Apple® II High-Speed SCSI Card Owner's Guide
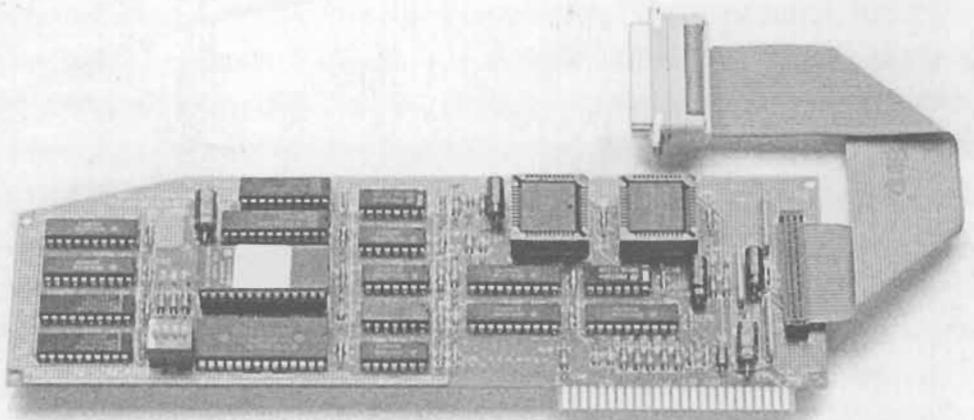
For the Apple IIe and IIGS®

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 Your Apple II High-Speed SCSI Card

The Apple® II High-Speed SCSI Card lets you connect SCSI devices to your Apple IIe or Apple IIGS® computer. **SCSI** (pronounced "SKUH-zee,"an acronym for *Small Computer System Interface*) is a standard used by many manufacturers who develop hardware and software products for use with personal computers such as the Apple IIe and Apple IIGS. SCSI provides a fast and reliable way for computers and peripheral devices to exchange information. The Apple II High-Speed SCSI Card also features **DMA,** or Direct Memory Access, which greatly speeds up information exchange through the SCSI card.

Some popular SCSI devices you can use with your Apple II computer are hard disk drives, CD-ROM drives, tape backup units, printers, and scanners:

- **Hard disk drives** offer much greater storage capacity and speed than floppy disks.

- **CD-ROM drives** let you access the data on CD-ROM discs—which store up to 550 megabytes of information using laser technology—as well as letting you play audio discs.

- **Tape backup units** provide fast and accurate backup copies of the contents of an entire hard disk.

- **Printers** let you print high-quality text and images.

- **Scanners** let you scan images and save them as files or incorporate them into text documents.

About this guide

This guide introduces you to the Apple II High-Speed SCSI Card; it provides all the instructions you'll need to install it in your Apple IIe or Apple IIGS computer and to connect SCSI devices to your computer through the card. In addition, the guide explains how to use the utility programs that come on the *Apple II High-Speed SCSI Card Utilities* disk; you use these programs to format, test, partition, and back up hard disks.

Here is a brief summary of what you'll find in this guide:

- Chapter 1, "Installing Your Apple II High-Speed SCSI Card in an Apple IIe," gives you instructions for installing the card in your Apple IIe computer. It also explains how to connect a SCSI device to your computer.

- Chapter 2, "Installing Your Apple II High-Speed SCSI Card in an Apple IIGS," gives you instructions for installing the card in your Apple IIGS computer. It also explains how to connect a SCSI device to your computer.

- Chapter 3, "Using the SCSI Utility Programs" teaches you how to use the programs that come on the *Apple II High-Speed SCSI Card Utilities* disk. These utilities let you test and partition a hard disk, and back up material stored on the hard disk.

- Chapter 4, "Working With the Apple II High-Speed SCSI Card," gives instructions on changing the card's switch settings and provides special instructions for using a LaserWriter IISC printer or an Apple Scanner with the Apple II High-Speed SCSI Card. Chapter 4 also contains a troubleshooting section.

- The Appendix, "Assembling a SCSI Chain," gives you special instructions you'll need if you're connecting more than one SCSI device to your computer.

At the end of this guide, you'll find a glossary to help you with any terms you may not know.

About the disks

Your Apple II High-Speed SCSI Card comes packaged with two disks—a 5.25-inch and a 3.5-inch version of the *Apple II High-Speed SCSI Card Utilities* disk. You use the utilities on either disk (depending on the type of disk drive you have) to format, test, and partition SCSI hard disks, and to back up hard disks.

Here is a brief summary of what's on the disks:

- Backup II—lets you copy the contents of a hard disk onto a set of floppy disks for safekeeping.

- SCSI Verify—lets you test a hard disk or CD-ROM drive to see if it's reading information correctly.

- HD SC Partition—lets you divide the space on a hard disk into smaller units. Each unit can then be formatted for use by a different operating system.

The 3.5-inch version of the *Apple II High-Speed SCSI Card Utilities* disk also contains some files from the GS/OS® operating system; you will need to install them if you are using an Apple IIGS computer with GS/OS. (These files are covered in more detail in Chapter 3.)

△ **Important:** You may find similar utilities on other disks that came with your computer or with an Apple Hard Disk SC. The utilities are provided with the Apple II High-Speed SCSI Card in the event that you are using a non-Apple device (one that doesn't come with its own utilities) and because the utilities have been upgraded and improved. *Do not use these utilities with older versions of Apple II SCSI cards.* The utilities are designed to run specifically on the Apple II High-Speed SCSI Card. △

An important change

If you're familiar with the original Apple II SCSI Card, you should familiarize yourself with an important change represented in the newer card. The Apple II High-Speed SCSI Card contains its own SCSI termination. This means that if you are connecting more than one SCSI device to your computer, you need to use a different number of terminators than before, or you may need to position the terminators differently. *Be sure to review the appendix carefully before connecting more than one SCSI device to the Apple II High-Speed SCSI Card.*

Conventions used in this guide

The following paragraphs illustrate several typographical conventions that are used in this book to help make learning easier.

When a new term is defined, the term appears in **boldface type.** You can find definitions for these terms in the glossary.

△ **Important:** Material set off in this manner is essential information that you need to read before continuing. △

❖ *By the way:* Paragraphs like this one contain interesting sidelights that you may be curious about, but do not need to know. ❖

▲ **Warning:** Warnings like this one alert you to situations in which you might damage your equipment, lose data, or hurt yourself if you don't follow the instructions carefully. ▲

Apple user groups

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

The Boston Computer Society
One Center Plaza
Boston, MA 02108
USA
(617) 367-8080

Installing Your Apple II High-Speed SCSI Card in an Apple IIe

This chapter gives you instructions for installing your Apple® II High-Speed SCSI Card in your Apple IIe computer, and for connecting a SCSI device to the card. The procedures are simple and take only a few minutes. All the instructions you need to install the card and connect the device are presented here. The only tool you'll need is the small metal wrench supplied with the card.

What you need

To install your SCSI card and connect a SCSI device to your computer, you should have

- an Apple IIe Enhanced (or an Apple IIe that has been upgraded with a 65C02 microprocessor and 128K of RAM)

- an Apple II High-Speed SCSI Card

- a SCSI system cable

- a SCSI cable terminator

- a cable extender (if you want the SCSI device to be more than 18 inches from your computer)

- a SCSI device (such as a hard disk drive, CD-ROM drive, or LaserWriter® IISC printer)

SCSI device
SCSI cable extender
Apple IIe Enhanced computer
SCSI system cable
Apple II High-Speed SCSI Card
SCSI cable terminator
Wrench and nuts
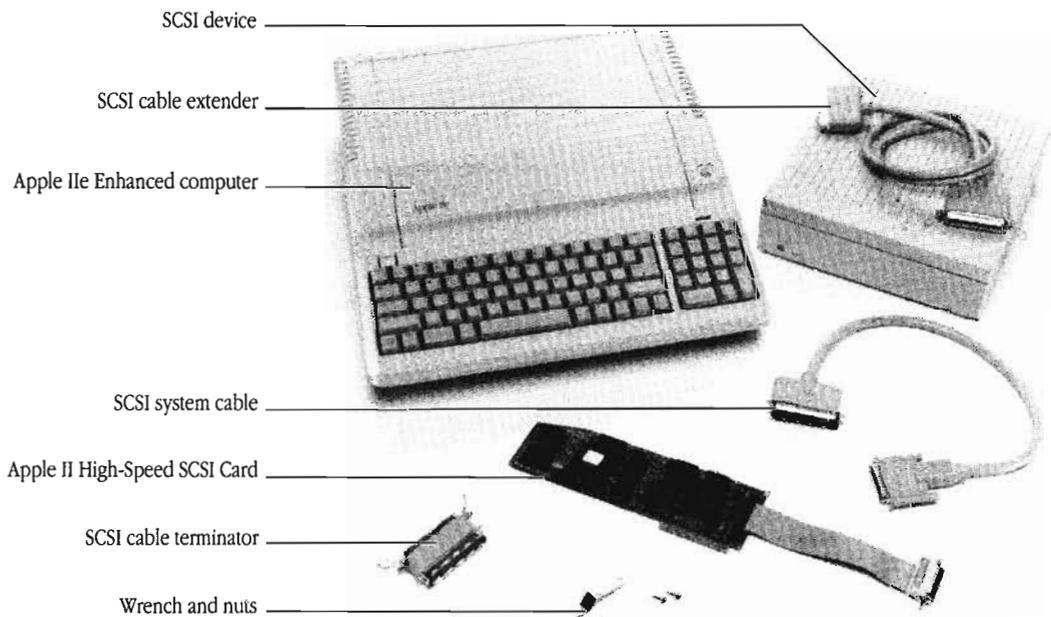
Figure 1-1 What you'll need

Chapter 1: Installing your Apple II High-Speed SCSI Card in an Apple IIe

If you're uncertain whether your Apple IIe is an enhanced version—or whether it has been upgraded appropriately—you'll need to check the number on the microprocessor inside the computer. Continue on in this chapter, performing the tasks as they are explained in the next few sections. At the appropriate time, you will be given instructions for checking the number.

Unpacking the card

When you take the Apple II High-Speed SCSI Card out of its protective bag, hold it by the edges, and be sure not to touch the gold "fingers" that extend from the card. Oil or moisture from your hands can attract dust that will weaken the card's connection to the computer.

Don't touch gold "fingers"
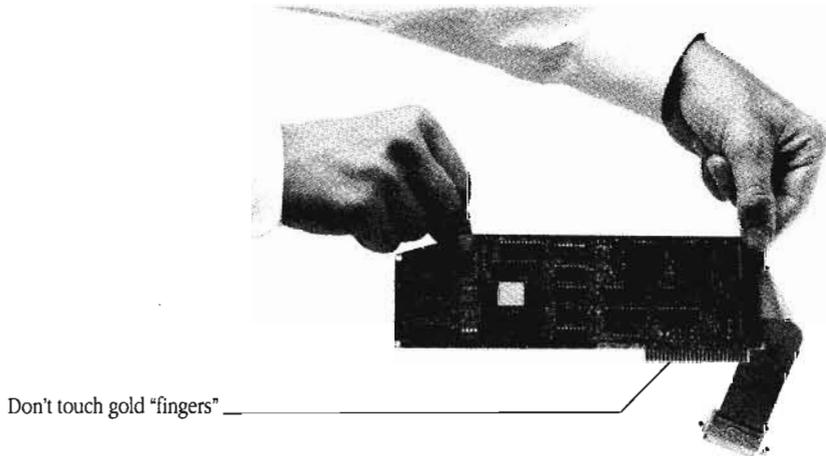
Figure 1-2 Handling the card carefully

Installing the card

Follow these steps to install your Apple II High-Speed SCSI Card:

1. **Make sure the computer's power is turned off and that the power cord is plugged into a grounded outlet.**

▲ **Warning:** Turn the computer's power off, but leave the computer's power cord plugged into a grounded outlet. Even with the power turned off, the power cord acts as a ground for the computer system, protecting against static electricity. ▲

2. **Remove the computer's lid.**

   With both hands, grasp the tabs that project from the back of the computer cover. Pull up firmly until the corner fasteners pop. Slide the cover back, away from the keyboard, until you can lift it up and off.

3. Touch the power supply case.

The power supply case is the large, metal box inside the computer (on the left as you face the front of the computer). Touching it discharges any static electricity that may be on your clothes or body.
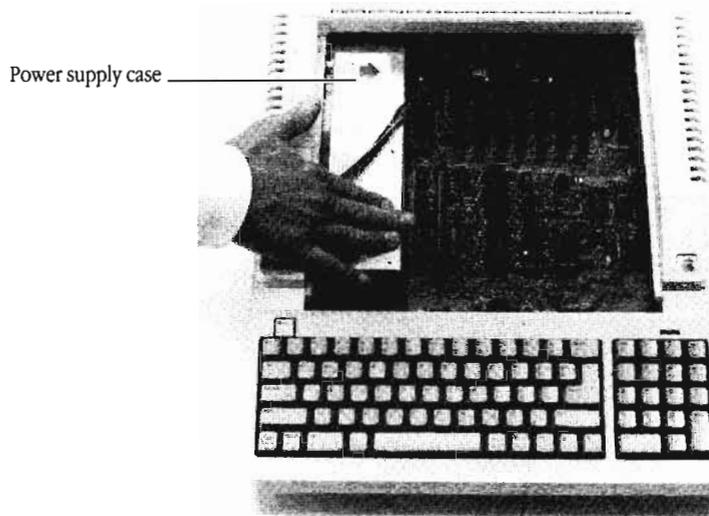
Power supply case —

Figure 1-3 Touching the power supply case

4. If necessary, check the number on the computer's microprocessor.
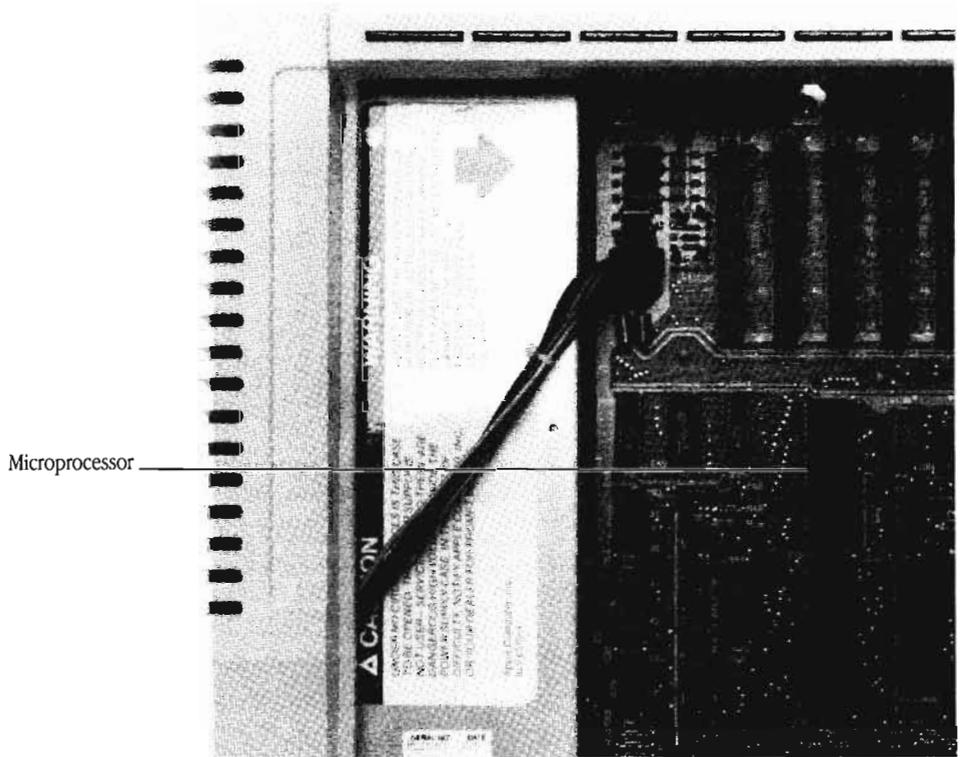
Microprocessor

Figure 1-4   Locating the computer's microprocessor

If the number on the microprocessor contains the sequence of numbers "6502," with no intervening letters or numbers, your Apple IIe is *not* enhanced or upgraded, and is not equipped to use the Apple II High-Speed SCSI Card. Contact the authorized Apple dealer from whom you purchased the card.

