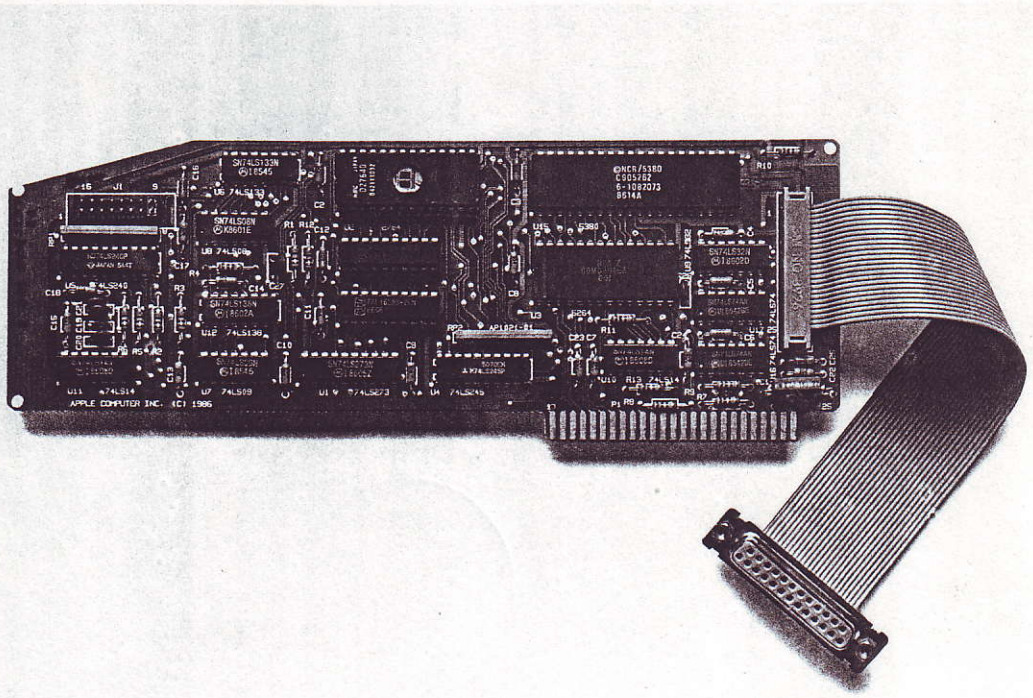
Apple® II

Apple II SCSI Card Owner's Guide



For the Apple II Plus, IIe, and IIGS®

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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-certified under test conditions that included use of shielded cables and connectors between system components. It is important that you use shielded cables and connectors to reduce the possibility of causing interference to 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.

Chapter 1

Installing Your SCSI Card

The Apple® II SCSI Card lets you connect up to four SCSI devices to your Apple II computer. **SCSI,** an acronym for *Small Computer System Interface,* is a standard and very fast way for peripheral devices to exchange information with a computer and with each other. This chapter explains how to install the SCSI card in an Apple IIGS®, Apple IIe, or Apple II Plus computer, and how to test an Apple Hard Disk SC or other SCSI hard disk.

Along with the SCSI card, you received the *Apple II SCSI Card Utilities* disk. The programs on this disk are designed for Apple Hard Disk SC users. They allow you to test the hard disk, back up the information on the hard disk, and divide the hard disk into partitions. The programs on the *Apple II SCSI Card Utilities* disk are explained in "Testing Your SCSI Hard Disk" later in this chapter, and in Chapters 2 and 3.

What you need to set up your SCSI system

Before you install your SCSI card, you should have

- ☐ an Apple IIGS, an Apple IIe, or an Apple II Plus with 64K of random-access memory (RAM)
- ☐ an Apple II SCSI Card
- ☐ an Apple SCSI system cable
- ☐ at least one SCSI peripheral device

Depending on your office setup and the number of peripheral devices in your SCSI system, you may also need one or more SCSI peripheral interface cables, cable extenders, and cable terminators.

Important Please read the *Apple SCSI Cable System* manual that comes with your Apple SCSI system cable before you attempt to connect any devices.

Unpacking your card

When you take the card out of its protective bag, hold it by the edges, not by the components, and be sure not to touch the gold "fingers" that extend from the card. Even a slight amount of oil and moisture from your hands could attract dust that would weaken the card's connection to the computer.

Installing your card

Here's how to install your card:

1. **Make sure the computer's power is switched off.**

Warning Leave the computer's power cord plugged into a grounded outlet, but turn off the power switch.

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

3. **Touch the power supply case.**

   The power supply case is the large box on the left, inside your computer. Touching it discharges any static electricity that may have built up on your clothes or body.

4. **Decide which slot you are going to use.**

Important Don't put your SCSI card in slot 3. Doing so will interfere with your video display.

On early models of the Apple II, slot 3 was used for 80-column cards—cards that made it possible to display text in 80 columns instead of the standard at that time, 40. On later models of the Apple II, 80-column capability was built in or installed through a special auxiliary connector slot. To allow earlier software to work with the newer models of the Apple II as well, the built-in and auxiliary 80-column capability was designed to emulate an 80-column card in slot 3. As a result, using slot 3 for an interface card such as the SCSI card interferes with the computer's "perception" that an 80-column card is already in that slot.

