AppleCD SC® Plus Owner's Guide

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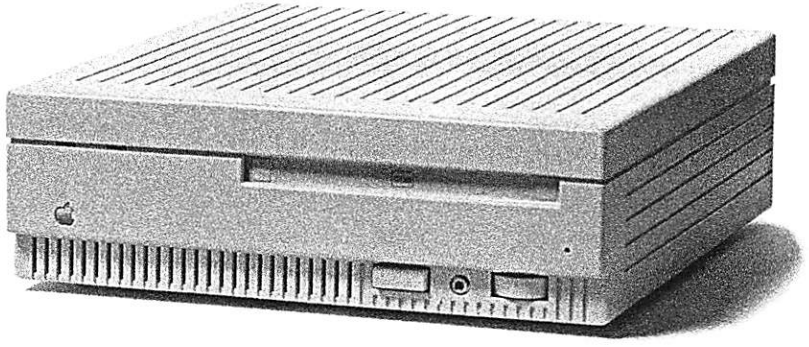
Important

This equipment has been tested and found to comply with the limits for a Class B digital device in accordance with the specifications in Part 15 of FCC rules. See instructions if interference to radio or television reception is suspected.

DOC Class B Compliance This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the radio interference regulations of the Canadian Department of Communications.

Observation des normes—Classe B Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la Classe B prescrites dans les règlements sur le brouillage radioélectrique édictés par le Ministère des Communications du Canada.

AppleCD SC® Plus Owner's Guide



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Contents

Radio and television interference

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

This equipment has been tested and found to comply with the limits for a Class B digital device in accordance with the specifications in 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 system 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.)

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: *Interference Handbook* (stock number 004-000-00345-4). This booklet is available from the U.S. Government Printing Office, Washington, DC 20402.

△ **Important:** Changes or modifications to this product not authorized by Apple Computer, Inc., could void the FCC certification and negate your authority to operate the product.

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

About This Book

This book explains how to install and use the AppleCD SC® Plus. You'll find a general introduction to the drive in Chapter 1, Macintosh® setup instructions in Chapter 2, Apple® II setup instructions in Chapter 3, a discussion of how to use CD-ROM discs in Chapter 4, and a discussion of how to play audio CDs and audio tracks on CD-ROM discs in Chapter 5. If you have problems setting up or using your AppleCD SC Plus, turn to Appendix A, "Troubleshooting." If you want to know how the AppleCD SC Plus works from a technical point of view, turn to Appendix B, "How the AppleCD SC Plus Works." If any of the CD-ROM terminology is confusing, turn to the glossary at the back of the book.

This book assumes that you are familiar with the information covered in the manuals that came with your computer. If you are unfamiliar with the basic operation of your computer, read your manuals before reading this book.

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

△ **Important:** Material set off like this is especially worth reading. △

▲ **Warning:** Text set like this warns you about situations that could cause harm to you or damage to your equipment or data. ▲

New terms are set off in boldface type the first time they are introduced. These terms will usually be defined in context; they will always be defined in the glossary at the back of the book.

Descriptions of specific tasks in this book often include numbered steps. Each step consists of a short instruction in boldface type followed (usually) by further explanation in plain type. Depending on your level of expertise with your computer, you may find that you can speed through some or all of the instructions by reading just the boldface steps.

If you have questions about the AppleCD SC Plus that aren't answered in this book, please send them to Apple on the Tell Apple card at the end of this book. Your feedback is invaluable in revising this guide and in writing manuals for similar products.

After you read Chapter 1, turn to Chapter 2 for Macintosh setup instructions or Chapter 3 for Apple II setup instructions.

About the AppleCD SC Plus

This chapter introduces the AppleCD SC® Plus drive, describes what you need in order to use it with your computer, and explains how to take care of it.

What is it?

The AppleCD SC Plus is a peripheral device for Macintosh® computers (excluding models earlier than the Macintosh Plus) and for Apple® IIGS® and enhanced Apple IIe computers. The *CD* in the name AppleCD SC Plus is short for CD-ROM drive. The *SC* is short for **SCSI,** an acronym for Small Computer System Interface. SCSI is a standard and very fast way for devices to exchange information with the computer and with each other. Using the AppleCD SC Plus, you can access the information stored on CD-ROM discs and play the audio passages on standard audio compact discs. **CD-ROM** is an acronym for *compact disc read-only memory. Read-only memory* means that information can be read from the **compact disc,** but not written on it.

CD-ROM discs are remarkable for the amount and diversity of information they can hold. One CD-ROM can hold up to 656 megabytes of information—that's 270,000 pages of text, one to eight hours of speech (depending on the sound quality), 2000 high-resolution images, or any combination of text, sound, and graphics. To give you some idea of how much text fits on a CD-ROM, consider this: it would take nine secretaries typing 100 words a minute for eight hours a day one year to fill up a single CD-ROM. To put it another way, one CD-ROM could contain an entire encyclopedia complete with illustrations, a 500-volume legal library, detailed financial reports on all the companies in the Fortune 500, or information on all the books in a library card catalog. Figure 1-1 gives you some idea of how the storage capacity of a CD-ROM compares to the storage capacity of magnetic disks.

The AppleCD SC Plus lets you access these CD-ROM libraries of text, sound, and graphics from your Macintosh or Apple II computer. You don't have to go to the library, hunt through a card catalog, then hunt through a shelf of books, then hunt through the index of a book to find the information you want—the library comes to your computer screen, and software does the searching and information retrieval for you. This ability to roam electronically through so much and so many kinds of information could revolutionize the way you work, learn, and create information of your own.

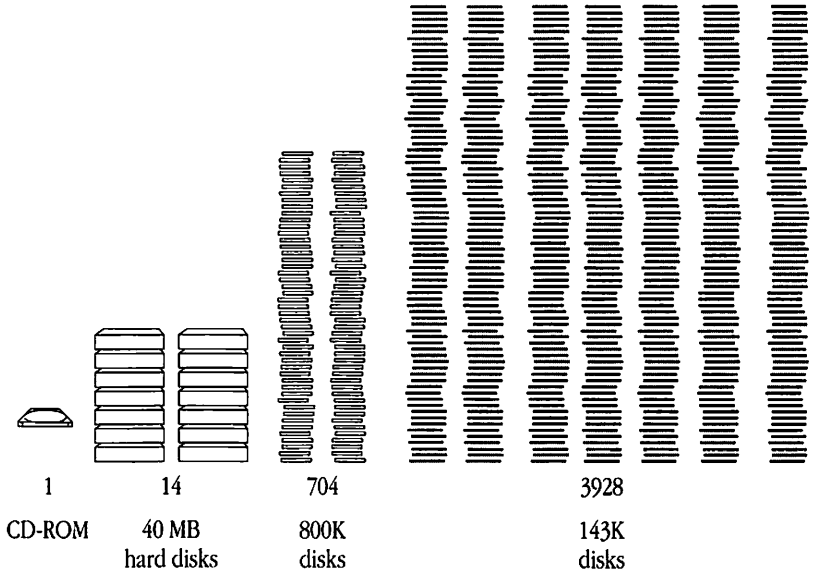

Figure 1-1 How the CD-ROM stacks up to other storage devices

Once you've set up your AppleCD SC Plus as described in Chapter 2, "Setting Up With a Macintosh," or Chapter 3, "Setting Up With an Apple II," you'll be able to use your AppleCD SC Plus with CD-ROM discs that use the ISO 9660/High Sierra format. **ISO** is the International Standards Organization. 9660 is the number ISO has assigned to the standard way of finding the information on CD-ROM discs. The **High Sierra format** is a subset of the ISO file system. Discs that conform to this standard can be accessed from a variety of different computers, including most Macintosh and Apple II computers. The retrieval software needs to be customized for the operating system of a particular type of computer, but information on a disc that uses the ISO 9660/High Sierra format does not.

For all its revolutionary potential, the AppleCD SC Plus is as easy to operate as its close relative, the audio CD player. Figure 1-2 gives you an overview of its parts.

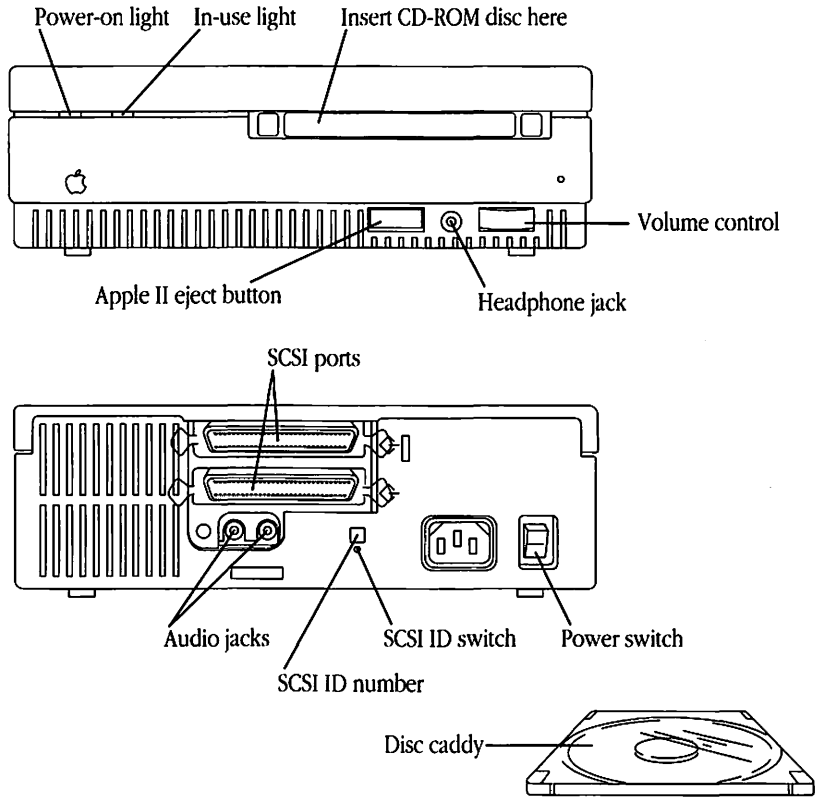

Figure 1-2 Anatomy of the AppleCD SC Plus

What you need

Besides the equipment in the AppleCD SC Plus box, you'll also need a SCSI cable for connecting the AppleCD SC Plus to your Macintosh or Apple II. (See Figure 1-3.) The reason you don't get the SCSI cable in the box is that there are two types: a **SCSI system cable** for connecting the AppleCD SC Plus directly to a Macintosh or to a SCSI card in an Apple II, and a **SCSI peripheral interface cable** for connecting the AppleCD SC Plus to another SCSI device. Determine which type of cable you need and get the appropriate cable from your authorized Apple dealer.

Depending on what other SCSI devices are connected to your computer, you may or may not need a **SCSI cable terminator.** See "About SCSI Devices," in Chapter 2 for Macintosh users or in Chapter 3 for Apple II users, to find out whether you need a cable terminator.

To connect the AppleCD SC Plus to an Apple IIe or Apple IIGS, you'll also need an Apple II High-Speed SCSI Card.

- *Note:* If you wish, you can use the version of the Apple II SCSI Card marked "Rev C" instead of the Apple II High-Speed SCSI Card. The Rev C designation appears on a label on the outside of the SCSI card box and on a label on the SCSI card ROM—the large chip located in the top row center of the SCSI card. Only the Rev C version of the Apple II SCSI Card will work with the AppleCD SC Plus. ❖

To use the AppleCD SC Plus with the **GS/OS®** operating system on an Apple IIGS computer, you must have GS/OS system software version 5.0.4 installed on your startup disk. The startup disk must be a hard disk, and your Apple IIGS must have at least 1 megabyte of random-access memory (RAM). Your authorized Apple dealer can help you obtain system software, memory, and any additional equipment you need.

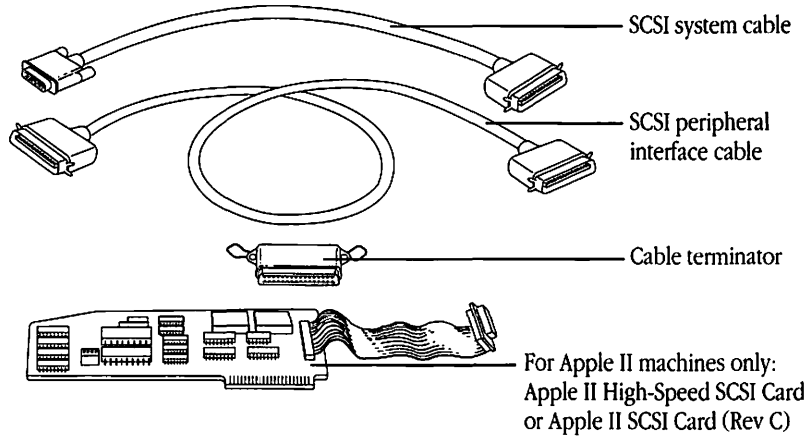

Figure 1-3 Equipment you'll need

Care and handling

Keep these important safety instructions in mind as you install and use your AppleCD SC Plus.

- Never transport the AppleCD SC Plus with a CD-ROM or a caddy inside.
- Never try to remove the cover from your AppleCD SC Plus. The AppleCD SC Plus contains high-voltage components that retain an electrical charge, even after the unit is switched off.
- Keep all air vents clear. Leave at least 4 inches of clearance between the vents on the back of the AppleCD SC Plus and any object that may restrict air flow.
- Keep your computer equipment away from any source of liquid (such as wash basins, bathtubs, and shower stalls). If you drink coffee or other beverages while you're at your computer, take care not to spill.
- Avoid exposing your equipment to damp or wet weather. If your system is near a window, be sure the window is closed in rainy weather.

- Avoid exposing your equipment to dust. If dust collects on the lens inside your AppleCD SC Plus, the drive might have problems recognizing your CD-ROM discs.
- Keep these instructions handy for reference.
- Follow all instructions and warnings dealing with your system.

▲ **Warning:** Electrical equipment may be hazardous if misused. Operation of this product or similar products must always be supervised by an adult. Do not permit children to handle cables. ▲

Once you've set up your AppleCD SC Plus and plugged it into a power source, you shouldn't need to disconnect it except under the following conditions:

- if the power cord or plug is frayed or otherwise damaged
- if anything is spilled into the equipment
- if your equipment is exposed to rain or any other excess moisture
- if your equipment is dropped or the case has been damaged
- if you suspect that your AppleCD SC Plus needs servicing or repair
- whenever you clean the case

When you disconnect the power plug, pull on the plug, not the cord.

If you need to clean the outside of the AppleCD SC Plus case,

- use a damp (not wet) lint-free cloth.
- don't use aerosol sprays, solvents, alcohol, ammonia-based products, or abrasives that might damage the equipment's finish.
- don't allow liquid or any foreign object to get into the drive.

Setting Up With a Macintosh

This chapter explains how to connect the AppleCD SC Plus to a Macintosh computer. If you are connecting your AppleCD SC Plus to an Apple IIGS or an enhanced Apple IIe computer, skip this chapter and go to Chapter 3.

The AppleCD SC Plus is a SCSI device, which means that it exchanges information with the computer according to the SCSI (Small Computer System Interface) standard. This standardization makes it possible for several SCSI devices to share the same port on the back of the computer and to share the same fast, efficient method of exchanging information with the computer and each other. You connect the first device directly to the port, and you connect other devices to each other to form a **SCSI chain.** (Note that Macintosh models earlier than the Macintosh Plus do not have a SCSI port and therefore cannot be connected to an AppleCD SC Plus.)

Before you read the specific instructions for connecting an AppleCD SC Plus to a Macintosh, you need to know something about connecting SCSI devices. The general rules for connecting SCSI devices are explained in the following section and summarized in Figure 2-1.

About SCSI devices

You connect the first SCSI device to the SCSI port on your computer using a SCSI system cable. The system cable is 18 inches long with a 50-pin connector on one end and a 25-pin connector on the other. You connect additional SCSI devices to each other using SCSI peripheral interface cables. Peripheral interface cables are 3 feet long with a 50-pin connector at both ends. If your SCSI devices are more than 3 feet apart, you can attach **SCSI cable extenders** to peripheral interface cables to make them longer.

△ **Important:** The total length of the SCSI chain cannot exceed 20 feet. △

You need a SCSI cable terminator at the beginning and end of the SCSI chain. A terminator absorbs the signals traveling along the cable, keeping the path open for new signals. If you have only one SCSI device, you need only one cable terminator. If you have two or more SCSI devices, you may need two terminators, depending on how many of the SCSI devices have built-in terminators.

