Macintosh

User's Guide

the Includes setup, troubleshooting, and important health-related information for the Macintosh LC 630 DOS Compatible

Apple Computer, Inc.

Contents

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Communications regulation information

FCC statement

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

Radio and television interference

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

This equipment has been tested and found to comply with the limits for a Class B digital device in accordance with the specifications in Part 15 of FCC rules. These specifications are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation.

You can determine whether your computer system is causing interference by turning it off. If the interference stops, it was probably caused by the computer or one of the peripheral devices.

If your computer system does cause interference to radio or television reception, try to correct the interference by using one or more of the following measures:

- Turn the television or radio antenna until the interference stops.
- Move the computer to one side or the other of the television or radio.
- Move the computer farther away from the television or radio.
- Plug the computer into an outlet that is on a different circuit from the television or radio. (That is, make certain the computer and the television or radio are on circuits controlled by different circuit breakers or fuses.)

If necessary, consult an Apple-authorized service provider or Apple. See the service and support information that came with your Apple product. Or, consult an experienced radio/television technician for additional suggestions. You may find the following booklet helpful: *Interference Handbook* (stock number 004-000-00493-1). This booklet, prepared by the Federal Communications Commission, is available from the U.S. Government Printing Office, Washington, DC 20402.

IMPORTANT Changes or modifications to this product not authorized by Apple Computer, Inc., could void the FCC Certification and negate your authority to operate the product.

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

DOC statement

DOC Class B Compliance This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus," ICES-003 of the Department of Communications.

Observation des normes—Classe B Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe B prescrites dans la norme sur le matériel brouilleur : "Appareils Numériques", NMB-003 édictée par le ministre des Communications.

VCCI statement

情報処理装置等電波障害自主規制について

この装置は、第二種情報装置（住宅地域又はその隣接した地域において使用されるべき情報装置）で住宅地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会（VCCI）基準に適合しております。

しかし、本装置をラジオ、テレビジョン受信機に近接してご使用になると、受信障害の原因となることがあります。

取扱説明書に従って正しい取り扱いをしてください。

CD-ROM drive

WARNING Making adjustments or performing procedures other than those specified in your equipment's manual may result in hazardous exposure.

WARNING Do not attempt to disassemble the cabinet containing the laser. The laser beam used in this product is harmful to the eyes. The use of optical instruments, such as magnifying lenses, with this product increases the potential hazard to your eyes. For your safety, have this equipment serviced only by an Apple-authorized service provider.

If you have an internal Apple CD-ROM drive in your computer, your computer is a Class 1 laser product. The Class 1 label, located on the computer, indicates that the drive meets minimum safety requirements. A service warning label is on the CD-ROM drive inside the computer.

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CLASS 1 LASER PRODUCT
LASER KLASSE 1
LUOKAN 1 LASERLAITE
APPAREIL A LASER DE CLASSE 1
EN60825
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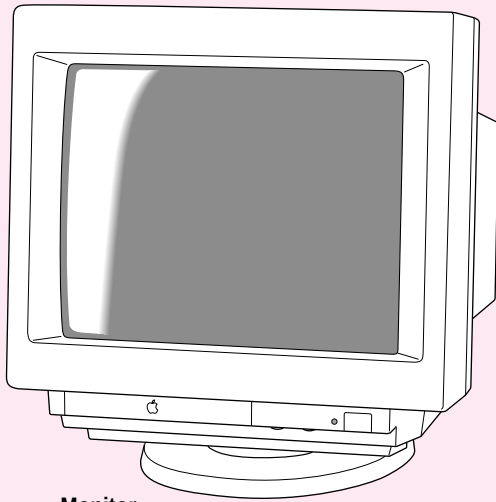
Your DOS-Compatible Macintosh Computer

Your Macintosh includes hardware and software that let you use DOS and Windows application programs directly on your Macintosh computer. It contains a high-performance microprocessor that's fully compatible with the latest DOS and Windows software. You can
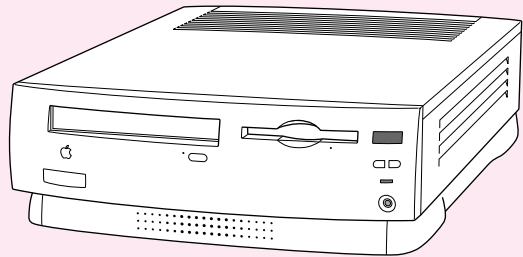
- simultaneously run Macintosh operating system (Mac OS) and PC application programs

- switch between the Mac OS and PC environment at any time without quitting the applications you're using

- view the current environment on a single monitor

- use the same hard disk for both Mac OS and PC software

- share files and folders (directories) between the Mac OS and the PC environment

- cut, copy, and paste data between Mac OS and DOS or Windows documents

- use your Macintosh keyboard and mouse with PC software

- use your Macintosh modem, monitor, and printer with PC software, or connect PC-compatible equipment

- use a joystick or other game controller with PC application programs

- share the random-access memory (RAM) in your Macintosh with the PC environment, or use a memory module (SIMM) for the exclusive use of the PC environment
- use the built-in Macintosh serial ports with PC software
- access PC CD-ROM discs using an Apple CD-ROM drive
- play Sound Blaster-compatible sounds
- communicate with network servers and other computers running PC software

To begin, follow the instructions in Chapters 1 and 2 to set up your computer and get started using it. Read Chapters 3 and 4 when you are ready to connect additional equipment to your computer and install Mac OS application programs. Read Chapters 5 and 6 to start using DOS and Windows application programs on your Macintosh computer. Turn to Chapters 7 and 8 if you have questions or problems using your Macintosh.
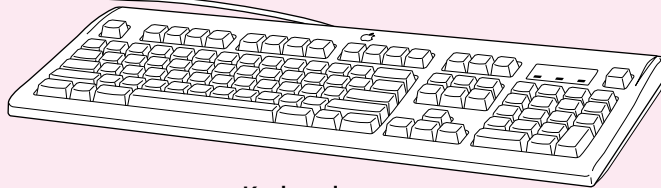
Monitor
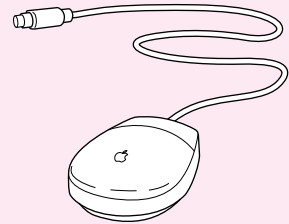
Macintosh DOS-compatible computer
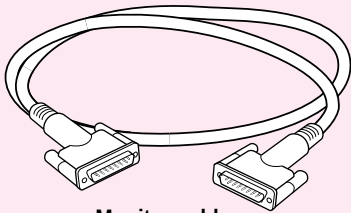
Keyboard cable (sometimes built into the keyboard as shown here)
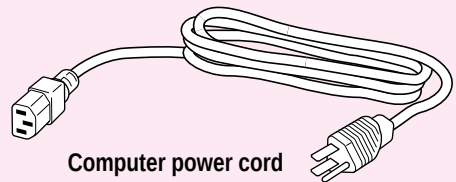
Keyboard
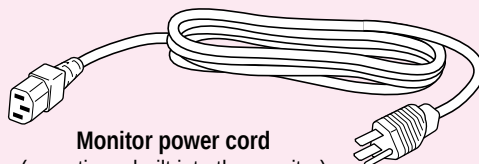
Mouse

Monitor cable (sometimes built into the monitor)

Computer power cord

Monitor power cord (sometimes built into the monitor)

1 Getting Started

The illustration on the facing page shows all the equipment you need to set up your computer and begin using it. Place your equipment on a sturdy, flat surface near a grounded wall outlet. Before following the setup instructions in this chapter, you may want to read "Arranging Your Office" in Appendix A (in the section on health-related information) for tips on adjusting your work furniture so that you're comfortable when using the computer.

Plugging in the computer
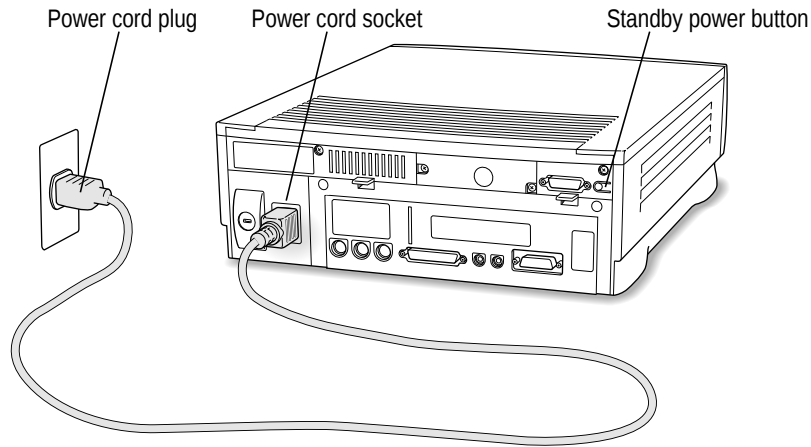
Before you plug your Macintosh into a wall socket, carefully read all the setup instructions in this chapter. Then, before you connect anything to your Macintosh, follow the instructions in this section to plug it in. The plug grounds the computer and protects it from electrical damage while you are setting up.

When you are ready to begin, follow these steps:

1   **Plug the socket end of the computer's power cord into the recessed power cord socket (marked with the symbol $\sim$) on the back of the computer.**

2   **Plug the other end of the power cord into a three-hole grounded outlet or power strip.**

Choose a power outlet to which you have easy access.

WARNING This equipment is intended to be electrically grounded. Your Macintosh is equipped with a three-wire grounding plug—a plug that has a third (grounding) pin. This plug will fit only a grounded 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!

Power cord plug   Power cord socket   Standby power button

IMPORTANT Be sure that at least one end of the power cord is within easy reach so that you can unplug the computer when you need to.

If the computer starts up: If you hear a tone, the computer has started up and you need to turn it off before proceeding. Press the power button (also called the standby power button) located on the back of the computer to turn the computer off.

Installing an expansion card

If you purchased any expansion cards for your Macintosh or extra memory for use in the PC environment, install the cards or memory now. (For instructions, see Appendix B, "Installing an Expansion Card or Memory for the PC Environment," as well as the documentation that came with the cards or memory module.) If you don't have an expansion card or memory to install, go on to the next section, "Connecting a Monitor."

Connecting a monitor

You can connect many types of monitors to your Macintosh. To connect a monitor from a manufacturer other than Apple, refer to the instructions that came with the monitor.

Connecting the monitor power cord

Monitors have two cords to connect—a power cord and a monitor cable.

To connect the monitor power cord, follow these steps:

1 **Place the monitor where you will be using it.**

You can place a monitor with a 15-inch or smaller screen on top of your computer. Don't place larger monitors on the computer.

Keep these considerations in mind:
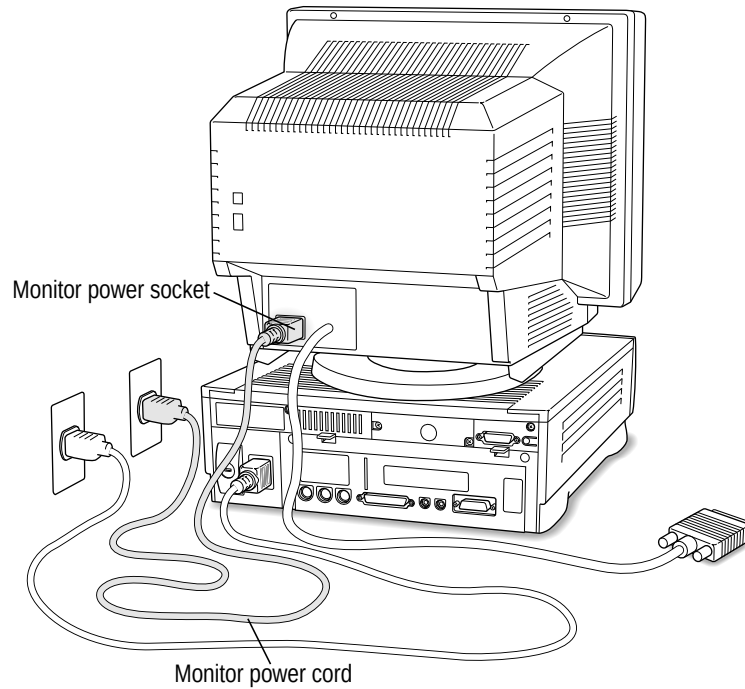
- Allow a few inches for air circulation around the sides of the computer and monitor.
- Make sure that the top of the screen is slightly below eye level when you're sitting at the keyboard.
- Position the monitor to minimize glare and reflections on the screen from overhead lights and windows.
- Consult "Arranging Your Office" in the section "Health-Related Information About Computer Use" in Appendix A for suggestions on locating your computer equipment.

2 **Connect the monitor power cord to the monitor.**

On some monitors, the cord is already attached.

3 **Plug in the monitor power cord.**

Be sure to plug the power cord into a three-hole grounded outlet or power strip.

Monitor power socket

Monitor power cord

Connecting the monitor cable

After you plug in the monitor power cord, you connect the monitor cable to the computer's monitor port.
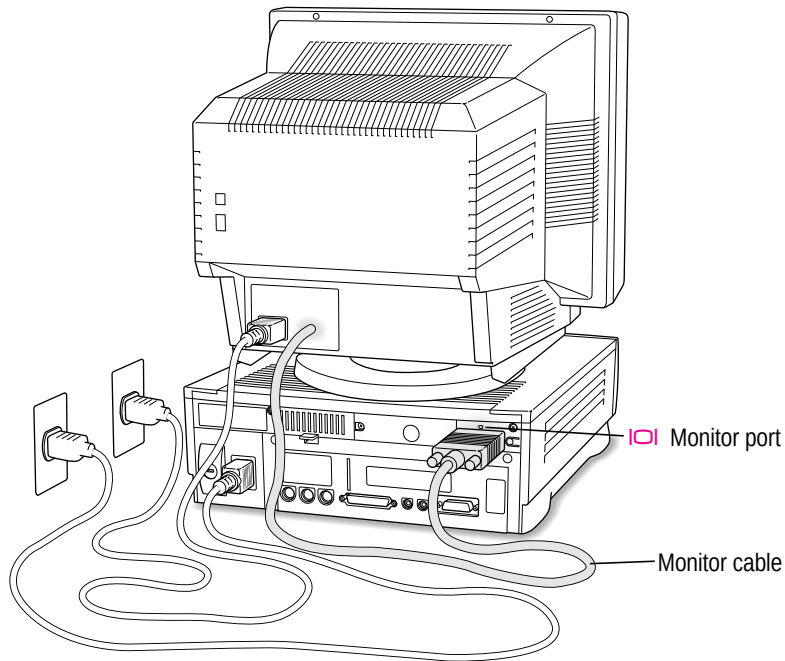
To connect the monitor cable, follow these steps:

1   Attach the monitor cable to the monitor.

On some monitors, the cable is already attached (as shown below).

2   Attach the monitor cable to the monitor port on the back panel of the computer.

The monitor port is on the upper-right corner of the back panel. It is marked with the |□| icon (symbol). Be sure you plug the cable into the correct port.

|□| Monitor port

Monitor cable

Connecting the mouse and keyboard

You have a choice of several keyboards for your Macintosh. The way you connect the mouse and keyboard depends on whether the keyboard has a separate cable or a built-in cable.
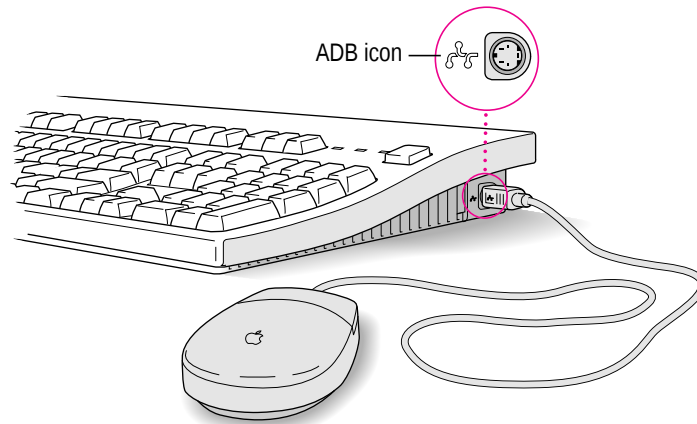
Connecting a keyboard with a separate cable

1 Plug the mouse cable into the port on either side of the keyboard.

Most right-handed people prefer to use the mouse with their right hand; most left-handed people prefer to use their left hand. Plug the mouse into the port on the side you prefer.

The plug and the port are marked with the ⌘ icon (symbol). Align the symbols before you insert the plug. (The positions of the port and icon on your keyboard may be different from those pictured here.)

By the way: A port marked with the ⌘ icon is called an Apple Desktop Bus (ADB) port.

ADB icon

2 Plug the keyboard cable (both ends are the same) into the other port on the keyboard.

If you plugged the mouse cable in on the right, for example, plug the keyboard cable in on the left.

3 Plug the keyboard cable into the port marked with the ⌘ icon on the back of the computer.
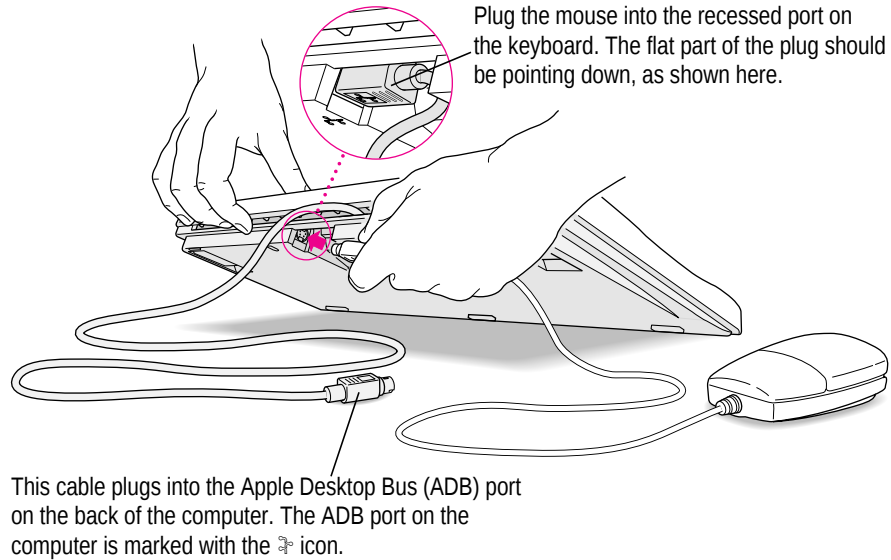
Some monitors have a port to which you can connect the keyboard or mouse. See the information that came with your monitor.

Connecting a keyboard with a built-in cable

1 **Plug the mouse cable into the recessed port on the back of the keyboard.**

The plug and the port are marked with the ⌘ icon (symbol). The positions of the port and icon on your keyboard may be different from those pictured.

By the way: A port marked with the ⌘ icon is called an Apple Desktop Bus (ADB) port.

Plug the mouse into the recessed port on the keyboard. The flat part of the plug should be pointing down, as shown here.

This cable plugs into the Apple Desktop Bus (ADB) port on the back of the computer. The ADB port on the computer is marked with the ⌘ icon.

2 **Plug the keyboard cable into the port marked with the ⌘ icon on the back of the computer.**

Some monitors have a port to which you can connect the keyboard or mouse. See the information that came with your monitor.

Connecting other equipment

If you are new to the Macintosh, it's a good idea to get some experience using your computer before you connect other equipment, such as a printer or scanner. To learn basic Macintosh skills, continue with the instructions in this chapter.

When you're ready to connect other equipment to your Macintosh, see the instructions in Chapter 3.

Turning the computer on
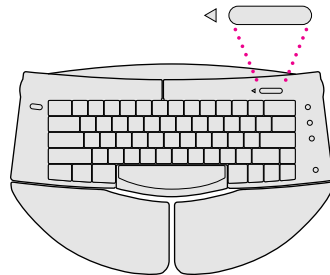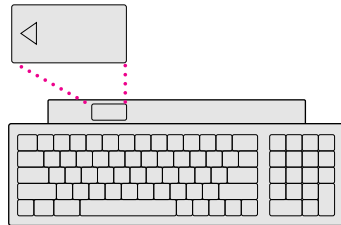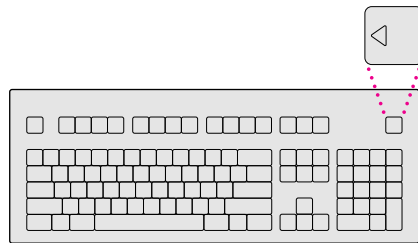
Follow these steps to turn the computer on:

1 **Turn on the monitor.**

See the information that came with your monitor for the location of the power button.

2 **Turn on your computer by pressing the Power key.**
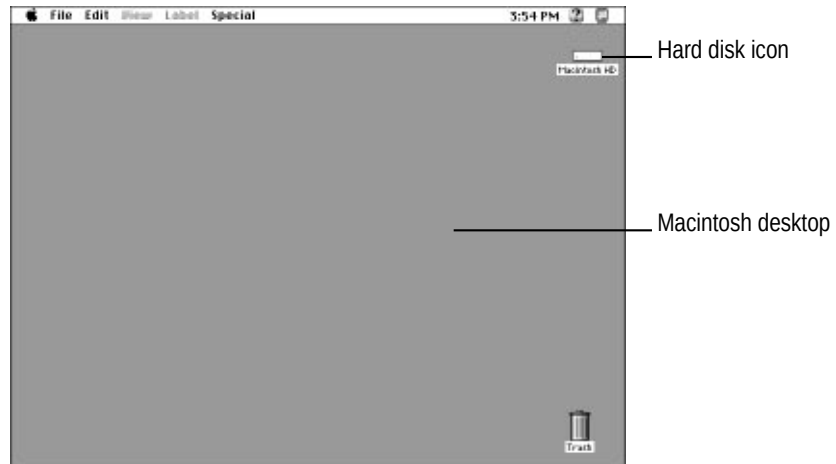
The Power key is at the top of the keyboard. You can recognize this key by the triangle outline on it (◁).

You hear a tone from the computer as it starts up.

3 **Check to see what's on your screen.**

■ If you see the Macintosh desktop, as in the illustration below, your system software has already been installed, and your computer is ready to use. Skip now to the section "What's Next?" later in this chapter.

Hard disk icon

Macintosh desktop

■ If you see a blinking question mark, you need to install system software on your computer's hard disk. (System software is the set of programs your computer uses to start itself up.) See "Installing or Reinstalling Mac OS System Software" in Chapter 7 for information on how to install system software.

■ If you see anything else on your screen, or nothing at all, see the next section, "Problems Turning Your Computer On?"

Problems turning your computer on?

If you don't see anything on the screen, check these items to see if you can identify the problem:

- Is the computer plugged into a power source? If it is plugged into a power strip, is the power strip turned on?

- Is the computer turned on? The power-on light on the front panel should be on. If it isn't on, press the standby power button on the computer's back panel (marked with the symbol ☼).

- Are the keyboard and mouse cables connected correctly? (Don't disconnect the keyboard or mouse cable while the computer is on. You could damage your equipment.)

- Is the monitor power cord plugged in?

- Is the monitor turned on? (Check the power-on light on the front of the monitor.)

- Is the monitor cable attached firmly to both the monitor and computer?

- Is the brightness control on the monitor adjusted correctly? (On Apple monitors, the brightness control is marked with the symbol ☀.)

What's next?

Congratulations! You've finished setting up your computer. Now continue with one of the following steps:

- If you are new to the Macintosh, turn to the next section, "Learning the Basics."

- If you are an experienced Macintosh user, turn to Chapter 2, "Getting Help," to learn about Macintosh Guide, your main source of information when you're working with the Mac OS (the Macintosh environment).

- If you want to connect other equipment, such as a printer, to your computer, see Chapter 3, "Connecting Additional Equipment."

- If you want to start using DOS or Windows application programs on your Macintosh, turn to Chapter 5, "Operating in the PC Environment."

Before you begin working with your computer, be sure to read the important health and safety information in Appendix A.
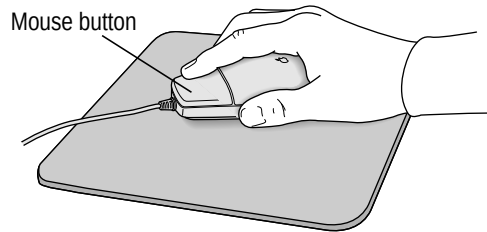
IMPORTANT If you need to turn off your computer at any point, please see "Turning the Computer Off" later in this chapter. It is very important to use the correct procedure for shutting down your Macintosh before turning it off.

Learning the basics

If you are new to the Macintosh, you should begin by looking at the easy-to-use program called the Macintosh Tutorial. The tutorial teaches you the basic skills you'll need to use your computer in the Macintosh environment. To start the tutorial, follow these steps:

1 **Slide the mouse along your mouse pad or desk.**

Hold the mouse as shown, with the cable pointing away from you. Don't press the mouse button (under your index finger). Notice that the arrow (‣) on the screen moves in the same direction that you move the mouse.

Mouse button

If the arrow doesn't move, make sure that the cables connecting the mouse and keyboard are secure and that your mouse is positioned as shown in the illustration.

2 **Move the tip of the arrow (‣) to the question mark (②) in the upper-right portion of the screen.**

If you run out of room on your mouse pad or desk while moving the mouse, pick up the mouse and place it where there's more room. (The arrow on the screen moves only when the mouse is in contact with the mouse pad or desk.)

3 **With the tip of the arrow on the question mark, press and hold down the mouse button.**

A list of choices (called a *menu*) appears. This is the Guide (②) menu, which is the place to go when you have a question about how to use your computer in the Macintosh environment (Mac OS). (The Guide [②] menu is not available when you're in the PC environment.)
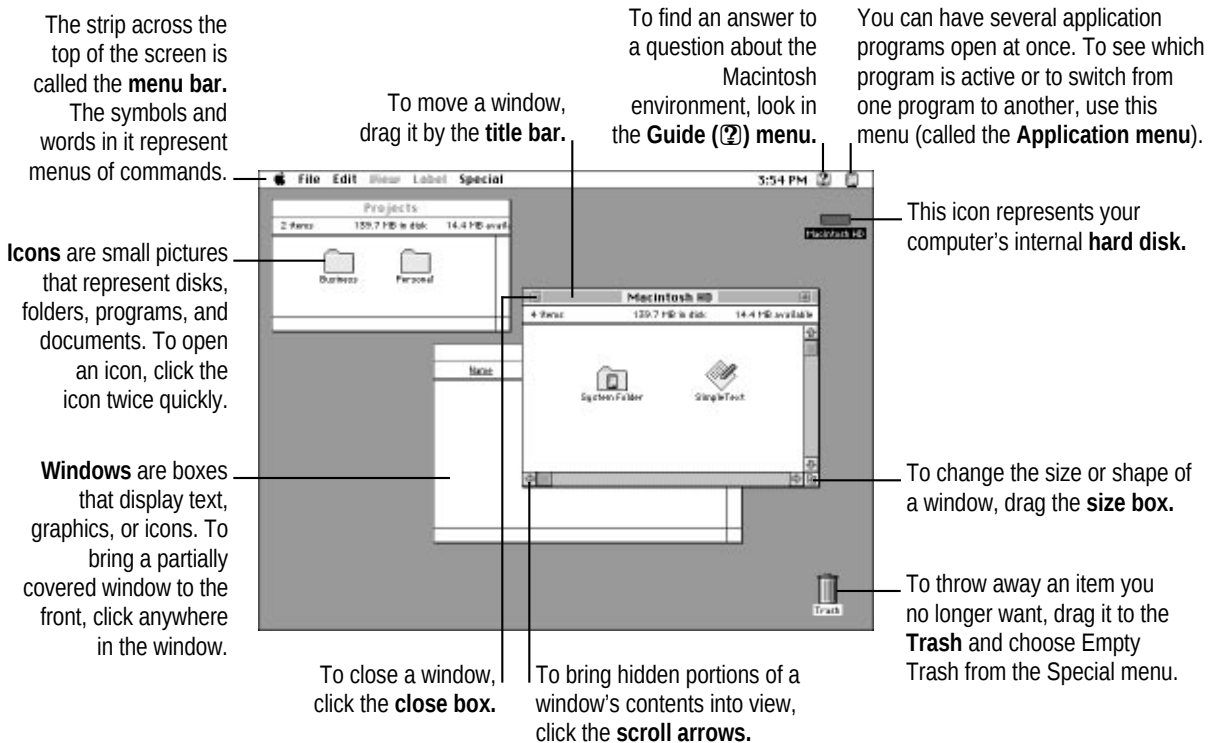
4 **While holding down the mouse button, move the arrow until the words "Macintosh Tutorial" are highlighted, then release the mouse button.**

A window appears welcoming you to the tutorial. You can set this book aside for now and follow the instructions on the screen. When you have completed the tutorial, return to this book.

Reviewing the basics

The following illustration summarizes many of the basic skills and terms you learned from the tutorial.

The strip across the top of the screen is called the **menu bar.** The symbols and words in it represent menus of commands.

Icons are small pictures that represent disks, folders, programs, and documents. To open an icon, click the icon twice quickly.

Windows are boxes that display text, graphics, or icons. To bring a partially covered window to the front, click anywhere in the window.