5. Choose a slot for the SCSI card.

The slot numbers are printed on the main circuit board.

△ **Important:** Don't put your SCSI card in slot 3. Doing so will interfere with the computer's video display. △

If you intend to use a SCSI device (such as a hard disk) as your startup drive, put your SCSI card in a slot with a higher number than the slots your other disk drives are connected to. The computer looks for a startup program first on the drive connected to the highest-numbered slot.

If you do *not* intend to use a SCSI device as your startup drive, put the SCSI card in a slot with a lower number than the slot your startup drive is connected to.

6. Remove the plastic cover from one of the large openings in the back panel of the computer.

Choose an opening near the slot you've chosen for the SCSI card.

7. Attach the SCSI ribbon cable to the inside of the computer's back panel. This will create a SCSI port on the back panel of your computer.

Attach the connector on the end of the ribbon cable to the inside of the back panel as shown in Figure 1-5. Tighten the nuts using the small wrench that came with your SCSI card.

By anchoring the connector to the back panel, you reduce stress on the cable and form a bond between the electromagnetic shielding on the computer's case and the shielding on the cable. This bond reduces the possibility that your computer will generate radio-frequency interference.
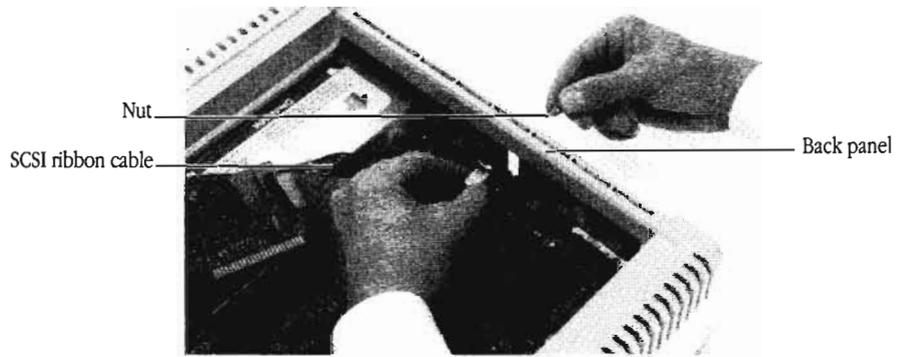
Figure 1-5   Connecting the ribbon cable

8. Insert the card in the slot.

Do not touch the gold "fingers" at the bottom of the card.
Make sure the side of the card with the integrated circuits
faces *away* from the power supply. (See Figure 1-4.)

Rock the card gently forward and back until it's seated in the
slot. Do not wiggle it from side to side.

Figure 1-6   Inserting the card in the slot

Chapter 1: Installing your Apple II High-Speed SCSI Card in an Apple IIe

9. Replace the computer's lid.

Slip the front edge of the lid in first, then lower the back edge into place. Press down on the back corners of the lid.

Now you're ready to connect your SCSI device to the SCSI card.

Connecting a SCSI device

Connecting a SCSI device to the SCSI card is not difficult. However, if you are connecting more than one SCSI device, you need to follow special instructions. And if you are connecting a LaserWriter IISC printer or an Apple Scanner to your computer, you may need to perform an additional step. Here's what to do next:

- If you are connecting only one device, and it is *not* a LaserWriter IISC printer or an Apple Scanner, continue through the end of this chapter.

- If you *are* connecting *only* a LaserWriter IISC printer or an Apple Scanner—or both—to your computer, you'll need to change a switch on the card. Go now to the section "Changing the Card's Switch Settings" in Chapter 4. Then, if you are connecting only one device, return here and continue on in this chapter; if both, go on to the Appendix, "Assembling a SCSI Chain." When you've completed the assembly, go to Chapter 3.

- If you have more than one SCSI device to connect to your computer, skip the rest of this chapter and go now to the Appendix, "Assembling a SCSI Chain." When you've completed the assembly, go to Chapter 3.

△ **Important:** You may find similar utilities on other disks that came with your computer or with an Apple Hard Disk SC. The utilities are provided with the Apple II High-Speed SCSI Card in the event that you are using a non-Apple device (one that doesn't come with its own utilities) and because the utilities have been upgraded and improved. *Do not use these utilities with older versions of Apple II SCSI cards.* The utilities are designed to run specifically on the Apple II High-Speed SCSI Card. △

An important change

If you're familiar with the original Apple II SCSI Card, you should familiarize yourself with an important change represented in the newer card. The Apple II High-Speed SCSI Card contains its own SCSI termination. This means that if you are connecting more than one SCSI device to your computer, you need to use a different number of terminators than before, or you may need to position the terminators differently. *Be sure to review the appendix carefully before connecting more than one SCSI device to the Apple II High-Speed SCSI Card.*

Conventions used in this guide

The following paragraphs illustrate several typographical conventions that are used in this book to help make learning easier.

When a new term is defined, the term appears in **boldface type**. You can find definitions for these terms in the glossary.

△ **Important:** Material set off in this manner is essential information that you need to read before continuing. △

3. Determine whether you need to reset the number.

- If the device is number 7, the number must be changed. Any other number from 0 to 6 is OK.

- If you want to start up from your device, give it number 6.

If you need to set the device ID number, continue through the next section. If you do *not* need to set the device ID number, skip the next section and go on to "Making the Connection" later in this chapter.

Changing the SCSI ID number

Follow the instructions in this section if you need to change the device's SCSI ID number:

△ **Important:** The following instructions are for Apple SCSI devices. If you have a SCSI device from another manufacturer, refer to the documentation that came with it for instructions on setting the SCSI ID number. △

1. Insert the point of a push pin or straightened paper clip into the SCSI ID switch and push gently.

As you push, the number increases. If you accidentally go past the number you want, keep pushing until the number cycles around again.
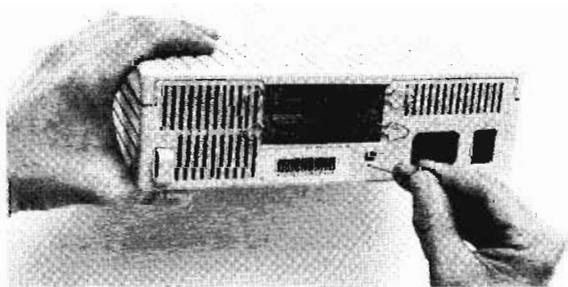
Figure 1-8 Setting the SCSI ID number

Making the connection

Now that you've set the SCSI device ID number—or determined that you do not need to change the setting—you're ready to connect the SCSI device to your Apple IIe. Follow these steps:

1. **Make sure the computer's power is off and that the power cord is plugged into a grounded outlet.**

2. **Make sure your SCSI device is turned off.**

▲ **Warning:** Be certain both your computer and the SCSI device are turned off. If either the computer or the device remains on, you could damage the SCSI card or the device. ▲

3. **Plug one end of the device's power cord into the device and the other end into a grounded outlet.**

   Don't turn the device on yet.

4. **Connect the smaller end of the SCSI system cable to the SCSI port you just installed on the computer and tighten the thumbscrews.**

5. **If you want the SCSI device to be more than 18 inches from your computer, plug the cable extender into the large end of the SCSI system cable.**

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

6. **Connect the large end of the SCSI system cable (or the other end of the cable extender) to one of the SCSI ports on the back of the SCSI device.**

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

7. **Connect the SCSI cable terminator to the other SCSI port on the back of the SCSI device.**

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

SCSI cable terminator

SCSI system cable
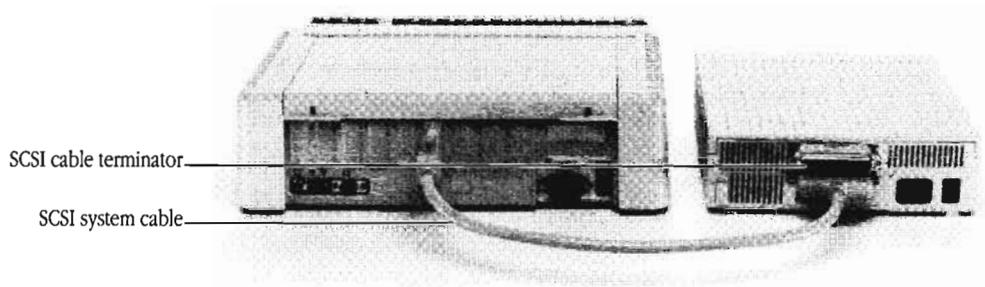
Figure 1-9   The completed connection (without cable extender)

SCSI cable terminator

SCSI system cable

SCSI cable extender
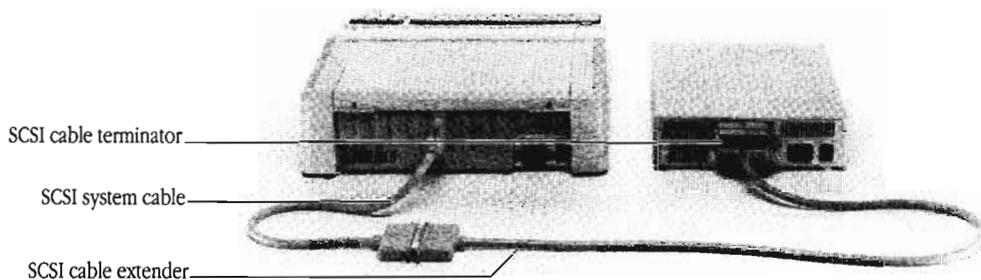
Figure 1-10   The completed connection (with cable extender)

△ **Important:** Some non-Apple SCSI devices include a terminator
inside the device. If you are connecting a non-Apple device,
check the documentation that came with the device for
information on termination. If the device contains its own
terminator, do *not* add the terminator, as directed in step 6. △

Connecting a SCSI device   13

What's next?

Now that you've installed your Apple II High-Speed SCSI Card in your Apple IIe, and you've connected your SCSI device to the SCSI card, what you do next depends on what you were doing before you opened this guide:

- If you were setting up your Apple IIe for the first time—following the setup instructions in the manual that came with your computer—go back to that manual and continue setting up your computer system. Then you'll need to learn some basic computer skills and concepts before learning to use the programs that came with your Apple II High-Speed SCSI Card. After you've gone through the introductory materials that came with your Apple IIe, return to Chapter 3 of this guide.

- If you're already familiar with operating the Apple IIe, continue on to Chapter 3, "Using the SCSI Utility Programs." There, you'll learn how to use the programs that came with your Apple II High-Speed SCSI Card.

Installing Your Apple II High-Speed SCSI Card in an Apple IIGS

This chapter gives you instructions for installing the Apple II High-Speed SCSI Card in your Apple IIGS® computer, and for connecting a SCSI device to the card. The procedures are simple and take only a few minutes. All the instructions you need to install the card and connect the device are presented here. The only tool you'll need to install the card is the small metal wrench supplied with the card.

What you need

To install your SCSI card and connect a SCSI device to your computer, you should have

- an Apple IIGS computer

- an Apple II High-Speed SCSI Card

- a SCSI system cable

- a SCSI cable terminator

- a cable extender (if you want the SCSI device to be more than 18 inches from your computer)

- a SCSI device (such as a hard disk drive, CD-ROM drive, or LaserWriter IISC)

SCSI cable extender

SCSI device

Apple IIGS computer

SCSI system cable

Apple II High-Speed SCSI Card

SCSI terminator

Wrench and nuts
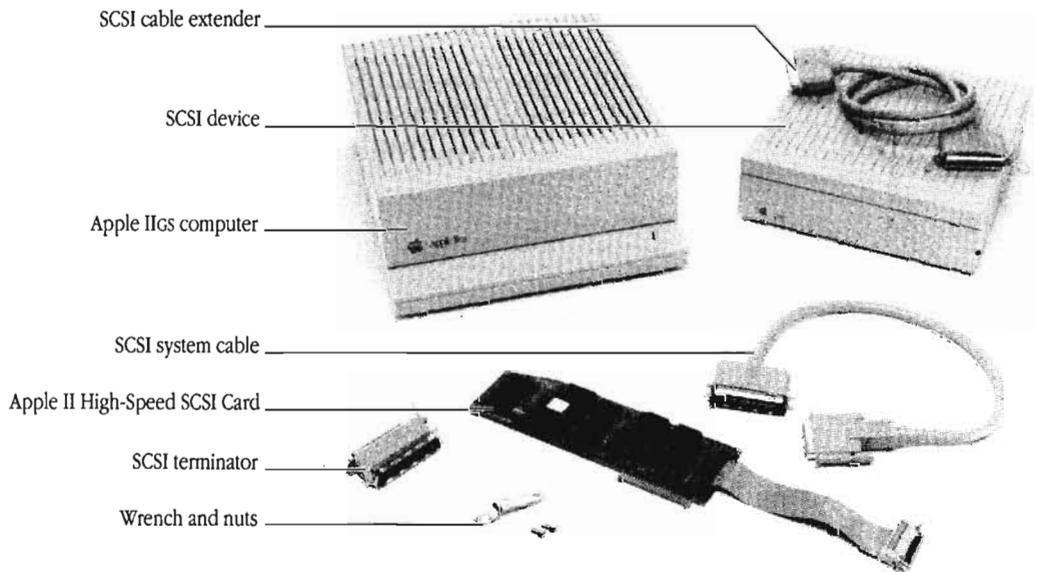
Figure 2-1   What you'll need

Unpacking the card

When you take the Apple II High-Speed SCSI Card out of its protective bag, hold it by the edges. Be sure not to touch the gold "fingers" that extend from the card. Oil or moisture from your hands can attract dust that will weaken the card's connection to the computer.