△ **Important:** Do not use more than two cable terminators in one SCSI chain. △

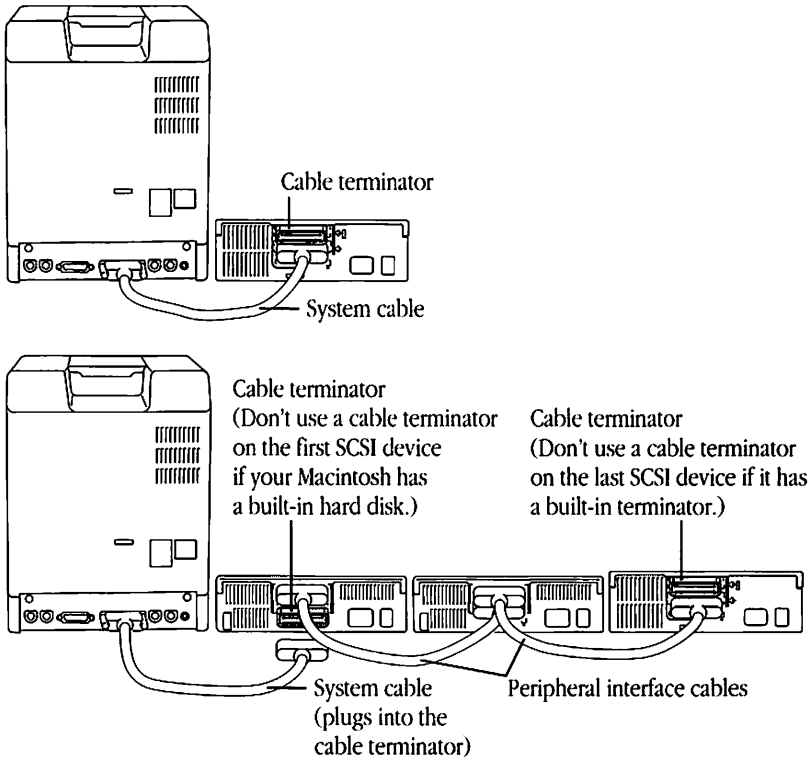

Figure 2-1 Connecting SCSI devices

In counting your cable terminators, be aware that some SCSI devices have cable terminators built in. This is the case with the Apple internal SCSI hard disk. Apple *external* SCSI devices do not have built-in cable terminators, but some non-Apple SCSI devices may. Check the manual furnished with the non-Apple device to see if it has a built-in terminator. If your device has a built-in terminator, put it at the beginning or end of the SCSI chain. If you have more than two external devices with built-in terminators, ask your authorized Apple dealer to remove the terminator from one or more of these devices.

Setting the SCSI ID number

Each SCSI device must have a unique ID number. This number gives the computer a way of identifying devices in a SCSI chain. The number need not conform to the physical location of the device in the SCSI chain. The numbers range from 0 to 7. Apple has designated standard **SCSI ID numbers** for different SCSI devices. These numbers are set for you, and you don't need to change the number unless you have two devices of the same type or unless you have a non-Apple device set to a number already in use. The computer's SCSI ID number is 7. The SCSI ID number for the AppleCD SC Plus is 3. The Apple internal hard disk's SCSI ID number is 0.

You'll find the ID number for the AppleCD SC Plus on the back below the bottom SCSI port. See Figure 2-2. If it is set to 3 and you don't have any other SCSI device set to 3, you can skip the rest of these instructions. If you need to change the ID number for the AppleCD SC Plus, follow these instructions:

1. **Make sure the AppleCD SC Plus is turned off.**
2. **Decide on an unassigned SCSI ID number.**
3. **Insert the point of a pushpin or a straightened paper clip into the SCSI ID switch.**

   The SCSI ID switch is the hole below the SCSI ID number. See Figure 2-2.

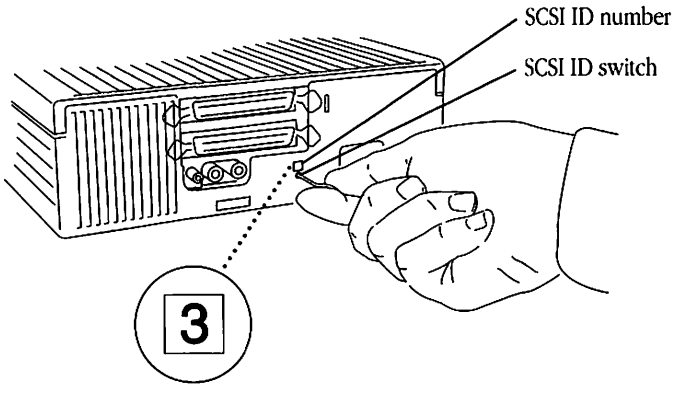

Figure 2-2 Inserting a pin into the SCSI ID switch

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

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

Connecting SCSI devices

You can connect up to seven SCSI devices to the SCSI port on your Macintosh computer. These instructions start from the assumption that you don't have any devices connected to your SCSI port. If you already have one or more devices connected to the SCSI port, read through the instructions to be sure you have connected the first SCSI device or devices correctly, then connect your AppleCD SC Plus according to the instructions beginning with step six.

△ **Important:** Besides the equipment in the box, you'll also need a SCSI cable for connecting the AppleCD SC Plus to your Macintosh. Get an Apple SCSI System Cable if you are connecting the AppleCD SC Plus directly to the computer. Get an Apple SCSI Peripheral Interface Cable if you're connecting the AppleCD SC Plus to another SCSI device. If you also need an Apple SCSI Cable Terminator, get one from your authorized Apple dealer. △

1. **Make sure your computer is plugged in and turned off.**
2. **Make sure your AppleCD SC Plus and any other SCSI devices are turned off, then plug each of them into a grounded power outlet.**

   The AppleCD SC Plus power cord came in the box with this guide. Plug it into the recessed power plug on the back of the AppleCD SC Plus as shown in Figure 2-3.

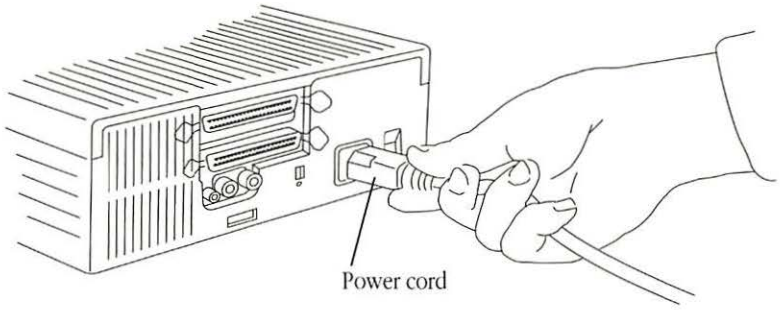

Figure 2-3 Plugging the power cord into the AppleCD SC Plus

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

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

   Doing this discharges any static electricity that may be on your clothes or body.

4. **Attach the system cable to the SCSI port on your computer and tighten the screws on the connector.**

   See Figure 2-4.

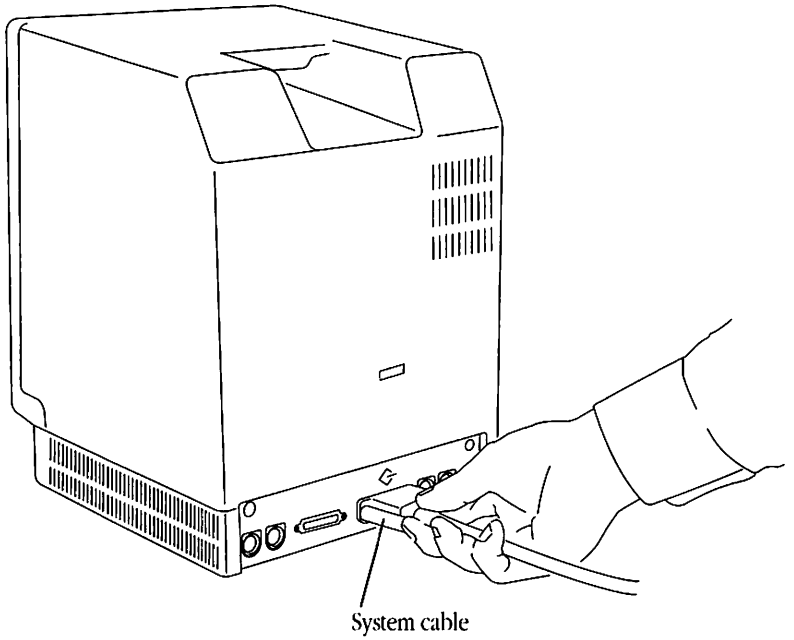

Figure 2-4 Attaching the system cable to the SCSI port on the computer

5. **Connect the system cable (and cable terminator if necessary) to the first SCSI device.**

   - If you are connecting only one SCSI device, plug the system cable into one port on the device and plug the cable terminator into the other port on the device. (See Figure 2-5.)

     Snap the diamond-shaped wire clips into the clip brackets to secure the connection. If you are connecting only one SCSI device, skip to the next section, "Installing the Resources for the AppleCD SC Plus."

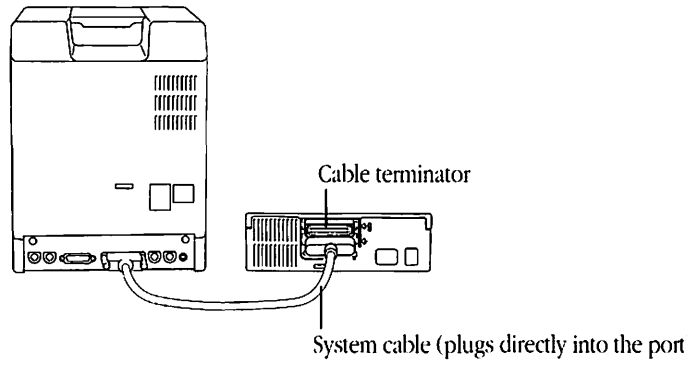

Figure 2-5 Attaching the system cable to one device

- If you are connecting two or more SCSI devices, plug the cable terminator and the system cable into the same port as shown in Figure 2-6. Snap the diamond-shaped wire clips into the clip brackets to secure the connection. (The cable terminator is not necessary if your Macintosh has a built-in hard disk.)

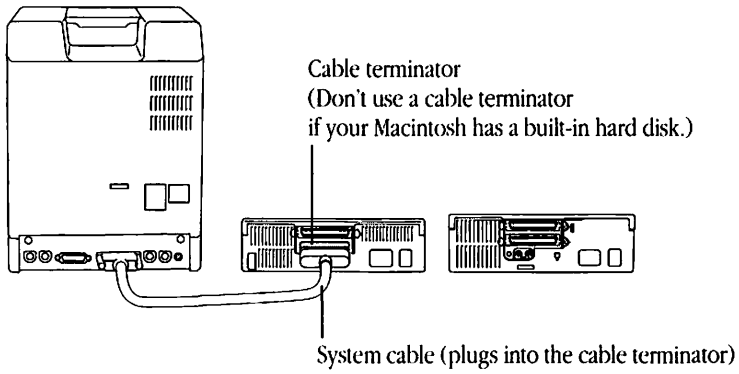

Figure 2-6 Attaching the system cable to the first device in a chain

6. **If you have additional SCSI devices, connect a peripheral interface cable to the other port on your first SCSI device.**

   See Figure 2-7. Snap the clips into the clip brackets to secure the connection.

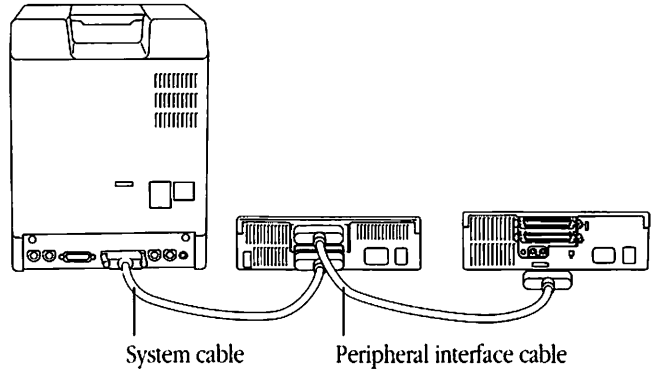

Figure 2-7 Attaching the peripheral interface cable to the first SCSI device

7. **Attach the other end of the peripheral interface cable to one of the ports on your next SCSI device.**

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

   Continue linking SCSI devices in this fashion up to a total of seven SCSI devices (not counting the computer).

8. **If necessary, plug a cable terminator into the empty port on the last SCSI device.**

   Don't use the cable terminator if the last device has a built-in cable terminator. Apple's external SCSI devices don't have built-in terminators, but SCSI devices from other manufacturers may. If you have any questions about whether to use a cable terminator at the end of your SCSI chain, ask your authorized Apple dealer.

   See Figure 2-8. If you use a cable terminator, snap the clips into the clip brackets to secure the connection.

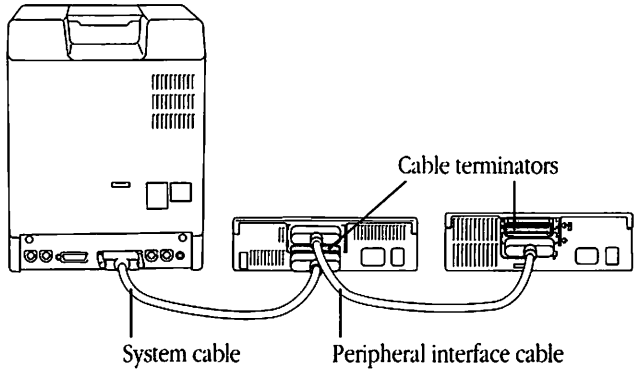

Figure 2-8 Plugging a cable terminator into the empty SCSI port on the last device

Installing the resources for the AppleCD SC Plus

Resources tell the computer how to communicate with a particular type of peripheral device. The AppleCD SC Plus resources are on the *Macintosh CD Setup* disk that came with your AppleCD SC Plus. You can install all the resources in one easy step, or you can customize your system by installing only the resources you need. In most cases, you'll want to install all the AppleCD SC Plus resources.

- *System file versions:* The AppleCD SC Plus is compatible with system software version 6.0.5 or later. (To find out which system software version you are using, look at the top of the Get Info window for the System file.) If you have an earlier version of the system software, see your authorized Apple dealer for an upgrade.

Installing all the resources

Here's how to install all the resources for the AppleCD SC Plus:

1. **Copy the *Macintosh CD Setup* disk onto a blank 3.5-inch disk.**

   After you've made a copy of the *Macintosh CD Setup* disk, put the original in a safe place. You shouldn't need it again unless something happens to your working copy.

2. **Insert your working copy of the *Macintosh CD Setup* disk.**

   You don't need to turn on the AppleCD SC Plus yet.

3. **Open the *Macintosh CD Setup* disk icon.**

4. **Open the Installer icon.**

   You'll see the Easy Install dialog box shown in Figure 2-9.

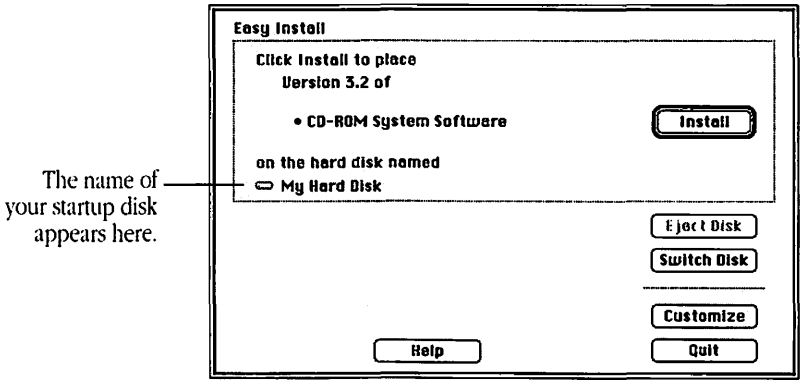

Figure 2-9 Easy Install dialog box

5. **If necessary, click the Switch Disk button until the name of the startup disk is displayed next to the disk icon.**

6. **Click Install.**

   After a short time, you'll see a message telling you that installation was successful and that you must now restart your computer.

7. **Click Restart.**

   You need to restart your computer in order for changes you've made in your System Folder to take effect.

Now read Chapter 4 for instructions on using CD-ROM discs. Read Chapter 5 for instructions on playing audio CDs or audio tracks on CD-ROM discs.

Installing specific resources

The Customize option lets you choose which AppleCD SC Plus resources you want to install on your startup disks.

△ **Important:** To use hierarchical file system (HFS) or ISO 9660/High Sierra discs, you must install the CD-ROM System Driver Software and the Foreign File System software. △

Here's how to install selected AppleCD SC Plus resources:

1. **Copy the *Macintosh CD Setup* disk onto a blank 3.5-inch disk.**

   After you've made a copy of the *Macintosh CD Setup* disk, put the original in a safe place. You shouldn't need it again unless something happens to your working copy.