To move a window, drag it by the **title bar.**

To find an answer to a question about the Macintosh environment, look in the **Guide (②) menu.**

You can have several application programs open at once. To see which program is active or to switch from one program to another, use this menu (called the **Application menu**).

This icon represents your computer's internal **hard disk.**

To change the size or shape of a window, drag the **size box.**

To throw away an item you no longer want, drag it to the **Trash** and choose Empty Trash from the Special menu.

To close a window, click the **close box.**

To bring hidden portions of a window's contents into view, click the **scroll arrows.**

Turning the computer off

To turn the computer off, you choose Shut Down from the Special menu. Detailed instructions follow.

1 **Move the tip of the arrow to the word "Special" at the top center of the screen.**

If the word "Special" does not appear at the top of the screen, you're working in the wrong program. Pull down the Application menu (to the right of the Guide [②] menu) and choose Finder. Then try step 1 again.

2 **With the tip of the arrow on the word "Special," press and hold down the mouse button.**

3 **While holding down the mouse button, move the arrow down the list of choices until the words "Shut Down" are highlighted, then release the mouse button.**

You can also shut down your computer from the keyboard.

1 **Press the Power key (marked with a triangle) on the keyboard.**

You will see a message asking whether you want to shut down or continue working.

2 **Click Shut Down.**

To turn the computer on, simply press the Power key again.

> **WARNING** Do not turn the computer off by pressing the standby power button on the back panel. If you do so, you may lose any work you haven't previously saved to a disk. You also risk losing any open documents.

Where to find answers

When you have questions about using your Macintosh, there are several places you can look for answers.
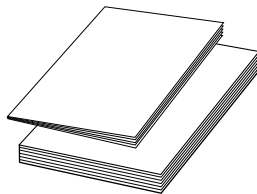
In this book

Use this book to help you set up your computer and learn about it, or to find solutions to problems.

In the Guide menu

The Guide menu (marked with the ⍰ icon) is your main source of information about the Macintosh environment. To learn how to get different kinds of help from the Guide menu, see Chapter 2 in this book.

In other manuals

For answers to questions about other equipment or about application programs you have purchased, see the manuals that came with the equipment or programs. Manuals for DOS and Windows are included with your computer.

From Apple's customer support hotline

If you can't find an answer in any of the materials provided, call the customer support hotline. (The phone number for the hotline is in the service and support information that came with your computer.)

Use the instructions in this
chapter to learn about the help
available to you in the Guide menu.

2 Getting Help

• • • • • •

The Guide menu is your main source of information when you're working with your computer in the Macintosh environment. The menu is identified by a question mark (⍰) in the upper-right corner of the screen.

```
                    3:54 PM  ⍰  ▯
         About Apple Guide
                                   ▯
         Show Balloons          ｜sh HD

         Macintosh Tutorial
         Macintosh Guide  ⌘?
         Shortcuts
```

(If you need instructions on using DOS or Windows, see the appropriate manual.)

Getting answers to your questions

When you have a question while working in the Macintosh environment, you can get the answer by choosing Macintosh Guide from the Guide menu.

1   Pull down the Application menu (in the upper-right corner of the screen) and choose Finder to make it the active application program.
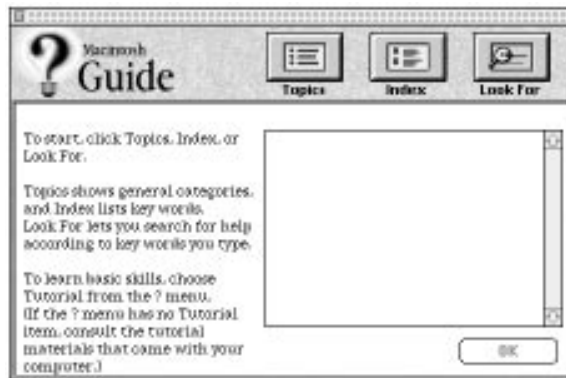
A checkmark in the menu indicates that the Finder is the active program.

2   Pull down the Guide menu (marked with the ⍰ icon) and choose Macintosh Guide.

The Macintosh Guide window appears.

Whenever you use Macintosh Guide, its window remains in front of other windows. If the window gets in your way, you can move it by dragging its title bar (the gray bar across the top of the window).

3 **Notice the three buttons at the top of the window: Topics, Index, and Look For.**

Macintosh Guide gives you three ways of finding information:

- **Topics** lets you choose from a list of general subjects; it is like the table of contents in a book.

- **Index** lets you choose from an alphabetical list of more specific subjects; it is like the index in a book.

- **Look For** lets you search for information related to a specific word or phrase that you type.
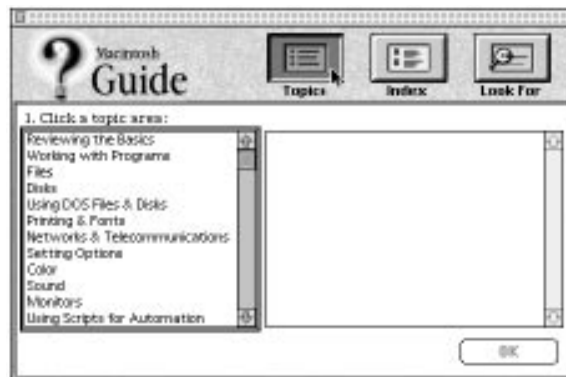
In the following sections you will practice using each method.

If you have problems while using Macintosh Guide, see "Tips for Using Macintosh Guide" later in this chapter.

Getting answers with the Topics button
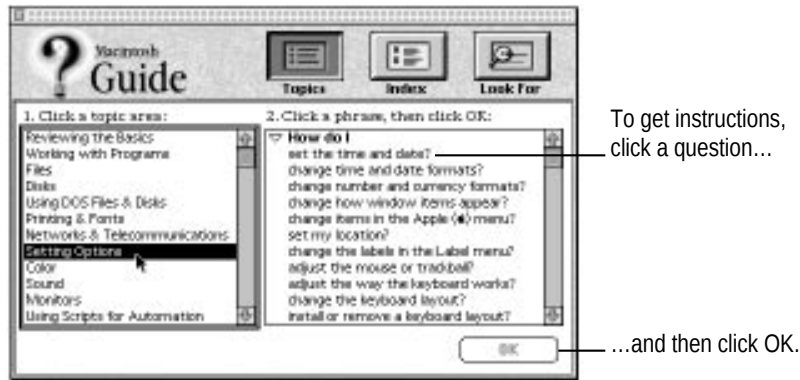
1 **In the Macintosh Guide window, click the Topics button.**

A list of general topics appears on the left side of the Macintosh Guide window. (Depending on the hardware and software you have, the list of topics may look different.)
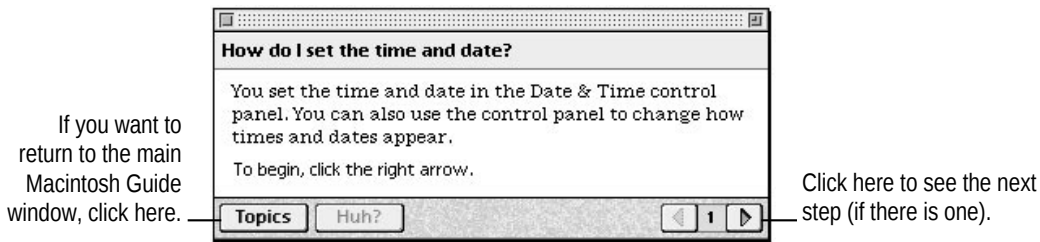
2 **Click "Setting Options" in the list of topics.**

When you click any topic area, a list of related questions appears on the right side of the Macintosh Guide window.

To get instructions, click a question…

…and then click OK.

3 **Click the question "How do I set the time and date?" and then click OK. Or double-click the question.**

A small window appears with instructions for you to follow.

If you want to return to the main Macintosh Guide window, click here.

Click here to see the next step (if there is one).

4 **Read and follow the instructions in this window.**

Macintosh Guide provides step-by-step instructions to answer the question you selected. When you have completed each step, click the right arrow in the lower-right corner to see the next step.
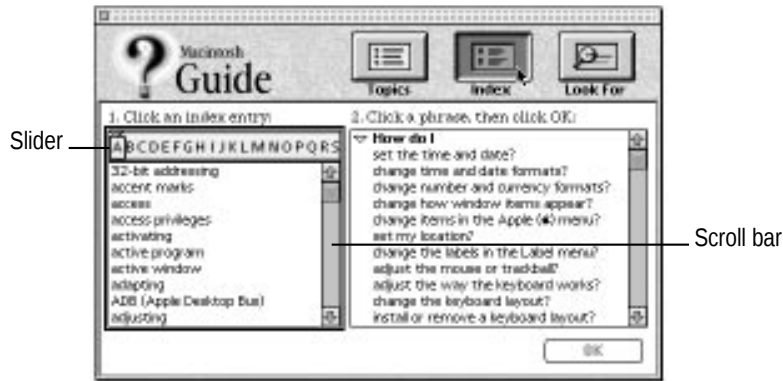
5 **When you have completed all the steps, click the Topics button in the lower-left corner to return to the main Macintosh Guide window.**

Now continue with the next section.

Getting answers with the Index button

1 **In the Macintosh Guide window, click the Index button.**

An alphabetical list of subjects appears on the left side of the window.
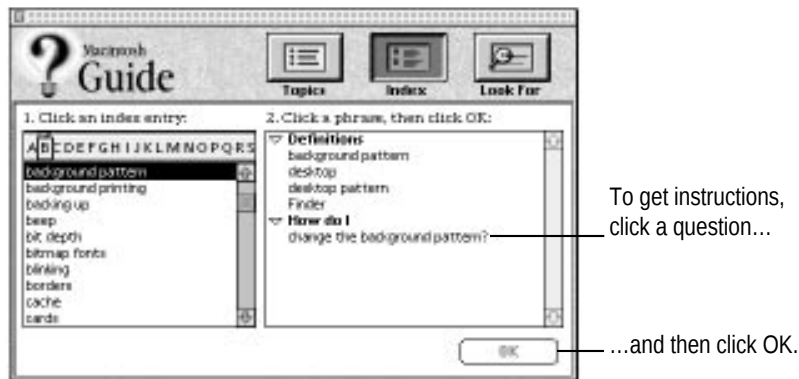
Slider

Scroll bar

2 **Scroll through the alphabetical list until the phrase "background pattern" is visible.**

You can scroll through the list either by dragging the slider to the letter *B* or by using the scroll bar at the right of the list.

3 **Click the phrase "background pattern" in the alphabetical list.**

When you click any index entry, a list of related questions appears on the right side of the Macintosh Guide window.

To get instructions, click a question…

…and then click OK.

4 **Click the question "How do I change the background pattern?" and then click OK. Or double-click the question.**

A small window appears with instructions for you to follow.

If you want to return to the main Macintosh Guide window, click here.

Click here to see the next step (if there is one).

5 **Read and follow the instructions in the window.**

Macintosh Guide provides step-by-step instructions to answer the question you selected. When you have completed each step, click the right arrow in the lower-right corner to see the next step.
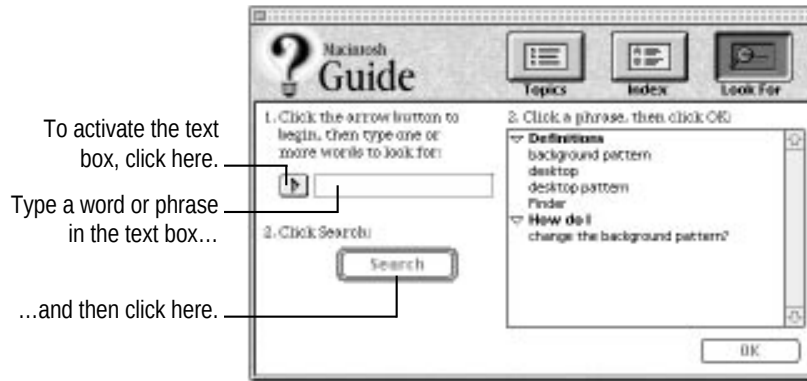
6 **When you have completed all the steps, click the Topics button in the lower-left corner to return to the main Macintosh Guide window.**

Now continue with the next section.

Getting answers with the Look For button

1   In the Macintosh Guide window, click the Look For button.
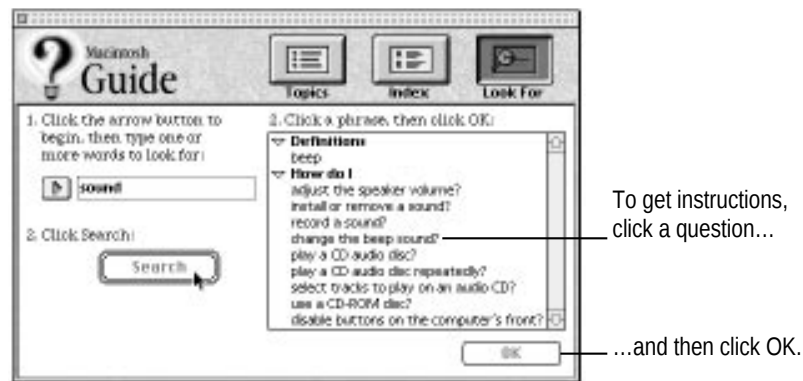
A small box appears on the left side of the window, where you can type text.

To activate the text box, click here.

Type a word or phrase in the text box…

…and then click here.

2   Click the arrow button to activate the text box.

3   Type "sound" in the text box and then click Search.
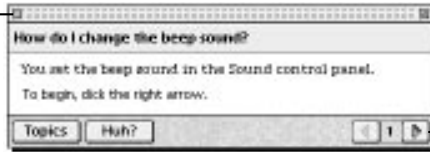
When you click Search, a list of questions related to the word or phrase you typed appears on the right side of the Macintosh Guide window.

To get instructions, click a question…

…and then click OK.

4 **Click the question "How do I change the beep sound?" and then click OK. Or double-click the question.**

A small window appears with instructions for you to follow.

If you want to close
Macintosh Guide,
click here.

How do I change the beep sound?

You set the beep sound in the Sound control panel.

To begin, click the right arrow.

Topics   Huh?   ◁ 1 ▷

Click here to see the next
step (if there is one).

5 **Read and follow the instructions in the window.**

Macintosh Guide provides step-by-step instructions to answer the question you selected. When you have completed each step, click the right arrow in the lower-right corner to display the next step.

**6** **When you have completed all the steps, click the close box in the upper-left corner to close Macintosh Guide.**
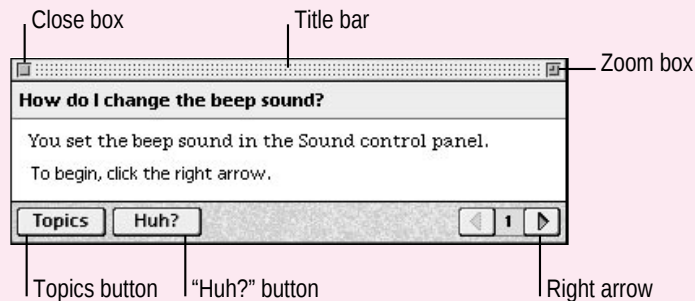
Tips for using Macintosh Guide

Here are a few tips for using Macintosh Guide effectively:

■ Macintosh Guide is available only in the Macintosh environment, and only when you are in the Finder—the desktop area where you can see the icons of disks, folders, and files. (Other programs may also have help available in the Guide menu, however.) If you don't see Macintosh Guide in the Guide menu, pull down the Application menu (to the right of the Guide menu) and choose Finder.

■ Follow the steps when you're instructed to; don't skip ahead or read ahead. That way the computer can check to make sure you've done a step correctly.

■ Unlike most windows, the Macintosh Guide window stays in front of other windows on the screen so that your instructions are never covered. If you need to move the Guide window out of the way, drag it by the title bar at the top of the window.

You can also move the window out of the way by clicking the zoom box. Click the box once to shrink the window; click it a second time to expand the window to its original size.

■ If you need more information about an instruction or a term, click the button labeled "Huh?" to get further explanation. (The "Huh?" button is dimmed when no additional information is available.)

■ If you want to return to the main Macintosh Guide window, click the Topics button in the lower-left corner of the Guide window.

■ When you're finished using Macintosh Guide, click the close box in the upper-left corner of the window.

Close box   Title bar

Zoom box

How do I change the beep sound?

You set the beep sound in the Sound control panel.

To begin, click the right arrow.

Topics   Huh?   ◁ 1 ▷

Topics button   "Huh?" button   Right arrow

Identifying objects on the screen

Sometimes you'll see an unfamiliar item on the screen and ask yourself, "What's that?" You can get an answer by using a Macintosh feature known as Balloon Help.

Balloon Help explains the function of icons, menus, commands, and other items in the Macintosh environment using balloons like those you see in comic strips.

Follow these steps to use Balloon Help:

1   Pull down the Guide menu (marked with the ② icon) and choose Show Balloons.

2   Point to any object on the screen that you want to identify.

A balloon appears next to the object. In the following illustration, for example, pointing to the Trash displays a balloon that explains how to use the Trash to throw items away.

Although balloons appear next to items when you point to them, the way you work does not change; you can still select icons, choose commands, and so on.

3   When you're finished using Balloon Help, choose Hide Balloons from the Guide menu.

Learning useful shortcuts

You can perform many tasks in the Finder more quickly if you use keyboard or mouse shortcuts. For example, instead of clicking an icon and choosing Open from the File menu, you can simply double-click the icon to open it.

Follow these steps to learn keyboard and mouse shortcuts:

1   Pull down the Guide menu (marked with the ⍰ icon) and choose Shortcuts.

The main Macintosh Shortcuts window appears.

2 **Click one of the category buttons.**

Another window appears, describing shortcuts for that category.

If you want to
close the window,
click here.

Working with icons

To open an icon

Double-click the icon

To copy an icon into another folder (instead of moving it)

Click here to return to
the main Macintosh
Shortcuts window for
more categories.

option + drag the icon

Topics

Click here to see the next
window (if there is one).

3 **Read about the shortcuts available for the category you selected.**

Click the right arrow in the lower-right corner of the window to display the
next window (if there is one).

4 **When you finish reading about the shortcuts for your category, click the Topics button in
the lower-left corner to return to the main Macintosh Shortcuts window. Or click the
close box in the upper-left corner to close the window.**
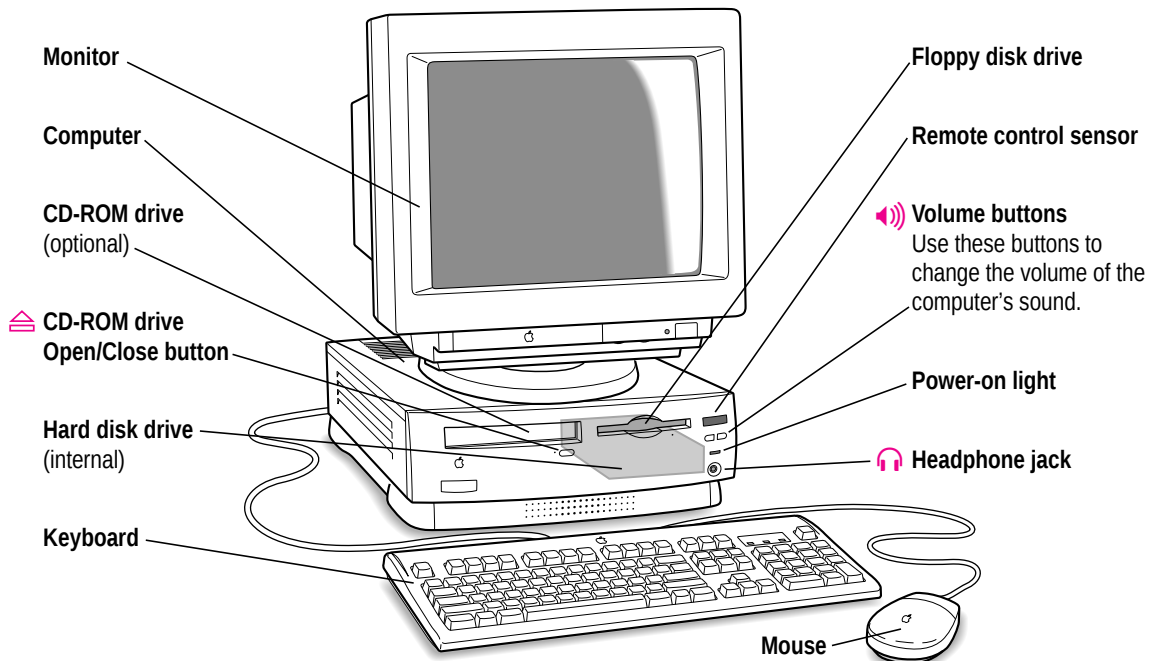
Read this chapter for information on
expanding your computer system
with additional hardware.

3 Connecting Additional Equipment
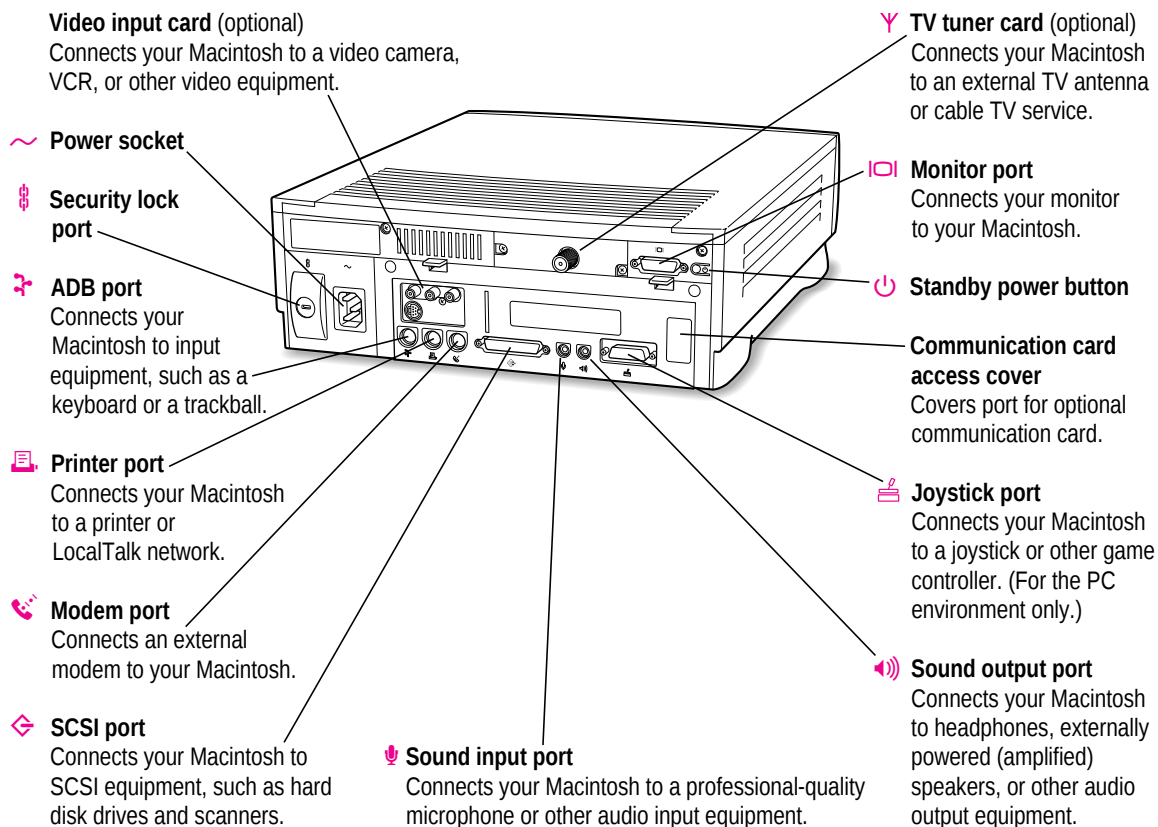
The illustration below shows a basic Macintosh system. You can expand your computer system by connecting additional hardware (such as a printer, modem, or external audio speakers).

Monitor

Computer

CD-ROM drive
(optional)

⏏ **CD-ROM drive**
Open/Close button

Hard disk drive
(internal)

Keyboard

Floppy disk drive

Remote control sensor

◀)) **Volume buttons**
Use these buttons to change the volume of the computer's sound.

Power-on light

🎧 **Headphone jack**

Mouse

Where to connect additional equipment
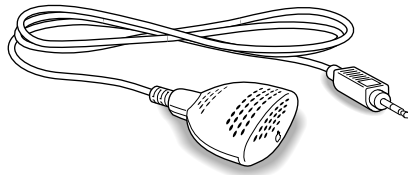
The illustration on this page shows where equipment should be connected to your computer.

For instructions on connecting additional equipment such as a printer or scanner, see the manual that came with the equipment.

Video input card (optional)
Connects your Macintosh to a video camera, VCR, or other video equipment.

∼ **Power socket**

Security lock port

ADB port
Connects your Macintosh to input equipment, such as a keyboard or a trackball.

Printer port
Connects your Macintosh to a printer or LocalTalk network.

Modem port
Connects an external modem to your Macintosh.

SCSI port
Connects your Macintosh to SCSI equipment, such as hard disk drives and scanners.

Sound input port
Connects your Macintosh to a professional-quality microphone or other audio input equipment.

TV tuner card (optional)
Connects your Macintosh to an external TV antenna or cable TV service.

Monitor port
Connects your monitor to your Macintosh.

Standby power button

Communication card access cover
Covers port for optional communication card.

Joystick port
Connects your Macintosh to a joystick or other game controller. (For the PC environment only.)

Sound output port
Connects your Macintosh to headphones, externally powered (amplified) speakers, or other audio output equipment.

Connecting an Apple PlainTalk Microphone
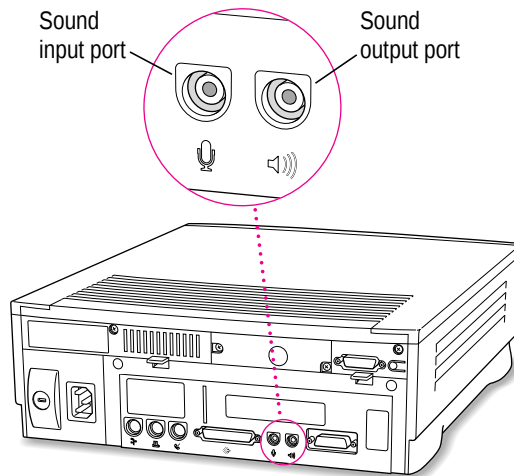
Your computer has a sound input port, which you can use to connect an Apple PlainTalk Microphone.

Use PlainTalk only: You should connect only the Apple PlainTalk Microphone. Other models of microphone will not work with your Macintosh.

To connect the microphone, do this:

■ **Plug the microphone's connector into the sound input port (marked with the icon) on the back of the computer.**
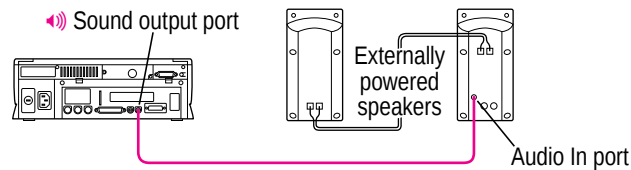
Connecting external stereo speakers

You can take advantage of your computer's stereo sound output by attaching externally powered (amplified) speakers. (Only externally powered speakers will work with your Macintosh.)

1 Assemble the speakers and the cable you need.

You need a cable with stereo miniplugs at each end to connect one or both speakers to the computer. (Some speakers require a dual-plug adapter. Others, like those shown here, accept a single stereo miniplug and are joined by standard speaker wires.)

The following illustration shows the equipment configuration and the connections for a computer sound system.

2 Turn off the Macintosh.

3 Plug a stereo miniplug into the sound output port on the Macintosh.

Stereo miniplug

4 Plug a stereo miniplug into the Audio In port on one of the speakers.

If the speakers take a dual-plug cable, connect both plugs to the speakers' Audio In ports.

5   **Connect the speakers together with speaker wires, if necessary.**
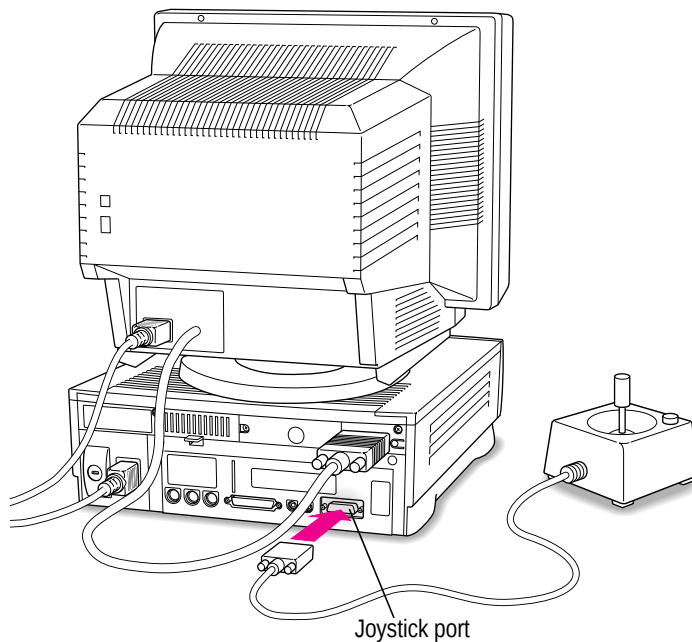
6   **Turn on the computer.**

You hear the computer's sound through the external speakers.

