



Apple®

Hard Disk 20SC Owner's Guide



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WARNING

This equipment has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of FCC rules. See instructions if interference to radio or television reception is suspected.



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Hard Disk 20SC Owner's Guide



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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 our instructions—it may cause interference with radio and television reception.

This equipment has been tested and complies with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules. These rules 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, especially if a “rabbit-ear” television antenna is used. (A rabbit-ear antenna is the telescoping-rod type usually found on television receivers.)

You can determine whether your computer is causing interference by turning it off. If the interference stops, it was probably caused by the computer or its peripheral devices. To further isolate the problem, disconnect the peripheral devices and their input/output (I/O) cables one at a time. If the interference stops, it was caused by either the peripheral device or the I/O cable. These devices usually require shielded I/O cables. For Apple peripheral devices, you can obtain the proper **shielded cable** from your authorized Apple dealer. For non-Apple peripheral devices, contact the manufacturer or dealer for assistance.

If your computer does cause interference to radio or television reception, you can 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 than the television or radio. (That is, make certain the computer and the radio or television set are on circuits controlled by different circuit breakers or fuses.)
- Consider installing a rooftop television antenna with a coaxial cable lead-in between the antenna and television set.

If necessary, consult your authorized Apple dealer or an experienced radio/television technician for additional suggestions.

Important

This product was FCC-certified under test conditions that included 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 radio, television, and other electronic devices.

A **shielded cable** has a metallic wrap around the wires to reduce the potential effects of radio-frequency interference.



Introduction



Your Apple® Hard Disk 20SC provides mass storage for any Macintosh™ computer that contains a Small Computer Systems Interface (SCSI) port, such as the Macintosh Plus, and for any Apple II computer that contains an Apple II SCSI peripheral card. The Hard Disk 20SC comes in beige or platinum to match your other Apple system components.

The Hard Disk 20SC gives you 20 megabytes of storage—about 10,000 pages of information. Plus it gives you fast, reliable performance. For even greater storage capacity, you can add one or more Hard Disk 20SCs to your original Hard Disk 20SC. While using your SCSI peripheral devices, you can also continue to use devices, such as 3.5-inch or 5.25-inch disk drives and hard disk drives, that connect to your computer through non-SCSI connectors. With a few exceptions, you'll use the hard disk just as though it were a larger version of a 3.5-inch disk or a 5.25-inch disk.

The *SC* in the name Hard Disk 20SC stands for *Small Computer*; it indicates that your hard disk is part of the family of peripheral devices that connects to your computer through the Small Computer System Interface (SCSI) cable. SCSI provides a faster way of sending information back and forth between your computer and a variety of peripherals. This interface is a new standard, developed by engineers from many companies working together through the American National Standards Institute. It provides compatibility with many devices of many types, from many different manufacturers. SCSI increases the speed, flexibility, expandability, and sophistication of your system.

About this manual

Throughout this manual, "Macintosh" or "Apple II" will mean any computer of these two families that can connect to an SCSI cable.

This manual assumes you have read the owner's guide that accompanies your Macintosh or Apple II computer and the *Apple SCSI Cable System* manual. If you are an Apple II owner, it assumes you have inserted an SCSI card in your computer and have read the accompanying manual, *How to Install Your Apple II SCSI Card*.

Words that appear in bold type are defined in the glossary.



Chapter 1



Getting Started

Setting up

To set up your Hard Disk 20SC, read the instructions in this chapter.

Do you have what you need?

Besides this manual, the Hard Disk 20SC box holds the hard disk and the following:

- a *Hard Disk 20SC Installation* disk (for the Macintosh family of computers)
- a Hard Disk 20SC power cord

Remove the plastic bag from the hard disk. It's a good idea to keep all your packing materials in case you need to transport your hard disk.

You will need the Apple SCSI Cable System, consisting of at least one system cable and one cable terminator. Depending on your office setup and peripheral devices, you may also need some peripheral cables and cable extenders. Please read the *Apple SCSI Cable System* manual, which accompanies these cables, before attempting to connect any devices. You can purchase these cables at your local Apple dealer.

Because the Apple II treats the Hard Disk 20SC like any other device, Apple II owners do not need a special installation disk. The section "Starting Up With an Apple II" later in this chapter explains how to format the Hard Disk 20SC for your Apple II.

Before you begin

Macintosh owners should make a copy of the *Hard Disk 20SC Installation* disk to ensure the safety of the disk. See your Macintosh owner's guide for instructions on copying an entire disk.

Handling the hard disk

Your Hard Disk 20SC is a mechanical device with moving parts. Treat your hard disk as you would a stereo turntable. You can carry it around; just be careful. Rough handling, such as dropping the hard disk, jarring or bumping it (especially while it's running), or allowing heavy objects to drop on it, can cause a malfunction or damage the information on the disk.

Inserting the Apple II SCSI Card

This section is for Apple II users; Macintosh users can skip to the next section, "Where to Place the Hard Disk." This section explains how to connect one or two Hard Disk 20SCs to an Apple II. To connect three or four Hard Disk 20SCs, see Appendix D of this manual. For additional explanation on where to place the SCSI card, see *How to Install Your Apple II SCSI Card*.

As long as you are using one or two Hard Disk 20SCs, you may insert the SCSI card in any slot except slot 3 (which is reserved for the 80-column card). To take advantage of the speed of the Hard Disk 20SC, an Apple II should start up from files on the hard disk. The Apple looks for a startup program in each disk drive, starting with the disk drive connected to the disk-controller card in the highest slot number.

Important

For all Apple IIs except the Apple IIGs, if you want to start up from files on the Hard Disk 20SC, put the SCSI card in a slot with a number higher than you've given to any other disk-controller card. For the Apple IIGs, you can use the control panel to set the startup drive.

magnetic interference:

Interference with the behavior of magnetic storage devices such as disk drives. Magnetic interference can be caused by the Macintosh power supply, located on the left side of the Macintosh, forming a local magnetic field.

Where to place the hard disk

To ensure proper ventilation while the hard disk is on, be sure not to block the air vents at the sides and back of the unit.

Macintosh: Many users find it convenient to place the Hard Disk 20SC under the Macintosh. If you prefer to put the hard disk to the side, place it on the right side. You risk **magnetic interference** from the Macintosh's power supply and video circuitry if you place the hard disk on the left side of the Macintosh.

Apple II: If you find it convenient to place the hard disk to the side of your Apple II, place it on the right side. You risk magnetic interference from the Apple's power supply if you place it on the left. You can also place it on a shelf above or below the computer. Do not put your monitor on top of the hard disk.

Connecting the hard disk

To connect the Hard Disk 20SC *directly* to either a Macintosh or an Apple II, follow the directions below. If you are connecting more than one SCSI device to your computer, read the *Apple SCSI Cable System* manual that accompanies the SCSI system cable.