2. **Insert your working copy of the *Macintosh CD Setup* disk.**
3. **Open the *Macintosh CD Setup* disk icon.**
4. **Open the Installer icon.**

   You'll see the Easy Install dialog box shown in Figure 2-9.

5. **Click Customize.**

   You'll see the Customize dialog box shown in Figure 2-10.

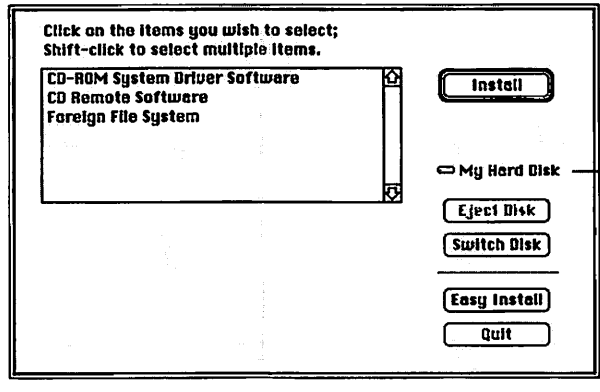

Figure 2-10 Customize dialog box

6. **If necessary, click the Switch Disk button until the name of the startup disk is displayed next to the disk icon.**

7. **Select the resources you want to install from the list of resources.**

   Information about each resource appears in the bottom of the Customize dialog box as you select it.

8. **Click Install.**

   After a short time, you'll see a message telling you that installation was successful and that you must now restart your computer.

9. **Click Restart.**

   You need to restart your computer in order for changes you've made in your System Folder to take effect.

Now read Chapter 4 for instructions on using CD-ROM discs. Read Chapter 5 for instructions on playing audio CDs or audio tracks on CD-ROM discs.

Setting Up With an Apple II

This chapter explains how to connect the AppleCD SC Plus to an Apple IIGS or an enhanced Apple IIe computer. If you are connecting your AppleCD SC Plus to a Macintosh, go to Chapter 2.

The AppleCD SC Plus is a SCSI device, which means that it exchanges information with the computer according to SCSI (Small Computer System Interface) standards. This standardization makes it possible for several SCSI devices to share the same fast, efficient method of exchanging information with the computer and each other. You connect the first device to a SCSI card, and you connect other devices to each other to form a **SCSI chain.** The SCSI card must be either an Apple II High-Speed SCSI Card, which is available from your authorized Apple dealer, or an Apple II SCSI Card (Rev C), an older type of SCSI card that also works with the AppleCD SC Plus. See the manual that came with the SCSI card for instructions on installing it.

The number of SCSI devices you can connect to one SCSI card depends on the operating system you are using and, under **ProDOS**® 8 software, the slot in which your SCSI card is installed.

If you're using ProDOS 8 software and the card is installed in slot 5, you can attach four devices to the card. If you're using ProDOS 8 software and the card is installed in one of the other slots, you are limited to two devices.

If you're using GS/OS software, you can attach up to seven devices to the card, no matter which slot the card is installed in. Each device can be divided into as many as 32 volumes.

See the manual that came with your SCSI card for other special instructions about installing and using the card.

Before you read the specific instructions for connecting an AppleCD SC Plus to an Apple II, you need to know something about connecting SCSI devices. The general rules for connecting SCSI devices are explained in the following section and summarized in Figure 3-1.

About SCSI devices

You connect the first SCSI device to a SCSI card inside your computer using a SCSI system cable. The system cable is 18 inches long. It has a 50-pin connector on one end and a 25-pin connector on the other. You connect additional SCSI devices to each other using SCSI peripheral interface cables. Peripheral interface cables are 3 feet long and have a 50-pin connector at both ends. If your SCSI devices are more than 3 feet apart, you can attach **SCSI cable extenders** to peripheral interface cables to make them longer.

△ **Important:** The total length of the SCSI chain cannot exceed 20 feet. △

You need a SCSI cable terminator at the beginning and end of the SCSI chain. A terminator absorbs the signals traveling along the cable, keeping the path open for new signals. If you have only one SCSI device, you need only one cable terminator. If you have two or more SCSI devices, you may need two terminators, depending on which SCSI card you have.

△ **Important:** Do not use more than two cable terminators in one SCSI chain. The Apple II High-Speed SCSI Card contains a built-in terminator. If you have the high-speed SCSI card, you'll need to add only one cable terminator, at the end of the SCSI chain. △

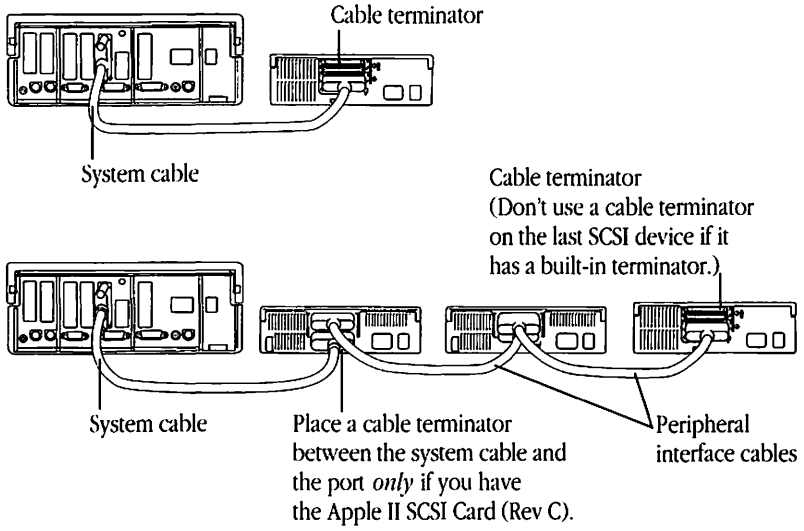

Figure 3-1 Connecting SCSI devices

In counting your cable terminators, be aware that some SCSI devices have cable terminators built in. Apple external SCSI devices do not have built-in cable terminators, but some non-Apple SCSI devices may. Check the manual furnished with the non-Apple device to see if it has a built-in terminator. If your device has a built-in terminator, put the device at the end of the SCSI chain. If you have more than two devices with built-in terminators, ask your authorized Apple dealer to remove the terminator from one or more of these devices.

Setting the SCSI ID number

Each SCSI device must have a unique ID number between 0 and 7. This number gives the computer a way of identifying devices in a SCSI chain and determines the priority of the devices. The computer's **SCSI ID number** is 7—the highest priority. If you want to start up from one of the devices in the SCSI chain, you should assign that device the number 6—the highest priority after the computer itself.

Set the AppleCD SC Plus SCSI ID number to 0. Removable media like CD-ROM discs can cause identity problems for other devices in a SCSI chain under ProDOS 8. By assigning the lowest priority to the AppleCD SC Plus and limiting each SCSI chain to one removable-media device, you will avoid this problem.

You'll find the SCSI ID number for the AppleCD SC Plus on the back below the bottom SCSI port. (See Figure 3-2.) Follow these instructions to set the ID number:

1. **Make sure the AppleCD SC Plus is turned off.**
2. **Insert the point of a pushpin or a straightened paper clip into the SCSI ID switch.**

   The SCSI ID switch is the hole below the SCSI ID number. (See Figure 3-2.)

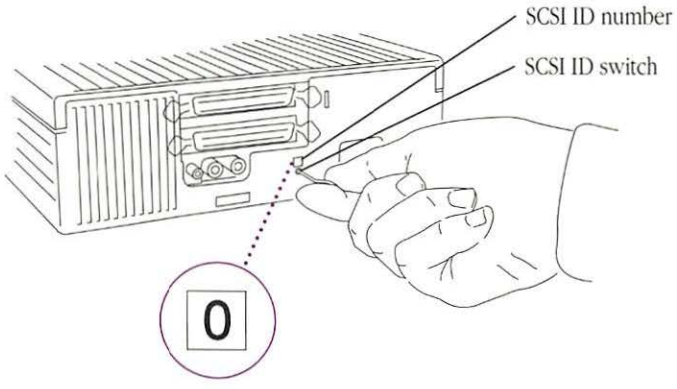

Figure 3-2 Inserting a pin into the SCSI ID switch

3. **Push gently until the number 0 appears.**

   If you go past 0, keep pushing until it cycles around again.

Connecting SCSI devices

These instructions start from the assumption that you have installed a SCSI card in your computer and that you don't have any devices connected to your SCSI card. If you already have one or more devices connected to the card, read through the instructions to be sure you have connected the first SCSI device or devices correctly, then connect your AppleCD SC Plus according to the instructions beginning with step six.

△ **Important:** Besides the equipment in the box, you'll also need a SCSI cable for connecting the AppleCD SC Plus to your Apple II. Get an Apple SCSI System Cable if you are connecting the AppleCD SC Plus directly to the SCSI card. Get an Apple SCSI Peripheral Interface Cable if you're connecting the AppleCD SC Plus to another SCSI device. If you also need a cable terminator, ask your authorized Apple dealer for the Apple SCSI Cable Terminator. △

1. **Make sure your computer is plugged in and turned off.**
2. **Make sure your AppleCD SC Plus and any other SCSI devices are turned off, then plug each of them into a grounded power outlet.**

   The AppleCD SC Plus power cord came in the box with this manual. Plug it into the recessed power plug on the back of the AppleCD SC Plus as shown in Figure 3-3.

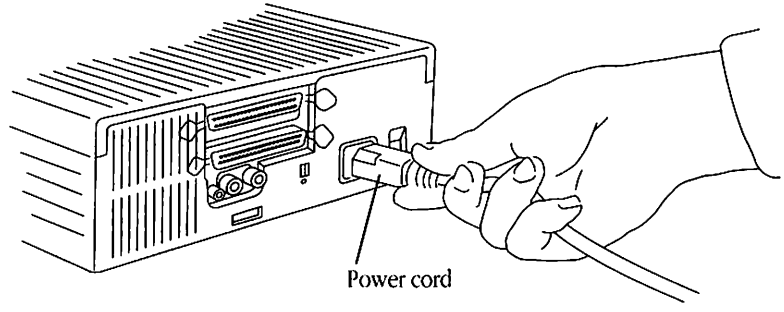

Figure 3-3 Plugging the power cord into the AppleCD SC Plus

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

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

   Doing this discharges any static electricity that may be on your clothes or body.

4. **Attach the system cable to the cable from the SCSI card and tighten the screws on the connector.**

   See Figure 3-4.

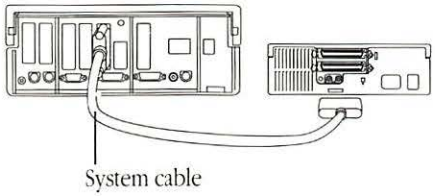

Figure 3-4 Attaching the system cable to the SCSI card cable

5. **Connect the system cable (and cable terminator if necessary) to the first SCSI device.**

   - If you are connecting only one device, plug the system cable into one port on the device and plug the cable terminator into the other port on the device. (See Figure 3-5.)

     Snap the diamond-shaped wire clips into the clip brackets to secure the connection. If you are connecting only one SCSI device, skip to the section "About the Apple II CD Setup Disks" later in this chapter.

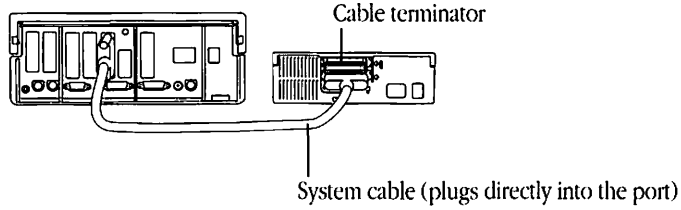

Figure 3-5 Attaching the system cable to one device

- If you are connecting two or more SCSI devices, plug the system cable into one port on the device. If you have the Apple II SCSI Card (Rev C), plug a cable terminator and the system cable into the same port, as shown in Figure 3-6. Snap the diamond-shaped wire clips into the clip brackets to secure the connection.

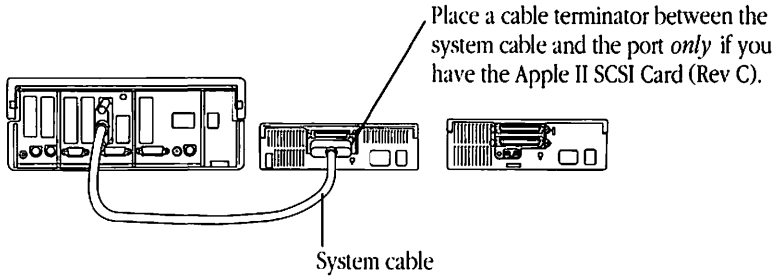

Figure 3-6 Attaching the system cable to the first device in a chain

6. **If you have additional SCSI devices, connect a peripheral interface cable to the other port on your first SCSI device.**

   See Figure 3-7. Snap the clips into the clip brackets to secure the connection.

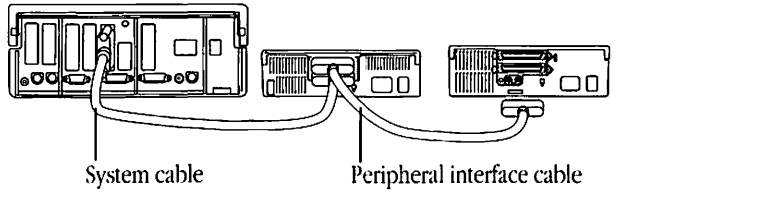

Figure 3-7 Attaching the peripheral interface cable to the first SCSI device

7. **Attach the other end of the peripheral interface cable to one of the ports on your next SCSI device.**

   Snap the clips into the clip brackets to secure the connection. Continue linking SCSI devices in this fashion. ProDOS 8–based application programs will recognize up to four SCSI devices if your SCSI card is in slot 5, or two SCSI devices if your SCSI card is in a slot other than 5.

8. **If necessary, plug a cable terminator into the empty port on the last SCSI device.**

   Don't use the cable terminator if the last device has a built-in cable terminator. Apple's external SCSI devices don't have built-in terminators, but SCSI devices from other manufacturers may. If you have any questions about whether or not to use a cable terminator at the end of your SCSI chain, ask your authorized Apple dealer.

   See Figure 3-8. If you use a cable terminator, snap the clips into the clip brackets to secure the connection.

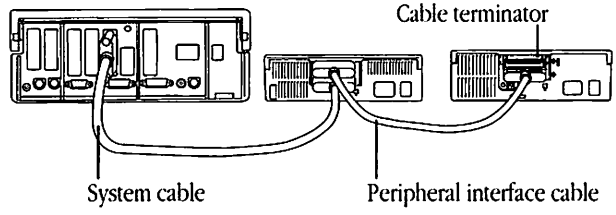

Figure 3-8 Plugging the cable terminator into the empty SCSI port on the last device

About the Apple II CD setup disks

Two Apple II CD setup disks are included with the AppleCD SC Plus: a 3.5-inch disk and a 5.25-inch disk. If you are running GS/OS on an Apple IIGS, use the 3.5-inch disk labeled *Apple IIGS CD Setup* to install the Apple IIGS resources for the AppleCD SC Plus on your startup disk. To work efficiently under GS/OS, your startup disk should be a hard disk.

To use ISO 9660/High Sierra CD-ROM discs with ProDOS 8, follow the instructions that came with the disc. You won't need to use either of the Apple II CD setup disks.

To play audio CDs or audio tracks on CD-ROM discs while running ProDOS 8 on an Apple IIGS or Apple IIe computer, you must start up your computer with one of the CD setup disks. If you have a 3.5-inch drive, use the *Apple IIGS CD Setup* disk. If you have a 5.25-inch drive, use the *Apple II CD Setup* disk. Read "ProDOS 8 Instructions" in Chapter 5 for instructions on using audio CDs under ProDOS 8.

△ **Important:** Any ProDOS 8 application programs you use with ISO 9660/High Sierra CD-ROM discs must be designed specifically to use the ISO 9660/High Sierra format. △

Installing the Apple IIGS resources for the AppleCD SC Plus

Resources tell the computer how to communicate with a particular type of peripheral device. The Apple IIGS resources for the AppleCD SC Plus are on the 3.5-inch disk labeled *Apple IIGS CD Setup*, which came with your AppleCD SC Plus. To operate your AppleCD SC Plus under GS/OS, you must first install the Apple IIGS resources on your startup disk, which should be a hard disk.

- *GS/OS system software version:* The AppleCD SC Plus is compatible with GS/OS system software version 5.0.4 or later. To run system software version 5.0.4, your Apple IIGS must have a least 1 megabyte of random-access memory (RAM). Your authorized Apple dealer can help you obtain the system software and memory you need.

