Apple® Hard Disk SC Owner's Guide

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Apple® Hard Disk SC Owner's Guide

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Contents

Radio and television interference

The equipment described in this manual generates and uses radio-frequency energy. If it is not installed and used properly—that is, in strict accordance with Apple's instructions—it may cause interference with radio and television reception.

This equipment has been tested and complies with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules. These specifications are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that the interference will not occur in a particular installation.

You can determine whether your computer is causing interference by turning it off. If the interference stops, it was probably caused by the computer or one of the peripheral devices.

If your computer system does cause interference to radio or television reception, try to correct the interference by using one or more of the following measures:

- Turn the television or radio antenna until the interference stops.
- Move the computer to one side or the other of the television or radio.
- Move the computer farther away from the television or radio.
- Plug the computer into an outlet that is on a different circuit from the television or radio. (That is, make certain the computer and the television or radio are on circuits controlled by different circuit breakers or fuses.)
- Consider installing a rooftop television antenna with a coaxial cable lead-in between the antenna and the television.

If necessary, consult your authorized Apple dealer or an experienced radio/television technician for additional suggestions. You may find helpful the following booklet, prepared by the Federal Communications Commission: "How to Identify and Resolve Radio-TV Interference Problems" (stock number 004-000-00345-4). This booklet is available from the U.S. Government Printing Office, Washington, DC 20402.

△ **Important** This product was tested for FCC compliance under conditions that included the use of shielded cables and connectors between system components. It is important that you use shielded cables and connectors to reduce the possibility of causing interference to radios, television sets, and other electronic devices. For Apple peripheral devices, you can obtain the proper shielded cables from your authorized Apple dealer. For non-Apple peripheral devices, contact the manufacturer or dealer for assistance. △

About This Guide

THIS GUIDE ACCOMPANIES THE APPLE® HARD DISK SC. IT EXPLAINS how to connect, prepare, and use any external Apple Hard Disk SC with any Apple Macintosh® computer that has a Small Computer System Interface (SCSI) port. You can also use the Hard Disk SC with an Apple IIGS®, Apple IIe, or Apple II Plus computer equipped with an Apple II SCSI Card.

Apple Computer does not support some large-capacity Hard Disk SC drives for use with the Apple II. Contact your authorized Apple dealer if you have a question about which Hard Disk SC you can use with an Apple II.

For the Macintosh

If you plan to use your Hard Disk SC with a Macintosh computer, read Chapters 1-6 of this guide.

Here's what you'll find:

- Chapter 1, "Unpacking the Hard Disk SC," introduces you to your Apple Hard Disk SC and gives important information about handling and caring for it.
- Chapter 2, "Connecting the Hard Disk SC to Your Macintosh," explains how to set up your hard disk. It takes you step-by-step through the process of connecting and preparing your hard disk. You'll also learn how to create a startup disk.
- Chapter 3, "Using the Hard Disk SC With Your Macintosh," describes how to shut down your Hard Disk SC, how to reconnect it to another computer, and how to prevent and solve problems you may encounter.
- Chapter 4, "HD Backup," describes how you can protect the files on your hard disk by copying them onto floppy disks and restoring them, if necessary.
- Chapter 5, "Disk First Aid," explains how to examine and repair damaged disks.
- Chapter 6, "Find File," describes how to find lost files.

If you need to partition your Hard Disk SC, for example, to use portions of your hard disk with A/UX®, Apple's version of the UNIX® operating system, see Appendix A, "Partitioning a Hard Disk SC Connected to a Macintosh."

This guide assumes that you've already set up your Macintosh and that you're familiar with the standard Macintosh skills and with the Finder™. For more information, see the *Macintosh System Software User's Guide.*

For the Apple II

If you plan to use your Hard Disk SC with an Apple IIGS, Apple IIe, or Apple II Plus computer, read Chapters 1 and 7 of this guide.

Here's what you'll find:

- Chapter 1, "Unpacking the Hard Disk SC," introduces you to your Apple Hard Disk SC and gives important information about handling and caring for it.
- Chapter 7, "Using the Hard Disk SC With Your Apple II," explains how to connect, prepare, and use your hard disk.

In order to prepare the Hard Disk SC for use with the Apple II, you will need to refer to the owner's guide or system software guide for your computer. You should also be familiar with the *Apple II SCSI Card Owner's Guide,* which accompanies the card you install in your Apple II to allow you to connect SCSI devices such as the Hard Disk SC. See Chapter 7 for more information.

Conventions used in this guide

❖ *By the way:* Text set off in this manner presents additional information or interesting sidelights.

△ **Important** This label tells you that what follows is essential information you need to read before continuing. △

▲ **Warning** Warnings like this alert you to situations where you could damage software or lose data. ▲

Definitions of terms sometimes appear in the margin.

New terms are set off in **boldface** the first time they are introduced. These terms are defined in the glossary.

C H A P T E R 1

Unpacking the Hard Disk SC

YOUR APPLE® HARD DISK SC IS A PERIPHERAL DEVICE FOR MACINTOSH® AND Apple II computers. It allows you to store very large amounts of information. The numbers before the letters *SC* refer to how many megabytes of information your hard disk can store. For example, the Hard Disk 20SC contains twenty megabytes of storage space, which is roughly equivalent to ten thousand pages of information.

SCSI (commonly pronounced "SKUH-zee") stands for Small Computer System Interface.

Your Hard Disk SC is a **SCSI device.** It exchanges information with the computer according to the SCSI standard. This standard provides a very fast way to send information back and forth. It also allows several devices to share the one Macintosh port or one card in an Apple II. You connect the first device to the port or Card and then connect the other devices to each other to form a **SCSI chain.**

While using your Hard Disk SC and other SCSI peripheral devices, you can continue to use other storage devices, such as floppy disk drives and hard disk drives, that connect to your computer through other kinds of connectors.

Unpacking

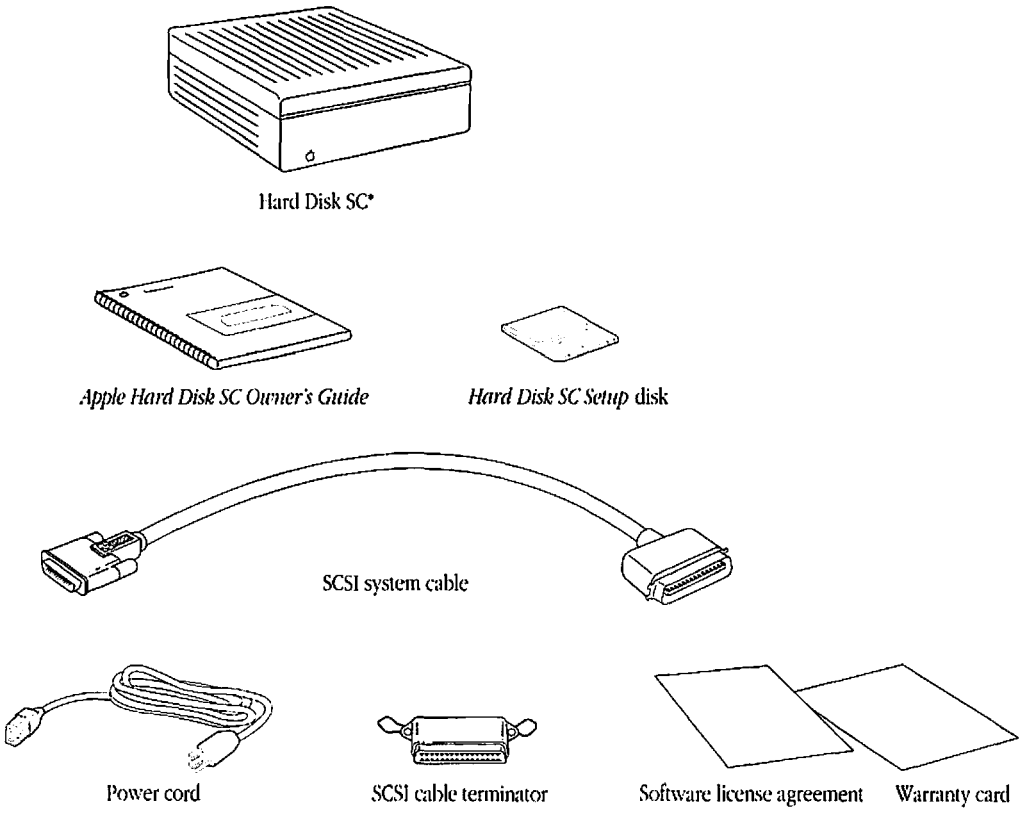
The first thing you need to do is to make sure your Hard Disk SC box has everything shown in Figure 1-1.

If something is missing, contact your authorized Apple dealer.

Your Hard Disk SC is a mechanical device with moving parts. Treat it as you would a stereo record player. If you drop, jar, or bump it, or drop heavy objects on it, especially when the hard disk is switched on, you could damage the disk or the information on the disk.

Save the packing materials. It's important to repack your hard disk to protect it and the information stored on it during transit or shipping.

■ **Figure 1-1** What's in the Hard Disk SC box



*Keep the Hard Disk SC in the plastic bag until you've read this guide.

Choosing a safe place to put your hard disk

Follow these guidelines when deciding where to put your hard disk:

- Keep all air vents clear. To ensure proper ventilation, allow 4 inches of clearance between the side and back vents and any object that might restrict the air flow.
- Do not set the Hard Disk SC on its side.
- Do not put a monitor directly on top of the hard disk. Magnetic interference from the monitor could damage the information on the hard disk.
- Do not place the hard disk next to the side of your computer that contains the power supply because of possible interference from the computer's power supply. The computer's power supply is on the same side as the power cord.
- You may place the hard disk on a shelf above or below the computer.
- If you have more than one hard disk, you may stack them on top of one another.
- If you're using a compact Macintosh computer such as a Macintosh Plus, SE, or SE/30, you may place your Hard Disk SC under the computer.

Important safety instructions

You're almost ready to connect your Hard Disk SC, but first read these important safety instructions.

▲ Warning This equipment is intended to be electrically grounded.

Your Hard Disk SC is equipped with a three-wire grounding plug—a plug having a third (grounding) pin. This plug will fit only a grounding-type AC outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact a licensed electrician to replace the outlet with a properly grounded outlet. Do not defeat the purpose of the grounding plug! ▲

For your own safety and that of your equipment, always take the following precautions.

Disconnect the power plug (by pulling the plug, not the cord) if any of the following conditions exists:

- the power cord or plug becomes frayed or otherwise damaged
- you spill something into the case
- your Hard Disk SC is exposed to rain or any other excess moisture
- your Hard Disk SC has been dropped or otherwise damaged
- you suspect that your Hard Disk SC needs service or repair
- you want to clean the case (use only the recommended procedure described below)

Be sure that you always do the following:

- Keep your Hard Disk SC away from sources of liquid, such as wash basins, bathtubs, shower stalls, and so on.
- Protect your Hard Disk SC from dampness or wet weather, such as rain, snow, and so on.
- Keep these instructions handy for reference by you and others.
- Read all the installation instructions carefully before you plug your Hard Disk SC into a wall socket.
- Follow all instructions and warnings dealing with your system.

▲ Warning Electrical equipment may be hazardous if misused. Operation of this product, or similar products, must always be supervised by an adult. Do not allow children access to the interior of any electrical product and do not permit them to handle cables. ▲

To clean the case, do the following:

1. Disconnect the power plug. (Pull the plug, not the cord.)
2. Wipe the surfaces lightly with a clean, soft cloth dampened with water.

C H A P T E R 2

Connecting the Hard Disk SC to Your Macintosh

THIS CHAPTER GIVES INSTRUCTIONS FOR CONNECTING YOUR HARD DISK SC to your Macintosh computer. It then shows you how to **initialize** your hard disk to prepare it for storing information.

The last section of this chapter describes how to set up your hard disk as a **startup disk** that contains the instructions your computer needs to start up.

If your Hard Disk SC is the only SCSI device that will be connected to the **SCSI port** on your computer, start by reading the next section, "Connecting a Single Hard Disk SC."

If you have other SCSI devices—for example, another external hard disk, the Apple Scanner, or the AppleCD SC™—read the section "Connecting a Chain of SCSI Devices," later in this chapter.

Connecting a single Hard Disk SC

Follow the instructions in this section if you're connecting only the Hard Disk SC to the SCSI port on your Macintosh. The instructions are the same whether or not your Macintosh has an internal hard disk.

What you need

To connect the Hard Disk SC to your Macintosh, you need the following items that came with your Hard Disk SC:

- power cord
- **SCSI cable terminator**
- **SCSI system cable**

  This cable attaches a SCSI device such as the Hard Disk SC to the SCSI port on your Macintosh. It has a large connector at one end and a small connector at the other.
- *Hard Disk SC Setup* disk

Figure 1-1 in Chapter 1, "Unpacking the Hard Disk SC," illustrates these items.

You'll also need a spare floppy disk for making a backup of the setup disk.

If you want to place your Hard Disk SC more than 18 inches from your computer, you will need:

- one or more **SCSI cable extenders**
- a second cable terminator (if your Macintosh doesn't have an internal hard disk)

Connecting the hard disk

These instructions assume that nothing is connected to the SCSI port on your Macintosh. If something is already connected to the SCSI port, use the instructions in "Connecting a Chain of SCSI Devices," later in this chapter, to connect your hard disk.

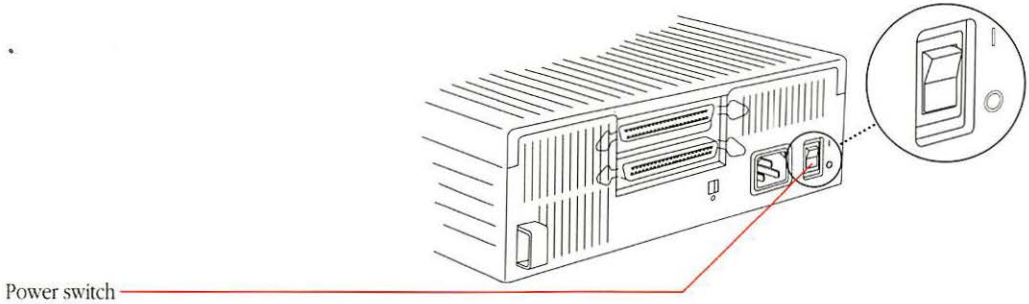
To connect your Hard Disk SC to your Macintosh, follow these steps:

1. **Make sure your computer is plugged in and turned off.**

2. **Make sure your Hard Disk SC is turned off.**

   The power switch is located in the lower-left corner of the back panel (as you face the front of the hard disk). Push down on the lower part of the switch to make sure it's off.

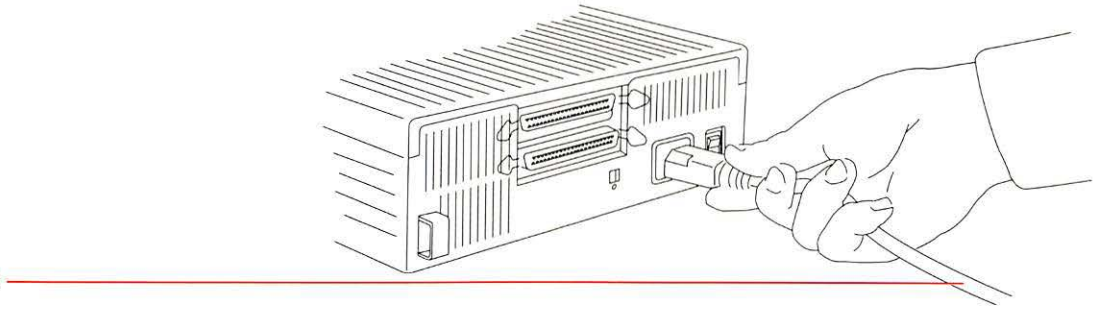
■ **Figure 2-1** Making sure the hard disk is off



3. **Attach the power cord to your Hard Disk SC.**

   Plug the power cord into the corresponding outlet on the back of the hard disk, as shown in Figure 2-2.

■ **Figure 2-2** Plugging the power cord into the Hard Disk SC



4. **Plug the cord into a grounded outlet.**

▲ Warning This equipment is intended to be electrically grounded.

Your Hard Disk SC is equipped with a three-wire grounding plug—a plug having a third (grounding) pin. This plug will fit only a grounding-type AC outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact a licensed electrician to replace the outlet with a properly grounded outlet. Do not defeat the purpose of the grounding plug! ▲

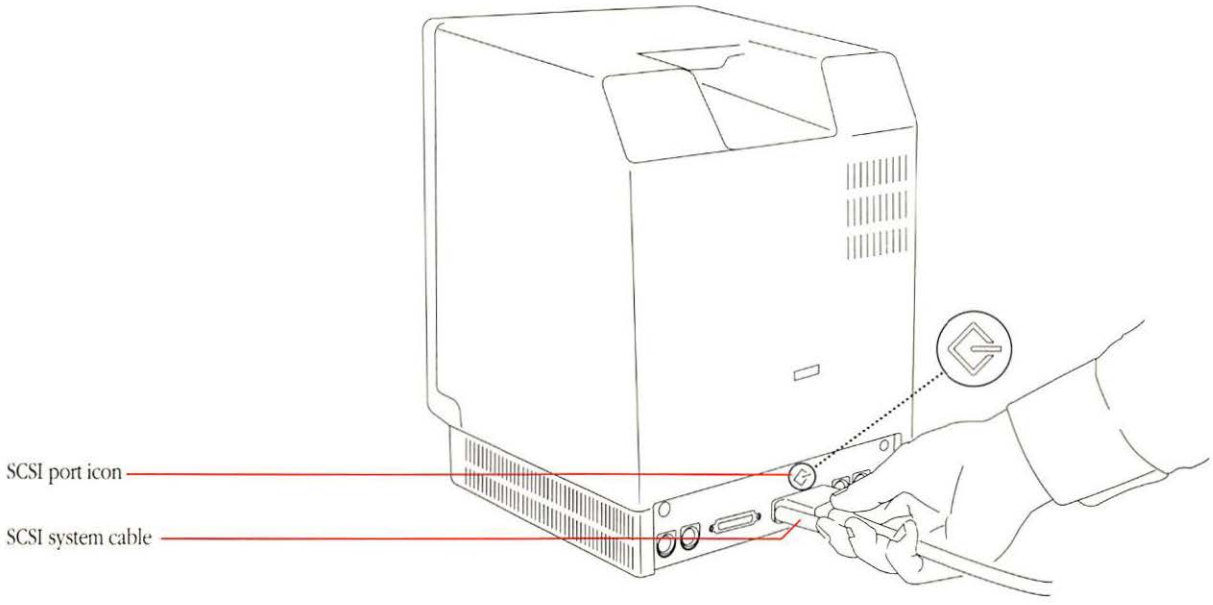
5. **Touch the metal part of a port on the back of your computer.**

   This safely discharges static electricity that may be on your clothes or body.

6. **Attach the smaller end of the SCSI system cable to the SCSI port on your computer.**

   Attach the smaller connector on the system cable to the SCSI port, as shown in Figure 2-3. Tighten the screws to secure the connection.

■ **Figure 2-3** Attaching the system cable to the SCSI port



7. If you are using a cable extender, follow the instructions below. If you are not using a cable extender, go on to step 8.

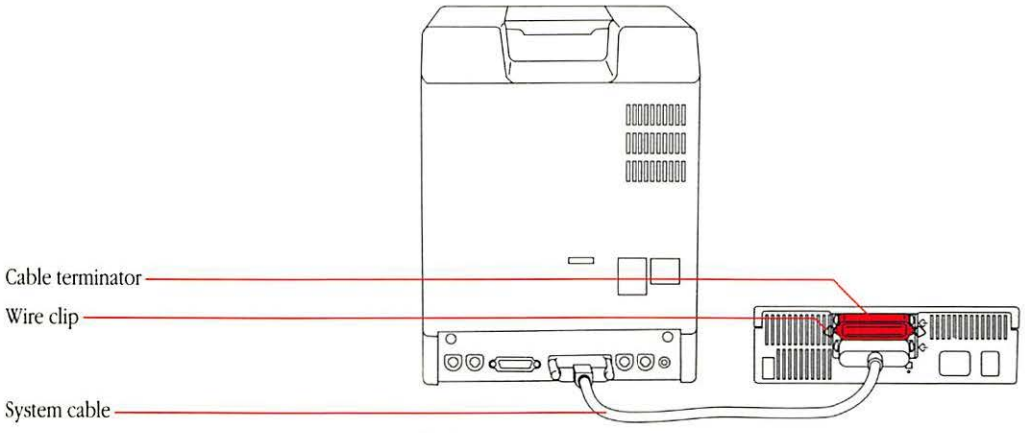
- If your Macintosh does not have an internal hard disk, connect a cable terminator to the system cable and a cable extender to the terminator.
- If your Macintosh has an internal hard disk, connect the cable extender directly to the system cable. (You don't need a cable terminator between them.)

You can add as many cable extenders as necessary, up to 20 feet of cable.

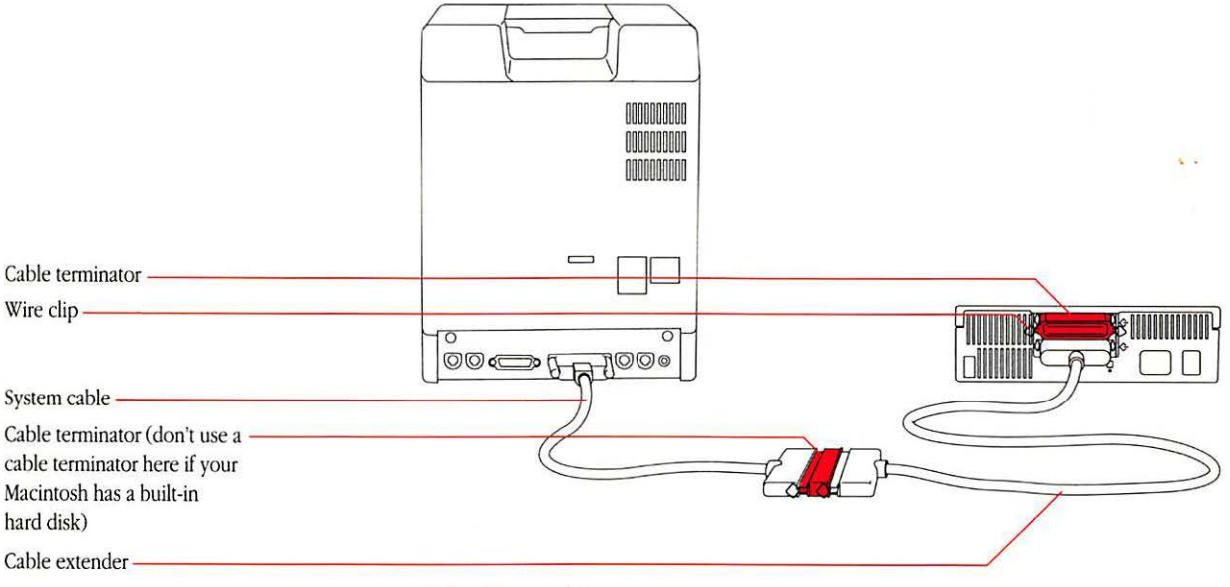
8. Connect the cable to one of the ports on your Hard Disk SC.

Snap the diamond-shaped wire clips into the clip brackets to secure the connection. See Figure 2-4.

■ **Figure 2-4** Attaching the system cable and cable terminator to the Hard Disk SC



Without cable extender



With cable extender

9. **Connect a cable terminator to the other port on your Hard Disk SC.**

   Snap the diamond-shaped wire clips into the clip brackets to secure the connection. (See Figure 2-4.)

Now you're ready to start up your system.

Copying the setup disk

Now that you've connected your Hard Disk SC to your Macintosh, you'll switch on your Hard Disk SC, start up your Macintosh with the setup disk, and make a copy of the disk.