Note: To control the volume of your external speakers, use the volume button on the front of the computer. If you are playing an audio compact disc (CD), you may also need to adjust the volume control in the program you're using to play CDs. For more information on sound and playing audio CDs, see the "Sound" topic of Macintosh Guide, available in the Guide (🄷) menu. For information on hearing sounds in the PC environment, see "Turning On PC Sounds" in Chapter 6.

Connecting a game controller

Connect a game controller, such as a joystick, as shown.

Joystick port

■ **Attach the joystick's connector to the joystick port on the lower-right corner of the computer's back panel. Tighten the thumbscrews securely.**

Expanding memory

The random-access memory (RAM) in your computer can be expanded. Installing additional RAM adds more memory chips to your computer and expands its capabilities. The *Technical Information* booklet that came with your computer describes how much additional memory can be installed in your Macintosh.

You can also add up to 32 megabytes (MB) of RAM for use exclusively in the PC environment. See Appendix B, "Installing an Expansion Card or Memory for the PC Environment," for further information.

Memory for your computer is provided in packages called Single Inline Memory Modules (SIMMs). The SIMMs must be the correct type for your computer. It is very important that the SIMMs be correctly installed in your Macintosh. Incorrect installation can result in errors, unpredictable results, and damage to your equipment and data.

WARNING To avoid damage to your computer, Apple recommends that only an Apple-certified technician install additional RAM. Consult the service and support information that came with your computer for instructions on how to contact an Apple-authorized service provider or Apple for service. If you attempt to install additional RAM yourself, any damage you may cause to your equipment will not be covered by the limited warranty on your computer. See an Apple-authorized dealer or service provider for information about this or any other warranty question.

Installing internal drives

Your Macintosh can hold up to three internal storage devices, including a floppy disk drive, a CD-ROM (compact disc read-only memory) drive, and a hard disk drive (several capacities are available). These drives may already be installed. If you want to add or replace an internal drive, see your Apple-authorized dealer.

Read this chapter for information on
installing and using application
programs in the Mac OS.

4 Installing and Using Application Programs in the Macintosh Environment

Your computer has several Macintosh application programs already installed, as well as some Macintosh programs that must installed before you can use them. You will need to run an application program's Installer program before the application program will work. You'll find these programs on your hard disk.

You may want to experiment with AppleScript, one of the programs on your hard disk. With AppleScript you can automate tasks in the Finder and other scriptable programs (programs that support AppleScript). Instructions for using AppleScript are included in the AppleScript folder.

If your computer has enough memory, you can install QuickDraw GX and PowerTalk. QuickDraw GX gives your computer more powerful printing and font capabilities. PowerTalk provides an open collaboration environment with a universal mailbox and other electronic mail services. To install each of these programs, open the folder of the item you want to install and double-click the Installer icon.
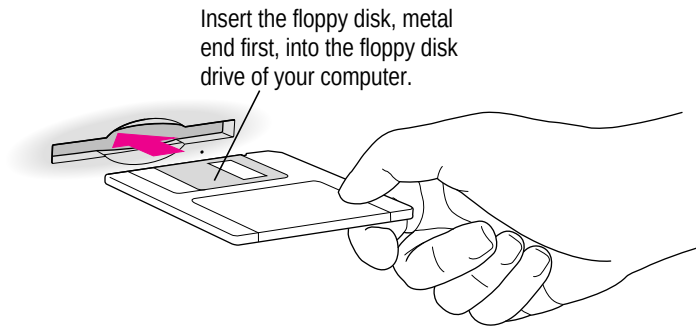
Another program, Video Monitor, is for use with computers that have audio-visual (AV) capabilities. For information on using Video Monitor, see the "Video" topic of Macintosh Guide, available in the Guide (②) menu.

If you want to install DOS application programs, see Chapter 5, "Operating in the PC Environment," and refer to your DOS manual.

Installing Macintosh application programs

You'll probably want to buy and install additional application programs. See the manuals you receive with your programs for instructions on installing and using them.

In most cases, you'll install a Macintosh application program on your internal hard disk from floppy disks that contain the program. The following illustration shows how to insert a floppy disk in your computer's floppy disk drive.

Insert the floppy disk, metal end first, into the floppy disk drive of your computer.

To use your programs most effectively, follow these guidelines:
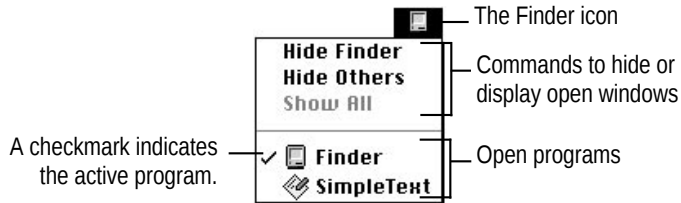
■ Put only one copy of each program on your hard disk. Having more than one copy can cause errors.

■ Whenever you copy a program disk to your hard disk, be careful not to copy a System Folder. Always check to see what you've copied, and drag any extra System Folders to the Trash.

■ If a program malfunctions consistently, try installing a fresh copy. If that doesn't help, find out from the software manufacturer whether your version of the program is compatible with the system software you're using.

For instructions on how to eject floppy disks, see the "Disks" topic of Macintosh Guide, available in the Guide (?) menu.

Working with several programs at a time

You can open as many application programs and desk accessories as your computer's memory allows.

All open programs in the Mac OS are listed in the Application menu at the right end of the menu bar. The name of the active program (the one you're using right now) has a checkmark next to it, and its icon appears in the menu bar.

The Finder icon

Commands to hide or display open windows

A checkmark indicates the active program.

Open programs

You can have programs open in both the Macintosh and PC environments at the same time, but only your Macintosh programs appear in the Application menu.

Finding out which programs are open

If you have several programs and windows open, you can find out which program is active and which other programs are open by pulling down the Application menu.

Switching programs

You can switch to another open program or desk accessory by choosing its name from the Application menu.

If a program's icon is dimmed in the menu, that means its windows are hidden. Choosing the program from the Application menu displays its windows.

You can also switch to another program by clicking in a window that belongs to an open program, or by double-clicking a program icon (or the icon of a document that was created with the program).

For instructions on switching from the Macintosh environment to the PC environment, see the section "Switching Between the Macintosh and PC Environments" in Chapter 5.

Hiding and showing windows on the desktop

You can hide all windows except those of the active program by choosing Hide Others from the Application menu.

The other programs remain open even though their windows are hidden. When you switch to another program, its windows become visible again.

If you want to see all the open windows, choose Show All from the Application menu.

Backing up your files

Making backup copies of important files is good protection against possible damage to the originals.

- You can back up files stored on your hard disk by copying them to floppy disks.

- You can back up an entire floppy disk by copying it to another floppy disk, or to a hard disk.

- You can use a commercial backup program to copy new and changed files from a hard disk to another hard disk, to a tape drive, or to a series of floppy disks.

- If your computer is on a network, you can back up files by copying them to a shared disk on the network.

To back up files in the Macintosh environment, copy the files to a disk manually or use a Macintosh backup program. Do not use PC backup programs in the Mac OS.

5 Operating in the PC Environment

Your DOS-compatible Macintosh comes with standard versions of DOS and Windows already installed. Also installed is software you can use to work in both the Macintosh and PC environments and share data between the two environments. This software is described in this chapter and the next.
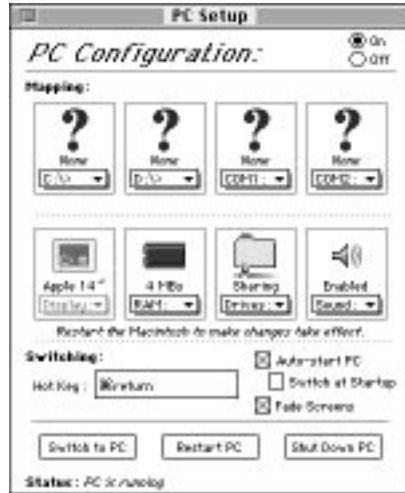
This chapter covers how to

- switch between the Mac OS and the PC environment
- set up and operate in the PC environment
- use floppy disks and disk drives
- cut, copy, and paste data between Mac OS and DOS or Windows documents
- run network software
- use multimedia, MIDI, and game applications
- use both Macintosh and PC peripheral devices in the PC environment

Switching between the Macintosh and PC environments

You switch between the Mac OS and the PC environment using the PC Setup control panel. Follow these steps:

1   Choose Control Panels from the Apple () menu.

2   Double-click the PC Setup icon to open the control panel

3   Click Switch to PC to switch to the PC environment.

4   To switch back to the Mac OS, press ⌘-Return.

Switching with a keyboard command

You can set a keyboard command, or hot key, to switch between the Mac OS and the PC environment. To set the hot key, you must be in the Macintosh environment (if you are in the PC environment, press ⌘-Return).

■ **To choose a hot key, open the PC Setup control panel and press the Tab key to select the Hot Key text field; then type the keys you want to use.**

The ⌘ key is automatically included. You can use any alphanumeric or special key. You can also include other modifier keys (Option, Control, and/or Shift).

⌘-Return always switches from the PC to the Mac OS, regardless of the control panel setting.

You can also switch to the PC by clicking Switch to PC in the control panel.

Ejecting disks in the PC environment

Here are a few commands you will find useful while you work in the PC environment.

■ **To eject a disk from the Macintosh disk drive while you're in the PC environment, press ⌘-E.**

■ **To eject a CD-ROM disc in the PC environment, press ⌘-Y.**

For more details, see the section "Working in the PC Environment," later in this chapter.

Turning the PC on and off

You use the buttons near the bottom of the control panel to switch environments, to restart the PC, or to shut the PC off.

■ **Switch to PC** immediately switches to the PC environment.

■ **Start/Restart PC** starts the PC if it's off, or restarts it if it's running (but doesn't switch to the PC environment).

■ **Shut down PC** turns off the PC.

IMPORTANT Clicking Off at the top of the PC Setup control panel prevents you from switching to the PC environment. When you restart the computer, the PC environment is turned off and any RAM you requested for it is available to the Mac OS.

Starting the PC automatically

To have the PC start automatically when you turn on your Macintosh:

■ **Click the checkbox next to Auto-start PC.**

To make the PC environment appear when you turn on your Macintosh:

1 **Click the checkbox next to Switch at Startup.**

2 **In the Control Panels folder, double-click the General Controls icon to open it.**

3 **Turn off the Shutdown Warning option in the General Controls panel.**

If Shutdown Warning is turned on when you switch from the Mac OS to the PC environment, you will not be able to switch back again for a few minutes.

Fading the screen

To have the screen fade briefly before switching environments, click the checkbox next to Fade Screens.

Setting up the PC environment

In order to take advantage of certain utilities, you may need to modify your DOS CONFIG.SYS file. For information about how to edit DOS files, see your DOS manual. For information about the kinds of changes you might need to make, read the information below.

Note: Your DOS system software also includes alternate versions of the CONFIG.SYS and AUTOEXEC.BAT files that allow you to select from a variety of memory management options each time you start DOS. For information on how to install these alternate files, see "Replacing the CONFIG.SYS and AUTOEXEC.BAT Files" in the section "Reinstalling the DOS-Compatibility Software" in Chapter 8.

Memory management utilities

If you use a memory management utility such as EMM386 or QEMM, you need to configure it to be compatible with your DOS-compatibility hardware and software.

IMPORTANT Apple does not recommend using automated memory configuration utilities with your DOS-compatible Macintosh because they can require more memory than management utilities you configure manually. Additionally, some memory configuration utilities may not be able to determine the exact nature of the DOS-compatibility hardware, and therefore may not be compatible.

If you want to use EMM386 (included as part of DOS) and don't require expanded memory, set CONFIG.SYS to the following:

```
DEVICE=C:\DOS\EMM386.EXE NOEMS RAM=D000-EFFF
```

If you require expanded memory, set CONFIG.SYS to the following:

```
DEVICE=C:\DOS\EMM386.EXE RAM=D000-EFFF FRAME=D000
```

If you want to use QEMM, use the frame option (ST:F):

```
DEVICE=C:\QEMM\QEMM386.SYS RAM ST:F ARAM=B080-B7FF
ARAM=C900-DFFF R:1
```

If you want to use the Stealth mapping option (ST:M), set CONFIG.SYS to

```
DEVICE=C:\QEMM\QEMM386.SYS RAM ST:M X=C800-CFFF X=FC00-
FCFF X=FE00-FFFF ARAM=B080-B7FF ARAM=C900-DFFF R:2
```

Configure other memory management utilities such that D000 through EFFF is the only area in the BIOS that can be mapped to upper memory.

To prevent the ROM BIOS from becoming corrupted when the DOS-compatibility card is configured for 2 MB of memory, set the switch in the CONFIG.SYS file to turn memory testing off.

```
DEVICE=C:\DOS\HIMEM.SYS /TESTMEM:OFF
```

For more information on making the best use of memory, read the sections on memory management in your DOS manual, or refer to the documentation for your memory manager if you are using something other than EMM386.

Working in the PC environment

When you switch to DOS or Windows, you're operating in a real PC world. The floppy disk drive, mouse, and keyboard all act as they would with a standard PC. There are, however, some mapping issues you need to be aware of.

Floppy disk drives and floppy disks

■ The Macintosh floppy disk drive is drive A. To eject a disk from this disk drive while you're in the PC environment, press ⌘-E.

■ If you insert a Mac OS-format floppy disk while you're in the PC environment, it is ejected.

You can access an unlocked floppy disk only in the environment that was in the foreground when the floppy disk was inserted.

When you insert a locked PC disk, both environments have access to it.

Blank disks are formatted as DOS disks in the PC environment. In the Mac OS, you can format disks for DOS or the Mac OS (among other choices).

Some blank disks are preformatted by the manufacturer. If you insert a new, blank disk in the PC environment and it is ejected, it may have been preformatted as a Macintosh disk. To use the disk in the PC environment, you must first return to the Mac OS and reformat (reinitialize) the disk as a DOS disk.

The Mac OS Disk Copy application program cannot read a DOS-formatted floppy disk unless the disk is unlocked.

Floppy disks formatted in the PC environment in DOS 720K format are not readable by some DOS computers. Instead, format the disk in the Macintosh environment, choosing "DOS 720K" as the format. See "How do I prepare a disk for use?" in the "Disks" topic of Macintosh Guide, available in the Guide (⍰) menu.

Restarting the PC from a floppy disk

To restart (reboot) the PC environment from a floppy disk, insert the disk into the floppy drive. Press ⌘-Control-Alt-[keypad] period. When the floppy disk is ejected, immediately reinsert it into the disk drive.

CD-ROM discs and drives

You can use DOS and Windows CD-ROM discs in Apple CD-ROM drives.

To eject a CD-ROM disc in the PC environment, press ⌘-Y. If the CD-ROM disc cannot be ejected (because a file is in use or the CD-ROM disc is being shared), the Macintosh beeps.

You can listen to audio CDs in either the PC environment or Mac OS, but you cannot control them from both environments at the same time. For example, if you began listening to an audio CD while working in the PC environment and then switched to the Mac OS, you would have to return to the PC environment in order to adjust the CD's volume.

Playing an audio CD in Windows while running low-level media tools, such as PC Tools or Microsoft Anti-Virus, may cause your system to crash. It is best to reduce computer activity to a minimum while using such tools.

You cannot use more than one CD-ROM drive at a time in the PC environment.

The PC sets up a drive letter (E) for a CD-ROM drive even if no drive is connected. If no CD-ROM drive is connected to your system, you can use this drive letter and free some memory by editing the AUTOEXEC.BAT and CONFIG.SYS files.

In the AUTOEXEC.BAT file, add `REM` to the beginning of the line

```
LH C:\DOS\MSCDEX /D:CDDRVR /L:E
```

In the CONFIG.SYS file, add `REM` to the beginning of the line

```
DEVICE=C:\Apple\CDROM.SYS /D:CDDRVR
```

Prefacing these commands with `REM` makes DOS ignore them.

Pointing device

The standard Macintosh pointing device has one button; most PC devices have two. The button on the Macintosh pointing device behaves like the left button on a PC device.

- To simulate the right button, press the = key on the keypad.
- To press the left and right buttons at the same time, press the mouse button and the = key simultaneously.

If you have Windows installed, you can use its Mouse control panel to switch the button assignment.

Note: DOS does not come with a mouse driver. A mouse driver for Windows is installed on your system along with Windows, however.

Keyboard

The DOS-compatible Macintosh supports all Apple keyboards.

The Option key on an Apple keyboard can be used as the Alt key in the PC environment.

The Apple Extended Keyboard and the Apple Design Keyboard can be used normally. With the Apple Keyboard II, use the following equivalents for keys on a PC keyboard. These equivalents also apply to the Apple Adjustable Keyboard if the function key keyboard isn't plugged in.

PC key	Equivalent on Macintosh keyboard
F1 through F9	⌘-1 through 9
F10	⌘-0
F11	⌘-(minus)
F12	⌘-(equals)
F13	⌘-[
F14	⌘-]
F15	⌘-\
Home	⌘-[keypad] 7
PageUp	⌘-[keypad] 9
End	⌘-[keypad] 1
PageDown	⌘-[keypad] 3
Insert	⌘-[keypad] 0
Del	⌘-[keypad] (period)

Using the Apple Adjustable keyboard: If you are using the Apple Adjustable keyboard, you cannot use key combinations made up of keys from the main keyboard and function keys (for example, Shift-F1). This means you cannot restart the PC using the ⌘-Control-Alt-[keypad] period key combination. Click Restart PC in the PC Setup control panel instead.

MacShare

MacShare is a PC application program that lets the PC view Mac OS folders and volumes as drive letters. You can have as many shared drives as there are drive letters.

■ **To specify the number of drive letters, modify your CONFIG.SYS file to include a LASTDRIVE statement.**

LASTDRIVE=x

where x is a letter between E and Z. (The PC reserves drives A through D for its floppy and hard disk drives.)

For example, if you use M as your LASTDRIVE value, you could have up to nine extra drives using drives labeled E through M. A CD-ROM drive, if installed, uses E.

Each additional drive letter uses 100 bytes of PC memory.

Clipboard

You can exchange clipboard information between the PC environment and the Mac OS. The type of information you can exchange depends on whether you're running DOS or Windows.

Windows Clipboard

You can exchange text, PICT, RTF, and bitmap files between the Mac OS and Windows using the Copy and Paste commands from the Edit menu. You can also purchase additional third-party software to provide translations for other data types.

DOS "Clipboard"

If you're running DOS, you can capture text or a PICT file from a region of the screen that you define using the DOSCLIP TSR (Terminate-and-Stay-Resident program). The memory-resident program is loaded automatically each time you switch to DOS. You activate DOSCLIP by pressing a keyboard combination, or keystroke, (preset to Shift-Control-C) and then selecting a region to copy.

Keystroke starts process: On the PC side, enter the keystroke first; then, holding down the mouse button, select a region to copy. (This process works only if a DOS mouse driver is installed.) Releasing the mouse button sends the selection to the Clipboard. In the Mac OS, you select the area first and then issue the keystroke.

To capture text or a PICT file from a region on the screen if you don't have a DOS mouse driver installed, follow these instructions:

1 Activate DOSCLIP.

The DOSCLIP activation keystroke is preset to Shift-Control-C.

A cursor appears in the center of the screen.

2 Use the keyboard arrow keys to move the cursor to the upper-left corner of the region you want to copy.

3 Holding down the Shift key, use the arrow keys to move the cursor to the lower-right corner of the region.

4 Release the Shift key.

The selected area is copied to the Clipboard.

■ You can paste text into DOS from the Mac OS. The preset keystroke is Shift-Control-V.

Changing the predefined keystrokes in DOS

You change the preset keystrokes for copying and pasting by editing the AUTOEXEC.BAT file.

■ **To change the keystroke for the Copy command, use the form**

`C:\APPLE\DOSCLIP/C`*nm*...

■ **To change the keystroke for the Paste command, use the form**

`C:\APPLE\DOSCLIP/P`*nm*...

In both cases, *n* is a number representing a key scan code from the following table, and *m...* is one or more of the characters A, C, and S (for Alt, Control, and Left- or Right-shift).

For example, the preset code for Copy is `/C46CA`—/C[opy using the key] 46 [which is C, plus the] C[ontrol key plus the] A[lt key]. To change the keystroke to F3, you'd type the following:

`C:\APPLE\DOSCLIP/C61`

Note: To get on-screen help about other DOSCLIP options, type `DOSCLIP /?` at the DOS prompt.

Key	Scan code	Key	Scan code
0	11	**' "**	40
1	2	**, <**	51
2	3	**- _**	12
3	4	**. >**	52
4	5	**/ ?**	53
5	6	**; :**	39
6	7	**= +**	13
7	8	**[{**	26
8	9	**\ |**	43
9	10	**] }**	27
` ~	41		
+ (keypad)	78	**tab**	15
- (keypad)	74	**alt**	56
arrow (down)	80	**bksp**	14
arrow (left)	75	**caps**	58
arrow (right)	77	**center**	76
arrow (up)	72	**ctrl**	29
del	83	**pgdn**	81
end	79	**pgup**	73
enter	28	**prtsc**	55
esc	1	**scroll**	70
home	71	**shift (left side)**	42
ins	82	**shift (right side)**	54
num	69	**space**	57

Key	Scan code	Key	Scan code
F1	59	F7	65
F2	60	F8	66
F3	61	F9	67
F4	62	F10	68
F5	63	F11	87
F6	64	F12	88
A	30	N	49
B	48	O	24
C	46	P	25
D	32	Q	16
E	18	R	19
F	33	S	31
G	34	T	20
H	35	U	22
I	23	V	47
J	36	W	17
K	37	X	45
L	38	Y	21
M	50	Z	44

Tips for using the Clipboard

When the PC environment is running, you have three separate clipboards to work with—the Mac OS Clipboard, the Windows Clipboard, and DOSCLIP. Translation between the clipboards takes place each time you switch between the PC and Macintosh environments. When using these clipboards there are a few things to keep in mind.

■ If you copy an item to the Macintosh Clipboard, switch to Windows, and then copy an item to the Windows Clipboard, the original Macintosh Clipboard contents will be deleted. To prevent this, remove the PC Clipboard extension from the Extensions folder (inside the System Folder in the Mac OS).

■ In order to translate the contents of the Macintosh Clipboard to the Windows Clipboard, Windows must be already running when you switch environments. If you switch to DOS and then launch Windows, the Macintosh Clipboard will be translated into DOSCLIP, and the Windows Clipboard will be blank.

■ In order to translate the contents of the Macintosh Clipboard to DOSCLIP, Windows must not be running when you switch environments. If Windows is running when you switch to the PC, the Macintosh Clipboard will be translated into the Windows Clipboard, and DOSCLIP will be blank.

■ DOSCLIP contents cannot be pasted into Windows, or vice versa.

■ Graphics can be copied from a DOS application program to DOSCLIP, but graphics cannot be pasted into a DOS program from DOSCLIP.

■ After copying a graphic from DOS using DOSCLIP, you may experience difficulty in pasting the graphic into a Macintosh application program. If this happens, try increasing the Macintosh program's memory. (See the question "How do I change a program's memory size?" in the "Working with Programs" topic of Macintosh Guide, available in the Guide [②] menu.)

■ Sounds cannot be copied between the Macintosh and the PC.

■ Plain text is automatically translated from one environment to another, but in order to retain font and style information, additional Macintosh Easy Open translators must be used (for example, MacLink Plus from DataViz).

- When using DOSCLIP from within certain application programs, it may not be possible to select the text using the mouse. In these cases, either use the keyboard to select your text, or check that the standard DOS mouse driver is *not* loaded.

- When the PC environment is active, all Macintosh programs are put in the background to allow the PC Clipboard to run in the foreground. If you do not want your Macintosh programs to run in the background while you are in the PC environment, you must disable the Clipboard translation by removing the PC Clipboard Extension from the Extensions folder (inside the System Folder in the Mac OS).

Running network software

The DOS-Compatibility Software on your computer supports any networking protocols, operating systems, or application programs that are compatible with Novell's Open Data-Link Interface specification (ODI).

- **To set up the software, install your networking client software in the PC environment.**

Networking client software such as Netware is not included with the DOS-compatible Macintosh.

Compatible and incompatible protocols

You can run NetWare in the PC environment at the same time that you're running AppleTalk in the Mac OS.

To use IPX or TCP networking protocols, you must have an Ethernet card installed in your computer's communication slot. (The Ethernet card is not a standard feature.)

You can use the IPX and TCP protocols at the same time in either the PC environment or the Mac OS, or you can use one protocol in the PC environment and the other protocol in the Mac OS. However, you cannot use the same protocol in both environments at the same time.

If you want to use the IPX protocol in the PC environment and you have installed MacIPX in the Mac OS, remove MacIPX from the Control Panels folder or select AppleTalk as your network interface in the MacIPX control panel.

If you want to use the TCP protocol in the PC environment, remove MacTCP from the Control Panels folder or select an interface other than Ethernet in the MacTCP control panel.

Network performance is improved by adding memory to the DOS-compatibility card installed in your computer, as described in Appendix B.

For more information, see Appendix E, "Installing Network Management Software."

Using multimedia, MIDI, and game application programs

These types of programs, whether they are run in the PC or Macintosh environment, see a marked performance improvement when there is a memory SIMM on the DOS-compatibility card for the exclusive use of the PC environment. See the *Technical Specifications* booklet to determine whether your computer has a SIMM installed on the DOS-compatibility card. You can also install a SIMM with greater memory capacity, as described in Appendix B, "Installing an Expansion Card or Memory for the PC Environment." QuickTime application performance is especially improved with a SIMM.

Some DOS-based MPEG players require a VGA monitor to output video. All VGA modes can be displayed on Macintosh monitors supported by the DOS-compatible Macintosh. If the monitor specified to display the PC is a VGA monitor, select VGA in the Display box in the PC Setup control panel. You cannot select VGA for a shared monitor configuration from the PC Setup control panel if your monitor is not capable of displaying VGA. Multiscan monitors can display VGA.

Using Macintosh peripherals in the PC environment

You use the serial ports of your Macintosh just like the serial ports of any PC-compatible computer.

The maximum data transfer rate supported by the DOS-compatible hardware when a COM port is mapped to a Macintosh serial port is 19,200 bits per second (bps). If you're capturing serial output to a Mac OS text file, there is no limit.

Using printers

For DOS or Windows printing, use the LPT1.DOS or LPT1 serial port. In general, you must use printers that are Macintosh-compatible and use their corresponding printer extension for the Macintosh. However, in a PC Novell NetWare environment you can print to a PC-compatible printer attached to a Novell network. See Appendix E, "Installing Network Management Software."

DOS uses the printer selected in the Macintosh Chooser as the default LPT1 device. If you have a serial printer directly connected to a COM port, however, DOS uses that printer instead.

The DOS-compatible software can process output for Epson and PostScript printers, and for all printers that use Hewlett-Packard's page control language (PCL).

QuickDraw printers such as the StyleWriter or ImageWriter work only with Epson emulation. (If a printer is not a PostScript or PCL printer, it's considered to be a QuickDraw printer.) For non-PostScript PCL printers, use the appropriate PCL driver in the PC environment. For non-PostScript, non-PCL printers, configure your DOS application program to use the Epson LQ-2500 driver. If this driver isn't available, try another Epson LQ or LX series driver. Be sure to turn on the PCL option if it's available for your printer.

The Epson emulator works by first translating the DOS text to a similar Macintosh font, then interpreting that text into a series of QuickDraw commands. Some characters in the original DOS character set may not have exact translations to a Macintosh font. The use of a PostScript font is recommended in these cases, because the PostScript standard requires no translation.

About color: Color printing is not supported under Epson emulation. When printing from the PC to a color or grayscale QuickDraw printer, be sure to select the Black & White option in the Print dialog box.

If you have a PCL printer, printing is limited to text-only or graphics-only when printing over an AppleTalk network. To print text only, select your printer's driver in the Windows Control Panel. To print graphics only, choose the LaserJet III driver from the Windows Control Panel. If you need to print mixed graphics and text, many Windows programs bit-map their text so that it becomes a graphic. Additionally, PCL printing of text and graphics together is possible when printing over a Novell network, where a PC print server is connected to the PCL printer and handles the print job. Select your printer's own driver in the Windows Control Panel.

For PostScript printers, use the Apple LaserWriter II NT driver (or another PostScript driver if the Apple LaserWriter II NT driver is not available) or the Windows PostScript driver.

IMPORTANT Be sure to make settings in the Mac OS PC Print Spooler that match the drivers you use in the PC environment, or your printer will not work correctly. See "Setting Preferences in the PC Print Spooler" for details.

Turning off Background Printing in the Macintosh Chooser may increase the performance of some printers.

Configuring a printer for Windows: For better performance when you configure a printer for Windows, select LPT1.DOS instead of LPT as the port.

IMPORTANT If you try to print a file using a PostScript printer driver for a non-PostScript printer, and the preferences are set to Epson, your file will not be printed. Instead, the file will be moved to a folder called "Spooler Rejected" in the Mac OS. To print the file, choose the proper printer driver in the PC environment and try again.