To install the Apple IIGS resources for the AppleCD SC Plus on a hard disk with GS/OS system software version 5.0.4 or later installed, follow these steps:

1. **Turn on your hard disk and the AppleCD SC Plus.**
2. **Turn on your computer.**
3. **Copy the *Apple IIGS CD Setup* disk onto a blank 3.5-inch disk.**

   After you've made a copy of the *Apple IIGS CD Setup* disk, put the original in a safe place. You shouldn't need it again unless something happens to your working copy.
4. **Insert your working copy of the *Apple IIGS CD Setup* disk in your computer's disk drive.**

   You'll see a window called APPLEIIGS.FILES.
5. **Open the Installer icon in the APPLEIIGS.FILES window.**

   You'll see the Apple IIGS Installer dialog box shown in Figure 3-9.

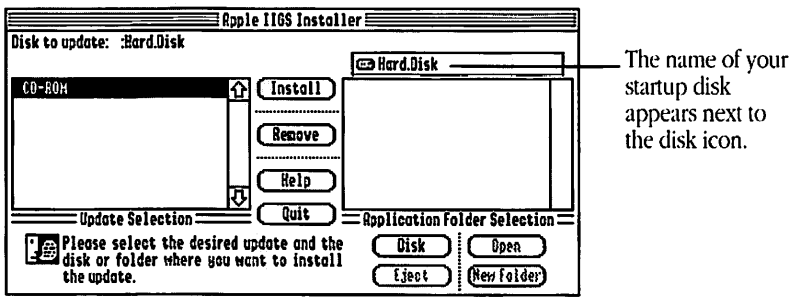

Figure 3-9 The Apple IIGS Installer dialog box

6. **If necessary, click the Disk button until the name of your hard disk is displayed next to the disk icon.**
7. **Click Install.**
8. **When you get the message "The Installation has been successfully completed," click OK.**
9. **Click the Disk button until the name *CD.Setup* is displayed next to the disk icon.**
10. **Click Eject.**

    The disk drive ejects the *Apple IIGS CD Setup* disk.
11. **Click Quit.**

    A message appears alerting you that the system files on your startup disk have been altered.
12. **Click Restart System.**

    You need to restart your computer in order for the changes you've just made to your system files to take effect.

Now read Chapter 4 for instructions on using CD-ROM discs. Read Chapter 5 for instructions on playing audio CDs or audio tracks on CD-ROM discs.

Using CD-ROM Discs

This chapter provides general instructions for using CD-ROM discs with the AppleCD SC Plus. You may get additional specific instructions with individual discs.

Operating instructions

When you buy a CD-ROM, it usually comes in a container called a **jewel case.** The jewel case protects the CD-ROM from scratches during shipping and handling at the store. Before you start up a CD-ROM, you must put it into a **caddy**—a plastic case that protects the CD-ROM from damage. When you insert the caddy into the AppleCD SC Plus, the metallic shutter on the caddy slides away to expose a section of the disc to the drive's optical read head.

CD-ROM discs are as sturdy as audio CDs, and there is special data on CD-ROM discs to correct errors resulting from tiny scratches. But serious scratches could possibly wipe out pages of information. Because a gap in data can't be smoothed over the way a gap in sound can be, the AppleCD SC Plus was designed to access CD-ROM discs and CDs inside protective caddies. You may find it convenient to store your CD-ROM discs in caddies when they're not in use. You can get additional caddies from your authorized Apple dealer.

△ **Important:** The CD-ROM must be inside the caddy before you insert it into the AppleCD SC Plus. △

Starting up

Follow these instructions to put a CD-ROM disc into the caddy and to put the caddy into the AppleCD SC Plus. After that, follow the instructions that came with the CD-ROM you're using.

❖ *By the way:* You won't hear the audio portion of a CD-ROM disc if your AppleCD SC Plus is connected to a computer that is functioning as a file server under GS/OS or under Macintosh system software versions earlier than version 7.0. If you are using a Macintosh with system software version 7.0 or later and you have set up the AppleCD SC Plus as a shared volume on your own computer, you will be able to hear the audio portion of a CD-ROM disc yourself, but other people on the network who have access to the AppleCD SC Plus will not be able to hear it. ❖

1. **Open the caddy.**

   Press in on the corners of the case with one hand while you lift the clear plastic lid with the other hand. (See Figure 4-1.)

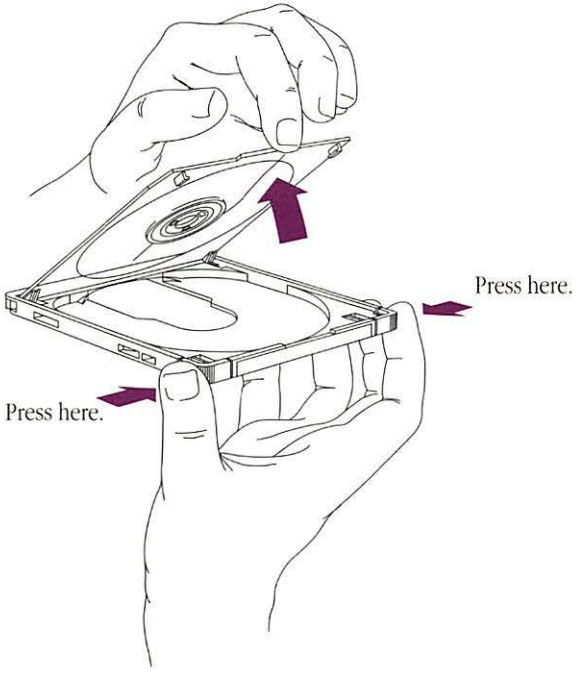

Figure 4-1 Opening the caddy

2. **Put the CD-ROM into the caddy, label side up.**

   Try not to touch the bottom surface of the CD-ROM as you transfer it from the jewel case to the caddy. Hold the CD-ROM by the edges, like a phonograph record, with the label side up. Tip the leading edge of the CD-ROM down slightly as you insert it, so that it doesn't catch on the ledge of the caddy. (See Figure 4-2.) Close the caddy lid.

△ **Important:** Be sure the CD-ROM lies flat in the caddy; if it isn't lying flat, the AppleCD SC Plus won't be able to read the disc when you insert the caddy in the drive. △

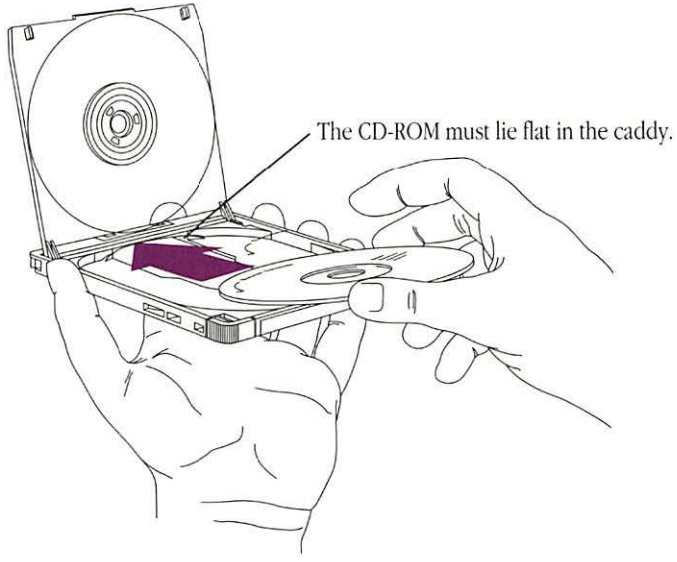

Figure 4-2 Putting the CD-ROM into the caddy

3. **Turn on the AppleCD SC Plus. Do this before turning on your computer and before inserting a caddy with a CD-ROM.**

   The power switch is on the back of the AppleCD SC Plus, in the lower-left corner if you are facing the front of the drive. (See Figure 4-3.) When it's on, you'll see a light on the front of the AppleCD SC Plus.

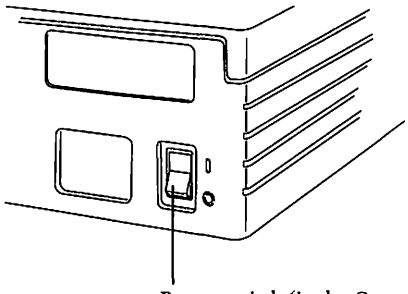

Figure 4-3 Turning on the AppleCD SC Plus

△ **Important:** If you have other SCSI devices connected to your computer, be sure the first and last devices on the chain are also turned on. △

4. **Start your computer.**

5. **Put the caddy containing your CD-ROM into the AppleCD SC Plus.**

   Put the caddy into the AppleCD SC Plus with the label side of the CD-ROM facing up, metal shutter end first as shown in Figure 4-4.

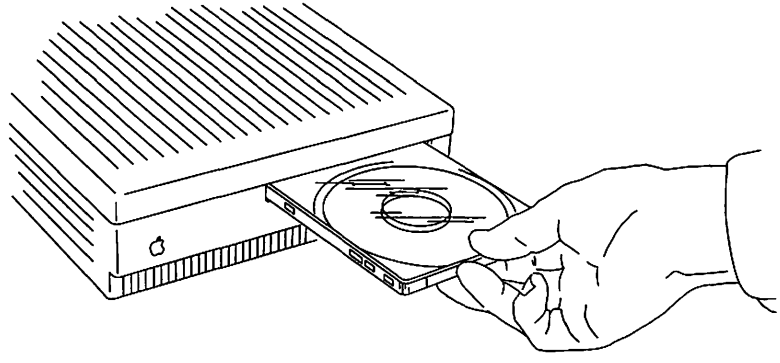

Figure 4-4 Putting the CD-ROM into the AppleCD SC Plus

   The CD-ROM icon appears on the desktop if you are using a Macintosh, or if you are using an Apple IIGS with GS/OS.

6. **Follow the instructions that came with your CD-ROM.**

Stopping

When you finish using a CD-ROM, eject it according to the following instructions.

If you're using an Apple II, eject the CD-ROM by pressing the eject button on the AppleCD SC Plus as shown in Figure 4-5. (The AppleCD SC Plus power switch must be on for the eject button to work.)

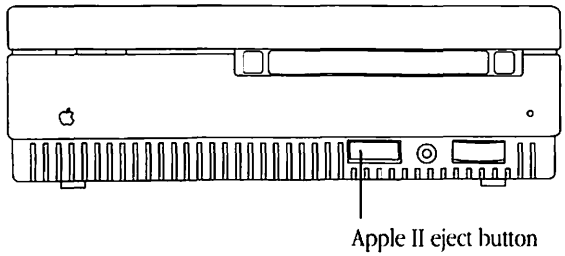

Figure 4-5 Ejecting a CD-ROM (Apple II only)

If you're using a Macintosh, select the CD-ROM icon and eject the CD-ROM by choosing Eject from the File menu or by dragging the CD-ROM icon to the Trash. Do not use the eject button; it is for use with Apple II machines only and will not work with a Macintosh.

❖ *By the way:* You can also eject CD-ROM discs using the CD Remote desk accessory explained in Chapter 5. ❖

△ **Important:** Do not transport the AppleCD SC Plus with a caddy inside. △

You do not need to turn off the power switch for the AppleCD SC Plus until you turn off the computer's power switch. The AppleCD SC Plus spindle motor shuts off automatically when the caddy is ejected or when the CD-ROM has not been accessed for a few minutes.

❖ *Maintenance tip:* If dust collects on the lens inside of the AppleCD SC Plus, performance will be degraded. For best performance and longer time between maintenance, avoid exposing CD-ROM discs and the AppleCD SC Plus to environments with excessive dust or smoke. ❖

About CD-ROM discs

Accessing the information on a CD-ROM isn't much different from accessing the information on most magnetic disks used with computers. CD-ROM discs use the same operating systems and file systems used by magnetic disks: HFS (hierarchical file system) for Macintosh files, ProDOS 8 (Professional Disk Operating System 8) for Apple II files, and GS/OS for Apple IIGS files. If you know how to work with files and folders (subdirectories) on a hard disk, 3.5-inch disk, or 5.25-inch disk, you know how to work with the files on a CD-ROM.

Another file system associated with CD-ROM discs is the ISO 9660/High Sierra format. ISO 9660/High Sierra is a standard way of organizing the information on a CD-ROM. The standard was proposed by representatives from major computer, CD-ROM, and electronic information companies. CD-ROM discs that conform to the ISO 9660/High Sierra standard can be accessed from a variety of computers. The discs need not be customized for each different computer's operating system. You don't need to know anything about the ISO 9660/High Sierra format to use ISO 9660/High Sierra formatted CD-ROM discs. You use application programs as you always have.

When you open an ISO 9660/High Sierra disc icon, you may find that file icons are uniform in appearance—that they don't differ, as Macintosh or GS/OS files do, according to what type of application was used to create them. This is because ISO 9660/High Sierra files are designed to be accessed by a variety of different computers; they may not have the Macintosh-specific or GS/OS-specific information required to generate unique icons.

Exploring the possibilities

In many cases a CD-ROM will come with a setup disk. The data—up to 500 books' worth—will be on the CD-ROM and the retrieval software will be on the setup disk.

Retrieval software, also called the retrieval system or the search system, is simply a program that gives you a way of getting at the information on the CD-ROM—whether it's by typing a **keyword** that describes the information you're after, by picking a category on a menu, or by pointing to an icon on the screen. Programs that use the keyword system generally let you expand or refine your search through the use of commands such as AND, OR, and NOT. These commands are called **Boolean operators,** after George Boole, the British mathematician who invented this logic system.

For example, suppose you were using an encyclopedia program and wanted information on the space program in the Soviet Union. Instead of typing *space* as your keyword, you could refine the search by typing *space* AND *Soviet.*

The advantage of putting the data on one medium and the retrieval software on another is that the data on the CD-ROM can be prepared in the ISO 9660/High Sierra format, a universal format accessible to a variety of different computers, and the retrieval software can be customized for a particular computer's operating system. Another reason for separating the data from the retrieval software is so that the data can be independently updated.

In terms of how you interact with the information, CD-ROM products fall into three general categories: databases, productivity and creativity tools, and multimedia experiences.

In the database category are encyclopedias, library card catalogs, and corporate data on CD-ROM discs. An encyclopedia on a CD-ROM might allow a student to type a keyword such as *Mars* and read all about the planet a few seconds later. A card catalog on a CD-ROM might allow a librarian, for example, to type the author, title, or subject matter of a book and find out everything about the book or books that fit that descriptor. A corporate database on a CD-ROM might allow an investor to type the name of a subsidiary and get all sorts of information about it or its parent company, including profit/loss statements, executive biographies, or excerpts from the annual report.

Productivity tools like templates, tools, and clip art are naturals for distribution on CD-ROM discs. Examples from this category are desktop publishing toolkits, legal boilerplates, and financial spreadsheets. A CD-ROM for desktop publishers might include a dictionary, a thesaurus, page-layout templates, and libraries of fonts and clip art. A CD-ROM for lawyers could have boilerplates for all sorts of routine contracts and forms for routine legal functions. A CD-ROM for financiers might include spreadsheet models for different investment analyses.

Some of the most exciting CD-ROM programs integrate text, speech, and graphics on one disc. Examples of this genre are map programs and interactive games in which different choices take you down different story paths. A map program might take you on a walking tour of a city where what you see and hear depends on which turns you decide to take. The possibilities for interactive games and educational products are almost unlimited. Imagine a storybook with animated illustrations that reads itself aloud and allows children to make decisions about how the story turns out.

This gives you some idea of the possibilities inherent in this new medium, but because it is a new medium, the possibilities are only limited by the imagination of software developers and information providers. You can find out about specific CD-ROM products from your authorized Apple dealer or by looking through computer magazines and CD-ROM specialty magazines and trade journals.

Instructions for using the retrieval program will be furnished with the CD-ROM for which the program is intended.

Questions and answers

This section answers some common questions about CD-ROM discs. If you can't find an answer here, check the index to see if the subject is covered elsewhere in this book. If your question isn't answered in the book, send it in with your Tell Apple card so it can be answered in a future revision.

How does the AppleCD SC Plus work?

The AppleCD SC Plus is an optical storage device designed to read the information recorded on CD-ROM discs. Information is recorded on a CD-ROM as a spiral of pits and land. **Pits** reflect light differently than non-pitted areas (called **land**), and this difference between pits and land can be detected by a photo detector in the AppleCD SC Plus and converted to digital information that the computer can process. The pits—ten billion of them—are arranged on the CD-ROM in a three-mile spiral track. The whole thing is sealed in plastic.

