information between the Apple /// and the ProFile controller. Before installing the card, you must first remove the Apple ///'s top cover to allow access to the inside of the computer.

Before removing the cover on your Apple ///, or connecting or disconnecting anything on either the Apple /// or the ProFile, TURN OFF THE POWER SWITCHES on the rear of the computer and the ProFile drive, and all other attached peripheral devices.

Removing the Apple III's Cover

The cover is attached to the case of the Apple *III* by two captive screws (Figure 2-1) located on the underside of the left and right corners of the face of the computer. Using a short, flat-blade screwdriver, turn each of these screws one-quarter turn in either direction.

Before tilting the Apple *III*, you should remove all connections from the back so you do not accidently damage a connector.

If your screwdriver isn't short enough, tilt the Apple *III* slightly to either side and loosen the corresponding screw. The screws should become loose, however they won't fall out of the case because they are held captive. Carefully remove the cover by tilting it forward and lifting it straight up.

Because of electromagnetic interference regulations, the United States Federal Communications Commission prohibits the operation of an Apple *III* with its cover removed. To remind you of this, there is a small red light on the left side of the main board, near the back. If you see that this light is on, TURN YOUR APPLE *III* OFF. (Don't forget to save any programs or data you might be working on.) Remember, never remove the cover from the Apple *III*, or connect or disconnect anything on either the Apple *III* or the ProFile while the power is on.

Installing the Interface Card

Now that you have removed the cover, look down into the rectangular well on the inside of the Apple *III*. Notice that there are four identical connectors (Figure 2-2) mounted on the main board. These connectors, often called "slots", are numbered, from 1 to 4, counting from left to right. Their purpose is to hold Apple peripheral interface cards. The ProFile demonstration program diskette supplied with your drive is configured to have the ProFile interface card installed in slot 4. You can install the card in any one of the slots, however, if you do not choose slot 4, you must first reconfigure the diskette by changing the peripheral slot assignment of the ProFile driver as explained in Chapter 3.

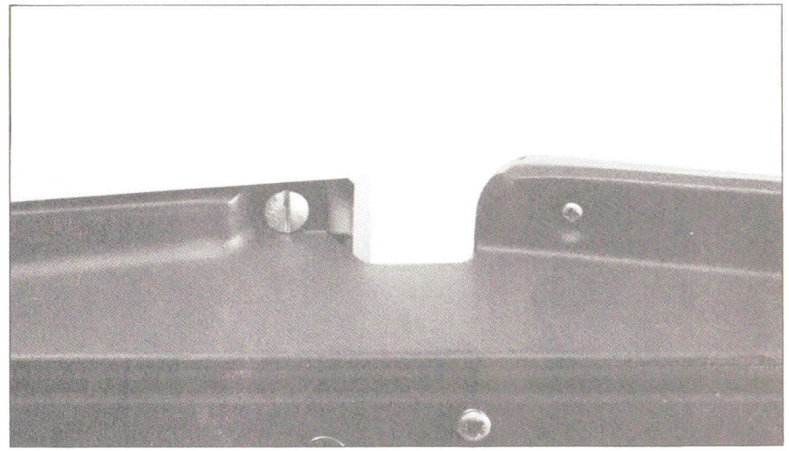

Figure 2-1. Apple *III* Cover Attachment Screw Locations

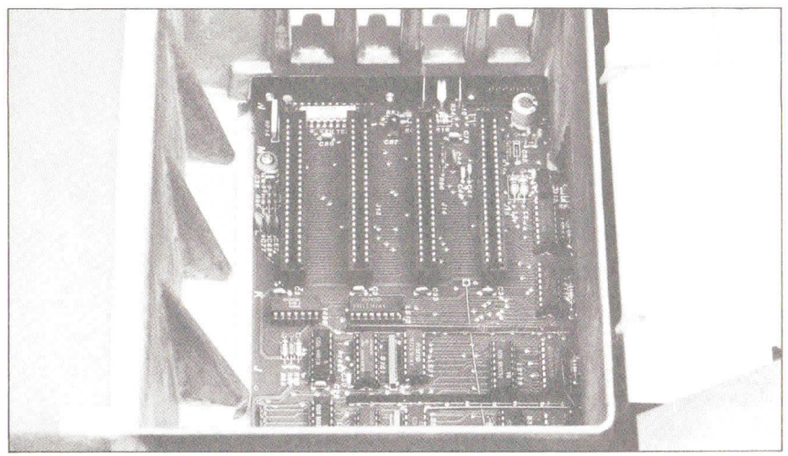

Figure 2-2. Apple *III* Peripheral Card Slots

Some Apple *III*'s were shipped with dummy cards mounted in the four peripheral card slots. Before installing your ProFile interface card, you must remove the dummy card (or any other peripheral interface card) from the slot you wish to use.

To remove a dummy card (or a peripheral interface card), rock the card slightly toward the keyboard then pull it straight up and out of the well as shown in Figure 2-3. To assist you, there is a hole drilled in the top of each card. You can insert a screwdriver into the hole and pry the card up, using the side of the well for leverage. Now you are ready to install your ProFile interface card.

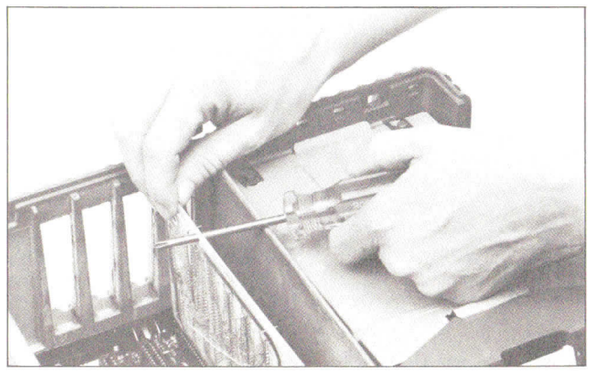

Figure 2-3. Removing a Dummy or a Peripheral Card

Handle the ProFile interface card with care. Grasp it only by the corners or edges, and try not to touch the delicate components. Above all, don't grasp the card by the gold "fingers" on its bottom edge connector—they are the medium through which the computer communicates to the card and their efficiency decreases if they are dirty or scratched.