If you intend to use a SCSI device as your startup drive, you should put your SCSI card in a higher-numbered slot than any of those you've used for other disk drive controller cards. The computer looks for a startup program in each drive—starting with the drive connected to the disk drive controller card in the highest-numbered slot.

If you don't intend to use a SCSI device as your startup drive, you should put the SCSI card in a lower-numbered slot than that of the card connected to your preferred startup device.

- *Apple IIGS users:* With the Apple IIGS you can designate which slot you want the computer to start up from. The startup device need not be connected to the card in the highest-numbered slot unless you leave the startup slot set to Scan in the Control Panel.

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

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

6. Attach the SCSI card cable to the inside of the back panel.

Before inserting the card, attach the connector at the end of the ribbon cable to the inside of the back panel as shown in Figure 1-1. Tighten the bolts using the small wrench that came with your SCSI card. By anchoring the connector to the back panel, you reduce stress on the cable and form a bond between the electromagnetic shielding on the computer's case and the shielding on the cable. This bond substantially reduces the possibility that your computer will generate radio-frequency interference.

Figure 1-1 shows how to connect the ribbon cable in an Apple IIGS. The back panel on the Apple IIe looks a little different, but you make the connection the same way.

If you're using an Apple II Plus, see your authorized Apple dealer for instructions on anchoring the ribbon cable to the back panel.

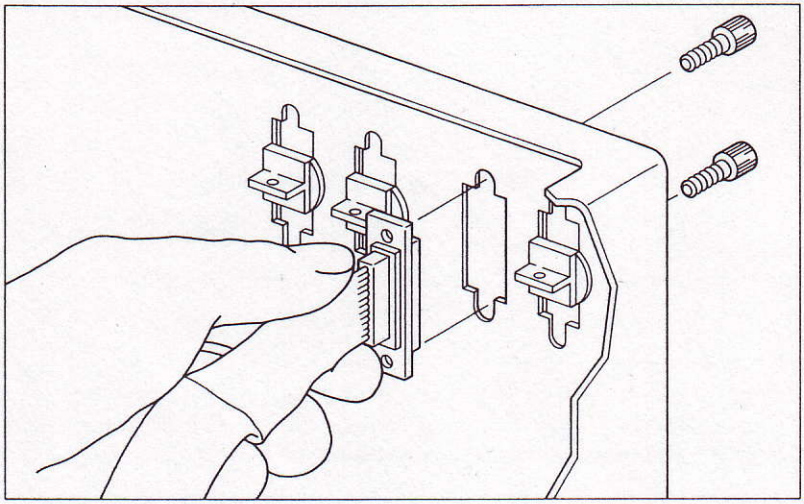

Figure 1-1
Connecting the ribbon cable

7. Make sure the jumper on the SCSI card is in the correct position.

The jumper is the small rectangular box near the upper-left corner of the card. Make sure the jumper is fitted securely onto the pins farthest to the right, beneath the number 9. (See Figure 1-3.) With the jumper in this position, your computer will have top priority in any communication along your SCSI cable.

- *Changing the jumper position:* For instructions on changing the jumper position, see "Setting the Priority of SCSI Devices" later in this chapter.

10. On the Apple IIGS, activate the slot.

Each port on the back of the Apple IIGS acts as a slot with a card in it. When you actually put a card into a slot, you need to use the Control Panel program to "turn off" the corresponding port and to turn on the slot. For details, see your Apple IIGS owner's guide.

❖ *Note:* Slots are automatically active on the Apple IIe and the Apple II Plus.

11. Refer to the *Apple SCSI Cable System* manual for instructions on connecting SCSI devices to the card.

Depending on the slot you have used, you can connect up to four SCSI devices to your SCSI card. You'll connect the first SCSI device to the card using a SCSI system cable. You can add additional SCSI devices to the **SCSI chain** using SCSI peripheral interface cables. See the *Apple SCSI Cable System* manual for important installation instructions.

Warning Never plug a cable other than the system cable into the SCSI connector. Doing so may damage or destroy your SCSI card.

Possibilities and limits

ProDOS is an Apple II operating system that supports mass storage devices such as hard disk drives. (An operating system is a program on every application disk that handles the way information is transferred from disks to memory.)

ProDOS®-based applications recognize up to four SCSI devices connected to a SCSI card in slot 5 and up to two SCSI devices connected to a SCSI card in any other slot. The devices are distinguished by ID numbers. See "Setting the Priority of SCSI Devices" later in this chapter for information on how SCSI numbers are assigned.

The drive with the highest priority is identified as drive 1. The drive with the second highest priority is drive 2. If you have more than two drives attached to a SCSI card in slot 5, ProDOS applications see the devices with the third and fourth highest priority as drive 1 and drive 2 in slot 2.