To use the Hard Disk 20SC with any Apple II product, the Apple II must contain an Apple II SCSI card. Apple II owners should read *How to Install Your Apple II SCSI Card* before connecting any SCSI cables.

Wait to turn on your computer until you have finished reading the instructions in this chapter.

Figures 1-1 and 1-2 show a Macintosh Plus and an Apple II correctly connected to a Hard Disk 20SC with an SCSI system cable and a cable terminator. You may have chosen to use a cable extender, in addition to the SCSI system cable. If so, your setup will be slightly different from the ones pictured.

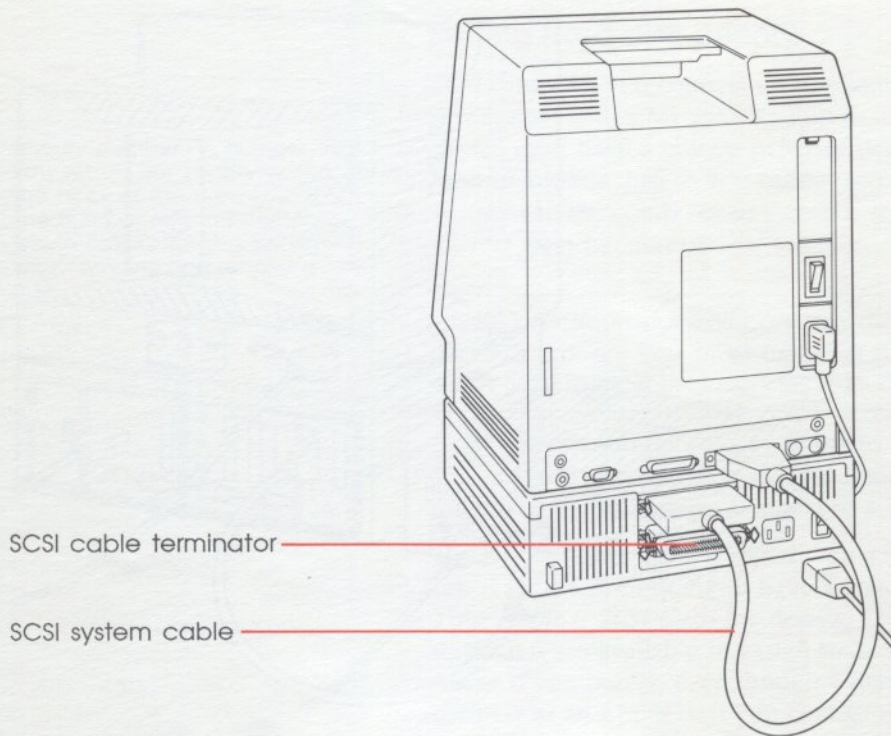


Figure 1-1

Macintosh Plus correctly connected to a Hard Disk 20SC

1. With your computer plugged in and *switched off*, touch any one of the metal connectors on the back of the computer.
This procedure discharges any static electricity that may be on your body.
2. Without touching the metal pins in the SCSI connector, attach the 25-pin connector to the back of the computer by inserting the connector into the SCSI port or card.
Tighten the screws gently with a small screwdriver.
3. Attach the 50-pin connector to either port on the back of the Hard Disk 20SC.
Press the diamond-shaped wire clips toward the connector, snapping them into the clip brackets to secure the connection.
4. Attach the cable terminator to the remaining port on the back of the Hard Disk 20SC.
Press the diamond-shaped wire clips toward the terminator, snapping them into the clip brackets to secure the connection.

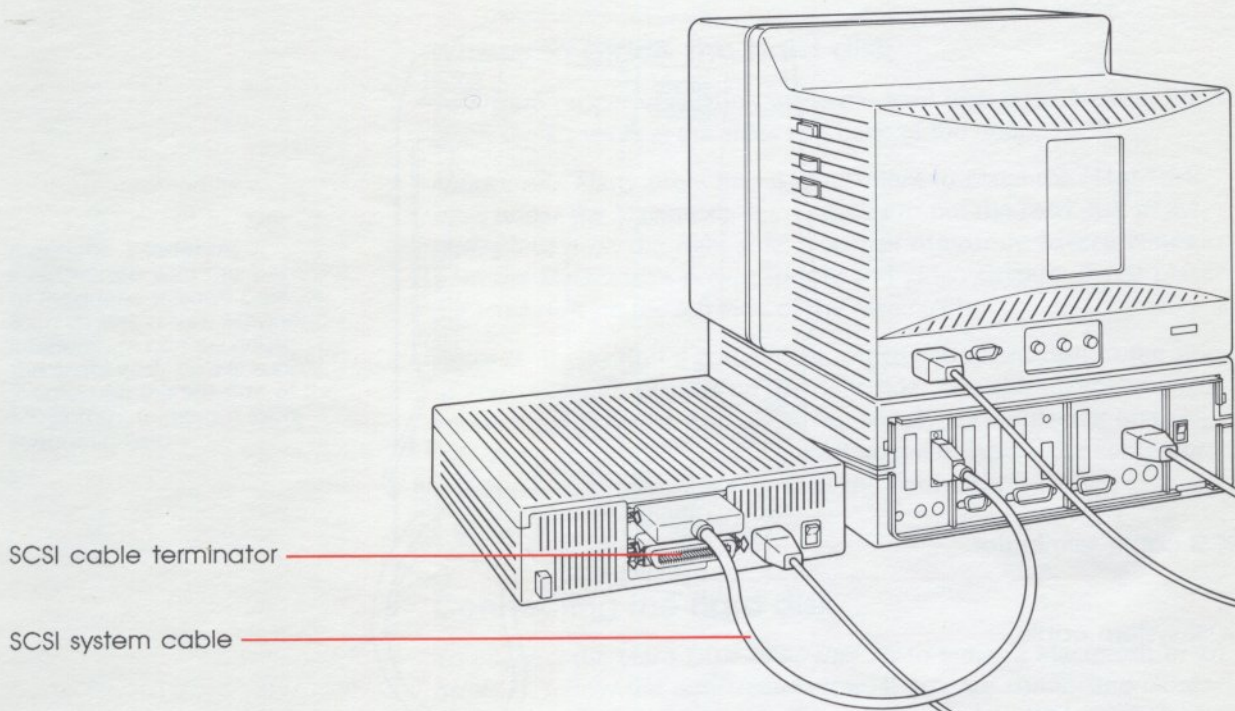


Figure 1-2

Apple II correctly connected to a Hard Disk 20SC

5. With the Hard Disk 20SC connected to your computer and both these devices *switched off*, attach the Hard Disk 20SC power cord to the hard disk, and plug the power cord into a three-prong AC outlet.