Don't touch gold "fingers"
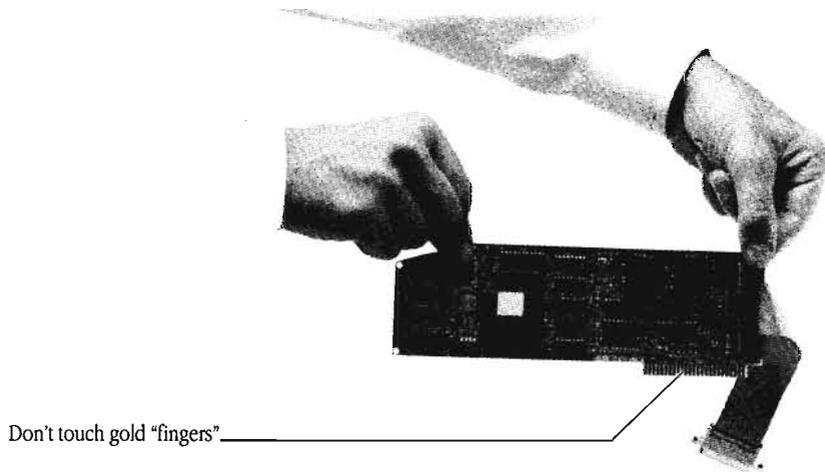
Figure 2-2 Handling the card carefully

Installing the card

Follow these steps to install your Apple II High-Speed SCSI Card:

1. **Make sure the computer's power is turned off and that the power cord is plugged into a grounded outlet.**

▲ **Warning:** Turn the computer's power off, but leave the computer's power cord plugged into a grounded outlet. Even with the power turned off, the power cord acts as a ground for the computer system, protecting against static electricity. ▲

2. Remove the computer's lid.

Wrap your hands around the rear corners of the computer's case and push in the lid latches with your index fingers while you lift the lid with your thumbs and middle fingers. When you feel the lid release, lift it all the way off the case and put it aside.

3. Touch the power supply case.

The power supply case is the large, metal box inside the computer (on the left as you face the front of the computer). Touching it discharges any static electricity that may be on your clothes or body.
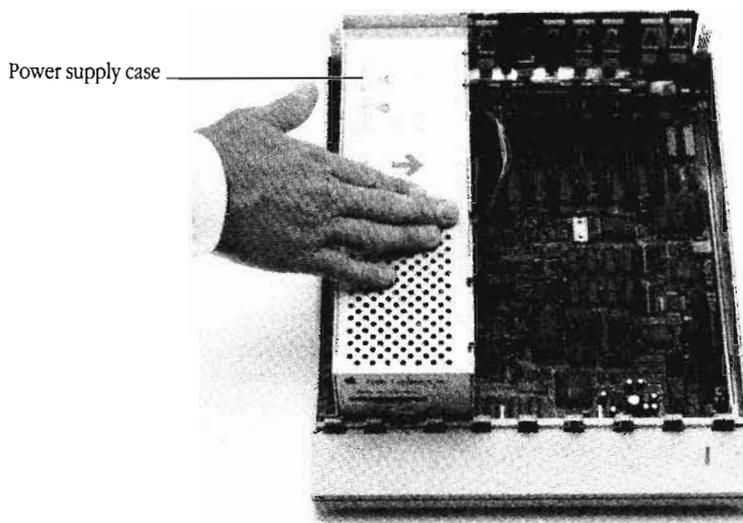
Power supply case ——————

Figure 2-3   Touching the power supply case

Chapter 2: Installing Your Apple II High-Speed SCSI Card in an Apple IIGS

4. **Choose a slot for the SCSI card.**

   If you plan to use AppleTalk® software with your Apple IIGS, put the SCSI card in slot 1 or 2. If not, slot 7 is recommended. (For more detailed information about choosing slots for your peripheral cards, see the manual that came with your computer.)

5. **Remove the plastic cover from one of the large openings in the back panel of the computer.**

   Choose an opening near the slot you've chosen for the SCSI card.

6. **Attach the SCSI ribbon cable to the inside of the computer's back panel. This will create a SCSI port on the back panel of your computer.**

   Attach the connector on the end of the ribbon cable to the inside of the back panel as shown in Figure 2-4. Tighten the nuts using the small wrench that came with your SCSI card.

   By anchoring the connector to the back panel, you reduce stress on the cable and form a bond between the electromagnetic shielding on the computer's case and the shielding on the cable. This bond substantially reduces the possibility that your computer will generate radio-frequency interference.

   Figure 2-4 shows how to connect the ribbon cable.

Back panel ————————————————————————— Nut
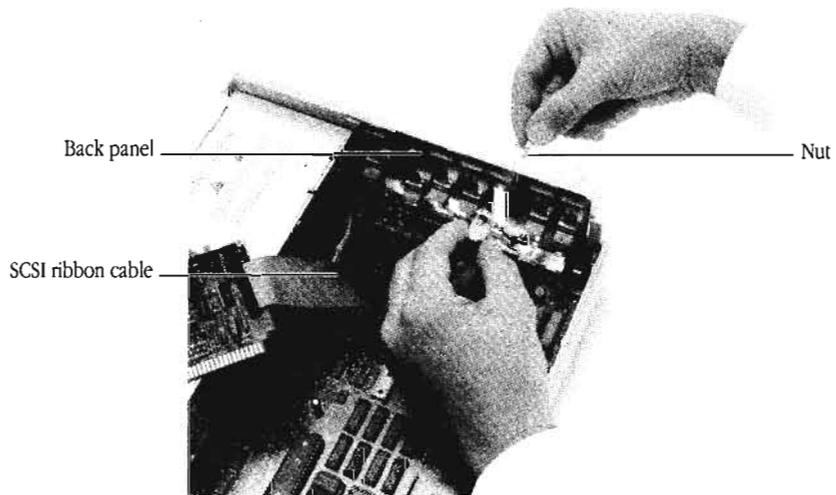
SCSI ribbon cable ——————

Figure 2-4 Connecting the ribbon cable

7. Insert the card in the slot.

Do not touch the gold "fingers" at the bottom of the card. Make sure the side of the card with the integrated circuits faces *away* from the power supply. (See Figure 2-4.)

Rock the card gently forward and back until it's seated in the slot. Do not wiggle it from side to side.
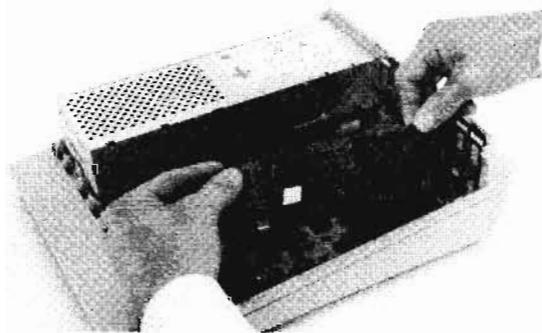
Figure 2-5 Inserting the card in the slot

Chapter 2: Installing Your Apple II High-Speed SCSI Card in an Apple IIGS

8. Replace the computer's lid.

Slip the front edge of the lid on, then lower the back edge into place. Press down on the back corners of the lid until you hear the latches click shut.

Now you're ready to connect your SCSI device to the SCSI card.

Connecting a SCSI device

Connecting a SCSI device to the SCSI card is not difficult. However, if you are connecting more than one SCSI device, you need to follow special instructions. And if you are connecting a LaserWriter IISC printer or an Apple Scanner to your computer, you may need to perform an additional step. Here's what to do next:

- If you are connecting only one device, and it is *not* a LaserWriter IISC printer or an Apple Scanner, continue through the end of this chapter.

- If you *are* connecting *only* a LaserWriter IISC printer or an Apple Scanner to your computer, or both, you'll need to change a switch on the card . Go now to the section "Changing the Card's Switch Settings" in Chapter 4. Then, if you are connecting only one device, return here and continue on in this chapter; if both, go on to the Appendix, "Assembling a SCSI Chain." When you've completed the assembly, go to Chapter 3.

- If you have more than one SCSI device to connect to your computer, skip the rest of this chapter and go now to the Appendix, "Assembling a SCSI Chain." When you've completed the assembly, go to Chapter 3.

Checking the SCSI ID number

Before you connect your SCSI device to your Apple IIGS, take a moment to check the SCSI ID number on the back panel of the device. The computer and each SCSI device connected to a SCSI card must have a unique ID number between 0 and 7. This number gives the computer a way of identifying devices connected to it. It also determines the priority of the devices so that information can be exchanged between the computer and the SCSI devices more efficiently. Because you are connecting only one device, all you need to do is make sure the device's number is different from the computer's number.

Follow these steps to check the SCSI ID number:

1. **Make sure the device is turned off.**

2. **Locate the SCSI device's ID number.**

   On SCSI devices manufactured by Apple Computer, the number appears in a small window on the back panel of the device.

SCSI ID number indicator
SCSI ID number switch
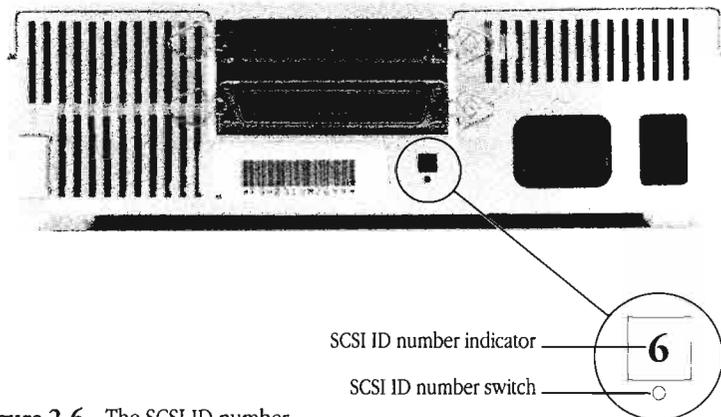
Figure 2-6 The SCSI ID number

3. **Determine whether you need to reset the number.**

   ▪ If the device is number 7, the number must be changed. Any other number from 0 to 6 is OK.

■ If you want to start up from your device, give it number 6 .

If you need to set the ID number, continue through the next section. If you do *not* need to set the ID number, skip the next section and go on to "Making the Connection" later in this chapter.

Changing the SCSI ID number

Follow the instructions in this section if you need to change the device's SCSI ID number:

△ **Important:** The following instructions are for Apple SCSI devices. If you have a SCSI device from another manufacturer, refer to the manual that came with it for instructions on setting the SCSI ID number. △

1. **Insert the point of a push pin or straightened paper clip into the SCSI ID switch and push gently.**

   As you push, the number increases. If you accidentally go past the number you want, keep pushing until the number cycles around again.
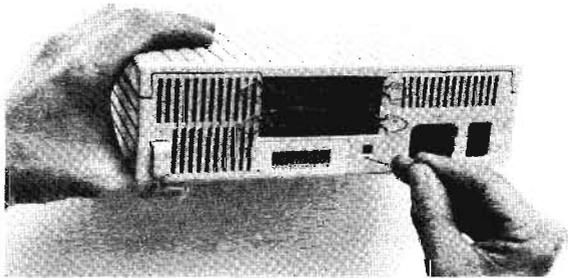
Figure 2-7 Setting the SCSI ID number

Making the connection

Now that you've set the SCSI device ID number—or determined that you do not need to set the ID number—you're ready to connect the SCSI device to your Apple IIGS. Follow these steps:

1. **Make sure that the computer's power is off and that the power cord is plugged into a grounded outlet.**

2. **Make sure your SCSI device is turned off.**

▲ **Warning:** Be certain both your computer and the SCSI device are turned off. If either the computer or the device remains on, you could damage the Apple II High-Speed SCSI Card or the device. ▲

3. **Plug one end of the device's power cord into the device and the other end into a grounded outlet.**

   Don't turn the device on yet.

4. **Connect the smaller end of the SCSI system cable to the SCSI port you just installed on the computer and tighten the thumbscrews.**

5. **If you want the SCSI device to be more than 18 inches from your computer, plug the cable extender into the large end of the SCSI system cable.**

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

6. **Connect the large end of the SCSI system cable (or the other end of the cable extender) to either of the SCSI ports on the back of the SCSI device.**

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

7. **Connect the SCSI cable terminator to the other SCSI port on the back of the SCSI device.**

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

What's next?

Now that you've installed your Apple II High-Speed SCSI Card in your Apple IIGS, and you've connected your SCSI device to the SCSI card, what you do next depends on what you were doing before you opened this guide:

- If you were setting up your Apple IIGS for the first time—following the setup instructions in the documentation that came with your computer—go back to that manual and continue setting up your computer system. Then you'll need to learn some basic computer skills and concepts before going on to the next steps: activating the slot into which you inserted the SCSI card and using the Startup option in the Apple IIGS Control Panel to set your startup slot. You'll also need these essential skills before you can learn to use the hard disk utility programs that came with your Apple IIGS. After you've gone through the introductory materials that came with your Apple IIGS, return to Chapter 3 of this guide.

- If you're already familiar with how to operate the Apple IIGS, and how to use the mouse and the Finder™ application, continue on to Chapter 3, "Using the SCSI Utility Programs." There, you'll find instructions for activating the SCSI card's slot and for using the Startup option to set your startup slot. You'll also learn to use the programs that came with your Apple II High-Speed SCSI Card.