See Appendix B for more detailed information about how the AppleCD SC Plus works.

How are CD-ROM discs made?

Data, in electronic form, is first formatted so it's compatible with retrieval and indexing software. During this data preparation phase, an index is created, and data is compressed, if necessary. The reformatted, indexed information is then tested and declared ready for premastering. **Premastering** involves writing the information onto a 9-track tape in the order that you want it to appear on the CD-ROM. This tape is sent to the mastering plant where the information on it is burned by laser onto the photoresist layer of a glass disc. The **photoresist layer** is a thin layer of light-sensitive material that is developed after exposure, resulting in a **master disc.** The glass master is used to make metal molds called **stampers.** These stampers are used in the injection molding process that produces the discs. These plastic CD-ROM discs are coated with reflective aluminum to make the data on them readable, then with another layer of plastic to protect the data from physical damage. The finished products are labeled, packed in jewel cases, and distributed.

Is it feasible to have my own data distributed on CD-ROM discs?

Yes. If you need 100 or more copies of 20 megabytes or more of information, it makes sense to distribute your data on CD-ROM discs.

Contact a CD-ROM disc manufacturer or service bureau for advice on how to prepare your data for the manufacturing process.

Are CD-ROM discs similar to audio CDs?

Yes. They are physically identical and use the same spiral format for storing data, but while audio CDs are exclusively designed for playing sounds, you can use CD-ROM discs to access sounds, data, and graphics.

Is a CD-ROM similar to a videodisc?

Both use optical technology, but **videodiscs** store analog information while CD-ROM discs store digital information. Videodiscs are typically used for storing broadcast-quality still or motion pictures.

How much can I expect to pay for CD-ROM discs?

As with software, you're not paying for the material the disc is made of: you're paying for the information on the disc. Prices vary widely according to the amount and type of data on the CD-ROM and the audience it's designed for. The prices of currently available CD-ROM discs range from almost free to several thousand dollars, depending on content. General purpose products will generally cost less than specialized market products.

Where can I get CD-ROM discs?

You can get CD-ROM discs at many computer software stores or by responding to advertisements in CD-ROM publications.

Using CD Remote or the Media Controller to Play Audio Tracks

This chapter explains how to use the CD Remote program (or optionally, under GS/OS, the Media Controller program) to play audio CD tracks on CD-ROM discs or audio CDs. To do so, you need to attach headphones, amplified speakers, or an ordinary stereo system to the AppleCD SC Plus and use the CD Remote program included on your CD setup disk to start, stop, and otherwise control the CD in the AppleCD SC Plus. You can get amplified speakers or headphones at most electronics stores, or you can use your existing stereo system. The CD Remote programs are slightly different for Macintosh systems, Apple IIGS systems, and ProDOS 8 system software running on an Apple IIGS or an enhanced Apple IIe computer. After connecting headphones or amplified speakers, find the instructions in this chapter that apply to your computer system.

❖ *By the way:* You need headphones or speakers only for *audio* CDs or for CD-ROM discs that have CD-audio tracks. If a particular CD-ROM requires headphones or speakers, the documentation for it will say so. ❖

Connecting headphones and speakers

Figure 5-1 shows how to connect headphones to the AppleCD SC Plus. Figure 5-2 shows how to connect amplified speakers to the AppleCD SC Plus. Figure 5-3 shows how to connect the AppleCD SC Plus to your stereo system. You can also connect amplified speakers to the headphone jack and use the headphone volume control to change the speaker volume.

For optimum audio performance, you may want to connect a grounding wire from the grounding post on the AppleCD SC Plus to your stereo amplifier or receiver.

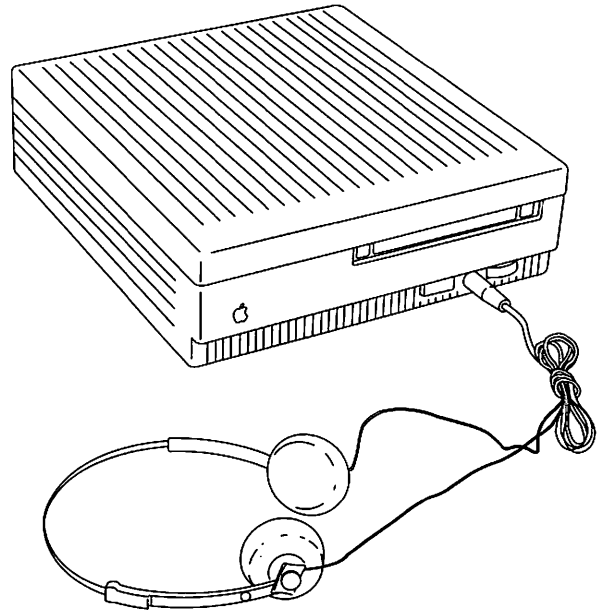

Figure 5-1 Connecting headphones to the AppleCD SC Plus

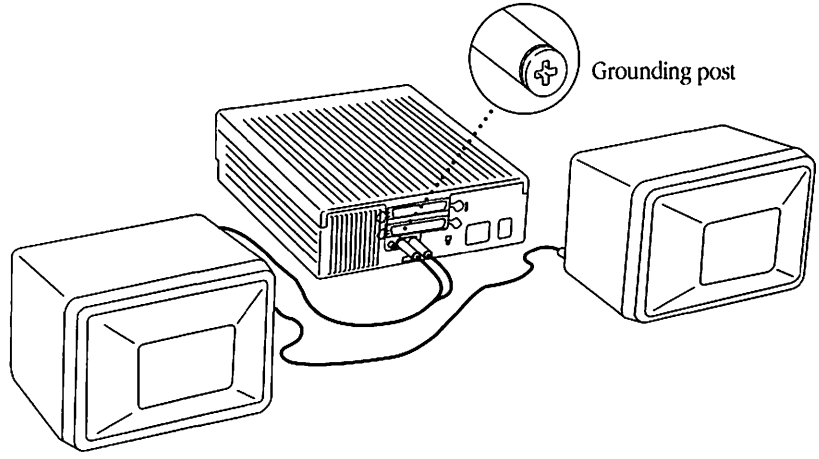

Figure 5-2 Connecting amplified speakers to the AppleCD SC Plus

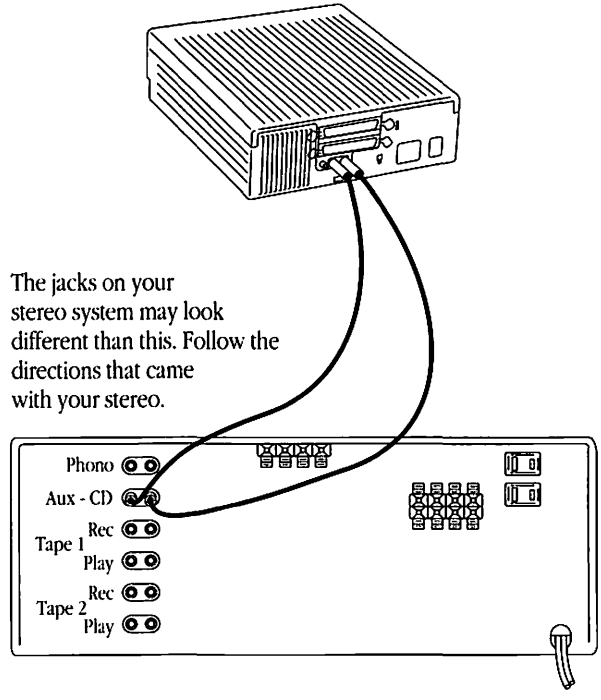

Figure 5-3 Connecting the AppleCD SC Plus to a stereo system

❖ *Volume control:* The dial on the lower-right corner on the front of the AppleCD SC Plus controls the headphone volume. Turning it left reduces the volume; turning it right increases the volume. It's a good idea to turn down the volume before you play your first CD. Once you've got something playing, you can adjust the volume upward. ❖

Macintosh instructions

Follow these instructions to install and use the Macintosh CD Remote desk accessory.

❖ *By the way:* If you have more than one AppleCD SC Plus, the CD Remote desk accessory will work only with the CD drive with the lowest SCSI ID number. For more information about SCSI ID numbers, see "Setting the SCSI ID Number" in Chapter 2. ❖

Installing the CD Remote desk accessory

If you are using Macintosh system software earlier than version 7.0, use the Font/DA Mover on your Macintosh Utilities disk to copy the CD Remote desk accessory from the *Macintosh CD Setup* disk to the System file on your startup disk. You'll find instructions for using the Font/DA Mover in the manuals that came with your computer.

If you are using system software version 7.0 or later, CD Remote is installed automatically on your startup disk when you follow the directions in Chapter 2 for installing all the resources for the AppleCD SC Plus.

Using the CD Remote desk accessory

These instructions assume that you've already installed the CD Remote desk accessory on your startup disk as explained in the previous section.

1. **Turn on the AppleCD SC Plus.**
2. **Start up your Macintosh with the startup disk containing the CD Remote desk accessory.**
3. **Put the audio CD (or the CD-ROM with audio tracks) into the caddy and insert it into the AppleCD SC Plus just as you would any CD-ROM.**

   If you insert an audio CD, its icon appears on the desktop with the name Audio CD 1. If you insert a CD-ROM with audio tracks, its icon appears with the name of the disc.

❖ *By the way:* If you open an audio CD icon, you'll see document icons labeled Track 1, Track 2, and so on. You can't play an audio CD by opening the track icons. If you select one of the track icons and choose Get Info from the File menu, you'll see the track's playing time. If you drag an audio CD track icon to a disk icon, its icon will be copied to that disk, but it won't be usable. ❖

4. **Choose CD Remote from the Apple menu.**

The CD Remote desk accessory window appears. See Figure 5-4.

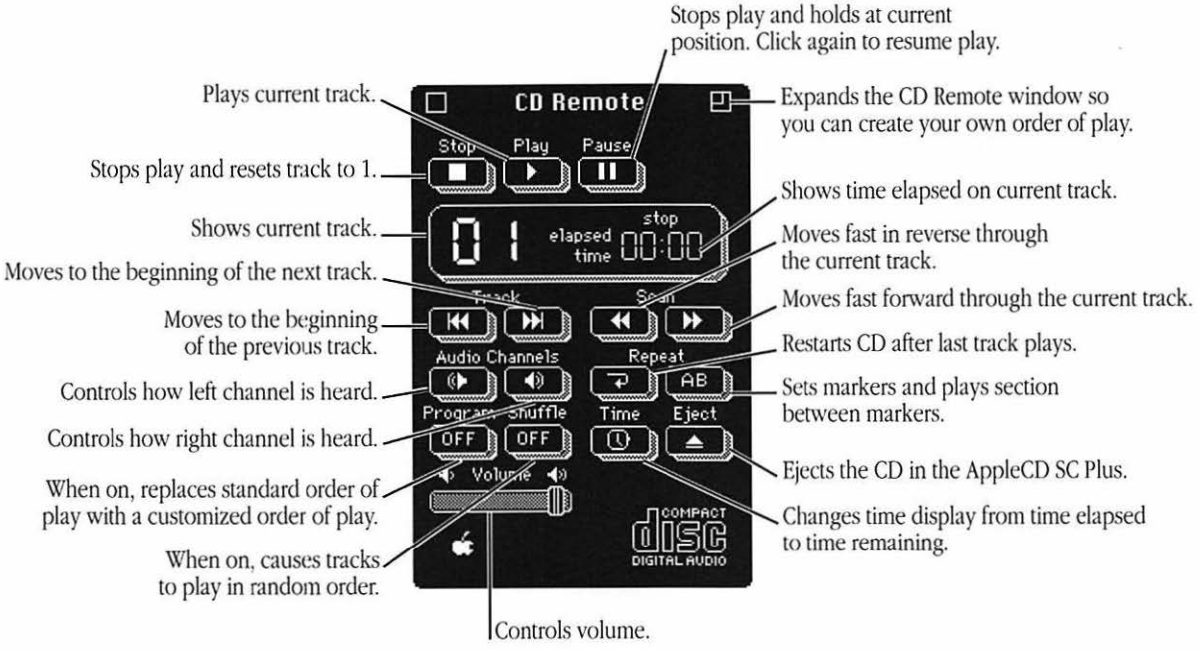

Figure 5-4 Macintosh CD Remote desk accessory

Starting

The Play button starts play. Unless you have paused using the Pause button, changed the track using one of the Track buttons, clicked the Shuffle button for random play, or reordered the tracks using the program play feature, play will start at the beginning of the first track. The current track is shown in the track and time display. As the track plays, time elapsed is shown on the right side of the display. (To see time remaining on the track instead of time elapsed, click the Time button.)

After clicking Play, you can close the desk accessory and use your computer for other work. The CD will continue to play in the background. When you want to turn off the CD, change tracks, or change CDs, open the CD Remote desk accessory and make the necessary changes.

- *Playing audio tracks on a CD-ROM:* If you are playing audio tracks on a CD-ROM, you may notice that one or more tracks won't play. Such tracks contain the data used by your computer and are not audio tracks. ❖

Moving

There are two ways to move to different parts of the CD: using the Scan buttons or using the Track buttons. Clicking the Track buttons moves you backward or forward to the beginning of a track. While the CD is playing, pressing the Scan button moves you backward or forward through a track. (You can hear the track as it scans.) Where you end up depends on how long you hold the button down.

Continuous play

If you want the CD to play continuously—to start over when it reaches the end—click the Repeat button labeled with a right arrow. Click the button again to turn off continuous play.

Changing the order of play

The Shuffle button gives you the option of hearing the tracks on the CD in random order. Click the Shuffle button to On when you want random play. Click the Shuffle button to Off when you want to hear tracks in their original order. You can also change the order of play by creating a customized play list. See "Creating a Customized Play List" later in this section for instructions on how you can designate which tracks you want to hear and in what order you want to hear them.

Setting markers

You can set markers within one audio track on a CD and play the section between markers over and over again. To set markers:

1. **Begin playing the CD at a point just before the place where you want to set the first marker.**

   See "Moving," earlier in this section, for information about beginning to play the CD from a point other than the first track.

2. **Click the AB button.**

   The label on the button changes to A.

3. **When the audio passage reaches the place where you want to set the first marker, click A.**

   The first marker is set, and the label on the button changes to B.

4. **When the audio passage reaches the place where you want to set the end marker, click B.**

   The end marker is set, and the label on the button changes to A↻B. The section you've marked will play over and over until you click A↻B again.

5. **When you've heard enough, click the A↻B button.**

   When you click A↻B, the label on the button changes back to AB.

Controlling how stereo channels are heard

When both the left and right audio channel buttons are selected, you hear the left channel through the left speaker and the right channel through the right speaker. If you deselect one of the channel buttons, you hear one channel through both speakers.

Controlling volume

In addition to using the headphone volume control on the front of the AppleCD SC Plus, you can use the volume control in CD Remote to adjust the volume of the sound from both the headphones and the jacks on the back of the drive. Drag the slider to the right to increase volume, or to the left to decrease volume.

The volume control in CD Remote cannot override the headphone volume control on the AppleCD SC Plus. For example, the loudest volume setting for CD Remote cannot make the headphone volume any louder than the current setting of the headphone volume control on the AppleCD SC Plus. If you turn the CD Remote volume control all the way up and still can't hear anything through the headphones, try turning the volume control on the front of the AppleCD SC Plus to the right.

Stopping

There are two ways to stop play: using the Stop button and using the Pause button. Clicking the Stop button stops play and resets the track number to 1. Clicking the Pause button stops play without losing your place on the CD. To resume play after clicking the Pause button, click the Pause button again or click Play.

To eject the CD, click the Eject button or drag the audio CD icon to the Trash. When you eject the disc its icon disappears from the desktop.

When you finish using an audio CD, be sure to eject the disc and close the CD Remote desk accessory before inserting a CD-ROM disc that doesn't have audio tracks.

Creating a customized play list

To create your own customized play list, you must first click the zoom box in the upper-right corner of the CD Remote window. This expands the window as shown in Figure 5-5 so you can view a list of the tracks on the CD and choose which ones you want to hear and in what order you want to hear them.