1. **Switch on your Hard Disk SC.**

   The power switch is located in the lower-left corner of the back panel (as you face the front of the hard disk). When you switch it on, you should hear the hard disk fan start up. But you won't see the disk-use light on the front panel go on.

2. **Wait at least ten seconds.**

   This allows your Hard Disk SC to get up to speed.

3. **Insert the *Hard Disk SC Setup* disk into a floppy disk drive, and switch on your Macintosh.**

   If you're using a Macintosh II computer, press the Power On key on the upper-right corner of the keyboard to turn the computer on.

4. **Copy the *Hard Disk SC Setup* disk onto a blank floppy disk.**

   See the manuals that came with your Macintosh if you're not sure how to copy a floppy disk.

5. **Choose Shut Down from the Special menu.**

   You don't need to switch off the computer or the hard disk. The Macintosh ejects any floppy disks. Put the original *Hard Disk SC Setup* disk in a safe place.

   If you're using a Macintosh II, choosing Shut Down turns the computer off.

Now you're ready to prepare your Hard Disk SC to store information. This process is called initializing the hard disk.

Initializing and naming your hard disk

You may have noticed while copying the setup disk that no icon for your new hard disk appeared on the Macintosh desktop. The computer cannot recognize the hard disk until you use the Apple HD SC Setup program to initialize the disk. Initializing prepares the hard disk to receive information by organizing its surface into tracks and sectors.

△ **Important** If you plan to use your Hard Disk SC with more than one type of Macintosh, you must initialize it using the slowest computer. For details, see "Connecting Your Hard Disk to Another Computer" in Chapter 3. △

1. **Insert your backup copy of the *Hard Disk SC Setup* disk into the internal disk drive, and restart the computer.**

2. **Open the disk icon.**

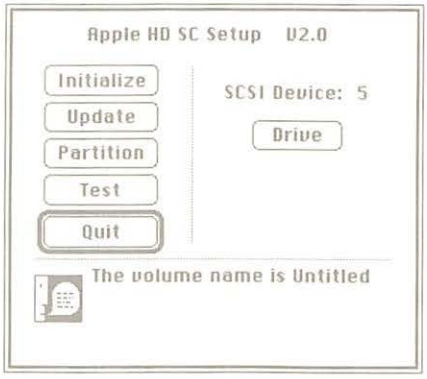
   Select the disk icon and choose Open from the File menu, or just double-click the icon.

3. **Open Apple HD SC Setup.**

   Select the Apple HD SC Setup icon and choose Open from the File menu, or just double-click the icon.

   A dialog box appears.

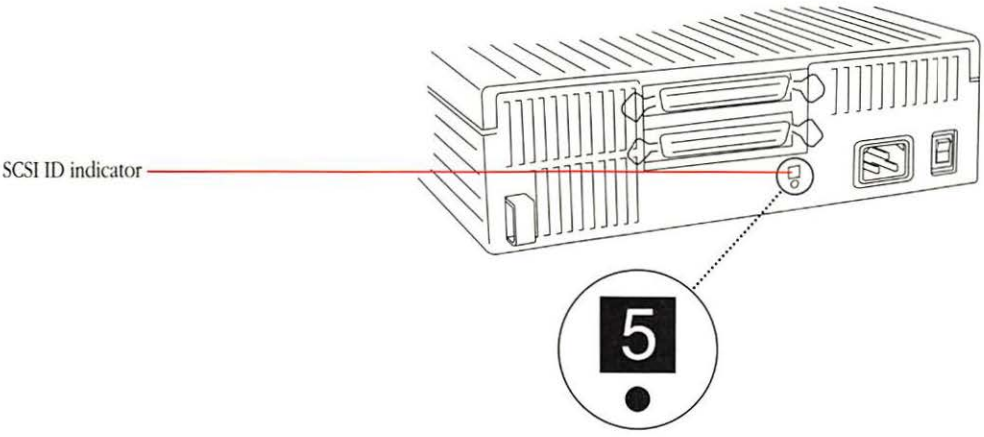
■ **Figure 2-5** The Apple HD SC Setup dialog box



❖ *Note:* The Update and Test buttons are explained in Chapter 3, "Using the Hard Disk SC With Your Macintosh." The Partition button is explained in Appendix A, "Partitioning a Hard Disk SC Connected to a Macintosh."

You should see the words "SCSI Device" and the number 0 or 5. This is the **SCSI ID number** of a SCSI hard disk drive. An internal hard disk is preset to SCSI ID number 0. The Hard Disk SC is preset to ID number 5. This number also appears in the **SCSI ID indicator** on the back panel of the Hard Disk SC. (You may see a different number if the preset number was changed.)

■ **Figure 2-6** The SCSI ID number



4. **Make sure that the SCSI device number in the dialog box matches the SCSI ID number of the hard disk you want to initialize. If they do not match, click Drive until they do.**

   The SCSI ID number of an Apple internal hard disk is 0. The SCSI ID number of the Hard Disk SC is preset to 5.

▲ **Warning** Make sure that you have chosen the hard disk that you want to initialize, and not an internal hard disk, if you have one. Initializing destroys any information on the hard disk. ▲

- *No device number?* If the SCSI ID number does not appear, the disk may be switched off or incorrectly connected. Shut down and switch off the computer. Check the power switch, power cord connections, and cable connections. See "Connecting a Single Hard Disk SC," earlier in this chapter, if you suspect the hard disk is incorrectly connected.

5. Click Initialize.

A dialog box appears, reminding you that initializing erases all of the information from the hard disk.

6. Click Init.

Messages appear in the Setup dialog box, describing the initialization process. Initialization takes several minutes, depending on the size of your hard disk and on the type of Macintosh you have.

In addition to preparing the disk, initializing automatically tests the disk and installs the **driver,** which controls the exchange of information between the hard disk and your Macintosh.

A **driver** is a program that lets a peripheral device and computer send and receive files.

- *Trouble?* If you see a message that the hard disk failed to initialize properly, try again. If you are still unable to initialize the disk, there may be a hardware problem. See your authorized Apple dealer.

7. Name the disk.

A message tells you when initializing has been successfully completed and asks you to name the disk. You can type up to 27 characters, and you can use any keyboard character except the colon (:).

Press the Return key when you've typed the name you want.

- *By the way:* If you want to partition your hard disk (to use it with A/UX®, for example), turn now to Appendix A, "Partitioning a Hard Disk SC Connected to a Macintosh." Partitioning erases all the information on a hard disk, so you should partition the disk before you store information on it.

8. Click Quit.

Clicking Quit returns you to the desktop, where the Hard Disk SC icon appears with the name you gave it.

Now you're ready to make your Hard Disk SC a startup disk. Turn to "Creating a Startup Disk," later in this chapter.

Connecting a chain of SCSI devices

Follow the instructions in this section if your Hard Disk SC will be part of a chain of two or more SCSI devices connected to the SCSI port on your Macintosh.

What you need

To connect the Hard Disk SC as part of a SCSI chain, you need the following items that came with your Hard Disk SC:

- power cord
- **SCSI system cable**

  This cable attaches a SCSI device such as the Hard Disk SC to the SCSI port on your Macintosh. It has a large connector at one end and a small connector at the other.
- **SCSI cable terminator**
- *Hard Disk SC Setup* disk

Figure 1-1 on page 3 illustrates these items.

❖ *You may not need some of these items:* If you're adding your Hard Disk SC to an existing SCSI chain, you will not need the SCSI system cable. If your chain already includes more than one device, you probably won't need the cable terminator that came with your Hard Disk SC.

You also need:

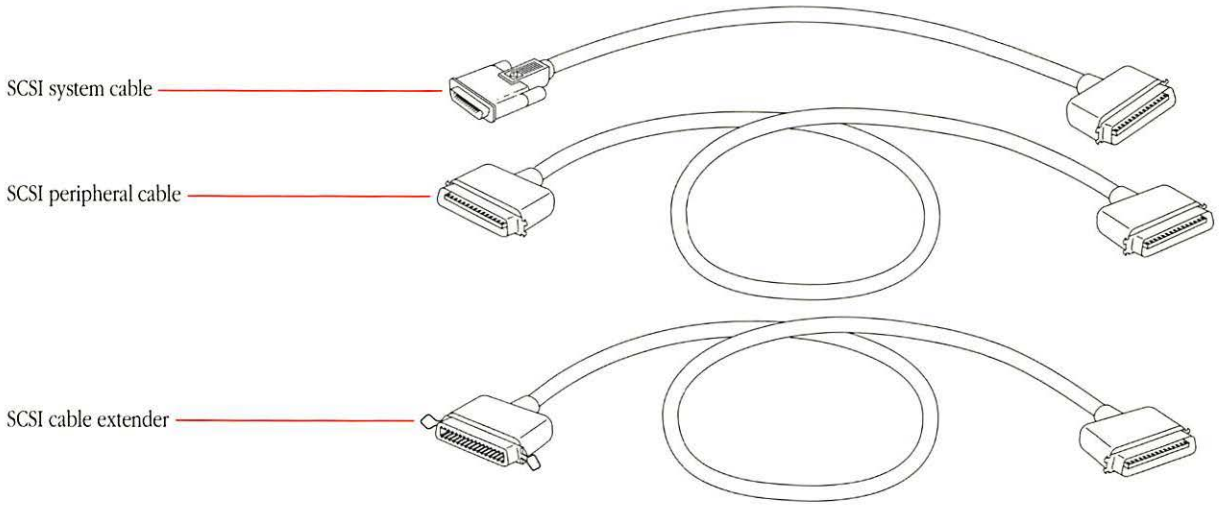
- one or more **SCSI peripheral cables**

  These cables connect one SCSI device to another. They have the same size connector at each end.
- a blank floppy disk
- a second cable terminator (if your Macintosh doesn't have an internal hard disk)

  See the following section, "About Cable Terminators," for more information.
- one or more **SCSI cable extenders** (if you want to place your SCSI devices farther apart than the cables allow)

Figure 2-7 illustrates the three types of SCSI cables. If you don't have the items you need, visit your authorized Apple dealer.

■ **Figure 2-7** Three types of SCSI cables



About cable terminators

In a chain of two or more SCSI devices, you need *exactly two* SCSI cable terminators—one at the beginning and one at the end. The terminators absorb old signals traveling along the cables and keep the path open for new signals. Using too many or too few cable terminators may damage your Macintosh or your SCSI devices.

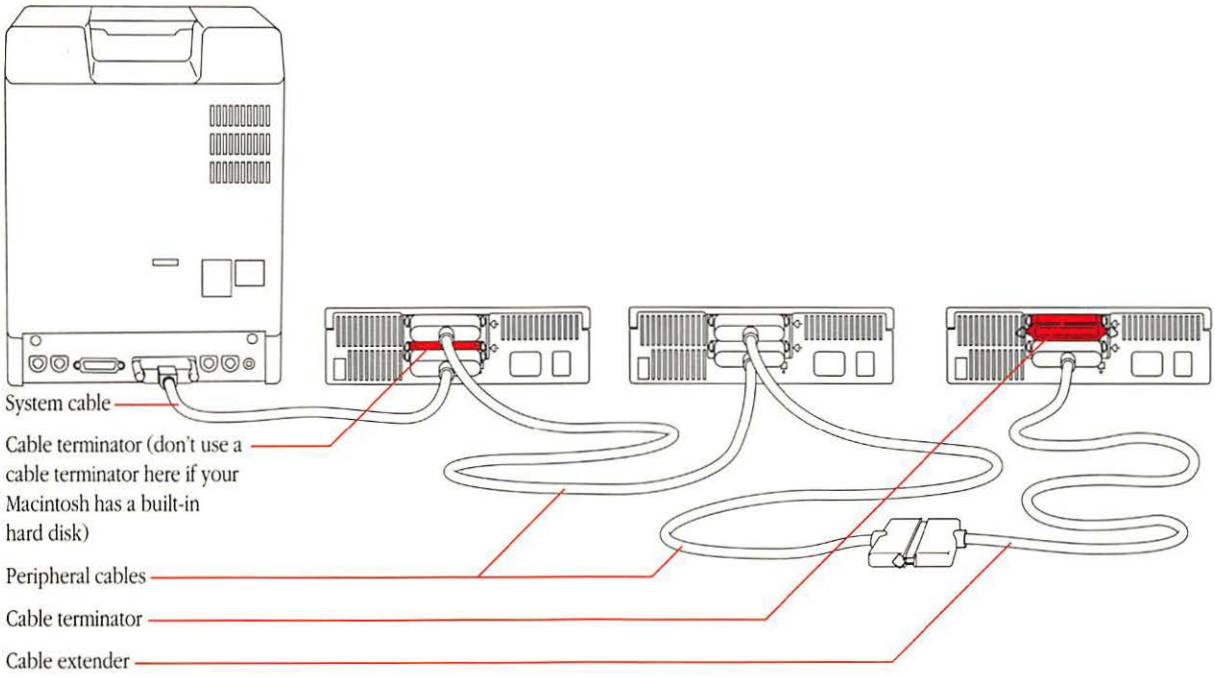
The following guidelines will help you determine where to place your SCSI devices and how many cable terminators to connect.

- If your Macintosh has an internal SCSI hard disk, *do not* put a terminator at the beginning of the chain. An Apple internal SCSI hard disk has a built-in cable terminator.
- If your chain consists entirely of Apple external SCSI devices (with no internal SCSI hard disk), you need to connect *two* terminators, one at the beginning and one at the end of the chain.
- Some SCSI devices from manufacturers other than Apple have built-in terminators. A device with a built-in terminator must go at the beginning or end of the chain. If your Macintosh has an Apple internal SCSI hard disk, a device with a built-in terminator must go at the *end* of the chain.

Check the guide that came with your external device to determine whether it has a built-in terminator.

- If you have more than two devices with built-in terminators (including an internal hard disk), ask your authorized Apple dealer to remove the terminator from one or more of these devices.

■ **Figure 2-8** Connecting SCSI devices



▲ Warning Do not use more than two cable terminators in a SCSI chain or damage may occur to the devices in the chain. If you're connecting your Hard Disk SC in the middle of an existing SCSI chain, do not use the cable terminator that came with your Hard Disk SC. If you read the instructions in this section and still are not sure how to set up the SCSI chain correctly, consult a more experienced Macintosh user or contact your authorized Apple dealer. ▲

Changing the SCSI ID number

Each SCSI device must have a unique **SCSI ID number.** The number allows the computer to identify all the devices in a SCSI chain. It is not necessarily related to the physical location of the device in the chain. Apple uses a standard ID number for each type of SCSI device. These numbers are set for you, and you don't need to change them unless you have two devices set to the same number.

The computer's SCSI ID number is 7. The Apple internal hard disk has a SCSI ID number of 0. The preset ID number for the Hard Disk SC is 5.

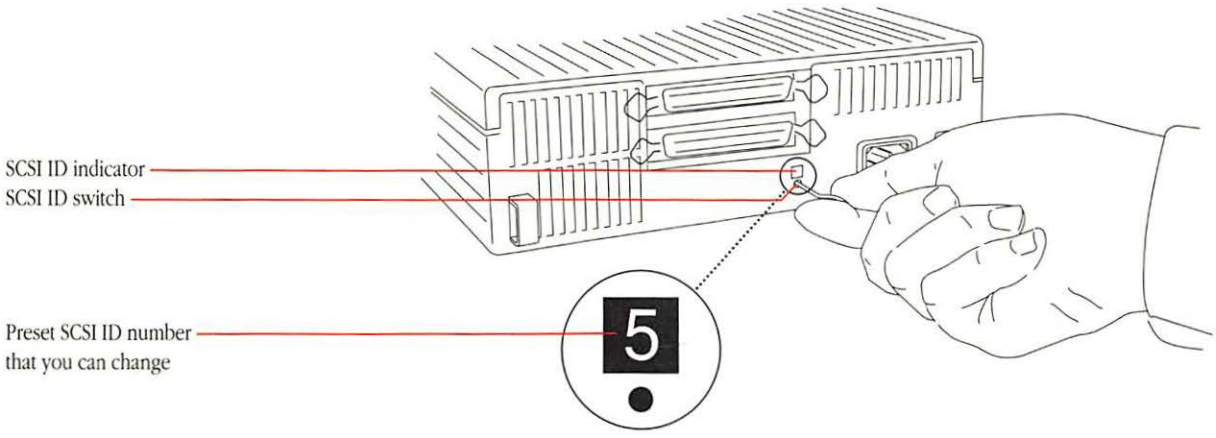
△ **Important** If you're connecting more than one Hard Disk SC, make sure you give each hard disk a unique ID number. Also, check the guides that came with your other SCSI devices to determine if there's an ID number conflict. Every SCSI device in a chain must have a unique ID number between 0 and 6. △

You'll find the SCSI ID number for the Hard Disk SC on its back panel. If you need to change its ID number, follow these instructions:

1. **Make sure the Hard Disk SC is switched off.**
2. **Decide on an unassigned SCSI ID number.**
3. **Insert a pushpin or a straightened paper clip into the SCSI ID switch.**

   The SCSI ID switch is in the hole below the **SCSI ID indicator,** as shown in Figure 2-9.

■ **Figure 2-9** Changing the SCSI ID number



4. **Push gently until the number you want appears.**

   If you go past the number you want, keep pushing gently until it cycles around again.

Connecting SCSI devices

You can connect up to seven SCSI devices to the SCSI port on your Macintosh if there's no internal hard disk. If your Macintosh has an internal SCSI hard disk, you can connect up to six devices.

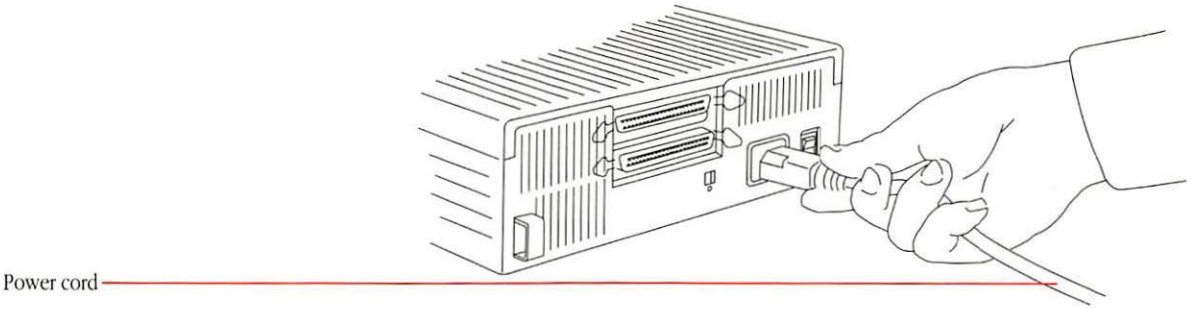
These instructions assume that no devices are already connected to your SCSI port. If you already have one or more devices connected to the SCSI port, read through the first five steps to be sure you have connected the first SCSI device correctly, then connect your Hard Disk SC according to the instructions beginning with step 6.

1. **Make sure your computer is plugged in and turned off.**

2. **Make sure your Hard Disk SC and any other SCSI devices are turned off, then plug each of them into a grounded power outlet.**

   Plug the power cord into the corresponding outlet on the back of the hard disk, as shown in Figure 2-10, and then plug the cord into a grounded outlet.

■ **Figure 2-10** Plugging the power cord into the Hard Disk SC



▲ **Warning** This equipment is intended to be electrically grounded.

Your Hard Disk SC is equipped with a three-wire grounding plug—a plug having a third (grounding) pin. This plug will fit only a grounding-type AC outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact a licensed electrician to replace the outlet with a properly grounded outlet. Do not defeat the purpose of the grounding plug! ▲

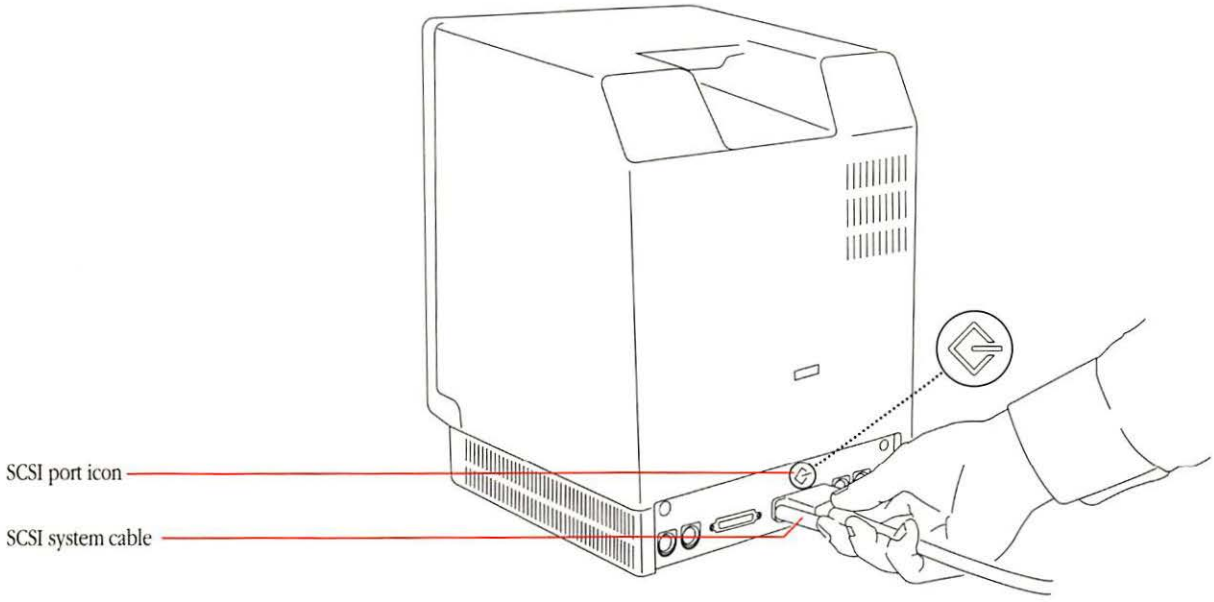
3. **Touch the metal part of a port on the back of your computer.**

   This safely discharges static electricity that may be on your clothes or body.

4. **Connect the smaller end of the SCSI system cable to the SCSI port on your computer.**

   Connect the smaller end of the system cable to the SCSI port, as shown in Figure 2-11. Tighten the screws to secure the connection.

■ **Figure 2-11** Attaching the system cable to the SCSI port on the computer



5. **If your Macintosh *does not* have an internal SCSI hard disk, connect a cable terminator to the system cable.**

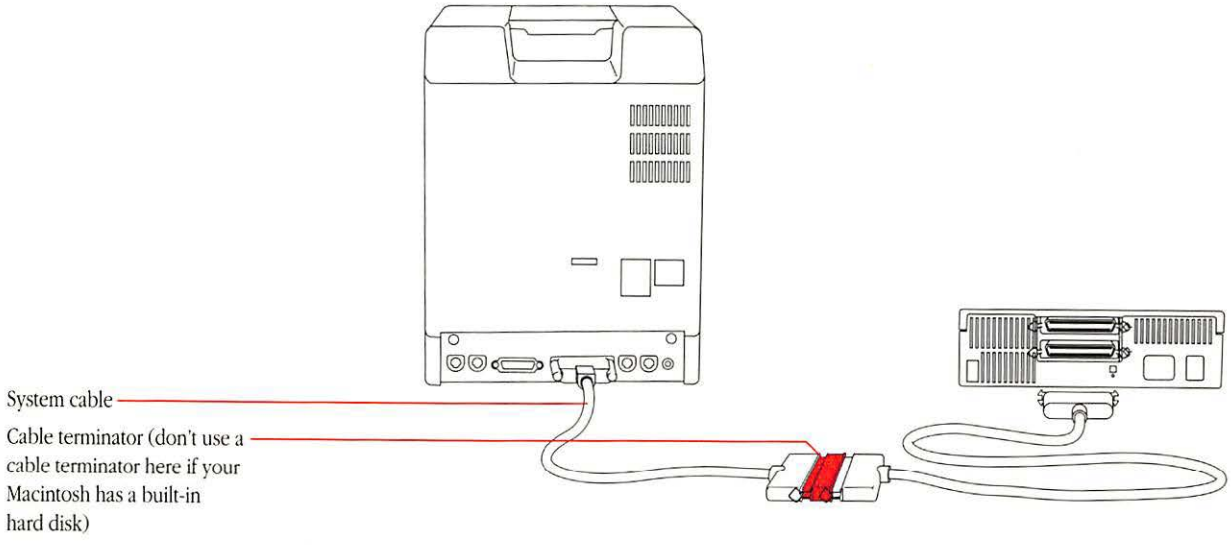
   If your Macintosh has an internal SCSI hard disk, *do not* attach a cable terminator.