This remapping of slot 5 devices to slot 2 lets you get around the ProDOS limit of two devices per slot. It works only if you do not put a disk drive controller card in slot 2. (You may, however, use slot 2 for a serial interface card without interfering with the remapping.)

If you don't want to worry about which devices appear to be in slot 5 and which appear to be in slot 2, refer to your SCSI devices by their volume names (the names you give them when you format them) rather than by their slot and drive numbers.

There is no limit on the size of devices SCSI can handle, but the maximum storage area ProDOS recognizes is 32 **megabytes** (MB). If you attach a device larger than 32 MB, you must divide it into parts, each of which is 32 MB or smaller, using the HD SC Partition program explained in Chapter 2 of this guide. Each part counts as one SCSI peripheral device in your system. ProDOS applications therefore recognize as many as four volumes of up to 32 MB each attached to a SCSI card in slot 5, or as many as two volumes of up to 32 MB each attached to a SCSI card in any other slot.

negabyte is a measure of rage capacity. One megabyte uals 1024 kilobytes, or 1,048,576 tes. (A byte is a unit of ormation large enough to present a single letter, number, nctuation mark, or other aracter.)

Setting the priority of SCSI devices

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

Important If you have a SCSI device that uses removable media, it should have the lowest priority of any device on the SCSI chain—ID number 0. There should never be more than one **removable media device** per chain.

removable media device is one iat allows you to insert and emove disks, tapes, or other iedia—as opposed to a fixed iedia device, which isn't designed or disk or tape swapping.

You set the ID number of most SCSI devices by inserting a pushpin or a straightened paper clip in the SCSI ID switch and pressing until the SCSI ID indicator shows the number you've chosen for that device. (Apple has designated standard SCSI ID numbers for different SCSI devices. These numbers are set for you, and you don't need to change them unless you have two devices of the same kind or some other reason to change the priority of a device.) The manual that comes with the device explains how to set the SCSI ID number.

The computer's priority is determined by the position of the jumper in the upper-left corner of the Apple II SCSI Card. It should be on the pins to the far right of the jumper block as shown in Figure 1-3.

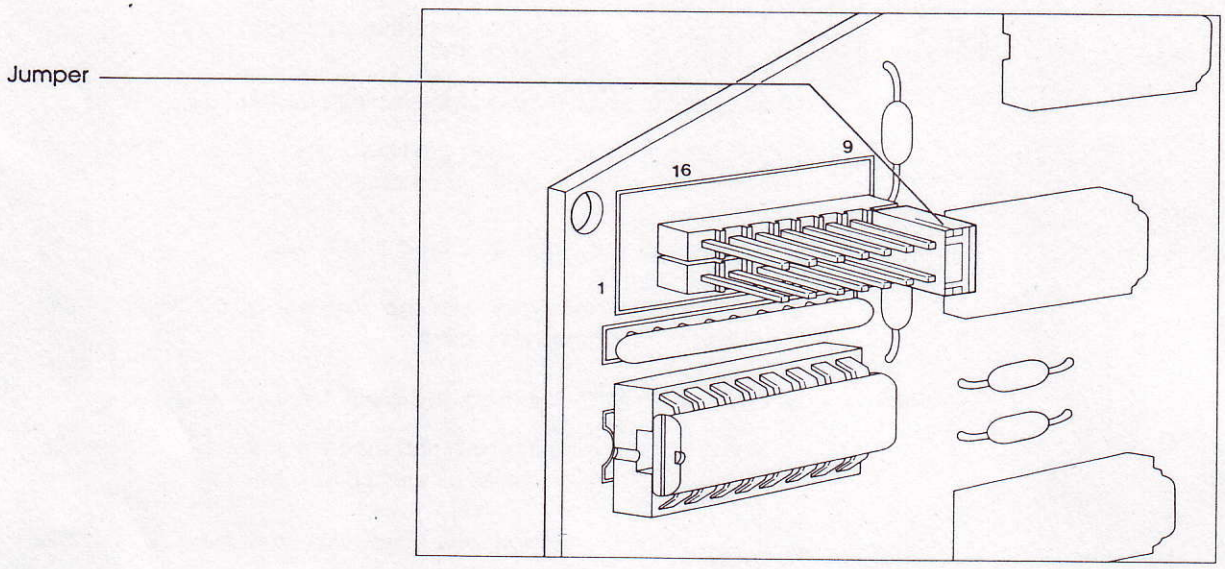

Figure 1-3
The jumper in the standard position

- *About the pin numbering scheme:* The SCSI card uses a jumper block on a 16-pin connector to set the priority of the computer. The numbers 9 and 16 that you see on the jumper block refer to pin positions—they are not SCSI ID numbers.

Testing your SCSI hard disk

The HD-SCSI Test on the *Apple II SCSI Card Utilities* disk tells you whether your hard disk is reading and writing data properly. This test verifies only the hardware; it can't tell you whether you have software problems. If your hard disk fails the test, it isn't working properly, even though you may not have noticed anything wrong. You should have it checked by an authorized Apple dealer.