Note: Data sent to the LPT1 port is automatically routed to the printer selected in the Chooser in the Mac OS. There is no actual parallel port on the DOS-compatible Macintosh.

AppleShare Print Server

The AppleShare Print Server should not be installed in a DOS-compatible Macintosh because the server's software conflicts with the PC Print Spooler. You can, however, connect your DOS-compatible Macintosh to a network that uses an AppleShare Print Server.

Setting preferences in the PC Print Spooler
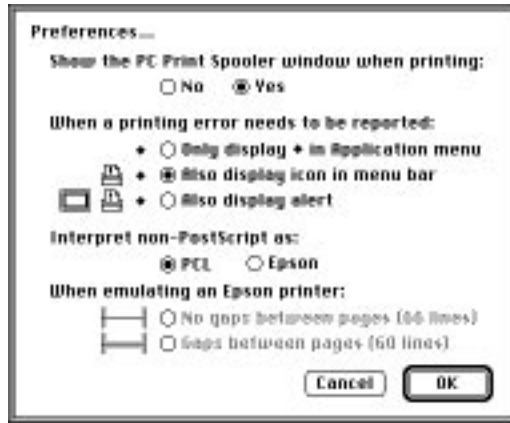
You can set preferences in the PC Print Spooler to control a variety of print functions.

To choose your Print Spooler settings, follow these steps:

1 **In the Macintosh environment, open the Extensions folder inside the System Folder.**

2 **Find the PC Print Spooler icon and open it.**

3 Choose Preferences from the File menu.

A dialog box appears.

4 Choose your settings as appropriate.

The selection you make for "Interpret non-PostScript as" must match the type of printer you have specified in the PC environment. If the settings are mismatched, your printer may produce gibberish. In addition, the PCL option works only if the printer is set up to accept PCL commands.

The selection you make for "When emulating an Epson printer" determines how much of a page is available for printing. If you use the option that allows gaps between pages, configure your application programs to print to a 60-line page, rather than a 66-line page, or your margins will be off and your pages will not print correctly.

5 Click OK.

66 lines maximum for Epson: Page sizes greater than 66 lines (standard letter size paper) are not supported by the Epson driver. Legal and other larger sizes will be cut off after either 60 or 66 lines, depending on the setting you've chosen. If you find that your printing is clipped at either the top or bottom of the page, click the No Gaps option.

Using PC peripherals

Because of the RS-422 implementation of the Macintosh, the following RS-232 signals are not available to the PC:

- Carrier Detect (CD)
- Data Set Ready (DSR)
- Request to Send (RTS)
- Ring Indicator (RI)

Applications or serial devices requiring these signals won't work.

While the DOS-compatible Macintosh does not support Carrier Detect (CD), you can set most communications application programs to respond to the CARRIER string sent back by most modems.

For more information about accessing serial ports from DOS, see the documentation that came with your DOS software.

IMPORTANT The following chart lists the various signals present on the Macintosh Mini DIN-8 connector, and on what pins these signals are present on PC-style DB-9 and DB-25 connectors. This information may be of use if you are planning to have a custom cable built. Refer to the manual for the serial device that you plan to attach to the Macintosh for the recommended serial connection, and use the chart below to find out what the proper Macintosh wiring should be.

Macintosh signal	Macintosh Mini DIN-8	DB-9	DB-25	RS-232 name
HSK0	1	4	20	DTR
HSK1	2	8	5, 8	CTS, DCD
TXD-	3	3	2	TXD
GND	4	5	7	GND
RXDA-	5	2	3	RXD
TXDA+	6	N/C	N/C	
GP1	7	N/C	N/C	
RXD+	8	5	7	GND

**Use the instructions in this chapter
if you need to change settings for
the PC environment.**

6 Configuring the PC Environment

• • • • • •

This chapter covers how to configure the PC environment and change PC options using the PC Setup control panel.

Your Macintosh comes with the PC environment already configured and ready to use. Read this chapter only if you want to change the way the PC environment is set up, or if you have reinstalled the DOS-compatibility software and need to reconfigure it.

You can control how your Macintosh and your DOS-compatible hardware and software work together with the PC Setup control panel. You use the control panel to accomplish the following tasks:
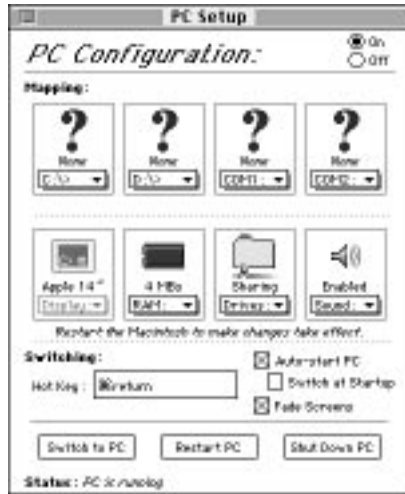
■ choose folders or volumes to be shared between the Mac OS and the PC environment

■ turn the PC card on and off

■ configure PC serial ports

■ set display options

■ set the shared memory size

■ turn PC sounds on and off and use Sound Blaster sound capabilities

■ configure PC drives

You also use the control panel to switch environments immediately and to start, restart, or shut down the PC.

Choosing settings

To choose settings, follow these steps:

1 **Choose Control Panels from the Apple ($\bullet$) menu.**

2 **Double-click the PC Setup control panel to open it.**

3 **When you have specified the settings you want, close the control panel.**

All settings except RAM take effect as soon as you make them. If you change the RAM setting, you must restart the Macintosh before the change takes effect.

Online help available: To get brief on-screen explanations of items in the control panel, choose Show Balloons from the Guide (②) menu. To get detailed step-by-step help, see the "DOS Compatibility Software" topic of Macintosh Guide, available in the Guide (②) menu.

Configuring the PC serial ports

Your DOS-compatible Macintosh supports two serial ports, COM1 and COM2. You can map these ports to an unused Macintosh printer port or modem port, to a text file for later processing, or to a setting of None.

■ **To assign a Macintosh serial port to a COM port, make a selection in the COM port's pop-up menu.**

When you map a port to a text file, a dialog box appears that you use to specify a name and location for the file. Macintosh serial ports already in use appear dimmed in the menu. (The printer port may be in use by AppleTalk, which may be used for a network or LaserWriter connection; the modem port may be in use by communications or fax software.) Changes to these selections take place immediately.

Assigned ports may not be available to the Mac OS: Mac OS programs may no longer be able to access ports that you've assigned to DOS. Allocate these ports only when they're needed, and deallocate them when they're no longer required by your DOS programs. (You won't have to restart the computer to have the changes take effect.)

The maximum baud rate supported by the DOS-compatible Macintosh when a COM port is mapped to a Macintosh serial port is 19,200. However, when the MODE command is issued in DOS and the serial port is set at 19,200 baud, the incorrect message "Function not supported on this computer" is displayed. This occurs because DOS is looking for specific hardware (a PC UART) that is not emulated by the DOS-compatible Macintosh. The Macintosh actually does support 19,200 baud, and can be set by a number of communication application programs.

Setting the monitor

The monitor connected to your Macintosh DOS-compatible system displays the environment (Mac OS or PC) you're working in. Even though you see only one environment at a time, the other environment can still be active in the background.

To set the monitor for the PC environment:

■ **Choose a monitor type in the Display pop-up menu.**

See the *Technical Information* booklet that came with your computer for a list of supported Macintosh monitors and for VGA and SVGA monitor specifications.

If the DOS-compatibility software recognizes the monitor connected to your computer as a non-multiscan display, it makes the appropriate selection for you; other menu options are dimmed.

16" monitor requires driver: If you have a 16" monitor, the PC doesn't use the entire screen unless you install a display driver for the program that you're using. (DOS can't use a video driver, so there will always be a large black border around the DOS screen.) See "Reinstalling Video Drivers" in the section "Reinstalling the DOS-Compatibility Software" in Chapter 8 for instructions.

Setting the time and date

The PC environment uses the same date and time settings as the Mac OS. If you change the time and date on the PC, it will not affect the time and date on the Mac OS.

When you restart the PC, it synchronizes its time and date with the settings you've chosen in the Mac OS. (The PC may lag up to 10 seconds behind the Mac OS.)

Setting shared memory

You can install a 72-pin SIMM (memory module) on the DOS-compatible card in your computer to give the card up to 32 MB of RAM for its exclusive use. When no SIMM is installed, the card uses a portion of the RAM installed in your Macintosh.

If your computer came with a SIMM already installed on the DOS-compatible card, you cannot share memory between the Mac OS and the PC environment. The PC uses the memory installed on the DOS-compatible card exclusively. The shared memory options in the PC Setup control panel will be dimmed (unavailable). See the *Technical Specifications* booklet to determine whether your computer contains a SIMM installed on the DOS-compatible card.

■ **Choose the amount of memory you want for your PC in the RAM pop-up menu.**

In the RAM pop-up menu, a small square (□) shows the RAM that the PC is currently using and a bullet (•) indicates how much RAM you assigned. When the Macintosh starts up, it claims RAM for its own use before it sets aside RAM for the PC. If the PC has less RAM than you installed, turn off the Mac OS RAM disk (if you're using one) in the Memory control panel. You may also need to lower the disk cache size in the Memory control panel to 128K or less.

Memory changes take place when you restart the Macintosh.

IMPORTANT Memory that you set aside for the PC environment is not available to the Mac OS. To make this memory available, you must turn off the PC (click the Off button at the top of the PC Setup control panel) and restart the Macintosh.

Changing the amount of conventional memory

Many DOS and Windows programs require conventional memory to run. At the same time, many device drivers and TSRs may be loaded into conventional memory. If you find that you do not have enough conventional memory to run some of your DOS or Windows programs, take the following steps.

To increase Upper Memory Block (UMB) space to 122K instead of 64K, add the following line to your CONFIG.SYS file:

```
DEVICE=C:\WINDOWS\EMM386.EXE RAM=D000-EFFF FRAME=D000
```

To load DOS into the UMB (high memory) also add the following to your CONFIG.SYS file:

```
DOS=HIGH, UMB
```

Insert the LOADHIGH (LH) command before all TSRs and device drivers in the AUTOEXEC.BAT file. For example:

```
LH C:\DOS\SMARTDRV.EXE /X
```

This will load these into UMB (high memory). If you run out of UMB space, you may see an error message like this during the boot process:

```
Run time error R6009

-not enough space for environment.
```

In this case, remove LH from TSRs and device drivers one or two at a time, and try again until the error message does not appear.

If a DOSCLIP copy command is executed from within Harvard Graphics 3.0, then the PC crashes when Harvard Graphics is quit. To prevent this, use the steps outlined above, making sure that SMARTDRV is one of the drivers preceded with LH.

IMPORTANT To prevent the System BIOS from becoming corrupted when the PC is configured for 2 MB of memory, set the switch in the CONFIG.SYS file to turn memory testing off:

```
DEVICE=C:\DOS\HIMEM.SYS /TESTMEM:OFF
```

Choosing shared folders or volumes

You can set up a Mac OS folder, Macintosh hard disk, shared disk, or CD-ROM disc on a network to act as a PC drive.

Sharing a folder on your Macintosh hard disk is a convenient way to transfer files between the Mac OS and the PC environment, especially if you are dealing with many files, or large files.

You can share entire disks, or volumes. This is especially useful for network volumes, CD-ROM drives, or other volumes that otherwise would not be readily available to the PC environment. DOS treats all shared volumes as network volumes. Some DOS commands, such as FORMAT, CHKDSK, UNDELETE, and SUBST will not work on shared volumes.

■ **Choose an available drive letter from the Sharing pop-up menu in the PC Setup control panel.**

A dialog box appears, letting you select a folder or disk (volume) for the drive.

Shared folders and volumes revert to their usual unshared status when you shut down your Macintosh. To have a folder or volume automatically assigned to a drive letter at startup, click the checkbox next to Attach at Startup. The name of an automatically attached folder or volume appears underlined in the Sharing pop-up menu. To turn off an assignment, choose the underlined item in the menu.

IMPORTANT For the sharing functions to work properly, DOS must be running, MacShare should be loaded as part of the AUTOEXEC.BAT file, and a LASTDRIVE=x statement should appear in the CONFIG.SYS file, where x is the highest drive letter available for sharing. AUTOEXEC.BAT and CONFIG.SYS have x preset to M. See "MacShare" in the section "Working in the PC Environment" in Chapter 5 for more information.

See the "Using DOS Files & Disks" topic of Macintosh Guide, available in the Guide (⌘) menu, for more information on transferring files between the PC environment and the Mac OS using floppy disks and other media.

IMPORTANT Use caution when handling the drive file. Erasing one of these is equivalent to reformatting the hard drive it is emulating. The drive file is locked when it is installed on your computer. If you must unlock it, be very careful not to erase it.

Using shared folders

Because two operating systems have access to each shared folder, there may be a noticeable slowdown in performance when using these folders for high-speed PC applications such as multimedia programs, or during large file transfers between them. For optimum performance, place PC application programs and their files in the C or D drive rather than in a shared folder. The performance of Macintosh programs is unaffected by placing them in shared folders.

Since the PC doesn't understand the concept of resource forks the same way the Macintosh does, information in a Macintosh file's "resource fork" is lost when it is copied by the PC. For example, if a Macintosh file is copied between two shared folders using the COPY command in DOS, that file's original icon will be lost, and the file itself may be unusable in the Mac OS.

Many document files do not have resource forks and can be copied between shared folders with no problems. The applications that created the files contain the resource information for these files. However, QuickTime files cannot be successfully copied between shared folders.

In some Microsoft application programs, there is a misrepresentation of the shared drive icons. When you open a file from a shared folder in Microsoft Excel or Microsoft Word, the shared drive icon may appear as a floppy disk or CD. This does not affect the file's content, and the file is still usable.

Do not attempt to use shared folders from a DOS shell run from Windows.

Strange text characters in a document

When using shared folders to exchange documents between the Mac OS and the PC, in some cases a Macintosh application program may not be able to interpret the file format of a PC document. When this happens, the document's formatting is displayed incorrectly and you may see strange characters in the document.

- Try using a different application program.
- Translate the document into a different file format using one of the file format translation utilities available for the Macintosh (such as MacLink Plus Easy Open Translators from DataViz).
- Transfer the text using DOSCLIP.
- Use the Export feature found in many programs.
- Use a PC-Macintosh translation utility.

Turning on PC sounds

To have Sound Blaster and other PC sounds played through the Macintosh speaker or through headphones, you need to make settings in both the PC Setup control panel and in the Sound control panel.

Choosing a setting in the Sound pop-up menu

The Sound pop-up menu in the PC Setup control panel gives you three choices:

- To hear PC sounds in both the PC environment and the Mac OS, choose Enabled.
- To hear PC sounds only when you're in the PC environment, choose Auto Enabled.
- To shut off PC sounds entirely, choose Disabled.

Sound control panel takes precedence: The setting in the PC Setup control panel's Sound pop-up menu has no effect on sounds generated in the Mac OS. If the volume is set to 0 in the Sound control panel, however, you won't hear any PC sounds no matter what the setting is in the PC Setup control panel's Sound menu.

For sounds generated by the Sound Blaster card and for sounds from the PC, the Sound control panel must be set with the Internal CD playthrough option turned on. For instructions, see the "Sound" topic of Macintosh Guide, available in the Guide (⍰) menu.

The PC Sound control in the PC Setup control panel does not affect sounds produced by the Sound Blaster card. Only PC-generated sounds such as the system beep are affected by this control. To turn off both PC and Sound Blaster-generated sounds, use the master volume control of the Mixer Control application from the Audio program group, or turn off the Internal CD playthrough in the Sound control panel in the Mac OS. (For instructions, see the "Sound" topic of Macintosh Guide, available in the Guide (⍰) menu.)

The Sound Blaster hardware installed in your DOS-compatible Macintosh is not able to record sounds.

The DOS-compatible Macintosh does not fully support Sound Blaster 8-bit, Sound Blaster 2.0, or Sound Blaster Pro drivers. If problems occur, use the Sound Blaster 16 driver that comes with your computer.

Configuring drives C and D

You use the C: and D: pop-up menus to create or select PC drives. Drive C is required; drive D is optional. You can use a PC-formatted SCSI hard drive attached to your Macintosh, or you can create a drive container—a virtual PC drive—on any Macintosh hard drive. You can even use a drive container created by SoftPC or SoftWindows.

To use a PC-formatted SCSI drive as a startup (boot) drive, format the drive to be bootable by using the FORMAT C: /S command.

■ **To create a drive container for drive C or D, choose New Drive File from the C: or D: pop-up menu.**

Set a location for the drive container, and give it a name and a size. Then click Initialize Drive File.

When using a PC-formatted SCSI device as the PC's C or D drive, ensure that the driver for that device is not loaded by PC Exchange. This would cause PC Exchange to mount the drive instead of the PC environment. Open the PC Exchange control panel and click the Options button. Make sure the SCSI driver for the device you want to use is not checked. Then click OK. This ensures that the PC will be able to load the C drive.

Single versus multiple partitions: When you initialize a container this way, it contains a single partition. To initialize a container with multiple partitions, prepare it in DOS using the FDISK command instead of initializing it through the PC Setup control panel. Then format it using the FORMAT command. Use the /S parameter in the FORMAT command to make the container bootable (for example, type FORMAT C: /S at the DOS prompt). See the DOS manual for further instructions on using these commands.

■ **To change the drive container for drive C or D, choose Other Drive File from the C: or D: pop-up menu, then locate the new drive container in the dialog box that appears.**

The change takes effect the next time you restart the PC. To have the change take place immediately, click the Restart button at the bottom of the control panel.

■ **To use a PC drive or partition, choose Drive Partition from the C: or D: pop-up menu.**

A dialog box appears with a list of available partitions.

If you use a PC drive or partition and you have a utility that mounts these devices on the Macintosh, unmount the drive or partition before starting the PC by dragging its icon to the Trash.

WARNING If you don't unmount the drive or partition, you may lose data because both the Macintosh and the PC may write to the device at the same time.

If you intend to mount your PC drive file, partition, or disk on the Macintosh using Macintosh PC Exchange, do not use a PC compression program. Drives that are compressed cannot be mounted.

Managing PC files from the Mac OS

You can gain access to files in a drive container even if you're in the Mac OS. Follow these steps:

1 **Double-click the drive container in the Finder.**

The drive container appears as a disk icon on the Mac OS desktop.

My PC files (container)   My PC files (disk)

2 **Double-click the container's disk icon.**

The icon opens and you have access to the files inside it.

You can now manipulate these files as you would any Mac OS files.

Drive container may be read-only: If the PC is running, you won't be able to add anything to the drive container from the Mac OS. To do so, shut down the PC from the PC Setup control panel and then do steps 1 and 2 above.

Changing the size of the drive container

You may find, after installing software in a drive container, that the container is too small or too large for your needs. You cannot change the size of an existing drive container, but you can create a new one in the appropriate size and move the software to it. You can also create an additional drive container to supplement the existing one.

Two active containers maximum: For the following procedure to work, drive D must be available for assignment to a new drive container. If both drives C and D have been assigned, you must first set drive D to None and drive C to the container you need to replace. (The contents of the container mapped to drive D are unaffected.)

Calculating the proper size

To determine the proper size for the new container, follow these steps:

1   Make sure you're in the Mac OS, then open the PC Setup control panel.

You see a small apple at the upper-left corner of the screen when you're in the Mac OS.

2   Check the name of the container associated with drive C.
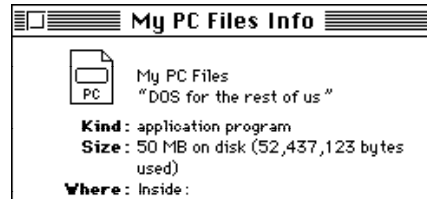
The name of the container appears above the C: pop-up menu.

3   Locate the container in the Finder.

4 Open the container's Get Info window and note the container's size.

To open the container's Get Info window, select the container's icon and choose Get Info from the File menu.

5 Close the Get Info window by clicking its close box.

6 Switch to the PC environment.

7 At the DOS C: prompt, type `DIR`**.**

Note how much space is available.

8 Subtract the amount of available space on the drive from the container size.

The number you get is the current size you need for storage.

9 Add 10 percent to the result of the calculation in step 8.

It's a good idea to have extra space available, because some applications may need to write temporary work files to the drive, or you may need to add software to the drive at a later time. The 10 percent figure, however, is arbitrary; use a number that suits your needs.

If the current container is too large, the result of this calculation is the size that the new container should be. Skip to step 12.

10 Determine the amount of storage needed by the additional software you want to install.

To do so, add together the individual storage space required for each program you want to install. This information is probably available in the documentation that came with your software.

11 Add the sums from steps 9 and 10.

The resulting sum is the size that the new container should be.

12 Press ⌘-Return to switch back to the Mac OS.

Creating the new container

Now that you know what size the container should be, you're ready to create it.

1 Follow the instructions under "Configuring Drives C and D" earlier in this chapter to create a new container for drive D.

You may need to remove some files from your hard disk to free enough space for the new container.

2 Click Restart PC at the bottom of the PC Setup control panel.

3 Click Switch to PC.

You now have two drives available—drive C, your original container, and drive D, the container you just created.

Moving the files

You can transfer your files from the old container to the new one in either the Mac OS or the PC environment.

■ **To move files in the Mac OS, drag all the files from the existing drive container to the new one.**

To move the files in the PC environment, follow these steps:

1 At the DOS prompt, type `FORMAT D: /S` **and press Return.**

This command makes the new drive container bootable.

Answer Y when DOS asks if you're sure.

2 When the DOS prompt returns, type the following command:

`XCOPY C:\*.* D:\*.* /E /V`

This command copies all the files and directories from your drive C container to your drive D container.

3 Press ⌘-Return to switch back to the Mac OS when copying is complete.

4 **In the PC Setup control panel, choose None from the D: pop-up menu.**

Doing so deallocates drive D.

5 **Choose Other Drive File from the C: pop-up menu and select the container you just created.**

Your new container is now associated with drive C.

6 **Click Restart PC at the bottom of the PC Setup control panel.**

7 **Click Switch to PC.**

8 **At the DOS prompt, type** DIR**.**

You should see a list of all the files you copied.

You may want to run some of your programs to verify that everything has been copied correctly.

■ **To throw away the original drive container, first switch to the Mac OS. Then drag the original container to the Trash and choose Empty Trash from the Special menu.**

Doing so frees up the space on your hard disk that the container held in reserve.

Understanding the status line

The status line at the bottom of the control panel gives you messages about the status of the PC hardware and software. Messages can include any of the following:

- **DOS-compatibility card not present** Your computer's system software did not recognize the DOS-compatible card installed in your computer. Reinstall the PC software according to the directions in Chapter 8.

  If reinstalling the software doesn't help, contact an Apple-authorized service provider for assistance, or call Apple's customer support hotline. (The phone number for the hotline is in the service and support information that came with your computer.)

- **PC Setup software not loaded** An error occurred during the start-up process and the DOS environment won't run.

- **PC is running** You've clicked Start PC and the card is active.

- **PC is shut down** The card is installed but not running. To start the card, click Start PC, or select Auto-Start PC and restart the computer.

- **PC is turned off** The Off button at the top of the PC Setup control panel is selected.

- **Not enough memory** Your computer must have at least 8 megabytes (MB) of RAM installed, and the PC requires at least 2 MB of free RAM if you don't have a SIMM installed on the DOS-compatible card for the exclusive use of the PC. Turn off the RAM disk, if you're using one, in the Memory control panel, and restart your Macintosh.

7 Troubleshooting in the Macintosh Environment

When you have questions

If you want to know how to do a particular task in the Mac OS, refer to Macintosh Guide in the Guide (②) menu. For instructions on using Macintosh Guide, see Chapter 2 of this manual.

If you have problems working in the PC environment on your Macintosh, see Chapter 8, "Troubleshooting in the PC Environment."

If you have questions about using DOS, see your DOS manual.

When you run into trouble

While you're using your computer, you may occasionally see a bomb icon or an error message, or you may have a problem such as the pointer (▶) "freezing" on the screen. If you have trouble with your computer, take a few minutes to read the information in this chapter. If your problem is related to a particular procedure, you should also look for information on that procedure in Macintosh Guide, available in the Guide (②) menu. For additional troubleshooting information and a list of common questions relating to the Mac OS, see the "Troubleshooting" topic of Macintosh Guide.

If you are unable to access Macintosh Guide (for example, if your screen is "frozen"), refer to this chapter to see if you can resolve the problem.

Take your time

When you see an error message, you don't have to take action immediately. The message stays on the screen until you click the OK button or turn off the Macintosh.

To help diagnose and correct the problem, gather as much information on the situation as you can before starting over.

- Make a note of exactly what you were doing when the problem occurred. Write down the message on the screen and its ID number (if any). Also list the programs you were using and the names of any items you know have been added to the System Folder since the system software was installed. This information will help a service person diagnose the problem. (It is helpful to keep a printed copy of the items in your System Folder. For instructions on printing the contents of a folder, see the "Printing & Fonts" topic of Macintosh Guide, available in the Guide [2] menu.)

- Check the screen for any clues. Is a menu selected? What programs and document icons are open? Note anything else that seems relevant.

- If you were typing text and were not able to save it before the problem occurred, you can write down the parts of the text still visible on the screen so that some of your work will be easy to replace.

- Ask other Macintosh users about the problem you're having; they may have a solution for it.

If you need repair service, consult the service and support information that came with your computer for instructions on how to contact an Apple-authorized service provider or Apple for assistance.

Start over

Often you can eliminate a problem simply by clearing the computer's memory and starting over.

If you can, save any open documents before restarting the Macintosh. If your system is frozen and does not respond to anything you do, or if you have a "bomb" message on the screen, saving may not be possible. You can try pressing ⌘-Option-Esc to quit the program in use when the problem occurred; if this works, you can then save the documents open in other programs before restarting.

To restart your Macintosh, try the following steps:

1   If you can, choose Restart from the Special menu or from the dialog box that's on the screen.

Dialog boxes contain messages from the computer. If something goes wrong, a message may appear on the screen, asking you to restart the computer.

2   If you can't choose Restart, hold down the ⌘ and Control keys while you press the Power key (marked with a triangle).

This key combination restarts the computer. (Use this key combination only when you can't choose Restart from the Special menu.)

3   If nothing happens, turn off your computer with the standby power button, wait at least 10 seconds, and then turn it on again.

4   If the standby power button doesn't turn off the computer, unplug your Macintosh.

If you suspect that the problem is with other equipment, such as a printer or an external hard disk that's attached to your computer, turn that equipment off for 10 seconds or longer, then turn it on again and restart the Macintosh.

Rebuild your desktop regularly

A process known as "rebuilding the desktop" helps your Macintosh keep track of data on your startup disks. Although you usually use the hard disk in your computer as a startup disk, you can also start up from any other disk that has system software installed. It's a good idea to rebuild the desktop of your startup disks once a month or so.

To rebuild the desktop of a startup disk, follow these steps:

1 **Hold down the Option and ⌘ keys while you start up your computer.**

Do not release the keys until you see a message asking whether you want to rebuild the desktop.

2 **Click OK.**

Solutions to common problems

The computer is turned on but the screen is dark.

One of the following is probably the cause:

- You have a screen saver program that darkens the screen when the computer has not been used for a certain period.

  Press a key or move the mouse to turn off the screen saver.

- The monitor's brightness control (☼) is not adjusted properly.

  Check the monitor's brightness control and turn it up if necessary.

- The Macintosh or the monitor is not getting power.

  Make sure the monitor is plugged in and turned on, and that the monitor cable is firmly connected to both the computer and the monitor.

  Make sure the computer's power cord is firmly connected to the computer and plugged into a grounded electrical outlet, and that the outlet has power.

  If you have more than one monitor and only one is dark, check that it is set up correctly in the Monitors control panel. For information on using more than one monitor, see the "Monitors" topic of Macintosh Guide, available in the Guide (②) menu.

■ The monitor is plugged into the wrong port on the computer.

Make sure the monitor is plugged into the monitor port (marked with the ▯ icon) on the upper-right corner of the computer's back panel. If the monitor is plugged into another port, it will not work.

If you are displaying video from your computer on a television screen, it is normal for your computer monitor to be dark.

The computer won't start up.

■ The game controller is plugged into the wrong port.

Make sure the game controller is plugged into the joystick port on the lower-right corner of the computer's back panel. If the game controller is plugged into another port, the computer will not start up.

The computer's clock keeps time inaccurately.

Your computer has a clock that runs continuously. When the computer is turned off, a battery keeps the clock running. If your clock begins to keep time inaccurately, have your Apple-authorized service provider replace the battery.

When you start up, a disk icon with a blinking question mark appears in the middle of the screen.

This icon indicates that your Macintosh cannot find the system software it needs to start up. One of the following is probably the cause:

■ Your computer may be having a problem recognizing external equipment that uses the Small Computer System Interface (SCSI).

Turn off all external SCSI equipment and disconnect the first SCSI device in the chain from your computer's SCSI port. Then restart the computer. If the computer starts up after you disconnect your SCSI equipment, refer to the manuals that came with the equipment for information on the proper way to connect SCSI equipment and assign SCSI ID numbers.