   Snap the diamond-shaped wire clips into the clip brackets to secure the connection.

6. **If you want to use a cable extender, plug it into the cable terminator (if you attached one) or into the system cable.**

   Snap the diamond-shaped wire clips into the clip brackets to secure the connection. See Figure 2-12.

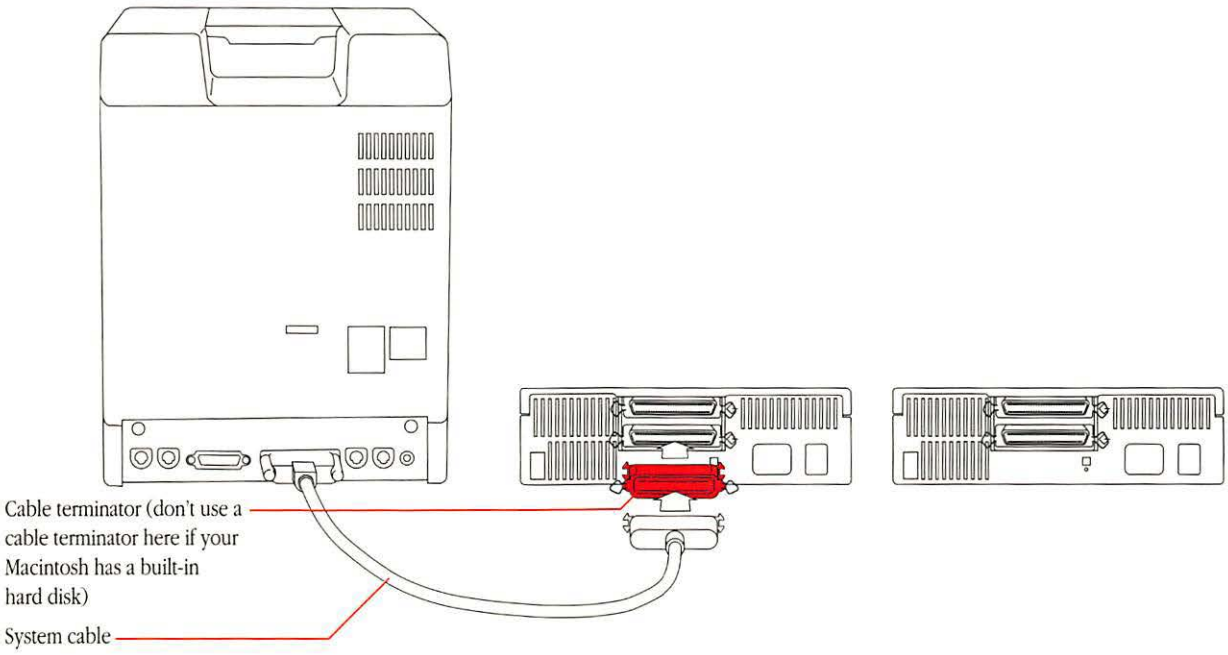
■ **Figure 2-12** Attaching the system cable to the cable extender



7. Connect the cable or terminator to the first SCSI device.

Snap the diamond-shaped wire clips into the clip brackets to secure the connection. See Figure 2-13.

■ **Figure 2-13** Attaching the cable to the first device in a SCSI chain

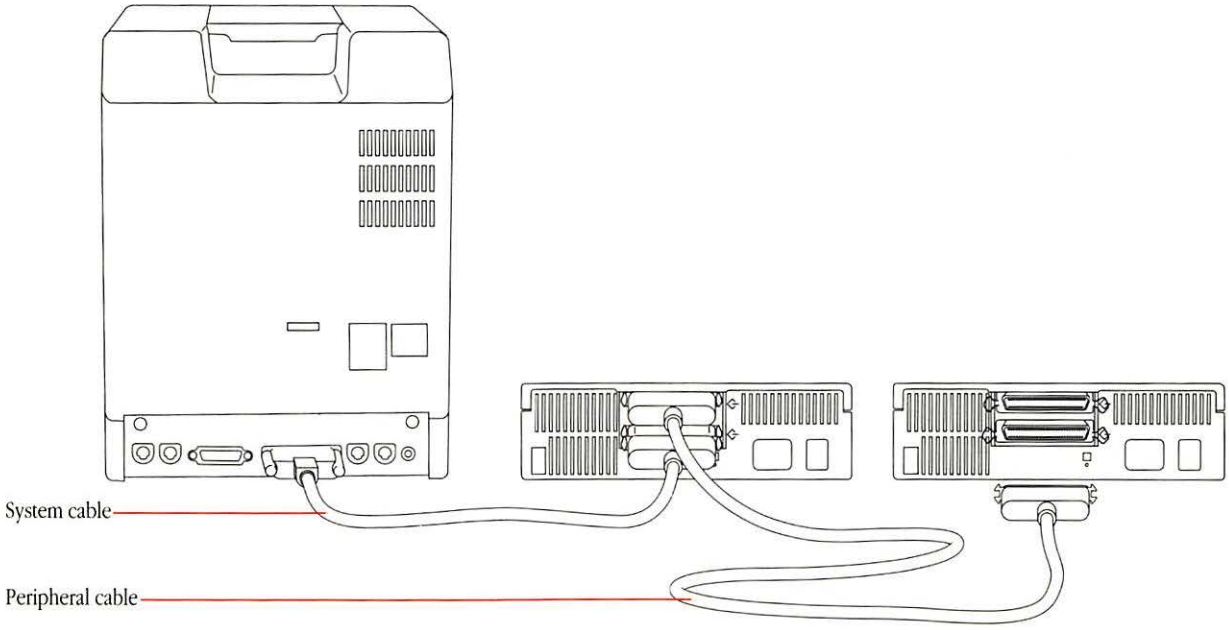


8. **Connect a SCSI peripheral cable to the other port on your first SCSI device.**

   The peripheral cable is 3 feet long and has the same size connector at each end.

   Again, snap the clips into the clip brackets to secure the connection. See Figure 2-14.

■ **Figure 2-14** Attaching the peripheral cable to the first SCSI device



9. **Connect the other end of the peripheral cable to one of the ports on your next SCSI device.**

   Snap the clips into the clip brackets to secure the connection.

10. **Follow steps 8 and 9 for each additional SCSI device in the chain.**

    You can also connect cable extenders like extension cords between a peripheral cable and the next SCSI device.

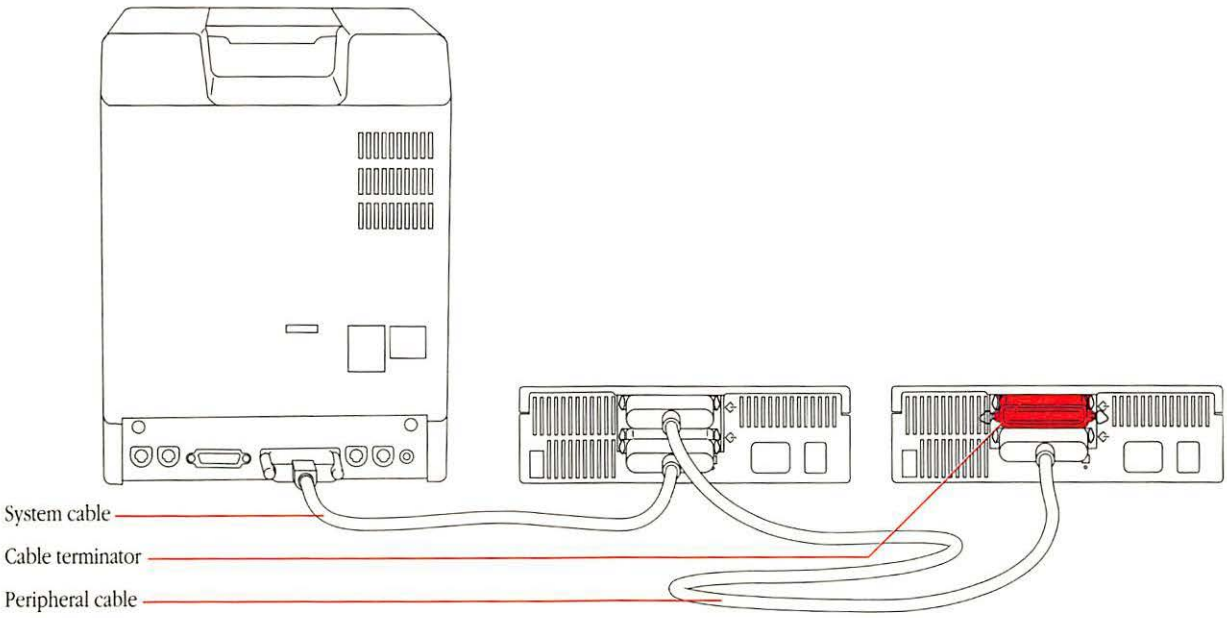
△ **Important** The total cable length cannot be longer than 20 feet. △

11. **If the last SCSI device in the chain *does not* have a built-in terminator, plug a cable terminator into the empty port on the device.**

    Don't use the cable terminator if the last device has a built-in terminator. Apple external SCSI devices don't have built-in terminators, but SCSI devices from other manufacturers may. Check the owner's guide if you're not sure whether the device has a built-in cable terminator. For more information, see "About Cable Terminators," earlier in this chapter.

    Snap the clips into the clip brackets to secure the connection. See Figure 2-15.

■ **Figure 2-15** Plugging the cable terminator into the empty SCSI port on the last device



Now you're ready to start up your system.

Copying the setup disk

Now that you've connected your Hard Disk SC to your Macintosh, you'll switch on your Hard Disk SC, start your Macintosh, and make a copy of the disk.

1. **Switch on your Hard Disk SC and the first and last devices in the chain.**

   The power switch for the Hard Disk SC is located in the lower-left corner of the back panel (as you face the front of the hard disk). When you switch it on, you should hear the hard disk fan start up. But you won't see the disk-use light go on.

△ **Important** If you have more than one SCSI device connected to your Macintosh, you should always switch on the first and last device in the chain before you turn on the computer, and you should leave these devices on while you use the computer. Other devices do not need to be switched on. △

2. **Wait at least ten seconds.**

   This allows your Hard Disk SC to get up to speed.

3. **Insert the *Hard Disk SC Setup* disk into the internal disk drive, and switch on your Macintosh.**

   If you're using a Macintosh II computer, press the Power On key on the upper-right corner of the keyboard to turn the computer on.

4. **Copy the *Hard Disk SC Setup* disk onto a blank floppy disk.**

   See the manuals that came with your Macintosh if you're not sure how to copy a floppy disk.

5. **Choose Shut Down from the Special menu.**

   You don't need to switch off the computer. The Macintosh ejects any disk in the floppy disk drive. Put the original disk in a safe place.

   If you're using a Macintosh II, choosing Shut Down turns the computer off.

Now you're ready to prepare your Hard Disk SC to store information. This process is called initializing the hard disk.

Initializing and naming your hard disk

You may have noticed while copying the setup disk that no icon for your new hard disk appeared on the Macintosh desktop. The computer cannot recognize the hard disk until you use the Apple HD SC Setup program to initialize the disk. Initializing prepares the hard disk to receive information by organizing its surface into tracks and sectors.

Each SCSI hard disk on your system must be initialized separately, but it does not matter in which order you initialize them.

△ **Important** If you plan to use your Hard Disk SC with more than one type of Macintosh, you must initialize it using the slowest computer. For details, see "Connecting Your Hard Disk to Another Computer" in Chapter 3. △

1. **Insert your backup copy of the setup disk into the internal disk drive, and restart the computer.**

2. **Open the disk icon.**

   Select the disk icon and choose Open from the File menu, or just double-click the icon.

3. **Open Apple HD SC Setup.**

   Select the Apple HD SC Setup icon and choose Open from the File menu, or just double-click the icon.

   A dialog box appears.

■ **Figure 2-16** The Apple HD SC Setup dialog box

❖ *Note:* The Update and Test buttons are explained in Chapter 3, "Using the Hard Disk SC With Your Macintosh." The Partition button is explained in Appendix A, "Partitioning a Hard Disk SC Connected to a Macintosh."

You see the words "SCSI Device" and a number from 0 to 6.

4. **Make sure that the SCSI device number in the dialog box matches the SCSI ID number of the hard disk you want to initialize. If they do not match, click Drive until they do.**

❖ *No device number?* If the SCSI ID number does not appear, the disk may be switched off or incorrectly connected. Shut down and switch off the computer. Check the power switch, power cord connections, and cable connections. See "Connecting SCSI Devices," earlier in this section, if you suspect the hard disk is incorrectly connected.

▲ Warning Make sure that you have chosen the hard disk that you want to initialize, and not some other hard disk. Initializing destroys any information on the hard disk. ▲

5. **Click Initialize.**

A dialog box appears, reminding you that initializing erases all of the information from the hard disk.

6. **Click Init.**

Messages appear in the Setup dialog box, explaining the course of the initialization. Initialization takes several minutes, depending on the size of your hard disk and on the type of Macintosh you have.

In addition to preparing the disk, initializing automatically tests the disk and installs the **driver,** which controls the exchange of information between the hard disk and your Macintosh.

A **driver** is a program that lets a peripheral device and computer send and receive files.

❖ *Trouble?* If you see a message that the hard disk failed to initialize properly, try again. If you are still unable to initialize the disk, there may be a hardware problem. See your authorized Apple dealer.

7. **Name the disk.**

A message tells you when initializing has been successfully completed and asks you to name the disk. You can type up to 27 characters, and you can use any keyboard character except the colon (:).

Press the Return key when you've typed the name you want.

❖ *By the way:* If you want to partition your hard disk (to use it with A/UX, for example), turn now to Appendix A, "Partitioning a Hard Disk SC Connected to a Macintosh." Partitioning erases all the information on a hard disk, so you should partition the disk before you store information on it.

8. Click Quit.

Clicking Quit returns you to the desktop, where the Hard Disk SC icon appears with the name you gave it.

Now you can make your Hard Disk SC a startup disk.

Creating a startup disk

To take full advantage of the speed and storage capabilities of your Hard Disk SC, you should make it a startup disk. A **startup disk** is any disk that has the necessary software—such as the System file, contained in the System Folder—to set the computer into operation.

See your Macintosh manuals for a full discussion of startup disks.

❖ *By the way:* You need only one startup hard disk, regardless of how many hard disks are attached to your system. If your system already includes a SCSI startup disk, you may not want to add a System Folder to another Hard Disk SC. But you may want to transfer startup capability to your new SCSI hard disk from a smaller or slower hard disk.

Setting up the System Folder

To set up your new Hard Disk SC as a startup disk, you need to put a System Folder on your hard disk. Follow these steps:

1. Use any existing startup disk to start up your Macintosh.

If you have just initialized your hard disk, the *Hard Disk SC Setup* disk is your **current startup disk.** If you want to use the System Folder on that disk, you can continue without restarting.

If you want to use a System Folder that you've already customized, then restart your Macintosh using the disk that contains that System Folder. Choose About the Finder from the Apple menu and make a note of the version numbers there. Compare them to the version numbers on the setup disk to make sure you're using the most recent version of system software. You can see version numbers by selecting the System icon and Finder icon and choosing Get Info from the File menu.

2. **Drag the System Folder icon from the current startup disk to the hard disk.**

3. **If the System Folder you copied does not contain the most recent system software for your computer, use the Installer on the *Macintosh System Tools* disk to update the system software on your hard disk.**

   The Installer is found on the *System Tools* disk that came with your Macintosh or your System Software Update. It is described in your system software guide.

❖ *Note:* It's a good idea to make a backup copy of your System Folder.

If your computer system includes more than one hard disk with a System Folder, skip step 4 and read the next sections, "Startup Scanning Order" and "Changing the Startup Device."

4. **If your new Hard Disk SC is your only startup disk (hard disk with a System Folder), choose Restart from the Special menu.**

   This restarts your Macintosh using your hard disk as the current startup disk. In the Finder, its icon appears in the upper-right corner of the desktop.

   Go on to Chapter 3, "Using the Hard Disk SC With Your Macintosh."

Startup scanning order

When you switch on your Macintosh, it uses the following **scanning order** to look for a startup disk in the following order:

1. Internal floppy disk drive 1 (the lower drive in a Macintosh SE, the right-hand drive in a Macintosh II)
2. Internal floppy disk drive 2 (the upper drive in a Macintosh SE, the left-hand drive in a Macintosh II)
3. External disk drive connected to the drive port

4. Startup device set in the Control Panel (Macintosh SE and II computers only)
5. SCSI devices in declining order (ID number 6 to 0)

△ **Important** If you want to start up from your hard disk, do not insert a floppy disk until you see the happy Macintosh icon on the screen. If there is a floppy disk containing a System Folder in a disk drive when you switch on your computer, it becomes the current startup disk.

If you insert a floppy disk that is not a startup disk, your Macintosh ejects it and continues to scan for a startup disk. △

Changing the startup device

If you have one of the Macintosh SE or Macintosh II computers, you can use the Control Panel to designate a startup disk.

1. Choose Control Panel from the Apple menu.

2. Click the Startup Device icon.

Use the scroll bar if necessary to bring the Startup Device icon into view.

The Startup Device icon

❖ *The Startup Device icon is missing?* Insert your *Macintosh System Tools* disk, open the disk icon and its System Folder, and drag the Startup Device icon to the System Folder on your hard disk. Then restart your computer and begin with step 1.

3. Click the icon that represents the hard disk you want to use to start up.

The next time you start up your computer, the system uses the selected hard disk as the startup disk (if it contains a System Folder), unless there is a floppy disk inserted or a hard disk connected to the disk drive port and that disk contains a System Folder.

If you want to designate no startup device in the Control Panel and have the Macintosh scan for a startup disk in the way designated in "Startup Scanning Order," just click an empty area of the Startup Device panel, or hold down the Command key and click the selected icon to deselect it.

4. **Close the Control Panel.**

- *Note:* If you have set your internal hard disk (SCSI ID number 0) as the startup device and you want your Macintosh to scan for a different startup disk when you start up the computer, hold down a combination of four keys—Command, Option, Shift, and Delete—until a disk with a question mark appears on the screen. Then release the keys. The computer will look for another startup disk.

Chapter 3, "Using the Hard Disk SC With Your Macintosh," describes such things as switching off, reconnecting, testing, and solving problems that may occur while using your hard disk.

CHAPTER 3

Using the Hard Disk SC With Your Macintosh

THIS CHAPTER DESCRIBES HOW TO SHUT DOWN YOUR HARD DISK SC, HOW to connect it to another computer, and how to prevent and solve problems that may occur.

Switching off your hard disk

You can leave your Hard Disk SC on indefinitely; it draws very little power. Be sure to switch it off, however, when you won't be using it for a week or more or when you want to disconnect it.

To switch off your hard disk, follow these steps:

1. **Quit the application you're working in and return to the desktop.**
2. **Choose Shut Down from the Special menu.**

   If you're using a Macintosh II, choosing Shut Down turns the computer off. Otherwise you see a dialog box that tells you it's safe to switch off your computer.
3. **When Shut Down is completed, switch off your hard disk.**
4. **Switch off your Macintosh.**

▲ **Warning** Never switch off the Hard Disk SC while the disk-use light is blinking. If you do, you may lose information on the hard disk. ▲

Connecting your hard disk to another computer

Your Hard Disk SC retains its information when you disconnect it. You can reconnect it to any Macintosh computer that has a SCSI port and use the information stored on the hard disk.

- If you plan to reconnect your Hard Disk SC to the same type of Macintosh it was initialized with, you need only follow the directions in Chapter 2 of this guide.
- If you plan to reconnect your hard disk to another type of Macintosh, you may want to reinitialize the disk to make sure that it operates most efficiently with that computer.

Depending on what types of Macintosh computers you have, the computers may exchange information with the Hard Disk SC at different rates. For example, the Macintosh Plus uses a slower rate of exchange than the Macintosh SE, which, in turn, uses a slower rate than the Macintosh II and Macintosh SE/30 computers. The Macintosh that you use to initialize your Hard Disk SC affects its speed and performance, even when you connect it to another Macintosh.

If you plan to use your hard disk regularly with more than one Macintosh and the computers exchange information with the Hard Disk SC at different rates, initialize it using the slowest one. For example, if you expect to move your Hard Disk SC back and forth between a Macintosh Plus and a Macintosh SE, initialize it with the Macintosh Plus. If you're not sure which Macintosh you plan to use is the slowest, contact your authorized Apple dealer.

If you've been using a Hard Disk SC with an Apple II computer and you want to connect it to a Macintosh, you must reinitialize it because the computers use different file systems.

Likewise, if you want to connect to an Apple II a hard disk you've been using with a Macintosh, you need to reinitialize the disk after you've connected it to the Apple II.

Reinitializing erases all information on the hard disk, so be sure to back up the hard disk first.

▲ Warning To avoid damaging your equipment, always switch off the Hard Disk SC and your computer before connecting or disconnecting the hard disk. ▲

Reinitializing your hard disk

To initialize your Hard Disk SC so it works efficiently with another type of Macintosh, follow these steps:

1. **Back up all the files on your Hard Disk SC.**

   You can use HD Backup, described in Chapter 4, to back up your files on floppy disks. You can also use a tape backup device, or you can copy the files to another hard disk.

2. **Switch off your system and disconnect your hard disk.**

3. **Connect your hard disk to the other Macintosh.**

   Follow the steps in Chapter 2, "Connecting the Hard Disk SC to Your Macintosh."

4. **Start up your new system and reinitialize the hard disk.**

   Use Apple HD SC Setup, described in Chapter 2.

5. **Restore your files.**

   If you used HD Backup to back up files, see Chapter 4 for instructions on restoring the files.

   If you plan to use your Hard Disk SC as a startup device, make sure that the system files you want to use are appropriate for the Macintosh to which you have connected the hard disk. You can use the Installer to update the system files so that they will work most efficiently with your Macintosh. See your Macintosh system software guide for details.

Updating the driver

Whenever Apple develops a new version of the hard disk driver, it is built into Apple HD SC Setup. You can use the program's Update feature to install the latest version of the driver without erasing the information on your disk. (Initializing also installs the driver, but it erases your disk.)

To update your driver:

1. **Start up your Macintosh using a floppy disk containing the latest version of Apple HD SC Setup.**

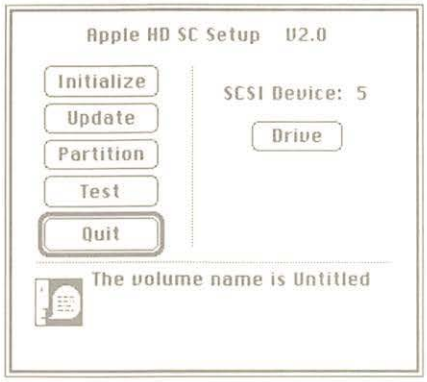
   If necessary, open the disk icon.

2. **Open Apple HD SC Setup.**

   You can double-click the icon to open it.