SCSI cable terminator

SCSI system cable
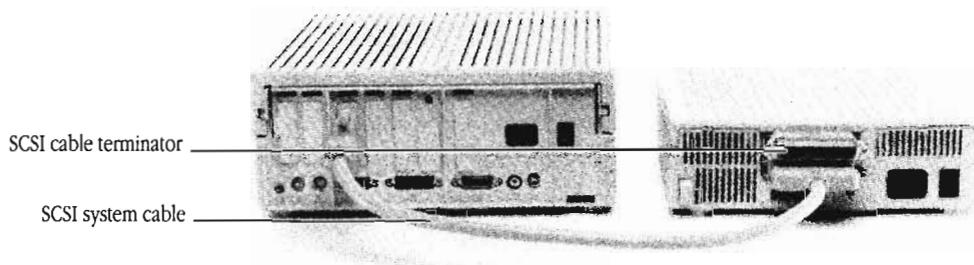
Figure 2-8 The completed connection (without cable extender)

△ **Important:** Some SCSI devices from manufacturers other than Apple include a terminator inside the device. If you are connecting a non-Apple device, check the documentation that came with the device for information on termination. If the device contains its own terminator, do *not* add the terminator, as directed in step 6. △

SCSI cable terminator

SCSI system cable

SCSI cable extender
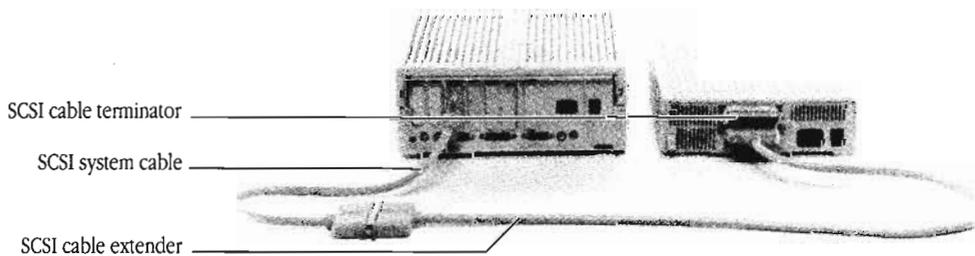
Figure 2-9 The completed connection (with cable extender)

Using the SCSI Utility Programs

This chapter teaches you how to use the utility programs on the *Apple II High-Speed SCSI Card Utilities* disk:

- HD SC Partition

- Backup II

- SCSI Verify

You use the three utilities to prepare, test, and back up SCSI hard disks connected to your Apple IIe or Apple IIGS computer. Similar utilities come with your computer or with Apple hard disks. However, you must use the utilities provided with this card. Other versions may not work properly with the Apple II High-Speed SCSI Card.

△ **Important:** The instructions in this chapter assume that you have already installed the Apple II High-Speed SCSI Card in your computer and connected your SCSI device or devices, and that you are familiar with the basic techniques for operating your computer. These techniques are presented in the manuals that came with your computer. If you have difficulty understanding the instructions in this chapter, read the documentation that came with your computer to learn basic skills. △

Apple IIGS users only

If you have an Apple IIGS, you have just a few more steps to complete before you're ready to use your Apple II High-Speed SCSI Card. You need to

activate the slot you chose for the Apple II High-Speed SCSI Card

install new SCSI drivers, if you use the GS/OS® operating system.

Activating the slot

Before your computer can communicate with the SCSI device or devices you connected to it, you need to activate the slot into which you inserted the Apple II High-Speed SCSI Card. Open the Control Panel and find the number that corresponds to the slot into which you inserted the SCSI card. Set this slot to "Your Card." (If you don't know how to use the Control Panel, see the documentation that came with your computer for instructions.)

Installing the SCSI drivers

Along with the three utilities on the *Apple II High-Speed SCSI Card Utilities* disk, you'll find an Installer program that you should use to install new SCSI drivers onto your startup disk. Your startup disk probably already contains versions of some of these SCSI drivers; however, *to ensure that your card will function properly, you must install the new versions of the SCSI drivers.*

△ **Important:** You must use the Installer to install the SCSI drivers; you cannot merely copy them from one disk to another. △

Follow these steps to install the SCSI drivers:

1. **Start up the computer with the *Apple IIGS System Disk* (or any startup disk that includes a System Folder).**

   In a few moments you'll see the Finder desktop.

2. **Insert the *Apple II High-Speed SCSI Card Utilities* disk in an empty disk drive.**

   If you have only one 3.5-inch disk drive, eject the system disk and insert the System Tools disk. You'll need to swap disks during this procedure; just follow the instructions on the screen when you're prompted to insert a disk.

3. **Open the Utilities disk.**

4. Open the Apple IIGS.Files folder.

You see the Installer icon in the window.
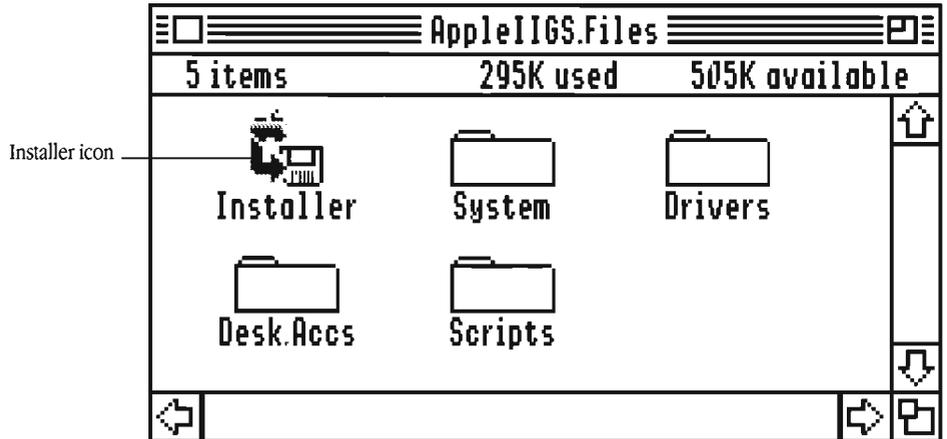
Figure 3-1   The Installer icon in the Apple IIGS.Files window

5. Open the Installer.

Select the icon and choose Open from the File menu, or double-click the icon. In a few moments you'll see the Installer screen.
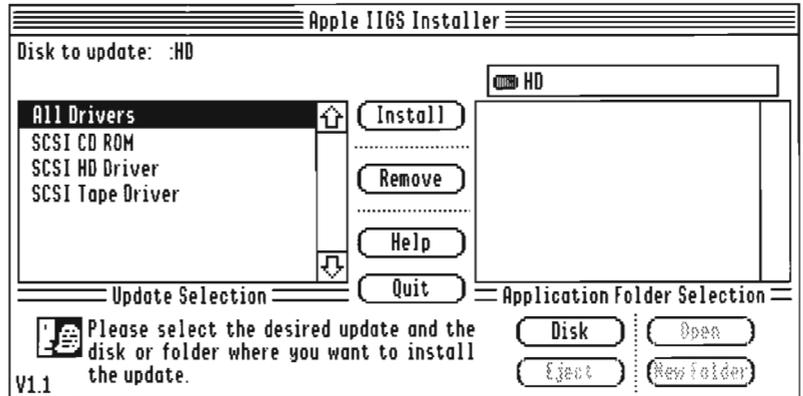
Figure 3-2   The Installer screen

The window on the left displays an alphabetical list of the drivers available on the utilities disk. The window on the right corresponds to the current startup disk.

6. Select the option you want to install.

You have a choice of installing a single driver or all the drivers on the utilities disk. If you have only one device connected to your computer, you should probably choose only that device's driver; doing so will save valuable space on your system disk. If you are likely to need most or all of the drivers, choose the All Drivers option.

7. **Click Install.**

A dialog box shows a series of messages to keep you informed of the progress of the installation and to prompt you when to swap disks.

When the driver has been installed, you see a dialog box letting you know whether the installation process was successful. (If the installation process fails, the dialog box will indicate the reason.)

8. **Click OK.**

9. **Click Quit.**

You see a dialog box with a button labeled RESTART SYSTEM.

10. **Click RESTART SYSTEM to restart your computer.**

Now that you've installed the new SCSI drivers, you're ready to go on to the utilities on the *Apple II High-Speed SCSI Card Utilities* disk, or to the utilities on the disk that came with your computer.

△ **Important:** The utilities on the *Apple II High-Speed SCSI Card Utilities* disk are ProDOS® 8 utilities. If you prefer to work with the Finder, you can perform the same procedures by using Finder commands instead of the utilities. The Verify command performs the same task as the HD SC Verify utility program; you can partition a hard disk from the Finder by using the Advanced Disk Utility. However, while it is possible to back up a hard disk by using the Copy Files command, the Backup II Utility on the *Apple II SCSI Card Utilities* disk provides more options, faster operation, and more economical use of disk space. △

Using HD SC Partition

When you partition a hard disk, the computer recognizes each partition as if it were a separate disk. You can initialize or erase one partition without affecting the others. And you can use different operating systems on the different partitions.

If you are using the ProDOS operating system and your hard disk has a storage capacity greater than 32 megabytes, or if you would like your computer to treat a single large hard disk as if it were two or more small ones, use the HD SC Partition utility to divide your hard disk into partitions.

△ **Apple IIGS Users:** HD SC Partition is a ProDOS 8 utility program. If you prefer using GS/OS and the Finder, or if you need more than four partitions, you can use the Advanced Disk Utility to partition your hard disk. Use HD SC Partition only if you want to work from within the ProDOS 8 operating system. See the manual that came with your computer for more information on the Advanced Disk Utility. △

The maximum size of a partition is 32 megabytes, because that's the maximum size ProDOS can handle. If you want to store as much information as possible in a single partition, you may want to choose an unequal allocation of memory, such as 32 MB in one partition and 8 MB in the other. If your information falls into two distinct categories that require equal storage space, on the other hand, you should divide your hard disk into equal parts.

The number of partitions you'll see after you use the HD SC Partition utility depends on what type of Apple II you have or on what slot you installed the SCSI card in. If you are using an Apple IIe and you installed the card in slot 5 (and no card in slot 2), the computer will recognize four partitions on the hard disk; when the card is installed in any of the other slots, the operating system will recognize only two.

△ **Important:** If you have saved information on your hard disk, copy that information to other disks before using the HD SC Partition program. Creating partitions on your hard disk erases anything previously stored there. You can copy all the information on your hard disk using the Backup II program, described later in this chapter, or you can copy individual files using the file-copying utility on your system utilities disk. △

1. **Turn on your hard disk.**

2. **Start up the computer with the *Apple II High-Speed SCSI Card Utilities* disk.**

3. **Select HD SC Partition and press Return.**

   You see the screen shown in Figure 3-3.

```
SCSI HD Partition Utility      Main Menu                    V2.0


    ┌Main Menu──────────┐
    │                   └──────────────────────────────────┐
    │      Please select an option·                        │
    │      ┌─────────────────────────┐                     │
    │      │1. Partition SCSI Hard Disk│                   │
    │      └─────────────────────────┘                     │
    │      2. Quit                                          │
    │                                                      │
    │                                                      │
    │                                                      │
    │                                                      │
    │                                                      │
    └──────────────────────────────────────────────────────┘


   ─────────────────────────────────────────────────────────
    Type number, or use arrows, then press Return.     ▲? for Help
```
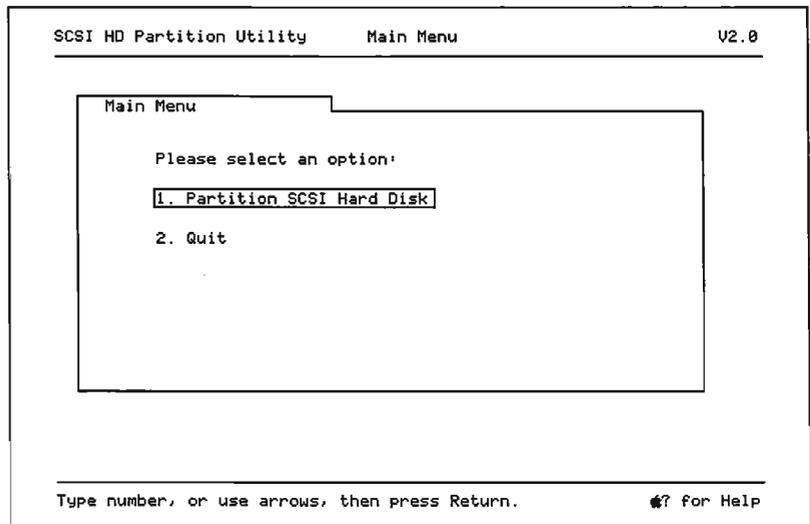
Figure 3-3   The HD SC Partition menu

4. Press Return to select Partition SCSI Hard Disk.

You see the Select Hard Disk screen, similar to the one shown in Figure 3-4.

```
SCSI HD Partition Utility       Select Hard Disk       Escape: Main Menu


   Main Menu
     Select Hard Disk
       Drive  Volume Name  Type     Size      Priority#  Partitions
       1      /MASTER      ProDOS   41.5 MB      5          1
       2      /SECOND      ProDOS   80.5 MB      4          2








   ─────────────────────────────────────────────────────────────────
   Type number, or use arrows, then press Return.           ? for Help
```
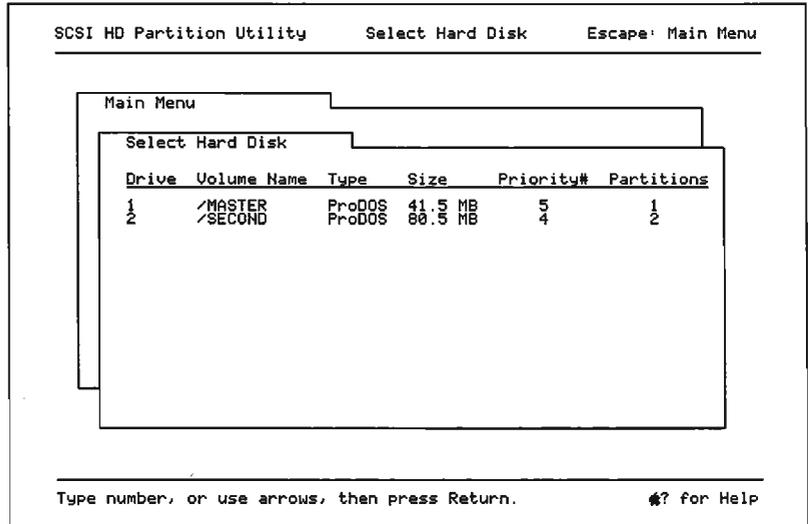
Figure 3-4   The Select Hard Disk screen

5. Select the hard disk you want to partition and press Return.

If you have only one hard disk, it will already be selected. If you have more than one hard disk, use the arrow keys to select the hard disk you want to partition.

