Apple® Tape Backup 40SC
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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Radio and television interference

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

This equipment has been tested and complies with the limits for a Class B computing device in accordance with the specifications in Subpart J, 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.

If your computer system 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 are on circuits controlled by different circuit breakers or fuses.)

□ Consider installing a rooftop television antenna with a coaxial cable lead-in between the antenna and the television.

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

You may find helpful the following booklet, prepared by the Federal Communications Commission: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the U.S. Government Printing Office, Washington, DC 20402.

Important   This product was FCC-verified 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 radios, television sets, and other electronic devices. 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.

Preface

Your Apple® Tape Backup 40SC device provides a reliable way to protect your work. With the Tape Backup 40SC, you can make **backups** of the entire contents of a **disk,** of any **partitions** on your disk, or of individual **files,** according to your needs.

The Tape Backup 40SC works with any **system** that uses a Macintosh® computer and that has a **Small Computer Systems Interface (SCSI)** port. SCSI increases the speed, flexibility, expandability, and sophistication of your system. In particular, SCSI speeds up the information flow between your Macintosh, **hard disk drive,** and tape backup device. (Chapter 1 provides more information on SCSI.) The Tape Backup 40SC backs up all Apple hard disks and most **hard disks** made by other manufacturers.
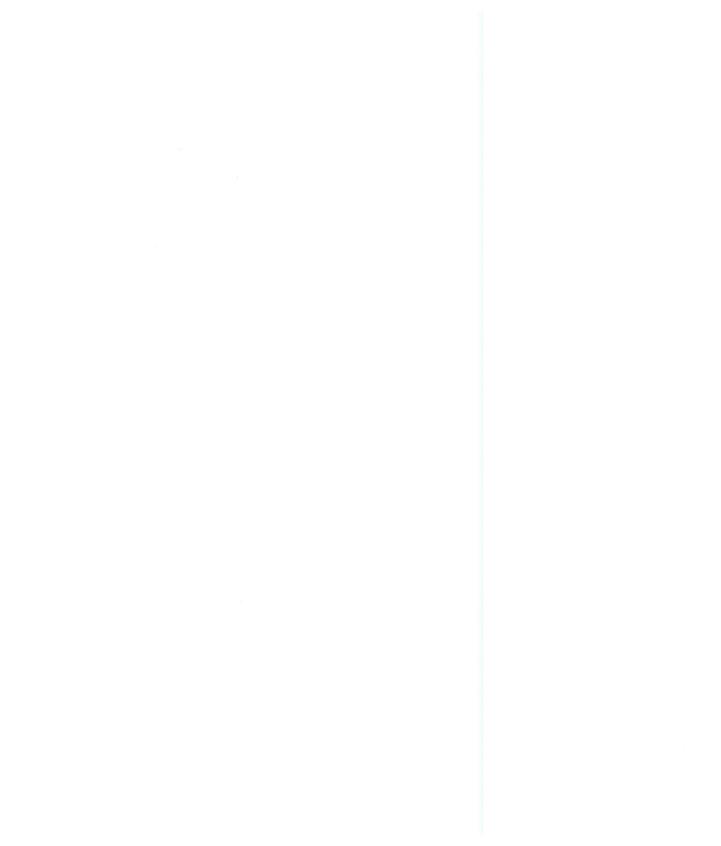
About this guide

This guide describes how to set up and use your Tape Backup 40SC. The guide explains how to make tape-cartridge copies of hard-disk contents and how to restore, or transfer, the contents of the tape cartridge back to your disk, in case you need to.

Throughout this guide, the word *Macintosh* means any computer of the Macintosh family that can connect to a SCSI cable.

This guide assumes that you have read the owner's guide that accompanies your Macintosh computer, *The Apple SCSI Cable System* guide, and the guide for your hard disk drive. You should be familiar with the basic mouse techniques used with all Macintosh **applications,** such as clicking, dragging, and using the **Finder**™.

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

Chapter 1

Setting Up

To set up your Tape Backup 40SC, read the sections on the equipment, SCSI background, and organizing your SCSI chain. Set the SCSI ID switch, and then choose the section that describes your Macintosh system from "Connecting the Tape Backup 40SC," given later. When you have connected your tape backup device, go on to Chapter 2 to start up the Tape Backup 40SC.

Tape Backup 40SC equipment

The Tape Backup 40SC box holds

- □ Apple Tape Backup 40SC device
- □ *Apple Tape Backup 40SC Owner's Guide*
- □ *Apple Tape Backup 40SC* disk
- □ 40 **megabyte (MB)** Tape Cartridge, which is formatted and factory-tested with this tape backup device
- □ power cord

Remove the Tape Backup 40SC from the plastic bag. It's a good idea to keep all your packing materials in case you need to transport the Tape Backup 40SC, which is shown in Figure 1-1.

Figure 1-1
Tape Backup 40SC

You can place the Tape Backup 40SC where it's convenient as long as the total length of the **cable** system you use to connect your Macintosh system and other devices is no longer than 20 feet (6.5 meters).

SCSI background

SCSI (commonly pronounced *SKUH-zee*) stands for *Small Computer System Interface*. SCSI is a set of rules for developing hardware and software products for use on small computer systems like Macintosh computers. SCSI is a fast, reliable way for computers and **peripheral devices** to exchange data. Engineers from many companies developed the SCSI standard, approved by the American National Standard Institute (ANSI).

Read this section to learn about the special terms, equipment, and rules you'll use with your SCSI Cable System and Tape Backup 40SC.

SCSI dictionary

When used to talk about SCSI, the following words have special meanings.

- **SCSI bus:** The physical path on which electronic data travels among SCSI devices.

- **SCSI chain:** A group of SCSI devices that you connect with the SCSI Cable System. For example, a Macintosh Plus connected to a SCSI hard disk and a tape backup device forms a SCSI chain, as shown in Figure 1-2.
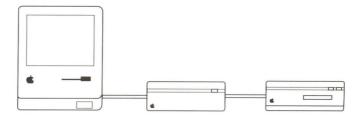
Figure 1-2
SCSI chain

- **SCSI connector:** The specially configured end pieces of the SCSI cables that connect to the SCSI port on the back of the Macintosh and to each other. The System Cable has a DB-25 connector that you attach to the computer. All other Apple SCSI connectors are 50-pin connectors. Figure 1-3 shows the types of connectors.
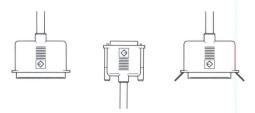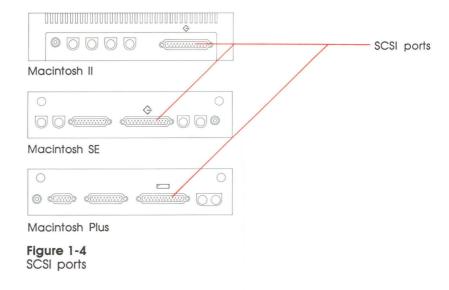
Figure 1-3
SCSI connectors

- **SCSI device:** Any device that can communicate on the SCSI bus, including your computer and any SCSI peripheral device. The peripheral device may be built into your computer (internal) or attached to your computer with the SCSI Cable System (external).

- **SCSI icon:** The graphic symbol that represents SCSI equipment. You'll see the **icon** above the SCSI port on the back panel of a Macintosh computer, and on the SCSI Cable System and Cable Terminators. You won't see this icon on the desktop.

- **SCSI ID number:** A number that is set in the hardware of a SCSI device that identifies it on the SCSI bus. The computer and other devices use the **SCSI ID number** to locate each device and to distinguish it from the other devices in the SCSI chain. This number also determines which device communicates first on the SCSI bus when several devices want to use the bus at the same time.

- **SCSI port:** The **port** that allows data to pass through the SCSI bus. The port includes both the connector on the back panel of a SCSI device and the circuits inside the device. Figure 1-4 shows the SCSI ports, which are marked by SCSI or hard disk icons.

Figure 1-4
SCSI ports

SCSI Cable System equipment
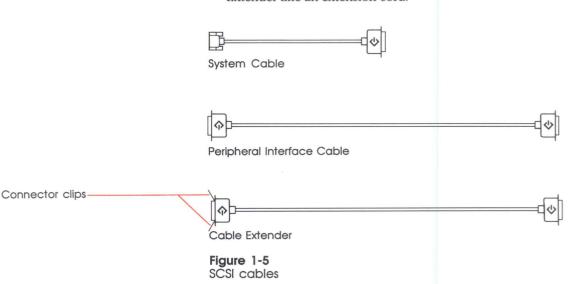
You use the Apple SCSI Cable System, which consists os cables and terminators, to connect the Tape Backup 40SC to your Macintosh. You can purchace this system from your authorized Apple dealer. Depending on the number and type of devices in your SCSI chain and your space requirements, you'll choose a combination of cables and cable terminators.

Cables

Figure 1-5 illustrates the cables you'll use, which are described here.

- **System Cable:** An 18-inch cable with a DB-25 connector at one end and a 50-pin connector at the other end. You use this cable to connect the first *external* SCSI peripheral device to the computer.

- **Peripheral Interface Cable:** A cable 3 feet long with *identical* 50-pin connectors at each end. The inside of each connector is recessed and lined with gold ribbon pins. You attach each 50-pin connector to a SCSI port on an external peripheral device. You use this cable to connect *external* SCSI peripheral devices to each other.

■ **Cable Extender:** A cable 3 feet long with *different* 50-pin connectors at each end. One 50-pin connector contains protruding, gold ribbon pins and has SCSI clips. You attach this connector to the Peripheral Interface Cable or to the System Cable 50-pin connector. The other 50-pin connector is recessed and lined with gold ribbon pins; and you attach this connector to a Cable Terminator or to the next device. You use the Cable Extender like an extension cord.

System Cable

Peripheral Interface Cable

Connector clips

Cable Extender

Figure 1-5
SCSI cables

Terminators

Terminators terminate the SCSI bus. There must be *one terminator at each end* of the SCSI bus. However, if the bus is only one cable long, then you only need one terminator. The terminators ensure that data travels reliably on the SCSI bus, as shown in Figure 1-6 and Figure 1-7. Terminators control voltage range and keep signals from bouncing off one end of the line and rippling back, interfering with new messages.
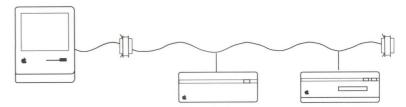
Figure 1-6
Using the SCSI bus *with* terminators
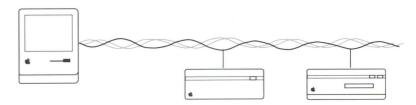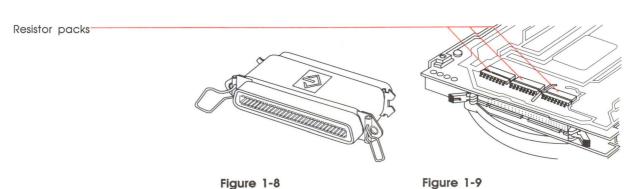
Figure 1-7
Using the SCSI bus *without* terminators

You attach Cable Terminators either to a SCSI port on a SCSI device or to a SCSI cable. Terminators are built into some SCSI devices using electrical resistor packs that are plugged into sockets on a device's circuit board. For example, Apple internal hard disks have built-in terminating resistors. Apple SCSI external peripheral devices do not have built-in terminating resistors. Figure 1-8 and Figure 1-9 show the two types of terminators.

■ **Cable Terminator:** A plastic case containing electrically terminated resistors that ensure signal integrity along the SCSI bus.

Resistor packs

Figure 1-8
Cable Terminator

Figure 1-9
Terminating resistors

Review the following SCSI dos and don'ts:

SCSI dos

- ☐ Always use an Apple SCSI System Cable to start connecting a SCSI chain.

- ☐ Always end a SCSI chain with a terminator. The terminator can be built into a device or attached to the *last available SCSI port*.

SCSI don'ts

- ☐ Don't use more than two terminators in the SCSI chain. More than two terminators can damage your computer, the SCSI chip in your computer, or external storage devices such as hard disks.

- ☐ Don't use more than 20 feet (6.5 meters) of cable to connect your SCSI devices.

- ☐ Don't attach more than seven SCSI devices to your computer. The Apple SCSI Cable System supports a maximum of eight SCSI devices. On a Macintosh system, the computer itself counts as one device. If the system contains an internal hard disk, the hard disk also counts as a SCSI device. For example, you could connect a maximum of six external devices to a Macintosh that has an internal hard disk.

- ☐ Don't crimp the cables when you set up and connect your SCSI chain. Sometimes, crimping the cables can cause physical damage to the cables or devices.

Table 1-1 and Table 1-2 show the equipment you need for various combinations of devices.

Table 1-1
SCSI cable formula for a Macintosh *without* internal hard disk

Number of peripheral devices and distance from computer or other devices	System Cable	Peripheral Interface Cable	Cable Extender	Cable Terminator
1 device *within 18 inches of computer*	Yes	No	No	1
1 device *more than 18 inches from computer*	Yes	No	Yes*	2
2 or more devices *less than 3 feet apart*	Yes	Yes*	No	2
2 or more devices *3 feet or more apart*	Yes	Yes*	Yes*†	2

* You need this type of cable, but the *number* of cables you need depends on the distance between devices and on how many devices you are connecting.

† Remember that you cannot use more than 20 feet of cable.

Table 1-2
SCSI cable formula for a Macintosh *with* internal hard disk

Number of peripheral devices and distance from computer or other devices	System Cable	Peripheral Interface Cable	Cable Extender	Cable Terminator
1 device *within 18 inches of computer*	Yes	No	No	1
1 device *more than 18 inches from computer*	Yes	No	Yes*	1
2 or more devices *less than 3 feet apart*	Yes	Yes*	No	1
2 or more devices *3 feet or more apart*	Yes	Yes*	Yes*†	1

* You need this type of cable, but the *number* of cables you need depends on the distance between devices and on how many devices you are connecting.

† Remember that you cannot use more than 20 feet of cable.

Organizing your SCSI chain

Before you connect your Tape Backup 40SC, you must set up and lay out the cables and terminator or terminators you'll use.

About the System Cable

Follow these important guidelines to attach the System Cable properly.

□ Match the SCSI icon on the System Cable and the SCSI icon on the back panel of the Macintosh to attach the System Cable to the correct port. (On the Macintosh Plus, the icon may be a hard disk icon.)

□ Attach only the Apple SCSI System Cable to the SCSI port on your computer. Connecting other cables to this port can seriously damage the SCSI chip or your computer.

About terminators

Read the following descriptions to find out where to put terminators in your SCSI chain:

□ Make sure the *first* peripheral device and the *last* peripheral device in your SCSI chain are terminated (either internally or externally).

□ Some non-Apple SCSI devices have built-in terminators. If you have only one such device, place it at the end of your SCSI chain and don't add a Cable Terminator.

□ If you have more than one non-Apple device that has internal terminating resistors, make certain that you have only *two* terminators in the SCSI chain. Your authorized Apple dealer or representative can remove any extra terminators for you.

□ If the second terminator you are using is a Cable Terminator, attach it to the *last available SCSI port* on the last external SCSI peripheral device.

□ If the Macintosh contains an internal hard disk, the hard disk contains terminating resistors. Attach one Cable Terminator to the *last available SCSI port* in your SCSI chain (unless the device that the port is on has internal terminating resistors).

□ If you attach only one external SCSI device to a Macintosh with the Apple SCSI System Cable, attach *one* Cable Terminator. Because the System Cable is only 18 inches long, one terminator will control the voltage range and protect the signals from reflecting back on the cable.

□ A cable system longer than 18 inches requires two terminators. If you connect *one* device to a Macintosh *without* an internal hard disk by using a System Cable and a Cable Extender, place a terminator between the System Cable and the Cable Extender *as well as* attaching a Cable Terminator to the last available SCSI port.

Figure 1-10 and Figure 1-11 show how to organize your devices. Notice the placement of terminators, with one at *the beginning* of the SCSI chain and one at *the end* of the chain. These systems include

□ Apple SCSI peripheral devices

□ Apple SCSI peripheral devices and non-Apple SCSI peripheral devices

If you have more peripheral devices than shown in these figures, place the devices in the middle of the chain.

Important   You can have only two terminators in the SCSI chain.

Have your authorized Apple dealer or representative or product manufacturer remove any extra internal terminating resistors. (Your peripheral-device manual should tell if the device contains internal terminating resistors.)

Internal terminators
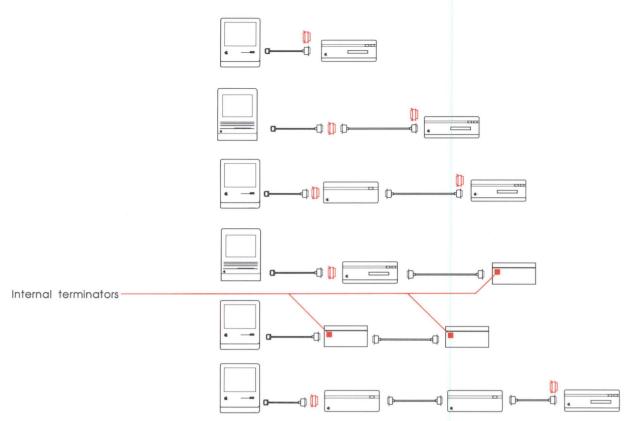
Figure 1-10
Macintosh computers *without* an internal hard disk and
external SCSI devices
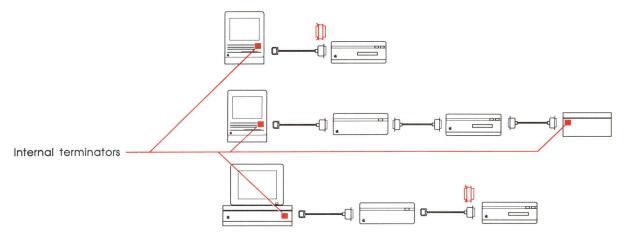
Figure 1-11
Macintosh computers *with* an internal hard disk and external
SCSI devices

Internal terminators

Setting the SCSI ID number

The SCSI standard lets you have a SCSI chain that includes up to
eight devices connected to each other. In order to establish a
communication path, each device must have a unique identity. The
Macintosh uses these numbers to distinguish and to identify the
devices. The SCSI ID number identifies each device regardless of its
physical location in your SCSI chain.