   Make sure the SCSI device number in the dialog box matches the ID number of the disk drive that you want to update. If not, click Drive until the numbers match.

■ **Figure 3-1** The Apple HD SC Setup dialog box



3. Click Update.

A message tells you when the update is complete.

4. Click Quit to return to the desktop.

❖ *By the way:* You can only update version 2.0 or later of Apple HD SC Setup. If you need to replace an earlier version, you must back up your files, initialize the disk with the new Apple HD SC Setup program, and then restore your files to the disk.

Testing your hard disk

You can use Apple HD SC Setup to test whether your hard disk is functioning properly. (The test routine checks the hardware only; to check for software problems, use the Disk First Aid™ program, as described in Chapter 5.) You may want to run the test every month or so.

The test takes several minutes. The exact length of time depends on the size of your hard disk and the type of Macintosh you use. Testing does not affect the information stored on the disk.

❖ *By the way:* You can keep a copy of Apple HD SC Setup on your hard disk for testing purposes. But you can't use the copy to initialize, update, or partition the hard disk containing it.

To run the test, follow these steps:

1. **Open Apple HD SC Setup.**

   You can start your Macintosh with your *Hard Disk SC Setup* disk, or, if your hard disk is working properly, you can run the test directly from your hard disk.

   The Apple HD SC Setup dialog box appears.

   Make sure the SCSI device number in the dialog box matches the ID number of the hard disk you want to test. If it does not, click Drive until the numbers match.

2. **Click Test.**

   A dialog box tells you that testing will take several minutes and cannot be interrupted.

3. **Click OK to continue.**

   When the test is complete, a message tells you whether the hard disk passed or failed. If it fails, have your Hard Disk SC checked by an authorized Apple dealer.

4. **Click Quit to return to the desktop.**

Troubleshooting

Occasionally you may experience difficulties while using your Hard Disk SC. This section presents the most common problems and the steps you can take to correct them. If after following the steps in this section you are still having difficulties—and you have a backup copy of all the information on your hard disk—you can try to reinitialize the hard disk and restore the information. If that doesn't work, contact your authorized Apple dealer for assistance. (See Appendix C, "Service and Support.")

▲ **Warning** Never try to remove the cover from the Hard Disk SC. It contains high-voltage components that retain an electrical charge even after the unit is switched off. ▲

Here are some typical problems and their possible solutions:

- Your Hard Disk SC doesn't switch on.

  If you don't hear the fan start up when you switch on the hard disk, make sure the power cord is plugged in and the electrical outlet is working. Double-check that the power switch is turned on. If your Hard Disk SC still doesn't switch on, see your authorized Apple dealer.

- The *Hard Disk SC Setup* icon doesn't appear on the desktop when you use the disk to start up your Macintosh.

  When you start up the Macintosh with the setup disk, you should see a disk icon in the top-right corner of the desktop. If no icon appears or if the disk is ejected from the disk drive, then the disk may be damaged. Replace it with a backup copy or a new one from your authorized Apple dealer.

- When you attempt to open Apple HD SC Setup, you immediately see the message "Drive selection failed."

  Make sure your Hard Disk SC is switched on. Check to see that the cables and cable terminators are correctly connected. Make sure that all the SCSI devices connected have different ID numbers. (See Chapter 2, "Connecting the Hard Disk SC to Your Macintosh.")

△ **Important** Shut down your computer and switch off the computer and all connected devices before checking cable connections. △

- You have more than one Hard Disk SC connected and the second device number does not appear when you click Drive in the Apple HD SC Setup dialog box.

  The drive whose number does not appear may be incorrectly connected or may not be switched on.

- When initializing your Hard Disk SC, you see the message "This drive is not working correctly. See your dealer."

  There is a hardware problem with your Hard Disk SC. See your authorized Apple dealer.

- The Hard Disk SC icon doesn't appear on the Finder desktop.

  Make sure you've initialized your Hard Disk SC. Only an initialized hard disk is recognized by the Macintosh.

  If you have properly connected and initialized your hard disk, check that the hard disk is switched on. If so, restart your Macintosh. (You must switch on the hard disk at least 10 seconds before you switch on the computer. If you switch on the hard disk after you've started up the computer, you need to restart the computer before it will recognize the hard disk.)

  The driver on the Hard Disk SC may have been damaged. Use the Update feature in the Apple HD SC Setup program to replace the driver. See "Updating the Driver," earlier in this chapter.

  If the SCSI device number of the hard disk does not show up in the Apple HD SC Setup dialog box and you're sure that you've connected your hard disk properly, there may be a problem with your hard disk. Contact your authorized Apple dealer.

  If all else fails, try to reinitialize the hard disk and restore your information from backup disks. (See Chapter 4, "HD Backup," for instructions on restoring the contents of your hard disk from backup disks.)

- The Finder desktop does not appear when you switch on your Macintosh with a Hard Disk SC that you've designated as your startup device.

  Start up with another disk, then check in the Control Panel that the correct startup device is selected. If necessary, copy the Startup Device icon from another System Folder to the System Folder on the hard disk. For more information on how the Macintosh looks for a startup device, see "Startup Scanning Order" in Chapter 2.

  If the Finder still doesn't appear when you switch on the designated hard disk, its System Folder may be damaged. Restart the computer from another disk, and use the Installer on the *Macintosh System Tools* disk to update the System Folder. Or copy an undamaged System Folder onto the hard disk.

▲ **Warning** If you replace a System Folder rather than using the Installer to repair it, all of its fonts and desk accessories are replaced by those in the copied System Folder. For this reason, you should keep a backup copy of your System Folder handy. ▲

If you're having problems with an internal SCSI hard disk, you can instruct the computer to ignore it during startup and look for another startup disk by holding down the Command, Option, Shift, and Delete keys (four keys) at the same time, just after you turn on your computer. Release the keys when you see a disk icon with a question mark.

- You see the message "This disk is damaged: Do you want to initialize it?" or the message "This is not a Macintosh disk."

  The organizational structure on the disk may need repair. Prepare a Disk First Aid disk, restart your Macintosh using that disk, and use Disk First Aid to examine and repair the disk. See Chapter 5, "Disk First Aid."

  If that fails, you probably need to reinitialize your Hard Disk SC and restore your files from backup disks.

- An application doesn't open correctly.

  Some applications are copy-protected and cannot start from a hard disk. Others may need to be installed with a special program. Check the application's guide for instructions.

  If you experience difficulty opening an application that's in a folder, move the application, its documents, and any other files associated with it to the disk directory window.

  If you still can't open the application, replace it with a backup copy.

- Your Macintosh appears to operate sluggishly with the Hard Disk SC.

  Your hard disk may have been initialized using a different type of Macintosh. Back up your files, reinitialize the hard disk, and restore your files. (If you plan to connect your hard disk to another type of Macintosh, see "Connecting Your Hard Disk to Another Computer," earlier in this chapter.)

  Your hard disk may be infected with a computer virus. Use a virus detection program, such as Apple Computer's Virus Rx™, to check if your hard disk has a computer virus, and follow the program's instructions for getting rid of the virus.

C H A P T E R 4

HD Backup

THE APPLICATION HD BACKUP, FOUND ON YOUR *HARD DISK SC SETUP* DISK lets you protect the contents of your Hard Disk SC by making **backups** (or copies) of your files on floppy disks. If something should go wrong with the files on your hard disk, HD Backup allows you to restore the saved files onto the hard disk.

It is very important to make copies of programs and other files in case they are damaged by malfunctioning hardware, faulty software, human error, external intervention (such as an exploring three-year-old), or mysterious events.

Approaches to backing up your hard disk

If you use floppy disks exclusively, it is relatively easy to make backup copies of files and disks and to recopy them should the need arise. When working with a hard disk that has 20 MB or more of storage, however, reconstructing your entire disk may be difficult. If you share that disk with other users, putting your files back together again may be impossible without the aid of a backup utility such as HD Backup.

To protect the contents of your hard disk, you need to copy its entire contents onto a set of floppy disks, onto another hard disk, or onto a tape (using a tape backup unit). This is called a **global backup.**

At the end of each work day or at some other regular period, you need to back up your disk again. However, since you probably use only a fraction of your disk during any work session, you need copy only the documents that you've modified or created recently. This procedure is called an **incremental backup.**

The incremental backup method used by HD Backup involves copying to floppy disks all files that you have created, modified, or copied on your hard disk since the last global backup. You copy these files to a stack of incremental backup disks.

When your stack of incremental backup disks is about half as large as your stack of global backup disks, you should probably do another global backup.

When working with an especially important document, you may also want to copy it onto a floppy disk whenever you save it. You can accomplish this easily with the Save As command, unless it is too large to fit on a floppy disk. In that case, you can use HD Backup's "Back up a single file" option to copy the file to two or more floppy disks.

If you lose all the information on your hard disk, you can restore it by reinitializing the hard disk and then using HD Backup to copy all the global backup disks and all the incremental backup disks onto the hard disk.

If you lose a single file, you can restore it from one of your backup disks without copying all the rest of the backup disks.

- *More than 20 MB?* If your Hard Disk SC has more than 20 MB of storage, you'll probably want to consider backup schemes that take less time than copying onto floppy disks.

Backing up files

Before you use HD Backup for the first time, copy it onto your hard disk. Keep the original and another copy handy, however, because you can't use the copy on the hard disk if the hard disk is damaged!

- *By the way:* HD Backup may not copy some files whose names begin with a period. To avoid problems, make sure that you rename all such files (so that they don't begin with a period) before running HD Backup. To find them on your hard disk, see Chapter 6, "Find File."

Be sure that you have on hand enough floppy disks to complete both a global backup and a number of incremental backups. It can take up to twenty-five 800K disks or fifteen high-density disks to back up a 20 MB hard disk. For the largest incremental backup, it may take thirteen 800K disks or eight high-density disks. (You may want to have two sets of global backup disks and two sets of incremental backup disks, in case your computer system fails *during* a backup.)

▲ Warning When you use HD Backup to back up files, all information previously stored on the backup disks is erased. Make sure that none of the disks contains documents or programs that you need. ▲

Global backup

To carry out a global backup:

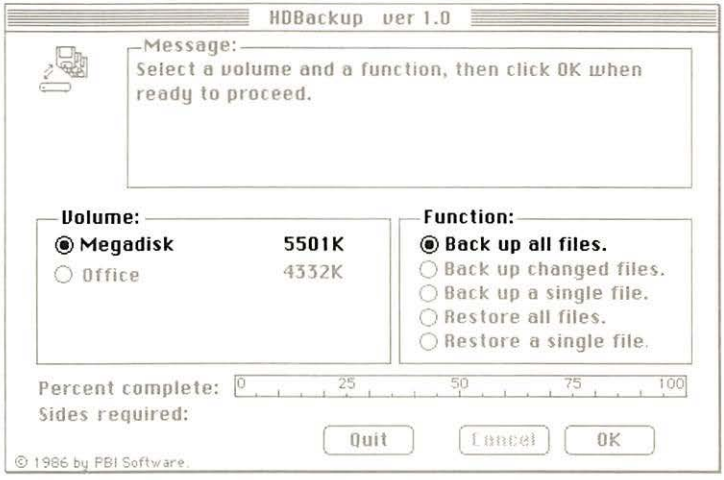
1. **Open HD Backup.**

   You can select the HD Backup icon and choose Open from the File menu, or you can just double-click the icon.

   A dialog box appears, instructing you to select a Macintosh volume and a function. *Volume* means your entire hard disk, unless you partitioned it. *Function* refers to the backup and restore options.

   For each Macintosh volume listed, HD Backup shows the amount of disk space in use, in kilobytes.

■ **Figure 4-1** The HD Backup dialog box



2. **If necessary, select the volume that you want to back up.**

   If you have only one hard disk, it is automatically selected.

   If you have more than five hard disks connected, the volume you want to back up may not be listed. In that case, return to the Finder and drag one or more of the hard disk icons to the Trash. Then switch off those hard disks. Open HD Backup again and select the volume you want.

3. **If necessary, select "Back up all files."**

   This option is automatically selected when you open HD Backup.

4. **Click OK.**

   HD Backup automatically ejects any disks found in your floppy disk drives and calculates how many disk sides are required to complete the backup.

❖ *How HD Backup calculates disk sides:* HD Backup calculates the number of sides at 400K per side. If you're using 800K disks, you need half as many disks as the number of sides displayed. If you're using high-density (1.4 MB) disks, you need about three disks for every ten (400K) sides required.

5. **As instructed by the dialog box, insert the first disk or disks from your global backup stack into your floppy disk drives.**

   If you have more than one floppy disk drive, you can insert disks in all the drives at once.

   If the disk is unreadable, the program asks you to eject it or initialize it. Click the appropriate button. You can reinitialize a readable disk by holding down the Option key as you insert the disk.

   HD Backup automatically names each disk with the name of the volume being backed up, preceded by a number. The first backup disk for a volume named Megadisk is always 1.Megadisk, followed by 2.Megadisk, and so on.

   Messages tell you whether HD Backup is waiting, initializing a disk, verifying a disk, or backing up files. The program also displays the name of each file as it is copied.

   As each disk is filled, HD Backup ejects it and requests the next one. A black line moves across the bar at the bottom of the window, indicating how much of the global backup has been completed. In addition, HD Backup updates the number of sides required to complete the backup. (This number may not be updated correctly if you use high-density disks. Even so, all the space on the disk is filled.)

   Click Cancel to halt the backup at any point.

△ **Important** If you cancel the backup, you cannot restore files from the backup disks that you've already created. △

6. **As each disk is ejected, label the disk with its assigned name as well as the date.**

7. **Insert the next disk.**

   If you insert a disk that you have just copied files onto, HD Backup ejects it and requests another.

8. **Repeat steps 6 and 7 until HD Backup tells you that the backup is complete.**

9. **Click OK, and then click Quit to return to the desktop.**

10. **Label your backup stack and store it in a safe place.**

Incremental backup

The procedure for an incremental backup is similar to that for a global backup. Refer to the previous section for more details.

1. **Open HD Backup.**

2. **If necessary, select the correct volume.**

3. **Select "Back up changed files" and click OK.**

   Any document or application that has been created, modified, or moved to the hard disk since the last global backup is copied.

   Some applications change when they are opened and may be backed up.

   When you select "Back up changed files," HD Backup does not display the number of disk sides required, but the bar at the bottom of the dialog box does show how much of a full backup you've completed.

△ **Important** Make sure your Macintosh clock is set to the correct date. This date is recorded with any file you create or change, and HD Backup uses it to determine whether a document needs to be included in an incremental backup.

If you want to be sure that a document is included in an incremental backup, you can save minor changes to your document and HD Backup will then back it up. △

4. **Insert the first disk or disks from your incremental backup stack into your floppy disk drives.**

   If you have more than one floppy disk drive, you can insert disks in all of your drives at once.

HD Backup names each incremental backup disk by adding a number *before* the name of the volume. That is, the first incremental backup disk for a volume called Megadisk is 1.Megadisk, the second is 2.Megadisk, and so on.

If you click Cancel, you cannot restore files from the backup disks that you have already created.

5. **As each disk is ejected, label the disk with its assigned name as well as the date, and insert the next disk.**

   Repeat as often as necessary.

6. **When the backup is complete, click OK and then click Quit to return to the desktop.**

   When the bar shows that more than 50 percent of a global backup has been done at the completion of an incremental backup, it's time to do another global backup.

7. **Label your incremental backup stack and store it in a safe place.**

Copying large files

The "Back up a single file" option allows you to copy a file that won't fit on a single floppy disk.

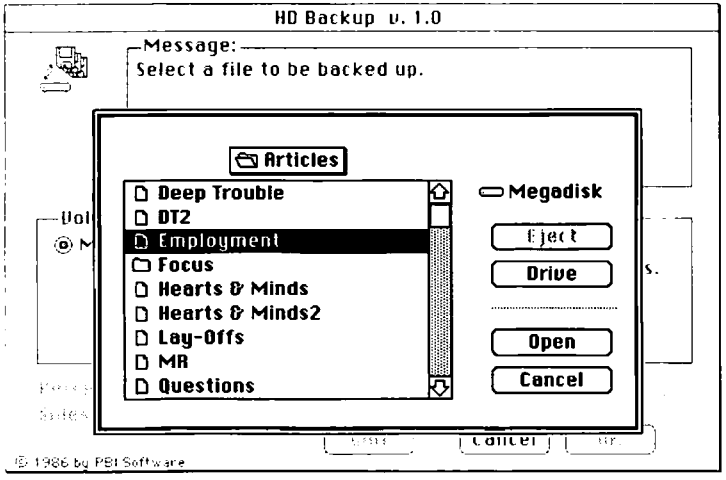
1. **Open HD Backup.**

2. **If necessary, select the volume containing the file you want to copy.**

3. **Select "Back up a single file" and click OK.**

   A directory dialog box appears.

■ **Figure 4-2** "Back up a single file" directory dialog box



4. **Find the file you want to copy.**

   See your Macintosh manual if you don't how to use a directory dialog box to find a file.

5. **Select the name of the file you want to copy and click Open.**

   Or you can double-click the name of the file.

   HD Backup asks you to insert a disk.

6. **Insert the backup disk or disks into your disk drives.**

   Neither the number of disk sides required nor the bar operates with "Back up a single file."

   HD Backup names each disk as in a global backup, placing a number before the volume name.

   If you click Cancel, you cannot restore the file from your backup disks.

7. **As each disk is ejected, label it with the assigned name and the date, and insert the next disk.**

   Repeat as often as necessary.

8. **When the backup is complete, click OK and then click Quit to return to the desktop.**

   Since "Back up a single file" uses the same naming procedure as "Back up all files," you should label these disks to distinguish them from those in your global backup stack.

9. **Store your backup disks in a safe place.**

Restoring files

If you used HD Backup to back up your files, you should use it to restore them to your hard disk. Because files and filenames on backup disks sometimes differ from those on disks created using the Finder, you can introduce errors by using the Finder to restore your files. (See "If Your Restoration Fails," later in this chapter, for instructions on using the Finder when you are unable to use HD Backup to reconstruct the contents of your hard disk.)

Here are some things you need to know about how HD Backup handles files:

- HD Backup renames files that have the same name. For example, two files in separate folders named Dear Hal become Dear Hal.1 and Dear Hal.2.
- HD Backup packs files into every available sector of disk space, so it sometimes splits a file into two or more pieces. These pieces are renamed to let you know they are part of a split file. HD Backup also uses a special icon for a split file you see in the Finder. For example, if your file called Poem is being copied onto a disk when the disk becomes full, that piece is renamed 1.Poem. The first file on the next disk is named 2.Poem.
- HD Backup uses icons to show all copied files, even if the directory from which they were copied is arranged by another view.

Icon for a split file

Restoring a single file

The "Restore a single file" option of HD Backup allows you to restore a single file from your backup disks to your hard disk without erasing or reorganizing the hard disk.

1. **Open HD Backup.**

2. **If necessary, select the correct volume.**

3. **Select "Restore a single file" and click OK.**

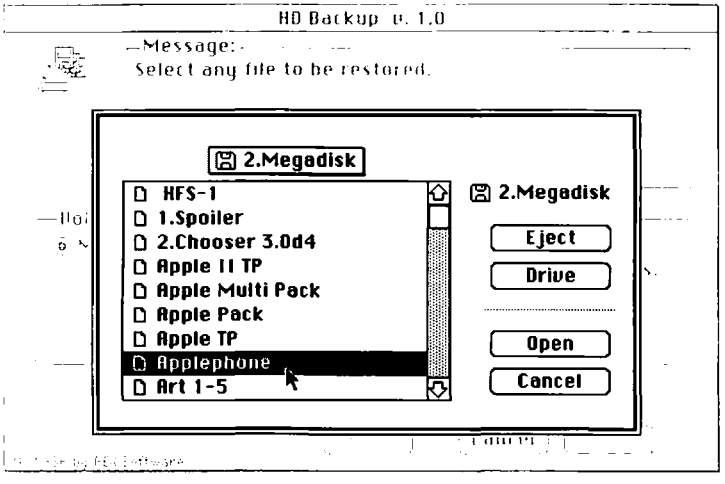
   HD Backup automatically ejects any disks found in your floppy disk drives and asks for a backup disk.

4. **Insert one of your backup disks.**

   You can restore files from any disk created with HD Backup.

   HD Backup presents a dialog box listing all the files on your backup disk, in numerical and alphabetical order. (Folders are not displayed.)

■ **Figure 4-3** "Restore a single file" directory dialog box



5. **Find the file you want to restore.**

   Scroll, if necessary, to find the file you want.

   If the file you are searching for is not on the disk, click the Eject or Drive button and insert another disk. Repeat the search until you see the file.

6. **Select the name of the file you want to restore, and click Open.**

   Or double-click the filename.

- *Split files:* If HD Backup split the file into two or more pieces, open the first piece. (Remember, the first piece of a file called Poem is named 1.Poem.)

  After the first piece is copied, HD Backup asks for the disk containing the second piece. As soon as you insert that disk, HD Backup automatically continues the restoration. (If the disk containing the first piece of the file is numbered 3, the disk containing the next piece of the file is numbered 4.)

  If your file is large enough to be spread onto three or more disks, repeat as often as necessary.

  If a file with the same name as the original file is in the hard disk directory window, then the restored split file keeps the name of the first piece—for example, 1.Poem.

7. **When the restoration is complete, click OK, and then click another option or click Quit to return to the desktop.**

8. **Use the Finder to move the file to the proper folder.**

   HD Backup automatically restores a single file to the hard disk window.

Restoring all files

Replacing the entire contents of a hard disk takes time, so you should be sure that the contents of your disk are seriously damaged before using the "Restore all files" option.

1. **Start up your Macintosh from a floppy disk (or a hard disk other than the one you are restoring).**

2. **Open HD Backup from a floppy disk (or another hard disk).**

3. **If necessary, select the volume (hard disk) to which you want to restore your files.**

4. **Select "Restore all files" and click OK.**

   HD Backup warns you that this option erases the selected volume.

5. **Click OK to continue.**

   If you don't want to erase the hard disk, click Cancel.

   The dialog box requests that you insert your disks, beginning with disk number 1.

6. **Insert your global backup disks in order.**

   If you have more than one floppy disk drive, you can insert disks into all of them.

   HD Backup ejects disks inserted in the wrong order or not belonging to the right set of backup disks.

7. **When all the global backup disks have been copied, insert your incremental backup disks in order.**

   HD Backup replaces files from the global backup with any modified versions of the same files.

   If you have no incremental backup disks, simply click Cancel and then Quit.

8. **When the restoration is complete, click OK and then click Quit to return to the desktop.**

If your restoration fails

If you are unable to restore all your files to your hard disk with HD Backup but your backup disks are still intact, you may be able to salvage much of the contents of your hard disk. This procedure does not reconstruct your folders, however. It should be used only if all else fails.

1. **Use the Finder to copy intact files (that is, files that are not split) from your backup disks to your hard disk.**

2. **Use the "Restore a single file" option of HD Backup to copy split files.**

3. **Create new folders for the files.**

CHAPTER 5

Disk First Aid

DISK FIRST AID IS A PROGRAM ON YOUR *HARD DISK SC SETUP* DISK THAT allows you to make minor repairs to a damaged disk. You can use Disk First Aid when your disk appears unreadable, or for preventive maintenance.

Preparing a Disk First Aid disk

For Disk First Aid to work properly in all cases, you should prepare a special startup disk on which you set Disk First Aid as the **startup application.** A startup application opens automatically when you start up the computer with the disk.

1. **Copy the System Folder and Disk First Aid from the *Hard Disk SC Setup* disk to a floppy disk.**
2. **Open the disk icon, select Disk First Aid, and choose Set Startup from the Special menu.**
3. **Eject the disk, label it, and store it in a safe place.**

When to use Disk First Aid

Disk First Aid helps you regain the use of an apparently damaged disk that uses the Macintosh hierarchical file system without destroying the information and programs stored there. (For more information about using Disk First Aid with floppy disks, see your Macintosh manuals.)