6. Press Return if you want to create two partitions, or type Y for Yes and press Return if you want to create four partitions.

If you are using an Apple IIe and your SCSI card is installed in slot 5, or an Apple IIGS with ProDOS 8, the computer will recognize four partitions on the disk. If the card is installed in any other slot, the computer will recognize only two partitions on the disk.

You see a screen similar to the one shown in Figure 3-5.

```
┌─────────────────────────────────────────────────────────────────┐
│ SCSI HD Partition Utility    Partition Hard Disk   Escape: Main Menu │
│ ─────────────────────────────────────────────────────────────── │
│    ┌─Main Menu──────────┐                                        │
│    │ ┌─Select Hard Disk────┐                                     │
│    │ │ ┌─Partition Hard Disk───┐                                 │
│    │ │ │                                                         │
│    │ │ │   Partition # 1              Partition # 2              │
│    │ │ │   32 Megabytes               32 Megabytes              │
│    │ │ │                                                         │
│    │ │ │   Partition # 3              Partition # 4              │
│    │ │ │   32 Megabytes               32 Megabytes              │
│    │ │ │                                                         │
│    │ │ │          Percent Megabytes Used                        │
│    │ │ │   |--------|--------|--------|--------|                │
│    │ │ │                                                         │
│    └─┴─┴─────────────────────────────────────────────────────── │
│ ←→selects partitions,   ↑↓changes size, RETURN accepts   ⌘? for Help │
└─────────────────────────────────────────────────────────────────┘
```
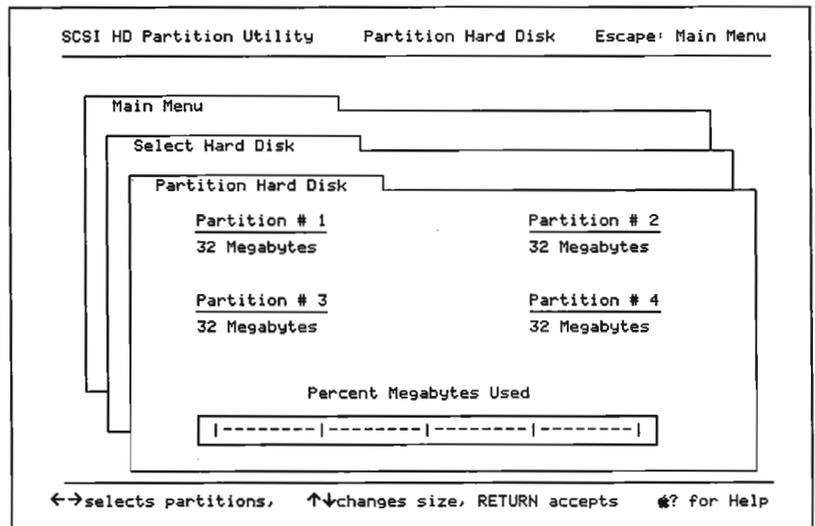
Figure 3-5   Determining partition sizes

The screen shows how much space is allocated to each partition and what percentage of usable storage space on the hard disk has been allocated. The preset allocation divides the space into equal parts. If that's what you want, skip to step 11. If you want to change the partition sizes, follow steps 7 through 10.

7. **Select the partition you want to decrease.**

   You must decrease the size of one partition before you can increase the size of the other.

   Press Left Arrow or Right Arrow to select a partition.

8. **Decrease the allocation.**

   Press Down Arrow to decrease the size of the partition.

   The shading on the horizontal bar along the bottom of the screen shows what percentage of usable storage space on the hard disk has been allocated.

9. **Select the second partition and increase its allocation.**

   Press Left Arrow or Right Arrow to select the other partition. Then press Up Arrow to increase its allocation.

10. **If you are creating four partitions, select the third and fourth partitions and change their allocations.**

    Press Left Arrow or Right Arrow to select each of the remaining partitions in turn. Then press Up Arrow to increase its allocation, or Down Arrow to decrease its allocation.

    Keep in mind that the total allocation cannot exceed the storage capacity of your hard disk. You must decrease the allocation of the one partition before you can increase the allocation of another.

11. **Press Return when you're satisfied with the size of your partitions.**

    You'll see a message advising you that creating new partitions will erase all data on the hard disk. If you didn't allocate all the space on the disk, you'll also be advised that there is still space on the disk.

12. **Type Y to create the partitions, or N to cancel the partitioning, and press Return.**

❖ *Why leave space unallocated?* If you type Y when there is unallocated space on the disk, partitioning will proceed. Leaving space unallocated might be useful, for example, if you want the partitions to match exactly the size of another storage device for purposes of making backups. ❖

If you type Y to create the partitions, you'll see a message telling you about hard formatting. Hard formatting removes bad blocks and rewrites every track on the disk surface. Be aware that hard formatting takes up to twenty minutes for a 40 MB hard disk. If you are partitioning the disk for the first time, or if you suspect there's something wrong with the disk, you should choose hard formatting.

13. **Press Return for hard formatting or type Y and press Return to skip hard formatting.**

After you press Return, the program creates the partitions in the sizes you've chosen. When the operation is complete, you see a message that the partitions were successfully written; the screen also directs you to "Press any key to restart."

14. **Press any key to restart your computer.**

The computer starts up again with the *Apple II High-Speed SCSI Card Utilities* disk. If you are finished using the utilities on the disk, select Quit to Launching Program to select another program to run.

Now that you've partitioned your hard drive, you can go ahead and store files on it. You don't need to format the disk. The HD SC Partition utility does that automatically.

During the partitioning process, HD SC Partition assigns default names to the partitions you create— HD.PARTITION1, HD.PARTITION2, and so on. If you want to rename your partitions, use the Rename utility that came with your computer. (If you are using an Apple IIGS, it's simpler just to rename the partitions' icons on the desktop.)

Using Backup II

Backup II is a utility program on the *Apple II High-Speed SCSI Card Utilities* disk that gives you an efficient way of copying the information from one ProDOS-formatted disk to others and of recovering that information should it ever be necessary. Although you can use Backup II with any type of ProDOS disk, it's designed primarily for backing up the information on hard disks.

In using Backup II, you make choices from a series of menus and then provide additional information in response to messages on the screen. Once you make these choices, you indicate the location of your **source** volume (the disk you are backing up) and your destination volume (the disk you are copying information to). And the backup procedure begins.

Backing up files

There are two ways to back up files: You can back up all the files on a disk, in a partition, or in a subdirectory. Or you can back up only those files that have been modified since the last time you backed up.

Before you begin backing up the information on your hard disk, be sure you have plenty of floppy disks handy. The number of disks you need depends on both the size of the hard disk you're backing up and the capacity of your backup disks. For example, it takes 26 3.5-inch floppy disks to back up a 20 MB hard disk. (If you have another hard disk drive of equal or greater storage capacity, you can use it to back up the first drive.)

Backing up all files

1. **Turn on your hard disk.**

2. **Start up the computer with the *Apple II High-Speed SCSI Card Utilities* disk.**

3. Select the Backup II program and press Return.

After a few seconds, you'll see the screen shown here.

```
┌─────────────────────────────────────────────────────────────┐
│ Backup II                    Main Menu                  V2.0 │
│ ───────────────────────────────────────────────────────────── │
│     ┌────────────────┐                                       │
│     │ Main Menu      ╲                                        │
│     │                 ─────────────────────────────────────┐ │
│     │     Please select an option·                         │ │
│     │     ┌─────────────────┐                              │ │
│     │     │1. Backup Files  │                              │ │
│     │     └─────────────────┘                              │ │
│     │     2. Restore Files                                 │ │
│     │                                                      │ │
│     │     3. Quit                                          │ │
│     │                                                      │ │
│     │                                                      │ │
│     │                                                      │ │
│     │                                                      │ │
│     │                                                      │ │
│     └──────────────────────────────────────────────────────┘ │
│                                                              │
│                                                              │
│   Type number, or use arrows, then press RETURN.   ⚫? for Help │
└─────────────────────────────────────────────────────────────┘
```
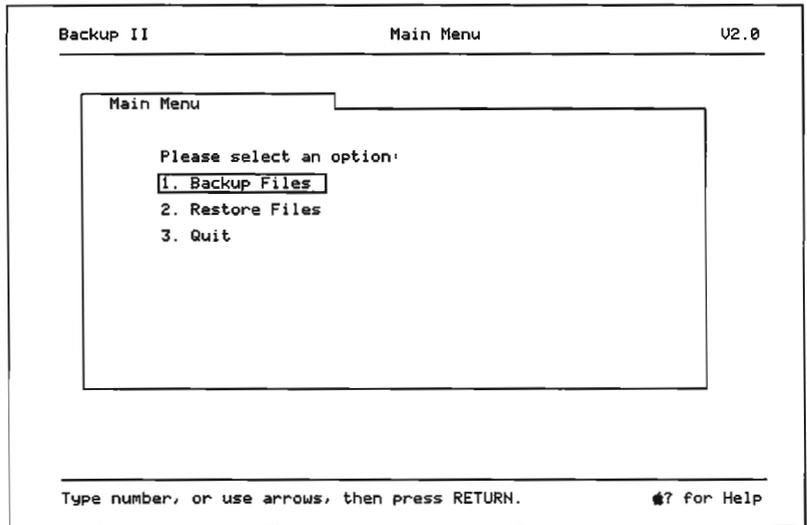
Figure 3-6   The Backup II menu

When you see the Backup II menu, you can remove the *Apple II High-Speed SCSI Card Utilities* disk from the disk drive. You won't need it again until you quit and restart the program.

4. Insert a blank disk into your destination drive.

The blank disk need not be formatted for ProDOS; Backup II will format it for you. But if the disk is formatted, the backup will go faster.

5. Press Return to select Backup Files.

You'll see this screen:

```
┌──────────────────────────────────────────────────────────────┐
│ Backup II              Backup Files          ESC: Previous Menu│
│ ─────────────────────────────────────────────────────────────│
│    ┌─ Main Menu ──────────────┐                               │
│    │ ┌─ Backup Files ─────────┴───────────────────────────┐   │
│    │ │                                                    │   │
│    │ │    Please select a backup option:                  │   │
│    │ │   ┌─────────────────────────┐                      │   │
│    │ │   │1. Backup modified files │                      │   │
│    │ │   └─────────────────────────┘                      │   │
│    │ │    2. Backup by pathname                           │   │
│    │ │    3. Retu:  :o main menu                          │   │
│    │ │                                                    │   │
│    │ │                                                    │   │
│    └─┤                                                    │   │
│      │                                                    │   │
│      └────────────────────────────────────────────────────┘   │
│ ─────────────────────────────────────────────────────────────│
│  Type number, or use arrows, then press Return.    ? for Help │
└──────────────────────────────────────────────────────────────┘
```
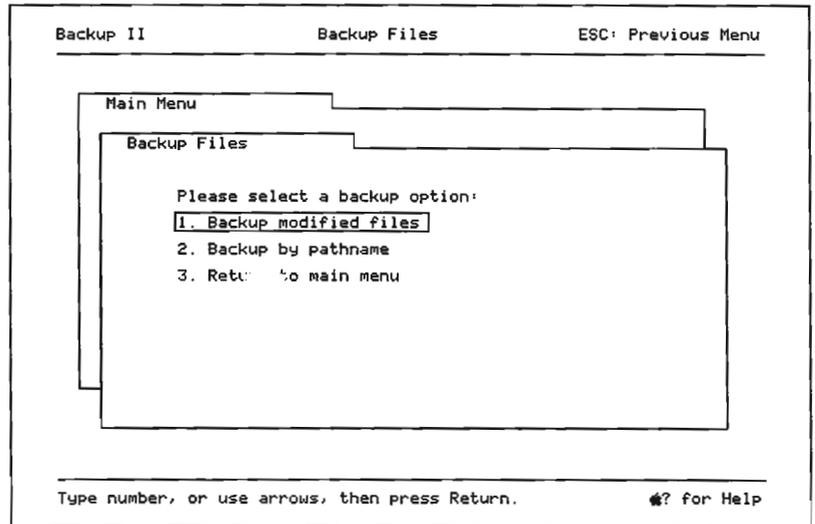
Figure 3-7   The Backup Files menu

6. Select Backup by Pathname and press Return.

You'll use the other option—Backup Modified Files—after you've made a backup of the volume and want to save only those changes made since the last backup.

7. Type the pathname of the source volume and press Return.

The source volume is the disk you want to copy—usually your hard disk or a partition on your hard disk. The pathname is the name of the disk or partition preceded by a slash (/).

If you prefer, you can type S followed by the slot and drive number of your source volume. If you are backing up your SCSI hard disk, type the number of the slot in which you installed the Apple II High-Speed SCSI Card.

❖ *Using a wildcard character:* You can use an equals sign (=) to represent all the files in a directory. For example, if you type /MY.HARD.DISK/=, Backup II will transfer all the files in the backup disk to the destination disk. If you type /MY.HARD.DISK/LETTERS/=, Backup II will transfer all the files in the subdirectory LETTERS on the disk MY.HARD.DISK. ❖

8. **Type the slot and drive number of your destination drive.**

    The destination drive is the drive containing your first backup disk. If your disk drive is connected to a port, type 5 for a 3.5-inch drive or 6 for a 5.25-inch drive. If your disk drive is connected to a controller card, type the number of the slot that contains the card.

9. **If the disk is blank, you're asked whether it's OK to format the disk. Type Y for Yes and press Return.**

10. **Select a listing output device and press Return.**

    If you select Screen, the contents of your source disk will be displayed only on your screen. If you select Printer, the contents will be displayed on your screen and printed.

    After you select an output device for the listing, Backup II checks that the source volume has been formatted for ProDOS. Then it constructs a table of contents for the backup and begins to transfer the information from your source disk to your first backup disk.

11. **Switch backup disks when prompted.**

    Messages on the screen tell you when to replace the disk in the destination drive with a new blank disk. After you replace a disk, press Return. (Some disk drives eject disks automatically; if yours does, you won't need to press Return after you insert the next disk.)

12. **As you take each backup disk out of the drive, label it.**

    Backup II names each backup disk BACKUP.VOLUMEx. The first backup disk is BACKUP.VOLUME1, the second is BACKUP.VOLUME2, and so on. You should include this name on the label, along with the date the disk was created and a brief description of what information is being backed up.