The test takes about 15 minutes and does not affect the data currently stored on the disk. You should run the HD-SCSI Test at the following times:

- after you initialize your hard disk for the first time
- every month or so for preventive maintenance, to avoid unexpected loss of data
- whenever you are having problems with the hard disk

Follow these steps to test an Apple Hard Disk SC or other SCSI hard disk connected to your Apple II computer:

1. **Turn on the hard disk and let it warm up.**

2. **Start up your computer with the *Apple II SCSI Card Utilities* disk in your startup disk drive.**

3. **Choose HD-SCSI Test from the Main Menu.**

   The ProDOS screen appears, and then you see a screen showing a list of the SCSI hard disks connected to your computer.

4. **If you have more than one hard disk connected, select the disk you want to test.**

   Press the Up Arrow or Down Arrow key (or the I or M key on an Apple II Plus) to move the arrow on the screen until it points to the disk you want to test.

5. **Press Return to begin the test.**

   While the test is in progress, a series of lines rotates in a pinwheel pattern on the screen and the light on the hard disk goes on.

   If you want to stop the test before it's over, press the Esc (Escape) key.

   When the test is complete, you see a message reporting the results—either Pass or Fail. If your hard disk fails the test, have it checked by an authorized Apple dealer.

The next chapter tells you how to partition your hard disk. If you don't need to use partitions, go on to Chapter 3, which explains how to back up the information on your hard disk.

Chapter 2

Dividing Your Hard Disk Into Partitions

If you're using an Apple II computer with a hard disk that has a storage capacity greater than 32 megabytes (MB), you need to create partitions on the disk in order to take advantage of all its storage space. You can do so using the HD SC Partition program on the *Apple II SCSI Card Utilities* disk.

Dividing a hard disk into partitions is necessary because the current version of ProDOS is designed for storage devices with capacities of 32 MB or less. Partitioning a hard disk makes each part appear to be a disk in its own disk drive. You identify each partition the same way you identify an actual disk—by slot and drive number. If you have an Apple Hard Disk 40SC connected to slot 5, for example, you identify one part of the hard disk as being in slot 5, drive 1, and the other part as being in slot 5, drive 2. Once you have formatted the parts, you can identify them by their volume names rather than by their slot and drive numbers.

You can divide your hard disk into two equal parts, or you can make one part bigger than the other. The maximum size of a partition is 32 MB, because that's the maximum size ProDOS can handle. If you want to have as much data as possible in a single partition, you may want to choose an unequal allocation of memory, such as 32 MB in one partition and 8 MB in the other. If your data falls into two distinct categories that require equal storage space, on the other hand, you should divide your hard disk into equal parts. Once you've made this decision, you're ready to use the HD SC Partition program.

Important If you have saved information on your hard disk, copy that information to other disks before using the HD SC Partition program. Creating partitions on your hard disk erases anything previously stored there. You can copy all the information on your hard disk using the Backup II program, described in Chapter 3 of this guide, or you can copy individual files using the file-copying utility on your system disk or system utilities disk.

These instructions assume that you have already installed your Apple II SCSI Card and have connected your hard disk to the card. You'll find instructions for installing the SCSI card in Chapter 1 of this guide. To connect the hard disk, follow the instructions that came with it.

You can return to the menu of the HD SC Partition program at any time, by pressing Esc one or more times. (Each time you press Esc you return to the previous menu.) If you want to cancel an operation in progress, press Command-Esc. (In addition to canceling the operation, pressing Command-Esc returns you to the HD SC Partition program menu.)

❖ *About keys and keystrokes:* The Command key, which you may also have seen identified as the Apple key or the Open Apple key, is the key marked with an Apple symbol. On older Apple IIe keyboards that have two keys marked with Apple symbols, the Command key is the one with the outlined Apple symbol.

When you are asked to press two or more keys whose names are joined with hyphens, you should hold down the first key or keys while you press and release the last key.

1. **Start up the *Apple II SCSI Card Utilities* disk and select the HD SC Partition program.**

   Press Up Arrow or Down Arrow to select HD SC Partition. Then press Return.

2. **Select Partition SCSI Hard Disk.**

   Press Up Arrow or Down Arrow to select Partition SCSI Hard Disk. Then press Return. You'll see a screen similar to the one shown in Figure 2-1.