With the computer facing you, hold the interface card with its gold "fingers" pointing down. The component side of the card should be facing to the right. Select one of the four peripheral card slots. Slide the front edge of the card into the card guide as shown in Figure 2-4. Continue to slide the card down until the "fingers" begin to enter the peripheral connector. At this point, you're probably going to have to exert force (not too much) to fit the interface card completely into its slot. A fully inserted interface card is shown in Figure 2-5. If the interface card doesn't seem to fit, remove it completely and try again, making sure that the card enters the card guide straight up and down.

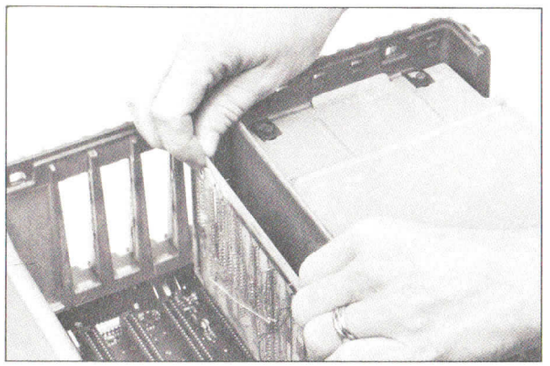

Figure 2-4. Installing the Interface Card

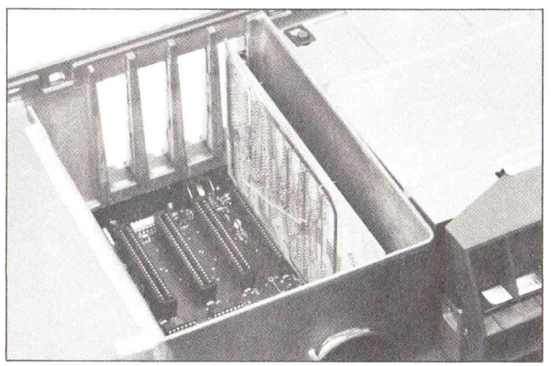

Figure 2-5. Fully Inserted Interface Card

Replacing the Apple III's Cover

Place the cover onto the top of the Apple *III* so that the back of the cover is flush with the back of the computer and the holes on the underside of the front of the cover fit over the two captive screws. Using a short, flat-blade screwdriver, tighten the two captive screws by pushing up on them and turning them each one-quarter turn in either direction (it may be necessary to tilt the Apple *III* slightly to each side to get access to the screws).

Connecting the Cables

Two cables are provided with the ProFile drive; the power cable and the interface cable. The power cable supplies AC power to the drive from an external source. The interface cable transfers control and data signals between the computer and the disk drive.

Before connecting any cables, make sure that the power switches on the back of both the Apple *III* and the ProFile are off.

The Interface Cable

The interface cable connects the ProFile to the interface card in the Apple *III*. Your ProFile is supplied with either a flat, ribbon cable or a round, shielded cable. Both have identical 25-pin, D-type connectors on each end. The connectors are called D-type because their shape resembles the letter D. Before making any connections, turn the computer around until the back is facing you.

Do not try to connect the interface cable to the 25-pin, D-type connector on the back of your Apple *III*. This connector, designated "PORT C", is only for a peripheral device requiring an RS-232 interface.

Notice that the D-type connector on the edge of the ProFile interface card protrudes slightly through the vertical access slot. Attach one end of your cable to this connector as shown in Figure 2-6. (The connector can go on in only one direction because of its shape.) As you make this connection, be sure you do not loosen the interface card from its slot in the Apple *III*. Attach the other end of the cable securely to the D-type mating connector on the back of the ProFile cabinet (see Figure 2-7). If your cable connectors have captive screws, tighten them down until the connection is secure.

The Power Cable

The AC power cable is a standard 3-conductor round type cable with a different connector on each end.

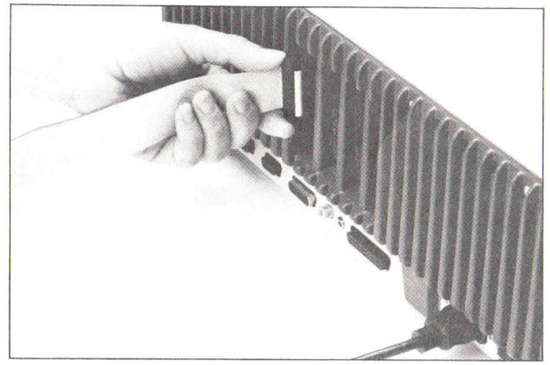

Figure 2-6. Connecting the Interface Cable to the Apple *III*

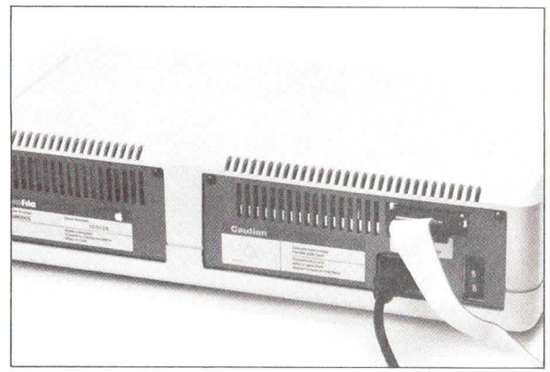

Figure 2-7. Connecting the Cables to the ProFile Drive

Always connect the power cable to the ProFile drive before connecting it to the power source.

Connect the mating plug on the power cord into the recessed 3-pin AC power connector (Figure 2-7) on the back of the ProFile cabinet (the plug can go on in only one direction). Next, carefully connect the other end of the power cord to the AC power receptacle. Your system is now completely connected and is ready to be powered up.

Powering Up and Checking Out ProFile

Reach around to the back of the ProFile and turn on the AC power switch. Notice that the READY (red) indicator on the front panel lights for about 2 seconds and the goes out for about 20 seconds while the drive comes up to operating speed. Then the indicator starts to flash while the drive performs a surface analysis of its disks. The surface analysis normally takes about 40 seconds, and then the indicator stays on continuously (does not flash) to indicate that power up and surface analysis are complete, and your drive is ready for operation. (Under certain conditions, it could take your drive up to 3 minutes to complete its power up and surface analysis.) Failure of the light to remain on after a maximum of 3 minutes indicates a possible hardware malfunction.