13. **When you see the message "Operation Complete," press Return to return to the Backup Files menu.**

14. **Press Esc to return to the Backup II menu.**

Backing up modified files only

To back up only those files modified or created since the last backup was made, select the Backup Modified Files option from the Backup Files menu by typing 1 or using the arrow keys. Then press Return. A backup of this type is called an **incremental backup.**

The steps you follow to perform an incremental backup are the same as those you followed to make a full volume backup. The only difference is that you select the Backup Modified Files option in step 6 rather than Backup by Pathname.

△ **Important:** Backup II follows the same naming conventions when backing up modified files as it does when performing a full backup. To avoid confusion when restoring files; be sure to date your backup disks and keep them in correct order. △

Restoring files

If you use Backup II to save files, you need to use Backup II to restore them, because the program copies files in a compact form that is not readable by applications.

There are two ways to restore files: by volume and by pathname. Use the volume method when you need to restore everything on your disk or partition. Use the pathname method when you need to restore only particular files.

Restoring all files

The Restore Entire Volume option lets you restore a volume, such as a hard disk or partition, to the state it was in when the last backup was made. This is done by restoring first the most recent full volume backup and then any incremental backups that followed. When using more than one set of backup disks to restore a volume, use the sets in chronological order, oldest set first.

If you are restoring files because of a damaged directory—that is, if your ProDOS application no longer recognizes your hard disk—you should reformat the disk before you restore files. To do so, use the formatting utility on the system disk or system utilities disk that came with your computer. Then follow these instructions to restore your files:

1. **Turn on your hard disk.**

2. **Start up the computer with the *Apple II High-Speed SCSI Card Utilities* disk.**

3. **Select the Backup II program and press Return.**

4. **Select Restore Files and press Return.**

5. Press Return to select Restore Entire Volume.

You'll see the screen shown in Figure 3-8.

```
Backup II               Restore Files         ESC: Previous Menu
─────────────────────────────────────────────────────────────

   ┌─ Main Menu ────────────────┐
   │  ┌─ Restore Files ──────────────┐
   │  │  ┌─ Restore Volume ────────────────────┐
   │  │  │                                     │
   │  │  │                                     │
   │  │  │              *********              │
   │  │  │              *CAUTION*              │
   │  │  │              *********              │
   │  │  │      The restore volume operation may delete
   │  │  │      files not present at the time of backup.
   │  │  │                                     │
   │  │  │                                     │
   └──┤  │                                     │
      └──┤                                     │
         └─────────────────────────────────────┘
─────────────────────────────────────────────────────────────
Are you sure you want to do this?  ██  Yes
```
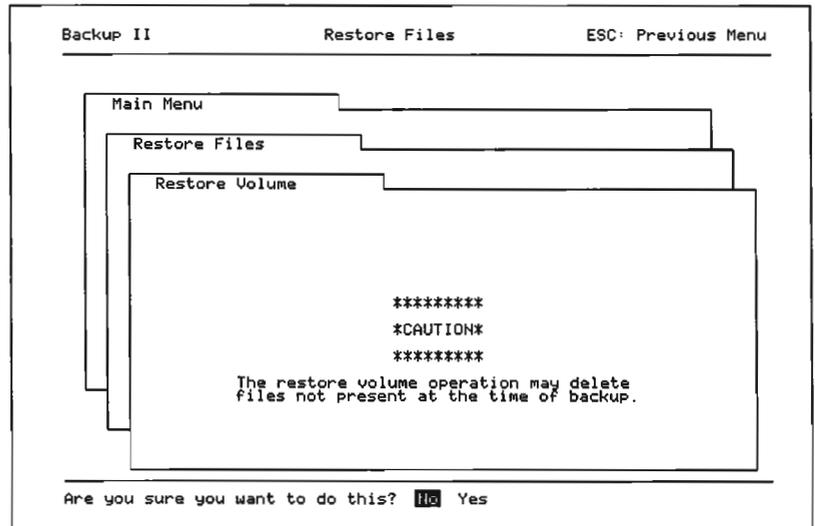
Figure 3-8   The Restore Entire Volume screen

▲ **Warning:** This message appears to inform you that if you added
files since the time you last backed up, those files will be deleted
in the process of restoring the hard disk to the condition it was
in at the time of the last incremental backup. ▲

6. If you want to continue, type Y, for Yes and press Return.

If you type N for No, you return to the Restore Files menu. If you type Y, you see the screen shown in Figure 3-9.

```
 ┌─────────────────────────────────────────────────────────────┐
 │  Backup II              Restore Files        ESC: Previous Menu │
 │ ──────────────────────────────────────────────────────────    │
 │  ┌─────────────────────────────────────────────────┐          │
 │  │ Main Menu                                        │          │
 │  │  ┌──────────────────────────────────────────┐   │          │
 │  │  │ Restore Files                            │   │          │
 │  │  │  ┌────────────────────────────────────────────────┐     │
 │  │  │  │ Restore Volume                                 │     │
 │  │  │  │                                                │     │
 │  │  │  │                                                │     │
 │  │  │  │        Restore from:                           │     │
 │  │  │  │        (Slot                        )          │     │
 │  │  │  │                                                │     │
 │  │  │  │        To device:                              │     │
 │  │  │  │                                                │     │
 │  │  │  │        Select a listing output device:         │     │
 │  │  │  │                                                │     │
 │  │  │  │           Press <Ret> to accept, <Esc> to exit │     │
 │  │  │  │                                                │     │
 │  │  │  └────────────────────────────────────────────────┘     │
 │ ──────────────────────────────────────────────────────────    │
 │                                                    ? for Help   │
 └─────────────────────────────────────────────────────────────┘
```
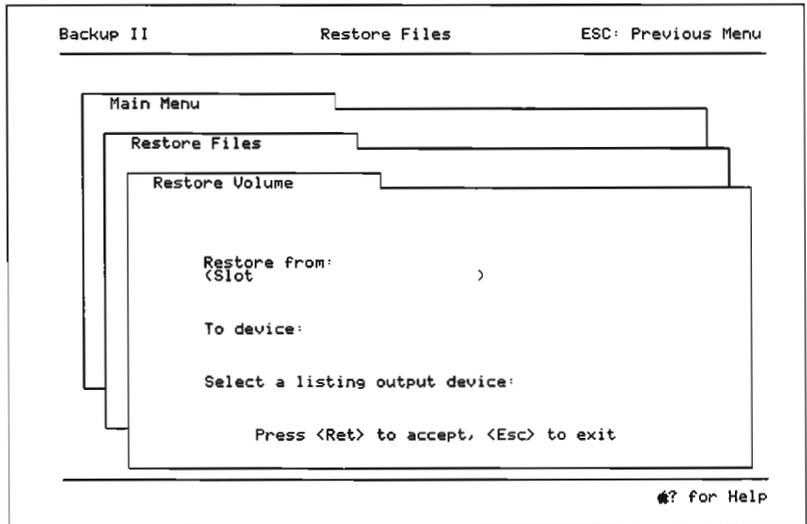
Figure 3-9 The Restore Volume screen

7. Put the first backup disk (/BACKUP.VOLUME1) in one of your disk drives.

8. Type the slot and drive number of the drive containing the backup disk and press Return.

9. Type the pathname of the drive onto which you are restoring the information and press Return.

If you prefer, you can type S followed by the slot and drive number of the drive.

10. Select a listing output device.

Use the arrow keys to select Screen if you want the listing
sent to the screen only; select Printer if you want the listing
sent to the screen and to a printer.

11. Switch backup disks when prompted.

After you restore the full volume backup, use the steps in the
next section, "Restoring Particular Files," to restore any
subsequent incremental backups. If you have more than one set
of incremental backups, be sure to restore them in chronological
order, oldest set first.

Restoring particular files

Use the Restore by Pathname option if you need to restore only
particular files that have been damaged or deleted by mistake.
Here's how:

1. Turn on your hard disk.

2. Start up the computer with the *Apple II High-Speed SCSI Card Utilities* disk.

3. Select the Backup II program and press Return.

4. Select Restore Files and press Return.

5. Select Restore by Pathname and press Return.

6. Put the first backup disk (/BACKUP.VOLUME1) in a disk drive.

7. Type the slot and drive number of the drive containing your backup disk and press Return.

Backup II replaces the slot and drive you type with the name
of the backup disk and waits for you to type the remainder of
the pathname.

Chapter 3: Using the SCSI Utility Programs

8. **Type the remainder of the pathname and press Return.**

You can use an equals sign to represent all the files in a directory. For example, if you type /BACKUP.VOLUME1/=, Backup II will transfer all the files in the backup disk to the destination disk. If you type /BACKUP.VOLUME1/LETTERS/=, Backup II will transfer all the files in the subdirectory LETTERS on the disk BACKUP.VOLUME1.

9. **Type the pathname of the device onto which you are restoring the information and press Return.**

Or you can type S followed by the slot and drive number of the volume.

10. **Select the listing output device.**

Use the arrow keys to select Screen if you want the contents of the backup disk sent only to the screen; select Printer if you want the listing sent to the screen and to the printer.

11. **Switch backup disks when prompted.**

Listing files

The List Files on Backup Media option shows you the contents of the backup volume in the slot and drive you specify. You can use this option to check that Backup II copied or restored the files you thought it would.

1. **Be sure the disk you want to catalog is a backup disk and is in one of your disk drives.**

2. **From the Backup II menu, select Restore Files and press Return.**

3. **Select List Files on Backup Media and press Return.**

4. **Type the slot and drive number of the drive containing the disk you want to catalog.**

5. **Select a listing output device.**

   Use the arrow keys to select Screen if you want the contents of the backup disk sent only to the screen; select Printer if you want the listing sent to the screen and to the printer.

6. **If the listing is longer than one screen, press Return to see more.**

   Keep pressing Return until the listing is complete.

7. **Press Esc to return to the Restore Files menu.**

8. **Press Esc to return to the Backup II menu.**

Quitting   Follow these steps to quit Backup II:

1. **Press Esc to return to the Backup II menu.**

2. **Select Quit to Another Program and press Return.**

3. **Type Y and press Return to confirm that you want to quit Backup II and return to the Main Menu.**

Using SCSI Verify

SCSI Verify is a utility program on the *Apple II High-Speed SCSI Card Utilities* disk that gives you an efficient way of testing your SCSI storage devices to ensure that they are reading correctly. It verifies only the hardware; it can't tell you whether you have software problems, or if there is something wrong with the information on your device. If your storage device fails the test, it isn't working properly, even though you may not have noticed anything wrong. You should have it checked by an authorized Apple dealer.

△ **Apple IIGS users:** If you prefer to work in the Finder, you can also test your SCSI storage device with the Verify command from the Disk menu. The Verify command and the SCSI Verify utility report exactly the same type of information. △

The test takes several minutes and does not affect the information stored on the device. You should run the SCSI Verify utility at the following times:

- after you partition or format your storage device for the first time

- every month or so for preventive maintenance, to avoid unexpected loss of information

- whenever you are having problems with the device

Follow these steps to test an Apple Hard Disk SC or other SCSI storage device connected to your computer:

1. **Turn on the device.**

2. **Start up your computer with the *Apple II High-Speed SCSI Card Utilities* disk.**

3. Select SCSI Verify from the Main Menu and press Return.

You see the SCSI Verify menu.

```
SCSI Verify Utility              Main Menu                    V2.0
_____

  ┌─ Main Menu ──────────┐
  │                      └──────────────────────────────────────┐
  │        Please select an option¹                             │
  │                                                             │
  │        1. Verify SCSI Device                                │
  │                                                             │
  │        2. Quit                                              │
  │                                                             │
  │                                                             │
  │                                                             │
  │                                                             │
  │                                                             │
  └─────────────────────────────────┘                          │
     │                                                          │
     └──────────────────────────────────────────────────────────┘

_____
 Type number, or use arrows, then press Return.      ←? for Help
```
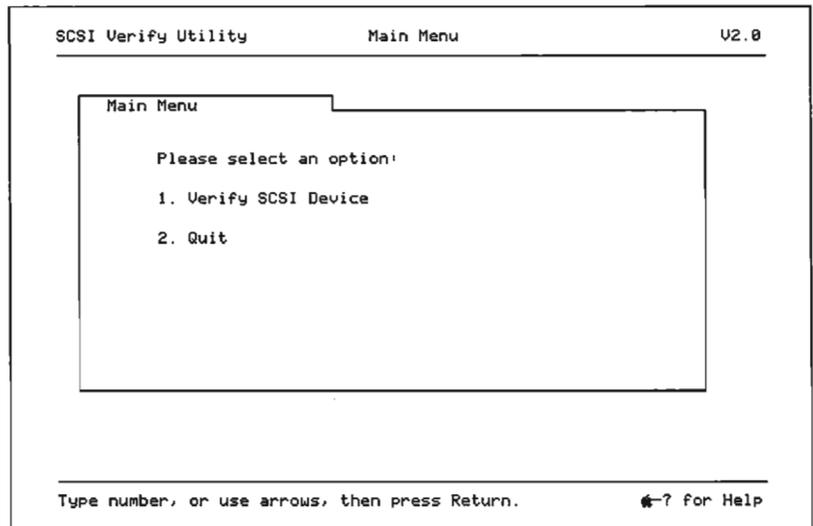
Figure 3-10 The SCSI Verify menu

4. Select Verify SCSI Device and press Return.

You see a screen showing a list of volume names—either partitions on a single device or the names of the devices connected to your system.

5. **Select the partition or device you want to verify and press Return to begin the verification process.**

A message on the screen indicates the percent of the volume or device that has been verified.

If you want to stop the test before it's over, press the Esc key. (There may be a short delay.)

The results of the test are given in terms of **blocks**—a unit of storage used to keep track of information on the device.

If your storage device passes the test, you will see a message reporting the results—No bad blocks found. If your device fails, you'll see a screen similar to the one shown in Figure 3-11.

```
SCSI Verify Utility            Verify SCSI Device
_____

 ┌─Main Menu─────────────────┐
 │ ┌─Select SCSI Device──────────┐
 │ │ ┌─Verify SCSI Device──────────┐
 │ │ │ Volume Name: Master    Size: 20.0  Megabytes
 │ │ │
 │ │ │         -Bad Block List-    (100 percent done)
 │ │ │    000115  000116  000117  000118   000119
 │ │ │
 │ │ │
 │ │ │
 │ │ │       5 bad blocks found!
 │ │ │
 │ │ │
_____
Press any key to continue.
```

Figure 3-11 List of bad blocks

If your SCSI storage device fails the test, use the Backup II utility on the *Apple II High-Speed SCSI Utilities* disk as soon as possible to back up the device. Then hard format the device (if possible) using the SCSI Partition utility. Then verify the device again. If you still have problems with the device, have it checked by an authorized Apple dealer.