Warning

The Hard Disk 20SC is intended to be electrically grounded. It's equipped with a three-wire, grounding-type plug, one that has a third (grounding) pin. This plug fits only into a three-prong (grounding-type) AC outlet. This is a safety feature. If you can't insert the plug into the outlet, have a licensed electrician replace the outlet and, if necessary, install a grounding conductor. Don't risk damage to your disks and data by circumventing the use of a grounding-type plug.

If you're adding a second Hard Disk 20SC to your system, see "Adding Additional Hard Disk 20SCs" in this chapter.

priority number: A number that you set on the priority switch at the back of the Hard Disk 20SC. The number tells the computer which device to give priority when sending and receiving files.

Setting hard disk priority

SCSI cables let you connect up to seven SCSI devices together on one system with a Macintosh or up to four with an Apple II. Each device must have a unique **priority number**, which serves as a kind of address. Just as you cannot receive mail without an address, neither can the computer or a device send or receive files without a correct priority number.

Important

Under no circumstances can two devices have the same priority number: You must assign a different priority number to each SCSI device that connects to an SCSI cable.

Eight priority numbers are available to SCSI device users, 0 through 7. The Macintosh is always assigned number 7. You can assign 0 through 6 to devices that connect to a Macintosh.

The Apple SCSI card is shipped with a priority of 7; however, you can reset the priority if you have a special need. See *How to Install Your Apple II SCSI Card* for details. The priority numbers 0 through 6 are available to assign to SCSI devices that connect to Apple II computers, even though a maximum of four devices can connect to an Apple II. If you change the priority setting of the Apple II computer, then the number 7 becomes available to assign to a device.

For Apple II computers, the priority numbers determine the slot and drive through which the devices are accessed. One or two Hard Disk 20SCs appear in descending order of priority in drives 1 and 2 of the slot in which you have inserted the SCSI card.

For three or four devices, in descending order of priority, the slot and drive assignments are

slot 5, drive 1

slot 5, drive 2

slot 2, drive 1

slot 2, drive 2

For more information see "Inserting the Apple II SCSI Card" earlier in this chapter and Appendix D.

tape backup device: A device that lets you back up the entire contents of the hard disk to a high-density tape medium.

In general, assign higher numbers to devices that you use most often. Usually you assign the higher numbers to hard disk drives, middle numbers to printers, and the lowest number to the **tape backup device**. Unless you have reason to do otherwise, assign number 6 to your first Hard Disk 20SC, number 5 to a second one, and so on in descending order.

As shown in Figure 1-3, the **priority switch** is located on the back panel of the Hard Disk 20SC.

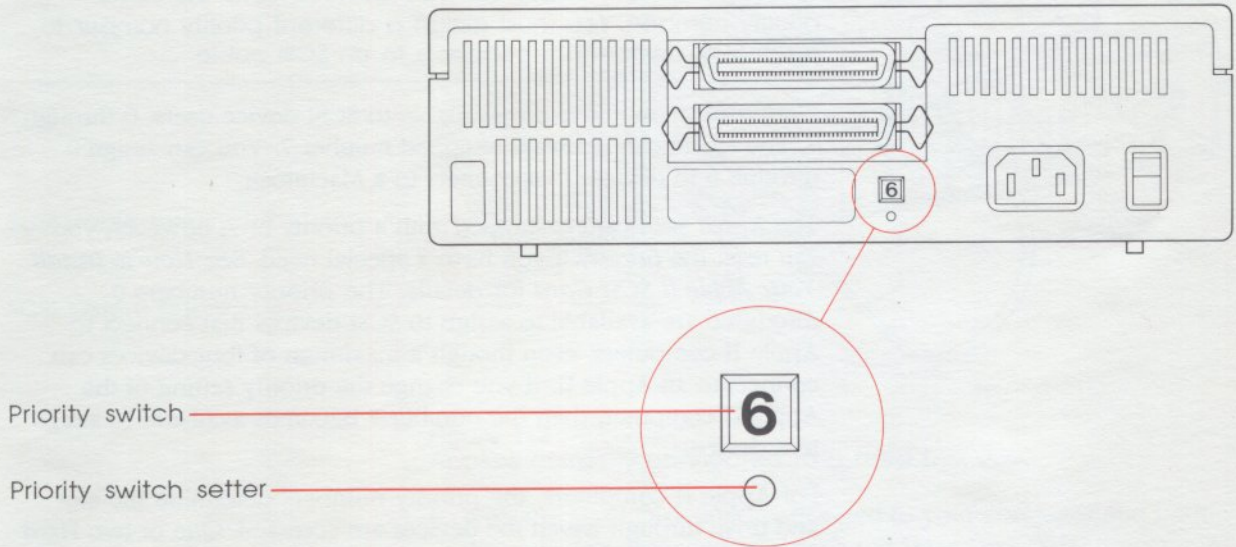


Figure 1-3
The Hard Disk 20SC priority switch

With the Hard Disk 20SC turned off, set the priority switch to the number of your choice. Insert the point of a push pin or unwound paper clip into the hole below the priority switch (the priority switch setter). Push gently. The numbers increase. If you go past the number you want, keep pushing until you cycle around to your choice.

The next section describes starting up your Hard Disk 20SC for the first time. Be sure to read it before you switch on the Hard Disk 20SC or your computer.

initialize: To prepare a blank disk to receive information by organizing its surface into tracks and sectors; same as *format*.

Starting up for the first time

The first time you start up your hard disk is different from any other time you start up, because the hard disk is not ready to store files. Getting it ready is called either **initializing** or *formatting* the hard disk.

Once you initialize the Hard Disk 20SC to run with a Macintosh, you cannot use that same Hard Disk 20SC with an Apple II unless you reformat it for the Apple II, and vice versa. Whenever a hard disk is formatted, any existing information is lost. If you choose to use your hard disk with a different family of Apple computers, be sure to back up all the data on the Hard Disk 20SC to 3.5-inch or 5.25-inch disks, another hard disk, or another backup device before reformatting it.

Starting up with a Macintosh

If you have two or more Hard Disk 20SCs, you must initialize each one. You may choose any order you wish.

1. Insert the *Hard Disk 20SC Installation* disk in the internal disk drive.
2. *If you have one Hard Disk 20SC connected:* Switch on the Macintosh and the Hard Disk 20SC in any order.

You will hear the hard disk fan and see the disk icon on the Macintosh desktop.

If you have two or more Hard Disk 20SCs connected: Switch the hard disks on. When they have been running for at least 10 seconds, switch on the Macintosh.

When the Macintosh recognizes the hard disk, the hard disk light blinks. The light blinks whenever there's disk activity; otherwise, the light remains off even though the hard disk is on.

3. Select the Hard Disk 20SC Installation icon and open it by choosing Open from the File menu or by double-clicking the icon.

As shown in Figure 1-4, you see the two icons for the System Folder and the Hard Disk 20SC Installer file in the Hard Disk 20SC window.