The SCSI ID number also determines the order in which devices
send and receive information when several devices want to use the
bus. Eight numbers (corresponding to the number of devices)—7
through 0—are used to establish identity and priority on the SCSI
bus. Although contention for using the SCSI bus rarely occurs,
devices with higher ID numbers establish higher priority for its use.
Generally, you assign the higher ID numbers to devices that you use
the most.

You must assign a unique SCSI ID to each peripheral device in order
to make sure the computer and devices know where each device is
and which one is communicating on the SCSI bus. For example, if
you have two hard disks and a tape backup device, each hard disk
and the tape backup device must have different ID numbers.

Your Macintosh is always assigned ID number 7. If you have an
Apple internal hard disk, it is set to ID number 0. You can use the
other numbers to organize your SCSI chain. Your Tape Backup 40SC
is already set to SCSI ID number 1. The SCSI ID switch is located on
the back panel of the Tape Backup 40SC, as shown in Figure 1-12.

SCSI ID number indicator

SCSI ID switch
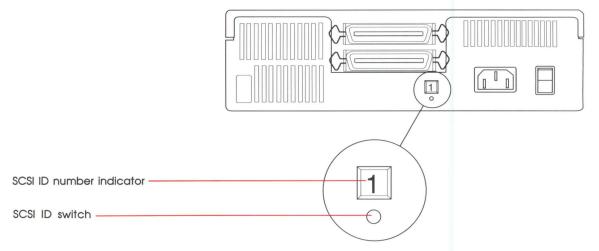
Figure 1-12
The Tape Backup 40SC SCSI ID number indicator and switch

If you need to change the SCSI ID number, follow these steps:

1. **Make sure the Tape Backup 40SC is turned off.**

2. **Choose an unassigned SCSI ID number.**

3. **Insert the point of a pin or straightened paper clip into the
   SCSI ID switch.**

4. **Push gently.**

   The number increases as shown by the **SCSI ID number
   indicator.**

5. **If you go past the number you want, keep pushing until the
   number cycles to your choice.**

Now choose the correct description that corresponds to your
Macintosh system from the section "Connecting the Tape Backup
40SC," which follows.

Connecting the Tape Backup 40SC

This section explains how to connect your tape backup device with SCSI cables to a Macintosh system with external SCSI devices; to a Macintosh system with non-SCSI devices; and to a Macintosh system with an internal hard disk. You need to read only the description for your Macintosh system.

Macintosh system with external SCSI devices

If your Macintosh already has other *external* SCSI peripheral devices connected, use this section to connect your Tape Backup 40SC.

When you have a SCSI chain attached to your Macintosh, you connect the tape backup device to the last device in your chain and move the Cable Terminator to the tape backup device. If you want to put the Tape Backup 40SC in another place in the chain or if you want more information on the SCSI chain, see *The Apple SCSI Cable System* manual.

You need a Peripheral Interface Cable, a Cable Terminator, and the Tape Backup 40SC power cord. Follow these steps to connect your system:

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

2. Place the Tape Backup 40SC where you want it.

Important Don't place the Tape Backup 40SC on the left side of a Macintosh Plus.

This location risks magnetic interference with your data transmission.

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

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

Attach only the SCSI Cable System DB-25 connector to the SCSI port on the computer.

Look for the SCSI icon or the hard disk icon on the back panel of the computer to identify the port.

Putting another type of cable connector in the SCSI port can seriously damage the SCSI chip inside your computer or the computer itself.

4. If you have two or more devices connected, remove the Cable Terminator from the last-connected device in your chain.

If you have one device connected, move the terminator so that it is between the System Cable and a SCSI port on your device.

5. Attach one 50-pin connector on the Peripheral Interface Cable to the available SCSI port on the last external peripheral device as shown in Figure 1-13.

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

Clips snap toward 50-pin connector

Peripheral Interface Cable
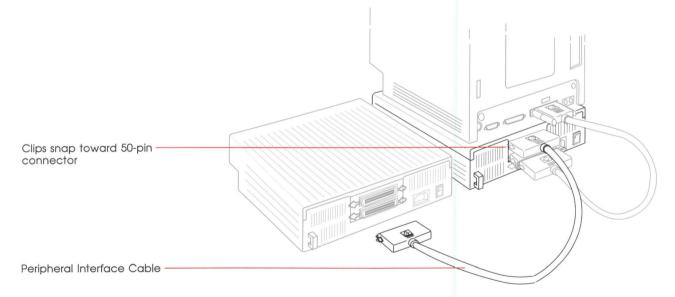
Figure 1-13

Attaching the Peripheral Interface Cable to an external SCSI device

6. Attach the other 50-pin connector on the Peripheral Interface Cable to a SCSI port on the Tape Backup 40SC, as shown in Figure 1-14.

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

If you're using Cable Extenders, attach them to the Peripheral Interface Cable wherever you need more space between devices. Snap the clips in the same way as you did earlier.
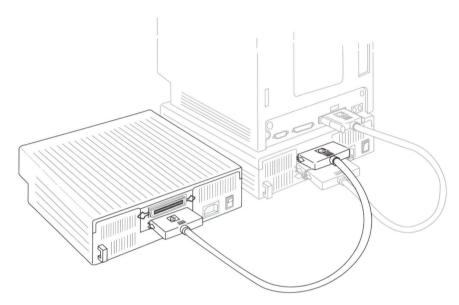
Figure 1-14
Attaching the Peripheral Interface Cable to the Tape
Backup 40SC

7. Attach the Cable Terminator to the available SCSI port on the Tape Backup 40SC, as shown in Figure 1-15.

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

Clips snap toward 50-pin
connector
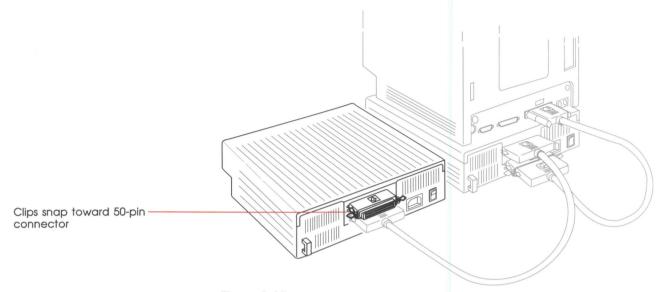
Figure 1-15
Attaching the Cable Terminator to the Tape Backup 40SC

Important   Remember that you must have a Cable Terminator on the first
and last SCSI device in your chain.

**8. With the Tape Backup 40SC attached to your Macintosh
system and all devices switched off, attach the Tape Backup
40SC power cord to the Tape Backup 40SC, and plug the
power cord into a grounded (three-prong) AC outlet.**

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

Your Tape Backup 40SC is equipped with a three-wire grounding
plug—a plug that has 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!

Now, go on to Chapter 2 to learn how to start up your system.

Macintosh system with non-SCSI hard disk drives

If your Macintosh has non-SCSI hard disk drives connected, follow the steps given here to connect your Tape Backup 40SC.

You create a SCSI chain by connecting the System Cable to both the SCSI port on your Macintosh and the SCSI port on your tape backup device. The System Cable enables the Tape Backup 40SC to communicate with your non-SCSI hard disk drives. If you want more information on the SCSI chain, see *The Apple SCSI Cable System* guide.

You need a System Cable, a Cable Terminator, and the Tape Backup 40SC power cord. Follow these steps to connect your system:

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

2. Place the Tape Backup 40SC where you want it.

Important Don't place the Tape Backup 40SC on the left side of a Macintosh Plus.

This location risks magnetic interference with your data transmission.

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

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

Warning Attach only the SCSI Cable System DB-25 connector to the SCSI port on the computer.

Look for the SCSI icon or hard disk icon on the back panel of the computer to identify the port.

Putting another type of cable connector in the SCSI port can seriously damage the SCSI chip inside your computer, SCSI card, or the computer itself.

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4. Attach the DB-25 connector of the System Cable to the SCSI port on your computer, as shown in Figure 1-16.

5. Tighten the thumbscrews on the DB-25 connector.

Thumbscrews

System Cable
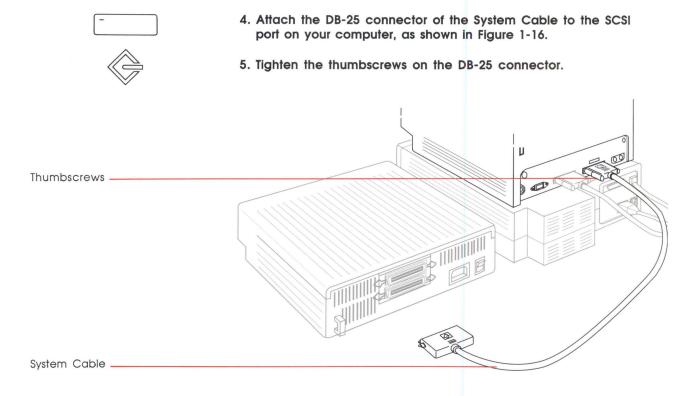
Figure 1-16
Attaching the System Cable to the Macintosh SCSI port

❖ *Note:* If you're using Cable Extenders, attach a Cable Terminator to the 50-pin connector of the System Cable and then attach the Cable Extender to the Cable Terminator. Be certain to snap all the clips. Then go on to step 6.

6. Attach the 50-pin connector of the System Cable or Cable Extender to a SCSI port on the back of the Tape Backup 40SC, as shown in Figure 1-17.

Press the diamond-shaped wire clips toward the connector, snapping them into the clip brackets to secure the connection.

Clips snap toward 50-pin
connector
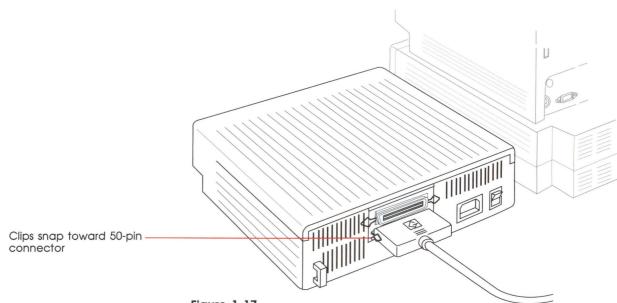
Figure 1-17
Attaching the System Cable to the Tape Backup 40SC

**7. Attach the Cable Terminator to the available SCSI port on
the back of the Tape Backup 40SC, as shown in Figure 1-18.**

Snap the clips into the clip brackets to secure the connection.
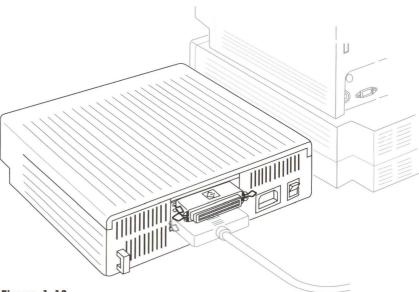
Figure 1-18
Attaching the Cable Terminator to the Tape Backup 40SC

8. With the Tape Backup 40SC attached to your Macintosh system and *switched off*, attach the power cord and plug it into a grounded (three-prong) AC outlet.

This equipment is intended to be electrically grounded.

Your Tape Backup 40SC is equipped with a three-wire grounding plug—a plug that has 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!

Now, go on to Chapter 2 to learn how to start up your system.

Macintosh system with an internal hard disk

If you have a Macintosh with an internal hard disk, use the steps given here to connect your Tape Backup 40SC.

❖ *Note:* If you have any *external* SCSI devices already connected to your Macintosh, use the section "Macintosh System with External SCSI Devices," given earlier, to connect your Tape Backup 40SC.

You use the System Cable to connect the tape backup device to your Macintosh. The System Cable connects to the SCSI port on the back of your Macintosh and a SCSI port on the back of your Tape Backup 40SC. The System Cable enables the Macintosh to communicate with the Tape Backup 40SC. If you want more information on the SCSI chain, see *The Apple SCSI Cable System* manual.

You need a System Cable, a Cable Terminator, and the Tape Backup 40SC power cord. Follow these steps to connect your system:

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

2. **Place the Tape Backup 40SC where you want it.**

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

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

Attach only the SCSI Cable System DB-25 connector to the SCSI port on the computer.

Look for the SCSI icon or the hard disk icon on the back panel of the computer to identify the port.

Putting another type of cable connector in the SCSI port can seriously damage the SCSI chip inside your computer or the computer itself.

4. Attach the DB-25 connector of the System Cable to the SCSI port on your computer.

5. Tighten the thumbscrews on the DB-25 connector.

Figure 1-19 shows the connectors for the Macintosh SE, and Figure 1-20 shows the connectors for the Macintosh II.

Thumbscrews
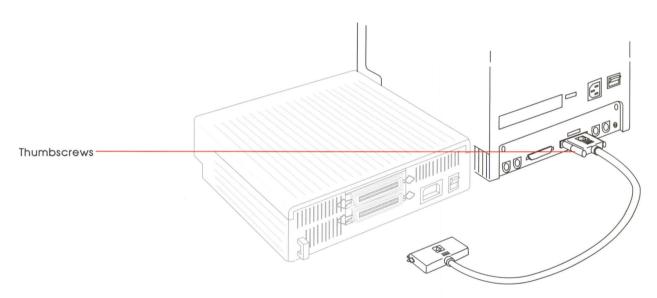
Figure 1-19
Attaching the System Cable to the Macintosh SE SCSI port

Thumbscrews
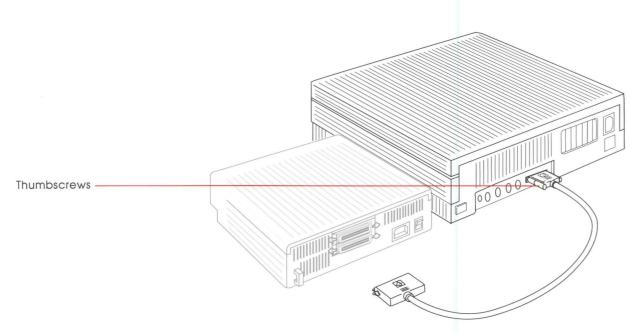
Figure 1-20
Attaching the System Cable to the Macintosh II SCSI port

❖ *Note:* If you're using Cable Extenders, attach the connectors and
snap the clips. Then go on to step 6.

6. **Attach the 50-pin connector on the System Cable or Cable
   Extender to a SCSI port on the back of the Tape Backup
   40SC, as shown in Figure 1-21.**

   Press the diamond-shaped wire clips toward the connector,
   snapping them into the clip brackets to secure the connection.

Clips snap toward 50-pin
connector
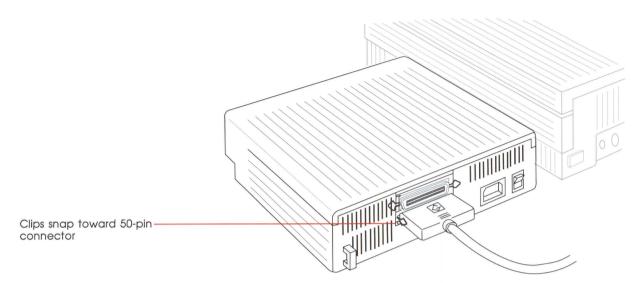
Figure 1-21
Attaching the System Cable to the Tape Backup 40SC

**7. Attach the Cable Terminator to the available SCSI port on
the back of the Tape Backup 40SC, as shown in Figure 1-22.**

Snap the clips into the clip brackets to secure the connection.
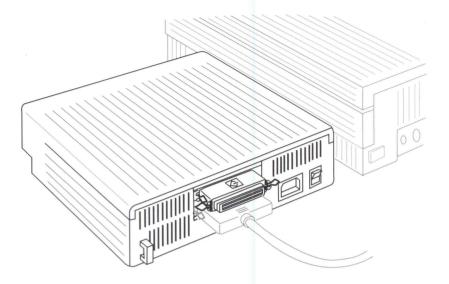
Figure 1-22
Attaching the Cable Terminator to the Tape Backup 40SC

Important   Remember that the internal hard disk has terminating resistors. You need a Cable Terminator on or inside the last external SCSI device in your chain.

---

8. With the Tape Backup 40SC attached to your Macintosh system and *switched off*, attach the power cord and plug it into a grounded (three-prong) AC outlet.

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

Your Tape Backup 40SC is equipped with a three-wire grounding plug—a plug that has 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!

Now, go on to Chapter 2 to learn how to start up your system.

Chapter 2

Starting Up

This chapter explains procedures for switching on your system, installing the *Tape Backup 40SC* application, and formatting non-Apple cartridges.

Before you start up your Macintosh system with the Tape Backup 40SC connected, read the next section "Switching on Your System" and then install the software.

Switching on your system

Follow these steps each time you use the Tape Backup 40SC.

Switch on your system as described in your Macintosh owner's guide. Generally, you switch on your devices in this order:

1. The external hard disk or disks if you have them.

2. The Tape Backup 40SC (*without* a tape cartridge inserted).

3. The Macintosh.

❖ *Remember:* Each time you use your SCSI chain, you must turn on the two terminated devices.

Each time you switch on the Tape Backup 40SC or each time the Macintosh recognizes the tape backup device, it calibrates any tape in the drive. This calibration process conditions the tape to ensure both the proper tension for movement in the tape drive, and the reliability of the tape so it can be used interchangeably with other tape cartridges. The calibration lasts 60–90 seconds.

Important   Do not turn on the Tape Backup 40SC with a tape cartridge inserted. Doing so wears down the tape-drive mechanism and the tape media.

If you want to use the Tape Backup 40SC after you have been using your Macintosh system, it's a good idea to switch on the tape drive and then choose Restart from the Special menu.

The Tape Backup 40SC has two lights on the front panel. A steady green light indicates that the power is on. A red light that flashes indicates activity, as shown in Figure 2-1.

Power light (green)

Activity light (red)
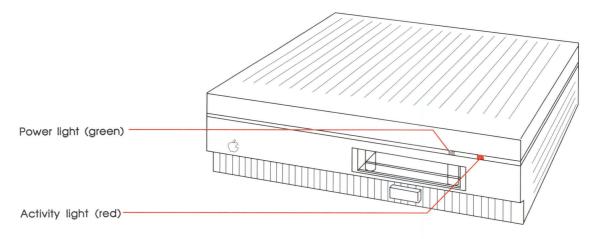
Figure 2-1
The front panel of the Tape Backup 40SC

Starting up the Apple Tape Backup 40SC software

The Apple Tape Backup 40SC application software makes the Tape Backup 40SC work. The Tape Backup 40SC application will not copy active files, including

☐ the **System file**

☐ the printer **drivers**

☐ the Tape Backup 40SC application

The application disk contains a System file so that it can be used as a **startup disk.** You can't restore a tape cartridge copy of a hard disk to a hard disk with an active System file. You can install the software onto your hard disk and run the application from the hard disk in certain situations.