Disk First Aid can examine or verify your disk, and it can repair damaged data structures. (Data structures organize the various files and documents on the disk.)

You need to run Disk First Aid when you see a message telling you a disk is damaged and asking whether you want to initialize it. Or you might see a message asserting that the disk is not a Macintosh disk. Disk damage resulting in such messages might be caused by a power interruption or a system failure.

Sometimes after a power outage, most of the available space on the disk disappears. If this happens, you should run Disk First Aid even if you have no other problems with your disk.

■ **Figure 5-1** This is when you need Disk First Aid

Disk First Aid cannot repair every kind of damage to a disk. If after using the program you still have problems with your disk, you may need to reinitialize it and restore your files from backup disks. But be sure to run Disk First Aid first.

❖ *Note:* If your hard disk fails to start up your Macintosh, the problem is likely with the System file, not the disk's data structures. You should start the computer with another startup disk and copy its System file to the hard disk. If you normally use an internal hard disk as the startup disk and you are unable to start up your Macintosh, you can instruct the computer to ignore the internal hard disk and look for another hard disk by pressing the Command, Option, Shift, and Delete keys (four keys) at the same time as you start up the computer. Or you can start up the computer with a floppy disk. If copying another System file to the hard disk solves the problem, you can try using the Installer to repair your damaged System file.

Examining or repairing your hard disk

Follow these steps to examine or repair your hard disk:

1. **Start up with your Disk First Aid disk.**

   Your Macintosh automatically opens Disk First Aid and presents a dialog box.

   If you haven't created a startup disk with Disk First Aid as the startup application, open Disk First Aid from the Finder. This works in most, but not all, cases.

   If you want to use the menus, close the dialog box by clicking Cancel. You can reopen it by choosing Open Volume from the File menu.

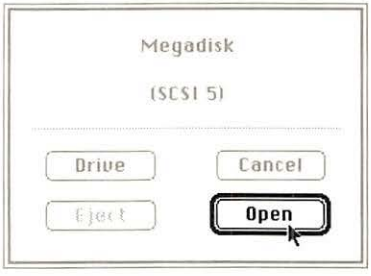
2. **Open the disk (volume) you want to examine or repair.**

   If necessary, find the correct hard disk by clicking Drive until its name appears in the dialog box. Then click Open.

   If you cannot find the volume, the hardware itself may be damaged. See "Testing Your Hard Disk" and "Troubleshooting" in Chapter 3 before contacting your authorized Apple dealer.

   If you open the startup disk or the disk from which you are running Disk First Aid, Disk First Aid tells you that it can examine the disk but not repair or erase it. Click Cancel if you want to open another volume.

■ **Figure 5-2** Opening the volume Megadisk



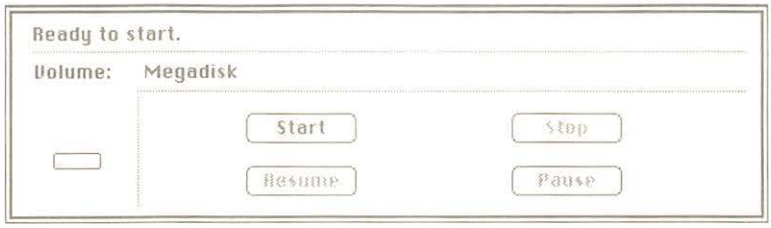
❖ *Tip:* If you plan to examine more than one disk, you may want to choose Repair Automatically from the Options menu. Then after you click Start, the disk is checked and automatically repaired, if necessary. (You can turn off the option by choosing it again.)

3. **Click the Start button.**

   Once you have started, you can stop or pause the process by clicking the appropriate button. If you click Stop, Disk First Aid presents an alert box. Click OK to stop, or click Cancel to resume examining the disk.

   After you click the Pause button, click Resume to continue.

■ **Figure 5-3** Examining the volume Megadisk



Once the selected disk is examined, the screen displays one of these three messages:

- `Finished. No repair necessary.`
- `Unable to verify status of disk.`
- `The disk "Megadisk" needs to be repaired. Do you want me to do this?`

This message does not appear if you have chosen Repair Automatically from the Options menu. In that case, Disk First Aid simply reports when it has completed the repair.

4. **If you see the third message above, click Repair.**

   Disk First Aid reports when the repair is completed.

   If Disk First Aid cannot repair your disk, it reports that it is unable to complete the repair.

5. **If you see the message "Unable to verify status of disk" or if Disk First Aid cannot complete the repair, try to back up the information on your disk and then reinitialize it.**

   To reinitialize your hard disk, choose Erase Disk from the Options menu, and then click the Initialize button.

   If you can't back up the information, contact your authorized Apple dealer for other suggestions before reinitializing your disk.

   Quit Disk First Aid and try to back up any files that you want to save. Copy them back onto the disk after you initialize it.

6. **Choose Quit from the File menu to return to the desktop.**

   If you want instead to examine another volume, choose Close and then Open Volume from the File menu.

CHAPTER 6

Find File

FIND FILE IS A MACINTOSH DESK ACCESSORY THAT HELPS YOU LOCATE FILES ON your disks. When you use the **hierarchical file system** to store a large number of **files**—including documents, application programs, folders, system files, and accessories—you may find it difficult to recall what you've named your documents or where you've placed them. Find File helps you do both.

When Find File is installed, you can use it to search for a file by specifying the entire **filename,** a keyword found in the name, or a sequence of characters contained in the name.

You can instruct Find File to display essential information about any item found in a search. Find File shows the chain of folders indicating where the file is stored on the disk, and it allows you to move the file to your desktop. You can also use Find File as a shortcut to open a specific document while you're using an application program. Find File can search within specified folders or on any disk. It can continue a long search even while you are working in an application.

Find File can search for files on hard disks and floppy disks. It does not, however, recognize folders on single-sided 400K disks.

Installing Find File

Find File is installed in the System file on the *Hard Disk SC Setup* disk. You can use the Font/DA Mover to install it on your startup disk. (For more information, see your Macintosh manuals.) Once installed, Find File appears as a desk accessory on the Apple menu.

Searching for files

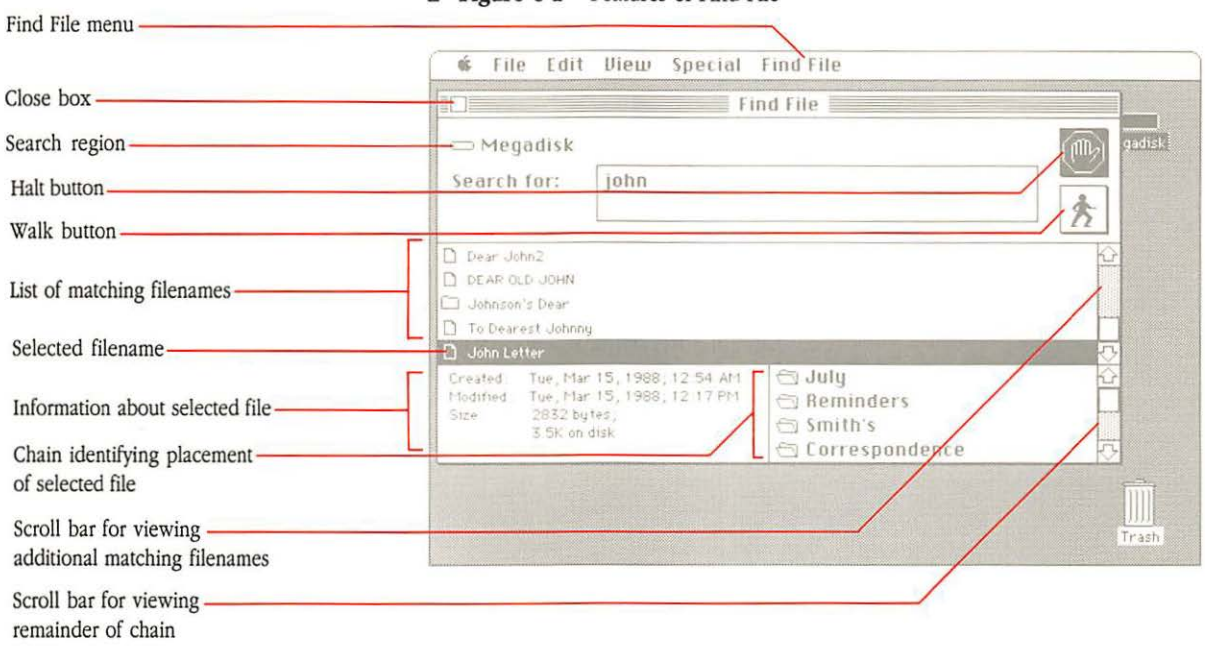
You can search for files whether you're in the Finder or in an application. Follow these steps:

1. **Choose Find File from the Apple menu.**

   The Find File window appears on the screen, with the insertion point blinking in the "Search for" box.

   The Find File menu appears at the right side of the menu bar.

■ **Figure 6-1** Features of Find File



2. Select the search region.

The search region—the disk or folder to be searched—is shown in the upper-left corner, just below the close box. It is preset as the current startup disk.

You can use Find File to search any disk or only a specified folder.

- To search another disk, click the disk icon shown to the left of the search region's name. If another hard disk is connected or a floppy disk is inserted, a different disk's name should appear.
- To search within a specified folder, choose Search Here from the Find File menu (or press Command-H). A directory dialog box appears. Select the folder you want to search and click Open Folder. Then click OK to return to the Find File dialog box. (See your Macintosh manuals for more information about using a directory dialog box.)

  When you click OK, you return to the Find File window. The selected folder is now the search region.

3. **To search, type any sequence of characters.**

   Find File attempts to match whatever you type with one or more filenames.

   Find File ignores the distinction between uppercase and lowercase letters and it searches for the character sequence regardless of where it appears in a filename.

   Find File's Search feature interprets a space to mean "and." For example, if you type `Dear John`, it looks for any filename containing both "Dear" and "John," such as Dear John, Dear Old John, or Johnson's Dear. On the other hand, it does not look for To John or Dear Maria.

■ **Figure 6-2** Matching text with filenames in Find File

❖ *Tip:* Avoid including articles (*a, and, the*) and small prepositions (such as *to, for, of*) in your character sequences. If you specify To Hal, for example, Find File does not locate the file named Letter For Hal.

4. **To start a search, click the "walk" button on the right side of the Find File window.**

   You can press Return or Enter as a short cut.

5. **To end a search, click the "halt" button.**

   Once you have ended a search, you can't continue where you left off. (Clicking the walk button again restarts the search at the beginning.)

You can type a new character sequence and begin a search whenever the Find File window is displayed, *unless a search is already in progress.*

As Find File locates files matching what you typed, it lists them along the left side of the window. Next to each filename, it displays a small icon identifying the file as a document, system file, application, or folder.

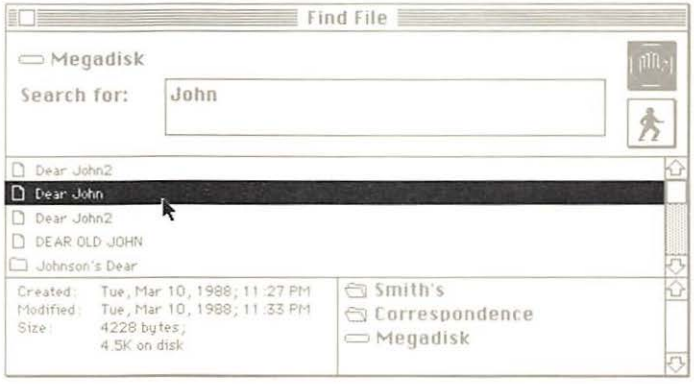
Should it find more than five matching filenames, Find File activates a scroll bar at the right side of the window so you can scroll to see all matching filenames. Find File displays filenames more than once if they appear in more than one folder. (See the Dear John2 files in Figure 6-2.)

Searching a disk containing hundreds of files can take some time. To tell you that a search is over, Find File beeps. If your speaker volume is set at zero, the menu bar blinks once.

Getting information

You can display information about a file by clicking its filename in the Find File window.

■ **Figure 6-3** Selecting a listed file to display information



In the lower-left portion of the window, Find File displays the date and time the file was created, when it was last modified, and its size. This information may help you determine whether the listed file is the one you want.

In the lower-right corner of the window, Find File displays the chain of folders that must be followed to get to the file. If a file is nested more than four folders deep, Find File activates a scroll bar at the right side of the window to let you view the remaining folders.

Operating in the background

Since a search can take several minutes, Find File has been designed to save you time by continuing to search for files in the background—while you're working within an application. To search in the background, follow these five steps.

1. **Start work in an application program.**

2. **Choose Find File from the Apple menu.**

   The Find File window appears in front of your work, and the Find File menu appears on the menu bar.

3. **To start a search, type a character sequence and then click the walk button.**

   Find File displays matching filenames as they are found.

4. **Click the active application's window to return to the application you are using.**

   With most application programs, you can write, calculate, or carry out other operations while the search continues. However, some applications may not allow you to return to your work without closing Find File or may automatically close Find File, halting the search, when you click the application window.

   Find File notifies you with a beep that its search is over.

△ **Important** Do not click Find File's close box if you want to run Find File in the background. Doing so immediately halts any search that is already in progress. △

5. **Redisplay the Find File window by choosing Find File from the Apple menu.**

   Filenames matching the character sequences that you typed are now displayed. You can click the application window to continue your work.

Opening files

Though Find File does not directly open documents, it is designed to help you find and open documents and applications.

While working in the Finder

If you're working in the Finder, you can use Find File to move a file to the desktop.

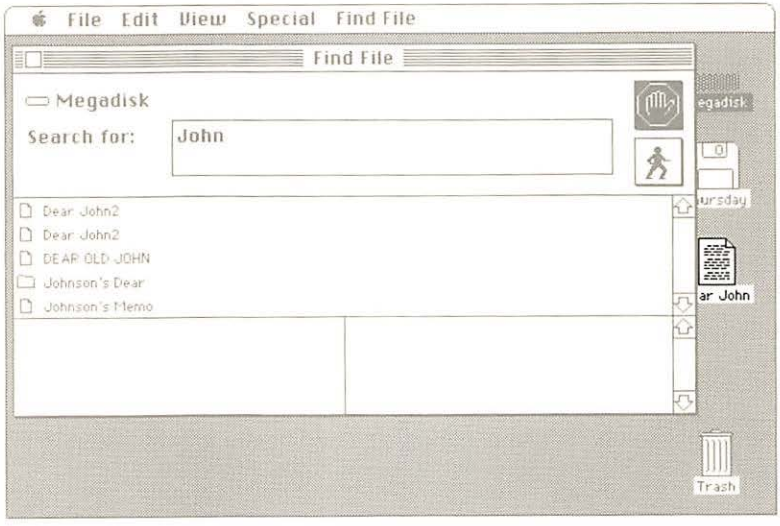
1. **Use Find File to find and then select a file.**

2. **Choose "Move to Desktop" from the Find File menu.**

   Or press Command-M.

   As shown in Figure 6-4, the selected file's icon appears beneath the disk icon(s) on the right side of your desktop.

■ **Figure 6-4** The document Dear John moved to the desktop



3. **Close Find File by clicking its close box.**

4. **Open the document or application.**

   When you quit the application, the file will still be shown on the desktop.

5. **To return the file to its original folder, select its icon and choose Put Away from the File menu.**

   You can move the file back with Put Away even if you change its name, but not if you move it to any other folder or to the disk window.

   You can also can drag the file's icon back into its original folder, into the Trash, or into any other folder.

While working in an application

If you're working in an application, you may be able to use Find File to help open any document that you created using that application.

1. **While working in an application, use Find File to find and then select a document.**

   If MultiFinder™ is turned on, hold down the Option key as you open Find File.

2. **Close any open documents if your application allows you to open only one document at a time.**

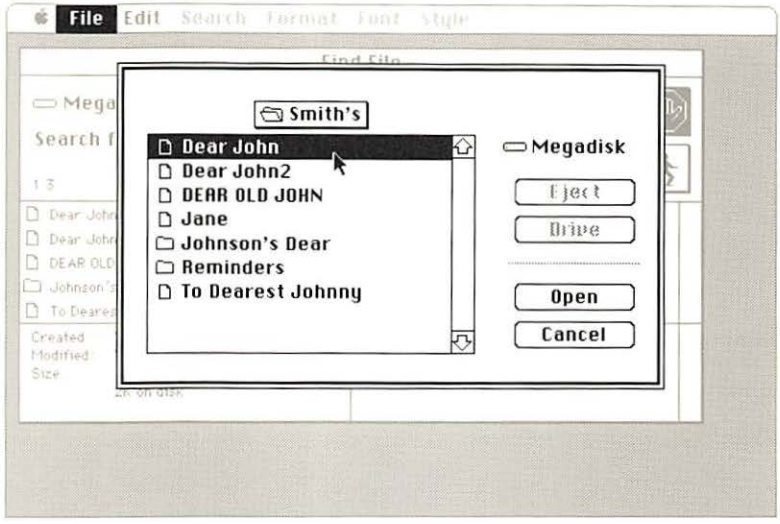
3. **Choose Open from the application File menu.**

   If the Open command is dimmed, close Find File. Then choose Open.

   A directory dialog box appears. The name of the folder or disk containing the selected document appears at the top.

   Let's say the MacWrite® document Dear John is nested in a folder named Smith's. If you find and select Dear John with Find File, Smith's automatically becomes the directory title when you choose Open from the MacWrite File menu.

■ **Figure 6-5** Opening a MacWrite document with the help of Find File



4. **Select and open the correct document from the directory list.**

Quitting Find File

You can quit Find File by clicking the close box, by choosing Close from the File menu when the Find File window is active, or by entering or leaving an application. Quitting Find File halts any search in progress.

C H A P T E R 7

Using the Hard Disk SC With Your Apple II

THIS CHAPTER GIVES INSTRUCTIONS FOR CONNECTING YOUR HARD DISK SC to your Apple IIGS, Apple IIe, or Apple II Plus computer. It then shows you how to **initialize** your hard disk to prepare it for storing information. You'll also learn how to set up your hard disk as a **startup disk** that contains the instructions your computer needs to start up. The final section of this chapter contains information about using and testing your hard disk.

Apple Computer does not support some large-capacity Hard Disk SC drives for use with the Apple II. Contact your authorized Apple dealer if you have a question about which Hard Disk SC you can use with an Apple II.

If your Hard Disk SC is the only **SCSI device** that you'll be connecting to a SCSI card, start with the next section, "Connecting a Single Hard Disk SC."

If you have other SCSI devices—for example, another external hard disk or the AppleCD SC—go to the section "Connecting a Chain of SCSI Devices," later in this chapter.

Connecting a single Hard Disk SC

Follow the instructions in this section if you're connecting a single Hard Disk SC to a SCSI card in your Apple II.

What you need

To connect the Hard Disk SC to your Apple II, you need these items that came with your Hard Disk SC:

- power cord
- **SCSI system cable**

  This cable attaches a SCSI device such as the Hard Disk SC to a SCSI card in your Apple II. It has a large connector at one end and a small connector at the other.
- **SCSI cable terminator**

Figure 1-1 on page 3 illustrates these items. (You don't need the Macintosh *Hard Disk SC Setup* disk.)

You also need an Apple II SCSI Card in order to connect the Hard Disk SC to your Apple II:

- For the Apple IIGS, you need the Apple II SCSI Card, Rev. C, Version 2.0 (or a later version).
- For the Apple IIe and Apple II Plus, you need the Apple II SCSI Card, Rev. C, Version 1.0 (or a later version).

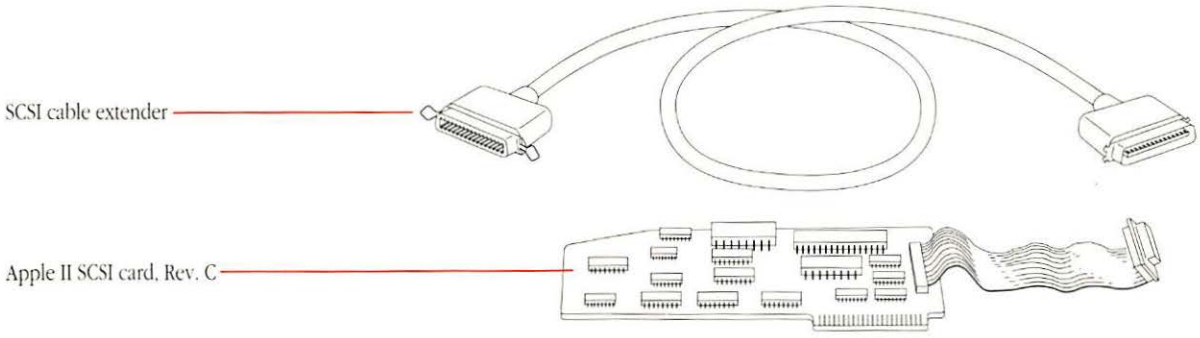
Finally, if you want to place your Hard Disk SC more than 18 inches from your computer, you will need:

- one or more **SCSI cable extenders**
- a second cable terminator

Figure 7-1 illustrates the Apple II SCSI card and the SCSI cable extender. If you don't have the items you need, visit your authorized Apple dealer.

△ Important Make sure your Apple II SCSI card is the correct version. Rev. C, version 2.0 is labeled "Ver 2.0" on the box and also on the card's ROM chip. (The ROM chip is the large chip located in the top row center of the SCSI card.) Rev. C, version 1.0 is labeled "Rev C" on the box and also on the card's ROM chip. If you're not sure whether the card you have is correct, check with your authorized Apple dealer. △

■ **Figure 7-1** The SCSI cable extender and the Apple II SCSI card



Connecting your hard disk

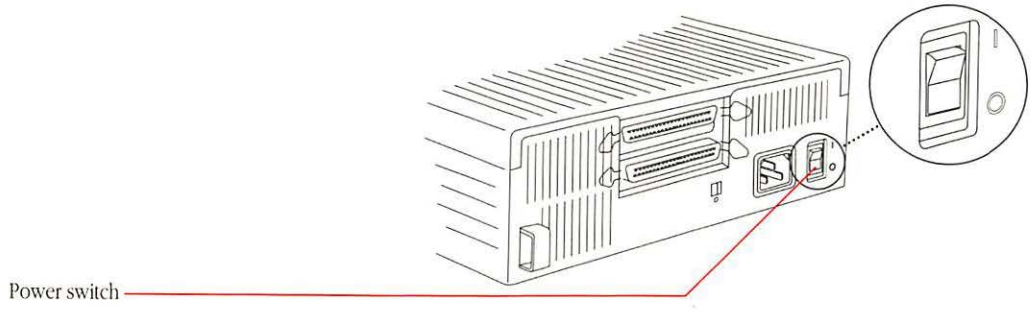
These instructions assume that you have installed a SCSI card in your Apple II (using the instructions that came with the card or the computer) and that you don't have any devices connected to your SCSI card. If something is already connected to the SCSI card, use the instructions in "Connecting a Chain of SCSI Devices," later in this chapter, to set up your system.

1. **Make sure your computer is plugged in and turned off.**

2. **Make sure your Hard Disk SC is turned off.**

   The power switch is located on the lower-left corner of the back panel (as you face the front of the hard disk). Push down on the lower part of the switch to make sure it's off.