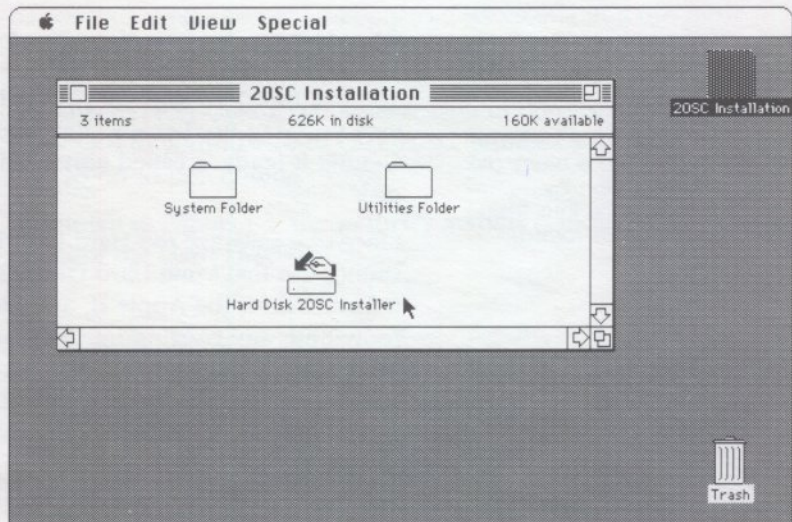


Figure 1-4
The System Folder and the Hard Disk 20SC Installer file

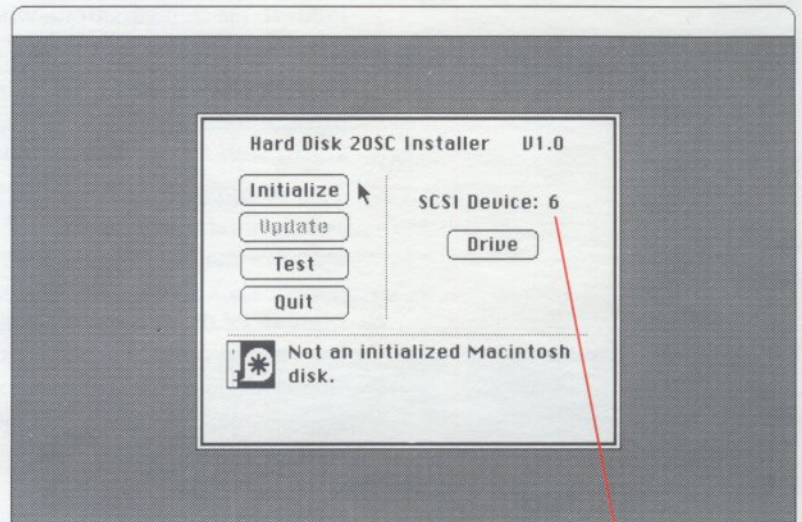
4. Double-click to open the Hard Disk 20SC Installer file icon.

You see the Hard Disk 20SC Installer dialog box, which has five buttons: Initialize, Update, Test, Quit, and Drive, as shown in Figure 1-5. The Initialize and Drive buttons are explained below; Test is explained in Chapter 2 under “Testing the Hard Disk 20SC With a Macintosh.”

driver: A program that lets the hard disk and the computer send and receive files.

You use the Update button to reinstall the current **driver** program, if the driver on your Hard Disk 20SC becomes damaged or to update to a new driver program, if one becomes available. You can update the driver program without losing any data. See the Troubleshooting section in Chapter 2 for more information on reinstalling a damaged driver. Use the Quit button to leave this dialog box and return to the desktop.

The SCSI device number in the dialog box must match the priority number of the disk drive you want to initialize, as shown in Figure 1-5.



These numbers must match.

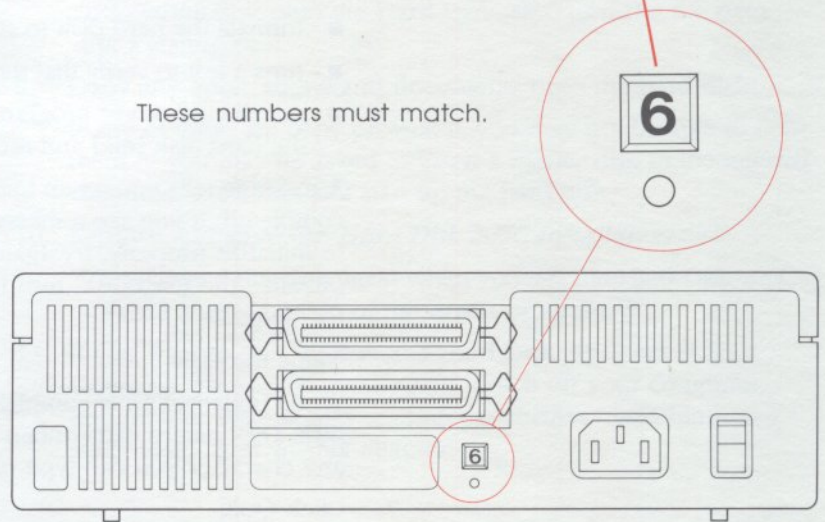


Figure 1-5
The SCSI device number and the priority switch number

Refer to these instructions when setting the correct device number:

One Hard Disk 20SC: The priority number that you set for the drive automatically appears as the SCSI device number. Go ahead with the next step, initializing the disk.

Two or more Hard Disk 20SCs: Make sure that the priority switch number on the back of the Hard Disk 20SC you wish to initialize matches the SCSI device number. If they do not match, click Drive until they do. If, when you click Drive, the number of the second drive does not appear, the disk may be incorrectly connected or switched off. When the priority number and the device number match, go ahead with the next step, initializing the disk. When you have initialized the first disk, initialize the next disk.

5. Click Initialize.

A dialog box appears, reminding you that initializing will erase all of the data on the hard disk. To continue, click OK. Initialization takes about 7 minutes. Messages appear in the Installer window, explaining the course of the initialization. Initializing does the following:

- formats the hard disk to store data
- runs a test to verify that the hard disk is OK
- installs the driver program, which lets the Macintosh and the hard disk send and receive files

A message tells you when initializing has been successfully completed. If you see a message that the Hard Disk 20SC failed to initialize properly, try again. If you are still unable to initialize the hard disk, turn to "Troubleshooting" in Chapter 2 for help.

6. Name the disk.

When initialization is complete, you are asked to name the disk. Disk names can contain up to 27 characters. You can use any character you can type on the keyboard, except colons (:).

7. Click Quit.

You return to the desktop, where the Hard Disk 20SC icon appears and is labeled with the name you gave it. (We gave it the name *Hard Disk 20SC*, shown in Figure 1-6.)