Normally, start up the application from the application disk

☐ to back up an entire **volume** or **partition** with a System file

☐ to back up all the files of a startup hard disk

☐ to restore a volume or partition tape cartridge copy to a hard disk

☐ to restore files to a hard disk

You could start up the application from a hard disk

☐ to back up a hard disk other than the startup disk

A **driver** is a program that lets a peripheral device and computer send and recieve information.

A **volume** is a storage device that is a source of or a destination for information.

A **partition** is a portion of a storage disk that is treated just like a separate device.

☐ to restore a volume or partition tape cartridge copy to a different hard disk

☐ to back up files that are not active

☐ to restore files to another hard disk

You can always run the Tape Backup 40SC application from the **floppy disk.** If you want to install the application on your hard disk, follow these steps:

1. Make a backup copy of the Tape Backup 40SC disk before you begin.

Your Macintosh owner's guide describes this process.

❖ *For A/UX users:* You must perform this step and the following steps in this chapter from the Macintosh Operating System (OS). Quit A/UX and return to the Macintosh OS by using the shutdown and reboot commands. Cancel the A/UX automatic boot from sash, and then quit the sash application by choosing Quit from the File menu.

2. Insert the Tape Backup 40SC disk.

A disk icon appears on your desktop, as shown in Figure 2-2.
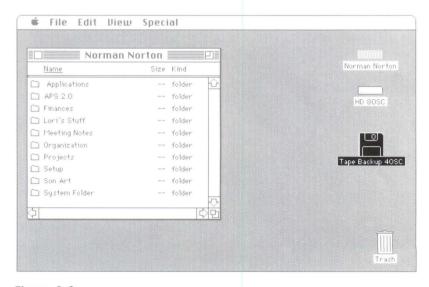
Figure 2-2
Tape Backup 40SC disk icon on the desktop

3. Open the disk icon.

You'll see an application icon, a **System Folder,** and a Tape
Disk utility icon, as shown in Figure 2-3.
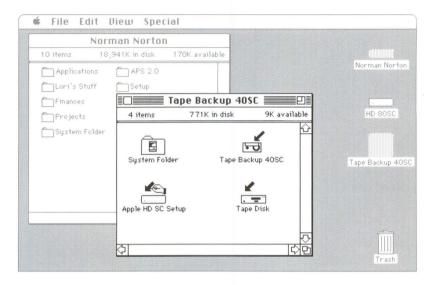
Figure 2-3
Tape Backup 40SC application folder

4. Drag the application icon to your hard disk.

Your desktop should look like Figure 2-4.
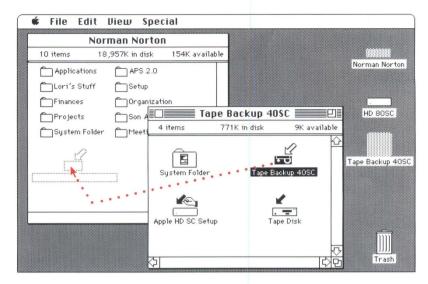
Figure 2-4
Installing the Tape Backup 40SC software

❖ *Note:* The *Tape Backup 40SC* disk has a System Folder. The folder is on the original because the Restore operation requires it. *Do not* copy this System Folder onto the hard disk.

If you need to update your system and the Finder, you can replace the copies on your hard disk with the files in this System Folder. See your Macintosh owner's guide for help.

If you're using Apple 40 MB tape cartridges, they're already formatted. You're ready to use the Tape Backup 40SC; you should now go on to Chapter 3.

If you're using non-Apple tape cartridges that are unformatted, you must **format** them. The next section, "Formatting a Tape Cartridge," describes this procedure.

Formatting a tape cartridge

Formatting a tape cartridge prepares it to receive, store, and transmit data. The process lasts about 40 minutes and must not be interrupted.

Warning	*Never* eject the tape cartridge while the red activity light is flashing.

You should format all unformatted tape cartridges as soon as you purchase them. Each tape cartridge stores up to 38.5 MB of data. You'll need more than one tape cartridge to back up a completely full 40 MB hard disk.

To format a tape cartridge, follow these steps:

1. **Open the Apple Tape Backup 40SC application.**

2. **Choose Format Cartridge from the pull-down File menu.**

```
  📷  File   Edit   Backup/Restore
      Format Cartridge...   ⌘F
      Clear Cartridge...   ⌖ ⌘K
      Verify Cartridge...
      ·······································
      Quit                 ⌘Q
```
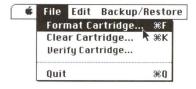
Figure 2-5
Choosing Format Cartridge from the File menu

3. **Follow instructions in the dialog boxes to direct the Format Cartridge operation.**

   When you insert the tape cartridge, make sure that the record-lock switch is in the unlocked position (to the left). See Chapter 4, "Care of the Tape Cartridge," for more information.

   Push firmly until the tape cartridge is inside the Tape Backup 40SC.

   A **dialog box** remains on the screen during the formatting process and tells you at approximately what time the process will be complete, as shown in Figure 2-6.

```
A tape cartridge is being formatted.
This process takes about 40 minutes
and cannot be interrupted.  The format
should be complete by:


              2:29 PM
```

Figure 2-6
Status screen

Warning   If you interrupt the formatting process, you will not be able to
use the tape cartridge to back up or restore information until
you completely reformat the tape cartridge. Turning off the
machine during the Format Cartridge operation may
permanently damage the tape cartridge. After interrupting the
formatting process, you will need to start the formatting process
again and complete it before you can use the tape.

**4. When the formatting is complete, click OK in the Completion
message to end the Format Cartridge operation.**

5. Eject the tape cartridge by pushing the eject button.

You are now ready to back up information onto the tape cartridge.
Chapter 3 tells you how to use the Tape Backup 40SC.

Chapter 3

Using the
Apple Tape Backup 40SC

This chapter explains how to use the Tape Backup 40SC device to back up and restore either the entire contents of your hard disk or individual files. The chapter also gives instructions for retrieving files from a Volume Backup copy of your hard disk by using Tape Disk and for checking your cartridges with the Verify Cartridge command to make sure your data remains safely archived. Each of the sections on the menu commands contains recommendations about using the operation. You'll find instructions for the other menu items and shutdown procedures at the end of the chapter.

Backing up the contents of your hard disk with the Tape Backup 40SC protects your work by copying the information to a tape cartridge. The tape cartridge provides a safe copy of your work in case of a catastrophe that destroys the contents of your hard disk. You can then restore the contents to your hard disk from the tape cartridge.

General rules for using the Tape Backup 40SC

In general, you should back up your hard disk every day, especially if you are working with large files or many different files. You can use the Backup Volumes and Partitions operation to back up the entire contents of a hard disk or back up critical files daily, and make a volume backup or a partition backup once a week. Use the Tape Backup 40SC to meet your specific data security needs.

Each tape cartridge stores up to 38.5 MB of data. The number of tape cartridges you need for a backup depends on whether you back up a whole volume, a partition, or individual files, and on what size and how full your disk is. The file backup operation allows for multiple backup sessions on one tape cartridge, and therefore, uses space on the tape cartridge more efficiently than the Backup Volumes and Partitions operation.

Follow these rules when you use the Tape Backup 40SC:

☐ Label your tape cartridges accurately at the end of each backup session. Make sure to include the date, time, and type of session. Also record the number of a tape cartridge in a series if you have used several cartridges in one session. You can use volume and partition backup tape cartridges to restore entire disk volumes. You can use file backup tape cartridges to restore individual files. (See "Backup Files" for more information on labeling your cartridges.)

☐ Don't turn on the Tape Backup 40SC with the tape cartridge in place. You should first turn on the machine and then insert the tape cartridge when the application asks for it.

☐ When you insert the tape cartridge, push firmly until it is inside the Tape Backup 40SC.

☐ You must manually eject the tape cartridge by pushing the eject button. Eject the tape cartridge each time you are finished using the Tape Backup 40SC.

If you are using A/UX, there are special steps that you must take to use the Tape Backup 40SC.

Important   The Tape Backup 40SC application *does not* work with disk volumes created with the `makefs` command available under A/UX.

☐ If you are adding extra hard disks to an A/UX system, you must initialize and partition them with HD SC Setup version 2.0 or later to use the Tape Backup 40SC software. Appendix B describes HD SC Setup in detail.

☐ If you are backing up or restoring A/UX file systems, you must use the Backup Volumes and Partitions or the Restore Volumes and Partitions operations, which are described later in this chapter. The Backup Files and the Restore Files operations, also described later, do not work with A/UX file systems.

☐ If you are using A/UX, you must return to the Macintosh OS to use the Apple Tape Backup 40SC software. Quit A/UX and return to the Macintosh OS by using the `shutdown` and `reboot` commands. Cancel the A/UX automatic boot from `sash,` and then quit the `sash` application by choosing Quit from the File menu.

Warning   *Never* eject the tape cartridge while the red activity light is on.

Apple 40 MB tape cartridges have a record-lock switch at the upper-left corner on the top of the cartridge. This switch is similar to a write-protect tab on a **3.5-inch disk.** When the switch is at the left, the Tape Backup 40SC can write information onto the cartridge. If you slide the switch to the right, the cartridge is write-protected and you cannot alter the information on it.

Make sure the record-lock switch is in the unlocked position (to the left) before you insert a tape cartridge to format, clear, verify, or back up. Figure 3-1 shows the record-lock switch on a tape cartridge.

Record-lock switch in
unlocked position ————

RECORD

40MB TAPE CARTRIDGE

Formatted DC 2000
1/4=inch tape (6.35mm)
205 feet (62.5m)
12,500 ftpi
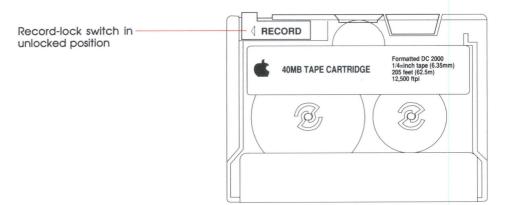
Figure 3-1
Tape cartridge record-lock switch

In order to ensure the most-reliable back up, it is recommended that you copy your *entire disk,* using both types of backup operations in the same backup procedure: the Backup Volumes and Partitions operation and the Backup Files operation. Thus, if you lose an important file, you can restore it from the Backup Files tape cartridges without replacing other files on the volume that you updated since the last backup procedure.

❖ *Remember:* The File Backup and File Restore operations only work with HFS (Hierarchical File System) volumes and partitions. You can use the Tape Disk utility to access a file from a volume or partition backup copy.

If your SCSI chain has more than one hard disk, repeat this procedure for each individual hard disk.

Important　All Apple-labeled 20 MB hard disks must be initialized with HD SC Setup version 2.0 or later in order to guarantee successful transfer of volumes from one disk to another by using the Volume and Partition Backup operation and the Volume and Partition Restore operation.

When you insert a tape cartridge, the Tape Backup 40SC conditions the tape to function in the machine. This process, called the *auto-load sequence*, takes about 90 seconds. At the end of the auto-load sequence, the activity light should go off and the tape drive motor should cease to make noise. If the activity light continues to flash rapidly and steadily, and if you don't hear any noise from the tape drive, the tape cartridge has not been properly loaded. Follow these steps to correct the problem:

1. Eject the tape cartridge.

2. Watch for the activity light to stop flashing.

❖ *Note:* If the light continues to flash, take your Tape Backup 40SC and the tape cartridge to your authorized Apple dealer or representative.

3. If the activity light stops flashing, reinsert the tape cartridge.

4. Wait 90 seconds for the auto-load sequence to finish.

The tape cartridge should load properly. If the activity light continues to flash and you still don't hear any noise from the tape drive, try a new tape cartridge. At this point, if the Tape Backup 40SC does not load the new tape cartridge, quit the application and shut down the device. Take your Tape Backup 40SC and the tape cartridges that you used to your authorized Apple dealer or representative.

Using the Backup/Restore menu

The Backup/Restore menu commands, shown in Figure 3-2, run the backup and restore operations that drive the Tape Backup 40SC.

```
  File   Edit   Backup/Restore
                Backup Volumes & Partitions...
                Restore Volumes & Partitions...

                Backup Files...
                Restore Files...
```

Figure 3-2
Backup/Restore menu commands

Each of the Backup/Restore menu commands prompts you with dialog boxes, like the one shown in Figure 3-3. A dialog box also alerts you if you're about to do something that could cause you to lose information, and gives you a chance either to cancel what you were about to do or to switch cartridges.

Message ————————

Buttons ————————

```
  File   Edit   Backup/Restore

 Please select the partitions you wish to back up:

 DRIVE      MAC VOLUME   SIZE (K)   PARTITION NAME PARTITION TYPE
 (SCSI 5)   Norman No...  19576
 (SCSI 6)   HD 80SC        2048     MacOS          Apple_HFS
 (SCSI 6)                  3072     Eschatology 1  Apple_A/UX_SUR2
 (SCSI 6)                 55592     A/UX Root      Apple_A/UX_SUR2
 (SCSI 6)                 14336     Swap           Apple_A/UX_SUR2
 (SCSI 6)                  3072     Eschatology 2  Apple_A/UX_SUR2
 Int. Flop... Tape Back...  800

                                            Cancel

                         Eject highlighted disk    Backup
```

Figure 3-3
Dialog box

The following sections describe the backup and restore operations in detail.

Backup Volumes and Partitions

The Backup Volumes and Partitions operation copies an entire hard disk volume or partition to a tape cartridge (or to several cartridges if the volume exceeds 38.5 MB). Some hard disks are separated into segments for use with different operating systems. You divide a hard disk into these segments, called *partitions,* with an application that prepares the disk to store information. The application either can prepare the entire disk surface as one storage site (volume), or can create several partitions to store information for use by different **operating systems** such as the Macintosh and Apple A/UX™. Tape Backup 40SC Version 2.0 treats each formatted storage unit, volume, or partition as a partition. Therefore, you may have a disk with one partition or many partitions. You can select any combination of volumes and partitions to back up. The application copies all information from each selected volume or partition onto a tape cartridge in one process. You can use the tape cartridge copy, or backup, to restore the entire contents of a disk volume or partition.

Important	Tape Backup 40SC Version 2.0 only supports one Macintosh partition per hard disk.
	You can back up several HFS partitions in one session if the partitions reside on separate devices connected to the Macintosh.

Follow these steps to do a volume or partition backup:

1. Open the Apple Tape Backup 40SC application.

You'll see the welcome message shown in Figure 3-4.

❖ *For A/UX users:* To open the Apple Tape Backup 40SC application, you must shut down A/UX and return to the Macintosh OS.
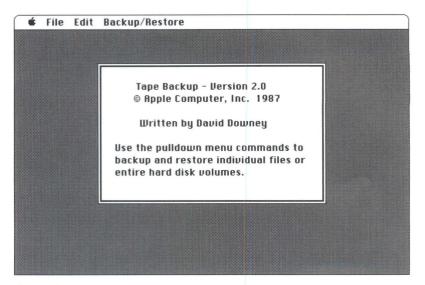
Figure 3-4
Welcome message

Important   If you want to back up a hard disk used for an AppleShare file
server, make sure to shut down the file server before you back
up the disk. By doing this, you can maintain all the established
access privileges.

See *AppleShare Administrator's Guide* for more information.

**2. Choose the "Backup Volumes and Partitions" command from
the Backup/Restore menu.**

A dialog box like the one in Figure 3-5 appears, showing you the
volumes and partitions available for backup. The screen
identifies each partition by its name, type, volume name, device
name, (if appropriate), and size. You can also see and select any
800K disks in any 3.5-inch disk drives.
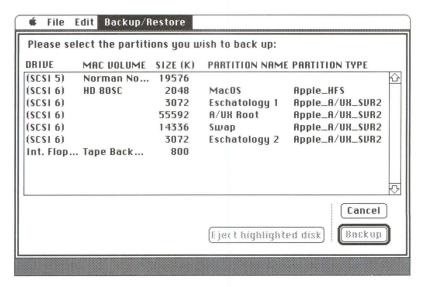
Figure 3-5
Backup Volumes and Partitions selection screen

3. Select the partitions you want to back up.

☐ To select an individual partition, click its name.

☐ To select a contiguous group of partitions, drag down the list of names including all of the partitions that you want to back up.

☐ To select noncontiguous partitions, hold down the Shift key and click the names of the partitions you want to back up.

If you select an 800K floppy disk to back up, the eject button is highlighted on the screen and you can eject that disk. If you eject the disk, the application removes the floppy volume from the backup list.

Figure 3-6 presents an example of selecting partitions.
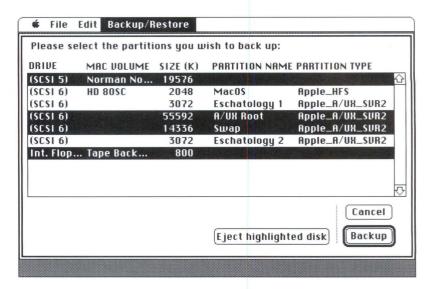
Figure 3-6
Selecting partitions for back up

4. Click the Backup button to begin the backup operation.

Follow the instructions in the dialog boxes to direct the Backup
Volumes and Partitions operation. Figure 3-7 shows one dialog
box you might see.