6. **If you have more than one partition or device to verify, repeat steps 4 and 5 for each verification.**

When you finish using SCSI Verify, follow these steps to quit:

7. **Press Esc to return to the SCSI Verify menu.**

8. **Select Quit and press Return to return to the Main Menu.**

Working with the Apple II High-Speed SCSI Card

This chapter is an introduction to some of the features of the Apple II High-Speed SCSI Card. Although it takes no special skills to use the card, you may need to know about some of the features of the card to use it properly, depending on the type of device you are using with your computer. In this chapter, you will find special instructions for using certain devices with the Apple II High-Speed SCSI Card—devices such as the Apple LaserWriter IISC or the Apple Scanner. (You'll need special software to use the LaserWriter IISC or Apple Scanner.)

In addition, you'll also find information about the card's four switches, instructions on how to use them to turn DMA on and off, and a chart to help you reset the computer's SCSI ID number. Finally, there's a brief troubleshooting section to help you if you encounter problems with the Apple II High-Speed SCSI Card.

Special instructions

You need to follow special procedures to use certain SCSI devices with the Apple II High-Speed SCSI Card. These procedures apply to only a few types of devices, but are important:

- If you plan to use *only* a LaserWriter IISC or an Apple Scanner with your computer, you *must* reset the computer's SCSI ID number to 2. This adds a three-second delay in the computer's startup process—time these devices need to complete their own startup process. See the instructions in the section, "Changing the computer's SCSI ID number," later in this chapter.

  If you do not change the computer's ID number, the computer will not recognize that the device is connected.

- When using an Apple Scanner (anywhere on the SCSI chain), the computer's SCSI ID number cannot be set to 0.

- If you connect a tape drive, be sure to remove the tape from the drive before turning on the computer. The device must not have the tape inserted when the computer checks for available SCSI devices.

- When starting up your computer and SCSI devices, turn on the SCSI devices first, wait about ten seconds, and then turn on the computer. If you start up the computer first, the computer may not recognize some devices connected to it.

- If you want to use any SCSI device, you need to turn on all the devices in the SCSI chain.

Changing the card's switch settings

For most uses, you don't have to configure the Apple II High-Speed SCSI Card before you install it in your computer. However, there are some occasions when you'll need to change some settings on the card—depending on the types of SCSI devices you attach or the programs you plan to use. This section tells you when and how to change the Apple II High-Speed SCSI Card's switch settings.

△ **Important:** If you plan to connect a LaserWriter IISC or an Apple Scanner by itself to the computer, you will need to change the SCSI card's switch settings. △

In the lower-left corner of the Apple II High-Speed SCSI Card, you will find a set of four switches, numbered 1 through 4. These switches control two of the card's features:

■ Switch 1 turns on and off DMA, or Direct Memory Access.

■ Switches 2, 3, and 4 together set the computer's SCSI ID number.

Turning DMA on and off

DMA stands for *Direct Memory Access*—a feature that allows the SCSI card to write information to, and read information from, a storage device (such as a disk drive) directly without having to depend on the computer's microprocessor to manage the operation.

The Apple II High-Speed SCSI Card comes with the DMA switch already in the closed, or on, position. However, if you have another card (such as an accelerator card) that uses its own DMA, you may need to turn off the SCSI card's DMA. Follow these instructions to turn DMA off:

1. **Switch the computer off, but leave the power cord plugged in.**

2. **Locate Switch 1 on the SCSI card and carefully move Switch 1 to the open, or off, position.**

   If necessary, use the end of an unsharpened pencil or other long, narrow device, to reach the switch.

Move Switch 1 to the open position to turn off DMA
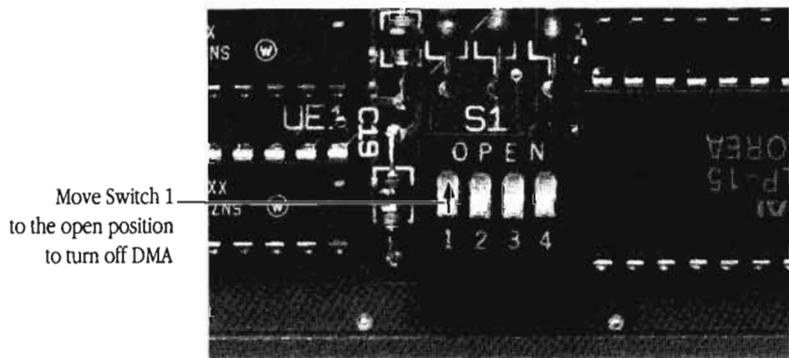
Figure 4-1   Turning off DMA

3. Switch the computer back on.

If later you want to turn DMA on again, simply turn off the computer, move Switch 1 to the closed or on position, and then turn the computer back on.

❖ *By the Way:* The two settings for the SCSI switches—open and closed—may at first seem confusing. They refer to the states of an electrical switch, which can be either open or closed. An open switch does *not* complete a circuit. A closed switch does complete a circuit, allowing an electrical impulse to pass. ❖

Changing the computer's SCSI ID number

The Apple II High-Speed SCSI Card comes with the SCSI ID number preset to 7. And for almost all uses, this is the best ID number to use for the computer. However, there may be occasions when you need to reset the computer's SCSI ID number. For instance, when you attach an Apple LaserWriter IISC or an Apple Scanner by itself to your computer, you need to reset the computer's ID number to 2. This provides a delay of three seconds in the startup process—a delay needed by these devices so they can be ready to respond to the computer when it scans for available devices on the SCSI chain.

△ **Important:** If you plan to connect a LaserWriter IISC or an Apple Scanner by itself to the computer, you will need to change the SCSI card's switch settings. △

The computer's SCSI ID number is determined by the positions of switches 2, 3, and 4 on the SCSI card. Follow these steps to reset the computer's SCSI ID number:

1. **Switch the computer off, but leave the power cord plugged in.**

2. **Choose an appropriate SCSI ID number for the computer from Figure 4-2.**

   If you are using a LaserWriter IISC or an Apple Scanner, use the settings for ID number 2.

3. **Refer to Figure 4-2 for the correct position of switches 2, 3, and 4.**

SCSI ID number 0   SCSI ID number 1   SCSI ID number 2   SCSI ID number 3

SCSI ID number 4   SCSI ID number 5   SCSI ID number 6   SCSI ID number 7

Figure 4-2 SCSI ID number switch settings

4. **Be sure to follow the installation instructions elsewhere in this guide to install the SCSI card.**

Troubleshooting

Use the information in Table 4-1 if you run into problems with your Apple II High-Speed SCSI Card. If none of the suggestions solves your problem, contact your authorized Apple dealer.

Follow these steps to use Table 4-1:

1. In the Problems section, look in the left column to find the description that most closely represents the problem you're experiencing.

2. Note the Solution numbers in the right column following that description.

3. Look under the Solutions section to find the solutions that correspond to the numbers.

Table 4-1 Troubleshooting

Problems

Problems	Solution Number
The computer won't recognize any SCSI device.	1, 3, 5, 6, 7, 8, 9, 10, 11, 13
The computer won't recognize a particular hard drive, CD-ROM drive, or tape drive.	1, 3, 5, 10, 11, 13
The computer won't recognize the LaserWriter IISC.	1, 3, 6, 7, 13
The computer won't recognize the Apple Scanner.	1, 3, 8, 9, 10, 13
When trying to start up from a SCSI device on an Apple IIGS, the sliding Apple appears.	1, 3, 5, 6, 8, 10, 11, 13, 14
When trying to start up from a SCSI device on an Apple IIe, the message 'SCSI BOOT ERROR' appears.	1, 5, 6, 8, 10, 11, 14
More devices appear than you have connected to your computer.	4
A drive won't work by itself, but it will work when connected to another drive.	12
The device you expected to start up from didn't start the computer.	2, 13, 14

Solutions

In general, the following solutions will fix most problems—even problems not listed here. Try them first and if none of them works, take the device to an authorized Apple service center.

1. Make sure all devices are plugged in and turned on. Make sure that there is a terminator at the end of the SCSI chain.

2. Make sure the startup device has a higher number than other connected devices. (Only block devices can be used as startup devices.) On the Apple IIGS, make sure the Startup option is set to the slot that contains the SCSI card.

3. On the Apple IIGS, use the Control Panel to set the slot containing the SCSI card to "Your Card."

4. Make sure no two devices—including the computer—have the same ID number.

5. If the device is a storage device, make sure it has been formatted.

6. If one of the devices is a LaserWriter IISC and there are other devices connected to the SCSI chain, make sure its SCSI ID number is lower than that of any other device.

7. If the device is a LaserWriter IISC and there are no other devices connected to the SCSI chain, make sure the computer's SCSI ID number is set to 2.

8. If one of the devices is an Apple Scanner and there are other devices connected to the SCSI chain, make sure the Apple Scanner's SCSI ID number is lower than that of any other device.

9. If the device is an Apple Scanner and there are no other devices connected to the SCSI chain, make sure the computer's SCSI ID number is set to 2.

10. If any device in the chain is a scanner, make sure the card ID is not set to 0.

11. If the device is a non-Apple device, it may already have a terminator. (See the manual for that device.) If the device contains a terminator, don't add an external terminator.

12. The hard drive may not supply termination power, in which case it can never be used alone on the SCSI chain, or the hardware may be damaged. Back up the drive, if possible, and take it in for service. (See the manual that came with the drive for information about termination, or contact the manufacturer.)

13. On the Apple IIGS with GS/OS, make sure you've installed the drivers for the SCSI card and for all of the devices connected to your computer.

14. If you want to start up from a device, make sure it contains an appropriate startup program.

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.
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 also offers service options designed to meet your needs. One of these is 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.

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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APDA, Mailstop 33-G
20525 Mariani Avenue
Cupertino, CA 95014-6299

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Fax: 408-562-3971
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AppleLink: APDA

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

Assembling a SCSI Chain

N ow that you've installed the Apple II High-Speed SCSI Card in your Apple IIe or Apple IIGS computer, it can communicate with up to seven SCSI devices. But first you need to connect them to your system. This chapter tells you how to set the SCSI ID numbers on your devices and then how to connect a chain of SCSI devices to your Apple IIe or Apple IIGS computer.

△ **Important:** If you have only one SCSI device to connect to your computer, do not use the instructions in this appendix. If you have an Apple IIe, see Chapter 1; if you have an Apple IIGS, see Chapter 2. △

To connect two or more SCSI devices to your computer, you'll need

- an Apple IIe Enhanced or Apple IIGS computer, with the Apple II High-Speed SCSI Card installed

- two or more SCSI devices

- a SCSI system cable

- a SCSI cable terminator

- one or more SCSI peripheral cables (depending on the number of devices you need to connect)

- a SCSI cable extender (if you want to put your devices farther away from each other than the cables allow)

SCSI cable extender ——

SCSI system cable ——

Apple IIGS computer ——

SCSI peripheral cable ——

SCSI terminator ——

Apple II High-Speed SCSI Card ——

Wrench and nuts ——
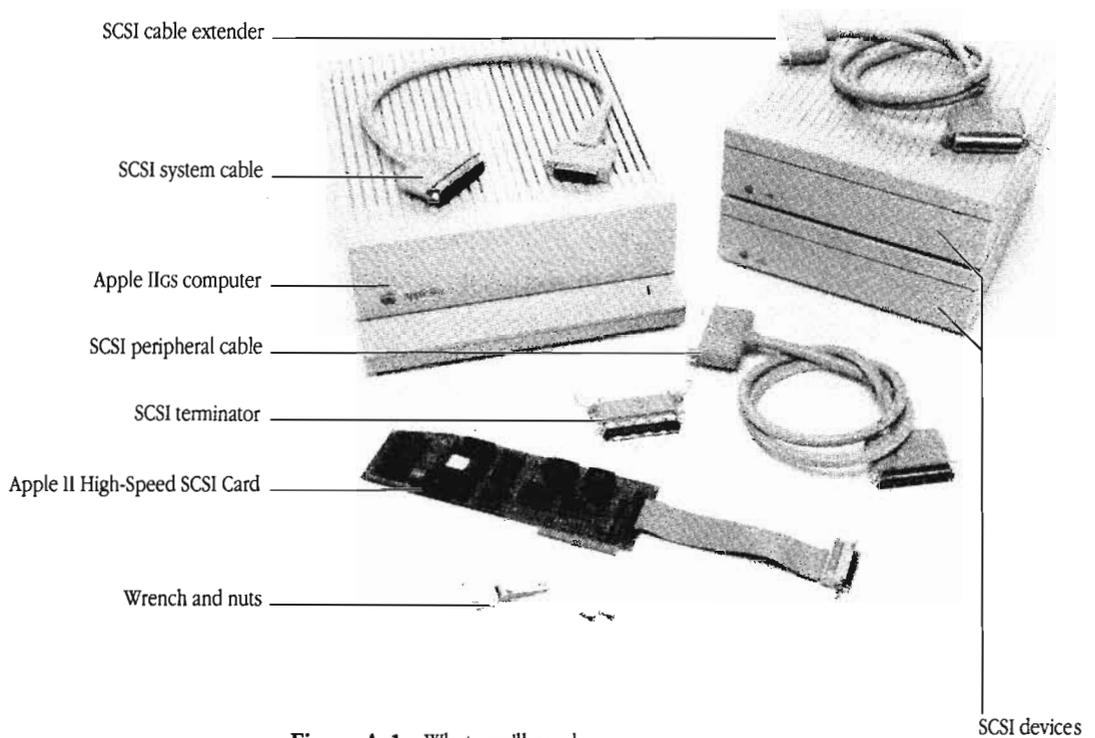
SCSI devices

Figure A-1 What you'll need

Setting the SCSI ID numbers

Before you connect your SCSI devices to your computer, take a moment to check the SCSI ID number on each device. The computer and each SCSI device connected to it must have a unique ID number between 0 and 7. This number gives the computer a way of identifying devices connected to it. It also determines the priority of the devices so that information can be exchanged between the computer and the SCSI devices efficiently. On SCSI devices manufactured by Apple Computer, the SCSI ID number appears in a small window on the back panel.