If you have a printer connected to your computer's SCSI port, make sure your printer is not supposed to be connected to the printer port instead. Check the manuals that came with your printer for information on how to connect it properly.

- System software is not installed on the startup hard disk, the system software is damaged, or the hard disk is not working properly.

Start up your computer using the *Disk Tools* floppy disk or (if you have a built-in CD-ROM drive) with the CD-ROM disc that contains system software. (For instructions on how to start up your computer from the CD-ROM disc, see "Starting Up From a CD-ROM Disc" in the section "Initializing a Hard Disk" later in this chapter.) Then follow the instructions in "Repairing a Damaged Disk" later in this chapter to test your startup hard disk and repair any damage.

If repairing the disk doesn't help, follow the instructions in "Installing or Reinstalling Mac OS System Software" later in this chapter to reinstall system software on your startup hard disk.

When you try to start up from a floppy disk, a disk icon with an X appears in the middle of the screen and the floppy disk is ejected.

This icon indicates that the floppy disk you tried to start up from is not a startup disk.

Wait a few seconds. The computer should start up from its internal hard disk. Make sure you insert floppy disks only after the computer has begun starting up.

A "sad Macintosh" icon appears and the computer won't start up.

This icon indicates that your Macintosh cannot start up because of a problem with the system software or the computer hardware.

Eject any floppy disks by turning off the computer and then holding down the mouse button while you turn the computer on again. Try starting up with the *Disk Tools* floppy disk or (if you have a built-in CD-ROM drive) with the CD-ROM disc that contains system software. (For instructions on how to start up your computer from the CD-ROM disc, see "Starting Up From a CD-ROM Disc" in the section "Initializing a Hard Disk" later in this chapter.) If the "sad Macintosh" icon appears again, consult the service and support information that came with your computer for information on contacting an Apple-authorized service provider or Apple for assistance.

The Macintosh "hangs" or freezes during startup.

If the Mac OS is sharing 16MB or more of memory with the PC environment and Disklight of Norton Utilities 3.1.1 is installed, the computer will freeze during startup. This does not occur with 8MB or less shared memory. Restart the Macintosh using one of the techniques described in "Start Over" in the section "When You Run Into Trouble," earlier in this chapter. Open the PC Setup control panel and change the shared memory setting to 8 MB or less.

The hard disk icon does not appear on the desktop.

If you don't see a hard disk icon on the desktop, try the following:

- If the hard disk is internal, shut down your computer, wait at least 10 seconds, and then turn it on again.
- If the hard disk is external, make sure that it is turned on and that its cable is connected firmly; then restart the Macintosh.
- Check the ID numbers of all SCSI equipment connected to your computer. See the manuals that came with your SCSI equipment for information on setting SCSI ID numbers.

■ If the hard disk is your startup disk, start your computer using the
Disk Tools floppy disk or (if you have a built-in CD-ROM drive) with the
CD-ROM disc that contains system software. (For instructions on how to
start up your computer from the CD-ROM disc, see "Starting Up From
a CD-ROM Disc" in the section "Initializing a Hard Disk" later in this
chapter.) Then follow the instructions in "Repairing a Damaged Disk"
later in this chapter to test your startup hard disk and repair any damage.

If repairing the disk doesn't help, follow the instructions in "Installing or
Reinstalling Mac OS System Software" later in this chapter to reinstall
system software on your startup hard disk.

Icons do not appear correctly on your screen.

You need to rebuild the desktop—a process that helps your Macintosh keep
track of files and folders on your hard disks. For instructions, see "Rebuild
Your Desktop Regularly" in the section "When You Run Into Trouble" earlier
in this chapter.

If icons do not appear correctly after you rebuild the desktop, restart your
computer while pressing the Shift key to temporarily turn off system
extensions. When you see the "Welcome to Macintosh—extensions off"
message, release the Shift key and press the Option and ⌘ keys until you see
a message asking if you want to rebuild the desktop.

Your Macintosh can't read a floppy disk.

If you see a message that a floppy disk is unreadable, try one of the following:

■ If the disk has never been used, you may simply need to initialize it. For
instructions, see the "Disks" topic of Macintosh Guide, available in in the
Guide (②) menu.

■ The disk may be damaged. See "Repairing a Damaged Disk" later in this
chapter for information on testing and repairing disks.

■ The disk may be a DOS disk that the Macintosh environment cannot use.
Try switching to the PC environment and inserting the disk again.

If you are trying to use a DOS disk in the Macintosh environment, consider the following:

■ The disk may have been formatted incorrectly on a DOS computer (or in the PC environment on your Macintosh). On DOS computers it's possible to format a standard double-sided disk in a high-density (1440K) format, and vice versa. Disks formatted in this way cannot be read by a Macintosh computer.

When formatting disks in the DOS environment for use in both the Mac OS and DOS, always format standard double-sided disks in the 720K format. Always format high-density disks in the 1440K format.

If a disk has been formatted incorrectly, switch to the PC environment and copy the disk's contents onto another disk that has been properly formatted.

The pointer (k) freezes on the screen.

Your system has a software problem.

■ Press ⌘-Option-Esc to quit the application program in use when the problem occurred. If this works, you can save the documents open in other programs before restarting.

■ Restart your Macintosh. (For instructions, see "Start Over" in the section "When You Run Into Trouble" earlier in this chapter.) Most software problems are temporary, and restarting usually corrects the problem.

■ Check the startup disk and program you were using when the problem occurred. Make sure that all programs, desk accessories, and system extensions you're using are compatible with the system software.

■ Sometimes incompatible system extensions or control panels can cause system software problems. Restart while holding down the Shift key; this temporarily turns off all system extensions. If your computer works normally after you do this, remove all extensions from the Extensions folder (inside the System Folder) and put them back into the Extensions folder one at a time. Restart after you add each extension. This procedure should identify any incompatible extensions.

You can also use the Extensions Manager control panel to turn off individual extensions. For information on using this control panel to manage system extensions, see the "Setting Options" topic of Macintosh Guide, available in the Guide (⍰) menu.

- If the problem recurs, you may need to reinstall system software. See "Installing or Reinstalling System Software" later in this chapter for instructions.

A dialog box with a bomb appears.

Your system has a software problem.

- Write down what you were doing when the message appeared, the text of the message, and the message number, if there is one.

- Restart your Macintosh. (See "Start Over" in the section "When You Run Into Trouble" earlier in this chapter for instructions.) Most software problems are temporary, and restarting usually corrects the problem.

- Check the startup disk and application program you were using when the dialog box appeared. Make sure that all programs, desk accessories, and system extensions you're using are compatible with the system software. Reinstalling the system software may correct the problem.

- Sometimes incompatible system extensions or control panels can cause system software problems. Restart while holding down the Shift key; this temporarily turns off all system extensions. If your computer works normally after you do this, remove all extensions from the Extensions folder (inside the System Folder) and put them back into the Extensions folder one at a time. Restart after you add each extension. This procedure should identify any incompatible extensions.

    You can also use the Extensions Manager control panel to turn off individual extensions. For information on using this control panel to manage system extensions, see the "Setting Options" topic of Macintosh Guide, available in the Guide (②) menu.

- If the problem recurs, you may need to reinstall system software. See "Installing or Reinstalling Mac OS System Software" later in this chapter for instructions.

The pointer (▸) doesn't move when you move the mouse.

One of the following situations is probably the cause:

■ Your system has a software problem.

Press ⌘-Option-Esc to quit the application program in use when the problem occurred. If this works, you can save the documents open in other programs before restarting.

Restart your Macintosh. See "Start Over" in the section "When You Run Into Trouble" earlier in this chapter for instructions.

Check the startup disk and program you were using when the problem occurred. Make sure that all programs, desk accessories, and system extensions you're using are compatible with the system software. Try starting up the computer from the *Disk Tools* disk or the CD-ROM disc that contains system software. (For instructions on how to start up your computer from the CD-ROM disc, see "Starting Up From a CD-ROM Disc" in the section "Initializing a Hard Disk" later in this chapter.) If your computer starts up normally, there may be an extension conflict.

If the problem recurs, you may need to reinstall system software. See "Installing or Reinstalling Mac OS System Software" later in this chapter for instructions.

■ The mouse is not connected properly.

Turn the computer off using the standby power button, check that the mouse and keyboard cables are connected properly, and then restart the computer.

■ Signals from the mouse are not reaching the computer, either because the mouse needs cleaning or because there is something wrong with the mouse.

Clean the mouse according to the instructions in Appendix A of this book.

If you have another mouse or pointing device, try connecting and using it. (Turn off the computer before connecting it.) If the new device works, there is probably something wrong with the mouse you replaced.

If none of these procedures solves the problem, consult the service and support information that came with your computer for instructions on how to contact an Apple-authorized service provider or Apple for assistance.

Typing on the keyboard produces nothing on the screen.

One of the following is probably the cause:

■ Your system has a software problem.

Restart your Macintosh. For instructions, see "Start Over" in the section "When You Run Into Trouble" earlier in this chapter.

Check the startup disk and application program you were using when the problem occurred. Make sure that all programs, desk accessories, and system extensions you're using are compatible with the system software.

If the problem recurs, you may need to reinstall system software. See "Installing or Reinstalling System Software" later in this chapter for instructions.

■ You haven't selected any text or set the insertion point (|).

Make sure the program you want to type in is the active program. Then place the pointer (▶) in the active window and click to set an insertion point (|) or drag to select text (if you want to replace the text with your typing).

■ The keyboard is not connected properly.

Turn off the computer using the standby power button, then check that the keyboard cable is connected properly at both ends.

If you have a keyboard with an ADB port (marked with the ⎇ icon) on each end, turn off the Macintosh using the standby power button and plug the keyboard cable into the other ADB port on the keyboard. (You may have to unplug the mouse to do this.) Then restart the computer.

■ The keyboard is damaged.

If you have access to another keyboard, try using it instead. (Turn the computer off before connecting it.) If the new keyboard works, there is probably something wrong with the one you replaced.

If none of these procedures solves the problem, consult the service and support information that came with your computer for instructions on how to contact an Apple-authorized service provider or Apple for assistance.

You can't start an application program or it quits unexpectedly. Or, when you try to open a program, you see a message that not enough memory is available.

One of the following is probably the cause:

■ The Macintosh ran out of memory.

Quit the programs that you have open and then open the program you want to use, or restart your Macintosh.

Use the Memory control panel to turn on virtual memory. For more information on virtual memory, see the "Memory" topic of Macintosh Guide, available in the Guide (②) menu.

■ The program needs more memory.
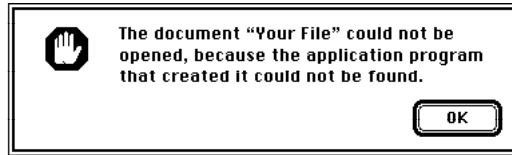
Use the program's Info window to give it more memory. For more information on increasing a program's memory, see the "Memory" topic of Macintosh Guide, available in the Guide (②) menu.

■ The program requires special hardware, such as a floating-point unit (FPU), and your computer doesn't have the hardware installed.

Check the documentation that came with the program to find out if the program requires a Macintosh with special hardware, such as an FPU. Then check the *Technical Information* booklet that came with your Macintosh to find out if your computer is equipped with such special hardware, or if the hardware can be installed. Consult your Apple-authorized service provider for information on installing special hardware in your computer.

You see a message that an application program can't be found.

The following dialog box appears if you try to open a document that was
created with software that is not on your hard disk.

The document "Your File" could not be
opened, because the application program
that created it could not be found.

OK

Normally, you see this message if you try to open a document that came from
another Macintosh with software that is different from yours.

■ The Macintosh Easy Open control panel is not installed. This is a control
panel that you can use to open documents when you don't have the
program that created them. Reinstall the control panel from the system
software disks or CD-ROM disc containing system software that came with
your computer. (See the section "Installing or Reinstalling Mac OS System
Software" later in this chapter for instructions.) See Appendix D for
instructions on using Macintosh Easy Open.

■ Some documents can be opened by more than one application program.
Try starting a program that you think might be able to open the document,
and then choose Open from the program's File menu to try to open the
document.

■ Purchase and install the correct software to use the document, or find out
if the creator of the document can convert it to a form that one of your
programs can use.

■ Don't try to open the files in the System Folder. Most of the files in the
System Folder are used by your computer for internal purposes and are not
intended to be opened.

■ Rebuild the desktop by holding down the Option and ⌘ keys while starting
up your computer. Keep holding down the keys until you see a message
asking whether you want to rebuild the desktop. Click OK.

- If the document is from a DOS computer and you want to open it in the Macintosh environment, use the PC Exchange control panel to specify which Macintosh program will open the document. For information about working with DOS documents in the Mac OS, see the "Using DOS Files & Disks" topic of Macintosh Guide, available in the Guide (⌂) menu.

You experience problems using a DOS document.

If you can't open a DOS document using a Macintosh program, try the following:

- Open the document from within the program by choosing Open in the program's File menu.

- Use the PC Exchange control panel to change the document's type to one that can be opened by the program.

If a DOS document is displayed incorrectly, or you see strange codes or characters in the document, try one of the following:

- Your application program may have special procedures for opening and saving documents with different file formats. See the information that came with your program.

- Try opening the document in another program.

Note: Some characters that can be displayed on the Macintosh are not accurately displayed on DOS computers.

For more information about working with DOS documents in the Mac OS, see the "Using DOS Files & Disks" topic of Macintosh Guide, available in the Guide (⌂) menu.

The Mac OS is running out of memory even though I'm not running any PC programs.

When sharing memory with the PC environment, the Macintosh allocates a portion of its memory to the PC. Because of this, the Mac OS may not be able to load all your system extensions, including the PC Setup control panel.

If this problem occurs, try the following:

- Add memory to the DOS-compatibility card, as described in Appendix B.

- Decrease the shared memory setting.

- Remove PowerTalk and QuickDraw GX from the Extensions folder inside the System Folder.

- Remove any other system extensions you don't need.

- Change the name of the PC Setup control panel to !PC Setup so that it loads first.

Shared memory assigned to the PC isn't available to the Mac OS until you turn off the PC. If the previous suggestions don't solve your problem, click the Off button at the top of the PC Setup control panel and restart the Macintosh.

Initializing a hard disk

Before you can use a new disk, the disk must be prepared so that the computer knows where to store information on the disk. This preparation is called *initializing* (or *formatting*) the disk.

When do you need to initialize a hard disk?

The hard disk inside your computer was initialized at the factory, so you shouldn't need to initialize it. You need to initialize a hard disk only if

■ you purchase a hard disk that has not been initialized at the factory

■ your hard disk is damaged

If a hard disk needs to be initialized, the disk's icon does not appear on the desktop when you start up the computer using another disk.

> **WARNING** Initializing a disk erases any information that may be on it. Before you initialize a damaged disk, try to repair it as described in "Repairing a Damaged Disk" later in this chapter.

Starting up from a CD-ROM disc

To initialize, test, or repair a hard disk, or to install system software on a hard disk, you need to start up your computer from another disk. If your computer has a CD-ROM drive, you can start up your computer using the CD-ROM disc containing system software that came with the computer.

To start up the computer using the CD-ROM disc, follow these steps:

1 **Turn your computer on.**

2 **Press the Open/Close button on your CD-ROM drive, and quickly insert the CD-ROM disc containing system software into the drive.**

3 **Immediately press and hold down the C key on your keyboard.**

Continue to hold down the key until you see the "Welcome to Macintosh" message.

If a blinking question mark appears, or if the computer starts up from your hard disk: You did not insert the CD-ROM disc quickly enough for the computer to recognize it as a startup disk. Follow these steps:

1   Shut down your computer.

The CD-ROM disc will remain in the CD-ROM drive.

2   Turn the computer on.

3   Immediately press and hold down the C key on the keyboard.

Continue to hold down the key until you see the "Welcome to Macintosh" message.

Starting up from a floppy disk

To initialize, test, or repair a hard disk, or to install system software on a hard disk, you need to start up your computer from another disk. If you don't have a built-in CD-ROM drive, you can start up the computer using either the *Disk Tools* or *Install Disk 1* floppy disk that came with your computer.

To start up your computer using a floppy disk, follow these steps:

1   Shut down your computer.

2   Insert the floppy disk into the disk drive.

If you want to initialize, test, or repair your hard disk, use the *Disk Tools* disk to start up your computer. If you want to install Mac OS system software, use the *Install Disk 1* disk.

3   Turn the computer on.

Reinitializing your computer's internal hard disk

You initialize the internal hard disk using a program called Internal HD Format, which is on the floppy disk labeled *Disk Tools* that came with your computer. If your computer came with a CD-ROM drive and you didn't receive floppy disks, you can find Internal HD Format on the CD-ROM disc that contains system software.

1 **Start up your computer from the *Disk Tools* disk or the CD-ROM disc that contains system software.**

See "Starting Up From a CD-ROM Disc" or "Starting Up From a Floppy Disk" earlier in this section.

2 **Double-click the Internal HD Format icon to open it.**

You may need to look in a folder called Utilities to find Internal HD Format.

3 **Type a name for your disk in the name box.**

4 **If you want to make sure that none of the hard disk's original information is recognizable after reinitialization, choose Zero Data in the Options menu.**

If you choose Zero Data, initialization may take a few minutes. (If you don't choose Zero Data, initialization will take less than 30 seconds.)

5 **Click Initialize.**

A message informs you that initializing the disk erases all information on it.

6 **Click OK.**

During initialization, a status bar shows you the progress of the initialization.

7 **When the initialization is complete, click Done.**

If a message reports that initialization failed, try again. If initialization fails a second time, take the disk to your Apple-authorized service provider for repair.

Initializing an external SCSI hard disk

You initialize an Apple external SCSI hard disk using a program called Apple HD SC Setup, which is on the floppy disk labeled *Disk Tools* that came with your computer. If your computer came with a CD-ROM drive and you didn't receive floppy disks, you can find Apple HD SC Setup on the CD-ROM disc that contains system software.

1   Start up your computer from the *Disk Tools* disk or the CD-ROM disc that contains system software.

See "Starting Up From a CD-ROM Disc" or "Starting Up From a Floppy Disk" earlier in this section.
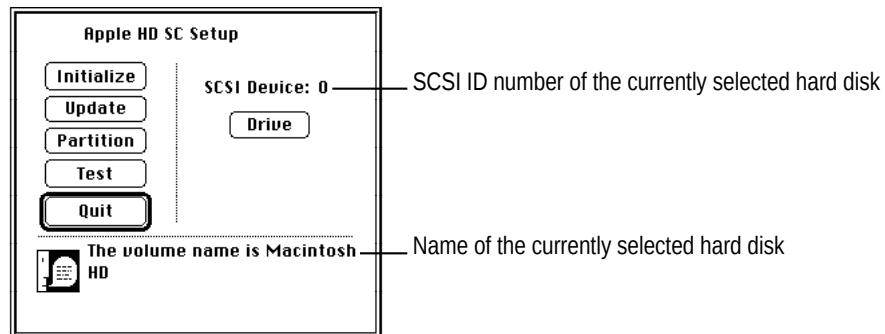
2   Open the Apple HD SC Setup icon.

You may need to look in a folder called Utilities to find Apple HD SC Setup.
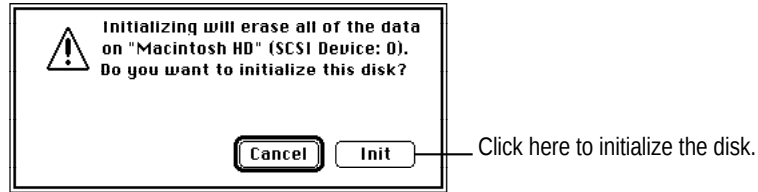
Apple HD SC Setup

3   Click Drive until the disk you want to initialize appears.

You cannot initialize the disk that you used to start up your computer or the disk that contains the Apple HD SC Setup program.

SCSI ID number of the currently selected hard disk

Name of the currently selected hard disk

4   Click Initialize.

5 **Click Init to initialize the hard disk.**

> ⚠ Initializing will erase all of the data on "Macintosh HD" (SCSI Device: 0). Do you want to initialize this disk?
>
> [Cancel] [Init] ——— Click here to initialize the disk.

6 **If a message appears asking you to name the disk, type a name and then click OK.**

7 **Click Quit when you see a message reporting that initialization was successful.**

If a message reports that initialization failed, try again. If initialization fails a second time, take the disk to your Apple-authorized service provider for repair.

Repairing a damaged disk

Disks can become damaged by repeated use and handling.

When do you need to repair a disk?

If you see a message reporting that a disk is damaged or unreadable, you may need to repair the disk.

Try these suggestions first

If you can't start up from a hard disk or you don't see the hard disk icon on the desktop, try the following:

- If the hard disk is internal, shut down your Macintosh, wait at least 10 seconds, and then turn it on again.

- If the hard disk is external, make sure that it is turned on and that its cable is connected firmly; then restart the Macintosh.

- If the hard disk is your startup disk, start up with a different startup disk. If the hard disk's icon appears on your desktop, reinstall system software on the hard disk (see "Installing or Reinstalling System Software" later in this chapter).

- Check the ID numbers of all SCSI equipment connected to your computer. Each device must have a unique ID number (the computer itself has the ID number 7). Also check that the chain of devices is terminated properly. For information on setting SCSI ID numbers and terminating a SCSI chain, see the manuals that came with your SCSI equipment.

- Test the disk following the instructions that come next.

Checking for damage on your internal hard disk

You can check for damage on your internal hard disk with the Internal HD Format program, which is on the floppy disk labeled *Disk Tools* that came with your computer. If your computer has a built-in CD-ROM drive and you didn't receive floppy disks, you can find the Internal HD Format program on the CD-ROM disc that contains system software. You can use Internal HD Format at any time to check for damaged blocks (segments of the hard disk that cannot reliably be used to store information).

1   Start up your computer from the *Disk Tools* disk or the CD-ROM disc that contains system software.

See "Starting Up From a CD-ROM Disc" or "Starting Up From a Floppy Disk" in the section "Initializing a Hard Disk" earlier in this chapter.

2   Open the Internal HD Format icon.

You may need to look in a folder called Utilities to find Internal HD Format.

3   Choose Scan All Blocks in the Functions menu.

If the program finds damaged blocks, it marks them so the computer will not store information in them. This process does not harm any information on the hard disk.

Testing an external SCSI hard disk

You can test an external Apple SCSI hard disk with the Apple HD SC Setup program, which is on the floppy disk labeled *Disk Tools* that came with your computer. If your computer has a built-in CD-ROM drive, and you didn't receive floppy disks, you can find the Apple HD SC Setup program on the CD-ROM disc that contains system software.

1   Start up your computer from the *Disk Tools* disk or the CD-ROM disc that contains system software.
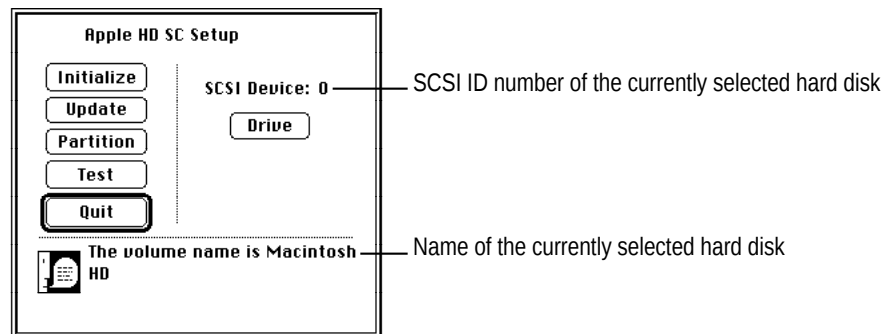
See "Starting Up From a CD-ROM Disc" or "Starting Up From a Floppy Disk" in the section "Initializing a Hard Disk" earlier in this chapter.

2   Open the Apple HD SC Setup icon.

You may need to look in a folder called Utilities to find Apple HD SC Setup.

Apple HD SC Setup

3   Click Drive until the disk you want appears.

SCSI ID number of the currently selected hard disk

Name of the currently selected hard disk

4   Click Test.

5   When a message tells you that testing is complete, click Quit.

If the test reveals a problem, you may be able to correct it by using Disk First Aid or another disk repair program (see the instructions in the next section), or you may need to reinitialize the disk (see "Initializing a Hard Disk" earlier in this chapter). Consult an Apple-authorized service provider for assistance, if necessary.

How to repair a hard disk or floppy disk

You can repair some types of disk damage by using the Disk First Aid program, which is included either on the *Disk Tools* floppy disk or on the CD-ROM disc containing system software that came with your computer.

1 Start up your computer from the *Disk Tools* disk or the CD-ROM disc that contains system software.

See "Starting Up From a CD-ROM Disc" or "Starting Up From a Floppy Disk" in the section "Initializing a Hard Disk" earlier in this chapter.

2 Open the Disk First Aid icon.
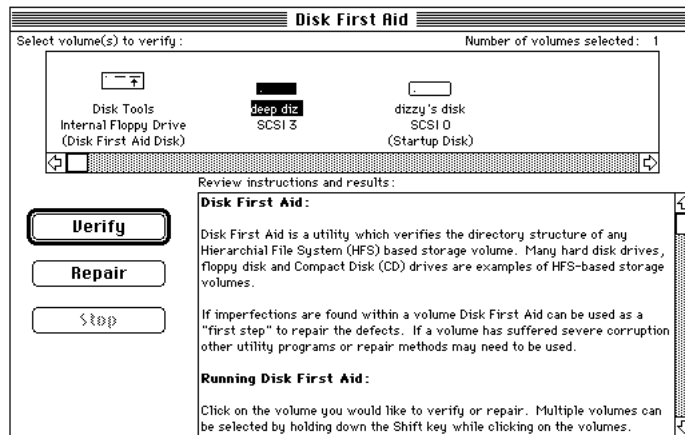
You may need to look in a folder called Utilities to find Disk First Aid.

Disk First Aid

3 Click the icon of the disk you want to test.

Disk icons appear in a box at the top of the Disk First Aid window.

4 **Click Repair to begin testing and repairing the disk.**

You can't repair the startup disk or the disk that contains the Disk First Aid program, but you can test these disks by clicking Verify. If the program reveals a problem with either of these disks, start up the computer from another disk so that you can repair the damaged disk.

If you want to test and repair another disk, click its icon and then click Repair.

5 **When testing and repair are finished, choose Quit from the File menu.**

If Disk First Aid cannot correct the problem

- Try repairing the disk again. Sometimes repeating the process corrects the problem.

- Use another disk repair or recovery program. Some disk repair programs let you recover information from a damaged disk.

- Consult a computer repair specialist for help.

- Once you have recovered all the information you can, erase (reinitialize) the disk. If initialization doesn't work, discard the damaged disk (if it's a floppy disk), or take it to your Apple-authorized service provider for repair (if it's a hard disk).

Installing or reinstalling Mac OS system software

System software is the set of programs and other files that the Mac OS uses to start itself up, keep track of your files, and run the application programs you use. System software is kept in the folder called the System Folder. When you turn on your computer, it looks for a startup disk, which is a disk that contains the system software. The startup disk is usually the hard disk that's inside your computer, although another hard disk or a floppy disk can also be a startup disk.

The accessory kit that came with your Macintosh provides system software on either a set of floppy disks or a CD-ROM disc. You can use the floppy disks or the CD-ROM disc to install the system software on your Macintosh if you need to do so.

When should you install system software?

Your Macintosh came with all the necessary system software installed on its internal hard disk, so you don't need to install system software on that disk unless you encounter software problems.

If you have a new hard disk or a newly initialized hard disk that doesn't contain system software, or if you want to upgrade to a more recent version of system software on a hard disk, follow the instructions in "Installing System Software" later in this chapter.

If you want to install DOS on a drive container or another volume that you're using as a PC drive, see "Reinstalling PC Software" in the section "Reinstalling the DOS-Compatibility Software" in Chapter 8.

When should you reinstall system software?

If you have a problem with your system software, you may see this icon in the middle of the screen:

If this icon appears, follow the instructions in "Repairing a Damaged Disk" earlier in this chapter to test your startup hard disk and repair any damage.

If repairing the disk doesn't help, follow the instructions in the next section, "Installing System Software," to reinstall system software on your startup hard disk.

Installing system software

Follow the steps in this section to do what is commonly called a "normal" installation of system software.

If you're installing system software on a hard disk for the first time, make sure that your hard disk has been initialized, a process that prepares the disk to store information. If you see the hard disk's icon on the desktop when you start up the computer, the disk has been initialized. If no disk icon appears when you start up, see "Initializing a Hard Disk" earlier in this chapter for instructions.

To do a normal installation, follow these steps:

1 Start up your computer from the *Disk Tools* disk or the CD-ROM disc that contains system software.

See "Starting Up From a CD-ROM Disc" or "Starting Up From a Floppy Disk" in the section "Initializing a Hard Disk" earlier in this chapter.

2 Find and open the Disk First Aid icon.

You may need to look in a folder called Utilities to find Disk First Aid.

Disk First Aid

After Disk First Aid starts, follow the instructions on the screen. Disk First Aid checks your hard disk for any problems.