The application tells you about how many tape cartridges are
required for the operation. You must format each cartridge prior
to using it for a backup.

```
┌─────────────────────────────────────┐
│  ┌───────────────────────────────┐  │
│  │                               │  │
│  │  Please insert the tape cartridge │
│  │  that you wish to use for the │  │
│  │  partition backup operation.  │  │
│  │                               │  │
│  │                               │  │
│  │   ┌────────┐   ┌──────────┐   │  │
│  │   │ Cancel │   │ Continue │   │  │
│  │   └────────┘   └──────────┘   │  │
│  │                               │  │
│  └───────────────────────────────┘  │
└─────────────────────────────────────┘
```

Figure 3-7
Backup Volumes and Partitions tape request message

The backup operation shows you a status screen, which is
presented in Figure 3-8. This screen reports the progress of the
backup operation for each partition and the completion
percentage for the total operation.

```
┌─────────────────────────────────────────────┐
│  ┌───────────────────────────────────────┐  │
│  │                                       │  │
│  │  A partition backup is in progress and will │
│  │  take up to 22 minutes per 20 MB of disk │
│  │                                       │  │
│  │  Partition:     Norman Norton         │  │
│  │  Elapsed time: 1      minutes         │  │
│  │  % Complete:   5    %                 │  │
│  │                                       │  │
│  │   ┌─────┬──────┬──────┬──────┬─────┐  │  │
│  │   │█    │      │      │      │     │  │  │
│  │   └─────┴──────┴──────┴──────┴─────┘  │  │
│  │  0%    25%    50%    75%    100%       │  │
│  │           ┌────────┐                  │  │
│  │           │ Cancel │                  │  │
│  │           └────────┘                  │  │
│  └───────────────────────────────────────┘  │
└─────────────────────────────────────────────┘
```
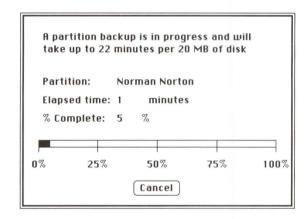
Figure 3-8
Backup Volumes and Partitions status screen

If your backup session requires more than one tape cartridge, the application requests that you insert the first tape cartridge at the end of the backup operation. The application may also request that you insert one of the other tapes in the session—such as tape 2 of 4—if the Macintosh or HFS partition starts on any tape other than the first tape cartridge or the last tape cartridge. The application then writes on the first tape cartridge a catalog that describes which partitions were copied in that session and where each partition copy is stored on the cartridges. This process ensures that the Tape Disk utility has all the information it needs to function.

5. **When the backup is complete, click the OK button on the completion message to end the Backup Volumes and Partitions operation.**

   Figure 3-9 shows the completion message.

Figure 3-9
Backup Volumes and Partitions completion message

6. **Eject the tape cartridge.**

❖ *Note:* Any time you insert a tape cartridge during the Backup Volumes and Partitions operation, the application checks whether or not the tape cartridge contains data. If the tape cartridge is not empty, the application displays a warning and allows you either to switch the tape cartridge or to cancel the operation.

You can cancel the Backup Volumes and Partitions operation in the middle, if necessary. All the volumes and partitions copied before you canceled the operation remain copied onto the tape cartridge and can be restored to the hard disk.

Backup Volumes and Partitions recommendations

The Backup Volumes and Partitions operation is the fastest and easiest way to protect your work. The Backup Volumes and Partitions operation copies the entire contents of your hard disk to a tape cartridge. It is recommended that you use this operation most of the time.

If you decide to use the Backup Volumes and Partitions operation, it is best to have at least three tape cartridges. Use one tape cartridge to back up today's work, one for tomorrow's work, and one for the next day's work. By doing this, if something happens during a backup operation, you have two other relatively current copies of your work to restore.

On the fourth day, begin to recycle the tapes. Use the oldest backup tape cartridge (the copy of the day-before-yesterday's work) to back up the current day's work. Use the Clear Cartridge operation to erase the tape cartridge before reusing it.

Plan to start the backup operation when you won't need the computer for at least 30 minutes. You can set up the computer to carry out the backup operation while you eat lunch, or at night after you go home (as long as you don't need to insert more tape cartridges).

If your hard disk contains more than 38.5 MB of data, you'll need more than one cartridge.

Backing up a full Apple Hard Disk 20SC takes 18 to 19 minutes. Backing up a full Macintosh Hard Disk 20 takes up to 25 minutes. Information is stored on your hard disk in different places according to the time that you save the data. The Tape Backup 40SC searches through the hard disk and copies all of the stored information. Remember that the Backup Volumes and Partitions operation is always the fastest way to make a backup copy of the contents of your hard disk.

After you copy information from your hard disk onto a tape cartridge, you may want to slide the record-lock switch to the locked position to guard against copying over information by accident.

Restore Volumes and Partitions

The Restore Volumes and Partitions operation *restores,* or writes all the data, a tape cartridge copy of a partition or of a volume to your hard disk. You should restore a tape cartridge copy of a partition to a hard disk of the same capacity.

❖ *Note:* You can restore a copied partition into a partition of the same or slightly larger size (within 4 MB). Restoring into a larger partition causes you to lose some disk space. The application will warn you of the potential loss and will give you a chance to cancel the operation.

You can repartition the disk in order to restore a tape cartridge copy of a different size volume or partition. You need to cancel the restore operation, and create a partition of the correct size by using HD SC Setup. See Appendix B, "Apple HD SC Setup," for instructions on creating partitions.

Warning Be sure to start up from the floppy disk called *Tape Backup 40SC* when you're planning to restore a partition. The *Tape Backup 40SC* disk won't allow you to restore over the System file or the application file in use on your startup disk.

The *Tape Backup 40SC* disk has a System Folder so that you can use it as a startup disk. Make sure to keep the System Folder on the original floppy disk.

Follow these steps to restore a volume.

❖ *For A/UX users:* If your hard disk suffered damage so severe that you have had to reinitialize the disk, use HD SC Setup version 2.0 or later to repartition your disk. (HD SC Setup version 2.0 is included on the *Tape Backup 40SC* disks and described in Appendix B.)

1. **Insert the *Tape Backup 40SC* disk into the internal disk drive in your Macintosh.**

2. **Start up your Macintosh system.**

❖ *For A/UX users:* Shutdown and reboot A/UX to restart your system.

3. **Open the Apple Tape Backup 40SC application from the floppy-disk icon.**

4. Choose the "Restore Volumes and Partitions" command from the Backup/Restore menu.

A dialog box like the one in Figure 3-10 appears showing you the volumes and partitions available for the Restore Volumes and Partitions operation. You see a list of destinations to which the copied information can be restored. For a disk separated into multiple partitions, the dialog box displays each partition as a separate choice. The screen identifies each *source partition* (the tape cartridge copy you made by using the Backup Volumes and Partitions operation) by displaying its name, type, volume name, size, and backup date.

Available storage devices (Destination)

Copy available to restore (Source)
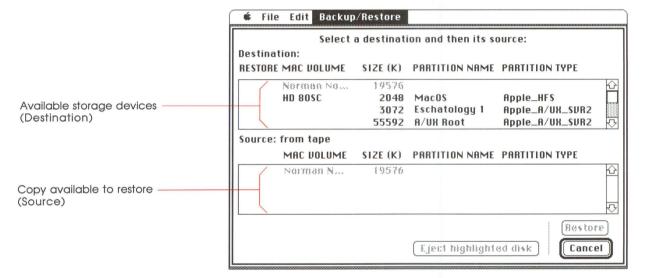
Figure 3-10
Restore Volumes and Partitions dialog box

5. Select a destination for the partition you want to restore.

As shown in Figure 3-11, the dialog box then displays a device name or SCSI ID number after the destination label. The SCSI ID number identifies the selected drive.

```
 File   Edit   Backup/Restore

            Select a destination and then its source:
Destination: (SCSI 5)
RESTORE  MAC VOLUME        SIZE       PARTITION NAME  PARTITION TYPE

         Norman Norton   19576   K                                    ⇧
         HD 80SC          2048   K   MacOS            Apple_HFS
                          3072   K   Eschatology 1    Apple_UNIH_...
                         55592   K   A/UH Root        Apple_UNIH_...⇩

Source: from tape
         MAC VOLUME        SIZE       PARTITION NAME  PARTITION TYPE

         Norman Norton   19576   K                                    ⇧


                                                                      ⇩

                                                        [ Restore ]

                        [ Eject highlighted disk ]      [ Cancel ]
```

Figure 3-11
Selecting a destination for a partition restore

All of the copied partitions (source items) that will fit into the
selected destination appear available to be selected. Any source
item that is too large, too small, or of another operating-system
type will be dimmed and cannot be selected.

Each destination can only receive one source item. Review the
selections you make by clicking the destination. To undo a
selection, first click the destination and then click the source.

6. **Select a source item to restore into the selected destination
device.**

You can select several partitions (either individual partitions or
entire volume copies) to restore during the same restore
operation. As you select each source partition, check marks
appear next to its name and the name of the selected destination,
as shown in Figure 3-12.

You can link each source partition to an individual partition or to
several partitions connected to the same SCSI chain.
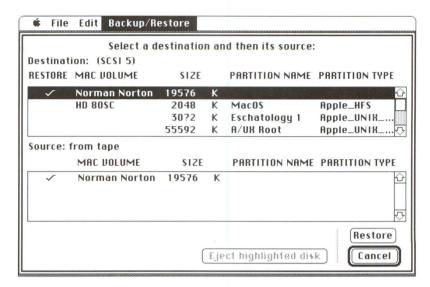
Figure 3-12
Source item and destination volume link

7. Click the Restore button to begin the restore operation.

8. Follow the instructions in the dialog boxes to direct the volume restore operation.

Figure 3-13 shows one dialog box you might see.
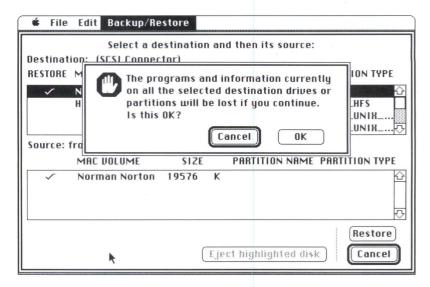
Figure 3-13
Restore warning

9. When the restore operation is complete, click OK in the completion message to end the volume restore operation.

Figure 3-14 shows the completion message displayed after the restore operation finishes.

Figure 3-14
Restore Volumes and Partitions completion message

10. Eject the tape cartridge.

You can cancel the Restore Volumes and Partitions operation in the middle, if necessary. When you cancel the Restore Volumes and Partitions operation, the disk volume on the hard disk becomes useless. Canceling the Restore Volumes and Partitions operation does not alter the tape cartridge copy. You can still restore it to your hard disk. You may have to reinitialize the hard disk and try the "Restore Volumes and Partitions" command again.

Restore Volumes and Partitions recommendations

Use the restore operation to reconstruct your hard disk if you have a catastrophe that ruins the data on your hard disk (and your day). The Restore Volumes and Partitions operation writes the contents of a hard disk from a tape cartridge back onto a hard disk.

If your hard disk crashes, you may need to reinitialize the hard disk and then start up from the *Tape Backup 40SC* floppy disk to perform the restore operation. See Appendix B, "Apple HD SC Setup," or your hard disk owner's guide for more information.

During the volume restore operation, the Tape Backup 40SC reads from the tape cartridge and then writes data onto the hard disk. Restoring a full Apple Hard Disk 20SC takes about 22 minutes. Restoring a full Macintosh Hard Disk 20 takes about 32 minutes. Other 20 MB hard disks may vary within this range.

The volume restore operation writes over any data that is currently on the hard disk. Dialog boxes warn you of the potential data loss and give you a chance to cancel the operation.

Important Don't restore a smaller-capacity tape cartridge copy of a hard disk to a larger-capacity hard disk. Restoring a smaller-capacity tape cartridge copy to a larger-capacity hard disk causes loss of active disk space. The Tape Backup 40SC application will not let you restore a volume or partition into a destination volume more than 4 MB larger. If you want to transfer files from a smaller-capacity disk to a larger-capacity one, use the Backup Files operation and the Restore Files operation.

To restore from one Apple 20 MB hard disk to another Apple 20 MB hard disk, follow these steps:

1. **Start up the Tape Backup 40SC application from the floppy disk.**

2. **Make a tape cartridge copy of the entire contents of your hard disk by using the Backup Files command. Select everything at the top level of the HFS.**

3. **By using HD SC Setup version 2.0 or later, initialize the hard disk to which you are restoring.**

   HD SC Setup Version 2.0 is included on the *Tape Backup 40SC* disk.

4. **Restore the copied contents of your hard disk by using the Restore Files command.**

   If this process fails, try using the Tape Disk utility to copy files.

Backup Files

The Backup Files operation copies individual files or folders you select to a tape cartridge. Backup Files only copies files stored on a Macintosh HFS formatted disk. The file backup operation copies files independent of their source locations (the places that the files came from on your hard disk), so you can back up files from several hard disks onto the same tape cartridge.

❖ *For A/UX users:* The Backup Files operation does not work with A/UX file systems. Refer to "Backup Volumes and Partitions" in this chapter for instructions on backing up A/UX.

With the Backup Files operation, you select folders or files from one level of HFS at a time. You can select whole folders, groups of folders, individual files, groups of files within a folder, or a combination of folders and files that reside on the same level of HFS.

You cannot select individual files nested in different folders to back up at the same time. You back up selected files from one folder and then go on to another folder.

You can also choose to back up only the files that have changed since the last Backup Files operation.

Follow these steps to back up files:

1. Open the Apple Tape Backup 40SC application from your hard disk.

2. Choose the Backup Files command from the Backup/Restore menu.

A dialog box like the one in Figure 3-15 appears, showing you the contents of the selected hard disk.

Disk drive ID ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

Disk contents ⎯⎯⎯⎯⎯⎯⎯⎯⎯
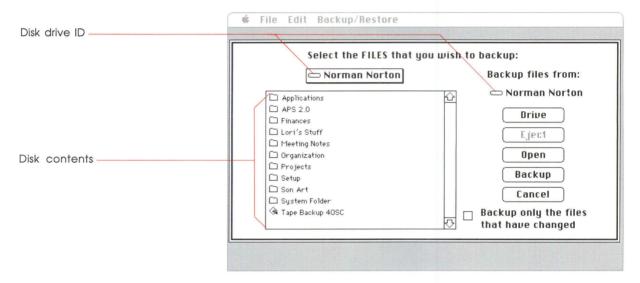
Figure 3-15
File/Source Volume selection

To select a different disk from which to back up files, click the Drive button.

3. Select the files or folders you want to back up.

☐ To select an individual file or folder, click its name, as shown in Figure 3-16.

Figure 3-16
Selecting an individual item for a file backup

□ To select a contiguous group of files, folders, or files and
folders that reside on the same level, drag down the list of
names including all names that you want to back up, as shown
in Figure 3-17.
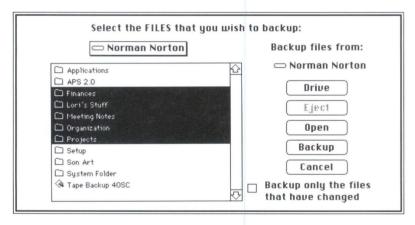
Figure 3-17
Selecting contiguous items for a file backup

□ To select files, folders, or files and folders on one level that are not contiguous, Shift-click the names of files and folders that you want to back up, as shown in Figure 3-18.

```
┌─────────────────────────────────────────────────────────────┐
│                                                             │
│      Select the FILES that you wish to backup:              │
│      ┌──────────────────────┐       Backup files from:      │
│      │ ▭ Norman Norton      │                               │
│      └──────────────────────┘       ▭ Norman Norton         │
│      ┌──────────────────────────┐△                          │
│      │ ▢ Applications           │    ┌─────────────┐         │
│      │ ▢ APS 2.0                │    │    Drive    │         │
│      │ ▢ Finances               │    └─────────────┘         │
│      │ ▢ Lori's Stuff           │    ┌─────────────┐         │
│      │ ▢ Meeting Notes          │    │    Eject     │        │
│      │ ▢ Organization           │    └─────────────┘         │
│      │ ▢ Projects               │    ┌─────────────┐         │
│      │ ▢ Setup                  │    │    Open     │         │
│      │ ▢ Son Art                │    └─────────────┘         │
│      │ ▢ System Folder          │    ┌─────────────┐         │
│      │ ◈ Tape Backup 40SC       │    │   Backup    │         │
│      └──────────────────────────┘▽   └─────────────┘         │
│                                      ┌─────────────┐         │
│                                      │   Cancel    │         │
│                                      └─────────────┘         │
│                                   ☐ Backup only the files    │
│                                      that have changed       │
└─────────────────────────────────────────────────────────────┘
```
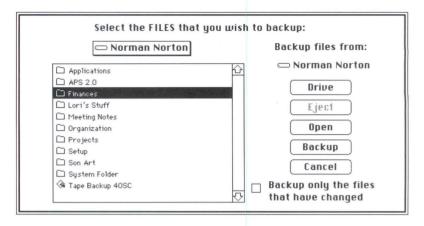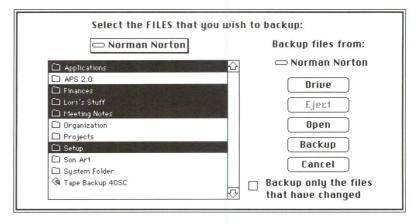
Figure 3-18
Selecting noncontiguous items for a file backup

□ To select only the files that you have either edited or created since the last backup, click the box next to the command "Backup only the files that have changed." The Tape Backup 40SC will search through the selected hard-disk volume, and will copy the changed files and any files created since the last backup.

You cannot copy certain files when they are open and being used by the computer or the application. These files include

□ the System file

□ the printer drivers

□ the Tape Backup 40SC application

If you select these files to back up, you'll see a message during the operation saying that these are busy files and can't be backed up. The application will continue to back up the rest of the files and folders you selected.

4. Click the Backup button to begin the backup operation.

5. Follow the instructions in the dialog boxes to direct the Backup Files operation.

Figure 3-19 shows a dialog box you might see.

Please insert the tape cartridge
that you want to use for the file
backup operation.

Cancel   Continue

Figure 3-19
Backup Files tape request message

6. Click OK in the Backup Files completion message to end the current session of Backup Files.

Figure 3-20 shows the completion message.

The backup operation was
completed successfully.

OK

Figure 3-20
Backup Files completion message

To back up more files during this session, select them from the directory.

Follow these steps to exit from the Backup Files operation:

1. **Click the Cancel button on the File/Source Volume selection screen.**

2. **Choose Quit from the File menu.**

3. **Eject the tape cartridge.**

4. **Label the tape cartridge with the session information.**

   Important labeling information follows these instructions.

Important   Make sure to list the beginning session and the ending session on each tape cartridge.

The Backup Files operation creates a catalog on the tape cartridge identifying which files and folders the Tape Backup 40SC copied in a file backup operation. When you copy files onto the same tape cartridge in subsequent sessions, the application keeps track of all of the sessions in the catalog on the tape cartridge.

The application also writes a catalog when you copy files and folders in one session during which you use more than one tape cartridge. The Tape Backup 40SC application tells you how many tape cartridges are needed when you select files that require more than one tape cartridge. The catalog resides on the first tape cartridge in the series. Each subsequent tape cartridge contains its own catalog of the specific files and folders that reside on it. At the end of a backup session, the application requests that you insert the first tape cartridge of that series in order to update the catalog with the complete Backup Files information for that session.