Hard Disk 20SC Icon

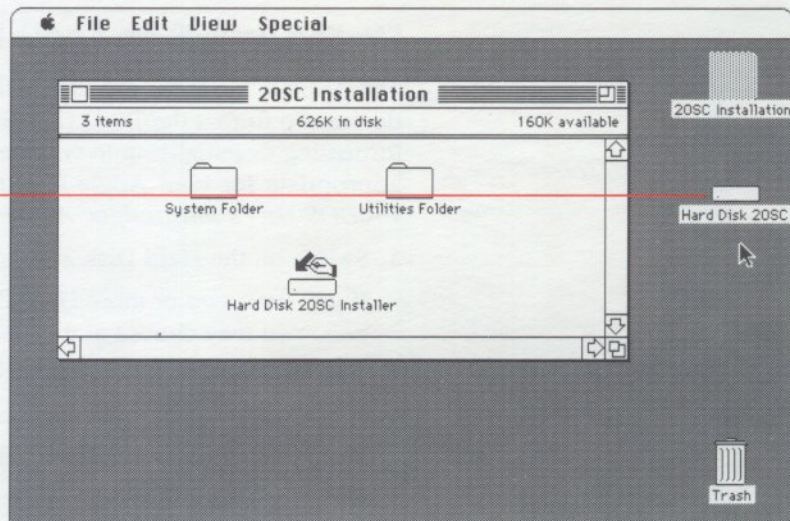


Figure 1-6

The Hard Disk 20SC icon on the desktop

System Folder: A Macintosh folder that contains files for desk accessories, fonts, and other basic information that is of general use by the Finder and other applications.

8. Copy the **System Folder** from the *Hard Disk 20SC Installation* disk onto the Hard Disk 20SC to make the hard disk a startup disk.
9. Copy any applications and documents onto the hard disk.
If any of these are copy protected, you may not be able to copy them or you may be asked to insert a master disk in the internal disk drive each time you start up the hard disk.
10. Remove and store the *Hard Disk 20SC Installation* disk.
You will need this disk again when you test the Hard Disk 20SC or install a new version of the driver program.
11. If you want to start up from the Hard Disk 20SC, select Shut Down on the Special menu, then switch off your computer. Restart your system after reading the section "Switching on a Macintosh" later in this chapter.

Starting up with an Apple II

The Apple II treats the the Hard Disk 20SC like any other storage device. To format the Hard Disk 20SC, see the section on formatting or initializing in whichever of the following manuals is appropriate for your Apple II: *Apple II System Utilities Guide*, *ProDOS User's Manual*, or *Apple II GS System Disk User's Guide*.

1. Switch on the Hard Disk 20SC.

If you have two or more Hard Disk 20SCs, you must initialize each one. You may choose any order you wish.

You hear the hard disk fan. Wait about 10 seconds.

2. Insert the *Apple II System Utilities Disk*, the *ProDOS User's Disk*, or the *Apple II GS System Disk* in one of the Apple disk drives.
3. Switch on the Apple II.

Figure 1-7 shows how to start up an Apple II with the Hard Disk 20SC.

Follow the instructions in the appropriate system software or utilities software you are using to format the disk. Formatting a Hard Disk 20SC takes a minute or so. The light blinks whenever there's disk activity; otherwise, the light remains off even though the hard disk is on.

The formatting program asks you to specify a slot and drive number for each Hard Disk 20SC that you are connecting. See "Inserting the Apple II SCSI Card" and Appendix D for more information on inserting the Apple II SCSI card into the correct slot. When asked to specify the slot and drive number of the Hard Disk 20SC, reference the following information:

One or two Hard Disk 20SCs: Specify the slot of your choice.

Higher priority number	= drive 1
Lower priority number	= drive 2

Three or four Hard Disk 20SCs:

Highest priority number	= slot 5, drive 1
Next highest	= slot 5, drive 2
Next highest	= slot 2, drive 1
Lowest	= slot 2, drive 2

Important	There is no SCSI card in slot 2. However, as long as the SCSI card is in slot 5, the operating system correctly formats the third and fourth hard disks.
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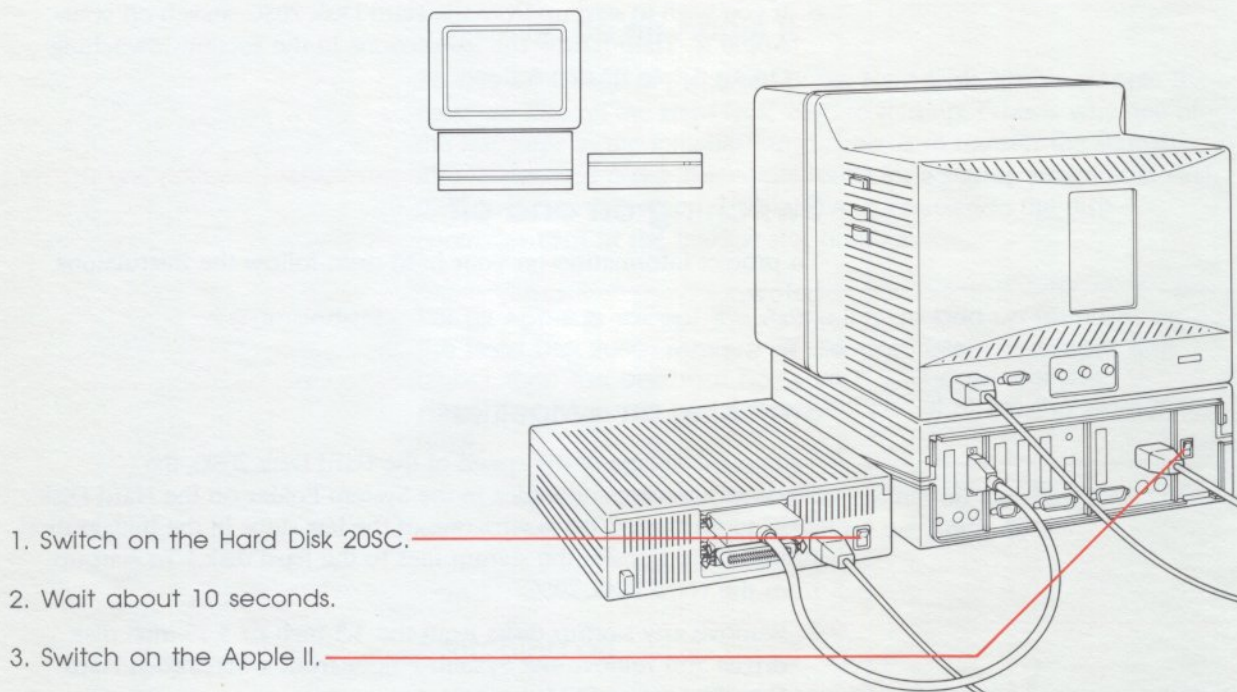


Figure 1-7

How to start up an Apple II with the Hard Disk 20SC

4. Copy the necessary startup files to the hard disk you have chosen as the startup disk.

Read about copying files in the *Apple II System Utilities Guide*, the *ProDOS User's Manual*, or the *Apple IIGS System Disk User's Guide*. See "Switching On and Off" for more information on starting up the hard disk after the first time.