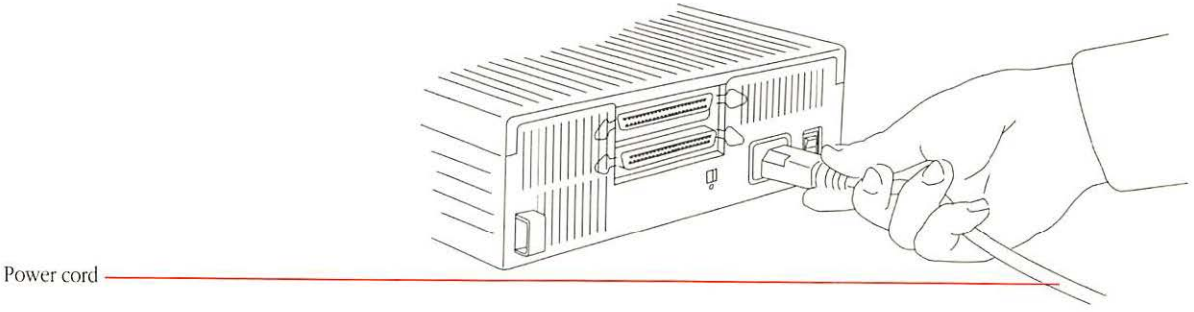
■ **Figure 7-2** Making sure the hard disk is off



3. **Attach the power cord to your Hard Disk SC.**

   Plug the power cord into the outlet on the back of the hard disk, as shown in Figure 7-3.

■ **Figure 7-3** Plugging the power cord into the Hard Disk SC



4. **Plug the cord into a grounded outlet.**

▲ Warning This equipment is intended to be electrically grounded.

Your Hard Disk SC is equipped with a three-wire grounding plug—a plug having a third (grounding) pin. This plug will fit only a grounding-type AC outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact a licensed electrician to replace the outlet with a properly grounded outlet. Do not defeat the purpose of the grounding plug! ▲

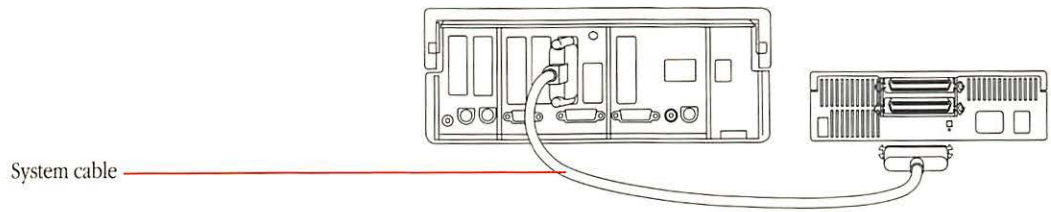
5. **Touch any of the metal connectors on the back of your computer.**

   This safely discharges static electricity that may be on your clothes or body.

6. **Attach the smaller end of the SCSI system cable to the cable from the SCSI card.**

   See Figure 7-4. Tighten the screws to secure the connection.

■ **Figure 7-4** Attaching the system cable to the SCSI card cable

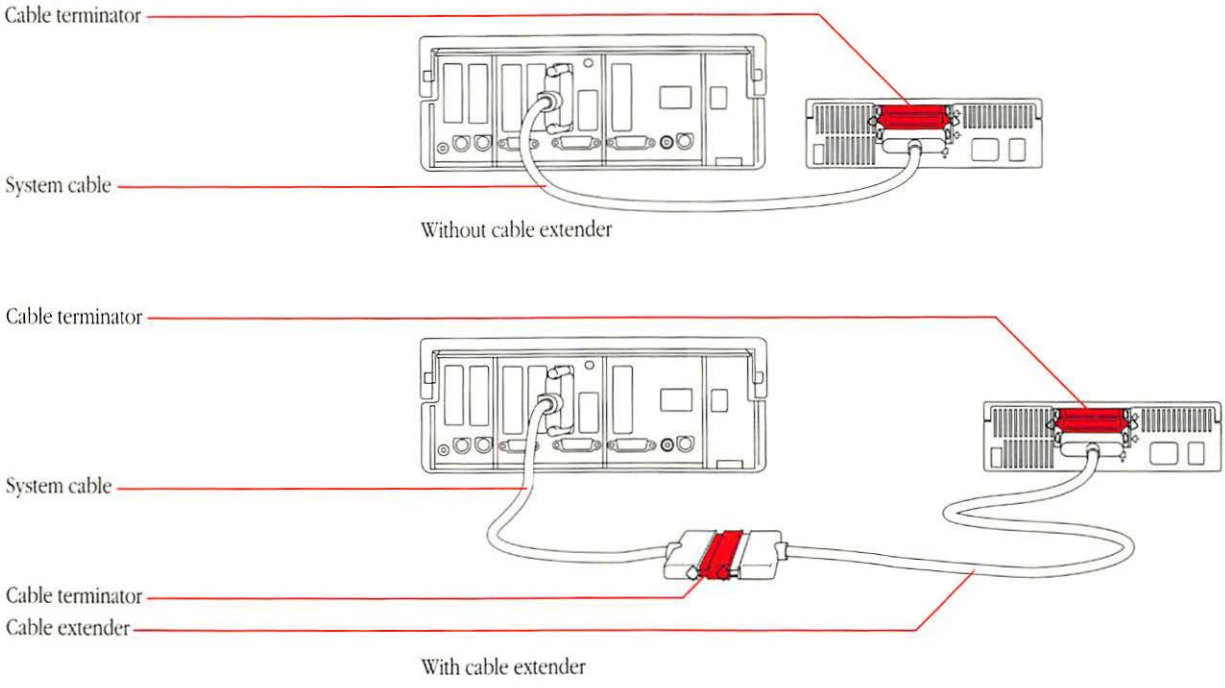


If you're not going to use a SCSI cable extender, skip step 7 and continue with step 8.

7. **If you want the Hard Disk SC to be more than 18 inches from your computer, connect a cable terminator to the end of the system cable and then plug the cable extender into the terminator.**

   Snap the diamond-shaped wire clips into the clip brackets to secure each connection. See Figure 7-5.

■ **Figure 7-5** Attaching the system cable (and cable extender) for one device



8. Connect the system cable (or cable extender) to one port on your Hard Disk SC.

Snap the diamond-shaped wire clips into the clip brackets to secure the connection. (See Figure 7-5.)

9. Connect a cable terminator to the empty port.

Snap the diamond-shaped wire clips into the clip brackets to secure the connection. (See Figure 7-5.)

Now you're ready to start up your system.

If you have the Hard Disk 20SC and don't want to partition your disk, skip to "Initializing Your Hard Disk," later in this chapter.

If you have a Hard Disk SC with more than 32 megabytes (MB) of storage space, you'll want to partition your disk because the ProDOS® file system limits volume size to 32 MB.

Refer to "Partitioning Your Hard Disk," later in this chapter, to learn how to partition and initialize your hard disk.

Connecting a chain of SCSI devices

Follow the instructions in this section if your Hard Disk SC will be part of a chain of SCSI devices. You can connect seven SCSI devices to a card in the Apple IIGS if you have system software 4.0 or later. Otherwise, you can connect four devices to a SCSI card in slot 5 of your Apple II (and two devices to a SCSI card in a different slot).

What you need

To connect the Hard Disk SC to your Apple II, you need these items that came with your Hard Disk SC:

- power cord
- **SCSI system cable**

  This cable attaches a SCSI device such as the Hard Disk SC to a SCSI card in your Apple II. It has a large connector at one end and a small connector at the other.
- **SCSI cable terminator**

Figure 1-1 on page 3 illustrates these items. (You don't need the Macintosh *Hard Disk SC Setup* disk.)

❖ *You may not need some of these items:* If you're adding your Hard Disk SC to an existing SCSI chain, you will not need the SCSI system cable. In addition, if the chain includes more than one device, you probably won't need the cable terminator that came with your Hard Disk SC.

You also need:

- one or more **SCSI peripheral cables** to connect one SCSI device to another

  SCSI peripheral cables have the same size connector at each end
- a second cable terminator (unless you have a device with a built -in cable terminator)

  See the next section, "About SCSI Devices," for more information.
- one or more **SCSI cable extenders** (if you want to place your SCSI devices farther apart than the cables allow)

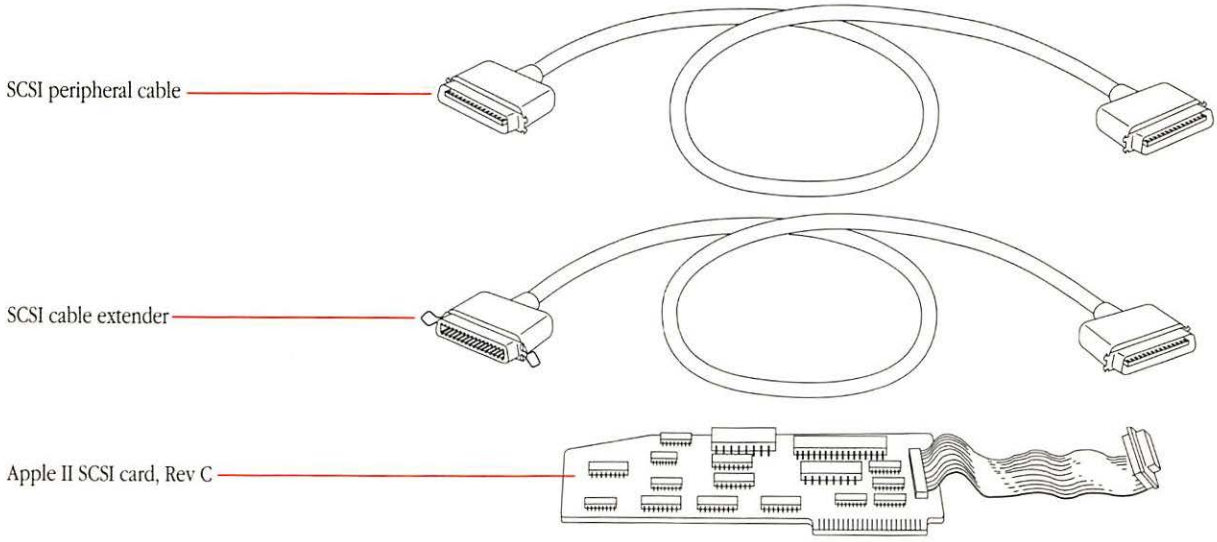
Finally, you need an Apple II SCSI Card in order to connect the Hard Disk SC to your Apple II:

- For the Apple IIGS, you need the Apple II SCSI Card, Rev. C, Version 2.0 (or a later version).
- For the Apple IIe and Apple II Plus, you need the Apple II SCSI Card, Rev. C, Version 1.0 (or a later version).

Figure 7-6 illustrates the Apple II SCSI card and the two types of SCSI cables you may need. If you don't have the equipment you need, visit your authorized Apple dealer.

△ Important Make sure your Apple II SCSI card is the correct version. Rev. C, version 2.0 is labeled "Ver 2.0" on the box and also on the card's ROM chip. (The ROM chip is the large chip located in the top row center of the SCSI card.) Rev. C, version 1.0 is labeled "Rev C" on the box and also on the card's ROM chip. If you're not sure whether the card you have is correct, check with your authorized Apple dealer. △

■ **Figure 7-6** Two types of SCSI cables and the Apple II SCSI card



About SCSI devices

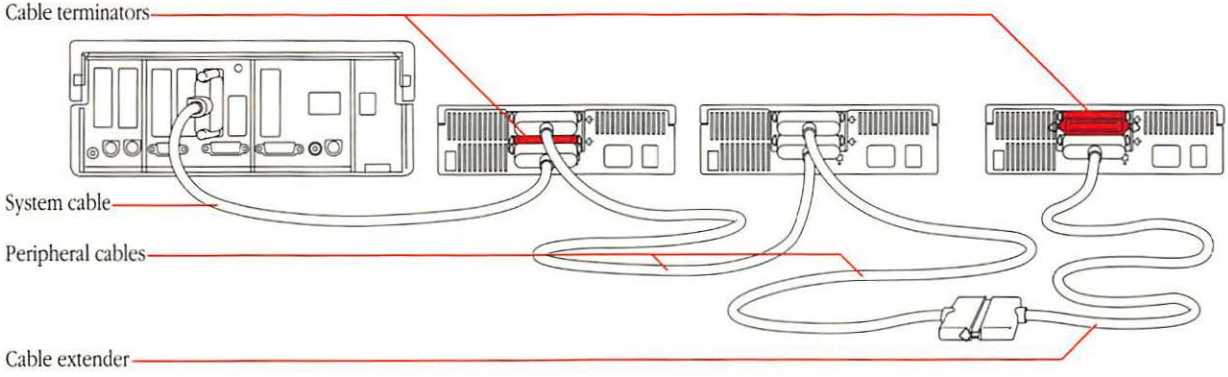
The number of SCSI devices you can connect to a SCSI card depends on which slot the card is in and what operating system your software uses.

If you have an Apple IIGS and you're using system software version 4.0 or later, you can attach seven devices to the card. Otherwise, you can connect four devices if the card is installed in slot 5, or two devices if the card is installed in another slot. See the *Apple II SCSI Card Owner's Guide* for other instructions about installing and using the card.

At the beginning and end of the SCSI chain, you need a SCSI cable terminator. So if you have two or more SCSI devices, you need two terminators.

Apple external SCSI devices, such as the Hard Disk SC, do not have built-in cable terminators. But some SCSI devices from other manufacturers do have them. Check the guides that came with any such devices to see if they have built-in terminators. Put a device with a built-in terminator at the beginning or end of the SCSI chain.

■ **Figure 7-7** Connecting SCSI devices



If you have more than two devices with built-in terminators, ask your authorized Apple dealer to remove the terminators from one or more of these devices. There must be only two terminators—one at the beginning and one at the end of the chain.

▲ Warning Do not use more than two cable terminators in a SCSI chain or damage may occur to the devices in the chain. If you're connecting your Hard Disk SC in the middle of an existing SCSI chain, do not use the cable terminator that came with your Hard Disk SC. If you read the instructions in this guide and still are not sure how to set up the SCSI chain correctly, ask a more experienced Apple II user or contact your authorized Apple dealer. ▲

Changing the SCSI ID number

Each SCSI device must have a unique **SCSI ID number.** The number allows the computer to identify all the devices in a SCSI chain. It is not necessarily related to the physical location of the device in the chain. Apple uses a standard ID number for each type of SCSI device. These numbers are set for you, and you don't need to change them unless you have two devices set to the same number. However, if you give higher numbers to devices you use more frequently, you may notice some performance enhancement.

The computer's SCSI ID number is 7. The preset ID number for the Hard Disk SC is 5. If you want to start up from one of the devices in the SCSI chain, you should assign ID number 6 to that device.

△ Important If you're connecting more than one Hard Disk SC, make sure you give each hard disk a unique ID number. Also, check the guides that came with your other SCSI devices to determine if there's an ID number conflict. Every SCSI device in a chain must have a unique ID number between 0 and 6. △

You'll find the SCSI ID number for the Hard Disk SC on its back panel. If you need to change the ID number, follow these instructions:

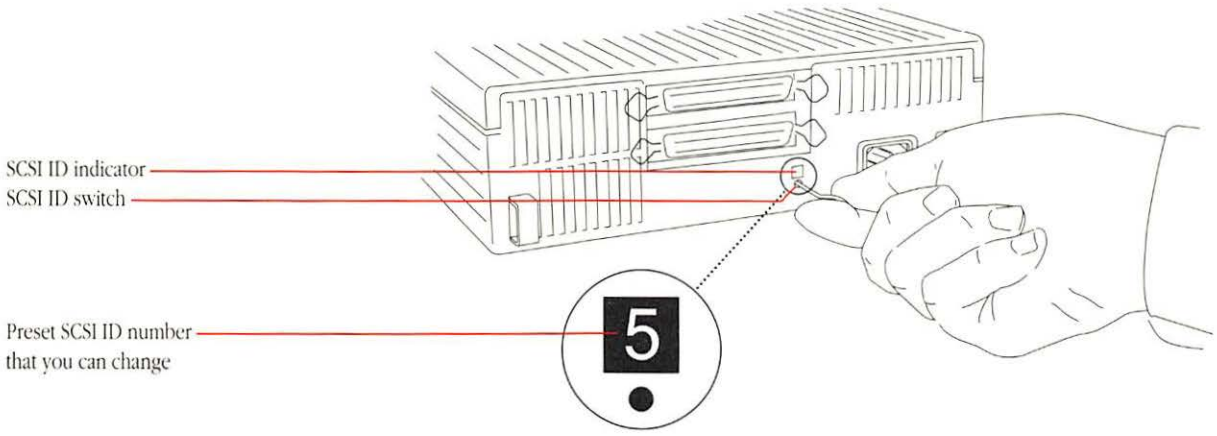
1. **Make sure the Hard Disk SC is switched off.**

2. **Decide on an unassigned SCSI ID number.**

3. **Insert a pushpin or a straightened paper clip into the SCSI ID switch.**

   The SCSI ID switch is in the hole below the **SCSI ID indicator,** as shown in Figure 7-8.

■ **Figure 7-8** Changing the SCSI ID number



4. **Push gently until the number you want appears.**

   If you go past the number you want, keep pushing gently until it cycles around again.

Connecting SCSI devices

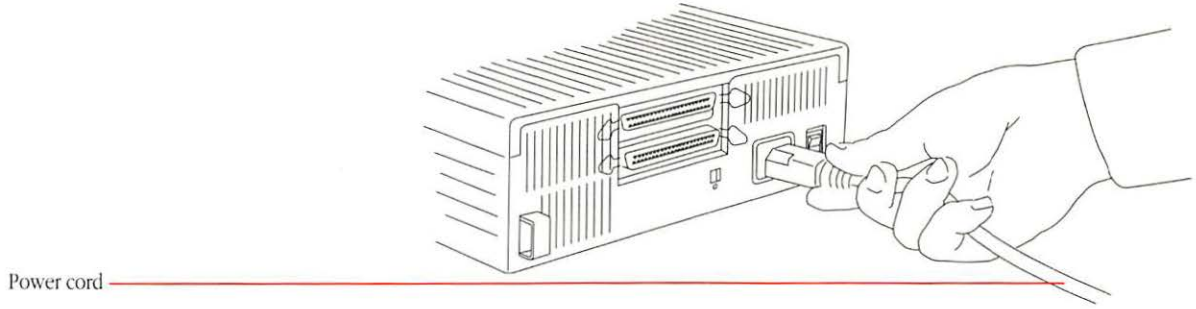
These instructions assume that you have installed a SCSI card in your Apple II (following the instructions that came with the card) and that you don't have any devices connected to your SCSI card. If you already have one or more devices connected to the card, read through the first four steps to be sure you have connected the first SCSI device correctly, then connect your Hard Disk SC according to the instructions beginning with step 5.

1. **Make sure your computer is plugged in and turned off.**

2. **Make sure your Hard Disk SC and any other SCSI devices are turned off, then plug each of them into a grounded power outlet.**

Plug the Hard Disk SC power cord into the power outlet on the back of the hard disk, as shown in Figure 7-9, and then plug the cord into a grounded outlet.

■ **Figure 7-9** Plugging the power cord into the Hard Disk SC



▲ Warning This equipment is intended to be electrically grounded.

Your Hard Disk SC is equipped with a three-wire grounding plug—a plug having a third (grounding) pin. This plug will fit only a grounding-type AC outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact a licensed electrician to replace the outlet with a properly grounded outlet. Do not defeat the purpose of the grounding plug! ▲

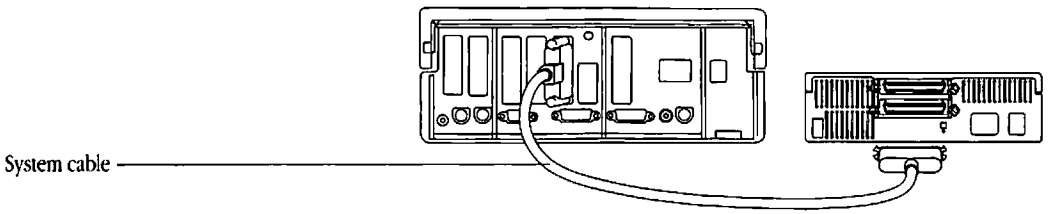
3. **Touch any of the metal connectors on the back of your computer.**

   This safely discharges static electricity that may be on your clothes or body.

4. **Connect the smaller end of the SCSI system cable to the cable from the SCSI card.**

   The system cable is 18 inches long. Plug the smaller end into the cable from the SCSI card, as shown in Figure 7-10. Tighten the screws to secure the connection.

■ **Figure 7-10** Attaching the system cable to the SCSI card cable

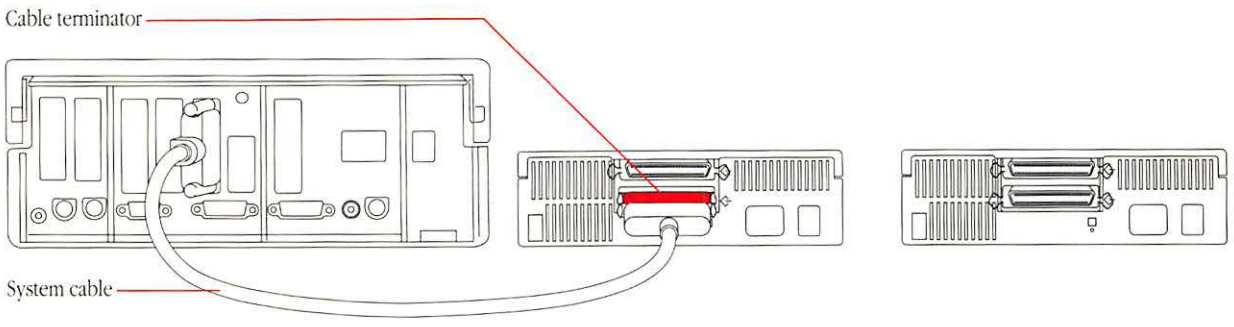


5. **Connect a cable terminator to the end of the system cable.**

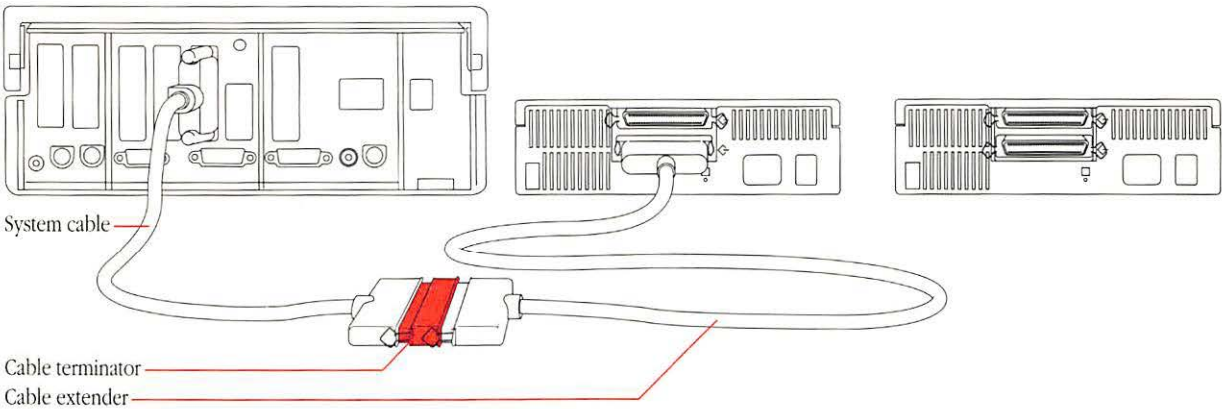
   Snap the diamond-shaped wire clips into the clip brackets to secure each connection. See Figure 7-11.

   Don't use a cable terminator if the first SCSI device in the chain has a built-in terminator. See "About SCSI Devices" earlier in this chapter for more information.