When you want to restore files, you must insert the first tape cartridge in the series and then the tape cartridge that the application requests. If you know where a particular file resides, you can insert that cartridge. For example, you could insert Tape 2 of 5. The Tape Backup 40SC application directs you to label each tape cartridge in a series with a specific numbering scheme. Label *each* cartridge you use to back up files, as shown in Figure 3-21.
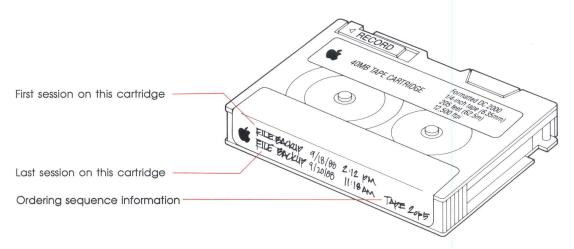

First session on this cartridge

Last session on this cartridge

Ordering sequence information

Figure 3-21
Labeling your cartridges

It's a good idea to keep a list of the files and folders copied in each session, and the identifying session and cartridge for each file or folder. By doing this, you can easily find a copied file when you need to restore it.

Important   When you want to reuse a tape cartridge, use the Clear Cartridge operation to erase the tape cartridge.

If you reuse the first tape cartridge in a series of file backup tape cartridges, you lose access to the master catalog for the series, as well as *all* of the files and folders copied onto that tape cartridge. The files and folders on other tape cartridges in the series are accessible through their own catalogs. Make sure to check the contents of any tape cartridge carefully before reusing it.

You can cancel the Backup Files operation at anytime, if necessary. The Apple Tape Backup 40SC application gives you the option of canceling the backup of either the current file only, or the current file and all the rest of the files you selected. All the files backed up before you canceled the operation remain copied onto the tape cartridge and can be restored to the hard disk.

Backup Files recommendations

The Backup Files operation copies the individual files that you select for backing up with your Tape Backup 40SC. When you have a small set of files that you want safely archived or individual files that are too large to back up onto a 800K floppy disk, you should back up these files daily, and back up volumes and partitions once a week. You can back up small individual files on floppy disks faster than you can with the Tape Backup 40SC application and device. See your Macintosh owner's guide for information on how to copy data onto floppy disks.

For the Backup Files operation you need at least two tape cartridges so you have one for storing files when the first tape cartridge is full and you don't want to clear the first tape cartridge. You may also want to make two copies of files so that you have a second copy to rely on.

The length of time needed for the Backup Files operation varies depending on the way that the files are distributed on the hard disk. You may need to be present throughout this operation if the application specifies that more cartridges may be needed.

After you copy information from your hard disk onto a tape cartridge, you may slide the record-lock switch to the locked position to guard against copying over information by accident.

The Tape Backup 40SC application doesn't save comments stored in the Get Info window. If you store important update information or pertinent messages in Get Info windows, keep a record of them before you make backup copies of your files. Then you can replace them in case you need to restore files or folders lost from your hard disk.

Restore Files

The Restore Files operation restores files to your hard disk from a tape cartridge copy that you created during a Backup Files operation.

❖ *For A/UX users:* The Restore Files option does not work with A/UX file systems. Refer to "Restore Volumes and Partitions" in this chapter for instructions on restoring A/UX file systems.

The Tape Backup 40SC application *does* remember the location of files and folders copied in the Backup Files operation. However, the application doesn't remember the disk volume from which the files were copied. You will see a directory listing the copied files and folders as you selected them before you made the copies. You use the directory in the same way as you do in the Backup Files operation.

Follow these steps to do a Restore Files operation:

1. **Open the Tape Backup 40SC application.**

2. **Choose the Restore Files command from the Backup/Restore menu.**

3. **To select files and folders to restore, insert the tape cartridge that has a catalog. (Thus, you should insert the first tape cartridge in a series.) You can select files and folders from one level of the HFS at a time. The session date identifies the top level of the HFS.**

   The Tape Backup 40SC application presents a dialog box that asks you to insert the tape cartridge that contains the selected files and folders, as shown in Figure 3-22.
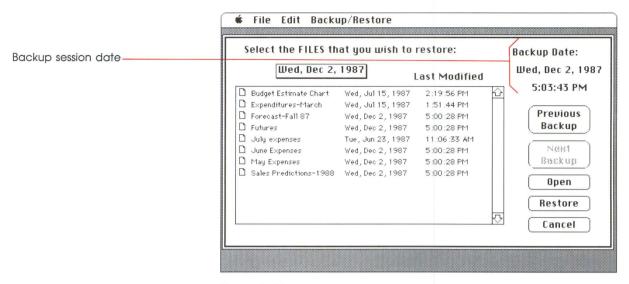
Backup session date ———

Figure 3-22
File selection dialog box

To select a different backup session, click the appropriate button.

4. Select the files you want to restore.

☐ To select an individual file, click its name, as shown in Figure 3-23.
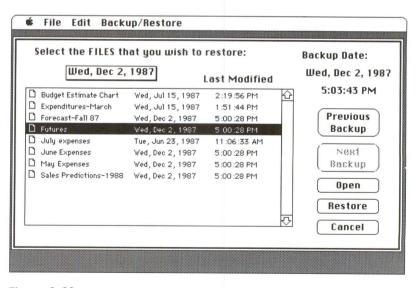

Figure 3-23
Selecting an individual item for Restore Files

□ To select a contiguous group of files, drag down the list of names, to include all names that you want to restore, as shown in Figure 3-24.
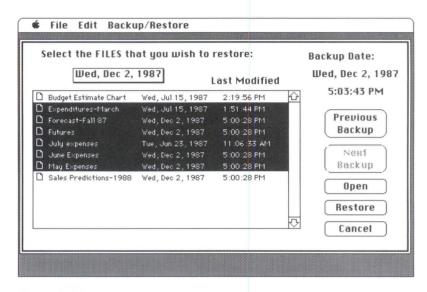

Figure 3-24
Selecting contiguous items for Restore Files

□ To select files that are not contiguous, Shift-click the names of files that you want to restore, as shown in Figure 3-25.
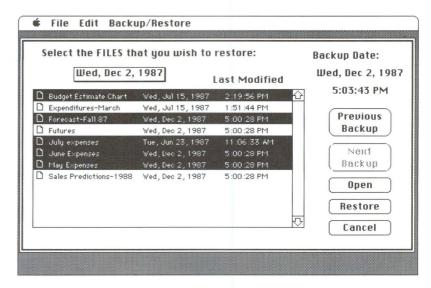
Figure 3-25
Selecting noncontiguous items for Restore Files

5. Click Restore.

A screen appears showing you the current contents of your disk.
You need to select a place to store your file or files.

☐ To select a different storage disk, click Drive.

6. Select a volume in which to restore the files. Double-click a folder to restore a file into it.

The folder must be open in order to restore the file into it. Figure
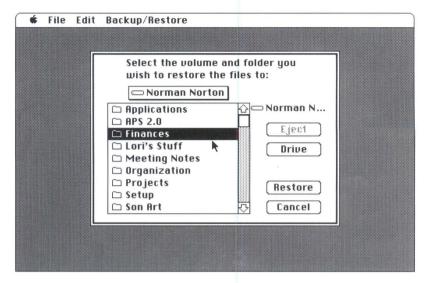3-26 shows a folder that is selected but not yet open.

Figure 3-26
Destination Volume/Folder selection

7. Click the Restore button to begin the restore operation.

8. Follow the instructions in the dialog boxes to direct the Restore Files operation.

The application presents a dialog box that monitors the progress of the restore operation, as shown in Figure 3-27.
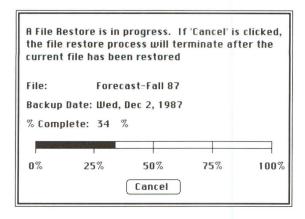
```
┌─────────────────────────────────────────────────┐
│  ┌───────────────────────────────────────────┐  │
│  │                                           │  │
│  │  A File Restore is in progress.  If 'Cancel' is clicked,│  │
│  │  the file restore process will terminate after the     │  │
│  │  current file has been restored                        │  │
│  │                                           │  │
│  │  File:         Forecast-Fall 87           │  │
│  │                                           │  │
│  │  Backup Date: Wed, Dec 2, 1987            │  │
│  │                                           │  │
│  │  % Complete:  34  %                       │  │
│  │                                           │  │
│  │  ┌──────────────┬──────┬──────┬──────┐    │  │
│  │  │██████████████│      │      │      │    │  │
│  │  └──────────────┴──────┴──────┴──────┘    │  │
│  │  0%      25%      50%      75%    100%     │  │
│  │              ┌─────────┐                  │  │
│  │              │ Cancel  │                  │  │
│  │              └─────────┘                  │  │
│  └───────────────────────────────────────────┘  │
└─────────────────────────────────────────────────┘
```

Figure 3-27
Restore Files in Progress status screen

The application will not replace a file with a folder of the same name, or a folder with a file of the same name.

As shown in Figure 3-28, the Restore Files operation gives you three options when it encounters files and folders that have the same names as files and folders already on the hard disk to which you are restoring:

☐ Skip, which indicates the application does not restore any files and folders having the same names

☐ Prompt, in which the application asks you whether to restore each time it encounters a file or folder having the same name

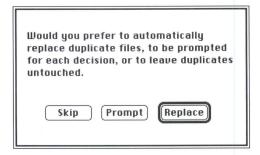□ Replace, in which the application automatically replaces any file or folder that has the same name

```
┌─────────────────────────────────────────┐
│ ┌─────────────────────────────────────┐ │
│ │                                     │ │
│ │  Would you prefer to automatically  │ │
│ │  replace duplicate files, to be     │ │
│ │  prompted for each decision, or to  │ │
│ │  leave duplicates untouched.        │ │
│ │                                     │ │
│ │  ┌─────┐  ┌────────┐  ┌─────────┐   │ │
│ │  │Skip │  │ Prompt │  │ Replace │   │ │
│ │  └─────┘  └────────┘  └─────────┘   │ │
│ └─────────────────────────────────────┘ │
└─────────────────────────────────────────┘
```

Figure 3-28
Restore Files choices

9. Click OK in the Restore Files completion message, shown in Figure 3-29, to end the current session of Restore Files.

```
┌─────────────────────────────────┐
│ ┌─────────────────────────────┐ │
│ │                             │ │
│ │  The restore operation was  │ │
│ │  completed successfully.    │ │
│ │                             │ │
│ │       ┌─────────┐           │ │
│ │       │   OK    │           │ │
│ │       └─────────┘           │ │
│ └─────────────────────────────┘ │
└─────────────────────────────────┘
```

Figure 3-29
Restore Files completion message

At the end of the Restore Files process, the application returns to the Restore Files selection screen. To restore more files during the session, select them from the directory.

Follow these steps to exit from the Restore Files operation.

1. **Click the Cancel button on the Restore Files selection screen.**

2. **Choose Quit from the File menu.**

3. **Eject the tape cartridge.**

Important   The Tape Backup 40SC application won't allow you to restore a System file over the System file that is currently driving the Macintosh.

You also can't restore the Tape Backup 40SC application over the Tape Backup 40SC application in use.

You can cancel the Restore Files operation at anytime. The **Cancel button** doesn't cancel the currently restoring file; it only cancels the selected files that haven't yet been restored. The Tape Backup 40SC completes the restore of the file it is processing when you click Cancel.

Restore Files recommendations

Once you have copied files from your hard disk onto a tape cartridge, the Restore Files operation writes the files from the tape cartridge onto a hard disk. If you lose files, delete files accidentally, or lose access to part of your hard disk, use the Restore Files operation to replace the previously copied files onto your hard disk.

The Restore Files operation reads from the tape first and then writes data onto the hard disk. The Restore Files operation takes varying amounts of time, depending on the length of the files and the number of pieces they were stored in on the hard disk when you copied them.

You can restore files copied with the Backup Files procedure.

Tape cartridge data access

This section explains how to use the Verify Cartridge command to verify that a tape cartridge remains safe to use for data storage. You will also find instructions for using the Tape Disk utility to retrieve individual files from tape cartridges that contain partition or volume backups.

Verify Cartridge

Normally, you can expect your tape cartridges to last a long time and to archive your data safely. However, on rare occasions, you may notice that a tape cartridge loses data or unexpectedly doesn't contain all the files you think it should.

During a Backup or Restore operation, you may see an error message saying that the tape drive has problems reading the tape cartridge or accessing the tape cartridge. You should immediately cancel the operation and use the Verify Cartridge command to check the tape cartridge.

The Verify Cartridge operation reviews the tape media and locates faulty segments. If faulty segments are identified, the Verify Cartridge operation copies the information from such segments and then prevents those segments from being used again. Once the Verify Cartridge operation has located the first faulty segment of tape media, it fixes that segment, and then gives you the opportunity to continue the operation or quit. The Verify Cartridge operation fixes any unreliable tape media areas and guarantees the reliability of the tape cartridge.

If you need to verify a tape cartridge, follow these steps:

1. **Choose Verify Cartridge from the File menu.**

   A dialog box appears asking you to insert the tape cartridge to be verified, as shown in Figure 3-30.

```
┌─────────────────────────────────────┐
│ ┌─────────────────────────────────┐ │
│ │                                 │ │
│ │  Please insert the tape cartridge│ │
│ │  that you wish to verify.       │ │
│ │                                 │ │
│ │  This is a nondestructive verify.│ │
│ │                                 │ │
│ │   ┌────────┐      ┌─────────┐   │ │
│ │   │ Cancel │      │ Continue│   │ │
│ │   └────────┘      └─────────┘   │ │
│ └─────────────────────────────────┘ │
└─────────────────────────────────────┘
```

Figure 3-30
Verify Cartridge screen

2. **Insert the tape cartridge and click Continue.**

   If the cartridge is already inserted, click Continue.

3. **Follow the instructions in the dialog boxes to direct the Verify Cartridge operation.**

   Figure 3-31 shows one dialog box you might see.

> There haven't been any bad blocks previously
> encountered by this application. If you still
> wish to verify all of the tape blocks the
> operation will require about 120 minutes.
>
> [Cancel]   [[Continue]]

Figure 3-31
Verify Cartridge status screen

4. Click OK in the completion message to exit the Verify Cartridge operation.

5. Eject the tape cartridge.

You can cancel the Verify Cartridge operation in the middle. When you click it, the Cancel button may not flash immediately as other buttons do. The Verify Cartridge operation finishes running the tape media to the end of the cartridge and then returns to the main menu. If you cancel the Verify Cartridge operation, it is possible that the tape media still contains some unreliable areas that have not been fixed.

Tape Disk

You can back up a Macintosh partition and use the tape cartridge copy to restore the partition to a hard disk, or you can back up files and restore them on an individual basis. On occasion, you may need to retrieve a single file from a partition or volume backup tape.

Warning You can only use the Tape Disk utility with Macintosh partitions.

The Tape Disk utility will not work with other operating system partitions.

You can use the Tape Disk utility to access files from a tape cartridge copy of any partition or volume. Tape Disk mounts the tape cartridge copy of a partition or volume to the desktop, and makes the tape cartridge act just like a hard disk. The purpose of Tape Disk is to allow you to access an individual file from a volume or partition copy of a hard disk on which you only need to restore or change one file.

Important	You must use System file 4.2 or later and Finder version 6.0 or later with the Tape Disk utility.

Follow these steps to use Tape Disk:

1. Turn on the Tape Backup 40SC device.

2. Insert the tape cartridge you want to use.

3. Insert the *Tape Backup 40SC* disk into a disk drive.

4. Open the disk icon.

You'll see several icons in the window, as shown in Figure 3-32.
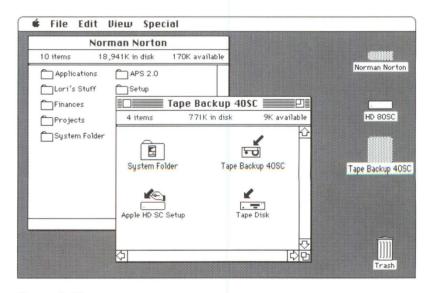
Figure 3-32
Tape Backup 40SC window

5. Drag the Tape Disk icon into the System Folder on your hard disk.

6. Choose Restart from the Special menu.

When the Macintosh starts up, Tape Disk searches for any connected tape drives with tape cartridges inserted. Tape Disk mounts any tape cartridge copies of hard disks that it finds. As shown in Figure 3-33, a dialog box appears that gives you the option of proceeding with or canceling the tape mounting operation.

Warning The Tape Disk utility only finds the *last* Macintosh partition in a backup session. If the partition you want to access is not the last in the session, you can only restore that copy using the Restore Volumes and Partitions operation. You won't be able to access the individual files.

Don't run Tape Backup 40SC with the Tape Disk utility installed under MultiFinder™. Either take Tape Disk out of the System Folder, or turn off MultiFinder. Then, restart the Macintosh.
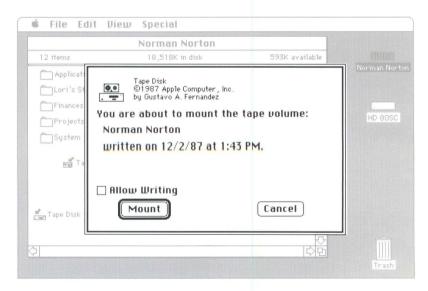
Figure 3-33
Tape Disk mounting screen

7. To edit a file, click Allow Writing and make certain that the tape cartridge record-lock switch is in the open (left) position.

Tape Disk takes several minutes to mount the tape cartridge. A tape drive icon with a stack of cartridges then appears on the desktop. Click the mounted tape drive icon to open it and to reach any information it contains.

Figure 3-34 shows the icon of a tape cartridge that has been mounted.
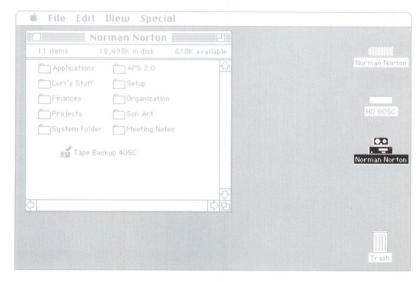
Figure 3-34
Icon of a mounted tape cartridge

Now you can use the tape cartridge copy of a hard disk just like you would use any hard disk. By using the Tape Disk volume, you can do almost any task that you can do by using the Finder with a hard disk. The Tape Disk volume functions very slowly. You should not use the Tape Disk volume as a hard disk for regular purposes. If you need to restore a file to a hard disk, or if you need to update a file that you have altered since the backup was completed, you can effectively complete these tasks. You can't set a startup disk using the Control Panel or select a startup application using the Set Start Up command in the Special menu.