3 When Disk First Aid has finished checking your hard disk, choose Quit from the File menu.

4 Shut down your computer.
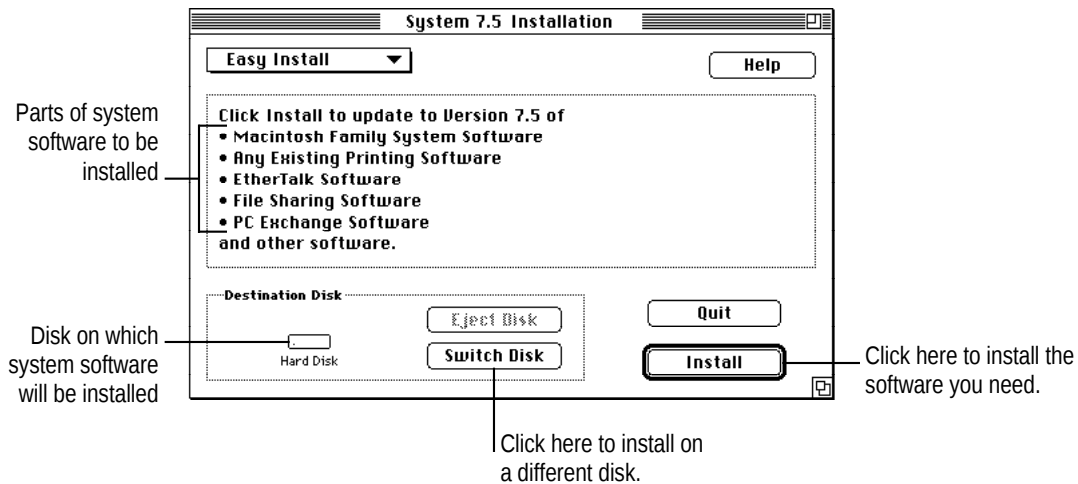
5 **Start up your computer from the *Install Disk 1* disk or the CD-ROM disc that contains system software.**

See "Starting Up From a CD-ROM Disc" or "Starting Up From a Floppy Disk" in the section "Initializing a Hard Disk" earlier in this chapter.

The Installer's Welcome screen appears. You may have to double-click the System Software Installer icon to open the Installer program.

6 **Click OK.**

The Easy Install dialog box appears.

Parts of system software to be installed

Disk on which system software will be installed

Click here to install the software you need.

Click here to install on a different disk.

7 **Make sure that the hard disk named in the box is the one on which you want to install system software.**

If it isn't, click Switch Disk until the correct disk name appears.

8 **Click Install.**

9 **Follow the instructions that appear on the screen.**

If you're installing system software from floppy disks, you see messages asking you to insert different disks.

10 **When you see a message reporting that the installation was successful, click Restart.**

If a message reports that installation was not successful, try installing again. (Follow the instructions on the screen.)

If, after reinstalling system software by doing a normal installation, you still experience problems with your computer, follow the steps in the next section for doing a "clean" installation of system software.

IMPORTANT Certain system extensions or application programs that were originally on your hard disk may not be installed with the Installer program. If you notice that a certain extension or program was not installed, you may need to install it separately. You can find these additional extensions and programs on the CD-ROM disc that contains system software. If you don't have a CD-ROM drive, see the service and support information that came with your computer for information on how to contact Apple directly for assistance.

Doing a clean installation of system software

The steps in this section outline what is commonly called a "clean" installation of system software. Do a clean installation if you can't determine what is damaged in your System Folder (especially if you think any special software, such as control panels, system extensions, or custom utilities, may be causing the problems you're experiencing). You should also do a clean installation if you're still having problems with your computer after you've reinstalled system software by doing a normal installation.

Testing your hard disk

To prepare your hard disk for a clean installation, follow these steps:

1 Start up your computer from the *Disk Tools* disk or the CD-ROM disc that contains system software.

See "Starting Up From a CD-ROM Disc" or "Starting Up From a Floppy Disk" in the section "Initializing a Hard Disk" earlier in this chapter.

2 Find and open the Disk First Aid icon.

You may need to look in a folder called Utilities to find Disk First Aid.

Disk First Aid

After Disk First Aid starts, follow the instructions on the screen. Disk First Aid checks your hard disk for any problems.

3 When Disk First Aid has finished checking your hard disk, choose Quit from the File menu.

Preparing an external SCSI hard disk for reinstallation of system software

If you're reinstalling system software on an Apple external SCSI hard disk, follow these additional steps. If you're reinstalling system software on your internal hard disk, skip to the next section, "Installing New System Software."

1 Find and open the Apple HD SC Setup icon.

You may need to look in a folder called Utilities to find Apple HD SC Setup.

Apple HD SC Setup

2 Click Drive until the disk on which you want to reinstall system software appears.

3 Click Update and follow the instructions on the screen.

4 **When you see a message that the update (preparation for reinstalling system software) was successful, click Quit.**

The external SCSI hard disk is now prepared for reinstalling system software, and you can proceed with the installation.
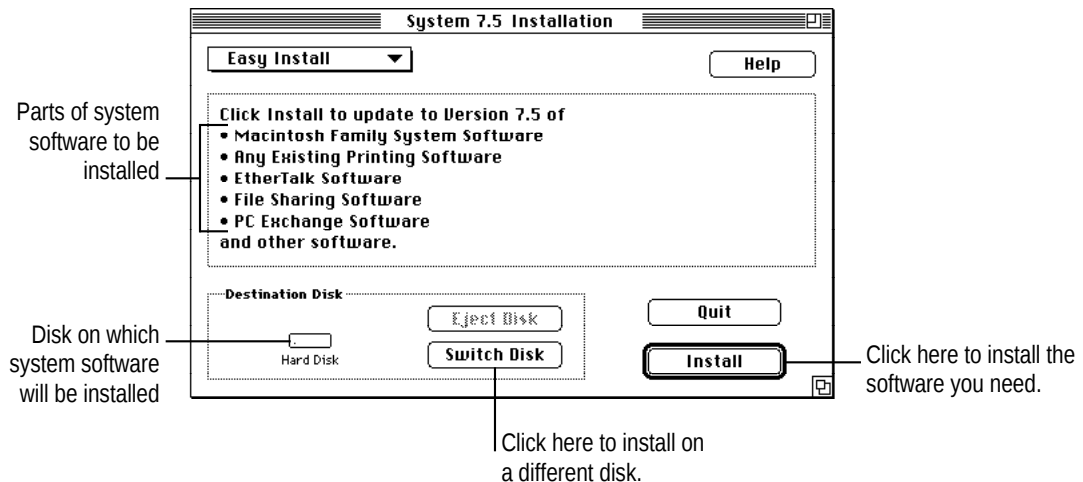
Installing new system software

1 **Insert the *Install Disk 1* disk into the floppy disk drive, or insert the CD-ROM disc that contains system software into the CD-ROM drive.**

The Installer's Welcome screen appears. You may have to double-click the System Software Installer icon to open the Installer program.

2 **Click Continue.**

The Easy Install dialog box appears.

Parts of system software to be installed

Disk on which system software will be installed

Click here to install the software you need.

Click here to install on a different disk.

3 **Make sure that the hard disk named in the Destination Disk box is the one on which you want to install system software.**

If it isn't, click Switch Disk until the correct disk name appears.

4 Hold down Shift–⌘–K to start the clean installation.

The following dialog box appears.

Select type of installation:
○ Update Existing System Folder
◉ Install New System Folder

[Cancel]   [OK   ]
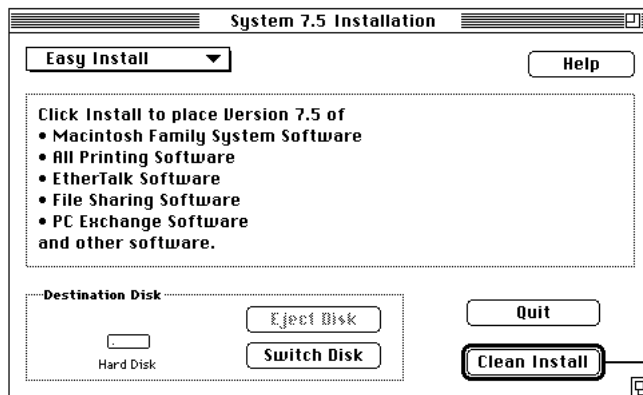
5 Click the Install New System Folder button and click OK.

The Easy Install dialog box appears. The Install button has changed to Clean Install, and the contents of your old System Folder have been moved to a new folder named Previous System Folder.

6 Click Clean Install.

═══════════ System 7.5 Installation ═══════════

[Easy Install   ▼]   [Help]

Click Install to place Version 7.5 of
• Macintosh Family System Software
• All Printing Software
• EtherTalk Software
• File Sharing Software
• PC Exchange Software
and other software.

┌─Destination Disk──────────────────┐
│   [Eject Disk]   [Quit]   │
│   [___]   │
│   Hard Disk   [Switch Disk]   [Clean Install] │ ── Click here to install the
└────────────────────────────────────┘   software you need.

7 Follow the instructions that appear on the screen.

It takes a few minutes to complete the installation.

8 When you see a message reporting that the installation was successful, you may need to click Restart.

You need to click Restart only if you installed software onto the startup disk.

If a message reports that installation was not successful, try repeating the clean installation procedure.

Replacing special software

1 Copy any special software items from the Previous System Folder back to your System Folder one item at a time, restarting the computer after copying each item.

Special software consists of items such as control panels, system extensions, or custom utilities that you may have added to your System Folder.

IMPORTANT Be very careful not to *replace* (copy over) any of the files in the System Folder with files from the Previous System Folder.

2 Check after each restart to make sure your computer is not having any software problems.

If any of your special software items causes software problems, contact the software manufacturer for assistance or an upgrade.

Doing a custom installation

For most Macintosh users, the Easy Install procedure described in the previous sections is appropriate, because it automatically installs all the items you need. However, if you'd like to select a combination of system software files for your specific needs, you can customize your system software installation. You use custom installation to install or update one or more specific files, or to save space on your hard disk by installing only the files you want.

To install customized system software, follow these steps:
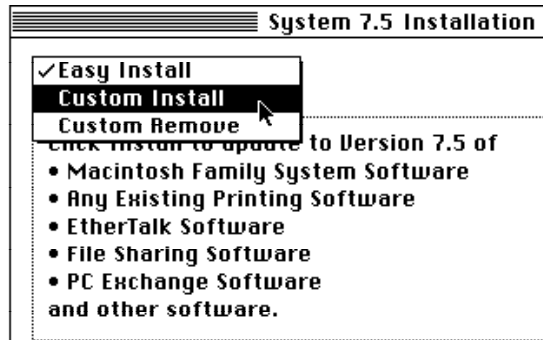
1 Insert the *Install Disk 1* disk into the floppy disk drive, or insert the CD-ROM disc that contains system software into the CD-ROM drive.

The Installer's Welcome screen appears. You may have to double-click the System Software Installer icon to open the Installer program.
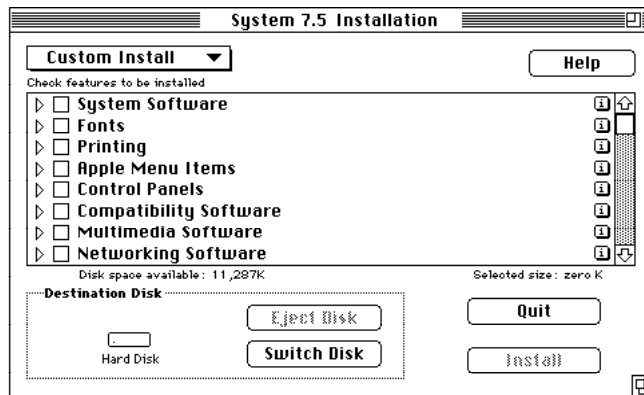
2 **Click OK.**

The Easy Install dialog box appears.

3 **Choose Custom Install from the pop-up menu.**

The Custom Install dialog box appears, listing all available system software components.

4 **Scroll through the list of components, clicking the checkbox next to each component you want to install.**

To get additional information about a component, click the box with the letter *i* in it to the right of the component.

5   Click Install.

6   Follow the instructions that appear on the screen.

7   When you see a message reporting that the installation was successful, click Quit.

If a message reports that installation was not successful, try installing again. (Follow the instructions on the screen.)

8   Restart your Macintosh.

The system software is installed and your computer is ready to use.

Consult this chapter if you have
problems using the PC environment
on your Macintosh.

8 Troubleshooting in the PC Environment

When you have questions

Read this chapter when you have questions about using the PC environment on your Macintosh.

If you have questions about using DOS or DOS application programs, see your DOS manual or the manuals that came with your programs.

WARNING If you have a problem with your DOS-compatibility hardware or software and nothing presented in this manual solves it, consult the service and support information that came with your computer for instructions on how to contact an Apple-authorized service provider or Apple for assistance. If you attempt to repair the DOS-compatibility hardware yourself, any damage you may cause to the DOS-compatibility hardware will not be covered by the limited warranty on your DOS-compatible Macintosh. Contact an Apple-authorized dealer or service provider for additional information about this or any other warranty question.

When I try to switch to DOS, my screen is blank or has no synchronization.

If the monitor has never worked in DOS, it is most likely not able to synchronize properly to the DOS video signal. Refer to the information in the *Technical Information* booklet on monitor specifications and video modes, and check with your monitor vendor to see if your monitor conforms to these specifications.

If your monitor was working previously, verify that its type is selected in the Display pop-up menu of the PC Setup control panel.

If its type doesn't show, use the Display pop-up menu to select the correct type. Restart the computer and, immediately after the chime sounds, hold down the ⌘-Option-P-R keys. When you hear another chime, release the keys. Then open the PC Setup control panel again. You'll get a message that PC Setup is not properly installed. This is normal. Verify the settings, and restart the computer again.

The Macintosh "hangs" or freezes during startup.

If the Mac OS is sharing 16 MB or more of memory with the PC environment, and Disklight of Norton Utilities 3.1.1 is installed, the computer will freeze during startup. This does not occur with 8 MB or less shared memory. Restart the Macintosh using one of the techniques described in "Start Over" in the section "When You Run Into Trouble" in Chapter 7. Open the PC Setup control panel and change the shared memory setting to 8 MB or less.

The DOS-compatibility software doesn't seem to be installed.

Open the Control Panels folder and look for the PC Setup control panel. If you find it, the DOS-compatibility software is installed. If not, or if you find it but it doesn't work, there may be a problem with the software. Reinstall the software according to the instructions in "Reinstalling the DOS-compatibility Software," later in this chapter.

If you do find the PC Setup control panel, open it. If drive C is mapped to a drive container, a drive container has been created. If drive C is not mapped to a drive container, follow the instructions in "Creating a Drive Container" in the section "Reinstalling the DOS-Compatibility Software" later in this chapter.

When I switch to the PC environment, I see this message: "Non-system disk or disk error. Replace and strike any key when ready."

The DOS-compatibility hardware can't find DOS.

Switch to the Mac OS by pressing ⌘-Return, open the PC Setup control panel, and make sure drive C is mapped to a drive container. If not, follow the instructions under "Configuring Drives C and D" in Chapter 6.

If drive C is mapped to a drive container, it may not be the drive container that holds DOS. If other drive containers have been created, double-click each one in the Mac OS and look for DOS folders and files. If you locate a container with DOS in it, map it to drive C.

If no drive container exists, the PC software may not be installed. First, create a drive container by following the instructions under "Configuring Drives C and D" in Chapter 6. Then follow the instructions under "Reinstalling PC Software" in the section "Reinstalling the DOS-Compatibility Software" later in this chapter.

I'm running applications in both environments and they seem sluggish.

You may be sharing Macintosh RAM with the PC. Performance may improve if you give the PC environment its own memory by installing a SIMM (memory module) on the DOS-compatibility card in your computer. For instructions, see Appendix B.

Additionally, significant drive access in one environment (including file sharing) can cause a slowdown in the other.

There is a delay when switching between environments.

When switching would interfere with a Mac OS system task, there is a slight delay until the task is completed.

There also may be a delay while clipboard information is transferred between the two environments. (If there's a large amount of information on the clipboard, you may actually see the translator window.)

If Shutdown Warning is turned on in the General Controls panel in the Mac OS, you cannot switch back to the Mac OS immediately after switching to the PC. Wait a few minutes and try switching again. To fix the problem, open the General Controls panel in the Mac OS and turn off the Shutdown Warning option.

I switched to the PC environment and I can't figure out how to switch back to the Mac OS.

Press ⌘-Return at any time to switch to the Mac OS.

Inserting a PC-format disk in the Mac OS brings up an initialization message.

Macintosh PC Exchange may not be installed. Look in the Control Panels folder for a control panel called Macintosh PC Exchange. If you don't find it, reinstall Macintosh PC Exchange from the floppy disks or CD-ROM disc that contains system software.

I'm in the PC environment and I can't figure out how to eject a floppy disk.

Press ⌘-E.

I'm in the PC environment and I can't figure out how to eject a CD-ROM disc.

Press ⌘-Y.

The PC drive file I initialized has only one partition.

Macintosh PC Exchange configures drives to have a single partition. The DOS program FDISK can configure a drive with up to four partitions. See your DOS manual for more information.

The PC won't start up, and there's a message saying there is not enough free memory.

Your computer must have at least 8 MB of RAM installed. If you don't have a SIMM installed for the exclusive use of the PC environment (see the *Technical Information* booklet), the PC requires at least 2 MB of free RAM if you are using DOS, and 4 MB if you are using Windows. Turn off the RAM disk, if you're using one, in the Memory control panel. Additionally, set the disk cache size in the Memory control panel to 128K or less.

The PC Setup icon has a red slash through it at startup.

If PC Setup doesn't have enough memory to allocate to the PC at startup time, it will turn itself off. Check the Memory control panel for disk cache and RAM disk sizes; the disk cache should be set no higher than 128K, and the RAM disk should be off (or have a small amount of memory allocated to it). Restart the Macintosh if you change either of these settings.

If these steps don't correct the problem, throw away the PC Setup Prefs file in the Preferences folder within the System Folder and restart the Macintosh. Then use the PC Setup control panel to recreate your settings.

When I switch to the Mac OS from the PC environment, the following message appears: "PC Clipboard requires additional system services in order to function. Please ensure that the DOS-compatibility card is successfully installed."

Macintosh Easy Open software is either not installed or has been turned off. Turn on the Macintosh Easy Open control panel, or reinstall it from the *DOS Compatibility Installer (for the Mac OS)* disk. If your computer has a built-in CD-ROM drive and you don't have the floppy disk, use the DOS Compatibility Installer program on the CD-ROM disc that contains system software.

I set the DOS-compatibility card to use 4 MB (or more) of RAM, but I get an error message from my PC application program saying that there's not enough memory to run it.

If you are sharing memory between the Macintosh and PC, the Mac OS may be using some of the RAM you requested for the PC. Turn off the RAM disk, if you're using one, in the Memory control panel; then restart the Macintosh.

A PC program displays a message that it needs 540K to run, but I have 4MB of memory allocated to the PC environment.

The program is referring to conventional memory. Most of the balance of the 4 MB of memory you assigned to the PC is used by the EMM386 memory management software. Configure your application program to use more extended memory and less conventional memory. You may also need to disable some device drivers or other software in your CONFIG.SYS and AUTOEXEC.BAT files to free up more conventional RAM. See the section on managing memory in your DOS manual for more information.

The Mac OS is running out of memory even though I'm not running any PC programs.

When sharing memory with the PC environment, the Macintosh allocates a portion of its memory to the PC. Because of this, the Mac OS may not be able to load all your system extensions, including the PC Setup control panel.

If this problem occurs, try the following:

- Add memory to the DOS-compatibility card, as described in Appendix B.
- Decrease the shared memory setting.
- Remove PowerTalk and QuickDraw GX from the Extensions folder inside the System Folder.
- Remove any other system extensions you don't need.
- Change the name of the PC Setup control panel to !PC Setup so that it loads first.

Shared memory assigned to the PC isn't available to the Mac OS until you turn off the PC. If the previous suggestions don't solve your problem, click the Off button at the top of the PC Setup control panel and restart the Macintosh.

My monitor flashes oddly when I switch environments.

This is a natural effect when a single monitor is used by two different environments. Turn on the Fade Screens option in the PC Setup control panel.

The PC environment is frozen, and pressing Control-Alt-Delete doesn't reset the system.

Press the ⌘-Control-Alt-[keypad] period keys. The system will reset with a cold start.

When I print a document in the PC environment, the top and bottom get clipped.

In the Mac OS, open PC Print Spooler in the Extensions folder, choose Preferences from the File menu, and click "Gaps between pages (60-lines)."

In the PC environment, configure your applications to print to a 60 line page, rather than a 66-line page, or your margins will be off and your pages will not print correctly.

When I start up certain software in the PC environment, my Apple monitor shows a jumbled image and the display rolls.

Some application programs that write directly to the hardware (especially games) may cause the Apple 13", 14", and 16" monitors to lose video synchronization at program startup. Call the software company to see if the software has a switch to force it to make BIOS calls (or if an upgrade is available with this feature).

DOS begins to start up but then the screen freezes. My cursor blinks, but I cannot type anything.

Press ⌘-Control-Alt-[keyboard] period to restart the PC. When you see the message "Starting MS-DOS," press and hold the F5 key. This will bypass your CONFIG.SYS and AUTOEXEC.BAT files. Edit the CONFIG.SYS file so that the HIMEM.SYS driver looks like the following:

```
DEVICE=C:\DOS\HIMEM.SYS /TESTMEM:OFF
```

Restart the PC; it should now start up normally.

Reinstalling the DOS-compatibility software

Your Macintosh DOS-compatible computer comes with the DOS-compatibility hardware and software already installed. You should reinstall the software only if you are having severe software problems. Follow the instructions in this section.

There are several steps to reinstalling your DOS-compatibility software:

- install the Mac OS software
- create a storage area (called a *drive container*) for DOS software
- set aside RAM for the PC environment, if necessary
- install the Microsoft MS-DOS operating system (and Microsoft Windows if you wish)
- install the additional DOS software that came with your DOS-compatible computer
- install your own PC software

For information on setting up the software after you install it, including additional changes you may need to make to the DOS AUTOEXEC.BAT and CONFIG.SYS files, see Chapter 5.

Reinstalling Mac OS software

You'll install several extensions and control panels in your System Folder.

1 Start up your Macintosh while holding down the Shift key.

This starts the Macintosh with extensions turned off.

2 Insert the floppy disk named *DOS Compatibility Installer Disk (for Mac OS Environment)* into the floppy disk drive.

If your computer has a built in CD-ROM drive, and you don't have this floppy disk, insert the CD-ROM disc that contains system software.

3 Find the DOS Compatibility Installer icon and double-click it to open it.

4 Click Install in the dialog box that appears.

The software is automatically installed onto your hard disk.

5 When the installation is complete, click Quit and restart your Macintosh.
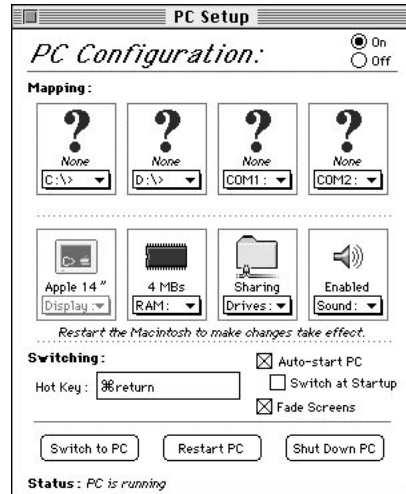
The following Mac OS software is now installed in your System Folder:

Name	Location
Macintosh Easy Open	Control Panels folder
PC Exchange	Control Panels folder
PC Setup	Control Panels folder
PC Setup Guide Additions	Extensions folder
PC Clipboard	Extensions folder
PC Clipboard Translators	Extensions folder
PC Print Spooler	Extensions folder
PC Network Extension	Extensions folder

Creating a drive container

A drive container is a file on a Macintosh hard disk that acts as a hard drive for the PC. You create a drive container using the PC Setup control panel.

1   Open the PC Setup control panel.

2   Choose New Drive File from the C: pop-up menu.

A dialog box appears.

3   Choose a location for the drive container.

The drive container can be on any hard disk attached to the Macintosh. At least 40 MB of free space is recommended.

It's best to locate the container at the root level of your hard disk (not in any folders or sub-folders) so that you can locate it easily.

4 **Type a name for the drive container.**

You can type up to 31 characters. Pick a descriptive name such as PC Drive or PC Container so that you can easily identify it.

When you finish, press the Tab key to move to the Size field.

5 **Type a size (in MB) for the drive container.**

At least 40 MB is recommended. The exact amount of space you need depends on what application programs you intend to install for DOS and Windows. Check the documentation that came with the programs to see how much space you'll need, then allow some extra room for growth. (The software included with your DOS-compatible computer requires about 25 MB.)

6 **Check Initialize Drive File to automatically initialize the drive container with a single partition.**

If you want more than one partition, you can leave the box unchecked and use the FDISK and FORMAT programs after you've installed DOS. (See your DOS manual for instructions and information about the FDISK and FORMAT commands and their options.)

7 **Click Create.**

Assigning RAM to the PC

The PC needs memory to operate. You can provide memory with a memory module (SIMM) installed on the DOS-compatibility card in your computer, or by assigning it RAM from your Macintosh. If a memory module is installed on the DOS-compatibility card, the RAM pop-up menu options will be dimmed (unavailable). The amount of memory available to the PC will depend of the amount of RAM on the installed SIMM. See the *Technical Specifications* booklet to find out whether your DOS-compatibility card includes a SIMM and what RAM capacity the SIMM has. If a SIMM is installed, skip to "Reinstalling PC Software," next.

Memory installed on the DOS-compatibility card in your computer is for the exclusive use of the PC environment, and provides a marked increase in performance of PC applications.

If no memory module is installed, you need to assign RAM to the PC.

1   Choose a memory size from the RAM pop-up menu in the PC Setup control panel.

If you're installing DOS only, choose a minimum of 2 MB. If you intend to install Windows, choose a minimum of 4 MB.

Note: Windows performance will increase if you allocate more memory to the PC. However, RAM assigned to the PC is not available in the Mac OS until you turn off the card in the PC Setup control panel and restart the computer.

2   Restart the Macintosh.

IMPORTANT If the RAM size is set to 2 MB, modify the CONFIG.SYS file in DOS as follows:

```
DEVICE=C:\DOS\HIMEM.SYS /TESTMEM:OFF
```

Reinstalling PC software

You begin by installing the Microsoft MS-DOS operating system included with your computer. You can also install Microsoft Windows if you wish.

1   Open the PC Setup control panel and click Switch to PC.

The Macintosh desktop disappears, and you see a message about a missing operating system or about a disk error. Ignore the message.

2   Insert the CD-ROM disc containing DOS and Windows software into the computer's CD-ROM drive.

If you are using floppy disks, insert the *Microsoft MS-DOS Setup* floppy disk and press Return.

The DOS disks and manual are in the same shrink-wrapped package.

3   If you are using the CD-ROM disc, find and open Microsoft MS-DOS Setup.

4 **Follow the instructions that appear on the screen.**

If you are using floppy disks, press ⌘-E to eject a disk when necessary.

Note: The MS-DOS installation disks do not include a DOS mouse driver. A mouse driver for Windows is automatically installed, however, if you install Microsoft Windows. Mouse drivers for DOS are widely available from third-party sources.

5 **When DOS installation is complete, you may want to install Windows. If you are using the CD-ROM disc, find and open the file called Windows Series Installation Instruction Diskette 1 of 6, type** `A:setup`**, and press Return.**

If you are using floppy disks, insert the disk labeled *Windows Series Installation Instruction Diskette 1 of 6*, type `A:setup`, and press Return.

The Windows disks and manual are in the same shrink-wrapped package.

You can skip this and the next step if you don't want to install Windows.

6 **Follow the instructions that appear on the screen.**

If you are using floppy disks, press ⌘-E to eject a disk when necessary.

The following PC software is now installed:

DOS (directory)
WINDOWS (directory)
COMMAND.COM
AUTOEXEC.BAT
CONFIG.SYS

Installing additional PC software

Your DOS-compatible computer comes with additional software utilities that you may want to install. The following table describes the function of each program. For more information on using these programs, see Chapter 5, "Operating in the PC Environment."

Program name	Function
DOSCLIP	Lets you copy and paste between DOS and Mac OS.
WINCLIP	Lets you copy and paste between Windows and Mac OS.
MACSHARE	Lets you share Mac OS volumes and folders with the PC environment.
CDROM	Lets you access your Macintosh CD-ROM drive from the PC environment.
MACODI	Provides support for accessing networks in the PC environment.

To install the additional software, follow these steps:

1 **With the PC environment on the screen, insert the disk named *DOS Compatibility Installer Disk (for PC Environment)* into the disk drive.**

2 **Choose one of the options below to install software for either DOS alone or both DOS and Windows.**

- To install software for DOS alone, type A:INSTALL at the DOS prompt and press Return.

- To install software for both DOS and Windows, start Windows, select the Run command from the File menu, type A:SETUP for the program name, and click OK.

3 **Follow the instructions that appear on the screen.**

Replacing the CONFIG.SYS and AUTOEXEC.BAT files

Your DOS-compatible PC software includes alternate versions of the CONFIG.SYS and AUTOEXEC.BAT files that let you select from a variety of DOS memory-management options. Each time you start DOS, you will see a menu that asks if you want to optimize memory for just DOS, for a DOS program that requires maximum conventional memory, for a DOS program that requires maximum expanded memory, or if you want to start Windows immediately.