■ **Figure 7-11** Attaching the system cable (and cable extender) for the first device



Without cable extender



With cable extender

6. **If you want the first device to be more than 18 inches from your computer, connect a cable extender to the cable terminator.**

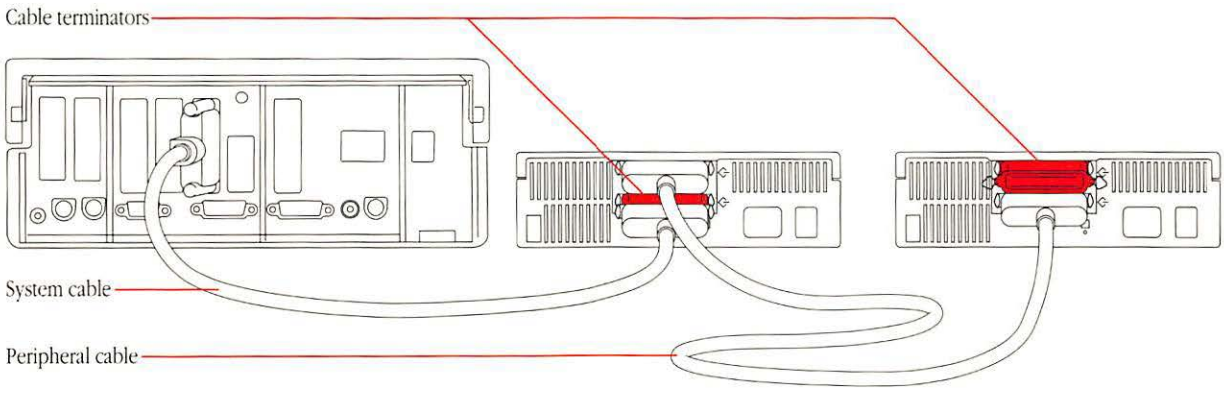
   Otherwise go on to step 7.

   Snap the diamond-shaped wire clips into the clip brackets to secure each connection. (See Figure 7-11.)

7. **Connect the cable terminator (or cable extender) to one of the ports on your first SCSI device.**

   Snap the diamond-shaped wire clips into the clip brackets to secure each connection. (See Figure 7-11.)

■ **Figure 7-12** Connecting the peripheral cable and cable terminator to the last device



8. **Connect a SCSI peripheral cable to the other port on your first SCSI device.**

   The peripheral cable is 3 feet long and has the same size connector at each end.

   Snap the clips into the clip brackets to secure the connection. See Figure 7-12.

9. **Connect the other end of the peripheral cable to one of the ports on your next SCSI device.**

   Snap the clips into the clip brackets to secure the connection.

10. **Follow steps 8 and 9 for each additional SCSI device in the chain.**

    You can use cable extenders like extension cords between a peripheral cable and the next SCSI device.

11. **Plug a cable terminator into the empty port on the last SCSI device, unless the device has a built-in terminator.**

    Apple's external SCSI devices don't have built-in terminators, but SCSI devices from other manufacturers may. For more information, see "About SCSI Devices," earlier in this chapter.

    Snap the clips into the clip brackets to secure the connection. See Figure 7-12.

△ **Important** The total cable length cannot be longer than 20 feet. △

Now you're ready to start up your system.

If you have the Hard Disk 20SC and don't want to partition your disk, skip to "Initializing Your Hard Disk."

If you have a larger Hard Disk SC, you will want to partition your disk because the ProDOS file system limits volume size to 32 MB.

Partitioning your hard disk

There are two reasons to **partition** a hard disk for use with an Apple II computer:

- If you have a Hard Disk SC larger than 32 MB, you can use partitions to take advantage of all of the disk's storage space.
- If you have an Apple IIGS and are using system software version 4.0 or later, you can initialize each partition for a different file system and store on the same hard disk applications and documents that use different file systems.

Here's how to partition a hard disk:

- If you have an Apple IIGS computer and are using system software version 4.0 or later, use the Advanced Disk Utility on the *Apple IIGS System Tools* disk. You'll find instructions in the guide that came with the disk or with your computer.

  The Advanced Disk Utility that comes with version 4.0 of system software lets you create seven partitions for each SCSI card. If you have two hard disks connected to the card, for example, you can create four partitions on the first hard disk and three partitions on the second.

  The Advanced Disk Utility that comes with version 5.0 of system software lets you create eight partitions for each SCSI device. If you have two hard disks connected to the card, you can create sixteen partitions—eight partitions on each hard disk.

- If you have an Apple IIGS computer and are using system software version 3.1 (or an earlier version), use the HD SC Partition program on the *Apple II SCSI Card Utilities* disk. You'll find instructions in the *Apple II SCSI Card Owner's Guide*.

  You can have four partitions for a single SCSI card if the card is in in slot 5 and only two partitions if the card is in another slot. (So, if you have two hard disks connected to a SCSI card *not* installed in slot 5, you can't partition them.)

- If you have an Apple IIe or Apple II Plus computer, first initialize the Hard Disk SC (see the next section, "Initializing Your Hard Disk") and then use the HD SC Partition program on the *Apple II SCSI Card Utilities* disk. You'll find instructions in the *Apple II SCSI Card Owner's Guide*.

  You can have four partitions for a single SCSI card if the card is in in slot 5 and only two partitions if the card is in another slot. (So, if you have two hard disks connected to a SCSI card *not* installed in slot 5, you can't partition them.)

▲ Warning When you partition a disk, you erase all information on the disk. If you must repartition a hard disk, be sure to make a backup copy of everything on the disk first. To do so, you can use the Backup II program on the *Apple II SCSI Card Utilities* disk. If you're using the Apple IIGS computer, you can also use the Finder to copy files to floppy disks. ▲

Initializing your hard disk

Your new Hard Disk SC needs to be prepared to store files. This process is called *initializing*. If you've already used the Advanced Disk Utility with the Apple IIGS to partition your hard disk, it is already initialized, so you should skip this section.

△ **Important** If you have a Hard Disk SC with more than 32 MB of storage space, you should partition your disk. The ProDOS file system limits volume size to 32 MB. For more information, see the previous section, "Partitioning Your Hard Disk." △

To initialize the Hard Disk SC, see the section on initializing (sometimes called *formatting*) in the appropriate manual:

- Apple IIGS: any Apple IIGS guide that describes how to use the Finder to initialize disks
- Apple IIe and Apple II Plus: the *Apple II System Disk User's Guide* or the *ProDOS User's Manual*

To initialize your Hard Disk SC, follow these steps:

1. **Switch on your Hard Disk SC.**

   The power switch for the Hard Disk SC is on the back, in the lower-left corner as you face the front of the hard disk. When you switch it on, you should hear the hard disk fan. However, you won't see the disk-use light on the front panel go on.

2. **Wait at least ten seconds.**

   This allows your Hard Disk SC to get up to speed.

3. **Insert the appropriate disk into a disk drive:**

   - Apple IIGS: *Apple IIGS System Disk* (you should also have the *Apple IIGS System Tools* disk handy)
   - Apple IIe and Apple II Plus: *Apple II System Utilities* disk or *ProDOS User's Disk*

4. **Switch on the monitor.**

5. **Switch on the Apple II.**

6. **Follow the instructions in the appropriate guide.**

   Initializing a Hard Disk SC takes several minutes. The light on the front of the hard disk blinks whenever there's disk activity; otherwise, the light remains off even though the hard disk is on.

Creating a startup disk

To take full advantage of the speed and storage capabilities of your Hard Disk SC, you should make it a **startup disk.** A startup disk is any disk that has the necessary program files to set the computer into operation.

If you have more than one SCSI hard disk, only one can be your startup disk—the disk with the highest SCSI ID number. However, if you have an Apple IIGS, you can use the Control Panel to designate the startup slot. If you have more than one hard disk connected to the card in that slot, the startup disk is the disk with the highest ID number. (See your Apple IIGS owner's guide for instructions on using the Control Panel.)

1. **Make sure that the necessary startup files are on the hard disk you have chosen to be the startup disk.**

   - Apple IIGS: If you are using system software version 4.0 (or a later version), use the Installer that's on the *Apple IIGS System Tools* disk. You'll find instructions in the guide that comes with the disk or in your owner's guide. If you're using an earlier version of system software, see your Apple IIGS owner's guide for instructions on copying startup files to the hard disk.
   - Apple IIe or Apple II Plus: Copy the necessary startup files to the hard disk you have chosen as the startup disk. You'll find instructions on copying files in the *Apple II System Utilities* guide or the *ProDOS User's Manual.*

2. **Switch off your computer if it's on.**

3. **Switch on the Hard Disk SC and wait at least 10 seconds.**

4. **Restart your computer.**

   - Apple IIGS: If you have designated the correct startup slot in the Control Panel, your computer goes right to the hard disk to start up. If two or more hard disks are connected to the card in that slot, the startup disk must be the one with the highest SCSI ID number. If the startup slot setting is at Scan, your computer looks for a startup disk beginning with the disk drive connected to the card in the slot with the highest number.
   - Apple IIe or Apple II Plus: Your computer looks for a startup disk beginning with the disk drive connected to the card in the slot with the highest number.

Switching off your hard disk

You can leave your Hard Disk SC on indefinitely; it draws very little power. Be sure to switch it off, however, when you won't be using it for a week or more or when you want to disconnect it.

To switch off your hard disk, follow these steps:

1. **Quit the application you're working in.**
2. **Make sure the disk-use light on the hard disk is off.**
3. **Switch off the Hard Disk SC.**
4. **Switch off the computer.**

▲ **Warning** Never switch off the Hard Disk SC when the light on the front of the case is blinking. You may lose information on the hard disk. ▲

Connecting your hard disk to another computer

Your Hard Disk SC retains its information when you disconnect it. You can easily reconnect it to your computer or to another Apple II computer with the correct version of the Apple II SCSI Card.

Follow the appropriate procedure for connecting your hard disk either as a single SCSI device or as one device in a chain of SCSI devices. See "Connecting a Single Hard Disk SC" or "Connecting a Chain of SCSI Devices," earlier in this chapter.

▲ **Warning** To avoid damaging your equipment, always switch off the Hard Disk SC and your computer before connecting or disconnecting the hard disk. ▲

If your Hard Disk SC was initialized with an Apple II, you can use it with a Macintosh, but you must reinitialize it because the Macintosh uses a different file system.

If you have a Hard Disk SC that was initialized with a Macintosh, you must reinitialize it after you connect it to your Apple II. Follow the instructions in "Initializing Your Hard Disk," earlier in this chapter.

Reinitializing erases all the information on the hard disk, so be sure to back up the hard disk first.

Testing your hard disk

You can test your Hard Disk SC with your Apple II by running HD-SCSI Test, a program on the *Apple II SCSI Card Utilities* disk that accompanies your Apple II SCSI Card. See the *Apple II SCSI Card Owner's Guide* for details.

APPENDIX A

Partitioning a Hard Disk SC Connected to a Macintosh

APPLE HD SC SETUP, A PROGRAM FOUND ON THE *HARD DISK SC SETUP* DISK, allows you to initialize your hard disk and to divide it into **partitions.** Creating partitions is an advanced feature that you need if you plan to use your Hard Disk SC to store information from several types of computers or **operating systems.**

For example, you need to create partitions if you plan to use portions of your hard disk with A/UX, Apple's version of the UNIX operating system.

You can select a standard partition scheme, or you can create custom partitions. It's a good idea to read about both methods before choosing one to use.

If you have just initialized your Hard Disk SC and don't need to create partitions, return to "Creating a Startup Disk" in Chapter 2.

△ **Important** Whenever you partition a disk for the first time, and in many cases when you repartition your disk, information stored on your disk is erased. So be sure to back up all files that you need before attempting to create partitions. For details, see Chapter 4, "HD Backup." △

Creating standard partitions

Apple HD SC Setup allows you to partition your entire SCSI hard disk according to a standard scheme by following this simple procedure. Apple HD SC Setup automatically removes old partitions when creating new **standard partitions.**

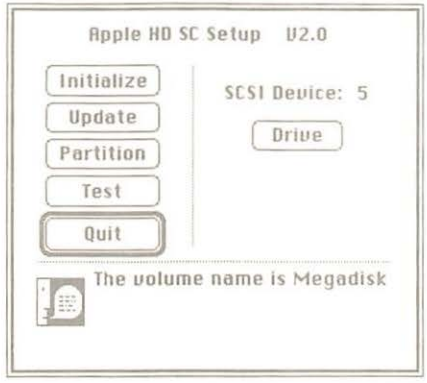
1. **Start your Macintosh with your *Hard Disk SC Setup* disk, and open the disk icon.**

   Select the disk icon and choose Open from the File menu, or just double-click the icon.

2. **Open Apple HD SC Setup.**

   A dialog box appears.

■ **Figure A-1** The Apple HD SC Setup dialog box



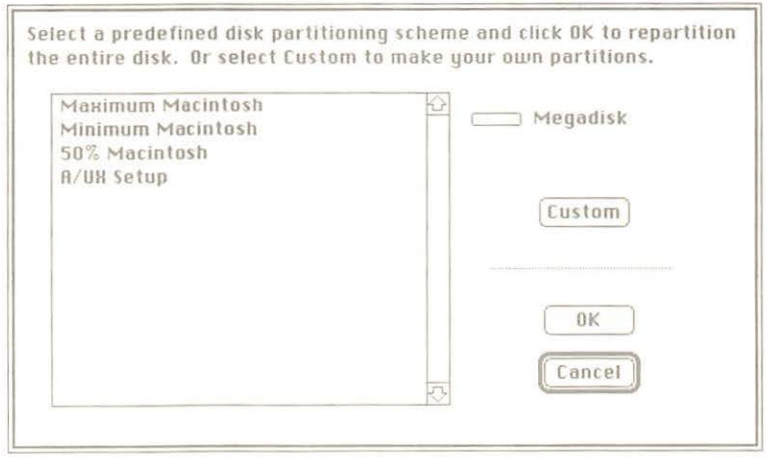
△ **Important** If you have more than one Hard Disk SC connected, make sure that the SCSI device number matches the SCSI ID number of the hard disk you want to partition. If they do not match, click Drive until they do. Remember, partitioning erases all information on the hard disk. △

3. Click Partition.

The Partition dialog box appears. Make sure that the name of the correct disk appears on the right.

■ **Figure A-2** The Partition dialog box

The latest version of Apple HD SC Setup may include different standard partitions



Macintosh volume refers to the part of your hard disk that uses the Macintosh hierarchical file system for storing information.

4. **Select the standard partition scheme that you want.**

   Here are some standard partition schemes:

   - Maximum Macintosh. This partition scheme is used when you first initialize your hard disk. It sets up a small partition for the driver and a large partition that uses most of the remaining disk space for the **Macintosh volume.** Use this scheme if your disk has been partitioned in some other way and now you want to use it only as a Macintosh volume.
   - Minimum Macintosh. This scheme creates a Macintosh volume that has about two megabytes of disk space, enough to use your hard disk as a startup disk. (See "Creating a Startup Disk," in Chapter 2.) You'll need files establishing another operating system to make use of the remainder of the disk.
   - 50% Macintosh. This scheme creates a Macintosh volume using about half your disk space and sets aside the other half for use with another operating system.
   - A/UX Setup. This scheme creates a minimum Macintosh volume with about two megabytes of disk space, enough to use your hard disk as a startup disk. It also creates a Root and Usr partition for executable and data files, a Swap partition for virtual memory, and two Eschatology partitions for Autorecovery purposes. To use this scheme, you need a Hard Disk SC that holds 80 megabytes or more.

     You should select this partition scheme if you're going to install A/UX from a different medium, such as tape or floppy disks. Or you should select this scheme if you need to repartition a severely damaged Hard Disk SC with this scheme before you restore its information with the Apple Tape Backup SC.

     If you want to partition an extra hard disk for storing A/UX file systems, refer to the next section, "Creating Custom Partitions."

❖ *By the way:* You can check with your authorized Apple dealer to make sure that you have the most current version of the Apple HD SC Setup program so that you can select from all of the available partition schemes.

5. **Click OK.**

   You can also double-click the partition scheme that you want.

In most cases, a dialog box appears, reminding you that partitioning erases the information on your hard disk. If you click Cancel when this dialog box appears, you return to the main Setup dialog box, and no partitioning takes place.

▲ **Warning** Partitioning erases all the information on your hard disk. ▲

6. **If necessary, click OK to continue.**

   Partitioning begins, and a dialog box appears with status messages at the bottom. Partitioning takes much less time than initializing. The dialog box tells you when partitioning is completed.

7. **Click Quit to return to the desktop.**

   The icon of the hard disk you partitioned appears on the desktop. This icon actually represents the Macintosh volume that's part of your hard disk. You can no longer use all the space on the disk to store Macintosh files unless you selected the Maximum Macintosh partition scheme.

   When you open the icon, the size of the Macintosh volume is displayed just below the title bar, if you are using the By Icon or By Small Icon view.

If you want to make your Hard Disk SC a startup disk, turn back to "Creating a Startup Disk" in Chapter 2.

Creating custom partitions

If you have a special requirement for a partition scheme other than those described above, you can use Apple HD SC Setup to create custom partitions on your hard disk. For example, A/UX users may want to partition an additional hard disk for use with mountable A/UX file systems. If you don't need custom partitions, skip this section.

Adding a custom partition merely assigns disk space. Frequently, however, you must remove, group, or move existing partitions to create the disk space you need for a new partition. This means you will be erasing or moving the information that a partition contains, so always make a backup of all your information before you work with these procedures.

The following sections tell how to create and customize partitions on your Hard Disk SC:

- "To Add a Partition"—create a particular type of partition with a specific size
- "To Remove a Partition"—remove existing partitions to make space for new ones
- "To Group Partitions"—combine the free space on the disk
- "To Move a Partition"—move a partition and its contents to another place on the hard disk
- "To Lock or Unlock the Macintosh Volume Partition"—make sure that its contents cannot be erased
- "To View Your Partitions"—see detailed information about each partition on the hard disk

To add a partition

You can create another partition on your hard disk by following these steps:

1. **Open Apple HD SC Setup.**

   If necessary, start your Macintosh with your *Hard Disk SC Setup* disk, and open the disk icon. Then open the Apple HD SC Setup icon.

   The Apple HD SC Setup dialog box appears.

△ **Important** If you have more than one Hard Disk SC connected, make sure that the SCSI device number in the dialog box matches the ID number of the hard disk you want to partition. If they do not match, click Drive until they do. Partitioning may erase the information on the disk. △

2. **Click Partition.**

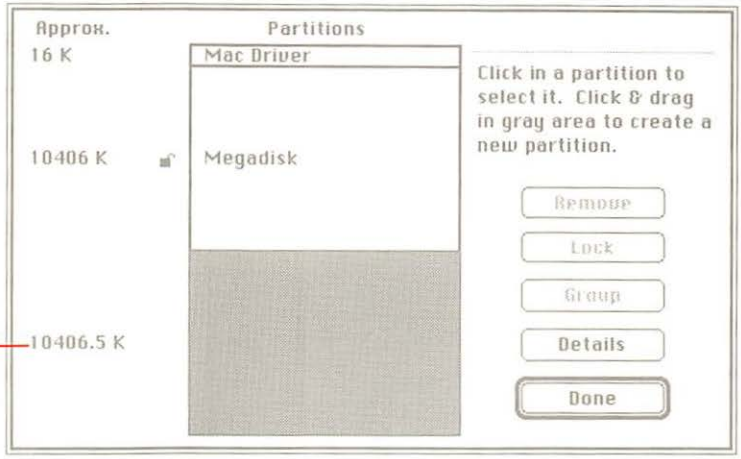
   The Partition dialog box appears. Check to see that the name of the correct disk appears on the right.

3. **Click Custom in the Partition dialog box.**

   The Custom Partition dialog box appears, as shown in Figure A-3.

   Each partition is represented by a rectangle, and its size, in kilobytes, is shown on the left. Sections of **free space,** portions of the disk not contained in a defined partition, are gray.

■ **Figure A-3** The Custom Partition dialog box



There must be a section of free space large enough to hold your new partition.

If there is not sufficient free space, you may need to remove one or more partitions. For example, if you've just initialized your disk, you may need to remove your Macintosh partition before you can create any other partitions. (See "To Remove a Partition," later in this section.)

❖ *For A/UX users:* To make free space for A/UX file systems, you need to select and remove the Macintosh partition. Then go on to step 2.

If the free space is divided into sections by existing partitions and no single section is large enough for your new partition, you need to remove a partition or combine the sections of free space by grouping the partitions. (See "To Group Partitions," later in this section.)

Clicking Done returns you to the main Apple HD SC Setup dialog box.

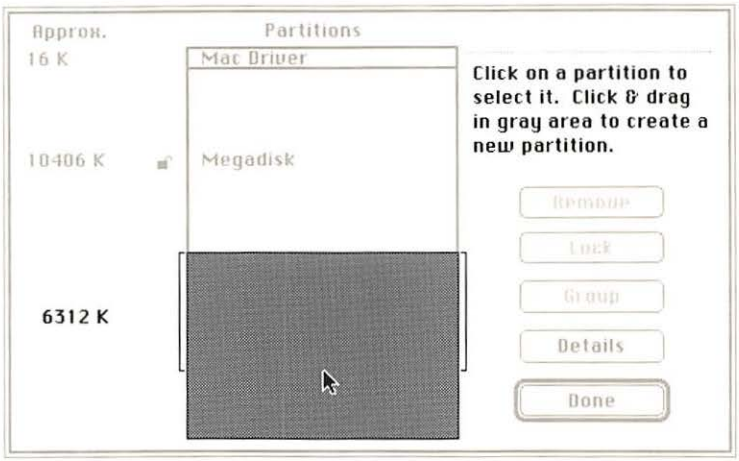
4. **Press a gray rectangle representing free space, and drag to adjust the size of the new partition.**

Two brackets appear, representing the new partition, as shown in Figure A-4. If you place the pointer in the upper half of the free space rectangle, the brackets start at the top of the rectangle; if you place the pointer in the lower half of the rectangle, the brackets start at the bottom.

If you move the pointer too far to the left or right of the rectangle, the brackets disappear.

The size, in kilobytes, is shown on the left as you drag.

■ **Figure A-4** Creating a custom partition



5. Release the mouse button when you are satisfied with the size of the new partition.

You don't need to be exact. You still have a chance to change the size.

Apple HD SC Setup immediately presents the Partition Type dialog box, similar to that shown in Figure A-5.

6. Select the partition type by clicking in the list on the left.

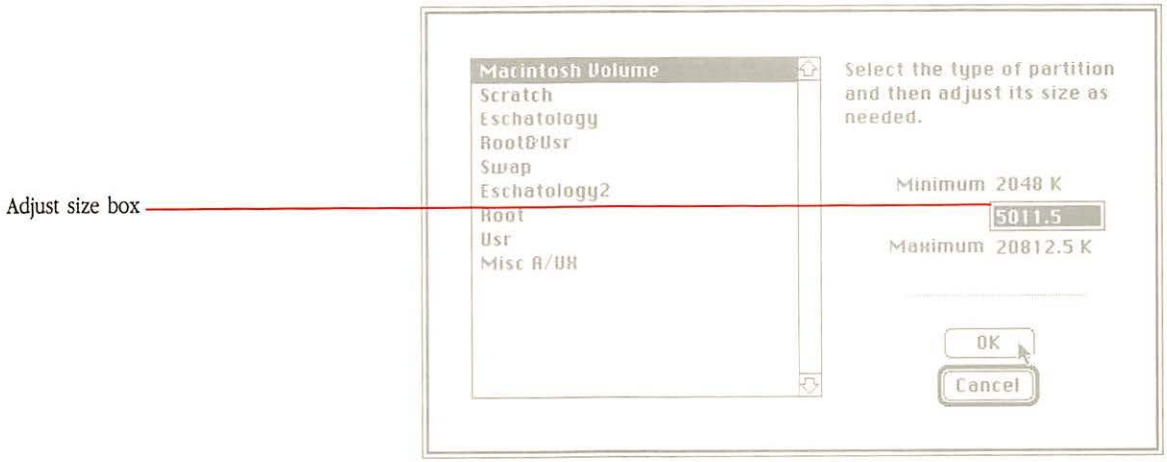
You have several choices. The first two choices are not listed if they are already on your hard disk—for example, if you've already initialized the disk.