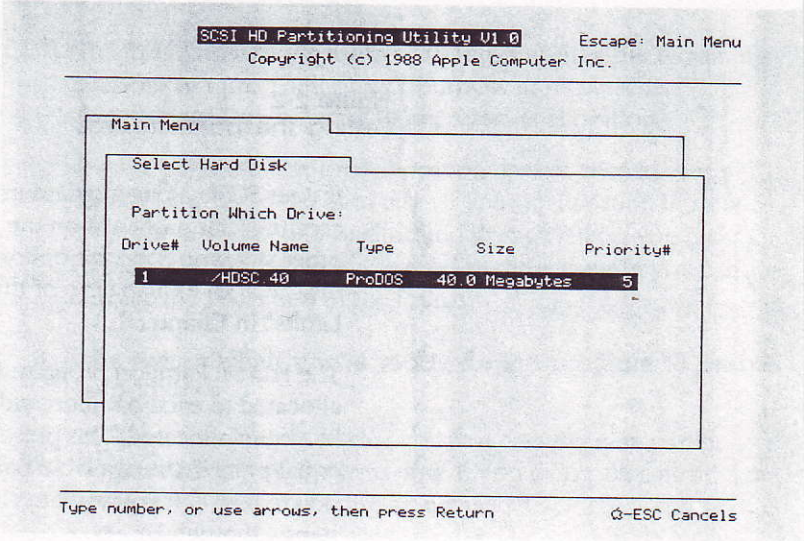

Figure 2-1
Selecting the device you want to partition

3. Select the device you want to partition.

Press Up Arrow or Down Arrow to select the device you want to partition (or type the drive number), then press Return. You'll see a screen similar to the one shown in Figure 2-2.

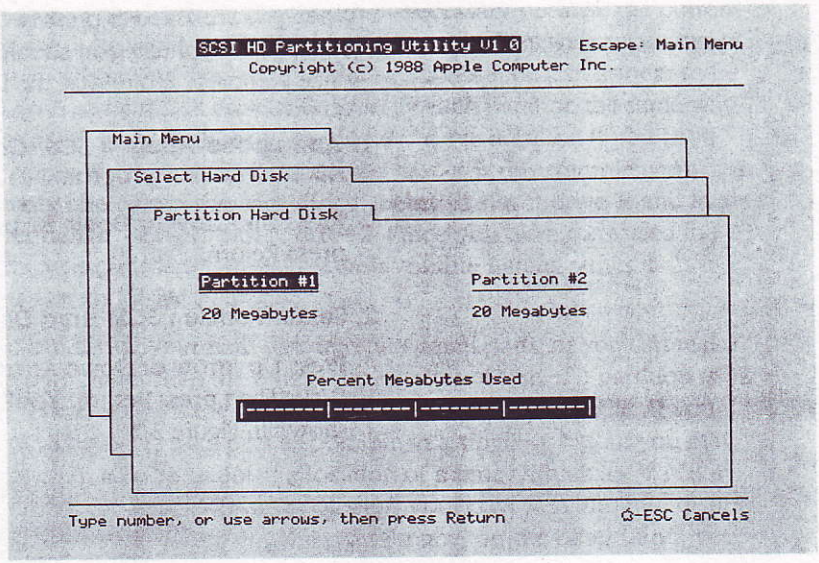

Figure 2-2
Setting the partition sizes

If your SCSI card is installed in slot 5, you have the option of creating four partitions on the disk. If the card is installed in any other slot, you have the option of creating two partitions on the disk. For an explanation of these limits, see "Possibilities and Limits" in Chapter 1.

The HD SC Partition program screen shows how much space is allocated to each partition and what percentage of the hard disk has been allocated. The preset allocation divides the space into equal parts in the available partitions. If that's what you want, skip to step 8. If you want to change the partition sizes, follow steps 4 through 7.

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

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

   Press Left Arrow or Right Arrow to select a partition.

5. **Decrease the allocation.**

   Press Down Arrow to decrease the size of the partition.

   The shading on the horizontal bar along the bottom of the screen shows what percentage of the hard disk has been allocated. As you press Down Arrow, the amount of shading decreases to correspond to the new allocation.

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

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

7. **If you are partitioning a hard disk connected to a SCSI card in slot 5, select the third and fourth partitions and change their allocations.**

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

   Keep in mind that the total allocation cannot exceed the storage capacity of the hard disk. If your reallocation in steps 5 and 6 did not leave any unallocated storage space, you must decrease the allocation of the third partition before you can increase the allocation of the fourth.

8. **Press Return when you're ready for the program to create the partitions.**

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

9. Type `Y` to create the partitions, or `N` to cancel the partitioning.

If you don't want to lose the information stored on the hard disk, or if there is unallocated space on the disk and you want to allocate it before partitioning, type `N`. Otherwise, type `Y`.

- *Why leave space unallocated?* If you type `Y` when there is unallocated space on the disk, partitioning will proceed without allocating the remaining space. Leaving space unallocated might be useful, for example, if you want the partitions to match exactly the size of another storage device for purposes of making volume copies.

10. When you see the message "Partition Complete," restart the computer.

That's all there is to it. Now format each partition using the formatting option on your system disk or your system utilities disk. When you're asked for the location of the disk you want to format, type the slot number and drive 1 for part 1, drive 2 for part 2. (If you have partitioned a hard disk connected to a SCSI card in slot 5 into more than two parts, the third part is identified as slot 2, drive 1, and the fourth part as slot 2, drive 2.) After formatting the parts, you'll be able to identify them by their volume names rather than by their slot and drive numbers.