In addition to indicating that the drive is ready by remaining on continuously, the READY indicator also shows activity by flashing rapidly whenever the drive is communicating with the computer.

Next, turn on your video monitor, then reach back behind your Apple /// and turn the power switch ON.

You can check out the operation of your ProFile drive by running the ProFile demonstration program, but first, make sure your interface card is installed in slot 4 of the Apple ///. To run the program, simply insert the demonstration program diskette into the built-in drive. Boot the Apple /// by holding the CONTROL key down while pressing then releasing the RESET button behind the keyboard. The built-in drive's red light comes on and the drive starts to whir. After the Apple /// has loaded the information it needs from the diskette, it begins to communicate with the ProFile drive. The READY indicator on the front of the ProFile will flash rapidly as the demonstration programs stored in the drive are displayed on the screen.

Before you can use your ProFile to run any of the other Apple /// programs, you must add the device driver, described in the following paragraph, to any boot diskettes that will be used in the Apple ///'s built-in drive. Chapter 3 describes the step-by-step procedures for installing the driver software.

If the READY indicator does not come on within 1 to 3 minutes after you turn on ProFile, you may have a possible hardware problem. If this condition occurs and you have already installed your driver software correctly, try to access the ProFile from the Apple ///. The Apple /// will display an I/O error message on the screen if there is a problem. However, if there is no problem, the READY indicator will flash rapidly as the computer accesses the drive and will remain on following completion of the operation. The Apple /// will also display an I/O error message if you attempt to access the drive before its power up sequence is completed.

To minimize the possibility of equipment failure, you should not turn your ProFile off unless you are not planning to use it for an extended period of time. Observe the following precautions when powering down your ProFile.

- Do not turn off power while the drive is active (indicator light flashing). If you do, the heads will settle over a data area instead of returning to their home position outside of the data area.
- When the drive is no longer active, make sure the indicator remains on steady (not flashing) for at least four seconds before turning off power.

Using the Device Driver

A device driver is a machine language subroutine that is used by the Apple ///'s Sophisticated Operating System, SOS, to communicate with a peripheral device such as your ProFile drive. The device driver program works directly with the computer's hardware and electronics to perform the actual electronic manipulation of the disk drive.

To record information on or retrieve information from your ProFile, SOS must communicate with the ProFile device driver. The device driver will, in turn, communicate directly with the controller in the ProFile disk drive.

Each time your Apple /// boots a diskette in its built-in drive, the device drivers are read from the diskette and loaded into memory. The device

drivers are stored in a system file called SOS.DRIVER in the root directory of every boot diskette. Once loaded, the drivers remain in your Apple ///'s memory until you turn off power or reboot the system.

The SOS.DRIVER file on a boot diskette usually contains drivers for the console, graphics, audio, the printer, and any other peripheral devices already connected to your Apple ///. However, it does not include a driver for ProFile. Instead, this driver is included on the ProFile device driver diskette supplied with your disk drive. The name of that driver is .PROFILE.

To use your ProFile disk drive, you must first boot the Apple /// with a diskette that contains the .PROFILE driver. If your boot diskettes do not yet have .PROFILE as part of their SOS.DRIVER, refer to Chapter 3, which describes how to transfer the .PROFILE driver to a SOS.DRIVER file.

Backing Up Your Diskettes

People often make duplicate or backup copies of important documents, so that if one copy is accidently lost or destroyed there will always be another. For this same reason, we can't stress enough the importance of making a backup copy of your device driver diskette. The demonstration program diskette cannot be backed up because it is copy protected. There are many ways to destroy a diskette: leaving it out in the sun or in a hot car trunk, bending it, leaving it close to a powerful magnetic field, and so on. Failure to make a backup copy may cause you to lose hours, or days, of work.

Right now, take a few minutes to make a copy of the diskettes that came in the package with your disk drive. Remember, these diskettes can be used in the Apple ///'s built-in drive or in an attached drive such as the Disk ///, or the Disk II for Apple ///. To make your copies, refer to the paragraph in Chapter 3 entitled "Copying a Diskette". If you need more detailed information, Your Apple /// Owner's Guide includes a section on how to use the System Utilities "bulk copy" utility to make copies of diskettes. After you have made at least one copy of each diskette, store the original in a safe place. It will serve as a backup in case you lose or damage your copy.

Operating Your Drive

With the exception of the AC power switch, the ProFile drive contains no operating controls. After initial power up, all drive operations are controlled by the Apple ///. Programs that keep track of files, save information, and retrieve information are part of the Apple ///'s operating system. The few special commands required to use the drive and manipulate files are described in the reference manual for the product or programming language you are using. For example, if you are using Business Basic as your Apple ///'s programming language, you should first read, and later refer, to the applicable chapters of the Apple /// Business Basic Reference Manual.

Remember! Before your Apple /// can communicate with the ProFile, the ProFile device driver must be added to the SOS.DRIVER file of your boot diskettes as described in Chapter 3.

Backing Up Your ProFile Files

The Apple /// System Utilities diskette includes a file handling utility that permits you to transfer files between the ProFile and the built-in drive, or an attached drive such as a Disk ///, or a Disk II for Apple ///. For instructions on how to use this utility, refer to the paragraph in Chapter 3 entitled "Copying Files". Detailed instructions on how to use the file handling utility are provided in the Apple /// Owner's manual. You can use the file handling commands to back up your ProFile files on diskettes, but you must remember that the physical size of the file you are transferring from the ProFile cannot exceed the number of blocks available on the diskette.

If Pascal is your primary programming language, you can back up your ProFile by using the Pascal Filer's Transfer command to transfer files to diskettes. Again, the physical size of the file being transferred from the ProFile cannot exceed the number of blocks available on the diskette.

Caring for Your Drive

The ProFile disk drive, unlike the computer, is a mechanical device, with motors and moving parts. Therefore it is somewhat more delicate than the computer. The ProFile drive is completely aligned and tested at the factory, and with proper care and handling should provide troublefree operation. However, rough handling, such as dropping the drive, sharply jarring it, or allowing heavy objects to fall on it, could cause a malfunction.