- Driver. If your hard disk already contains a driver partition, this partition type is not listed.
- Macintosh Volume. This represents the Macintosh hierarchical file system. If there is already a Macintosh partition on your hard disk, this type isn't listed.

- Scratch. Scratch is disk space that you don't normally use while working in your Macintosh operating system, but some programs may request it for use as temporary storage.
- The Eschatology, Root&Usr, Swap, Eschatology2, Root, Usr, and Misc A/UX partition types are used for A/UX. Note that, by default, Swap uses slice 1 in its A/UX device name, Usr uses slice 2, while Root&Usr and Root both use slice 0. (If you want to use any of the other partitions, you must use the A/UX `pname(1M)` utility to associate these partitions with A/UX device nodes.)

  You can create multiple partitions on a Hard Disk SC used by A/UX. For example, you may want to partition one half of the hard disk as a Root partition (slice 0) and the other half as a Usr partition (slice 2). However, because both Root&Usr and Root are associated with slice 0, do not create both of these partitions on the same hard disk.

■ **Figure A-5** The Partition Type dialog box



❖ *By the way:* You can check with your authorized Apple dealer to make sure that you have the most current version of the Apple HD SC Setup program so that you can select from all of the available partition types.

7. **If you want to change the size of the partition, type the correct size in kilobytes.**

   You can enter the partition size to the precision of a half-kilobyte (0.5 K). You cannot use other fractions.

   The maximum possible size is shown below the Adjust Size box. If you've selected a partition type, the minimum possible size is shown above.

8. **Click OK.**

   Apple HD SC Setup creates the new partition and again presents the Custom Partition dialog box, where the new partition is shown.

   You can create additional custom partitions as long as you have sufficient free space.

9. **Click Done in the Custom Partition dialog box to return to the main Apple HD SC Setup dialog box.**

10. **Click Quit to return to the desktop.**

    If your hard disk has a Macintosh volume, it is represented on the desktop by a hard disk icon. When you open the icon representing the hard disk, the volume size is displayed just below the title bar, if you are using the By Icon or By Small Icon view.

❖ *For A/UX users:* If you used Apple HD SC Setup to create custom A/UX partitions that you want to mount, you must make a file system on each partition. Refer to `mkfs`(1M), `mount`(1M), and `mklost+found`(1M) in the *A/UX System Administrator's Reference* for more information. Note that the `dp`(1M) utility, also described in the *A/UX System Administrator's Reference*, has a P command that will assist you in determining the number of physical blocks in each partition, which is a necessary argument for the `mkfs` command.

To remove a partition

Working in the Custom Partition dialog box, you can remove any partition from your hard disk to make space for new custom partitions.

▲ Warning Don't remove the driver partition unless you have a special reason. If you remove it, you won't be able to use your hard disk after restarting your Macintosh. Removing any partition erases all the information in that partition. ▲

1. **Follow steps 1-3 in "To Add a Partition," earlier in this section.**

   When you see the Custom Partition dialog box, go on to the next step here.

2. **Select the partition you want to remove by clicking its rectangle.**

3. **Click Remove.**

   An alert box asks you to confirm that you want to erase the information in the partition.

4. **Click OK.**

   When a partition is removed, the space it occupied becomes gray to represent free space. If another area of free space is adjacent, the two gray areas are combined.

To group partitions

Grouping partitions combines the free space on your disk. It's like sliding books together so you can place a stereo on your bookshelf. The procedure is simple. However, because grouping usually involves moving a large amount of information, it's a good idea to back up your hard disk before you group partitions.

1. **Follow steps 1-3 in "To Add a Partition," earlier in this section.**

   When you see the Custom Partition dialog box, go on to the next step here.

2. **Click Group.**

   An alert box warns that it will take time to move information from one portion of your disk to another. Because grouping usually involves moving a large amount of information, you're warned that some might be lost.

   Click Cancel if you decide not to group the partitions.

3. **Click OK.**

   All partitions are grouped together on the disk and are shown grouped together at the top of the Partitions display.

To move a partition

You can use the mouse to move a partition into adjacent free space or into any free space larger than the partition. Because moving a partition involves moving its contents, it's a good idea to back up your hard disk before you begin.

1. **Follow steps 1-3 in "To Add a Partition," earlier in this section.**

   When you see the Custom Partition dialog box, go on to the next step here.

2. **Drag the partition to its new position.**

   You must drag the partition more than half way into the gray rectangle.

   When you release the mouse button, an alert box warns that it will take time to move information from one portion of your disk to another. You're also warned that some information might be lost in the process.

   Click Cancel if you decide not to move the partition.

3. **Click OK to confirm.**

To lock or unlock the Macintosh volume partition

Locking your Macintosh volume partition is just like locking a floppy disk. You cannot alter or erase the information it contains, but you can still read the information.

1. **Follow steps 1-3 in "To Add a Partition," earlier in this section.**

   When you see the Custom Partition dialog box, go on to the next step here.

2. **Click the Macintosh volume partition to select it.**

3. **Click Lock or Unlock.**

   The button displays which action you can take.

   If you click Lock, in some cases an alert box warns that the partition will not be locked until you restart your Macintosh.

   When the partition is locked, the lock icon to the left of the rectangle is closed, and the Unlock button replaces the Lock button.

To view your partitions

You can display a list of partitions on your hard disk.

1. **Follow steps 1-3 in "To Add a Partition," earlier in this section.**

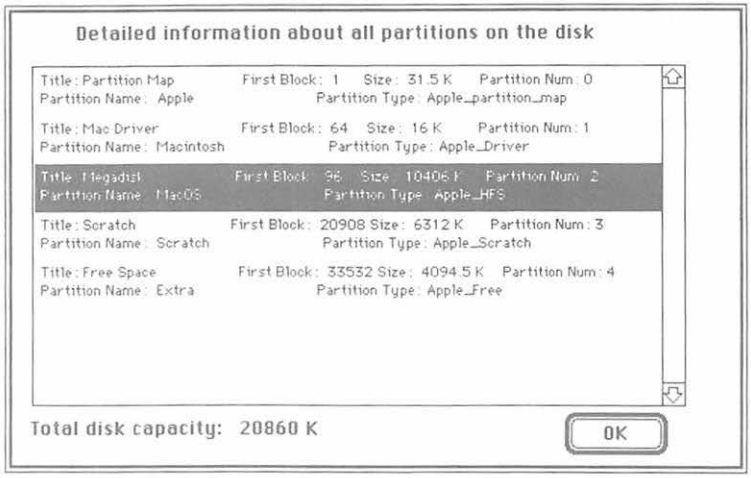
   When you see the Custom Partition dialog box, go on to the next step here.

2. **Click Details.**

   A window appears, similar to that shown in Figure A-6 (at the top of the next page). It shows each partition, its name, type, size in kilobytes, and the block where the partition begins on the disk. At the bottom of the window, the total disk capacity is displayed.

   At the top, the Details window also shows the partition map, which contains information about the partitions on the disk. You cannot directly change the partition map, which takes up a very small portion of the disk.

■ **Figure A-6** The Details window with a highlighted partition



If you select a partition before clicking Details, that partition is highlighted in the Details window. If you select a partition in the Details window by clicking one of its lines, the partition is highlighted when you return to the Custom Partition dialog box.

3. Click OK to return to the Custom Partition dialog box.

You can also double-click a partition in the Details window to return to the Custom Partition dialog box.

A P P E N D I X B

Specifications

Height:	78 mm (3.07 in)	
Width:	246 mm (9.69 in)	
Depth:	266 mm (10.47 in)	
Weight:	3.63 kg (8 lb) for Hard Disk 20SC	
	4 kg (9 lb) for Hard Disk 40SC and Hard Disk 80SC	
	4.27 kg (9 lb 7 oz) for Hard Disk 160SC	
Temperature:	Operating	10° to 40° C (50° to 104° F)
	Storage	–40° to 50° C (–40° to 122° F)
Relative humidity (noncondensing):	20% to 80%	
Altitude:	Operating	0 to 10,000 ft
	Shipping	–1000 to 40,000 ft
Input power:	Line voltage	85 to 270 volts AC, 47 to 64 Hz
	Power	60 watts

Storage:	**20SC**	**40SC**	**80SC**	**160SC**
Formatted data capacity (megabytes)	20	40	80	160
Bytes per block	512	512	512	512
Total disk blocks	39,360	78,246	156,370	327,780
Drive startup time (seconds)	20	20	20	20
Drive spindown time (seconds)	20	20	20	20
Average access time (milliseconds)	68	30	20	18
Transfer rate (megabytes per second)	up to 1.25			
Interface:	Two 50-pin SCSI ports			

A P P E N D I X C

Service and Support

TO HELP YOU GET THE BEST PERFORMANCE FROM YOUR SYSTEM, APPLE Computer, Inc., has established a worldwide network of full-support authorized Apple dealers. If you need answers to technical questions or information about product updates, your authorized Apple dealer can help you. Apple's Technical Support organization backs each dealer and international technical support group via an AppleLink® network, a state-of-the-art on-line electronic information service, to ensure prompt, reliable assistance.

Your dealer has the latest information on new hardware and software products as well as product updates. If you wish to upgrade your system, your dealer can help you select compatible components.

If your product requires service, your local authorized Apple dealer is trained and ready to support you. Apple provides factory-quality parts and the latest available diagnostic equipment to the more than three thousand authorized Apple service centers throughout the world. Apple guarantees parts and warranty labor. (Regulations in each country determine the length of warranty. Some restrictions may apply, depending on the country of original purchase.)

If for some reason you cannot return to the authorized dealer from whom you purchased your system, go to the nearest service location. For the location nearest you, in the United States or Canada, call or write to one of the following:

Apple Computer, Inc.
Attn: Customer Relations
20525 Mariani Avenue
Cupertino, CA 95014
USA
(800) 538-9696

Apple Canada, Inc.
7495 Birchmount Road
Markham, Ontario, L3R 5G2
Canada
(800) 268-7796 or
(800) 268-7637

For locations in other countries, either call the Apple headquarters in your country or write to the United States address given above.

Apple*Care*

Your Hard Disk SC comes with a 90-day warranty. You can add to this protection with the Apple*Care*® Service Agreement (available in the United States, Canada, and Australia only), which extends full warranty coverage up to three years. Your Apple*Care* contract will be honored at any participating authorized Apple dealer within the country of purchase—an added benefit if you relocate. Local service means time saved in getting your Apple system back to work.

You can purchase Apple*Care* at any time, but it's a good idea to purchase it with your system, or at least before your warranty has expired, to avoid an inspection at your own expense.

User groups

Ask your authorized Apple dealer for the name of the user group nearest you, or call (800) 538-9696. For information about starting your own user group, contact one of the following.

- The Boston Computer Society
  One Center Plaza
  Boston, MA 02108
  USA
  (617) 367-8080
- Berkeley Macintosh User's Group
  1442-A Walnut Street #62
  Berkeley, CA 94709
  USA
  (415) 549-BMUG (415-549-2684)

For more information

APDA™ provides a wide range of development products and documentation, from Apple and other suppliers, for programmers and developers who work on Apple equipment. For information about APDA, contact

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(800) 282-APDA (800-282-2732)
Fax: 408-562-3971
Telex: 171-576
AppleLink: APDA

If you plan to develop Apple-compatible hardware or software products for sale through retail channels, you can get valuable support from Apple Developer Programs. Write to

Apple Developer Programs
Apple Computer, Inc.
20525 Mariani Avenue, Mailstop 51-W
Cupertino, CA 95014-6299

Glossary

Apple menu: The menu farthest left in the Macintosh menu bar, indicated by an Apple symbol, from which you choose **desk accessories.**

application or **application program:** A program written for some specific purpose, such as word processing, data base management, graphics, or telecommunication.

background: A program operates "in the background" if it continues to function, automatically, while you use another program.

back up: (v) To make a spare copy of a disk or of a file.

backup: (n) A copy of a disk or file.

boot disk: See **startup disk.**

buttons: On the Macintosh, the pushbutton-like images in dialog boxes where you click to designate, confirm, or cancel an action.

card: See **peripheral card.**

choose: On the Macintosh, to pick a command by dragging through a menu. You often choose a command after you've **selected** something for the program to act on.

Chooser: A Macintosh **desk accessory** that lets you print from any attached printer for which you have a printing resource on the startup disk. You also use the Chooser to designate the port to which a printer is attached.

connector: A plug, socket, jack, or port. See **port.**

current startup disk: The disk that contains the system files the computer is currently using. The startup disk icon is usually in the upper-right corner of the desktop.

desk accessories: "Mini-applications" that are available from the Macintosh **Apple menu** regardless of which application you're using.

directory: A pictorial, alphabetical, or chronological list of the contents of a folder or a disk. In a Macintosh, a directory is a file that contains a list of all the names and locations of other files stored on a disk. These other files may themselves be directories (called *subdirectories*). In Apple II terminology, a directory is sometimes called a *catalog*.

directory dialog box: A type of dialog box you use to work in the hierarchical file system from within an application, such as HD Backup.

disk: An information storage medium consisting of a flat, circular, magnetic surface on which information can be recorded in the form of small magnetized spots, in a manner similar to the way sounds are recorded on tape. See also **5.25-inch disk, hard disk, 3.5-inch disk.**

drag: On the Macintosh, to position the pointer on something, press and hold the mouse button, move the mouse, and release the mouse button. When you release the mouse button, you either confirm a selection or move an object to a new location.

driver: A program that lets the hard disk and the computer send and receive files. On your Hard Disk SC, the driver is in its own partition.

file: A collection of information stored on a disk.

filename: The name that identifies a file. The maximum character length of a Macintosh filename is 31 characters for a document or folder. A name can't contain a colon (:), and it should not begin with a period (.).

5.25-inch disk: A flexible plastic **disk** measuring 5.25 inches in diameter and having a thin, flexible paper or plastic jacket. Usually called a *floppy disk*. See also **hard disk, 3.5-inch disk.**

folder: On the Macintosh, a holder of documents and applications on the desktop. Folders allow you to organize information in any way you want.

font: In typography, a complete set of type in one size and style of character. In computer usage, a collection of letters, numbers, punctuation marks, and other typographical symbols with a consistent appearance.

format: See **initialize.**

free space: The portion of a disk that is not contained in a **partition.**

global backup: The process of backing up all the files on a hard disk. Compare **incremental backup.**

hard disk: A disk made of metal and sealed into a drive or cartridge. A hard disk, compared to a floppy disk, can store very large amounts of information and exchange information with the computer at a much faster rate.

hierarchical file system: A form of computer memory organization in which **files,** including **folders**, are nested within folders, or in which files and subdirectories are included in **directories.**

icon: An image that graphically represents an object, a concept, or a message. For example, in the Finder, a readable floppy disk in a disk drive is represented by a floppy disk icon on the desktop.

incremental backup: The process of backing up all files on a hard disk that have been created, modified, or copied onto the disk since the last **global backup.**

initialize: To prepare a blank disk to receive information by organizing its surface into tracks and sectors (also called *formatting*) and installing a file system.

interface: The devices, rules, or conventions by which one component of a system communicates with another.

Macintosh volume: The portion of your hard disk that uses the Macintosh hierarchical file system for storing information. The Macintosh volume is a partition on the hard disk. See **partition.**

magnetic interference: Interference with the behavior of magnetic storage devices such as disk drives.

megabyte: Abbreviated to **MB.** A unit of measurement equal to 1024 kilobytes (or 1,048,576 bytes), roughly 500 pages of information.

operating system: Software that controls a computer by performing such basic tasks as managing memory and managing communications between the computer and peripheral devices.

partition: (n) A portion of a storage device, such as the Hard Disk SC, that the computer treats as a separate device. For example, if you select the 50% Macintosh partition scheme provided by Apple HD SC Setup, your Macintosh volume, shown as a hard disk icon in the Finder, will take up about half the space on your hard disk. See also **Macintosh volume.** (v) To create partitions.

peripheral card: A removable printed-circuit board that plugs into one of the expansion slots of an Apple II computer. Peripheral cards allow the computer to use peripheral devices or to perform some subsidiary or peripheral function. Often shortened to *card.* An example is the Apple II SCSI card.

peripheral device: A piece of hardware—such as a video monitor, disk drive, printer, or modem—used in conjunction with a computer and under the computer's control. Peripheral devices are often (but not necessarily) physically separate from the computer and connected to it by wires, cables, or some other form of interface. They often require **peripheral cards.**

port: The metal sockets on the back of your computer into which you plug connector cables such as the SCSI peripheral cable.

scanning order: The order in which the operating system scans the disk drives looking for a startup disk.

SCSI: See **Small Computer System Interface.**

SCSI cable extender: The cable that you connect between a SCSI system cable or peripheral cable and a SCSI device in order to increase the distance between the computer and a SCSI device or between two SCSI devices. A cable extender has a 50-pin connector at each end, one that works as a plug and the other as a socket.

SCSI cable terminator: A plug that prevents the reflections of signals traveling along a SCSI cable, keeping the electronic path clear for new signals. If you have only one SCSI device, use one cable terminator. If you have a SCSI chain, you need one cable terminator at the beginning and one at the end of the chain. Do not use more than two cable terminators in a SCSI chain.

SCSI chain: A group of SCSI devices linked to each other through SCSI peripheral and extender cables and linked to the SCSI port on a Macintosh computer or to a SCSI card in an Apple II computer. An internal hard disk in a Macintosh computer is always the first device in a SCSI chain. A SCSI chain must use two SCSI cable terminators.

SCSI device: A device, such as the Hard Disk SC and AppleCD SC, that uses the Small Computer System Interface.

SCSI ID indicator: The small square hole on the back of an Apple SCSI device through which you can view the SCSI ID number as you change it with the SCSI ID switch.

SCSI ID number: A number assigned to each SCSI device (from 0 to 6) connected to a computer and also assigned to the computer (always number 7). It tells the computer which device to give priority to when sending and receiving information. Some devices, such as internal hard disks, have preset SCSI ID numbers that you usually don't change. Other devices, such as external hard disks, have a SCSI ID switch that you can use to change the ID number. The higher the number means the greater the priority.

SCSI ID switch: The small internal lever you push with a pin to change the **SCSI ID number** of a device. For the Hard Disk SC, the switch is on the back panel.

SCSI peripheral cable: The cable that links SCSI devices to each other. A peripheral cable has a 50-pin connector at each end.

SCSI port: The port on the back panel of the Macintosh to which you connect SCSI devices.

SCSI system cable: The cable that links the first SCSI device with the computer. The system cable has a 50-pin connector at one end and a 25-pin connector at the other end, which attaches to the computer.

sector: Part of a **track** on a disk. When a disk is initialized, its surface is divided into tracks and sectors.

select: On the Macintosh, to designate where the next action is to take place. To select, you click an icon or drag across information.

shielded cable: A cable with a metallic wrap around the wires to reduce the potential effects of radio-frequency interference.

Small Computer System Interface: Abbreviated **SCSI** (pronounced "SKUH-zee"). A specification of mechanical, electrical, and functional standards for connecting intelligent peripheral devices—such as hard disks, tape drives, and optical disks—to small computers.

standard partition: One of the predefined partitions, such as 50% Macintosh and A/UX Setup, that you can use Apple HD SC Setup to create. See also **partition.**

startup application: The application on a startup disk that automatically opens when you start up your computer. Usually the Finder is the startup application, but you can use the Set Startup command in the Special menu of the Finder to select a different application as the startup application.

startup disk: A disk with all the necessary program files—such as the Finder and System file contained in the System Folder for the Macintosh—to set the computer into operation. In Apple II terminology, sometimes called a *boot disk.*

System file: A file Macintosh computers use to start up and to provide systemwide information.

System Folder: A Macintosh folder that contains files for desk accessories, fonts, and other basic information that is of general use to the Finder and other applications.

tape backup device: A device that lets you back up the entire contents of the hard disk to a high-density tape medium.

3.5-inch disk: A flexible, plastic **disk** measuring 3.5 inches in diameter and having a hard-shell plastic jacket. Double-sided 3.5-inch disks can store almost six times more data than single-sided 5.25-inch disks. See also **5.25-inch disk, hard disk.**

tracks: A series of concentric circles that are magnetically drawn on the recording surface of a disk when it is initialized.

volume: A general term referring to a storage device or to part of a storage medium formatted to contain files; a source of or destination for information. A volume can be an entire disk or only part of a disk. See also **Macintosh volume.**

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Tell Apple About Your .....

- Please contact your authorized Apple dealer when you have questions about your Apple products. Dealers are trained by Apple Computer and are given the resources to handle service and support for all Apple products. If you need the name of an authorized Apple dealer in your area, call toll-free: 800-538-9696.

- Would you like to tell Apple what you think about this product? After you have had an opportunity to use this product, we would like to hear from you. You can help us to improve our products by responding to the questionnaire below and marking the appropriate boxes on the card at the right with a **#2 lead pencil.** If you have more than one response to a question, mark all the boxes that apply. Please detach the card and mail it to Apple. Include additional pages of comments if you wish.

1. What capacity is your Hard Disk SC? (**1**=20 MB, **2**=40MB, **3**=80MB, **4**=160 MB)
2. How would you rate the Hard Disk SC overall? (**1**=poor...**6**=excellent)
3. Where did you purchase your Hard Disk SC? (**1**=dealer, **2**=corporate purchase, **3**=educational purchase, **4**=other)
4. Where are you using your Hard Disk SC? (**1**=business, **2**=school, **3**=home, **4**=other)
5. Which computers are you using with the Hard Disk SC? (**1**=Macintosh Plus, **2**=Macintosh II family, **3**=Macintosh SE family, **4**=Apple IIe, **5**=Apple IIGS, **6**=other)
6. Does your computer have an internal hard disk? (**1**=no, **2**=yes)
7. Which factors contributed to your buying the Hard Disk SC? (**1**=increased speed, **2**=hardware compatibility, **3**=an Apple product)
8. How many SCSI peripheral devices are connected to your computer? (**1**=1, **2**=2, **3**=3, **4**=more than 3)
9. Did you consult the manual before connecting your Hard Disk SC? (**1**=no, **2**=yes)
10. How would you rate the Hard Disk SC manual overall? (**1**=poor...**6**=excellent)
11. How easy was the Hard Disk SC manual to read and understand? (**1**=difficult...**6**=very easy)
12. Did the guide contain the information you needed? (**1**=no, **2**=yes)
13. Were the illustrations useful? (**1**=no, **2**=yes)
14. Which topics, if any, were confusing to you?
15. If you experienced any problems with the manual, please describe them. (Page numbers would be useful.)
16. What suggestions do you have for improving the Hard Disk SC?

Thanks for your time and effort.

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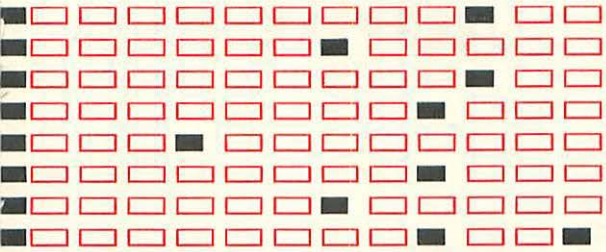
.....Hard Disk SC



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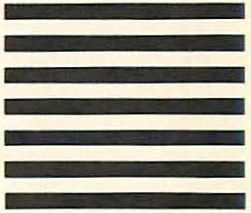

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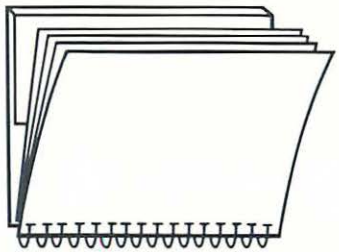

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