5. Copy any applications and documents onto the hard disk.

If any of these are copy protected, you may not be able to copy them or you may be asked to insert a master disk in the internal disk drive each time you start up the hard disk.

6. If you wish to start up from the Hard Disk 20SC, switch off your Apple II. Then follow the instructions in the section "Switching On an Apple II" that follows.

Switching on and off

To protect information on your hard disk, follow the instructions below.

Switching on a Macintosh

To take advantage of the speed of the Hard Disk 20SC, the Macintosh must use the files in the System Folder on the Hard Disk 20SC to start up. (This is why one of the last steps in the initialization process is to transfer the startup files to the hard disk.) To start up from the Hard Disk 20SC:

1. Remove any startup disks from the 3.5-inch or 5.25-inch disk drives and remove the System Folder from a Macintosh Hard Disk 20 (not an SCSI device).

When you switch on the Macintosh, it automatically looks for the necessary startup files in the places and order shown below:

1. internal disk drive
 2. external disk drive
 3. a Macintosh Hard Disk 20 (not an SCSI device)
 4. the Hard Disk 20SC with the highest priority number
 5. another Hard Disk 20SC with the next highest priority number
2. Switch on the Hard Disk 20SC and the Macintosh in any order.

Once the Hard Disk 20SC becomes the current startup disk, it remains so until you manually switch to another startup disk. See your owner's guide for information on how to manually switch to a different startup drive from a hard disk.

Switching on an Apple II

To take advantage of the speed of the Hard Disk 20SC, an Apple II must use files on the Hard Disk 20SC to start up. (This is why one of the last steps in the initialization process is to transfer the startup files to the hard disk.) The Apple looks for a startup program in each disk drive, starting with the disk drive connected to the disk-controller card in the highest slot number.

Important For all Apple IIs except the Apple IIgs, to start up from files on the Hard Disk 20SC, remove all disk-controller cards from slots higher than the one that holds your SCSI card. For the Apple IIgs, you can use the control panel to set the startup drive.

To start up from the Hard Disk 20SC, switch on the Hard Disk 20SC, wait at least 10 seconds, then switch on the Apple II.

Switching off

You can leave your Hard Disk 20SC on and unused for several days; it draws very little power. Switch it off, as described here, when you won't be using it for a week or more or when you want to connect it to (or disconnect it from) the computer or another Hard Disk 20SC.

1. Quit the application you're working in and return to the desktop or the operating system prompt. Macintosh users click Shut Down from the Special menu; wait until you hear the beep.
2. Switch off the Hard Disk 20SC.

Important Never switch off the Hard Disk 20SC while the light is blinking. You may lose information on the hard disk.

3. Switch off the computer.

Connecting and disconnecting hardware

To avoid damaging the device you're working with, always switch off the Hard Disk 20SC and your computer before connecting or disconnecting hardware.

Adding additional Hard Disk 20SCs

You can add one or more Hard Disk 20SCs to your system by attaching them with an SCSI peripheral interface cable (and an SCSI cable extender or cable terminator, if necessary). The maximum number of devices possible on an SCSI system with a Macintosh is seven, plus the computer. The maximum number of SCSI devices for an Apple II system is four, plus the computer.

For a complete discussion on how to connect SCSI devices with the appropriate cables, see the *Apple SCSI Cable System* manual.

To add an additional Hard Disk 20SC to the original one, follow these instructions:

1. Switch off the first Hard Disk 20SC and then the computer.
2. Attach the second Hard Disk 20SC to the first with an SCSI peripheral interface cable.

Notice that the second hard disk connects to the first, not to the computer, as shown in Figure 1-8.

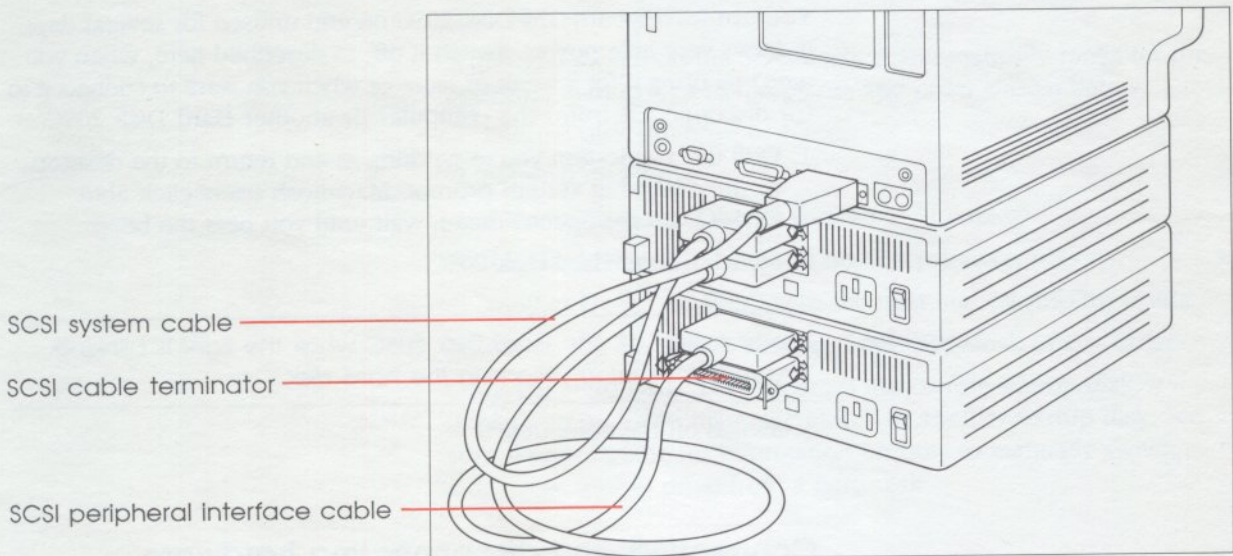


Figure 1-8
Connecting two hard disks

3. Switch on both Hard Disk 20SCs in any order.
4. When they have each been on at least 10 seconds, switch on the computer.
5. Insert the *Hard Disk 20SC Installation* disk in the internal disk drive of the Macintosh or the operating system disk in drive 1 of an Apple II system.

See “Inserting the Apple II SCSI Card” and Appendix D for information on where to place the Apple II SCSI card when connecting additional Hard Disk 20SCs.

6. Repeat the initialization procedure described in “Starting Up for the First Time” for the uninitialized Hard Disk 20SC. There is no need to copy the system startup files unless you want to start up from the newly initialized Hard Disk 20SC.

Reinitializing a Hard Disk 20SC

It is unusual to want to reinitialize a Hard Disk 20SC. You may want to do so if you initialized the Hard Disk 20SC to run with a Macintosh and now want to use it with an Apple II or vice versa.