Chapter 3

Backing Up the Information on Your Hard Disk

Backup II is a program on the *Apple II SCSI Card Utilities* disk that gives you an efficient way of copying the information from one ProDOS-formatted disk to others and of recovering that information should it ever be necessary. Although you can use Backup II to copy the **files** from any type of ProDOS disk to any other type of ProDOS disk, it's designed primarily for backing up the information on hard disks. (Copying large-capacity disks is very time-consuming using the file-copying utility on the system disk or system utility disk that came with your computer.)

A **file** is any body of information saved by name on a disk—for example, a word-processed document, a computer-generated drawing, or an application program.

About Backup II

Backup II is a menu-driven program. That is, you make choices from a series of menus and then provide additional information in response to messages on the screen. These choices made, you indicate the location of your **source volume** and your **destination volume.** And the backup procedure begins.

A **volume** is a place where files are stored. Although it is possible to have several volumes on one disk or one volume that spans several disks, the norm is one volume per disk. For this reason, the word *volume* is often used interchangeably with the word *disk*. The **source volume** is the volume you're copying from. The **destination volume** is the volume you're copying to.

The discussion of Backup II in this chapter assumes that you are familiar with the information covered in the manuals that came with your computer. If you have difficulty understanding how to use Backup II, read those books for important background information.

Backing up files

There are two ways to back up files: You can back up all the files in a volume, or you can back up only those files that have been modified since the last backup.

Before you begin backing up the information on your hard disk, be sure you have plenty of 3.5-inch or 5.25-inch disks handy. The number of disks you need depends on both the size of the volume you're backing up and the capacity of your backup disks. For example, it takes 26 3.5-inch disks to back up a full 20 MB hard disk.

Backing up all files

Follow these instructions to back up all the files on a disk:

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

2. **Start up the *Apple II SCSI Card Utilities* disk.**

3. **Select the Backup II program.**

   Press Up Arrow or Down Arrow to select Backup II. Then press Return. After a few seconds, you'll see the screen shown in Figure 3-1.

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

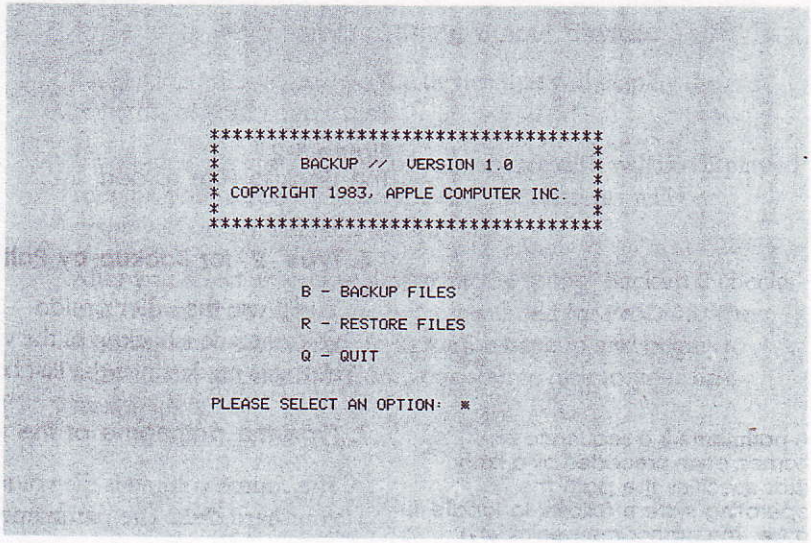

Figure 3-1
The Backup II menu

4. **Insert a blank disk into your destination drive.**

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

5. Type `B` for Backup Files.

You'll see the screen shown in Figure 3-2.

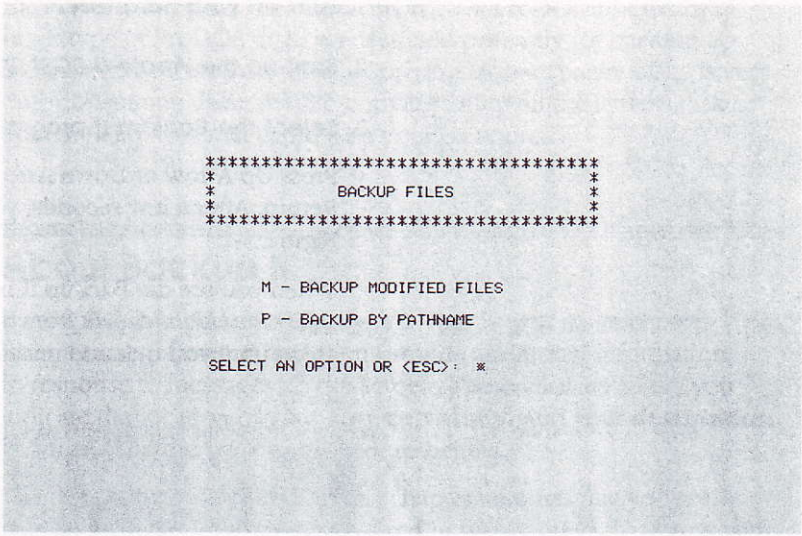

Figure 3-2
The Backup Files screen

6. Type `P` for Backup by Pathname.

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

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

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

The source volume is the volume you want to copy—usually your hard disk. The pathname is the volume name preceded by a slash.