If Your Drive Doesn't Work

If your ProFile does not operate, re-read this manual carefully to make sure that the interface card is correctly installed in the appropriate slot in the Apple /// (usually slot 4) and the cables are properly connected—this cures most problems.

If you can run the ProFile demonstration program but cannot get your operational programs to work with ProFile, make sure that the software you are using is based on SOS, version 1.1 or later, and that you have reconfigured your boot diskettes as explained in Chapter 3.

This isn't likely, but if your drive received excessive rough handling during shipping or unpacking, one of the connectors inside of the ProFile cabinet may be loose. If this condition is suspected, contact your dealer–he will be glad to help you.

Do not attempt to enter the ProFile cabinet as this could void your warranty.

3

Installing The Driver Software

Reconfiguring a Boot Diskette

The information in this chapter is condensed from the chapter in your Standard Device Drivers manual entitled "The System Configuration Program". For a complete description of how the System Configuration Program (SCP) is used to configure the Sophisticated Operating System (SOS), refer to the Standard Device Drivers manual and to your Apple /// Owner's Guide.

The device driver diskette supplied with your ProFile system contains a file named PROFILE.DRIVER. This file contains the driver that permits the Apple ///'s Sophisticated Operating System (SOS) to communicate with your ProFile. The boot diskettes supplied with your Apple /// do not include the driver program, therefore, before you can use your ProFile with any of these boot diskettes, you must transfer the .PROFILE driver from your driver diskette to the SOS.DRIVER file of each boot diskette. To do this, use your System Utilities diskette, version 1.1 or later, and perform the steps listed in the paragraph entitled "Adding the ProFile Device Driver".

The Apple ///'s built-in drive is mentioned throughout the following procedures. The built-in drive must be used for booting the system but if you have another drive, such as a Disk /// or a Disk II for Apple ///, attached to your computer, you can use it for any of the other functions and reduce the inconvenience of swapping diskettes. Remember to identify any attached drives correctly as .D2, .D3, or .D4 when entering information from the keyboard.

Adding the ProFile Device Driver

Before your ProFile can communicate with your Apple *III*, you must add the ProFile device driver to your boot diskettes (System Utilities, Business BASIC, VisiCalc, Pascal, etc.). Its easy to do if you follow these steps and observe the prompts on the monitor screen.

1. Using the System Utilities "bulk copy" routine, make a clean backup copy of the boot diskette that you wish to reconfigure. The bulk copy routine is described later in this chapter in a paragraph entitled "Copying a Diskette". Remember, you cannot make a copy of a copy protected diskette. Use your backup copy for the remaining steps of this procedure.
2. Verify that the diskette you plan to reconfigure (for example Business BASIC) has enough blocks available for the .PROFILE driver. You can determine this as follows.
    a. Insert the System Utilities diskette into the built-in drive.
    b. Boot the Apple *III*—hold the CONTROL key down and press RESET.
    c. Remove the System Utilities diskette and insert the ProFile driver diskette.
    d. Type F for File Handling commands.
    e. Type L for List Files.
    f. Type .D1 and press RETURN.
    g. Press RETURN twice to display the directory.
    h. The number of physical blocks required by the ProFile driver file is listed under the PHYS column.
    i. Remove the ProFile driver diskette and insert the boot diskette.
    j. Press ESCAPE.
    k. Repeat steps e through g.
    l. Read the number of blocks available immediately following the directory listing. If this number is less than the number of blocks required by the ProFile driver (step h), you must delete one or more drivers. You will be shown how to delete drivers when you get to step 7.

3. Insert the System Utilities diskette into the built-in drive and press ESCAPE twice to return to main menu.
4. Type S for the Systems Configuration Program (SCP) option and you will see the SCP menu on the screen.
5. Type R for the Read a Driver File option and the Apple tells you that no drivers are loaded.
6. Remove the System Utilities diskette and insert the boot diskette. Type .D1/SOS.DRIVER and press RETURN. A listing of all the drivers currently in the SOS.DRIVER file appears on the screen.
7. If there is sufficient space on your diskette for the ProFile driver (as determined in step 2), remove the boot diskette from the built-in drive, insert the ProFile driver diskette, and go to step 10. If you do not have sufficient space, you may find it necessary to delete one or more drivers from the SOS.DRIVER file as described in step 8. For example, if you do not have a printer and are not planning to use one, you could choose to delete the printer driver. However, in the case of the System Utilities diskette, you may want to keep all of the existing drivers, but still do not have enough blocks available in which to add the ProFile driver. In this case, you can increase the available space by creating two diskettes as described in the paragraph entitled "Creating a Two-Stage Boot".
8. Delete a driver from the SOS.DRIVER file of your boot diskette as follows.
    a. Press ESCAPE to display the SCP menu.
    b. Remove the boot diskette and insert the System Utilities diskette.
    c. Type D for Delete a Driver.
    d. Type the number of the driver you wish to delete and press RETURN.
    e. Type Y (for yes).
    f. Press ESCAPE to display the SCP menu.

9. Type R for Read a Driver, remove the System Utilities diskette from the built-in drive, and insert the ProFile device driver diskette.
10. Type .D1/PROFILE.DRIVER and press RETURN. Notice that the driver named .PROFILE has been added to the bottom of the current configuration list.
11. Remove the ProFile driver diskette and insert the System Utilities diskette. Press ESCAPE and the SCP menu is displayed.
12. Select the option entitled "Change System Parameters" by typing the letter C. The System Parameter Display now appears on the screen.
13. Select the option entitled "Peripheral Slot Assignments" by typing its option number. The screen will display a list of all presently installed device drivers and their current peripheral slot assignments. The ? mark following the .PROFILE driver indicates that a slot is not yet assigned to this driver.
14. Type the number appearing to the left of the .PROFILE driver and press RETURN. You are asked to enter the number of the slot you wish assigned to your driver. Type a number from 1 to 4 (usually 4). This number corresponds to the peripheral slot in the Apple *///* where you installed your interface card. Press RETURN. The ? is now replaced by the peripheral slot number which you just assigned. Press ESCAPE twice to display the SCP menu.
15. Select the option entitled "Generate New System" by typing the letter G. The Apple *///* asks you to Enter Driver File Name.
16. Remove the System Utilities diskette, insert the boot diskette, and type .D1/SOS.DRIVER. Press RETURN. Type Y (for yes) indicating that you wish to delete the existing SOS.DRIVER file. If the message "File is Write Protected" is displayed on the screen, type Y (for yes) indicating that you wish to delete the file anyway. If the message "System Generated" appears on the screen, go to step 17. If messages such as "Driver File Too Large" or "No Room On Volume" appear on the screen, repeat step 8, and steps 15 through 17. This will allow you to delete another driver and generate a new SOS.DRIVER file on your boot diskette.