Here are some guidelines to help you decide what ID numbers to assign:

- If you'll be using one of the SCSI devices as your startup device, make sure its ID number is higher than that of any other SCSI device.

- Set ID numbers according to the types of devices you're connecting. Assign the highest numbers to storage devices, such as CD-ROM drives, hard disks, and so on. Assign lower numbers to less frequently used devices, such as printers, scanners, or tape backup units.

Follow these steps to set the SCSI ID number for each Apple SCSI device you'll be connecting to your Apple II computer. (If you have a SCSI device from another manufacturer, refer to the manual that came with it for instructions on setting the SCSI ID number.)

1. **Make sure the device is turned off.**

2. **Insert the point of a push pin or straightened paper clip into the SCSI ID switch and push gently.**

SCSI ID indicator
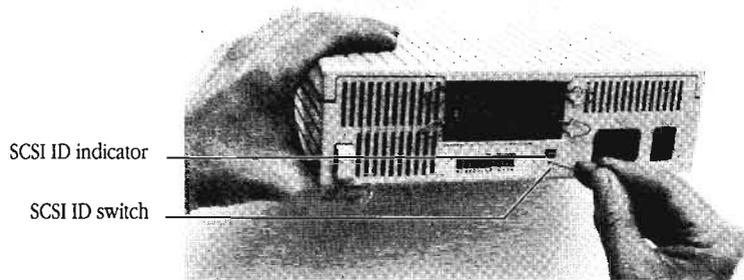
SCSI ID switch

Figure A-2 Setting the SCSI ID number

As you push, the number increases. If you accidentally go past the number you want, keep pushing until the number cycles around again.

△ **Important:** The computer's ID number is set with switches on the SCSI card. It is preset to 7. However, you may encounter instructions for specific SCSI devices—the Apple LaserWriter IISC or the Apple Scanner, for instance—that require you to reset the computer's ID number. You'll find more information in the section "Changing the Computer's SCSI ID Number" in Chapter 4. △

Some rules for SCSI chains

You're about to begin connecting cables and devices to create a SCSI chain. Before you begin, there are a few rules to keep in mind as you plan how to set up the chain.

- You can connect up to seven SCSI devices to the computer.

- You can use up to 20 feet (6.5 meters) of cables.

- SCSI chains must always include two terminators—one at each end of the chain.

△ **Important:** Because the Apple II High-Speed SCSI Card contains its own terminator, you need to attach only one other terminator. It should be attached to the last device in the chain. △

Connecting the SCSI devices

Follow these steps to connect your SCSI devices to your Apple IIe or Apple IIGS computer:

1. **Turn off the computer's power and leave the power cord plugged into a grounded outlet.**

2. **Make sure your SCSI devices are turned off, then plug each of them into a grounded power outlet. Don't turn the devices on yet.**

▲ **Warning:** Be certain your computer and all SCSI devices are turned off. If either the computer or any of the devices remains on, you could damage the SCSI card or the device. ▲

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 small end of the SCSI system cable to the SCSI port on the computer and tighten the thumbscrews.**

   You created the SCSI port when you connected the card to the back panel of the computer.
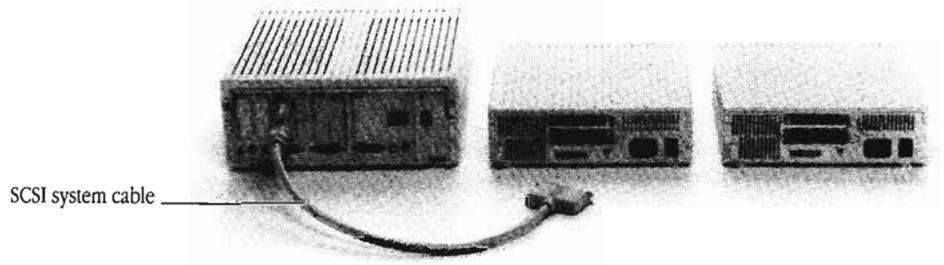
SCSI system cable

Figure A-3   Connecting the system cable

5. **If you want the first device to be more than 18 inches from your computer, connect a cable extender to the large end of the SCSI system cable.**

   The cable extender has clip brackets at both ends.

6. **Connect the large end of the SCSI system cable (or the other end of the cable extender) to either of the SCSI ports on the back of the first device in your SCSI chain.**

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

7. **Connect either end of the SCSI peripheral cable to the other port on the back of the first device.**

The peripheral cable has clip brackets at both ends. Snap the clips into the clip brackets to secure the connection.

SCSI system cable

SCSI peripheral cable
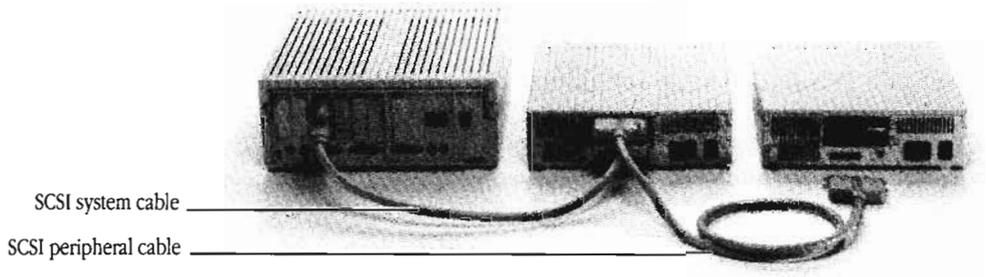
Figure A-4   Connecting the SCSI peripheral cable (without cable extender)

SCSI system cable

SCSI cable extender

SCSI peripheral cable
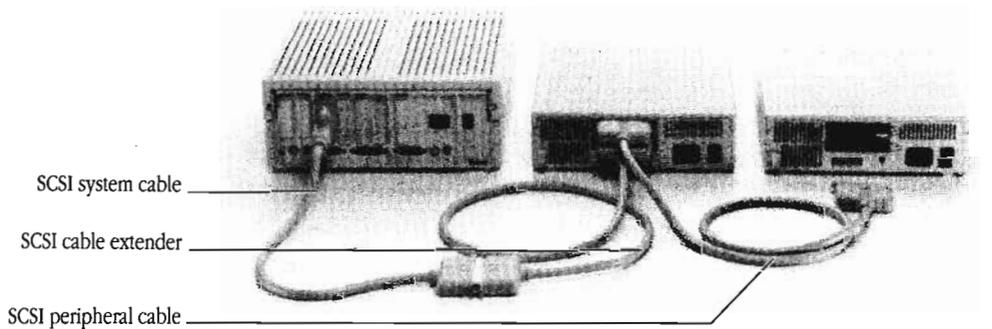
Figure A-5   Connecting the SCSI peripheral cable (with cable extender)

8. **Connect the other end of the SCSI peripheral cable to either of the SCSI ports on the back of the second device.**
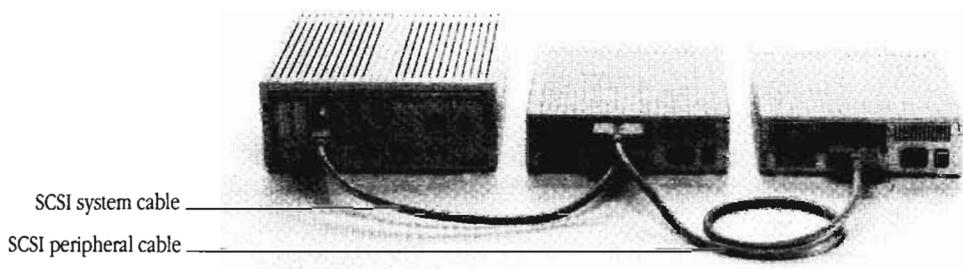
Figure A-6   Connecting the peripheral cable (without cable extender)
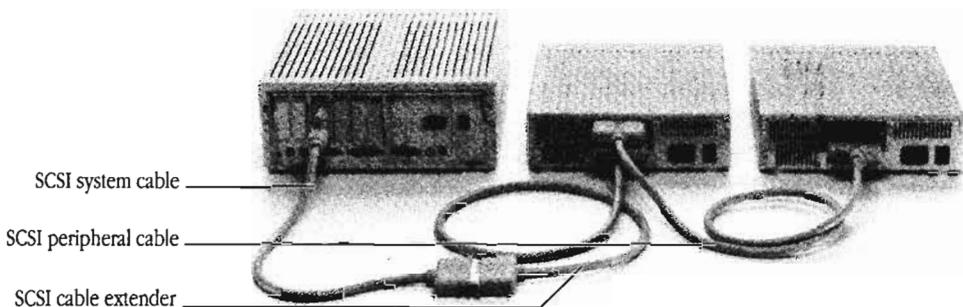
Figure A-7   Connecting the peripheral cable (with cable extender)

9. **Repeat steps 7 and 8 for each additional SCSI device you want to connect.**

10. **Connect the SCSI cable terminator to the remaining SCSI port on the back of the last SCSI device in your chain.**

△ **Important:** Although SCSI devices from Apple do not have built-in terminators, devices from other manufacturers may. Check the manual to make sure. If one of your devices has an internal terminator, place that device at the end of the chain, and do not add an external terminator. If you are connecting more than one device with an internal terminator, remove the extra terminators or have your Apple dealer remove them. △

SCSI terminator

SCSI system cable
SCSI peripheral cable
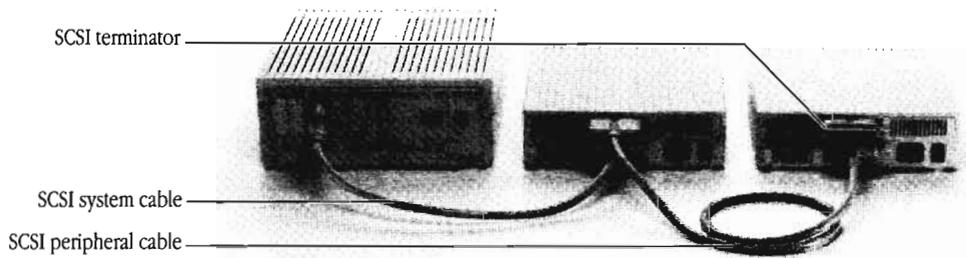
Figure A-8 A completed chain (without cable extender)

SCSI terminator

SCSI system cable

SCSI peripheral cable

SCSI cable extender
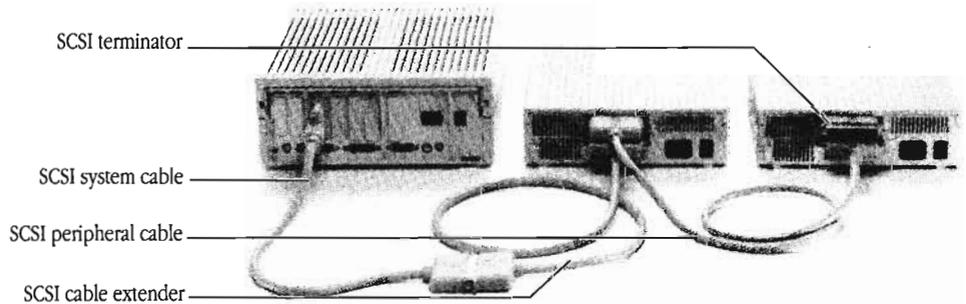
Figure A-9 A completed chain (with cable extender)

What's next?

Now that you've assembled your chain of SCSI devices, what you do next depends on how much experience you already have with operating your Apple IIe or Apple IIGS computer:

- If you were setting up your computer for the first time, go back to the setup instructions in the manual that came with your computer and continue setting up your computer system. Then you'll need to learn some basic computer skills and concepts before learning to use the programs that came with your Apple II High-Speed SCSI Card. After you've gone through the introductory materials that came with your computer, return to Chapter 3 of this guide.

- If you're already familiar with how to operate your computer, continue on to Chapter 3, "Using the SCSI Utility Programs." There, you'll learn how to use the programs that came with your Apple II High-Speed SCSI Card.

backup A copy of a disk or file. It's a good idea to make backups of all your important disks and of your hard disk.

bit A contraction of **binary digit.** The smallest unit of information a computer can hold. The value of a bit (1 or 0) represents a simple two-way choice, such as yes or no, on or off, positive or negative, something or nothing.

block A unit of storage. When you use a Verify utility to test a disk, the utility reports its progress, and any damage on the disk, in terms of numbers of blocks.

block device A device that stores information in blocks.

byte A unit of information consisting of a fixed number of **bits.** A byte can represent any value between 0 and 255. The sequence of bits in a byte represents an instruction, letter, number, punctuation mark, or other character.

destination volume The volume you are copying to.

DMA An acronym for Direct Memory Access, a feature that allows the SCSI card to write information to, and read information from, a storage medium (such as a disk drive) directly without having to depend on the computer's microprocessor to manage the operation.

file Any named, ordered collection of information stored on a disk—for example, a word-processed document or an application program.

GS/OS An operating system used with the Apple IIGS. GS/OS provides the capability to use the Apple IIGS Finder.

incremental backup A backup of those files modified or created since the last complete backup.

kilobyte A unit of storage capacity equal to 1024 bytes of information.

megabyte A measure of storage capacity equal to 1024 kilobytes, or about 500 full pages of information.

operating system   A program that handles the way information is transferred from disks to memory.

pathname   A sequence of names, each separated by a slash or colon, that specifies the path the operating system follows to locate a file. The pathname begins with the volume name, which is followed by the names of any folders or subdirectories in which the file is nested, and ends with the filename.

ProDOS 8   An Apple II operating system that supports mass storage devices such as hard disk drives. The utilities on the *Apple II High-Speed SCSI Card Utilities* disk use this operating system.

restore   To copy a file or group of files from a backup medium, such as a tape drive, to a floppy disk or hard disk.

SCSI   An acronym for *Small Computer System Interface,* which is a specification of mechanical, electrical, and functional standards for connecting peripheral devices (such as certain kinds of hard disks and printers) to small computers.

SCSI chain   A group of SCSI devices linked to one another using SCSI peripheral cables and linked to the SCSI port in the computer using a SCSI system cable.

SCSI ID number   A number assigned to a SCSI device. The computer uses the SCSI ID numbers to identify devices connected to it.

SCSI port   The port that you create by connecting the SCSI card's ribbon cable to the computer's back panel.

source volume   The volume you are copying files from.

volume   A place where files are stored. *Volume* is often used interchangeably with *disk,* although it is possible to have more than one volume on a disk or to have a volume that spans several disks.

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