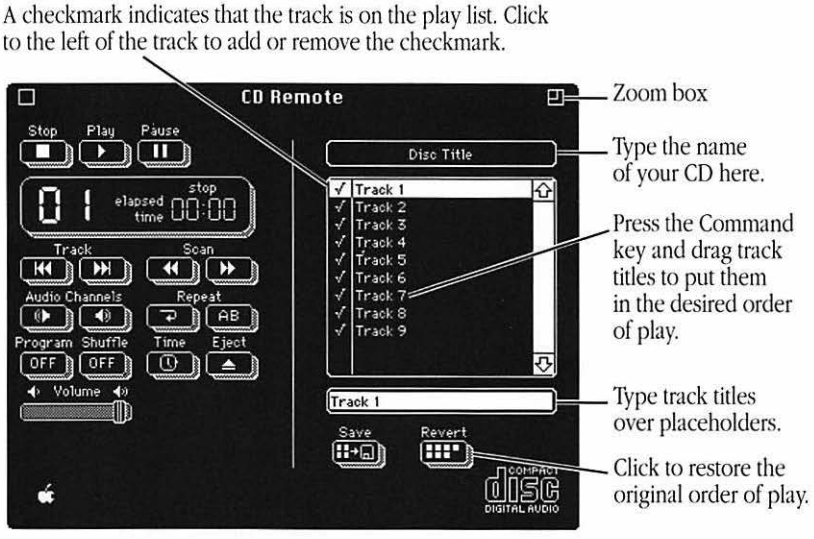

Figure 5-5 Expanded CD Remote window

Follow these instructions to create a customized play list:

1. **Select Disc Title and type the name of the CD in the AppleCD SC Plus.**

   For example, you would drag across *Disc Title* and type *Poggio's Greatest Hits* if that were the name of your CD.

2. **Select each track and type the name of that track.**

   For example, click Track 1. The name *Track 1* appears in the edit field at the bottom of the window. You would change *Track 1* to *Human Anatomy 101* by typing over it and then pressing Return. Scroll to see additional track titles.

3. **Select the tracks you want to include on your play list.**

   Checkmarks indicate that you want a track to be played. Click an existing checkmark to remove it. (The track will still show up on the list, but the track won't be played.) Click to the left of a track to add a checkmark. Scroll to see additional track titles.

4. **Arrange the play list in the order you want.**

   Press the Command key while you drag the track title you want to hear first to the top of the play list. Everything else will slide down to make room for it. Continue dragging track titles in this fashion until the tracks are arranged in the order you want to hear them. Scroll to see additional track titles.

5. **Save your play list by clicking the Save button.**

   Click the Revert button to bring back the previously saved play list.

6. **Click the Program button to On.**

   Click the Program button to Off when you want to hear tracks in their original playing order.

7. **Click Play to hear the tracks with checkmarks in the order they appear on your play list.**

   The next time you want to play your customized play list, just click the Play button. You don't need to zoom out to the expanded window unless you want to create a new program. To hear tracks in their original order (that is, the order in which they appeared before you started customizing the play list), click the Program button to Off.

Apple IIGS instructions

These instructions explain how to use two desk accessories to play audio CDs and audio CD tracks on CD-ROM discs from an Apple IIGS computer. The CD Remote desk accessory can be used only with the AppleCD SC Plus. The Media Controller desk accessory can be used with several different types of devices, including videodisc players and the AppleCD SC Plus. Both desk accessories are automatically installed on your hard disk when you follow the instructions in the section "Installing the Apple IIGS Resources for the AppleCD SC Plus" in Chapter 3.

To use either of these desk accessories, you need an Apple IIGS with at least 1 megabyte (MB) of random-access memory (RAM) and a hard disk. If you do not have at least 1 MB of RAM installed in your computer, use the ProDOS 8 CD Remote program described later in this chapter.

Using the CD Remote desk accessory

The Apple IIGS CD Remote desk accessory works much like a handheld CD remote controller, except that instead of pushing buttons to change tracks and to start and stop sounds, you click buttons on the screen. CD Remote is automatically installed on your startup disk when you follow the directions in Chapter 3 for setting up the AppleCD SC Plus.

To use the CD Remote desk accessory, follow these steps:

1. **Turn on your hard disk and the AppleCD SC Plus.**
2. **Turn on your computer.**
3. **Put the audio CD (or the CD-ROM with audio tracks) into the caddy and insert it into the AppleCD SC Plus just as you would any CD-ROM.**

   If you insert an audio CD, its icon will not appear on the desktop. If you insert a CD-ROM with audio tracks, its icon will appear on the desktop.

4. **Choose CD Remote from the Apple menu.**

You'll see the CD Remote desk accessory window shown in Figure 5-6.

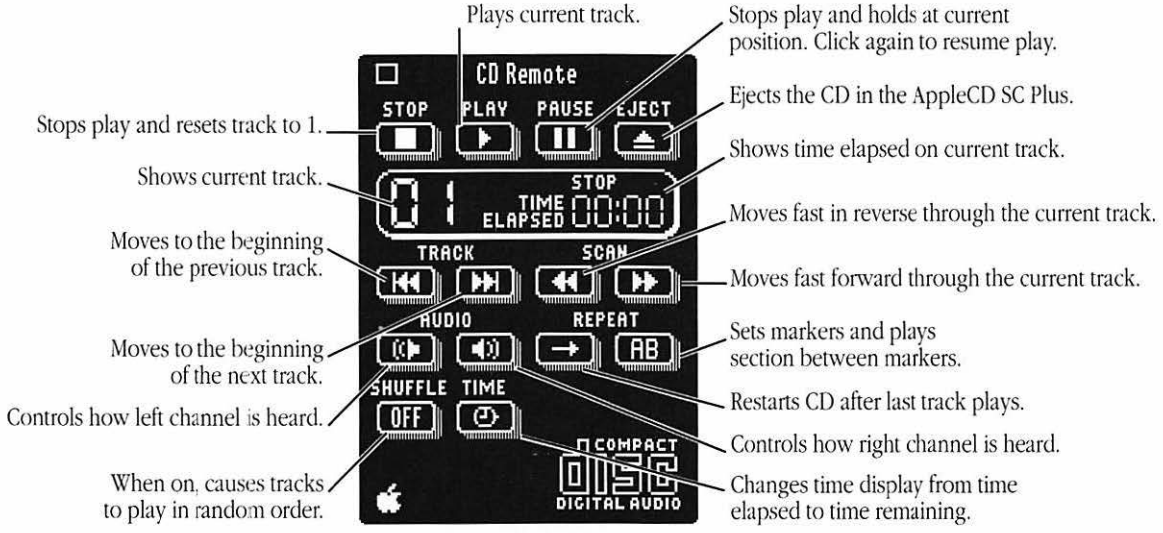

Figure 5-6 Apple IIGS CD Remote desk accessory

Starting

The Play button starts play from whatever place you have reached on the CD: from the beginning of the CD, from the beginning of a track you have switched to using one of the Track buttons, or from a place where you have paused using the Pause button. The current track is shown in the track and time display. As the track plays, time elapsed is shown on the right side of the display. (To see time remaining on the track instead of time elapsed, click the Time button.)

If the CD is already playing, clicking the appropriate Track button will move you to the beginning of the track before or after the current track and resume playing from there.

Once the CD has begun to play, you can close the desk accessory and use your computer for other work. The CD will continue to play in the background. Open the CD Remote desk accessory again when you want to stop playing the CD, change tracks, or switch to another CD.

- *Playing audio tracks on a CD-ROM:* If you are playing audio tracks on a CD-ROM, you may notice that one or more tracks won't play. Such tracks contain the data used by your computer and are not audio tracks. ❖

Moving

There are two ways to move to different parts of the CD: using the Scan buttons or using the Track buttons. Clicking the Track buttons moves you to the beginning of the next track or to the beginning of the previous track. While the CD is playing, pressing the Scan buttons moves you forward or backward through a track. (You can hear the track as you scan through it.) Where you end up depends on how long you hold the button down.

Continuous play

If you want the CD to play continuously—to start over when it reaches the end—click the Repeat button labeled with a right arrow. Click the button again to turn off continuous play.

Changing the order of play

The Shuffle button gives you the option of hearing the tracks on the CD in random order. Click the Shuffle button to On when you want random play. Click the Shuffle button to Off when you want to hear tracks in their original order.

Setting markers

You can set markers within one audio track on a CD and play the section between them over and over again. To set markers, follow these steps:

1. **Begin playing the CD at a point just before the place where you want to set the first marker.**

   See "Moving," earlier in this section, for information about moving to a point on the CD other than the beginning of the first track.

2. **Click the AB button.**

   The label on the button changes to A.

3. **When the audio passage reaches the point where you want to set the first marker, click A.**

   The first marker is set, and the label on the button changes to B.

4. **When the audio passage reaches the place where you want to set the end marker, click B.**

   The end marker is set, and the label on the button changes to an arrow that circles back on itself. The section you've marked will play over and over until you click the circling arrow again.

5. **When you've heard enough, click the circling arrow button.**

   When you click the circling arrow, the label on the button changes back to AB.

Controlling how stereo channels are heard

When both the left and the right Audio buttons are selected, you hear the left channel through the left speaker and the right channel through the right speaker. If you deselect one of the channel buttons, you hear one channel through both speakers.

Stopping

There are two ways to stop play: using the Stop button and using the Pause button. Clicking the Stop button stops play and resets the track number to 1 (or, if you're playing the audio tracks on a CD-ROM, to the first audio track). Clicking the Pause button stops play without changing your place on the CD. To resume play after clicking the Pause button, click the Pause button again or click Play.

To eject the CD, click the Eject button in the CD Remote window, or press the eject button on the AppleCD SC Plus (as shown in Figure 4-5).

When you finish using an audio CD, be sure to eject the disc and close the CD Remote desk accessory before inserting a CD-ROM disc that doesn't have audio tracks.

Using the Media Controller

The Apple IIGS Media Controller desk accessory works much like a handheld remote media controller, except that instead of pushing buttons to control the AppleCD SC Plus, a videodisc player, or other devices, you click buttons on the screen. The Media Controller is automatically installed on your Apple IIGS startup disk when you follow the directions in Chapter 3 for setting up the AppleCD SC Plus.

To play audio CDs or audio tracks on a CD-ROM disc with the Media Controller, you must first assign one of its eight media channels to your AppleCD SC Plus:

1. **Turn on your hard disk and the AppleCD SC Plus.**
2. **Turn on your computer.**
3. **Choose Control Panel from the Apple menu.**
4. **Scroll through the icons on the left until you see the Media Ctrl icon.**
5. **Click the Media Ctrl icon.**

   The Media Controller panel appears on the right.

6. **Select the appropriate media channel, media device, and port as shown in Figure 5-7:**

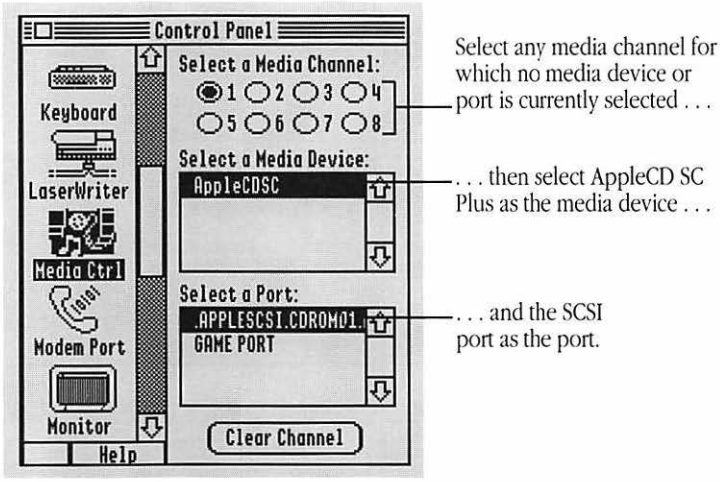

Figure 5-7 Assigning a media channel to the AppleCD SC Plus

7. **Close the Control Panel.**

After you have assigned a media channel to your AppleCD SC Plus, you can follow these steps at any time to use the Media Controller:

1. **Put the audio CD or CD-ROM disc with audio tracks into the caddy and insert it into the AppleCD SC just as you would any CD-ROM.**

2. **Choose Media Controller from the Apple menu.**

You'll see the Media Controller window shown in Figure 5-8.

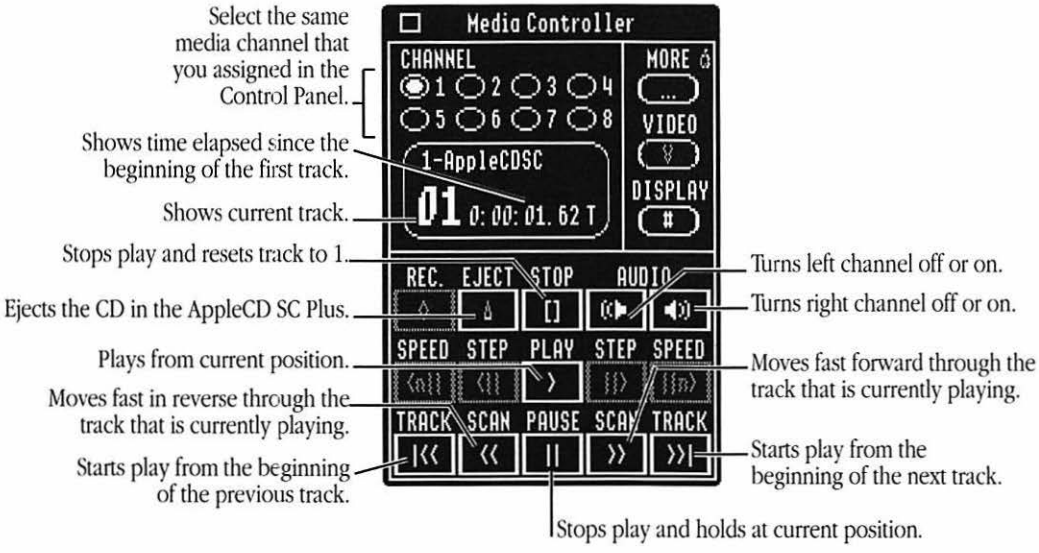

Figure 5-8 Apple IIGS Media Controller desk accessory

Starting

The Play button starts play from whatever place you have reached on the CD: either from the beginning, or, if you have previously pressed the Pause button, from the place at which you paused. The current track is shown in the track and time display after you press Play for the first time. As the track plays, time elapsed is shown on the right side of the display.

You can also start play from the beginning of the track before or after the current track by clicking the appropriate Track button.

Once the CD has begun to play, you can close the desk accessory and use your computer for other work. The CD will continue to play in the background. Open the Media Controller desk accessory again when you want to stop playing the CD, change tracks, or switch to another CD.

- *Playing audio tracks on a CD-ROM:* If you are playing audio tracks on a CD-ROM, you may notice that one or more tracks won't play. Such tracks contain the data used by your computer and are not audio tracks. ❖

Moving

There are two ways to move to different parts of the CD: using the Scan buttons or using the Track buttons. Clicking the Track buttons starts play from the beginning of the next track or from the beginning of the previous track. While the CD is playing, pressing the Scan buttons moves you forward or backward through a track. (You can hear the track as you scan through it.) Click Play, Pause, or Stop when you want to stop scanning.

Setting markers

You can use the Media Controller to set markers anywhere on a CD and play the section between them. To set markers, follow these steps:

1. **Click the More button (near the upper-right corner of the Media Controller window) until you see the word "Run" in the upper-left corner of the window, as shown in Figure 5-9.**

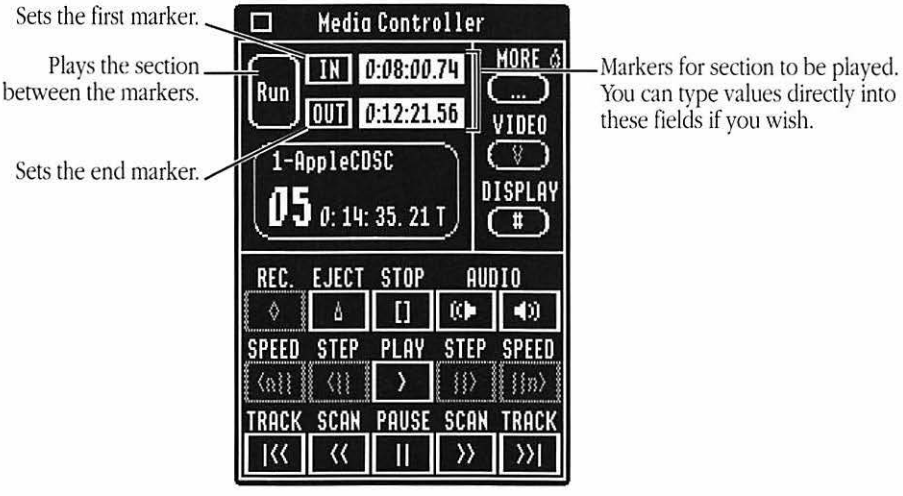

Figure 5-9 Setting markers

2. **Begin playing the CD at a point just before the place where you want to set the first marker.**

   See "Moving," earlier in this section, for information about moving to a point on the CD other than the beginning of the first track.