Important	Don't install Tape Disk while you are using version 1.1 of the Tape Backup 40SC application. You can mount tape cartridges copied with version 1.1.
	Also, don't use Tape Disk with an AppleShare™ file server. If you want to read backup tapes of AppleShare file server volumes, make sure that the Desktop Manager file resides in your System Folder. See your *AppleShare Administrator's Guide* for more information.

Although you can run applications from Tape Disk, you can't create new tape cartridge copies of hard disks. You also can't erase tape cartridges using Tape Disk.

The Tape Disk utility must reside in the System Folder in order to function. Simply remove the Tape Disk icon from the System Folder and restart the system if you don't want to mount tape cartridge copies of your hard disks.

Clear Cartridge

The Clear Cartridge command clears the **directory** information from the tape cartridge. After this process, the tape cartridge "forgets" that it contains information and you can use it for a new backup.

Use the Clear Cartridge command when you want to clear a tape cartridge of copies of files you no longer need. The Clear Cartridge operation clears the entire tape cartridge.

Follow these steps to clear a cartridge:

1. Open the Apple Tape Backup 40SC application.

2. Choose the Clear Cartridge command from the File menu.

An alert message appears telling you what is on the tape cartridge, as shown in Figure 3-35.

File Edit Backup/Restore

This tape cartridge contains a backup of
the partition listed below.

Volume: Norman Norton

Backup Date: Wed, Dec 2, 1987
                      1:43:38 PM

The above backup will be lost if this tape is
used for another backup, format, or clear.

[Cancel]   [Another Tape]   [[Continue]]
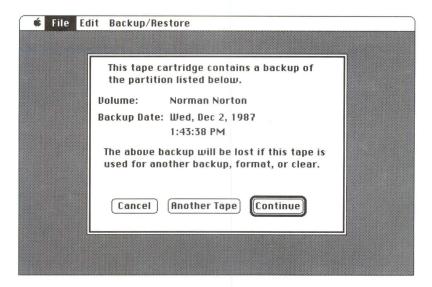
Figure 3-35
Loss of tape contents warning

3. **Click the Continue button to clear the tape cartridge.**

4. **When the Clear Cartridge operation is complete, click OK to exit the Clear Cartridge operation.**

Shutting down

Follow these steps to shut down the Tape Backup 40SC when you've finished:

1. **Choose Quit from the File menu.**

2. **Push the eject button on the Tape Backup 40SC, as shown in Figure 3-36, to remove the tape cartridge.**

Eject button ──────────────────────────────
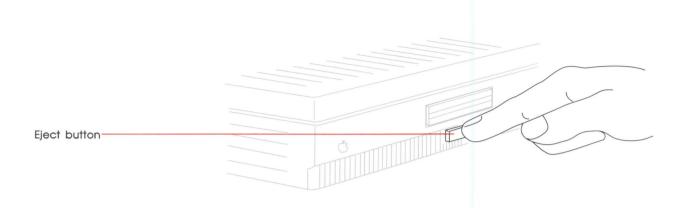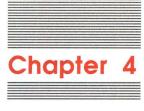
Figure 3-36
Tape Backup 40SC

Warning Don't store the tape cartridge in the Tape Backup 40SC. You
risk losing data if you turn the machine on and off with the tape
cartridge inserted. You can also wear down the tape drive
mechanism.
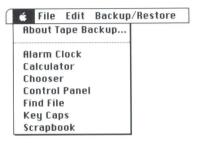
3. Turn off the Tape Backup 40SC.

❖ *Note:* You can leave the Tape Backup 40SC on and unused for
several days; it draws about as much power as a 25-watt light bulb.

Chapter 4

Reference

This chapter contains information about all the Tape Backup 40SC
software commands without emphasizing how to use them or how to
complete tasks with them.

Apple menu

The Apple menu always contains the **desk accessories** that are
installed in the System file on the current startup disk.

About Tape Backup...

About Tape Backup shows you the version and copyright
information for the Apple Tape Backup 40SC application, as shown
in Figure 4-1.
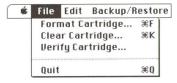
Figure 4-1
About Tape Backup display

Desk accessories

The commands on the Apple menu give you access to desk accessories like the Calculator and the Clock. You can use the Edit menu to cut, copy, and paste the information in most desk accessories.

See your Macintosh owner's guide or other manuals, as appropriate, for information on the other desk accessories you have installed on your startup disk.

File menu

```
  🍎  File  Edit  Backup/Restore
       Format Cartridge...  ⌘F
       Clear Cartridge...    ⌘K
       Verify Cartridge...
       ......................................
       Quit                  ⌘Q
```

The File menu commands let you format, clear, and verify cartridges, and quit the application.

Format Cartridge...

The Format Cartridge operation prepares the tape cartridge to store information. The process is similar to initializing a floppy disk. You must format all unformatted non-Apple tapes before you can use them for volume, partition, and file backups. If you need to format a non-Apple tape cartridge, see Chapter 2.

Clear Cartridge...

The Clear Cartridge operation erases the header information from a tape cartridge. You can then reuse the cartridge for any backup or restore operation.
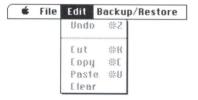
Verify Cartridge...

The Verify Cartridge operation checks a tape cartridge for any physical defects in the tape media that could cause the loss of data. The operation fixes the tape cartridge by copying any data in danger of being lost to a safe place on the tape media and then closing off the faulty tape area from further use. The Verify Cartridge operation guarantees the reliability of a tape cartridge.

Quit

The Quit command lets you leave the Apple Tape Backup 40SC application and return to the Finder.

Edit menu

🍎 File	**Edit**	Backup/Restore
	Undo ⌘Z	
	Cut ⌘H	
	Copy ⌘C	
	Paste ⌘U	
	Clear	

The Edit menu supports the desk accessories. The Edit commands are dimmed and can't be chosen when you work with the File menu and the Backup/Restore menu. For information on the Edit commands, see your Macintosh owner's guide.

Backup/Restore menu

```
  File   Edit   Backup/Restore
               Backup Volumes & Partitions...
               Restore Volumes & Partitions...

               Backup Files...
               Restore Files...
```

The Backup/Restore menu commands run the backup and restore operations that drive the Tape Backup 40SC.

Backup Volumes and Partitions...

The Backup Volumes and Partitions operation copies an entire partition to a tape cartridge. You can store the tape cartridge copy of your hard disk in an archive or use the copy to restore the contents of a hard disk.

Restore Volumes and Partitions...

The Restore Volumes and Partitions operation writes the copied contents of a disk from a tape cartridge back to a hard disk. You can restore the contents of a hard disk in the case of a catastrophe that causes data loss or unreliability.

Backup Files...
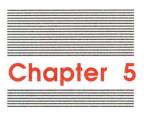
The Backup Files operation copies individual files and folders to a tape cartridge. You can then store the copy or use it to restore files if you should lose one from your hard disk.

❖ *For A/UX users:* The Backup Files operation does not work with A/UX file systems. Use the Backup Volumes and Partitions operation instead.

Restore Files...

The Restore Files operation writes a copy of a file or folder from a tape cartridge onto a hard disk. If you lose one file or folder by inadvertently deleting or some other accident, you have a safe way to replace your work.

❖ *For A/UX users:* The Restore Files operation does not work with A/UX file systems. Use the Restore Volumes and Partitions operation for A/UX file systems.

Chapter 5

Troubleshooting and Maintenance

This chapter explains some of the problems you might have while using the Tape Backup 40SC device and the Tape Backup 40SC application, and suggests some possible solutions. This chapter also tells you how to take care of your Tape Backup 40SC.

Troubleshooting

This section presents the most-common problems people have while using the Tape Backup 40SC, and steps you can take that will usually correct them. After following the steps in this section, if you are still having difficulties, contact your authorized Apple dealer for assistance.

Warning *Never* try to remove the cover from the main unit. The Tape Backup 40SC contains high-voltage components that retain an electrical charge, even after the unit is switched off.

Equipment problems and solutions

This section presents information regarding the tape backup device.

■ **Your Tape Backup 40SC doesn't switch on.**

If you don't see the green power light when you switch on the Tape Backup 40SC, make sure all the cables are properly connected, power cords are plugged in, and power switches are turned on. If your Tape Backup 40SC still will not switch on, see your authorized Apple dealer. (For more information, see Appendix C, "Service and Support.")

■ **A dialog box appears telling you the tape drive is not connected.**

The Macintosh isn't recognizing the tape backup device.

Try the following actions:

1. Check all cable and cord connections without leaving the application.

2. Click the OK button in the dialog box.

The Tape Backup 40SC application looks for a tape in the tape drive, but will continue through the program without one if you click OK.

3. Switch off the Tape Backup 40SC and switch it on again.

4. Switch off both the Macintosh and the Tape Backup 40SC, and then switch them on again.

■ **You lost the contents of a tape cartridge.**

Several occurrences can cause the loss of data from a tape cartridge. You may have used a Backup Volume tape cartridge to complete a file backup. You may have overwritten the contents of the cartridge accidentally. The cartridge might have been damaged by magnetic interference or by having been left in the Tape Backup 40SC.

Take the following precautions:

☐ Label your tape cartridges accurately.

☐ Remove the tape cartridge from the Tape Backup 40SC after any operation.

☐ Store the tape cartridges in their containers.

■ **A tape cartridge won't back up and the Macintosh won't respond.**

If you switched off the tape backup device during the Format operation, the break may have interfered with the proper functioning of the SCSI connector. You must restart the computer.

Restart the Macintosh and start the Tape Backup 40SC application again.

■ **Your hard disk crashes during a Restore operation.**

You or an internal error canceled the Restore operation.

Try the following steps to reconstruct your hard disk:

1. Reinitialize your hard disk by using HD SC Setup.

See Appendix B, "Apple HD SC Setup" for more information.

2. Start up the Macintosh with the Tape Backup 40SC disk.

3. Choose Restore from the Backup/Restore menu and follow the steps to restore.

■ **You can't back up files onto a tape cartridge.**

Several things could cause a tape cartridge to be unable to back up files. For example, the cartridge itself could be physically damaged or the disk file itself may be damaged.

Format all tape cartridges before you use them.

Application problems and solutions

This section presents troubleshooting information regarding the application.

■ **The Tape Backup 40SC disk doesn't appear correctly on the desktop.**

When you insert the *Tape Backup 40SC* disk, you should see a disk icon in the upper-right corner of the desktop. If none appears or if the disk is ejected from the disk drive, then the disk is damaged. If it's an original disk, your authorized Apple dealer must replace it .

■ **The Tape Backup 40SC application or the Tape Disk utility doesn't work from your hard disk.**

The System file on your hard disk isn't the latest version. You need System file version 4.2 or a later version, and Finder version 6.0 or a later version.

Install an updated version by using the Installer on your hard-disk installation disk.

■ **The Tape Backup 40SC application won't continue through a Backup Volume.**

The tape cartridge you are using is either blank or unformatted.

Format the tape cartridge you are using.

■ **The Restore Volume operation was unsuccessful.**

You must restore a disk volume copied during a Backup Volumes and Partitions operation to a hard disk with the same storage capacity.

Select a hard disk that's been initialized with the same HDSC Setup version. Make certain that both disks have exactly the same storage capacity. HD SC Setup version 2.0 or later is recommended.

- **You can't select a volume to restore in Restore Volume.**

  You are trying to restore over the volume on which the Tape Backup 40SC application or the system software is installed. The Tape Backup 40SC application won't allow you to restore over an active System file.

  Restart the Macintosh with the *Tape Backup 40SC* disk in the Macintosh internal disk drive.

- **You can't restore from a tape cartridge copy of a volume backup.**

  You or an internal error canceled the Backup Volume operation. Because the cancelation clears the tape header information, the Tape Backup 40SC application can't identify the tape cartridge or read any information from the tape cartridge.

  If available, use another tape cartridge copy of the volume backup for the restore operation.

Maintenance

This section explains how to care for your Tape Backup 40SC, the Tape Backup 40SC application disk, and tape cartridges.

Care and handling of the Tape Backup 40SC

Your Tape Backup 40SC is a mechanical device with moving parts. Treat your tape backup device as you would a stereo tape deck. You can carry it around; just be careful. Rough handling, such as dropping the Tape Backup 40SC, jarring or bumping it (especially while it is running), or allowing heavy objects to drop on it, can cause a malfunction or can damage the information on the tape cartridge.

Never try to remove the cover from the main unit. The Tape Backup 40SC contains high-voltage components that retain an electrical charge, even after the unit is switched off.

The operating environment

Your Tape Backup 40SC operates effectively in about the same temperature and humidity as you can: 50° to 95° Fahrenheit and 20 % to 80 % relative humidity.

Be careful to protect the Tape Backup 40SC from spilled liquids and hazardous vapors. Spilling any liquid inside or allowing the tape backup device to be exposed to chemical or solvent fumes (including steam from a coffee maker) can harm it.

Cleaning the Tape Backup 40SC device

Regular cleaning of the tape drive mechanism is recommended to ensure reliable operation of the Tape Backup 40SC. Be sure to establish and follow these cleaning procedures in order to avoid any malfunction of the Tape Backup 40SC or loss of data from your tape cartridges.

You need to clean two parts of the tape drive: the tape drive head and the tape drive puck, as shown in Figure 5-1.
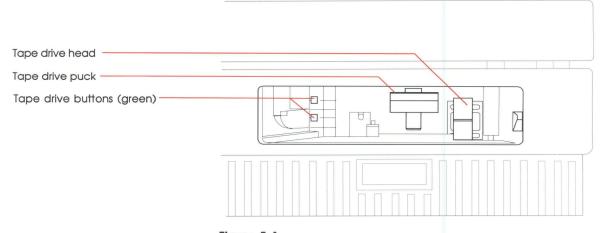
Figure 5-1
Tape drive mechanism

How often you need to clean your Tape Backup 40SC depends on how often and where you use the device. It's a good idea to clean the drive once a week if you're making multiple daily backups, or once a month if you're making a single daily backup. Remember to clean the device more often in a dusty or high traffic area.

You can clean your Tape Backup 40SC either by purchasing and using a cleaning kit, or by cleaning the tape drive puck and tape head using cotton swabs and 99% isopropyl alcohol.

Cleaning kit

You can buy a specially designed cleaning kit to maintain your Tape Backup 40SC. The DC2000 Data Cartridge Drive Cleaning Kit offered by 3M Corporation (part number DC 051111-12628) provides an effective and convenient solution for cleaning both the tape drive head and the tape drive puck.

Swabs and 99% isopropyl alcohol

An alternative method of cleaning the Tape Backup 40SC requires the following items:

□ Long-handled cotton swabs

□ 99% isopropyl alcohol

□ A nonconductive (nonmetallic) utensil

Follow these steps to clean your Tape Backup 40SC:

1. **Make sure the Tape Backup 40SC is plugged in and turned** *on*.

2. **Saturate a swab tip with alcohol.**

3. **Insert the nonconductive utensil into the left side of the tape drive. Press the lower green button with the utensil for about 20 seconds.**

   You'll hear the tape drive motor and see the red activity light.

4. **Insert the swab and hold the tip firmly against the left side of the puck.**

   While the puck is rotating, move the swab up and down for about 20 seconds.

   The activity light will flash and the motor will automatically stop about 20 seconds after you begin pushing the button. You can use the light as a guide.
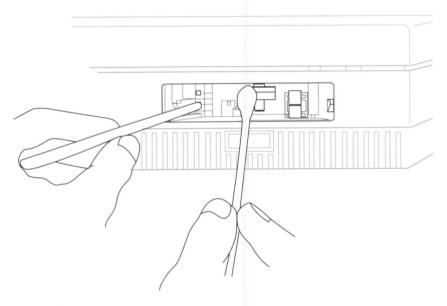
Figure 5-2
Cleaning the tape drive puck

5. **Release the button and remove the swab.**

6. **Saturate the tip of *another* swab with alcohol.**

   Do not reuse the swab used for cleaning the puck.

7. **Insert the swab and gently but firmly rub it up and down against the tape drive head. Make sure that the entire head surface gets clean. This process should take 5–10 seconds.**

   The head is the shiny surface on the right rear of the tape drive.

Tape drive head
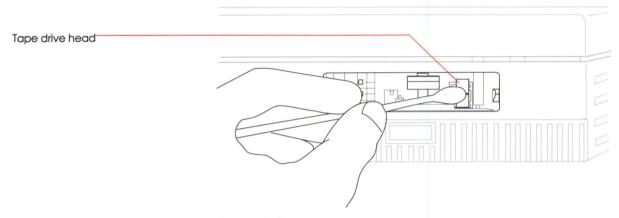
Figure 5-3
Cleaning the tape drive head

Wait 5 minutes to be sure the tape head is dry before you insert a tape cartridge into the drive.

Caution   *Never* clean the magnetic head with any head cleaner that contains active or abrasive ingredients.

To clean the outside of the Tape Backup 40SC, 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 tape backup device.

Care of the *Apple Tape Backup 40SC* disk

Although your *Apple Tape Backup 40SC* disk is quite tough, it does have a few modest physical requirements—about the same as those of audio cassettes.

Your *Apple Tape Backup 40SC* disk should be kept

□ dry

□ away from extreme temperatures (don't put it on top of your Macintosh or store it on the seat of your car)

□ out of direct sunlight

□ out of the range of anything that contains a magnet, like a telephone or monitor

When you insert the disk into the disk drive, the metal covering on the disk case slides to the left so the Macintosh can get information from the disk. When the disk is out of the disk drive, the metal covering closes by spring action to protect the disk underneath it. Never touch the exposed disk under the metal covering.

Beyond these precautions, you don't have to treat the disk with special care. You can carry it around in your briefcase or coat pocket.
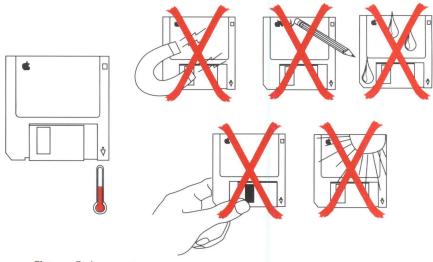
Figure 5-4
Disk dos and don'ts

Care of the tape cartridge

Follow these guidelines to protect your tape cartridges.