17. You have now configured your boot diskette to contain the .PROFILE driver in the new SOS.DRIVER file. Whenever you boot the Apple *///* with this diskette, you can communicate with ProFile. To verify that ProFile will actually communicate with the computer, boot the Apple *///* with your newly configured boot diskette and use the appropriate command to display the directory of the ProFile drive. (This command will differ depending on the programming language being used.) For Business BASIC, the command is CATALOG .PROFILE.

Copying a Diskette

You can make a backup copy of your diskettes by following these steps. You cannot make a backup copy of copy protected diskettes such as VisiCalc. Also, the source volume must be the same kind as the destination volume. For example, you cannot make a bulk copy between the ProFile and a Disk II floppy disk drive, or vise versa. For copying between different kinds of volumes, you must use the file copying procedure described in the next paragraph.

a. Insert the System Utilities diskette into the built-in drive.
b. Boot the Apple *///* — hold the CONTROL key down and press RESET.
c. Type D for Device Handling commands.
d. Type F for Format a Volume.
e. Remove the System Utilities diskette, insert the destination (blank) diskette, type .D1, and press RETURN twice.
f. After the message "Formatting Successful" is displayed, press ESCAPE.
g. Type C for Copy One Volume onto Another.
h. Remove the destination diskette from the built-in drive and insert the boot diskette.
i. Type .D1 and press RETURN.

j. If you do not have an external floppy disk drive, ignore this step and go to step k. If you do have an external drive, insert the destination diskette into this drive, type .D2, and press RETURN twice. If the message "Destroy Old Blank" appears, type Y (for yes). When the copy is completed, the message "Copy Successful" is displayed on the screen. Remove your new copy from the drive and ignore the remaining steps of this procedure.

k. Type .D1 and press RETURN twice.

l. Swap source (boot) and destination (blank) diskettes in the built-in drive as directed by prompts on the monitor screen. If the message "Destroy Old Blank" appears, type Y (for yes). When the copy is completed, the message "Copy Successful" is displayed on the screen.

Copying Files

If you are planning to backup your Profile files on diskettes, you can use the System Utilities File Copying routine. Refer to your Apple *III* Owner's Manual for a more detailed explanation of file copying. If Pascal is your primary programming language, you may prefer to use the Pascal Filer's Transfer command to copy files. This procedure is described in the Apple *III* Pascal manual entitled "Introduction, Filer, and Editor".

To copy a file from your ProFile to a floppy disk, first add the ProFile driver to the System Utilities diskette as described earlier in this chapter. If this is done, you can copy a file as follows.

a. Insert the System Utilities diskette into the built-in drive.

b. Boot the Apple *III* — hold the CONTROL key down and press RESET.

c. Type F for File Handling commands.

d. Type C for Copy Files.

e. Type the device and file names you wish to copy from. (Do not type the word "filename" but type the name actually assigned to the file.

.PROFILE/filename

f. Type the device and file names you wish to copy to

.D1/filename

g. Remove the Utilities diskette from the built-in drive and insert the destination diskette.

h. Press RETURN.

Creating a Two-Stage Boot

The Utilities Filer is a pascal program, so you can make a version of the System Utilities diskette with more available space by going to a two-stage boot. With a two-stage boot, some of the files you need to start the system are on a separate diskette that is used only for the first stage of the bootstrap operation. To make the two-stage boot, first use your existing System Utilities diskette to format two blank diskettes, then use the File Copying utility to transfer some of the files from the System Utilities diskette to one of the two blank diskettes and the remaining files to the other blank diskette.

1. Format two blank diskettes as follows.

   a. Insert the System Utilities diskette into the built-in drive.

   b. Boot the Apple *III*—hold the CONTROL key down and press RESET.

   c. Type D for Device Handling Commands.

   d. Type F for Format a Volume.

   e. Remove the System Utilities diskette, insert a blank diskette, type .D1, and press RETURN.

   f. Type UTILITY1 and press RETURN.

   g. When the message "Formatting Successful" appears, remove the diskette and label it UTILITY1.

   h. Insert another blank diskette into the drive, press RETURN, type UTILITY2, and press RETURN again.

   i. When the message "Formatting Successful" appears, remove the diskette and label it UTILITY2.

   j. Press ESCAPE twice to display the main menu.

2. Using the File Copying utility described in the following steps, first copy these files from the System Utilities diskette to UTILITY1:

   SOS.KERNEL
   SOS.INTERP
   SOS.DRIVER

Then copy these files from the System Utilities diskette to UTILITY2:

   SYSTEM.MISCINFO
   SYSTEM.PASCAL
   SYSTEM.STARTUP

Copy the files from the System Utilities diskette as follows.

a. Press F for File Handling Commands.
b. Press C for Copy Files.
c. Insert the System Utilities diskette into the built-in drive.
d. If you do not have an external floppy disk drive, skip this step and go on to step e. If you do have an external drive, type .D1/FILENAME and press RETURN. Insert UTILITY1 into the external drive and press RETURN. Repeat this step for each file you wish to transfer to UTILITY1. Next, remove UTILITY1 from the drive, insert UTILITY2, and repeat this step for each file you wish to transfer to UTILITY2. Skip steps e through j.
e. Type the device and file names you are copying from. (Do not type the word "filename" but type the actual name assigned to the file, for example "SOS.KERNEL".)

   .D1/filename

f. Press RETURN.
g. Type the device and file names you are copying to.