To install the alternate CONFIG.SYS and AUTOEXEC.BAT files, follow these instructions:

1   Switch to the PC environment.

2   At the DOS prompt, type the following:

```
C:
REN CONFIG.SYS CONFIG.BAK
REN AUTOEXEC.BAT AUTOEXEC.BAK
COPY ALT_CFGS\CONFIG.APL CONFIG.SYS
COPY ALT_CFGS\AUTOEXEC.APL AUTOEXEC.BAT
```

3   To restart the PC with the alternate files installed, type Control-Alt-[keypad] period.

If your keyboard has a Delete key, you can press Control-Alt-Delete instead.

The PC restarts and the new menu appears.

Modifying the CONFIG.SYS and AUTOEXEC.BAT files

You may want to modify the CONFIG.SYS file by hand to meet specific needs. Use the DOS Edit command (or any other DOS or Windows editor) and make the changes listed below.

IMPORTANT Make backup copies of your original files before you change them. That way you still have your originals in case problems develop.

Be sure to save the file when you are finished. To prevent the ROM BIOS from becoming corrupted when the PC is configured for 2 MB of memory, be sure to add the underlined text to the indicated line:

```
DEVICE=C:\DOS\HIMEM.SYS TESTMEM:OFF
```

If you do not intend to use software that requires expanded memory (EMS), make the following change:

```
DEVICE=C:\DOS\EMM386.EXE NOEMS RAM=D000-EFFF
```

If you intend to use software that does use expanded memory, or you're unsure what you may need in the future, make the following change:

```
DEVICE=C:\DOS\EMM386.EXE RAM=D000-EFFF FRAME=D000
```

Depending on how you have reconfigured the file, your CONFIG.SYS file should look something like this:

```
DEVICE=C:\DOS\SETVER.EXE
DEVICE=C:\DOS\HIMEM.SYS /TESTMEM:OFF
DEVICE=C:\DOS\EMM386.EXE RAM=D000-EFFF FRAME=D000
DOS=HIGH,UMB
FILES=30
LASTDRIVE=M
```

Additionally, your AUTOEXEC.BAT file should contain the following:

```
LH C:\DOS\SMARTDRV.EXE /X
@ECHO OFF
PROMPT $p$g
PATH C:\WINDOWS;C:\DOS
SET TEMP=C:\DOS
```

(The reference to Windows in the PATH line applies only if you chose to install Windows.)

See your DOS manual to learn how to edit and save your DOS files.

IMPORTANT Some memory configuration utilities, such as MEMMAKER, may not be able to determine the exact nature of the hardware of the DOS-compatible computer and, therefore, may not be compatible. Additionally, using third-party compression software such as DriveSpace on a drive container prevents you from accessing the container or the files within it from the Mac OS. For these reasons, Apple does not recommend using these programs with your DOS-compatible computer.

Bypassing the CONFIG.SYS and AUTOEXEC.BAT files at startup

To bypass the CONFIG.SYS and AUTOEXEC.BAT files during the startup process, press and hold the F5 key (⌘-5 on non-extended keyboards) after the memory testing is complete.

Reinstalling Sound Blaster software

To install Sound Blaster software, follow these steps:

1 Insert the *Sound Blaster Software Installation* disk in the floppy disk drive while the PC is in the foreground.

2 From DOS, type A:INSTALL **and press Return.**

3 Follow the instructions that appear on the screen.

4 Restart DOS to use the new software.

To do so, press Control-Alt-[keypad] period.

See the enclosed manual, *Using PC Sounds with the DOS-Compatibility Card,* for information about using the Sound Blaster utilities.

Reinstalling video drivers

If you intend to run Windows with 256 colors at a resolution of 640 by 480 pixels, or if you intend to use an Apple 16" or VGA display with 16 colors at a resolution of 800 by 600 pixels, follow these steps:

1 Insert the *Display Drivers Disk 1* disk in the floppy disk drive while the PC is in the foreground.

2 From DOS, type A: **and press Return to set the current drive to A.**

3 Type SETUP **and press Return to run the setup program.**

Follow the instructions on the screen to install the video drivers. Select Windows 3.1 as the application.

Note: If you are using an Apple 16" monitor, DOS is displayed at a resolution of 640 by 480 pixels centered on your monitor and surrounded by a large black border.

Read this appendix for important
health and safety instructions,
as well as tips on keeping your
computer in good working order.

Appendix A
Health, Safety, and Maintenance Tips

For your own safety and that of your equipment, follow all the instructions in this chapter. Keep these instructions available for reference by you and others.

Health-related information about computer use

Muscle soreness, eye fatigue, and other discomforts and injuries sometimes associated with using computers can occur from performing any number of activities. In fact, misuse of the same muscles during multiple activities can create a problem that might not otherwise exist. For example, if you engage in nonwork activities that involve repetitive stress on the wrist—such as bicycling—and also use your computer's keyboard improperly, you may increase your likelihood of developing wrist problems. Some individuals are at greater risk of developing these problems because of their health, physiology, lifestyle, and general exposure to stress. Work organization and conditions, such as workstation setup and lighting, also play a part in your overall health and comfort. Preventing health problems is a multifaceted task that requires careful attention to the way you use your body every hour of every day.

The most common health effects associated with using a computer are musculoskeletal discomfort and eye fatigue. We'll discuss each area of concern below.

Musculoskeletal discomfort

As with any activity that involves sitting for long periods of time, using a computer can make your muscles sore and stiff. To minimize these effects, set up your work environment carefully, using the guidelines that follow, and take frequent breaks to rest tired muscles. To make working with your computer more comfortable, allow enough space in your work area so that you can change position frequently and maintain a relaxed posture.

Another type of musculoskeletal concern is repetitive stress injuries (RSIs), also known as cumulative trauma disorders (CTDs). These problems can occur when a certain muscle or tendon is repeatedly overused and forced into an unnatural position. The exact causes of RSIs are not totally understood, but in addition to awkward posture, such factors as the amount of repetition, the force used in the activity, the individual's physiology, workplace stress level, and lifestyle may affect the likelihood of experiencing an RSI.

RSIs did not suddenly arise when computers were invented; tennis elbow and writer's cramp, for example, are two RSIs that have been with us for a long time. Although less common than other RSIs, one serious RSI discussed more often today is a wrist problem called carpal tunnel syndrome, which may be aggravated by improper use of computer keyboards. This nerve disorder results from excessive pressure on the median nerve as it passes through the wrist to the hand.

This section offers advice on setting up your work area to enhance your comfort while you use your computer. Since the effects of repetitive movements associated with using a computer can be compounded by those of other work and leisure activities to produce or aggravate physical problems, proper use of your computer system must be considered as just one element of a healthy lifestyle.

No one, of course, can guarantee that you won't have problems even when you follow the most expert advice on using computer equipment. You should always check with a qualified health specialist if muscle, joint, or eye problems occur.

Eye fatigue

Eye fatigue can occur whenever the eyes are focused on a nearby object for a long time. This problem occurs because the eye muscles must work harder to view an object that's closer than about 20 feet (6 meters). Improper lighting can hasten the development of eye fatigue. Although eye fatigue is annoying, there's no evidence that it leads to permanent damage.

Whenever you're engaged in an activity that involves close-up work—such as reading a magazine, doing craft work, or using a computer—be sure to have sufficient glare-free lighting and give your eyes frequent rest breaks by looking up and focusing on distant objects. Remember to have your eyes examined regularly.

To prevent discomfort and eye fatigue:

■ Arrange your workspace so that the furniture is properly adjusted for you and doesn't contribute to an awkward working posture.

■ Take frequent short breaks to give your muscles and eyes a chance to rest.

Arranging your office

Here are some guidelines for adjusting the furniture in your office to accommodate your physical size and shape.
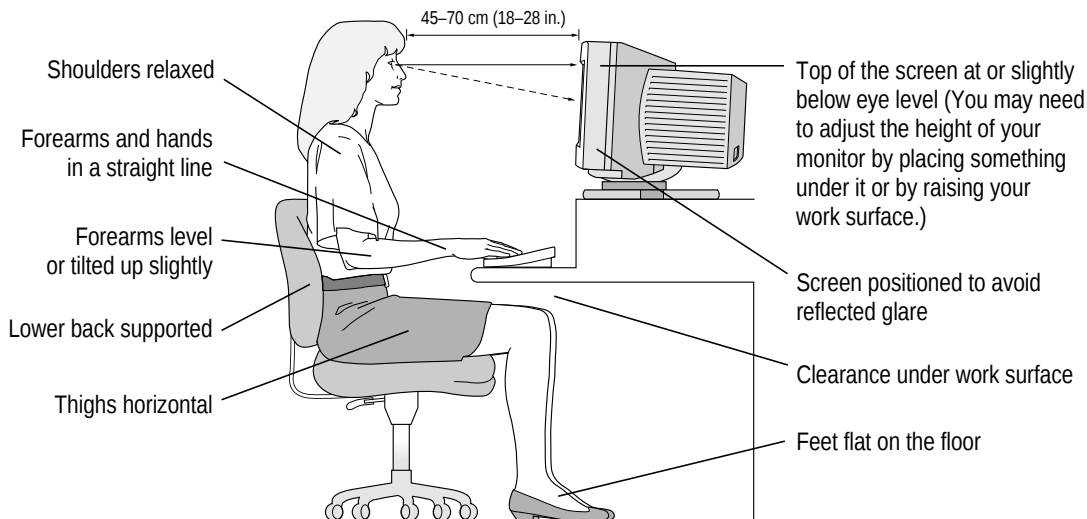
■ An adjustable chair that provides firm, comfortable support is best. Adjust the height of the chair so your thighs are horizontal and your feet flat on the floor.

The back of the chair should support your lower back (lumbar region). Follow the manufacturer's instructions for adjusting the backrest to fit your body properly.

■ When you use the computer keyboard, your shoulders should be relaxed. Your upper arm and forearm should form an approximate right angle, with your wrist and hand in roughly a straight line.

You may have to raise your chair so your forearms and hands are at the proper angle to the keyboard. If this makes it impossible to rest your feet flat on the floor, you can use a footrest with adjustable height and tilt to make up for any gap between the floor and your feet. Or you may lower the desktop to eliminate the need for a footrest. Another option is to use a desk with a keyboard tray that's lower than the regular work surface.

- Position the mouse at the same height as your keyboard. Allow adequate space to use the mouse comfortably.

- Arrange the monitor so the top of the screen is slightly below your eye level when you're sitting at the keyboard. The best distance from your eyes to the screen is up to you, although most people seem to prefer 18 to 28 inches (45 to 70 cm).

- Position the monitor to minimize glare and reflections on the screen from overhead lights and windows. You may want to use a tiltable monitor stand. The stand lets you set the monitor at the best angle for viewing, helping to reduce or eliminate glare from lighting sources you can't move.

45–70 cm (18–28 in.)

Shoulders relaxed

Forearms and hands in a straight line

Forearms level or tilted up slightly

Lower back supported

Thighs horizontal

Top of the screen at or slightly below eye level (You may need to adjust the height of your monitor by placing something under it or by raising your work surface.)

Screen positioned to avoid reflected glare

Clearance under work surface

Feet flat on the floor

Avoiding fatigue

- Change your seated position, stand up, or stretch whenever you start to feel tired. Frequent short breaks are helpful in reducing fatigue.

- Use a light touch when typing or using a mouse and keep your hands and fingers relaxed.

- Some computer users may develop discomfort in their hands, wrists, or arms after intensive work without breaks. If you begin to develop chronic pain or discomfort in your hands, wrists, or arms, consult a qualified health specialist.

- Allow adequate work space so that you can use your keyboard and mouse comfortably. Place papers or other items so you can view them easily while using your computer. A document stand may make reading papers more comfortable.

- Eye muscles must work harder to focus on nearby objects. Occasionally focus your eyes on a distant object, and blink often while you work.

- Clean your screen regularly. Keeping the screen clean helps reduce unwanted reflections.

What about electromagnetic emissions?

There has been recent public discussion of the possible health effects of prolonged exposure to extremely low frequency (ELF) and very low frequency (VLF) electromagnetic fields. Such fields are associated with electromagnetic sources such as television sets, electrical wiring, and some household appliances—as well as computer monitors.

Apple has reviewed scientific reports and sought the counsel of government regulatory agencies and respected health organizations. Based on the prevailing evidence and opinions, Apple believes that the electric and magnetic fields produced by computer monitors do not pose a health risk.

In response to those customers who wish to reduce their exposure to electromagnetic fields, Apple has lowered the emission levels of our products. We are also actively encouraging further scientific research so we can continue to promote the health and safety of our customers and employees.

Safety instructions

For your own safety and that of your equipment, always take the following precautions.

Turn off the computer completely and disconnect the power plug (by pulling the plug, not the cord) if any of the following conditions exists:

- the power cord or plug becomes frayed or otherwise damaged
- you spill something into the case
- your Macintosh is exposed to rain or any other excess moisture
- your Macintosh has been dropped or the case has been otherwise damaged
- you suspect that your Macintosh needs service or repair
- you want to clean the case (use only the recommended procedure described later in this chapter)

Be sure that you always do the following:

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

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

Handling your computer equipment

Follow these guidelines for handling your computer and its components:

- When setting up your computer, place components on a sturdy, flat surface, and carefully follow all setup instructions.

- When connecting or disconnecting a cable, always hold the cable by its connector (the plug, not the cord).

- Turn off your computer and all its components before connecting or disconnecting any cables to add or remove any component. Failure to do so could seriously damage your equipment.

- Never force a connector into a port. If the connector and port do not join with reasonable ease, they probably don't match. Make sure that the connector matches the port and that you have positioned the connector correctly in relation to the port.

- Take care not to spill any food or liquid on the computer, keyboard, mouse, or other components. If you do, turn your computer off immediately and unplug it before cleaning up the spill. Depending on what you spilled and how much of it got into your equipment, you may have to bring your equipment to an Apple-authorized service provider.

- Protect the computer and its components from direct sunlight and rain or other moisture.

- Keep all ventilation openings clear and unobstructed. Without proper air circulation, components can overheat, causing damage or unreliable operation.

WARNING This equipment is intended to be electrically grounded. Your Macintosh is equipped with a three-wire grounding plug—a plug that has a third (grounding) pin. This plug will fit only a grounded 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!

Handling the monitor

Follow these procedures for handling a monitor:

- Turn down the screen brightness control if you leave the computer turned on for extended periods. If the brightness is not turned down, the image on the screen could "burn in" and damage the screen.

  You can also use a "screen saver" program, which dims or varies the image on the screen when the computer has been idle for a specified period of time. These programs are available from independent suppliers and user groups.
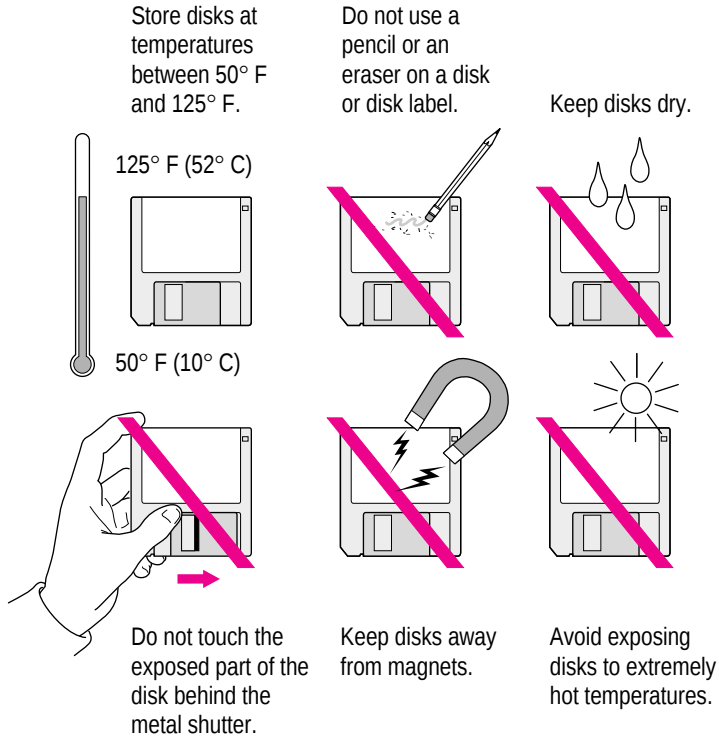
- Make sure that the ventilation openings on the computer and the monitor are clear and unobstructed.

- Some large monitors cannot safely be placed on top of the computer. Check the instructions that came with the monitor for setup information.

- If there is interference on the monitor's screen or on a television or radio near your computer, move the affected equipment farther away.

Handling the keyboard

Take care not to spill any liquid on the keyboard. If you do, turn off your computer immediately.

- If you spill liquid that is thin and clear, unplug the keyboard, turn it upside down to let the liquid drain out, and let it dry for 24 hours at room temperature. If, after you take these steps, the keyboard doesn't work, take it to an Apple-authorized service provider for repair.

- If you spill liquid that is greasy, sweet, or sticky, unplug the keyboard and take it to an Apple-authorized service provider for repair.

Handling floppy disks

Store disks at temperatures between 50° F and 125° F.

Do not use a pencil or an eraser on a disk or disk label.

Keep disks dry.

125° F (52° C)

50° F (10° C)

Do not touch the exposed part of the disk behind the metal shutter.

Keep disks away from magnets.

Avoid exposing disks to extremely hot temperatures.
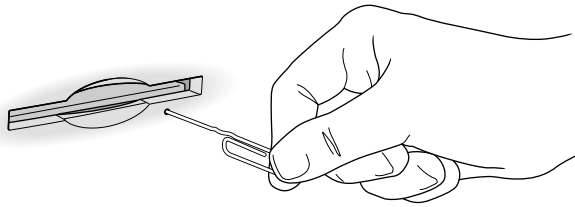
Ejecting a disk

For instructions on ejecting a floppy disk, a CD-ROM disc, or a removable media disk from the Mac OS, see the "Disks" topic of Macintosh Guide, available in the Guide (2) menu.

For instructions on ejecting disks in the PC environment, see "Ejecting Disks in the PC Environment" in the section "Switching Between the Macintosh and PC Environments" in Chapter 5.

If you can't eject a floppy disk

If you can't eject a floppy disk in the usual way, try the following in order:

- Hold down the ⌘ and Shift keys and press the number 1 key on your keyboard to eject a disk in the internal disk drive.

- Turn off the computer. If the disk isn't ejected, then hold down the button on your mouse or other pointing device while you turn the computer on again.

- Locate the small hole near the disk drive's opening, and carefully insert the end of a large straightened paper clip into it. Push gently until the disk is ejected. Do not use excessive force.

If nothing works, take the computer or disk drive to your Apple-authorized service provider to have the disk removed.

Power supply

The power supply in your computer is a high-voltage component and should not be opened for any reason, even when the computer is off. If the power supply needs service, contact your Apple-authorized dealer or service provider.

Cleaning your equipment

Follow these general rules when cleaning the outside of your computer and its components:

■ Use a damp, soft, lint-free cloth to clean the computer's exterior. Avoid getting moisture in any openings.

■ Don't use aerosol sprays, solvents, or abrasives.

Cleaning the computer case

To clean the case, do the following:

1 Turn off the computer completely and then disconnect the power plug. (Pull the plug, not the cord.)

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

Cleaning the monitor

To clean the screen, put household glass cleaner on a soft cloth and wipe the screen. Don't spray the cleaner directly on the screen, because the liquid might drip into the monitor or computer.
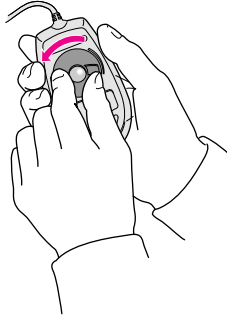
Cleaning the mouse

The mouse contains a small ball that must roll smoothly for the mouse to work properly. You can keep this ball free of dirt and grease by using the mouse on a clean, lint-free surface and cleaning it occasionally.

You need a few cotton swabs and a clean, soft, lint-free cloth.

1 Turn off your computer.
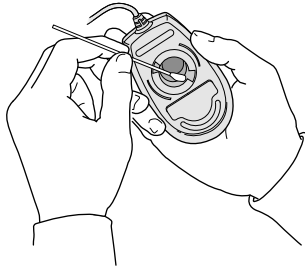
2 **Turn the mouse upside down and turn the plastic ring on the bottom counterclockwise to disengage it.**

If you have an older mouse, you may need to press the plastic ring (rather than turn it) to disengage it.

If the mouse is locked, see the next section, "Locking and Unlocking the Mouse," for instructions on how to unlock it.

3 **Turn the mouse right-side up with one hand and catch the ring and the ball with your other hand.**

4 **Clean the three small rollers inside the mouse with a cotton swab moistened with water.**

Rotate the rollers to clean all around them.

5 **Wipe the mouse ball with a clean, soft, dry, and lint-free cloth.**

6 **If necessary, wash the mouse ball with warm soapy water (use a mild soap such as a dishwashing liquid) and then dry the mouse ball thoroughly.**

7 **Gently blow into the mouse case to remove any dust that has collected there.**

8 **Put the ball and the ring back in place.**
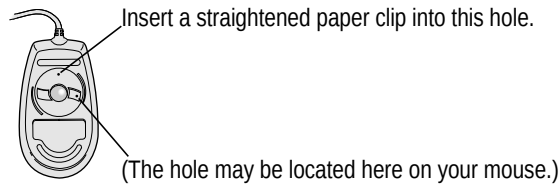
Your mouse should roll smoothly across your mouse pad or desk. If it doesn't, repeat these instructions carefully.

Locking and unlocking the mouse
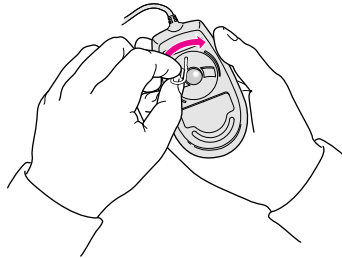
If you have a newer mouse, you can lock it so the ball can't be removed. A locking mouse has a small hole on the plastic ring.

To lock the mouse, follow these steps:
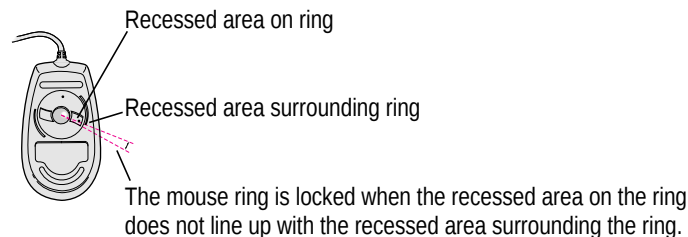
1 **Insert a straightened paper clip into the hole on the plastic ring.**

Insert a straightened paper clip into this hole.

(The hole may be located here on your mouse.)

2 **Press down on the paper clip while you turn the ring clockwise.**
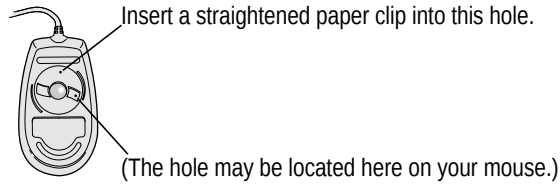
Turn the ring a very short distance, until it stops. When the recessed area on the ring is *not* lined up with the recessed area surrounding the ring, the mouse is locked.
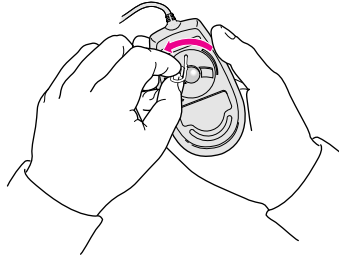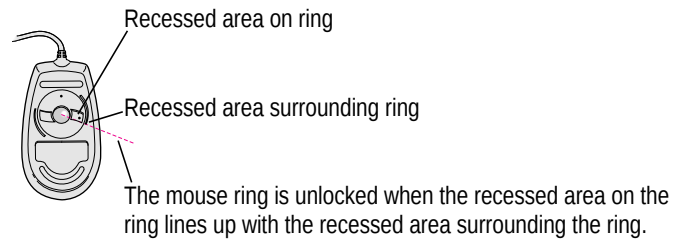
Recessed area on ring

Recessed area surrounding ring

The mouse ring is locked when the recessed area on the ring does not line up with the recessed area surrounding the ring.

To unlock the mouse, follow these steps:

1   **Insert a straightened paper clip into the hole on the plastic ring.**

Insert a straightened paper clip into this hole.

(The hole may be located here on your mouse.)

2   **Press down on the paper clip while you turn the ring counterclockwise.**

Turn the ring a very short distance. When the recessed area on the ring is lined up with the recessed area surrounding the ring, the mouse is unlocked.

Recessed area on ring

Recessed area surrounding ring

The mouse ring is unlocked when the recessed area on the ring lines up with the recessed area surrounding the ring.

Read this appendix for instructions
on installing an expansion card
in your computer or memory
for the PC environment.

Appendix B Installing an Expansion Card or Memory for the PC Environment

Expansion cards are printed circuit boards that can be installed in your computer to give it special capabilities, such as enhanced video capabilities, networking and communications, and additional processing power.

You can install an expansion card by following the instructions that came with the card, or by following the instructions in this appendix. However, be sure to read this appendix for instructions that may be specific to your computer.

If your computer comes with a Single Inline Memory Module (SIMM) installed on the DOS-compatibility card, you can remove it or replace it with a SIMM that has a higher memory capacity.
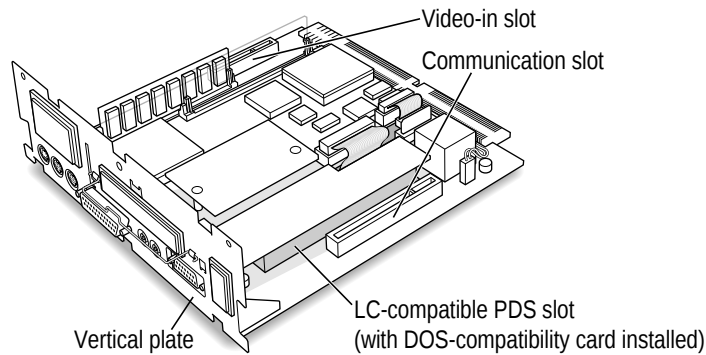
If your computer does not already have a SIMM installed on the DOS-compatibility card, you can add a SIMM that provides up to 32 MB (megabytes) of RAM for the exclusive use of your PC. The SIMM that your card uses is the same type of SIMM that your computer uses. Follow the instructions in this appendix to install a SIMM.

WARNING To avoid damage to your computer, Apple recommends that only an Apple-certified technician install additional RAM. Consult the service and support information that came with your Apple product for instructions on how to contact an Apple-authorized service provider or Apple for service. If you attempt to install additional RAM yourself, any damage you may cause to your equipment will not be covered by the limited warranty on your computer. See an Apple-authorized dealer or service provider for additional information about this or any other warranty question.

Cards fit into slots on the computer's logic board—the board that holds the components that make your computer work. There are three types of slots on your computer's logic board, each labeled on the board:

- a communication slot for an internal modem or an Ethernet card
- a video-in slot for a card that brings signals into the computer from a videocassette recorder (VCR), laserdisc player, video camera, or similar equipment

- an LC-compatible 68030 processor-direct slot (PDS). The DOS-compatibility card is already installed in this slot; you cannot add another card to it.

Video-in slot
Communication slot
LC-compatible PDS slot (with DOS-compatibility card installed)
Vertical plate

Note: The process you use to install a TV tuner card is different from the one described in this appendix. See the documentation that came with that card for instructions.

WARNING To avoid damaging your computer and expansion card, do not attempt to install any expansion card without first checking the documentation for that card. If the documentation specifies that an Apple-certified technician must install the card (usually because the installation requires special training or tools), consult the service and support information that came with your computer for instructions on how to contact an Apple-authorized service provider or Apple for assistance. If you attempt to install the card yourself, any damage you may cause to the computer or card will not be covered by the limited warranty on your computer. If the card is not an Apple-labeled product, check with an Apple-authorized dealer or service provider to see if you can install it yourself.

Installing an expansion card or SIMM involves three steps:

- opening the computer
- inserting the card or SIMM into a particular slot
- closing the computer

Opening the computer

1 **Shut down your computer by choosing Shut Down from the Special menu.**
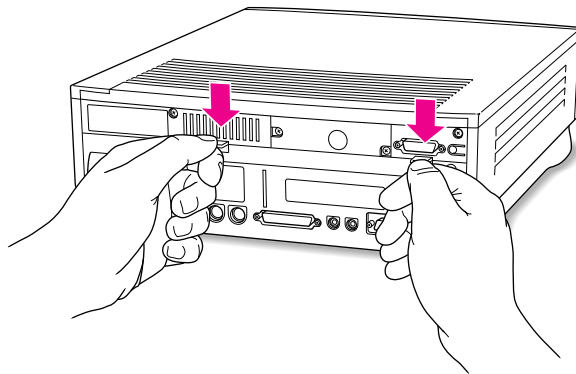
You can also press the Power key on the keyboard.