□ Manually eject the tape cartridge by pushing the eject button after each backup or restore operation.

□ Remove the tape cartridge when the Tape Backup 40SC is not in use.

□ Don't store the cartridge in the tape drive or leave it unattended in the Tape Backup 40SC for more than a day.

□ You may leave the Tape Backup 40SC on overnight if you set it up to complete a backup or restore operation.

□ Don't turn on the Tape Backup 40SC with the tape cartridge inserted.

You should turn on the Tape Backup 40SC and then insert the tape cartridge.

□ Allow the tape cartridge to acclimate to your operating environment for 8 hours, or for the amount of time it has been exposed to dissimilar conditions—whichever length of time is less.

□ Use the tape cartridge in a clean environment.

Apple 40 MB tape cartridges have a record-lock switch at the upper-left corner on the top of the cartridge. This switch is similar to a write-protect tab on a 3.5-inch disk. When the switch is at the left, the Tape Backup 40SC can write information onto the cartridge. If you slide the switch to the right, the cartridge is write-protected and the information on it cannot be altered.

Make sure the record-lock switch is in the unlocked position (to the left), as shown in Figure 5-5, before you insert a tape cartridge to format, clear, back up, or verify.

Record-lock switch in unlocked position
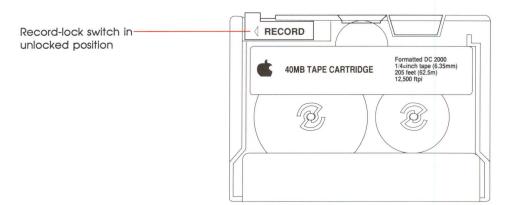
Figure 5-5
Tape cartridge record-lock switch

After you copy information from your hard disk onto a tape cartridge, you may want to slide the record-lock switch to the locked position to guard against copying over information by accident.

For more information

The documents listed here contain information on the SCSI standard used by the Tape Backup 40SC:

□ *SCSI American National Standard for Information Systems* (ANSI X3T9.282-2)

□ *Apple II SCSI Card Technical Reference*

In addition to these documents, the Apple Programmer's and Developer's Association (APDA™) is an excellent source for technical information on a wide variety of Apple products, including the Tape Backup 40SC. APDA has programming tools, technical notes, and reference manuals all available through membership in the association. To find out more about APDA, contact them at this address and phone number:

APDA
290 SW 43rd Street
Renton, WA 98055
Telephone: (206)-251-6548

Appendix A

Specifications

Table A-1 contains the specifications of the Tape Backup 40SC.

Table A-1
Tape Backup specifications

Physical

Height	3.07 in. (78 mm)
Width	9.7 in. (246 mm)
Depth	10.5 in. (266 mm)
Weight	7.3 lbs. (3.3 Kg)

General

Storage media
Type	0.25-inch magnetic tape cartridge
Length	205 ft. (62.5 m)
Width	0.25 inches (635 mm)

Data Capacity
Total capacity	38.5 MB
Encoding method	Group Code Recording (GCR)
Flux density	12,500 ftpi
Bit density	10,000 bpi (GCR)
Block size	8192 bytes (8320 with 128 bytes of system data appended)

Number of tracks	24 serpentine
Track width	8 mils (0.020 mm) write
	5 mils (0.0125 mm) read
	10 mils (0.025 mm) spacing

Speed and timing

Tape speed	60 ips R/W
	90 ips search/rewind
Drive data transfer rate	uncorrected raw: 600 Kb/s
	non-interleaved
	fully corrected: 400 Kb/s
	non-interleaved
SCSI data transfer rate	average for continuous tape
	motion: 21.3 Kb/s corrected,
	non-interleaved
	maximum burst rate (8 Kb):
	500 Kb/s
Rewind time	27 seconds, end-to-end
	(nominal)
Start/Stop time	150 ms (nominal)
R/W head positioning	
time	250 ms track-to-track

Environmental

Temperature

Operating	5° to 45°C (cartridge limited)
Storage/Transit	-40° to +65°C (hardware only)

Humidity

Operating	20% to 80% relative, noncondensing
	80°F maximum dew point/wet bulb
	(cartridge limited)

Altitude

Operating	tested to 15,000 ft.
Non-Operating	tested to 50,000 ft.

Power Requirements

AC Input (Universal)	85 to 270 VAC, 47 to 64 Hz
Power Consumption	15 W

Data Interface

Both ports	SCSI, 50-conductor cable

Appendix B

Apple HD SC Setup

After reading this appendix, you should be able to use HD SC Setup to initialize or partition your hard disk in case you need to before restoring a tape cartridge copy to the disk.

Apple HD SC Setup prepares for use any Apple SCSI Hard Disk—such as the Apple Hard Disk 20SC, the Hard Disk 40SC, or the Apple Hard Disk 80SC—that's connected internally or externally to a Macintosh computer through a SCSI port.

You can also use HD SC Setup to test your Hard Disk SC hardware and to divide your disk into partitions. These capabilities are advanced features of HD SC Setup that you use only if you plan to use your Hard Disk SC to store information from other types of computers or operating systems.

Important   To avoid problems, close all other applications before using Apple HD SC Setup, and make sure that MultiFinder is turned off.

For most purposes, you need a copy of Apple HD SC Setup that is on a 3.5-inch startup disk, such as *Utilities* disk 1.

If you're upgrading your Macintosh by adding an internal hard disk, but you no longer have the HD SC Setup program on your *System Tools* disk, you need to use the copy of Setup on *Utilities* disk 1. The HD SC Setup program is also included on the *Utilities* disk and described in the owner's guide that accompanies the external Hard Disk SC.

If you're currently using a hard disk that was prepared by using a version of Apple HD SC Setup before version 2.0, keep both that version and the current version. In some situations, you may need to use the earlier one. See "Replacing a Damaged Driver," later in this chapter, for more information.

However, if you're preparing a new hard disk, in addition to a hard disk that was prepared by using a version of Apple HD SC Setup before version 2.0, you should prepare both disks with the current version of Setup, to avoid confusion. In that case, you may be able to prepare the new hard disk, back up your files from the old one onto the new one, and then prepare the old one.

You can determine the version number of any copy of Apple HD SC Setup by selecting its icon in the Finder and choosing Get Info, or you can look at the top of the dialog box that appears when you open Setup.

Hard disk ID

Remember that each hard disk and each SCSI peripheral device must have its own SCSI ID number. If you need to assign a different SCSI ID number to your disk drive, see Chapter 1, "Setting the SCSI ID Number," for help.

Initializing your Hard Disk SC

The first time you start up your Hard Disk SC, you need to run HD SC Setup to *initialize* the disk—that is, to prepare the disk to receive information by organizing its surface into tracks and sectors. Here are the steps to initialize the disk:

1. **Start your Macintosh by using *Utilities* disk 1 as the startup disk.**
2. **Open Setup by clicking its icon and choosing Open from the File menu, or by double-clicking the icon.**

   A dialog box appears, as shown in Figure B-1.

```
┌─────────────────────────────────────────────┐
│  Apple HD SC Setup    U2.0                    │
│                                               │
│   ┌───────────┐                               │
│   │ Initialize│     SCSI Device: 0            │
│   └───────────┘                               │
│   ┌───────────┐       ┌─────────┐             │
│   │  Update   │       │  Drive  │             │
│   └───────────┘       └─────────┘             │
│   ┌───────────┐                               │
│   │ Partition │                               │
│   └───────────┘                               │
│   ┌───────────┐                               │
│   │   Test    │                               │
│   └───────────┘                               │
│   ┌───────────┐                               │
│   │║  Quit    ║│                               │
│   └───────────┘                               │
│  ┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈┈      │
│         The volume name is Megadisk          │
│   ┌──┐                                         │
│   │▒▒│                                         │
│   └──┘                                         │
└─────────────────────────────────────────────┘
```
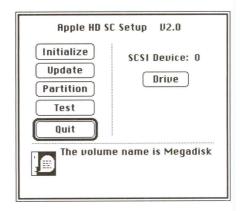
Figure B-1
The main Apple HD SC Setup dialog box

Next to the words *SCSI Device* is a number from 0 to 6. If you have only one Hard Disk SC, the preset ID number of the drive automatically appears as the SCSI device number.

Important If you have two or more Hard Disk SCs connected, make sure that the SCSI device number matches the SCSI ID number indicator of the hard disk you wish to prepare or test. If the numbers do not match, click Drive until they do. The SCSI ID number of your Apple internal hard disk is always 0. If you have a SCSI hard disk from another manufacturer, consult your hard disk owner's manual.

When you click Drive, if the number of the second drive does not appear, the disk may be switched off or incorrectly connected. Check your power switch and connections.

The Update, Partition, and Test buttons are explained later in this appendix.

3. Click Initialize.

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

Warning Make sure that you have chosen the hard disk that you want to initialize, and not another hard disk. Initializing destroys all information on the hard disk.

Messages appear in the Setup dialog box, explaining the progress of the initialization. Initialization takes several minutes. The exact length of time depends upon the size of your hard disk and type of computer.

In addition to preparing the disk, Setup's Initialize command automatically tests the disk and installs the driver, which controls exchanges between the hard disk and your Macintosh.

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

4. If necessary, name the disk.

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

Press the Return key when you are sure you have entered the right name.

5. Click Quit.

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

If you plan to partition your disk, click Partition instead of Quit. (See "Creating Partitions," later in this appendix for more information.)

Creating a startup hard disk

To take advantage of the speed and storage capabilities of your Hard Disk SC, you probably want to make it a startup disk. A startup disk is any disk that has the necessary program files—such as the Finder and System file, which are contained in the System Folder—to set the computer into operation. (See your Macintosh owner's guide for a full discussion of startup disks.)

Even if you have more than one SCSI hard disk, you need to create only one startup hard disk.

❖ *For A/UX users:* You can skip the instructions in this section, because you do not need to create a startup disk for restoring the A/UX partitions using Tape Backup 40SC nor when adding a new hard disk from which you will mount additional A/UX file systems; the hard disk labeled *SASH partition* has already been configured as a valid startup disk.

Setting up the System Folder

There is no System Folder on a hard disk that you've just initialized. To put a System Folder on your hard disk, follow these steps:

1. **Insert your *System Tools* disk into the built-in 3.5-inch disk drive.**

   If you want to use a System Folder that you have already customized, then insert the disk that contains that System Folder.

Important   Do not use the System Folder from your *Utilities* disk. It may not contain all the fonts, desk accessories, and printing software found in the System Folder on your Macintosh System Tools disk.

---

2. **Switch on your Macintosh.**

3. **Copy the System Folder from the current startup disk to the hard disk by dragging the System Folder icon to the hard disk icon.**

4. **If you're using a customized version of the System Folder that contains old system files or resources, use the Installer to update them.**

   The Installer is found on the *System Tools* disk and is described in your Macintosh owner's guide.

5. **If necessary, use the Font/DA Mover to add or remove fonts and desk accessories from your System file.**

   The Font/DA Mover is on your Macintosh *Utilities* disk 2 and is described in this guide.

6. **Choose Restart from the Special menu to restart your Macintosh with your hard disk as the current startup disk.**

Startup scanning order

When you switch on the Macintosh, it automatically looks for a startup disk in the following order:

1. The internal 3.5-inch disk drive or drives. If you have a Macintosh SE with two disk drives, it looks first at the lower drive. If you have a Macintosh II with two disk drives, it looks first at the drive on the right.

2. An external 3.5-inch disk drive.

3. A Macintosh Hard Disk 20 (not a SCSI device).

4. The SCSI hard disk with the highest ID number.

5. Another SCSI hard disk with the next-highest ID number.

Important   If you wish to start up from your hard disk, do not insert a 3.5-inch disk until your Macintosh is operating. If you insert a 3.5-inch disk containing a System Folder when you switch on your computer (or earlier), the disk becomes the current startup disk.

If you insert a 3.5-inch disk that is not a startup disk, your Macintosh ejects it and continues to scan for a startup disk.

Redesignating the startup device

If you have a Macintosh SE or Macintosh II, you can use the Control Panel to override the scanning sequence during startup.

1. **Choose Control Panel from the Apple menu.**

2. **Click the Startup Device icon.**

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

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

   When you start up your computer, the system uses that hard disk as the startup disk, unless there is a 3.5-inch disk inserted or a non-SCSI hard disk connected.

   If you no longer want to designate the hard disk as your startup device, hold down the Command (Apple) key and click the hard disk's icon in the Control Panel to deselect it.

4. **Close the Control Panel.**

❖ *Note:* If you have set your internal hard disk (SCSI device 0) as the startup device, and you want your Macintosh to ignore that hard disk during startup, press a combination of four keys—Command, Option, Shift, and Delete. You cannot switch off the internal hard disk separately.

Updating the driver

Whenever Apple develops a new version of the driver, it is built into Apple HD SC Setup. Setup's Update function is designed to allow you to install the latest version of the driver without erasing the information on your disk. Initializing, on the other hand, erases everything on your disk.

You may be able to update the driver if you have a version of Apple HD SC Setup later than version 2.0. However, you cannot use version 2.0 or later versions of Apple HD SC Setup to update a hard disk that is initialized with a version before 2.0.

To update your driver, follow these steps:

1. **Start up your Macintosh using *Utilities* disk 1 as the startup disk.**

2. **Open Apple HD SC Setup by double-clicking its icon.**

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

3. **Click Update.**

4. **When Setup notifies you that the update is complete, click Quit to exit from Setup.**

If you want to update a driver from an HD SC Setup version earlier than 2.0 to HD SC Setup version 2.0, follow these steps:

1. **Copy all the data on your hard disk using the Backup Files operation.**

   You need to back up the files as individual files so that you can restore them into the repartitioned disk. HD SC Setup version 2.0 remaps the disk so that it's not precisely the same size as earlier HD SC Setup versions.

The Get Info information stored with your files may not reappear when you restore the copied files. You should verify any Get Info information before you copy the files.

2. Reinitialize the disk using HD SC Setup version 2.0.

See the section "Initializing your Hard Disk SC" in this chapter for instructions.

3. Restore the copied files using the Restore Files operation.

You may not want to select all the copied files to restore and you may not want to restore all versions of HD SC Setup. You may choose to install or update your System file or Finder.

Replacing a damaged driver

You can also use Apple HD SC Setup's Update command to replace a damaged driver without erasing your disk. If your disk is initialized with a version of Setup earlier than 2.0, use that version to replace the driver. Later versions won't work.

After you have properly connected and initialized your hard disk, if the Hard Disk SC icon doesn't appear on the Finder desktop when you start up your machine, follow these steps:

1. Check that the hard disk is switched on.

If you have two or more Hard Disk SCs connected to your Macintosh, be sure to switch both on and leave them on for at least 10 seconds before you switch on your Macintosh.

2. If you can't start up your Macintosh by using the hard disk as a startup disk, replace its System Folder.

Restart the computer from another disk. Copy an undamaged version of the System Folder onto the problem hard disk.

Warning When you replace a System Folder, all of the files it contains are erased, so be sure to replace it with a copy that contains the same fonts, desk accessories, and software for peripheral devices. For this reason, you should keep a copy of your System Folder on a 3.5-inch backup disk.

3. **If the Hard Disk SC icon still doesn't appear on the Finder desktop, replace the driver.**

   When Setup opens from *Utilities* disk 1, click Update. Make sure that the SCSI device number in the dialog box matches the SCSI ID number of the disk that is not working correctly.

4. **When Setup notifies you that the driver has been updated, click Quit to exit from Setup.**

Testing your hard disk with Setup

You can use the HD SC Setup program to tell you whether or not the hard disk is functioning properly. (The Test routine checks the hardware only; it can't tell you anything about software problems.) A failure indicates something isn't working properly—even though you may not notice anything wrong. You may want to run the test every month or so to avoid unexpected loss of data.

The test takes several minutes. The exact length of time depends upon the size of your hard disk and your type of Macintosh.

Testing does not affect the data currently stored on the disk. To run the test, follow these steps:

1. **Insert *Utilities* disk 1 and switch on your Macintosh.**

   Be sure your hard disk is on.

2. **Open Apple HD SC Setup by double-clicking its icon.**

   Make sure the SCSI device number matches the SCSI ID number of the disk drive that you want to test. If the numbers do not match, click Drive until the device number and the ID number match.

3 **Click Test.**

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

❖ *Note:* You can also keep a copy of Apple HD SC Setup on your hard disk for testing purposes. Just open it and click Test. Do not, however, attempt to initialize, update, or partition the hard disk containing the Setup program.

4. **Click Quit to exit from Setup.**

Creating partitions

This section explains how to use version 2.0 and later of Apple HD SC Setup to create partitions on your hard disk. You need to create partitions if you plan to use portions of your hard disk with other (non-Macintosh) operating systems, such as A/UX, Apple's version of the AT&T UNIX® system for the Macintosh.

If you don't need to create partitions, skip this section for now.

Important   Whenever you partition a disk for the first time, and in many cases whenever you partition your disk again, Setup must erase all the information stored on your disk. Be sure to back up all files that you need before attempting to create partitions.

Standard partitions

Apple HD SC Setup allows you to partition your entire SCSI hard disk according to any one of four standard schemes by following this simple procedure. Setup automatically removes old partitions when creating new standard partitions.

If you have just used Setup to initialize your hard disk, to update the driver, or to test the hard disk, skip to step 3.

1. **Start your Macintosh by using *Utilities* disk 1 as the startup disk.**

2. **Open Setup by selecting its icon and choosing Open from the File menu, or by double-clicking the icon.**

   The main Apple HD SC Setup dialog box appears, as was shown earlier in Figure B-1.

Important   If you have two or more Hard Disk SCs connected, make sure that the SCSI device number matches the SCSI ID number indicator of the Hard Disk you wish to partition. If the numbers do not match, click Drive until they do.