   .D1/filename

h. Press RETURN.
i. Swap the source (System Utilities) and destination (UTILITY1) diskettes in the built-in drive, as directed by prompts on the monitor screen, until the file transfer is complete. Repeat steps e through i for each file you wish to copy.
j. Repeat steps e through i for each file you wish to transfer from the System Utilities diskette to UTILITY2. Remember to use UTILITY2 as the destination diskette.

Now you will have sufficient space in the SOS.DRIVER file of UTILITY1 in which to add the ProFile driver. To run your two-stage boot, put UTILITY1 in the built-in drive and boot the Apple /// by holding the CONTROL key down and pressing RESET. When the disk stops whirring, the following message appears

   Put Pascal system disk in built-in drive. Press RETURN

Remove UTILITY1 from the drive, insert UTILITY2, and press RETURN. The bootstrap process will continue until the display shows the System Utilities main menu.

Changing all Boot Diskettes

Since you are already using the System Configuration Program, now may be a convenient time to incorporate the .PROFILE driver into the SOS.DRIVER file on all of your diskettes. To do this, repeat the steps described in the previous paragraphs for each boot diskette you want to use with the ProFile drive. You don't have to add the .PROFILE driver to any diskettes that are not boot diskettes or that you don't intend to use with the ProFile drive.

Reformatting the Drive

If you have added the .PROFILE driver to a copy of your system Utilities diskette, you have the capability of reformatting your ProFile drive. Using this procedure, you can recover all available space on your ProFile without having to individually erase each file and subdirectory.

If, for any reason, you must reformat your drive, you will lose all data previously recorded on the drive.

Format your ProFile as follows:

1. Insert the System Utilities diskette in the built-in drive and boot the Apple ///.
2. Type D for Device Handling commands.
3. Type F for Format a Volume.
4. Type .PROFILE and press RETURN.
5. Type a volume name (for example PROFILE) and press RETURN.

Selecting Write/Verify or Write

Your ProFile writes data in either of two modes; Write/Verify or Write. In the Write/Verify mode, information is written during one revolution of the disk and read back (verified) during the following revolution. This is the default mode, and is the mode your ProFile will operate in unless you change the driver configuration. If you wish to increase your data transfer rate, you can reconfigure your driver for the Write mode, but you must remember that the information that you write on the disk is no longer automatically verified. To configure your ProFile for the Write mode follow these steps.

This procedure assumes you have already added the .PROFILE driver to the SOS.DRIVER file of your boot diskette as described earlier in this section in the paragraph entitled "Adding the ProFile Device Driver".

1. Insert the System Utilities diskette into the built-in drive and boot the Apple ///.
2. Type S for the System Configuration Program (SCP) option and you see the SCP menu on the screen.
3. Select the option to Read a Driver by typing R. The Apple tells you that no drivers are loaded.
4. Remove the System Utilities diskette and insert the boot diskette.
5. Type .D1/SOS.DRIVER and press RETURN. A listing of the Current Driver Configuration will appear.
6. The Apple again asks you to Enter Driver File Name. Ignore this request and press ESCAPE to display the SCP menu.
7. Remove the boot diskette and insert the System Utilities diskette.
8. Type E for the Edit Driver Parameters option.
9. Type the number of the driver to be edited, press RETURN, and Edit Driver Parameters appears on the screen.
10. Select the option entitled "Configuration Block Data" by typing its number and the driver configuration block appears on the screen.
11. Notice that the value in byte 0 is FF, which is the default (Write/Verify) value. To change to the Write mode, type 00 and press RETURN.
12. Press ESCAPE three times to return to the SCP menu. Select the option entitled "Generate New System" by typing G. The Apple asks you to Enter a Driver File Name.
13. Remove the System Utilities diskette, insert your boot diskette, and type .D1/SOS.DRIVER. Press RETURN. The Apple again asks you to Enter Driver File Name. Ignore this request.
14. Reboot your Apple /// with your newly configured boot diskette. Your ProFile drive will now operate in the Write mode.

4

How Your Drive Operates

Basic Functions

The ProFile disk storage system (Figure 4-1) consists of a 5-1/4" disk drive, its associated controller card, and a power supply, all packaged in a compact cabinet, and one peripheral interface card which is installed in the Apple *III* computer.

The disk drive is a fixed-media, rotating memory, storage device, consisting of two rigid 5-1/4" disks, four read/write heads, spindle drive mechanism, positioning mechanism, and recirculating air-filtration system. All of these components are enclosed in an environmentally sealed, protective, non-removable aluminum housing called an HDA (Head Disk Assembly). Associated analog and motor control cards are mounted beneath the HDA. The ProFile disk storage system does the following:

- Moves the read/write heads to the desired track
- Reads and writes data
- Provides a contamination-free environment.

Spindle Rotation

A brushless DC motor drives the spindle directly at a rotational speed of 3600 rpm (no belt or pulley is used). A mechanical brake ensures a fast stop of the spindle drive motor whenever power is removed.

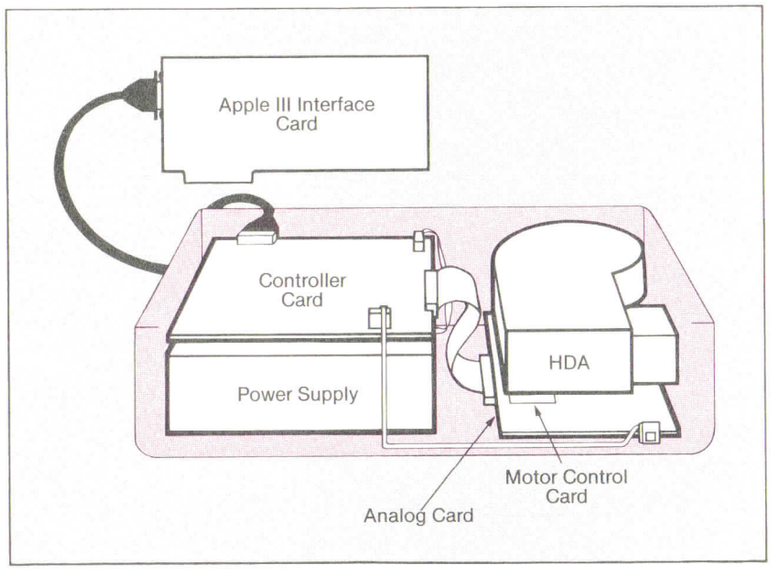

Figure 4-1. ProFile Disk Storage System

Head Positioning

An open loop stepper system moves the read/write heads. The heads are attached to a carriage that is driven and positioned by a band actuator connected to the capstan shaft of a stepper motor (see Figure 4-2). Positioning is achieved by wrapping and unwrapping the band around the capstan.