Warning

Reinitializing a Hard Disk 20SC erases any existing information on that hard disk. If you choose to reinitialize your Hard Disk 20SC, be sure to back up all the data onto 3.5-inch or 5.25-inch disks or another backup device before reinitializing it.

With a Macintosh

To reinitialize the Hard Disk 20SC with a Macintosh, start up the computer with the *Hard Disk 20SC Installation* disk in the internal disk drive.

If you try to reinitialize the same Hard Disk 20SC that you used to start up your computer, the Initialize button on the Install window will be grayed out, preventing you from inadvertently destroying data.

With an Apple II

To reinitialize the Hard Disk 20SC with an Apple II, use the appropriate formatting program.

There is no protection for an Apple II against reinitializing a hard disk filled with valuable information. Be sure to back up all the information you want to keep before reinitializing the hard disk.



Chapter 2



Maintenance and Troubleshooting

Maintenance

This chapter explains how to care for your Hard Disk 20SC and what to do should you encounter any problems with its operation.

Operating environment

Your Hard Disk 20SC can operate effectively in about the same temperature and humidity as you can: 50 to 104 degrees Fahrenheit and 20 to 80 percent relative humidity.

Be careful to protect the hard disk from spilled liquids and hazardous vapors. Spilling any liquid inside, or allowing the disk drive to be exposed to chemical or solvent fumes (including steam from a coffee maker), can harm it.

Cleaning

To clean the outside of the disk drive, just wipe it with a soft, damp cloth. To remove stains or dirt, add a drop of liquid detergent to the cloth and wipe the surface of the disk drive.

Troubleshooting

Occasionally you may have problems while using your Hard Disk 20SC. This section presents the most common problems and steps you can take that will usually correct them. If after following the steps in this section you are still having difficulties, contact your authorized Apple dealer for assistance.

Warning

Never try to remove the cover from the main unit. The Hard Disk 20SC contains high-voltage components that retain an electrical charge, even after the unit is switched off.

Problem descriptions and solutions

All of the problems below, except the first, pertain only to Macintosh computers. If you have problems with your Apple II, see the problem description or error message section of the owner's guide for your computer.

■ **Your Hard Disk 20SC doesn't switch on.**

If you don't hear the fan when you switch on the hard disk, make sure all cables are properly connected, power cords are plugged in, and power switches are turned on. If your Hard Disk 20SC still will not switch on, see your authorized Apple dealer (see Appendix B, "Service and Support").

■ **Your Hard Disk 20SC icon doesn't appear on the Macintosh Finder desktop.**

- You must initialize the Hard Disk 20SC before the Hard Disk 20SC icon will appear on the desktop.
- If you have two or more Hard Disk 20SCs connected to your Macintosh, you must switch on both and leave them on for at least 10 seconds before you switch on your Macintosh.
- Your System file or driver on the Hard Disk 20SC may have been damaged. Restart the Macintosh with the *Hard Disk 20SC Installation* disk in the internal disk drive. Replace the damaged System Folder on the Hard Disk 20SC with the undamaged System Folder on the installation disk. When you replace the damaged System Folder, all of the files it contained will be erased. The undamaged copy contains only the System and Finder files; you will have to replace any other files, such as custom fonts, desk accessories, and software for peripheral devices.

If the Hard Disk 20SC icon still doesn't appear on the Macintosh Finder desktop, the driver may be damaged. Insert the *Hard Disk 20SC Installation* disk in the Macintosh internal disk drive and open the Hard Disk 20SC Installer file. Make sure that the SCSI device number in the dialog box matches the priority number of the disk that is not working correctly. Double-click on the Update button to replace the damaged driver on the hard disk with the undamaged driver from the installation disk.

- Your Hard Disk 20SC may have been damaged if you turned it off or if there was a power failure while the light was blinking. If so, you must reinitialize the hard disk and restore the data from a backup copy.

- **The Hard Disk 20SC installation disk doesn't appear correctly on the desktop.**

When you start up the Macintosh with the *Hard Disk 20SC Installation* disk, you should see a disk icon in the top-right corner of the desktop. If none appears or the disk is ejected from the disk drive, then the installation disk is damaged and must be replaced by your authorized Apple dealer.

- **When you select the Hard Disk 20SC Installer file icon, you immediately see the message "Drive selection failed."**

Your Hard Disk 20SC is not switched on or your cables are incorrectly connected. Check to see that you have an SCSI cable terminator and that it is correctly connected.

- **You are running the initialize program and you see the message "This drive is not working correctly. See your dealer."**

There is a hardware problem with your Hard Disk 20SC. See your authorized Apple dealer.

- **An application doesn't work correctly.**

If you experience difficulty opening an application that's in a folder, move the application, its documents, and any other files associated with it out of the folder and leave them in the Directory window.

- **You have two or more Hard Disk 20SCs connected, and the second device number does not appear when you click Drive.**

The drive whose number does not appear is incorrectly connected or is not turned on.

Testing the Hard Disk 20SC with a Macintosh

You can run a test on the Hard Disk 20SC Installer file that tells you whether or not the hard disk is reading and writing data properly. (The test is for hardware only; it can't tell you anything about software problems.) A failure means something isn't working properly—even though you may not notice anything wrong. Have your Hard Disk 20SC checked by an authorized Apple dealer if it fails the test. You may want to run the test every month or so to avoid unexpected loss of data.

The test takes about 4 minutes; it does not affect the data currently stored on the disk.

Use the following instructions to test a Hard Disk 20SC that is connected to a Macintosh Plus:

1. Make sure the Hard Disk 20SC and the Macintosh are both switched on.
2. Select the Hard Disk 20SC icon and open it by choosing Open from the File menu or by double-clicking the icon.

You see two icons: the Hard Disk 20SC Installer file icon and the System Folder icon.

3. Double-click to open the Hard Disk 20SC Installer file icon.

The SCSI device number must match the priority number of the disk drive that you want to test. If the numbers match, then go ahead with next step. If not, click Drive until the device number and the priority number match. See Figure 1-5 for how the numbers should match.

4. Click Test.

When the test is complete, a message tells you whether the hard disk passed or failed.