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

Slot refers to the slot containing your disk drive controller card. If your disk drive is connected to the disk drive port rather than to a card in a slot, type the slot number that corresponds to the port (slot 5 for 3.5-inch drives, slot 6 for 5.25-inch drives).

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

   The destination drive is the drive containing your first backup disk.

9. **Type the drive number of your destination drive.**

   The drive connected directly to the disk drive controller card or disk drive port is drive 1. The drive connected to drive 1 is drive 2.

10. **If the disk is blank, you're asked whether it's OK to format the disk. Type `Y` for Yes.**

11. **Type `S` or `P` to select a listing output device.**

    The listing output device is the device that will display the contents of your source disk.

    If you type `S`, the contents of your source disk will be displayed only on your screen. If you type `P`, the contents will be displayed on your screen and printed.

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

12. Switch backup disks when prompted.

Messages on the screen tell you when to replace the disk in the destination drive with a new blank disk. (See Figure 3-3.) After you replace a disk, press the Space bar to continue.

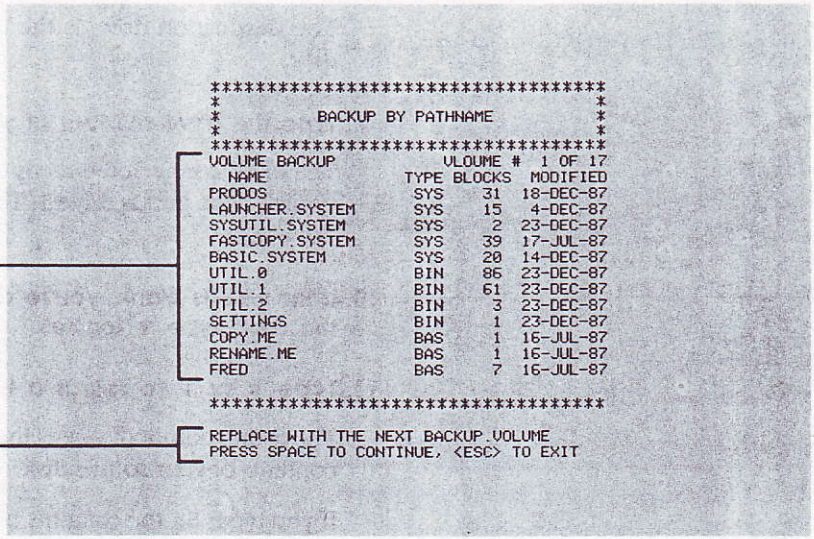

Figure 3-3
Contents of the volume and status of the backup

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

Backup II names each backup disk BACKUP.VOLUME*x*, where *x* is a number that indicates the order in which the disk was used in the backup procedure. The first backup disk is BACKUP.VOLUME1, the second is BACKUP.VOLUME2, and so on. You might want to include this name on the label, along with the date the disk was created and a brief description of what information is being backed up.

14. When you see the message "Operation Complete," press the Space bar to return to the Backup Files menu.

15. Press Esc to return to the Backup II menu.

Backing up modified files only

To back up only those files modified or created since the last backup was made, choose the Backup Modified Files option from the Backup Files menu by typing M. A volume backup of this type, made between full volume backups, is called an **incremental backup.**

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

Restoring files

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

There are two ways to restore files: by volume and by pathname. Use the volume method when you need to restore everything on a volume. Use the pathname method when you need to restore only particular files whose originals are damaged or have been deleted by mistake.

Restoring all files

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

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

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

2. **Start up the *Apple II SCSI Card Utilities* disk.**

3. **Select the Backup II program.**

4. **Type `R` for Restore Files.**

5. **Type `V` for Restore Volume.**

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

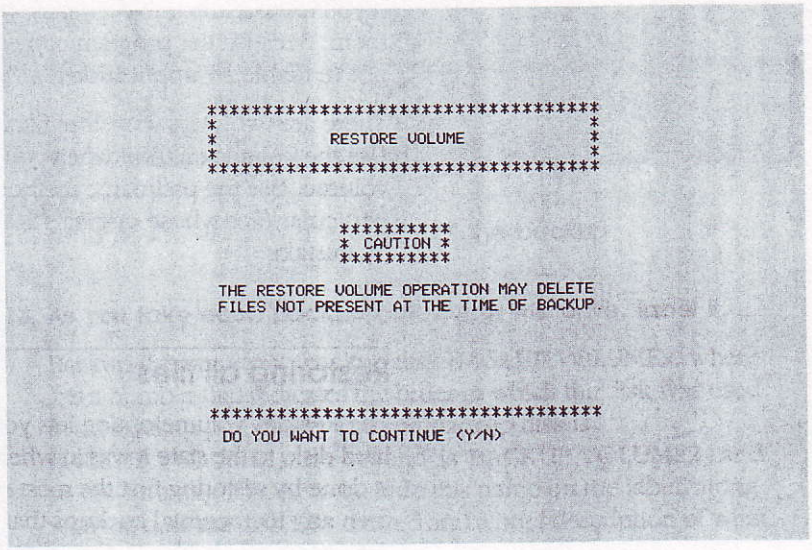

Figure 3-4
The Restore Volume information screen

This message appears to inform you that if you deleted files between the time you made the full volume backup and the time you made the last incremental backup, those same files will be deleted in the process of restoring the hard disk to the condition it was in at the time of the last incremental backup.