3. **When the audio passage reaches the point where you want to set the first marker, click IN.**

   The marker for your current position on the CD appears to the right of the IN button. This marks the beginning of the section you will play.

4. **When the audio passage reaches the point where you want to set the end marker, click OUT.**

   The marker for your current position on the CD appears to the right of the OUT button. This marks the end of the section you will play.

5. **To play the section you have marked, click the Run button.**

   The section will play once through.

You can also type the IN and OUT values you want (even if the CD is not currently playing) instead of clicking the IN and OUT buttons, as shown in Figure 5-9.

Controlling how stereo channels are heard

When you first open the Media Controller, you hear the CD's left channel through the left speaker and its right channel through the right speaker. If you click the left or right Audio button, you turn off both the speaker and the channel to which it corresponds, and you hear only the other channel through the other speaker. If you turn off both channels, you will not hear any sound. To turn either channel on again, click its Audio button again.

Controlling volume

In addition to using the headphone volume control on the AppleCD SC Plus, you can adjust the volume of each audio channel individually from the Media Controller:

1. **Click the More button (near the upper-right corner of the Media Controller window) several times, until the word VOLUME appears near the upper-left corner of the window.**
2. **Use the Volume scroll bars to adjust the volume for each channel as shown in Figure 5-10.**

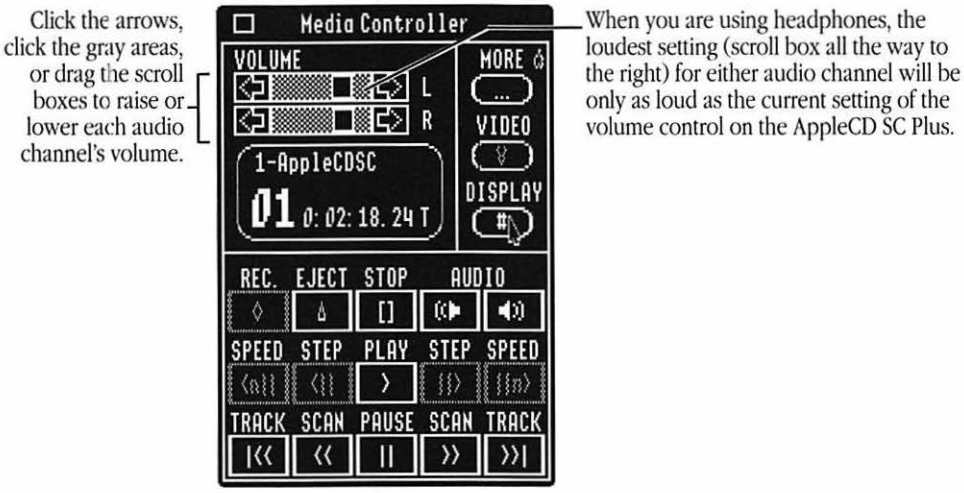

Figure 5-10 Controlling the volume of each audio channel individually

The volume controls in the Media Controller cannot override the headphone volume control on the AppleCD SC Plus. For example, the loudest volume settings in the Media Controller cannot make the headphone volume any louder than the current setting of the headphone volume control on the AppleCD SC Plus. If you turn the Media Controller's volume controls all the way up and still can't hear anything through the headphones, try turning the volume control on the front of the AppleCD SC Plus to the right.

Stopping

There are two ways to stop play: using the Stop button and using the Pause button. Clicking the Stop button stops play and resets the track number to 1. Clicking the Pause button stops play without changing your place on the CD. To resume play after clicking the Pause button, click Play.

To eject the CD, click the Eject button in the Media Controller window, or press the eject button on the AppleCD SC Plus (as shown in Figure 4-5).

When you finish using an audio CD, be sure to eject the disc and close the Media Controller desk accessory before inserting a CD-ROM disc that doesn't have audio tracks.

ProDOS 8 instructions

To play audio CDs while running ProDOS 8 on an Apple IIGS or an enhanced Apple IIe computer, you must start up your computer with one of the CD setup disks. If you have a 3.5-inch drive, use the *Apple IIGS CD Setup* disk. If you have a 5.25-inch drive, use the *Apple II CD Setup* disk.

When you start up from either of these disks, you will see the ProDOS 8 version of the CD Remote program. It works much like a handheld CD remote controller, except that instead of pushing buttons to change tracks and to start and stop the audio passage, you'll be pressing keys on your Apple IIe or Apple IIGS keyboard.

Before you begin

Before you use the ProDOS 8 CD Remote program, make a copy of the CD setup disk you'll be using and put the original in a safe place—you shouldn't need it again unless something happens to your working copy.

Using the ProDOS 8 CD Remote program

Here's how to use the ProDOS 8 CD Remote program:

1. **Turn on the AppleCD SC Plus.**
2. **Start up your Apple IIe (or Apple IIGS) with your working copy of the CD setup disk that fits your floppy disk drive.**

   If you have a 3.5-inch drive, use the *Apple IIGS CD Setup* disk. If you have a 5.25-inch drive, use the *Apple II CD Setup* disk.
3. **Put the CD into the caddy and insert it into the AppleCD SC Plus.**

   You'll see the CD Remote screen shown in Figure 5-11.

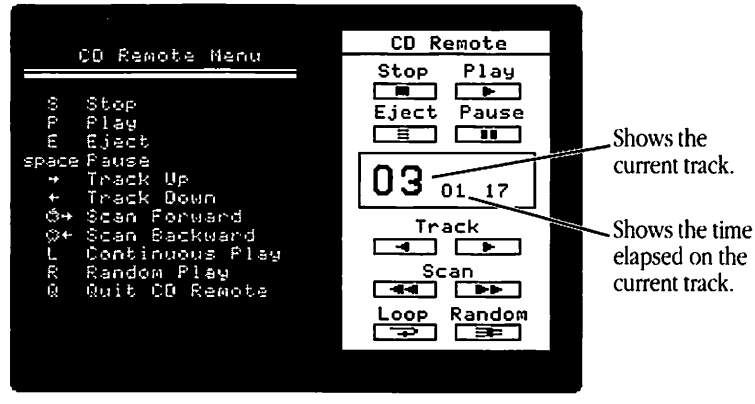

Figure 5-11 ProDOS 8 CD Remote screen

Here's a quick summary of the keys you press to control the CD Remote functions. Each function is explained in the sections following the list.

- Press P to start playing the current track.
- Press S to stop playing. When you do, the track number resets to 1.
- Press the Space bar to hold at the current position. Press the Space bar again or P to resume play.
- Press Right Arrow to start play from the beginning of the next track.
- Press Left Arrow to start play from the beginning of the previous track.
- Press Command–Right Arrow to move fast forward through the current track. (The Command key is the key with the Apple symbol—"Open Apple" on older models.)
- Press Command–Left Arrow to move in reverse through the current track.
- Press L for Loop (continuous play). After the last track plays, play will continue from the first track.
- Press R to hear tracks in random (shuffled) order.
- Press Q to quit.
- Press E to eject the audio CD.

Starting

Pressing P starts play. Unless you have changed the track by pressing Left Arrow or Right Arrow or have pressed R for random play, play will start at the beginning of the first track. The current track is shown on the left side of the track/time window. As the track plays, time elapsed is shown on the right side of the window.

Moving

There are two ways to move to different parts of the CD: by scanning, or by changing tracks. Pressing the Left Arrow or Right Arrow moves you forward or backward to the beginning of the next or previous track. Pressing Command–Left Arrow or Command–Right Arrow moves you backward or forward through a track. Where you end up depends on how long you hold the buttons down.

Continuous play

If you want the CD to play continuously—to start over when it reaches the end—press L for Loop (continuous play).

Stopping

There are two ways to stop play: pressing S for Stop, or pressing the Space bar to pause. Pressing S stops play and resets the track number to 1. Pressing the Space bar stops play without changing your place on the CD. To resume play after pressing the Space bar, press the Space bar again or press P for Play.

Press E to eject the disk. When you press E, the track/time window is blanked out to indicate that there is no CD in the AppleCD SC Plus. Press Q to quit the CD Remote program.

Troubleshooting

This section describes problems you may encounter while setting up and using your AppleCD SC Plus and suggests steps you can take to remedy the problems.

Many problems can be caused by improper installation of the resources for the AppleCD SC Plus. Make sure you install the resources exactly as described in Chapter 2 (for Macintosh users) or Chapter 3 (for Apple IIGS users).

If the troubleshooting suggestions in this appendix don't solve your problem, contact your authorized Apple dealer for assistance.

Problems starting up

The caddy won't open.

The caddy has a hinged top like a cigar box. Squeeze the sides of the caddy with the thumb and a finger of one hand where it says Open, while lifting the lid with your other hand.

The AppleCD SC Plus power light doesn't come on when you turn on the power.

Make sure the power cord is connected to the AppleCD SC Plus and to a three-hole grounded outlet.

Is the power outlet controlled by a wall switch that's turned off? If yes, turn on the wall switch, or better yet, use a different outlet.

When trying to start up an Apple IIGS from an AppleCD SC Plus connected to an Apple II High-Speed SCSI Card, an out-of-memory message appears or the computer freezes with the startup screen showing.

Make sure your Apple IIGS has at least 1 megabyte (MB) of random-access memory (RAM). To run system software version 5.0.4, your Apple IIGS must have at least 1 MB of memory. Your authorized Apple dealer can provide you with additional memory.

The computer doesn't seem to know that there is an AppleCD SC Plus attached.

Turn on the AppleCD SC Plus before turning on the computer.

Make sure that the first SCSI device in the chain is attached to the computer and that all of your SCSI devices are attached to each other.

Before turning on the computer, make sure that the AppleCD SC Plus power switch is on and that the first and last SCSI devices in the chain are also turned on.

Make sure that you are using the proper number of SCSI cable terminators. See "About SCSI Devices," in Chapter 2 for Macintosh users or in Chapter 3 for Apple II users, for information about cable terminators.

Check that the AppleCD SC Plus has a unique SCSI ID number. (Each SCSI device in the chain must have a different number.) The ID number appears on the back below the SCSI ports. See "Setting the SCSI ID Number" in Chapter 2 for Macintosh users or in Chapter 3 for Apple II users.

Macintosh users: Did you use the Installer on the *Macintosh CD Setup* disk to install the AppleCD SC Plus resources in the System Folder of your startup disk? If yes, did you restart the computer after using the Installer?

Apple II users: How many SCSI devices are connected to the SCSI card? If there are three or four, the card must be in slot 5 and there must be no disk drive controller card in slot 2. See the SCSI card manual for other troubleshooting tips.

You install the Macintosh resources for the AppleCD SC Plus manually, and your computer won't restart.

If you attempt to install the resources for the AppleCD SC Plus without using the Installer as described in Chapter 2, you may not be able to restart your computer. Restart from a floppy disk and install the resources according to the instructions in Chapter 2.

Problems inserting or ejecting a caddy

The caddy either is not being loaded into the drive or is not being ejected far enough to remove it easily.

Shut down your computer, leaving the AppleCD SC Plus turned on. Try to load the disc by pushing the caddy gently into the drive. If that doesn't work, turn off and then turn on the AppleCD SC Plus and try to eject the disc by pressing the eject button on the front of the drive.

If the disc is still jammed, make sure that both your computer and the AppleCD SC Plus are turned off; find a large paper clip; straighten at least 3 inches of the paper clip; and push the straight part of the paper clip firmly and horizontally into the pinhole located below and to the right of the drive door.

▲ **Warning:** Turn off the AppleCD SC Plus before you attempt to eject the caddy using a paper clip. If you fail to turn off the drive, you may damage it. Use a large paper clip and push it exactly horizontally into the pinhole. ▲

You eject a caddy by inserting a paper clip into the pinhole on the front of the drive, and the next time you insert a caddy the AppleCD SC Plus fails to load it into the machine.

Shut down your computer and then turn off the power to the AppleCD SC Plus. Wait about fifteen seconds, and then turn on the AppleCD SC Plus. Finally, turn on your computer and insert the caddy into the drive.

Problems using CD-ROM discs

You insert a CD-ROM disc but its icon does not appear on the desktop.

There are several possible causes of this problem. Perhaps you turned on the AppleCD SC Plus after you turned on your computer. Try restarting the computer.

Are the AppleCD SC Plus resources installed in your System Folder? If the resources aren't there, install the software.

You might need to change the standard configuration of the terminator at the end of your SCSI chain. (The standard configuration is shown in Figure 2-8 for Macintosh computers and in Figure 3-8 for Apple II computers.) Try this: First connect the cable terminator to the end of the SCSI system cable or peripheral interface cable. Then plug the terminator into one of the SCSI ports on the back of the AppleCD SC Plus (the other port remains empty).

There is no application program on a particular CD-ROM.

Read the manual that came with your CD-ROM. Many CD-ROM discs come with a separate floppy disk containing the information-retrieval program that accesses the information on the CD-ROM.

Information from a CD-ROM can be copied, saved to a disk, and printed on paper, but not cut or edited and saved back to the CD-ROM.

That's how it's supposed to work. CD-ROM is a read-only medium. That means that information can be read from it, but not written on it.

On a Macintosh computer you get the message "The file *'Filename'* could not be opened/printed (the application is busy or missing)." when you try to open a document on an ISO 9660/High Sierra disc.

If this happens, try opening the application program first; then open the document.

On a Macintosh computer you get the message "This is not a Macintosh disk: Do you want to initialize it?" when you insert a CD-ROM disc in the AppleCD SC Plus.

The disc is designed for a file system other than ISO 9660/High Sierra or Macintosh HFS—MS-DOS, for example. Eject the disc and exchange it for a disc that works with the AppleCD SC Plus.

Your Macintosh computer ejects the CD-ROM disc without giving you any error message.

Make sure you've inserted the disc correctly in the caddy (the label side should be up and the disc should be lying flat in the caddy).

You might need to change the standard configuration of the terminator at the end of your SCSI chain. (The standard configuration is shown in Figure 2-8 for Macintosh computers and in Figure 3-8 for Apple II computers.) Try this: First connect the cable terminator to the end of the SCSI system cable or peripheral interface cable. Then plug the terminator into one of the SCSI ports on the back of the AppleCD SC Plus (the other port remains empty).

If none of these suggestions works, the CD-ROM disc is damaged and needs to be replaced.

Problems using headphones

Plugging headphones into the headphone jack causes a malfunction of the AppleCD SC Plus or the computer it's attached to.

Static electricity when plugging in the headphones could be the culprit. Be sure all cards and cables are installed or connected exactly as described in the installation instructions. Plugging the headphones into the jack before turning on the AppleCD SC Plus might also avoid the problem. Make sure, however, that your equipment is properly grounded.

Problems playing audio CDs

You don't hear any sound when you try to use an audio CD.

Do you have headphones or amplified speakers attached to the AppleCD SC Plus? If you have headphones attached, but can't hear any sound, try adjusting the headphone connector to get a better fit.

Is the volume control turned all the way down? Turn it up slowly.

Did you use the CD Remote or Media Controller program to start the audio playback?

Did you click the Play button (or press P if you are using ProDOS 8)?

Did you click the Pause button (or press the Space bar if you are using ProDOS 8) and forget to click it again to resume play?

Using a Macintosh, you get a message that a file could not be opened or printed when you try to open one of the track icons on an audio CD.

You can't play tracks on audio CDs by opening track icons. Use the CD Remote desk accessory to play audio tracks.

You get a message to insert the CD when you double-click the icon of a mixed mode CD (one that combines audio tracks and data) while that CD is playing.

You can't open a mixed mode CD while it's playing. Click Stop in the CD Remote desk accessory before opening the CD.

Problems using CD-ROM discs with MultiFinder

You are using CD-ROM discs with MultiFinder® and you get the message "Not enough Finder memory to work with the disk *'Diskname.'*"

You are most likely to have this problem when you are working with CD-ROM discs containing a very large number of files. Open the System Folder, select the Finder™ icon, and choose Get Info from the File menu. When the Info window appears, press Tab to highlight Application Memory Size and increase the memory size to 210K. Restart the computer.

How the AppleCD SC Plus Works

Previous chapters of this manual discuss how to connect and set up the AppleCD SC Plus to work with a Macintosh or an Apple II, and how to access information contained on a CD-ROM or listen to an audio CD inserted in the AppleCD SC Plus. This appendix describes the construction of the CD-ROM medium, the process used to read the information on the disc, and the operation of the components inside the AppleCD SC Plus.

The AppleCD SC Plus was designed to work best with Macintosh and Apple II computers. However, any computer that is capable of communicating through the Small Computer System Interface (SCSI) bus may be attached to the AppleCD SC Plus.