Appendix A



Hard Disk 20SC Specifications

Height: 78 mm (3.07 in)

Width: 246 mm (9.69 in)

Depth: 266 mm (10.47 in)

Maximum weight: 3.63 kg (8 lbs)

Temperature: operating: 10 to 40 degrees C
(50 to 104 degrees F)
storing: -40 to 50 C
(-40 to 122 degrees F)

Relative humidity (noncondensing): 20 to 80%

Altitude: operating: -1000 to 10,000 ft
nonoperating (shipping): -1000 to 40,000 ft

Input Power: line voltage: automatically adapting
85 to 270 Volts AC, RMS
power: 60 watts

Storage: data capacity (formatted): 20 megabytes
bytes per block: 532
total disk blocks: 39360
drive startup time: 9 seconds
drive spindown time: 20 seconds
transfer rate: up to 1.25 megabytes
per second

Interface: SCSI expansion port: 50-pin interface



Appendix B



Service and Support

To help you get the best performance from your system, Apple Computer, Inc., has established a worldwide network of full-support authorized Apple dealers. If you need answers to technical questions or information about product updates, your authorized Apple dealer can help you. Apple's Technical Support organization backs each dealer and international technical support group via AppleLink™, 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, call (800) 538-9696; in Canada, call (800) 268-7796 or (800) 268-7637. For locations in other countries, either call the Apple headquarters in your country or write to

Apple Computer, Inc.
Attn: Customer Relations
20525 Mariani Avenue
Cupertino, California 95014
USA


Apple also offers service options designed to meet your needs. They range from carry-in contracts like the AppleCare[®] Service Agreement (U.S., Canada, and Australia only), which extends full warranty coverage up to three years, to self-service plans designed to allow large installations to repair their own equipment. Whether you use your computer at home, in the office, or at school, Apple has a low-cost service plan for you. For details, please visit your authorized Apple dealer.

AppleCare

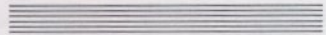
Your Hard Disk 20SC comes with a 90-day warranty. You can add up to three years to this protection with AppleCare—a one-time cost, carry-in service plan. It combines convenient service with fast turnaround.

Your AppleCare agreement will be honored at all authorized Apple dealers within the country of purchase—added protection should you relocate. Ask your local authorized Apple dealer for details.

You may purchase AppleCare at any time through your Apple dealer, but for uninterrupted protection, it's a good idea to buy it along with your system. Besides providing you with the complete coverage, purchase of AppleCare with your system avoids an owner-paid dealer inspection of your system if your warranty has expired.



Appendix C



Safety Information

Never try to remove the cover from your Hard Disk 20SC. The Hard Disk 20SC contains high-voltage components that retain an electrical charge, even after the unit is switched off.

You're almost ready to plug in your Hard Disk 20SC and get started, but first read these important safety instructions.

Warning This equipment is intended to be electrically grounded.

Your Hard Disk 20SC 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!

Be sure the power plug is disconnected (by pulling the plug, not the cord)

- if the power cord or plug is frayed or otherwise damaged
- if you spill anything into the case
- if your equipment is exposed to rain or any other excess moisture
- if it has been dropped or if the case has been otherwise damaged
- if you suspect that your computer needs servicing or repair
- whenever you clean the case (Use only the recommended procedure given below.)

- whenever you clean the case (Use only the recommended procedure given below.)

Be sure that you always do the following:

- Keep your equipment away from sources of liquids, such as wash basins, bathtubs, and shower stalls.
- Keep your equipment protected from dampness or wet weather.
- Read all the installation instructions carefully before you plug the product into a wall socket.
- Keep these instructions handy for reference by you and others.
- Follow all instructions and warnings dealing with your system.

Warning

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

To clean the case,

1. Disconnect the power plug. (Pull the plug, not the cord.)
2. Use a water-damp, clean, soft cloth. Wipe the surfaces lightly, but do not wipe the screen of the monitor. For cleaning the monitor screen, use only the special cloth provided and do not moisten it.



Appendix D



Connecting Three or Four Hard Disk 20SCs to an Apple II

If you are connecting three or four Hard Disk 20SCs with an Apple II, you must

- insert the SCSI card in slot 5
- reserve slot 2 for a card that connects a serial printer or modem only; it cannot contain a disk-controller card

Two hard disk drives are accessed through slot 5, drives 1 and 2, and two are accessed through slot 2, drives 1 and 2. There is no SCSI card in slot 2, but the operating system has been tricked into thinking there is a card in slot 2.

To take advantage of the speed of the Hard Disk 20SC, an Apple II should start up from files on the hard disk. The Apple looks for a startup program in each disk drive, starting with the disk drive connected to the disk-controller card in the highest slot number.

Important For all Apple IIs except the Apple IIGs, if you want to start up from files on the Hard Disk 20SC, put the SCSI card in a slot with a number higher than you've given to any other disk-controller card. For the Apple IIGs, you can use the control panel to set the startup drive.



Glossary

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

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

driver: A program that lets the hard disk and the computer send and receive files.

files: A collection of information stored on a disk.

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

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

format: To divide a disk into tracks and sectors where information can be stored. Blank disks must be formatted before you can save information on them for the first time; same as **initialize**.

hard disk: A disk made of metal and sealed into a drive or cartridge. A hard disk can store very large amounts of information compared to a floppy disk.

initialize: To prepare a blank disk to receive information by organizing its surface into tracks and sectors; same as *format*.

install: To put the driver program on the hard disk. See **driver**.

magnetic interference: Interference with the behavior of magnetic storage devices such as disk drives. Magnetic interference can be caused by the Macintosh power supply, located on the left side of the Macintosh, forming a local magnetic field.

megabyte: A unit of measurement equal to 1024 kilobytes, or 1,048,576 bytes; abbreviated Mb.

peripheral card: A removable printed-circuit board that plugs into one of the computer's expansion slots. Peripheral cards allow the computer to use peripheral devices or to perform some subsidiary or peripheral function.

peripheral device: A piece of hardware—such as a video monitor, disk drive, printer, or modem—used in conjunction with a computer and under the computer's control. Peripheral devices are often (but not necessarily) physically separate from the computer and connected to it by wires, cables, or some other form of interface. They often require **peripheral cards**.

port: The metal sockets on the back of your computer into which you plug connector cables such as the SCSI peripheral interface cable.

priority number: A number that you set on the priority switch at the back of the Hard Disk 20SC. The number tells the computer which device to give priority when sending and receiving files.

priority switch: The gauge that indicates the priority number of a device. For the Hard Disk 20SC, the switch is located at the back.

Small Computer System Interface (SCSI):

A specification of mechanical, electrical, and functional standards for connecting intelligent peripherals such as hard disks, printers, and optical disks to small computers.

startup disk: A disk with all the necessary program files—such as the Finder and System files contained in the System Folder in Macintosh—to set the computer into operation. In Apple II terminology, sometimes called a *boot disk*.

System Folder: A Macintosh folder that contains files for desk accessories, fonts, and other basic information that is of general use by the Finder and other applications.

tape backup device: A device that lets you back up the entire contents of the hard disk to a high-density tape medium.

3.5-inch disk: A flexible, plastic **disk** measuring 3.5 inches in diameter and having a hard-shell plastic jacket. Two-sided 3.5-inch disks can store almost six times more data than single-sided 5.25-inch disks. Compare **5.25-inch disk**, **hard disk**.

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Apple Computer, Inc.
20525 Mariani Avenue
Cupertino, CA 95014
(408)996-1010
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