6. **Type `Y`, for Yes, in response to the question "Do you want to continue?"**

   If you type `N`, for No, you return to the Restore Files menu. If you type `Y`, you see the message shown in Figure 3-5, asking you for the location of the source device, the location of the destination device, and where to send the listing.

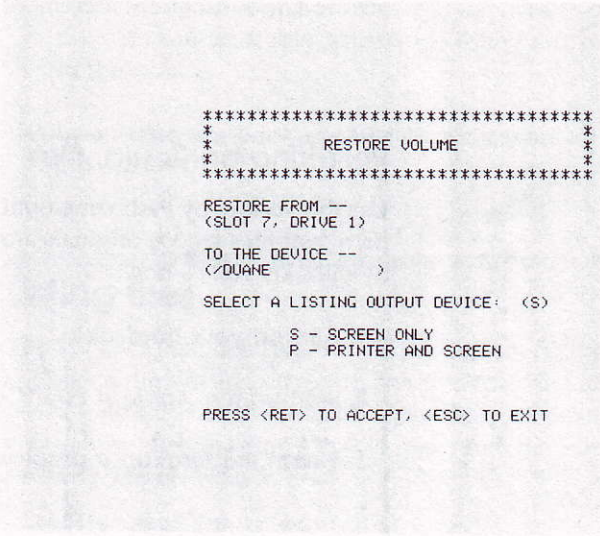

Figure 3-5
The Restore Volume selection screen

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

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

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

   If you prefer, you can type `S` followed by the slot and drive number of the device onto which you are restoring the information.

10. **Select a listing output device.**

    Type `S` if you want the listing sent to the screen only; type `P` if you want the listing sent to the screen and to a printer.

11. **Watch for messages on the screen telling you when to insert other backup disks.**

After you restore the full volume, follow the same procedure to restore any subsequent incremental backups in chronological order, oldest set first.

Restoring particular files

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

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

2. **Start up the *Apple II SCSI Card Utilities* disk.**

3. **Select the Backup II program.**

4. **Type `R` for Restore Files.**

5. **Type `P` for Restore by Pathname.**

6. **Type the slot and drive number of the drive you'll use for the backup disks.**

   Backup II replaces the slot and drive you type with the volume's name and waits for you to type the remainder of the pathname.

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

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

8. **Type the pathname of the device onto which you are restoring the information.**

   In place of a volume name, you may wish to use a slot and drive reference when restoring a volume. Type `S` for *slot,* then the slot number followed by a drive number.

9. **Select the listing output device.**

   Type `S` if you want the contents of the backup disk sent only to the screen; type `P` if you want the listing sent to the screen and to the printer.

10. **Insert different backup disks as prompted by messages on the screen.**

Listing files

The List Files command shows you the contents of the backup volume in the slot and drive you specify. You can use List Files after backing up a disk to check that Backup II copied the files you thought it would, or after restoring a disk to make sure that all the files were restored. Here's what to do:

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

   If you're listing the files on a hard disk, be sure the hard disk is turned on.

2. **Type `R` to choose Restore Files from the Backup II menu.**

3. **Type `L` for List Files.**

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

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

   Type `S` if you want the listing sent only to the screen; type `P` if you want the listing sent to the screen and to the printer.

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

   Keep pressing the Space bar until the listing is complete.

7. **Press the Space bar to return to the Restore Files menu.**

8. **Press the Space bar again to return to the Backup II menu.**

Quitting

When you finish using Backup II, return to the Backup II menu by pressing Esc and then choose Quit by typing Q. From there you can either supply the prefix and pathname of the application you want to use next or put the disk you want to use next in your startup drive and press Command-Control-Reset.

❖ *Note:* The Command key is the key marked with an outlined Apple symbol.

Glossary

backup: A copy of a disk or file. It's a good idea to make backups of all your important disks in case something happens to the originals.

byte: A unit of information large enough to represent a single letter, number, punctuation mark, or other character.

destination volume: The volume you are copying to.

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

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

megabyte: A measure of storage capacity equal to 1024 kilobytes, or 1,048,576 bytes.

operating system: A program on every application disk that handles the way information is transferred from disks to memory.

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

ProDOS: An Apple II operating system that supports mass storage devices such as hard disk drives.

removable media device: A device that allows you to insert and remove disks, tapes, or other media—as opposed to a fixed media device, which isn't designed for disk or tape swapping.

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

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

source volume: The volume you are copying from.

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