❖ *Note:* Non-Apple computers will require their own version of a SCSI device driver that is compatible with the AppleCD SC Plus. ❖

CD-ROM technology at a glance

To understand how the AppleCD SC Plus works, you should first understand how the CD-ROM medium is constructed and how the data is stored on and read back from the disc.

How CD-ROM discs are made

The CD-ROM is a thin plastic disc 12 centimeters in diameter. Information is stored in a plastic-encased spiral track on one side of the disc. The spiral track consists of shallow depressions (pits) in a reflective layer. During the CD-ROM manufacturing process, **binary** information (combinations of two values, such as 0 and 1) is encoded as pits cut into a master disc. Production copies are pressed from the master, and then a reflective aluminum layer is applied to the embossed surface. This aluminum layer is then covered with a protective plastic film. The information is encoded by the length of the pits and the distance between them (known as land). The CD-ROM encoding scheme defines binary "1" bits as the transition from pit to land or land to pit and "0" bits as constant pit or constant land. Data is read from the underside of the reflective layer on the CD-ROM. Pits appear as bumps on the reading side of the CD-ROM. A cross-section of the CD-ROM is shown in Figure B-1.

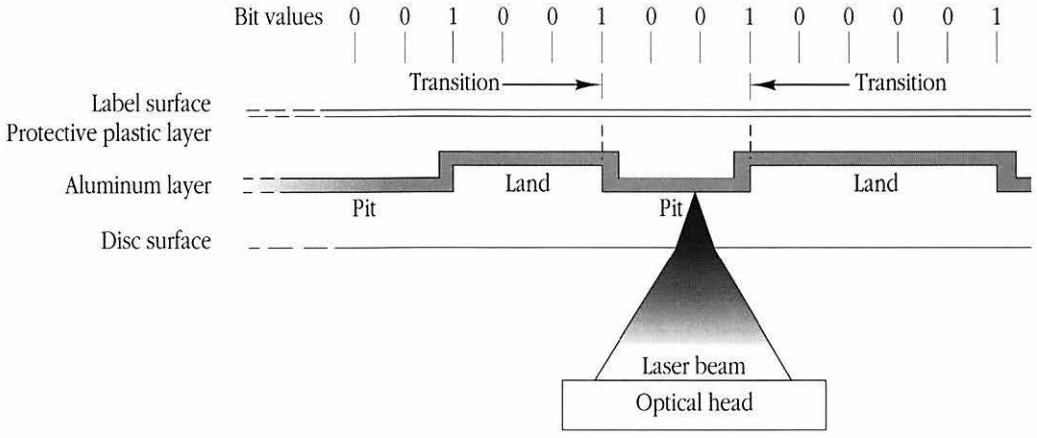

Figure B-1 A cross-section of the CD information surface

How the AppleCD SC Plus reads the CD-ROM

The spiral track on the CD-ROM is read by a noncontact pickup in the optical read head, which scans the disc as the disc spins above it. To retrieve the data from the CD-ROM, a low-power beam of light, emitted from a gallium arsenide laser in the optical head, is focused through the transparent layer of the disc onto the spiral track and reflected back into the optical pickup. Land fully reflects light, whereas interference effects occur when the laser beam overlaps a pit. This difference is sensed by the photodetector in the optical pickup. The modulated, reflected light is then converted to a radio-frequency signal by the photodetector. The signal is converted to raw data, sent over the SCSI bus to the computer, and interpreted as text, graphics, or sound for use in applications.

About the AppleCD SC Plus

The main components of the AppleCD SC Plus include

- a disc drive mechanism including an optical read head
- analog and digital servo electronics to maintain correct focus tracking and spindle motor speed
- digital electronics to read the recorded data and provide error correction
- a system controller
- a SCSI controller to communicate with whatever computer you're using—a Macintosh, an Apple II, or a non-Apple system
- analog electronics to output conventional audio CD stereo sound
- the power supply assembly

How these components interact is shown in the functional block diagram, Figure B-2. The main components are described following the block diagram.

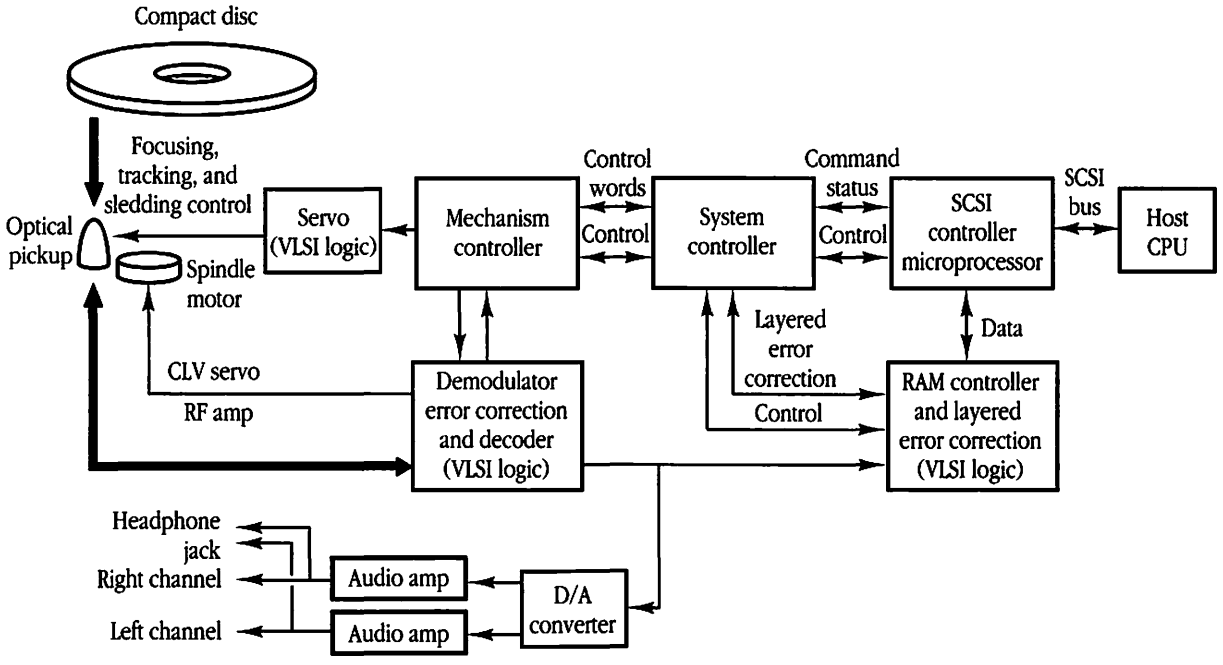

Figure B-2 A block diagram of the main components in the AppleCD SC Plus

The disc drive mechanism consists of a spindle motor, an optical read head with a noncontact pickup, and a mechanism for handling the CD-ROM caddy. The CLV (constant linear velocity) servo control causes the spindle motor to rotate the CD-ROM at a variable speed, so that the linear speed of the focused laser beam on the disc surface remains constant: the farther the laser beam is from the center, the slower the servo speed. The optical pickup is a noncontact sensor that reads the disc by monitoring the focused laser beam reflected off the CD-ROM.

Both the spindle and optical pickup mechanisms are controlled by the mechanism controller and analog servo electronics. The radio-frequency signal is converted into binary and passed to the demodulator and error-correction electronics. The error-correction circuitry corrects most CD-ROM data errors as they are encountered in real time. The mechanism controller controls the mechanical assemblies: the focus of the laser light source, the tracking for the optical pickup, and the spindle motor speed.

The digital electronics for CD-ROM make it possible for you to retrieve data stored on CD-ROM discs. The digital electronics process the digital information stored on the CD-ROM so that your computer can read and interpret it. Included in the digital electronics is the CD-ROM layered error-correction circuitry, which guarantees a bit error rate of less than 1 in 10^{12} bits. This powerful circuitry corrects any errors remaining after the previous error-correction and decoder stages.

The SCSI controller logic provides the communication link between the AppleCD SC Plus and host computer. The SCSI controller receives commands from the host and transfers them to the system controller. It also returns status information and data to the host computer from the AppleCD SC Plus. The SCSI controller utilizes a 64K data buffer, which ensures that the transfer of data from the CD-ROM to the host is always at the maximum rate.

The system controller processes the control information received by the SCSI controller from the computer and routes control instructions—such as eject disc, move the optical pickup to a specific track number, and so on—to the various electromechanical components in the AppleCD SC Plus.

The analog electronics for audio output make it possible for you to listen to CD stereo recordings either on your CD-ROM or on any ordinary audio CD. The analog electronics include a digital-to-analog converter and a stereo audio amplifier that drives headphones. Digitally recorded sound on the CD is converted by the electronics into an analog signal that is amplified and sent through the headphone jack and to the jacks on the back of the AppleCD SC Plus. The audio signal sent to the jacks requires amplified speakers or an amplifier that in turn drives a separate set of speakers.

Specifications

Physical

Depth	266 mm (10.47 in.)
Width	246 mm (9.69 in.)
Height	84 mm (3.31 in.)
Weight	4.0 kg (8.8 lb.)

General

Disc

Data surfaces	1
Disc diameter	12 cm
Disc center hole	15 mm
Thickness	1.2 mm
Track pitch	1.6 microns (15,875 tracks per in.)
Scanning velocity	1.2–1.4 meters per second
Rotation speed	Varies over radius ~530 to 230 rpm
Latency (average)	~55 to 130 milliseconds
Blocks per rotation	~8.4 to 19.5 variable

Data	
Data capacity	656 MB, Mode 1 748 MB, Mode 2
Number of blocks/disc	270,000 (typical)
Data per block	2048 bytes, Mode 1 2336 bytes, Mode 2
Address description	Minutes, seconds, frames
Audio capacity	
Playing time	74 minutes and 42 seconds
Data streaming rate	
Blocks per second	75 blocks per second
User bytes per second	150K, Mode 1 171.1K, Mode 2
SCSI bus transfer rate	1.5 MB per second
Modes supported	
CD-ROM CD-Audio	Modes 1 and 2

Environmental	**Noise (maximum)**	
	Drive on (seek or non-seek)	<46 dB
	Temperature	
	Operating temperature	+10°C (+50°F) to +40°C (+104°F)
	Storage (6 months)	–30°C (–22°F) to +50°C (122°F)
	Transit (72 hours)	–30°C (–22°F) to +55°C (+131°F)
	Humidity	
	Operating	10% to 90% noncondensing
	Storage	5% to 95% noncondensing
	Power requirements	
	AC input (Universal)	100 to 240V AC, 50 to 60 Hz
	Power consumption	
	Drive on	40 watts
Interface	**SCSI expansion ports**	50-pin connector

Service and Support

To help you get the best performance from your system, Apple Computer has established authorized Apple dealers who offer full support. 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 95014-6299
U.S.A.
(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 plans designed to meet your needs. One of these is the AppleCare® Service Agreement (available in the United States, Canada, and Australia only), which extends full warranty coverage up to three years. Your AppleCare 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 AppleCare 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.

binary (adj) Characterized by having two different components, or by having only two alternatives or values available. The binary system uses the two digits 0 and 1 to represent information. A single binary digit (0 or 1) is called a *bit*.

Boolean operator A word such as AND, OR, or NOT that allows you to refine your search for information. If a retrieval system recognizes these special words, it will explain how to use them.

browse To look through the information on a CD-ROM the way you page through a book or magazine waiting for something to capture your interest.

cable terminator See **SCSI cable terminator.**

caddy The plastic case that contains the CD-ROM while it's in use. When you insert the caddy in the drive, the metal shutter on the caddy slides away to give the laser access to the disc surface as it spins.

CD-ROM An acronym for *compact disc read-only memory.* A **compact disc,** 120 mm in diameter, that can store more than 550 megabytes of information as well as comprehensive error correction code. The information on the disc is designated *read-only memory* because a CD-ROM drive can access (read) the information on a CD-ROM, but not write information on it.

compact disc A metal-and-plastic disc in which information is stored digitally in the form of **pits** burned into the surface with a laser beam. Compact discs can be used to store many kinds of data, including text and images. See also **CD-ROM.**

disc See **compact disc.**

disk A flat, circular, magnetic surface, such as a floppy disk or a hard disk, that serves as a medium for storing information. See also **CD-ROM.**

GS/OS The standard operating system for the Apple IIGS.

High Sierra format The standard proposed by a number of computer and CD-ROM companies to specify how information is organized on a CD-ROM. The information is laid out in files located in a series of volumes, directories, and files. The High Sierra standard makes it possible to use the same CD-ROM with different kinds of computers. Only the retrieval software needs to be geared to the computer and its operating system. See **ISO.**

host computer In this book, the computer with which you use the AppleCD SC Plus—a Macintosh or an Apple II.

index system Like the index in a book, a list that shows the location of all the relevant information on the disc. CD-ROM retrieval software uses the index to find the information you ask for.

ISO Acronym for *International Standards Organization.* ISO standard 9660 is very similar, but not identical, to the **High Sierra format.**

jewel case A plastic case that protects the disc when it's not in use. When you buy a CD-ROM, it comes in a jewel case.

keyword A word that is likely to appear in the file you're trying to find.

keyword search A method of locating information on a CD-ROM. You type the word and the retrieval software searches for that word or derivatives of it.

land The area between pits on a CD-ROM track. See also **pit** and **optical storage.**

laser An acronym for *light amplification by simulated emission of radiation.* A device that produces an intense source of light that can be focused to a tiny spot.

master disc The glass model that is used to make the metal molds for mass-producing compact discs.

optical storage An information medium in which stored information is readable by a light detector. Information is recorded on CD-ROM discs as a pattern of pits and land (unpitted areas). The photodetector in the optical read head can tell the difference between pits and land by sensing the difference in the amount of light that is reflected.

peripheral interface cable See **SCSI peripheral interface cable.**

photodetector A device that detects the light reflected from CD-ROM discs and converts it into a signal for further processing.

photoresist layer A thin layer of material that is sensitive to light. A laser burns information into the photoresist layer on a glass disc to make a master.

pit A microscopic indentation on a CD-ROM track designed to be detected by a photodetector. See also **optical storage.**

premastering The process of writing information onto a 9-track tape and adding error correction and sector information, which is then used to create a master disc.

ProDOS 8 A disk operating system developed for standard Apple II computers. It runs on 6502-series microprocessors and on the Apple IIGS when the 65C816 microprocessor is in 6502 emulation mode.

retrieval engine See **retrieval software.**

retrieval software Software designed to locate and display on a computer screen the information on a CD-ROM.

SCSI An acronym for *Small Computer System Interface* (pronounced "SKUH-zee"). A standard way for peripheral devices to exchange information with each other and with the computer.

SCSI cable extender A cable you can attach to a **SCSI peripheral interface cable** to make it longer.

SCSI cable terminator A plug that absorbs the signals traveling along a SCSI cable, keeping the path open for new signals. If you have only one device, you need one cable terminator. If you have two or more SCSI devices, you need one cable terminator at the beginning and one at the end of the chain. Do not use more than two cable terminators in the chain.

SCSI chain A group of SCSI devices linked to each other using SCSI peripheral interface cables and linked to the SCSI port on the computer using a SCSI system cable.

SCSI ID number A number that distinguishes one SCSI device from another. There is a switch on each SCSI device for setting its ID number.

SCSI peripheral interface cable The cable that links SCSI devices to each other.

SCSI port The receptacle on the back of the computer and on the back of other SCSI devices for connecting SCSI devices to each other.

SCSI system cable The cable that links your first SCSI device to the computer.

search system See **retrieval software.**

stamper A metal mold, prepared from a CD-ROM **master disc,** that is used in the injection molding process used to manufacture CD-ROM discs in quantity.

system cable See **SCSI system cable.**

videodisc A double-sided optical disc capable of storing and playing back full-motion video.

word search See **keyword search.**

WORM An acronym for *write once, read many* times. It is a type of optical drive that allows users to save their own data to the disc once and access the information as often as they want. This type of drive provides an economical way of storing archival information for repeated access.

B

C

T

U

V, W, X, Y, Z

The Apple Publishing System

This Apple® manual was written and edited on a desktop publishing system using Apple Macintosh® computers and Microsoft Word. Proof pages were created on Apple LaserWriter® printers and on the QMS ColorScript 100 color printer. Final pages were produced in QuarkXPress and output directly to separated film on an AGFA Compugraphic ProSet 9000 series imagesetter. Line art was created with Adobe Illustrator. Screen shots were created and modified with system software and SuperPaint.

Display type is Apple's corporate font, a condensed version of Garamond. Text type is Adobe Garamond. Ornaments are ITC Zapf Dingbats® and custom symbols designed for Apple Computer.

PostScript®, the LaserWriter page-description language, was developed by Adobe Systems Incorporated.

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030-5123-A

Tuck end flap inside back cover when using manual.