---

3. **Click Partition.**

   The Partition dialog box appears. Check to see that the correct disk is shown on the right, as shown in Figure B-2.

```
┌─────────────────────────────────────────────────────┐
│ Select a predefined disk partitioning and click OK to repartition │
│ the entire disk. Or select Custom to make your own partitions.    │
│                                                                   │
│  ┌──────────────────────────────┐ △        ┌────┐               │
│  │ Maximum Macintosh            │ ▢      ──│    │ Megadisk      │
│  │ Minimum Macintosh            │          └────┘               │
│  │ 50% Macintosh                │                               │
│  │ A/UX Setup                   │                               │
│  │                              │        ┌──────────┐           │
│  │                              │        │  Custom  │           │
│  │                              │        └──────────┘           │
│  │                              │      ·····················      │
│  │                              │                               │
│  │                              │        ┌──────────┐           │
│  │                              │        │    OK    │           │
│  │                              │ ▽      └──────────┘           │
│  │                              │ ▽      ┌──────────┐           │
│  └──────────────────────────────┘        │  Cancel  │           │
│                                           └──────────┘           │
└─────────────────────────────────────────────────────┘
```
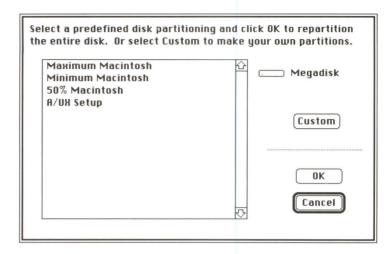
Figure B-2
The Partition dialog box

4. Select the standard partitioning scheme that you want.

There are four standard partition schemes:

☐ Maximum Macintosh. This partition scheme is the same one
that you created when you first initialized your hard disk. The
driver is always in a partition separate from the Macintosh
volume. Use this scheme if your disk has been partitioned
some other way, and you wish to use essentially all of your
hard disk as a Macintosh volume.

☐ Minimum Macintosh. No matter what size your hard disk, this
scheme allocates about 32 megabytes of disk space to your
Macintosh volume so you can use it as your startup disk. You
can copy your System Folder and utilities into this volume.
(See "Creating a Startup Hard Disk," earlier in this chapter.)
You'll need files establishing another operating system to
make use of the remainder of the disk.

☐ 50% Macintosh. This scheme creates a Macintosh volume
using about half your disk space, and it sets aside the other half
for future use with another operating system.

□ A/UX Setup. This partition scheme creates a minimum Macintosh volume (for startup), a Root and Usr partition (for executable and data files), a Swap partition (for virtual memory), and two Eschatology partitions (for Autorecovery purposes) on an Apple Hard Disk 80SC. You should only select this partitioning scheme if you're partitioning your Apple Hard Disk 80SC before installing A/UX from a different medium, such as tape or floppy disks; or you're repartitioning your severely damaged Apple Hard Disk 80SC before restoring these partitions with the Tape Backup 40SC device.

If you wish to partition an extra hard disk for storing A/UX file systems, refer to "Custom Partitions" later in this chapter.

5. Click OK.

As a short cut, you can double-click the partition scheme that you want instead.

In most cases, a dialog box appears, reminding you that partitioning erases all of the information on your hard disk. To continue, click OK.

Partitioning begins, and the main Setup dialog box appears, with status messages at the bottom. The Setup dialog tells you when partitioning is completed.

Partitioning takes much less time than initializing.

If you click Cancel, you return to the main Setup dialog box, but no partitioning takes place.

6. Click Quit to return to the desktop.

Your Macintosh volume is still shown, but it no longer takes up most of the disk, unless you selected the Maximum Macintosh partition scheme.

Custom partitions

If you have a special requirement for a partition scheme other than those just described, you can use Apple HD SC Setup to create custom partitions on your hard disk.

For example, A/UX users may wish to partition an additional hard disk for use with mountable A/UX file systems. If you do not have a need for such custom partitions, you may wish to skip the remainder of this appendix.

Adding a custom partition merely assigns disk space. Frequently, however, you must erase or move information—that is, remove, group, or move existing partitions—before you create a new partition.

To add a partition

Begin by following the first three steps described in "Standard Partitions," earlier in this appendix. Then follow these steps.

1. Click Custom in the Partition dialog box.

The Custom Partition dialog box appears. On the right, you'll see a Done button and four functional buttons—Details, Remove, Lock, and Group—described later in this section.

A rectangle represents each partition with its size, in kilobytes, shown on the left. **Free space,** that portion of the disk that is not contained in a defined partition, is gray, as shown in Figure B-3.

Free space

Approx.	Partitions	
16 K	Mac Driver	Click in a partition to select it. Click & drag in gray area to create a new partition.
10406 K	Megadisk	
		Remove
		Lock
		Group
10406.5 K		Details
		Done
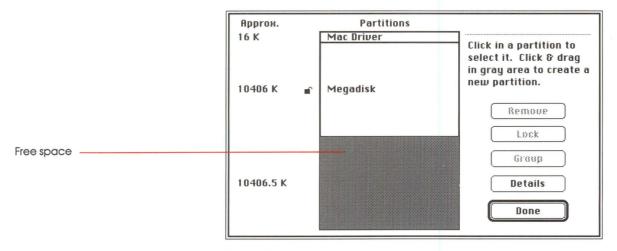
Figure B-3
The Custom Partition dialog box

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

If there is not sufficient free space, remove one or more partitions. For example, if you've just initialized your disk, you should remove your Macintosh partition. (For more information, see "To Remove a Partition," later in this appendix.)

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

If the free space is divided into sections by existing partitions,
with no single section large enough to hold your new partition,
you need to remove a partition or combine the sections of free
space by *grouping* the partitions. (For more information, see
"To Group Partitions," later in this appendix.)

Done returns Setup to the main dialog box.

**2. Move the mouse to place the pointer in a gray rectangle
representing free space, and press the mouse button.**

As shown in Figure B-4, Setup draws two brackets representing the
new partition. If you place the pointer in the upper half of the free
space rectangle, the brackets start at the top of the free space; if
you place the pointer in the lower half of the free space rectangle,
the brackets start at the bottom of the free space.
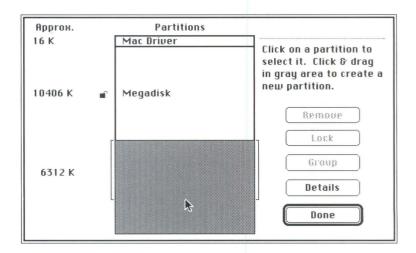
Figure B-4
Creating a custom partition

**3. Drag the pointer up or down, to adjust the size of the new
partition.**

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

The size, in kilobytes, is shown on the left.

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

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

Apple HD SC Setup immediately presents the Partition Type dialog box, as shown in Figure B-5. You use the left side to select a partition type for the custom partition you are creating. You use the right side to adjust its size.

Adjust Size box ————————

```
┌─────────────────────────────────────────────────────────────┐
│  ┌────────────────────────────┐  Select the type of partition │
│  │ Scratch              ⬆ │  and then adjust its size as  │
│  │ Eschatology           │  needed.                     │
│  │ Root&Usr              │                              │
│  │ Swap                  │                              │
│  │ Eschatology2          │                              │
│  │ Root                  │  Minimum   unknown           │
│  │ Usr                   │          ▬ 6312              │
│  │ Misc A/UX             │  Maximum  10406.5 K          │
│  │                       │                              │
│  │                       │  ............                │
│  │                       │       ┌────────┐             │
│  │                       │       │   OK   │             │
│  │                     ⬇ │       └────────┘             │
│  └────────────────────────────┘    ┌────────┐           │
│                                     │ Cancel │           │
│                                     └────────┘           │
└─────────────────────────────────────────────────────────────┘
```
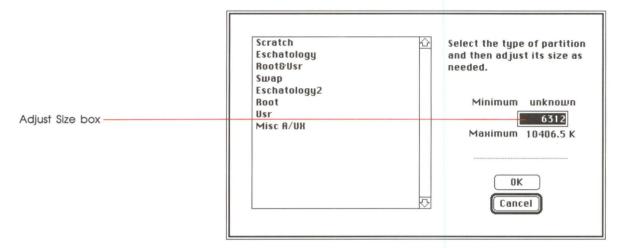
Figure B-5
The Partition Type dialog box

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

You have several choices:

☐ The Driver. If your hard disk already contains a driver partition, then this partition type is not listed.

☐ Macintosh Volume. This is the Macintosh hierarchical file system that you use on your hard disk, even when you don't create partitions. If there is already a Macintosh partition on your hard disk, then the partition isn't listed.

□ Scratch. **Scratch** is disk space that you don't normally use while working in your Macintosh operating system, but which some programs—non-Macintosh as well as Macintosh—may request for use as temporary storage.

□ The Eschatology, Root&Usr, Swap, Eschatology2, Root, Usr, and Misc A/UX partition types are used for A/UX. Note that, by default, Swap uses slice 1 in its A/UX device name, Usr uses slice 2, while Root&Usr and Root both use slice 0. (If you wish to use any of the other partitions, you must use the A/UX pname(1M) utility to associate these partitions with A/UX device nodes.)

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

6. If you wish to change the size of the partition, click the Adjust Size box and enter the correct size in kilobytes.

You can enter the partition size to a precision of a half-kilobyte (0.5K). Setup will not allow other fractions.

You can also change the number by editing in the normal Macintosh fashion.

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

7. Click OK.

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

You can create another custom partition as long as you have sufficient free space, but you can only select a listed partition type.

Click Cancel in the Partition Type dialog box if you wish to return to the Custom Partition dialog box without creating a new partition.

8. **Click Done in the Custom Partition dialog box to return to the main Setup dialog box.**

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

Your Macintosh volume is shown, with its new size.

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

To remove a partition

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

Important   Don't remove the driver partition unless you have a special reason. Without the driver partition, you won't be able to use your disk after restarting your Macintosh.

To remove a partition, follow these steps:

1. **Select the partition you wish to remove by clicking in its rectangle.**

2. **Click Remove.**

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

3. **Click OK.**

Click Cancel if you decide not to remove the partition.

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

To group partitions

Grouping partitions combines the free space on your disk. The process is similar to sliding books together to create an open space where you can place a stereo on your bookshelf. The procedure is simple as these steps show:

1. Working in the Custom Partition dialog box, click Group.

Setup presents an alert box, warning that moving information from one portion of your disk to another will take time. Because grouping usually means that a large amount of information is being moved, Setup also warns that some information might be lost.

2. Click OK.

All partitions are grouped together on the disk, and they are shown together at the top of the Custom Partition display.

Click Cancel if you decide not to group the partitions.

To move a partition

You can also use the mouse to move a partition into adjacent free space or into any free space larger than the partition. Follow these steps:

1. Working in the Custom Partition dialog box, select the partition.

2. Drag the partition to its new position.

Setup won't let you move a partition "just a little bit" into an adjacent free space. You must drag the partition more than half way.

When you release the mouse button, Setup presents an alert box, warning that moving information from one portion of your disk to another will take time. Setup also warns that some information might be lost in the process.

3. Click OK to confirm.

Click Cancel if you decide not to move the partition.

To lock a partition

While your Macintosh partition is locked, you cannot alter or erase the information it contains, but you can still read the information. To lock the Macintosh partition, follow these steps:

1. **Working in the Custom Partition dialog box, select the Macintosh partition by clicking in its rectangle.**

2. **Click the Lock button.**

   This step is similar to sliding the locking tab on a 3.5-inch disk. In some cases, Setup warns that the partition will not be locked until you next restart your Macintosh.

   The lock icon to the left of the rectangle closes. The Lock button changes to Unlock.

   Click Unlock to unlock the Macintosh partition, after selecting it.

To view your partitions

Follow these steps to see the size of your partitions:

1. **Working in the Custom Partition dialog box, click the Details button.**

   The Details window, shown in Figure B-6, appears. It shows each partition, its name, type, size in kilobytes, and the block where the partition begins on the disk. At the bottom of the window, the total disk capacity is displayed.

   The Details window shows one more type of partition, the partition map, which contains information about the partitions on the disk. You cannot directly change the partition map, which takes up a very small portion of the disk.
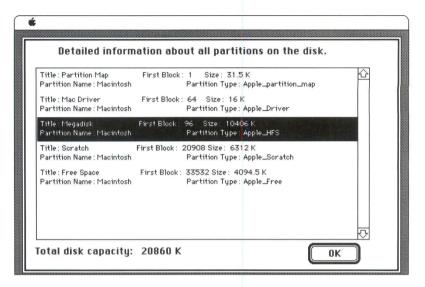
Figure B-6
The Details window with a highlighted partition

If you select a partition before clicking Details, that partition is highlighted in the Details window. If you select a partition in the Details window by clicking one of its lines, the partition is highlighted when you return to the Custom Partition dialog box. You can't select the partition map.

2. Click OK to close the Details window and return to the Custom Partition dialog box.

Appendix C

Service and Support

To help you get the best performance from your system, Apple Computer, Inc. has established a worldwide network of full-support authorized Apple dealers. If you need answers to technical questions or information about product updates, your authorized Apple dealer can help you. Apple's Technical Support organization backs each dealer and international technical support group via the AppleLink® system, 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 3000 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.   Apple Canada, Inc.
Attn: Customer Relations   7495 Birchmount Road
20525 Mariani Avenue   Markham, Ontario
Cupertino, California 95014   L3R 5G2
USA   CANADA

Apple also offers service options designed to meet your needs. One of these is the Apple*Care*® Service Agreement (available in the United States, Canada, and Australia only), which extends full warranty coverage up to three years. Your Apple*Care* contract will be honored at any participating authorized Apple dealer within the country of purchase—an added benefit if you relocate. Local service means time saved in getting your Apple system back to work.

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

Appendix D

Safety Information

For your own safety and the safety of your equipment, follow these important safety instructions.

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

Your Apple Tape Backup 40SC is equipped with a three-wire grounding plug—a plug that has 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 (disconnect 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 following recommended procedure)

- **Be sure that you always do the following:**

  □ Keep your equipment away from sources of liquids, such as wash basins, bathtubs, shower stalls, and so on.

  □ Keep it protected from dampness or wet weather, such as rain, snow, and so on.

□ Read all the installation instructions carefully before you plug the product in to 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, follow these steps:**

1. Disconnect the power plug. (Pull the plug and not the cord.)

2. Wipe the surfaces lightly with a water-damp, clean, soft cloth.

Warning   Isopropyl alcohol is flammable. Take precautions before cleaning your Tape Backup 40SC.

In addition, it is recommended to wear safety glasses while cleaning the tape drive mechanism. The rotating tape drive puck can cause alcohol to spatter out toward you. Be careful when looking into the tape drive during this operation.

Glossary

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

back up: (v.) To make a spare copy of a disk or of a file on a disk. Backing up your files and disks ensures that you won't lose information if the original is lost or damaged.

backup: (n.) A copy of a disk or file. It's a good idea to make backups of all your important disks and to use the copies for everyday work, keeping the originals in a safe place. (Some program or startup disks cannot be copied.)

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

cable: An insulated bundle of wires with connectors on the ends.

Cancel button: A button that appears in dialog boxes after you select certain commands. Clicking this button cancels the command.

check box: A small box or circle associated with an option in a dialog box. When you click the check box, you may change the option or affect related options.

crash: To cease to operate unexpectedly, possibly destroying information in the process.

data: Information, especially information used or operated on by a program. The smallest unit of information a computer can understand is a bit.

desk accessories: "Mini-applications" that are available from the Apple menu regardless of which application you're using—for example, the Calculator, Alarm Clock, or Puzzle.

desktop: In Macintosh, the computer's working environment—the menu bar and the gray area on the screen. You can have a number of documents on the desktop at the same time.

device: Frequently used as a short form of **peripheral device.**

dialog box: A box that contains a message requesting more information from you. Sometimes the message warns you that you're asking your computer to do something it can't do or that you're about to destroy some of your information. In these cases, the message is often accompanied by a beep.

directory: A pictorial, alphabetical, or chronological list of the contents of a folder or a disk.

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 **floppy disk, hard disk.**

driver: A program that lets a peripheral device and a computer send and receive files. Printer drivers control printers; a hard disk driver controls exchanges between a **hard disk** and a computer.

file: Any named, ordered collection of information stored on a disk. Application programs and operation systems on disk are examples of files. You make a file when you create text or graphics, give the material a name, and save it to disk; in this sense, synonymous with **document.** A Macintosh file consists of a **data fork** and a **resource fork.**

Finder: The application that maintains the Macintosh desktop and starts up other programs at the request of the user. You use it to manage documents and applications, and to get information from disks. It's the desktop you see upon starting up your computer, unless you have specified a different startup application.

floppy disk: A **disk** made of flexible plastic, as compared to a **hard disk,** which is made of metal.

format: (v.) To divide a disk or tape cartridge into tracks and sectors where information can be stored.

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

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.**

hard disk drive: A device that holds a hard disk, retrieves information from it, and saves information to it. Hard disks made for microprocessors are permanently sealed into drives.

icon: An image that graphically represents an object, a concept, or a message.

initialize: To prepare a blank disk to receive information by organizing its surface into tracks and sectors.

megabyte (MB): A unit of measurement equal to 1024 kilobytes, or 1,048,576 bytes.

menu: A list of choices presented by a program, from which you can select an action.

operating system: A program that organizes the actions of the parts of the computer and its peripheral devices.

partition: (n) A portion of a memory device—such as a hard disk or tape—that is treated like a device itself. For example, if you select the 50% Macintosh partition scheme provided by Apple HD SC Setup, your Macintosh volume, shown as a hard disk in the Finder, will take up about half your hard disk. (v) To create partitions.

peripheral device: A piece of hardware—such as a video monitor, disk drive, tape backup device, 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.

port: The metal sockets on the back of your computer and peripheral devices into which you plug connector cables such as the SCSI System Cable.

scratch: Disk space not normally available in the Macintosh operating system, but requested by some programs—Macintosh and non-Macintosh—for use as temporary storage.

SCSI ID number: A number assigned to each SCSI device connected to a computer. The device with the higest number has priority if a conflict occurs while sending or receiving data. Some devices, such as internal hard disks, have preset SCSI numbers. On others, such as external hard disks, you use a SCSI ID switch to set the ID number.

SCSI ID number indicator: The indicator that shows the SCSI ID number of a device. For the Tape Backup 40SC, the number indicator is located on 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 file contained in the Macintosh System Folder—to set the computer into operation.

system: A coordinated collection of interrelated and interacting parts organized to perform some function or achieve some purpose—for example, a computer system comprising a processor, keyboard, monitor, disk drive, and tape backup device.

System file: A file Macintosh computers use to start up and to provide system-wide information. The System file contains system programs.

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

system program: A program that makes the resources and capabilities of the computer available for general purposes, such as an operating system. Compare **application program.**

3.5-inch disk: A flexible, plastic **disk** measuring 3.5 inches in diameter and in a hard plastic jacket.

volume: A general term referring to a storage device; a source of or a destination for information. A volume has a name and a volume directory with the same name. Its information is organized into files.

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