Read/Write Heads and Disks

The drive uses two non-removable 5-1/4" disks as storage media. Each disk consists of an aluminum substrate covered on each side with a lubricated, thin, magnetic oxide coating. This coating formulation, together with the low load force/low mass of the Winchester-type heads, permits the heads to contact the disk surface during start/stop operations. The four read/write heads (one per disk surface) each access 152 data tracks. The total formatted capacity of the ProFile drive is approximately 5 megabytes.

Air Filtration System

An internal recirculating air system with an absolute filter maintains a clean environment within the HDA. Integral to the filter is a port which permits ambient air to equalize pressure without causing contamination. The filter never requires cleaning or replacement.

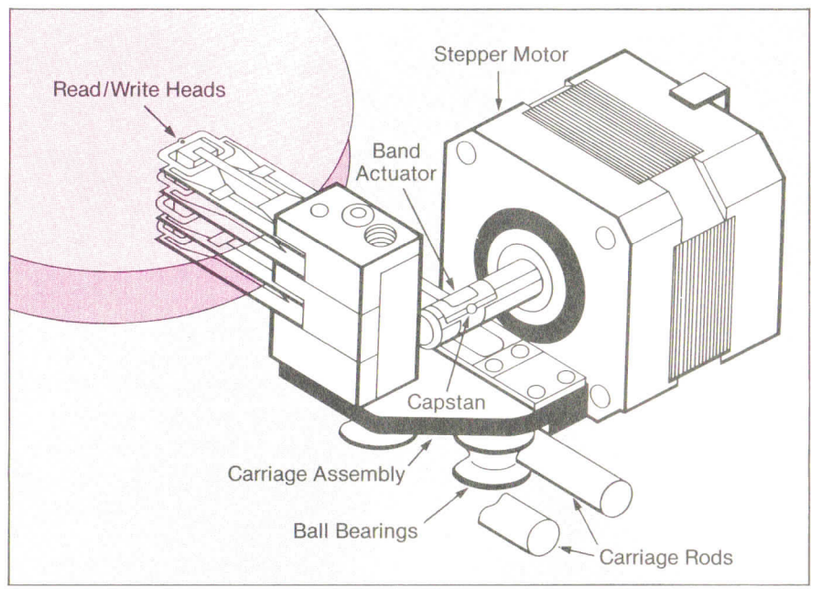

Figure 4-2. Positioning Mechanism

Drive Electronics

The ProFile electronics consist of the peripheral interface card, which resides in an Apple *III* peripheral card slot, a controller card, an analog card, a motor control card, and a power supply. The controller card, analog card, motor control card, and power supply are packaged, together with the HDA, in the ProFile cabinet. A 25-conductor interface cable connects the ProFile's controller card to the peripheral interface card in the Apple *III* (Figure 4-1).

Interface Card

The peripheral interface card serves primarily as a buffer area for data and control signals transmitted between the Apple *III* and the controller card. The interface card may be plugged into any of the four peripheral card slots on the Apple *III*.

Eight bi-directional data lines and five control lines are included in the 25-conductor cable connecting the peripheral interface card to the ProFile's controller card.

Data may be transferred one byte at a time or by Direct Memory Access (DMA) at one Megabyte per second. During a DMA data transfer, the Apple *III*'s central processing unit is disconnected from its memory bus allowing data to be transferred directly between the Apple *III*'s memory and the controller.

Controller Card

The controller card is mounted on top of the power supply in the ProFile cabinet. It has four main sections; a microprocessor, a random access memory (RAM), serializing/deserializing and error detection logic, and read/write control logic. The controller does the following:

- Communicates with the Apple *III* via the interface card
- Selects the read/write head and moves it to the proper track
- Provides signals to read and write serial data on the disk
- Converts 8-bit parallel data from the Apple *III* into serial data for the drive during a write operation
- Converts serial data from the drive into 8-bit parallel data bytes for the Apple *III* during a read operation
- Continuously monitors the ProFile for error conditions.

During the first 60 seconds following a power up, the controller performs a surface analysis, checks the data integrity of all sectors, and spares out any marginal sectors automatically. If a head positioning error is detected, the controller will automatically attempt to reposition the heads to the proper track location. If a read error occurs during operation, the controller retries the data and attempts to recover from the error automatically. If the error rate for a given sector is too high, the controller will automatically "spare" it (relocate the sector data to another area of the disk). The controller will attempt to spare a sector on a read operation only if valid data has not been recovered from the sector. If valid data cannot be recovered, the sector will be flagged as bad and a sparing attempt will be made on the next write or write/verify operation.

The microprocessor section supervises the controller hardware through signals on its input/output (I/O) ports and control information stored in the RAM. The microprocessor directly controls the two-phase stepper motor to move the actuator and heads from track to track, selects one of four read/write heads, and writes sector marks on the disk during the format operation (each track is divided into 16 sectors whose boundaries are defined by sector marks).

Under direction of the microprocessor, the controller's read/write control logic converts parallel data to serial data when writing and serial data to parallel data when reading, controls the transfer of data to and from the RAM, and controls the error detection logic. This logic detects errors in data read from the disk and outputs an error signal to the microprocessor. As a result, the controller tries again to read the data. Normally one or two retries will result in a successful read.

Analog Card

The analog card is the interface between the controller card and the HDA. It is mounted on the bottom of the HDA and is primarily dedicated to read/write functions. The analog card includes a write encoder, write driver, head select matrix, preamplifier, read detector, and sector detector.

The head select matrix selects one of the four read write heads for a read or write operation.

During a write operation, the write circuit receives serialized digital data

pulses from the controller and converts them into an encoded data stream of current reversals for the selected head. These current reversals are recorded on the disk surface as a series of polarity reversals (flux changes) having the same timing relationships as the encoded data.

During a read operation, the selected read/write head transforms the polarity reversals (flux changes) on the disk surface into an encoded data stream. The read circuit separates the encoded read data into streams of serialized digital clock and data pulses and sends them to the controller.

Motor Control Card

The motor control card is a small card mounted between the HDA and the analog card. Its function is to maintain spindle rotation speed at 3600 RPM, plus or minus 1%.

Power Supply

The power supply provides operating voltages of +5V, +12V, and -12V to the ProFile electronics.

A

Operating Specifications

Storage Characteristics

Data Capacity (Formatted)	4,980,736 bytes
Data surfaces	4
Heads per surface	1
Tracks per surface	152
Track spacing	254 tracks per inch
Bytes per block	512
Blocks per track	16
Blocks per surface	2432
Total number of blocks	9728

Drive Characteristics

Seek time distribution	330 tracks per second
Average seek time	180 milliseconds
Data transfer rate	5 megabits/second
Rotational speed	3600 RPM
Rotational start-up time	20 seconds
Drive ready to operate	60 seconds

Environmental Characteristics

Operating temperature	10°C (50°F) to 40°C (104°F)
Storage temperature	-22°C (-7.6°F) to 80°C (176°F)
Operating humidity	8% to 80% (no condensation)
Storage humidity	1% to 95%

B

The Pascal Language System

Adding Pascal to Profile Drive

The following information is intended for those persons whose programming requirements are primarily based on the Pascal language system. The files making up the Apple *III* Pascal System are supplied on three diskettes identified as PASCAL1, PASCAL2, and PASCAL3. The following table lists the system files found on each diskette.

PASCAL1	PASCAL2	PASCAL3
SOS.KERNEL	SYSTEM.EDITOR	LIBMAP.CODE
SOS.DRIVER	SYSTEM.SYNTAX	LIBRARY.CODE
SOS.INTERP	SYSTEM.COMPILER	SETUP.CODE
SYSTEM.PASCAL	SYSTEM.ASSMBLER	AIIFORMAT.CODE
SYSTEM.MISCINFO	OPCODES.6502	SYSTEM.LIBRARY
SYSTEM.LIBRARY	ERRORS.6502	
SYSTEM.FILER	SYSTEM.LINKER	

To eliminate the inconvenience of having to repeatedly swap the Pascal diskettes to access the different files, you can transfer the files from the Pascal diskettes to your ProFile drive as follows:

The Pascal system must be booted with your boot diskette in the built-in drive. You will find it easier and more convenient to perform the other steps of this procedure if you have an external drive such as a Disk ///, or a Disk II for Apple ///, attached to your Apple ///. If you do not have an external drive, all of the steps can be performed on your built-in drive, but the operation will require more frequent exchanges of diskettes.

1. Make copies of PASCAL1, PASCAL2, and PASCAL3 using the Apple /// Utilities diskette.
2. Use the Disk Format Utility on the Apple ///'s Utilities diskette to format a new diskette called PROFILEPASCAL.
3. Use the Systems Configuration Program (SCP) on the Apple ///'s Utilities diskette to add the .PROFILE driver from the ProFile device driver diskette to the SOS.DRIVER file of the PASCAL1 diskette as described in Chapter 3. Write the combined driver file onto the PROFILEPASCAL diskette as /PROFILEPASCAL/SOS.DRIVER. (It is necessary to write the file onto the PROFILEPASCAL diskette because there is not enough space on the PASCAL1 diskette.)
4. Place the copy of PASCAL1 you made in step 1 into the Apple ///'s built-in drive and boot the Pascal system.
5. Enter the Pascal Filer and perform the following transfer commands to transfer files from the PASCAL1 diskette to the PROFILEPASCAL diskette.

   /PASCAL1/SOS.KERNEL to /PROFILEPASCAL/SOS.KERNEL
   /PASCAL1/SOS.INTERP to /PROFILEPASCAL/SOS.INTERP
   /PASCAL1/SYSTEM.MISCINFO to /PROFILEPASCAL/SYSTEM.MISCINFO
   /PASCAL1/SYSTEM.PASCAL to /PROFILEPASCAL/SYSTEM.PASCAL
6. Remove the PASCAL1 diskette from the built-in drive and insert the PASCAL3 diskette.
7. Enter the Pascal Filer and perform the following transfer.

   /PASCAL3/SYSTEM.LIBRARY to /PROFILEPASCAL/SYSTEM.LIBRARY
8. Remove PASCAL3 from the built-in drive, insert your PROFILEPASCAL diskette, and reboot the Pascal system.

9. Place the PASCAL1 diskette in an external drive.
10. Enter the Pascal Filer and transfer the SYSTEM.FILER from the PASCAL1 diskette to your ProFile disk drive using the following transfer commands:

    /PASCAL1/SYSTEM.FILER to .PROFILE/SYSTEM.FILER
11. Quit from the Filer.
12. Remove the PASCAL1 diskette from the external drive.
13. Enter the Filer—this will execute the copy of the Filer which you just recorded on ProFile.
14. Place the PASCAL2 diskette into the external drive and use the following Filer Transfer command to copy all of the PASCAL2 files onto the ProFile drive:

    T /PASCAL2/=,.PROFILE/=
15. Place the PASCAL3 diskette into the external drive and use the following Filer Transfer command to copy all of the PASCAL3 files onto the ProFile drive:

    T /PASCAL3/=,.PROFILE/=

After completing the above steps, your ProFile drive will contain all of the necessary Pascal files, and PROFILEPASCAL will be the only diskette you need to boot the Pascal language system. This results in the following advantages to a Pascal user:

- faster program initiation
- minimum ProFile storage space is needed (approximately 175 kilobytes)
- convenience
- less shuffling of diskettes.

Detailed information on the Apple /// Pascal system can be found in the following three manuals:

Apple /// Pascal: Introduction, Filer, and Editor
Apple /// Pascal: Program Preparation Tools
Apple /// Pascal: Programmer's Manual (Volumes 1 and 2)

C

Profile Quick Reference

Profile Configuration Block

Parameter Name	Byte	Possible values	Default Value
Write/Verify	00	00 , FF	FF (Mode Enabled)

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