2 **Unplug all the cables except the power cord from your computer.**
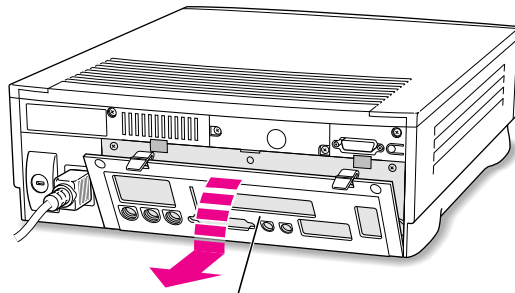
Leaving the power cord plugged in helps protect the computer from damage caused by electrostatic discharge.

IMPORTANT To avoid generating static electricity that may damage components, do not walk around the room until you have completed the installation of the expansion card or SIMM and closed the computer. Additionally, move the logic board as little as possible while it is outside the computer case.

3 **Place your thumbs on the two tabs at the top of the back panel, and press down.**
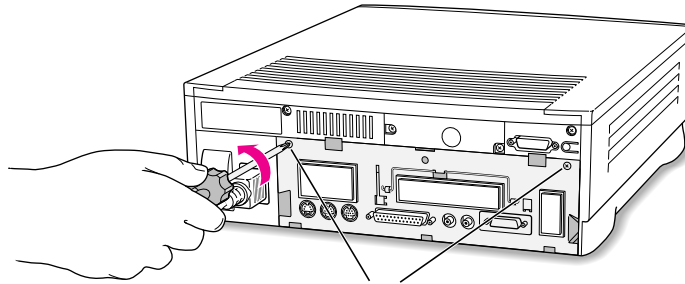
4 **Pulling gently, swing the panel down, and slip it out.**

Remove the back panel.
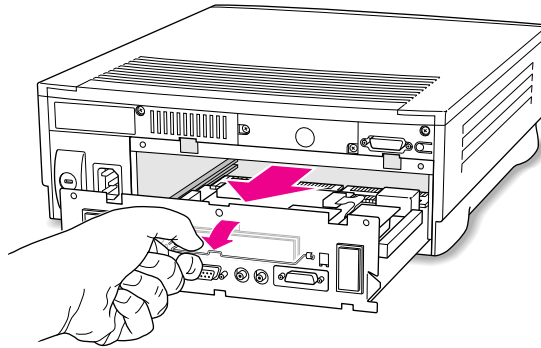
5   **If there are security screws on the vertical plate on the back of the computer, remove them with a Phillips screwdriver.**

If there are security screws, remove both screws from the vertical plate.

6   **Unplug the power cord from your computer.**

7   **Swing the handle out from its storage position. Then grasp the handle and gently but firmly pull it toward you.**
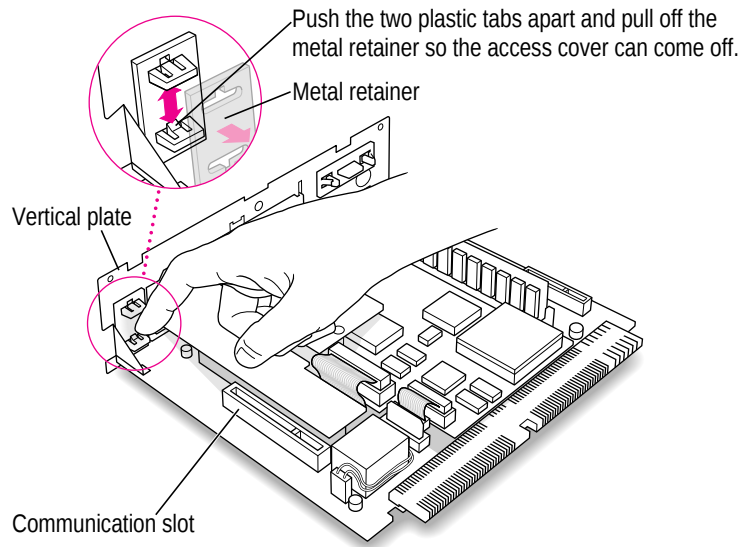
The vertical plate and the logic board to which it's attached slide all the way out of the computer.

What you do next depends on the type of equipment you want to install.
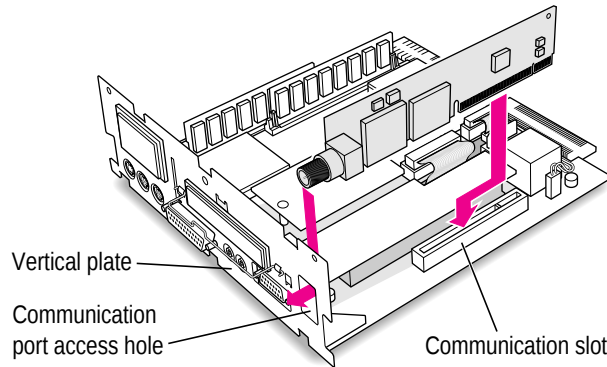
Installing a communication card

1 If your communication card has ports for connecting equipment, remove the plastic access cover from the vertical plate.

Push the two plastic tabs apart and pull off the metal retainer so the access cover can come off.

Metal retainer

Vertical plate

Communication slot

2 Remove the communication card from its static-proof bag.

Hold the card by its edges to avoid touching any connectors on the card.

3 Locate the slot on the logic board labeled COMMUNICATION SLOT.

4   Align the card over the communication slot.

Vertical plate

Communication port access hole

Communication slot

5   Press down on the card until the connector is solidly in place.

Don't force the card. If you meet resistance, pull the card out and try again.

To see if the card is properly connected, lift it gently. If it resists and stays in place, it's connected.

Installing or replacing a SIMM for the PC environment

Your computer may have come with a SIMM already installed on the DOS-compatibility card inside your computer. The SIMM provides memory for the exclusive use of the PC environment. (See the *Technical Information* booklet to find out whether your computer has such a SIMM installed.) To replace the SIMM with a SIMM of greater capacity, or to install a SIMM if you don't already have one installed, follow the instructions in this section.

Note: The SIMMs used by the DOS-compatibility card are the same 72-pin SIMMs used to expand memory in your Macintosh. They are interchangeable.
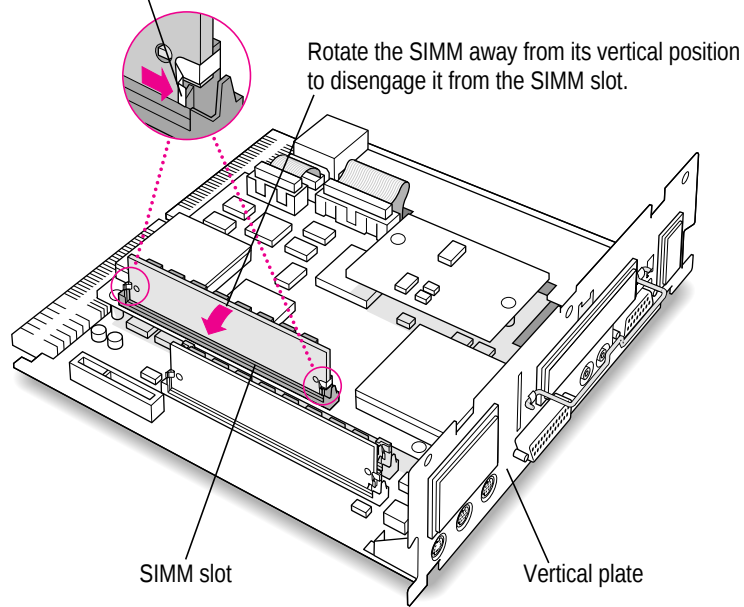
Removing a SIMM

If your computer has a SIMM already installed on the DOS-compatibility card, follow these steps to remove it.

1 Push the metal clips at either end of the SIMM away from the SIMM.

Use your fingernails.

To release the SIMM, move the metal clip on each side away from the SIMM.

Rotate the SIMM away from its vertical position to disengage it from the SIMM slot.

SIMM slot   Vertical plate
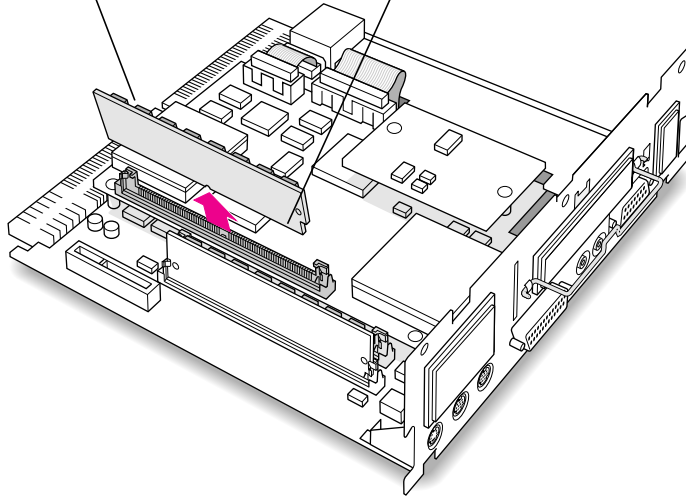
2 Rotate the SIMM until it is at a slight angle.

3 **Gently pull the SIMM from its slot.**

Hold the SIMM only by its edges. Don't touch the connectors along the bottom edge.

Pull the SIMM from the SIMM slot. (It comes out at a slight angle.)

Handle the SIMM by the sides only, so that you don't touch the connectors along the bottom edge.
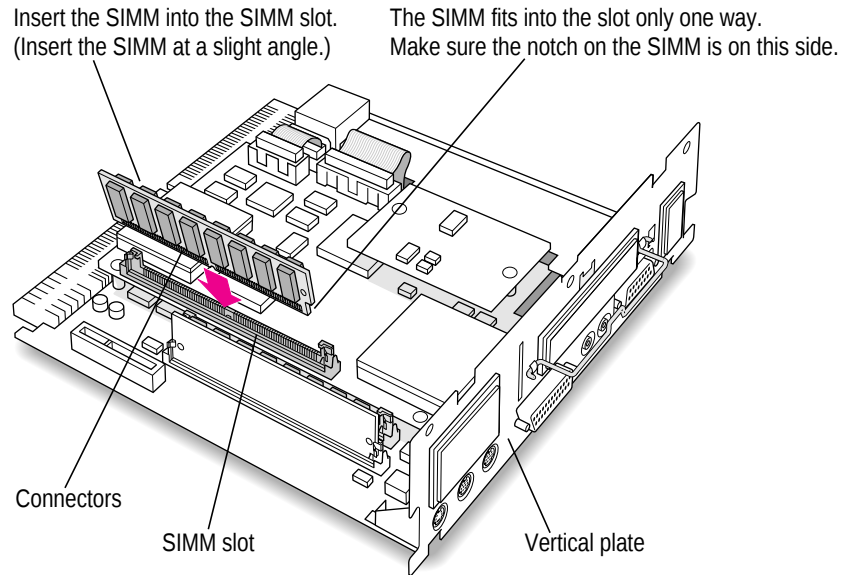
Installing a SIMM

1   Remove the SIMM from its static-proof bag.
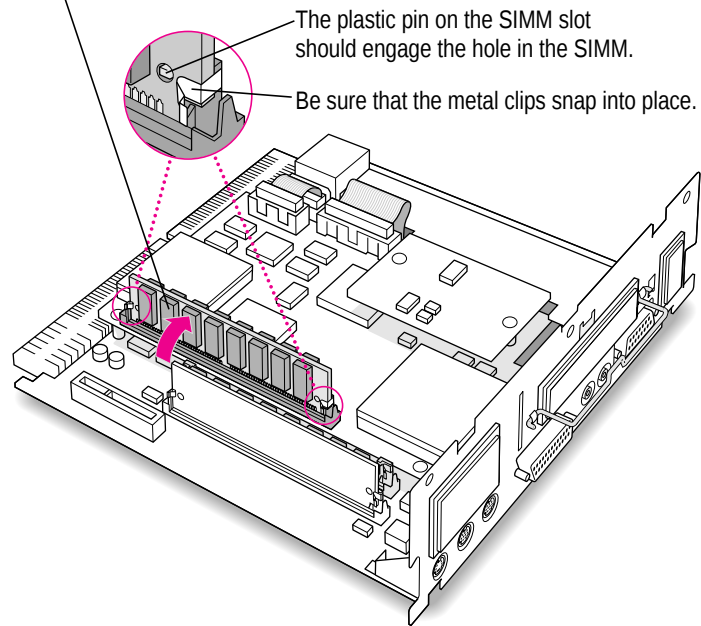
Handle the SIMM by its edges. Avoid touching the connectors.

2   Insert the SIMM into the SIMM slot on the DOS-compatibility card assembly, as shown in the illustration. (Your SIMM may have components on one side or on both sides, as shown.)

Insert the SIMM into the SIMM slot. (Insert the SIMM at a slight angle.)

The SIMM fits into the slot only one way. Make sure the notch on the SIMM is on this side.

Connectors

SIMM slot

Vertical plate
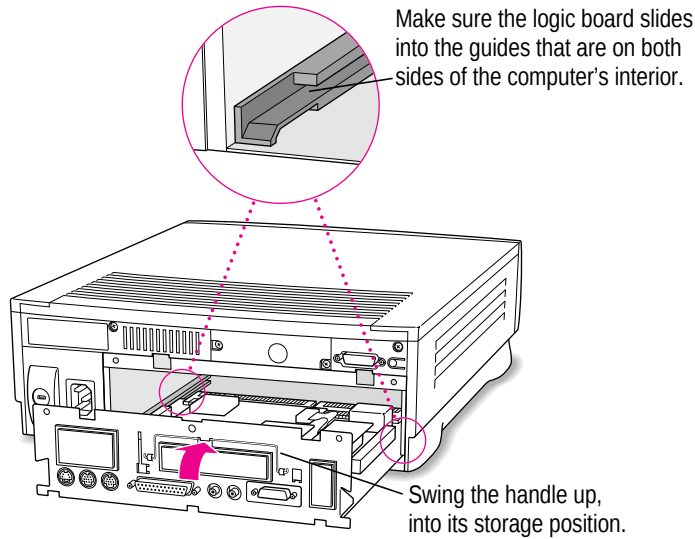
3 **Rotate the SIMM gently to the back until you feel it snap into place.**

Rotate the SIMM back until it snaps into place.

The plastic pin on the SIMM slot
should engage the hole in the SIMM.

Be sure that the metal clips snap into place.
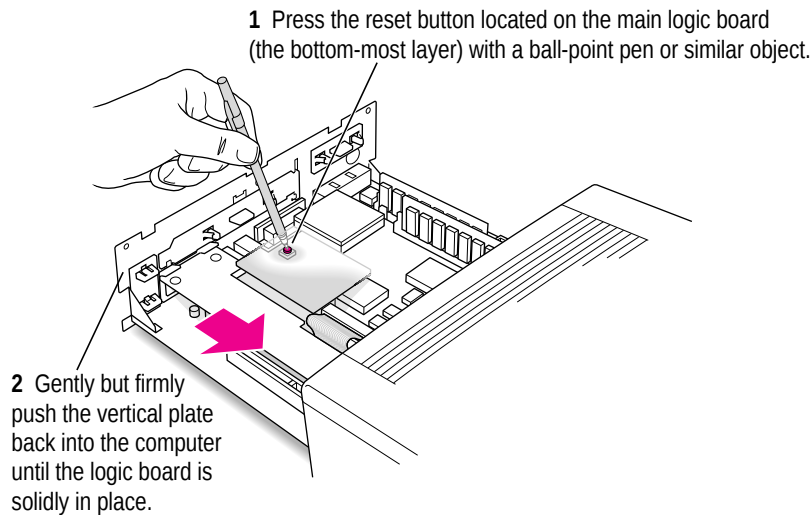
Closing the computer
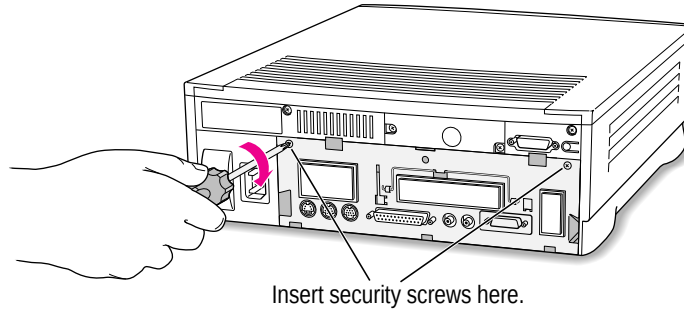
1 Slip the base of the logic board into the guide rails inside the computer case and swing the handle back into its storage position.

Make sure the logic board slides into the guides that are on both sides of the computer's interior.

Swing the handle up, into its storage position.
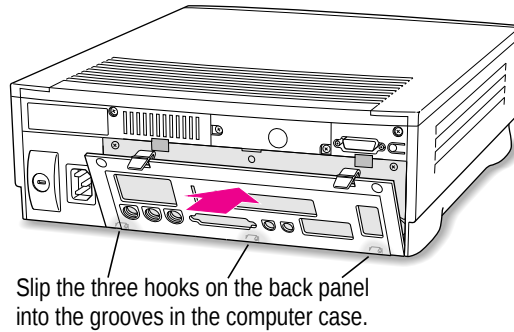
2 Press the reset button on the logic board, and then slide the logic board back into the computer.

1 Press the reset button located on the main logic board (the bottom-most layer) with a ball-point pen or similar object.

2 Gently but firmly push the vertical plate back into the computer until the logic board is solidly in place.
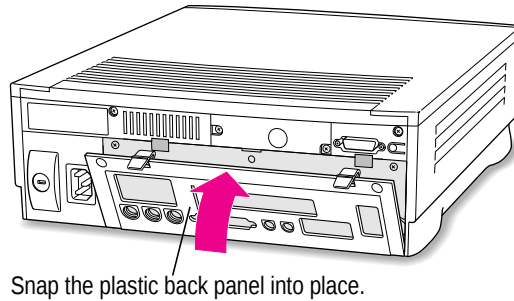
3 **If you removed security screws earlier, reinsert them now.**

Insert security screws here.

4 **Slip the three hooks at the base of the back panel into the grooves in the computer case.**

Slip the three hooks on the back panel
into the grooves in the computer case.

5 **Swing the back panel up and snap it into place.**

Snap the plastic back panel into place.

6 **Plug the cables back into the computer.**

7 **Reconnect the power cord.**

Your computer is now ready to turn on and use.

> **WARNING** Never turn on your computer unless all of its internal and external parts are in place. Operating the computer when it is open or missing parts can be dangerous, and can damage your computer.

Read this appendix to learn
how to use the special
keys on your keyboard.

Appendix C
Special Keys on Your Keyboard

• • • • • •
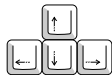
Your computer keyboard contains certain special keys that typewriter keyboards don't have. Many of these keys allow you to give commands to the computer without using the mouse. For example, in many application programs, pressing the ⌘ (Command) key at the same time as the Q key is often an alternative method of quitting a program.

The following table describes what you can do with the special keys on your keyboard. The number of special keys on your keyboard may vary from this list; it depends on the model of keyboard you have.

For information on how keys on Apple keyboards correspond to the keys on a PC keyboard, see "Keyboard" in the section "Working in the PC Environment" in Chapter 5.

Special keys on Apple keyboards		
Arrow keys		Use to move the insertion point, as an alternative to using the pointer. In some programs, the arrow keys have other functions.
Caps Lock key		Use to capitalize a series of letters (numbers and symbols aren't affected).
Clear key		Use to delete the current selection (or use the Delete key). In some programs, Clear has other functions.
⌘ (Command) key		Use in combination with other keys as an alternative to choosing a menu command.

Control key	control	In combination with other keys, this key provides shortcuts or modifies other actions.
Delete key	delete	Use to delete selected material, or the character to the left of the insertion point.
Enter key	enter	In a dialog box, pressing Enter is the same as clicking the outlined button. In some programs, pressing this key confirms information you have provided.
Escape key	esc	The function of this key depends on the program you're using.
Function keys	F1	Some programs allow you to use the 12 function keys to give commands. You can assign commands or action sequences to function keys with special utility programs.
Option key	option	Use in combination with other keys to produce special characters or modify actions.
Numeric keys	numeric keypad	Use to produce numbers and mathematical symbols; some programs use these keys as function keys to initiate actions.
Power key	◁	On some models, press to turn on the computer. Also press to shut down the computer on certain models.
Return key	return	Use to move the insertion point to the beginning of the next line. In a dialog box, pressing Return is the same as clicking the outlined button.
Shift key	shift	Use to produce capital letters (or the upper character on the key).
Other special keys	help home page up / del end page down	The function of these keys depends on the operating system and program you're using.
Tab key	tab	Use to move the insertion point to the next stopping place (such as a tab stop or field in a dialog box or program).

Follow the instructions in this
chapter if you have problems
opening some documents.

Appendix D
Using Macintosh Easy Open

• • • • • •
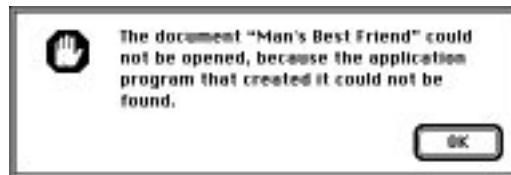
You use Macintosh Easy Open software to open a document when you don't have the application that created it.
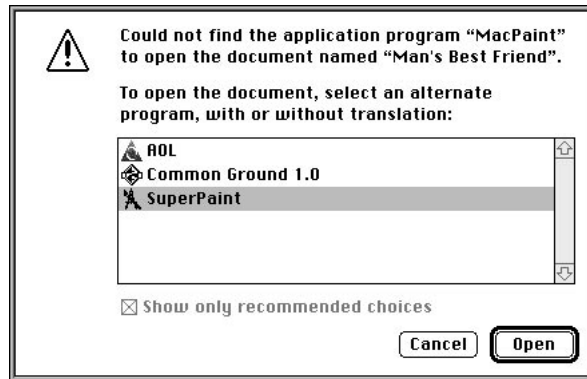
When you choose Open from an application's File menu with Macintosh Easy Open installed, you may see more documents than you did before. You'll also see additional information when you use a list view of the files in a folder (including DOS, Windows, and ProDOS documents).

Choosing an application to open a document

Without Macintosh Easy Open, you see this message when you try to open a document created by an application missing from your computer.

With Macintosh Easy Open installed, you see a list of programs that can open the document.

■ **Double-click any application in the dialog box to open the document.**

If you don't like the results you see when the document opens, quit the application and try again using a different choice from the list.

If Macintosh Easy Open can't find any application to open your document, you see this dialog box:

Note: Macintosh Easy Open lists only the programs that will produce the best results. To see applications that may produce less than optimum results, deselect "Show only recommended choices."

Using the Macintosh Easy Open control panel

You use the Macintosh Easy Open control panel to set preferences when you've installed additional translators available from your software retailer. Such translators give you more choices for opening documents.

On/Off

If you turn off Macintosh Easy Open, it won't try to find applications to open your documents. You'll still see extra information in list views.

Always Show Choices

When you use additional translators purchased from your software retailer, you can set preferences that determine which application opens a document. If you turn on Always Show Choices, Macintosh Easy Open presents the full list of applications and translators to open your documents, even if you have indicated a preference.

Include Choices from Servers

Turn off this option if you want Macintosh Easy Open to search for programs only on hard disks directly connected to your Macintosh, ignoring programs on shared disks. (Using applications over the network is slower than using them on a hard disk.)

Delete Preferences

Click this button to erase the record of choices you've made for specific translator preferences (useful only if you've previously installed translators purchased from your software retailer). You may want to erase your preferences when you install new translation software in order to have Macintosh Easy Open prompt you for new choices.

● ● ● ● ● ●

In this chapter

The DOS-compatibility card inside your computer supports network drivers that conform to Novell's Open Data-Link Interface (ODI). This appendix contains instructions for installing such network management software. It covers

- installing NetWare client software
- installing Novell's LAN Workplace for DOS TCP/IP software
- installing NetManage's Chameleon TCP/IP software
- installing Windows for Workgroups
- installing Spry's Air Series TCP/IP software
- installing Mosaic

Installing NetWare client software

The instructions below will guide you through installation of client software for Novell NetWare versions 3.12, 4.01, and 4.02. PersonalNetWare is not supported at this time. You must have Windows installed before installing the NetWare client software. If you need to reinstall Windows, see "Reinstalling PC Software" in the section "Reinstalling the DOS-Compatibility Software" in Chapter 8.

Before you start, be sure you have the appropriate floppy disks for the version of NetWare you wish to install.

In addition, you need to know the Ethernet frame type in use on your network segment. You must choose the appropriate frame type in Step 11 below. If you are not certain which one to select, ask your network administrator before you begin the installation.

1 **Insert the *Novell NetWare Client for DOS WSDOS_1* disk into the disk drive.**

2 **At the DOS prompt, type the following:**

```
A: <return>
```

```
INSTALL
```

3 **The NetWare Client Install screen appears.**

Follow the instructions, pressing Return for each selection.

4 **Define the directory for NetWare.**

The default is C:\NWCLIENT. Press Return once to confirm the entry and press it again to execute this step.

5 **Edit the CONFIG.SYS file.**

Change your LASTDRIVE statement so that it reads LASTDRIVE=Z.

6 **Add the following line to your AUTOEXEC.BAT file:**

```
CALL C:\NWCLIENT\STARTNET.BAT
```

Press Y-Return.

7 **Decide whether you wish to load the Windows support in the directory where you have loaded Windows.**

Press Y or N. If yes, press Return once to confirm the Windows subdirectory entry and again to execute this step.

8 **Select the driver for the network board. Press Return.**

9 **A message asks you to insert another disk. Follow the instructions on the screen.**

10 **In the dialog box, select Power Macintosh 6100 Ethernet Adapter and press Return.**

11 In the dialog box for selecting a frame type, press Return.

12 Use the arrow keys to choose the appropriate frame type for the Novell server you will be using.

13 Press Return. Then press Esc to continue.

14 Press Return to copy the MACODI.COM driver to the NetWare subdirectory.

15 Following the instructions on the screen, insert the *NetWare Client for DOS WSDOS_1* disk again.

16 If you wish to add files and a NetWare group to the Windows directory, insert the *NetWare Client for MS Windows WSWIN_1* disk and follow the instructions on the screen.

When installation is complete, a dialog box appears asking you to reboot (restart) the computer.

17 Eject the disk by pressing ⌘-E.

18 Press Control-Alt-Delete.

You now have additional network drives and mappings available. Your first network drive letter is Novell's default of F, unless this drive is already in use on your machine, or if your network is set up to use a different starting drive.

19 To log into the network, type:

```
F:

LOGIN <your user name>

PASSWORD: <your password, if any>
```

Conserving memory

During NetWare client installation you add the line

```
CALL C:\NWCLIENT\STARTNET.BAT
```

to the beginning of the AUTOEXEC.BAT file. This command then loads four programs into DOS memory—LSL.COM, MACODI.COM, IPXODI.COM, and VLM.EXE (in this order). To conserve memory in the lower DOS region, you may wish to edit the STARTNET.BAT file (installed with your NetWare software) to load those four programs with the LOADHIGH (LH) command. See your DOS documentation for details on manually optimizing DOS memory. (Be aware that the Microsoft utility MEMMAKER does not work with the DOS-compatible Macintosh.)

Mapping drive letters

When you map a network resource as a drive letter, the Macintosh PC Setup control panel recognizes that those drive letters are unavailable for use as shared folders. However, when the network no longer uses the drive letter, PC Setup will still show them as unavailable for sharing folders until you restart the PC.

In addition, if a drive letter is being shared before you start up the PC and Novell needs to use that drive letter, then the Novell network drive will take precedence over that shared drive letter.

For further information, see your Novell installation and administration manuals, or contact your network adminstrator.

Installing Novell's LAN Workplace for DOS TCP/IP software

IMPORTANT You must not have MacTCP installed when you run DOS TCP/IP software; the two will conflict with one another.

You can use the IPX and TCP protocols at the same time in either the PC environment or the Mac OS, or you can use one protocol in the PC environment and the other protocol in the Mac OS. However, you cannot use the same protocol in both environments at the same time.

If you want to use the IPX protocol in the PC environment and you have previously installed MacIPX in the Mac OS, remove MacIPX from the Control Panels folder or select AppleTalk as your network interface in the MacIPX control panel.

If you want to use the TCP protocol in the PC environment and you have previously installed MacTCP in the Mac OS, remove MacTCP from the Control Panels folder or select an interface other than Ethernet in the MacTCP control panel.

You must have Windows installed before installing the LAN Workplace for DOS software. If you need to reinstall Windows, see "Reinstalling PC Software" in the section "Reinstalling the DOS-Compatibility Software" in Chapter 8.

In addition, you need to know the following information before you start:

■ A legitimate, assigned IP address for the machine on which you're installing the TCP/IP software (for example, 222.111.11.1). For connecting to the Internet, your service provider will tell you the correct address. For TCP/IP networking within your company, your network administrator can provide you with an address.

If you have either a BOOTP or an RARP server to dynamically assign IP addresses, you don't need to know the IP address before beginning the installation.

- If you are on a network with a subnet mask, you need the IP address for that mask, for example:

  255.0.0.0 for client Class A IP addresses

  (those between 0.0.0.1 to 127.255.255.254]

  255.255.0.0 for client Class B IP addresses

  (those between 128.0.0.1 and 191.255.255.254]

  255.255.255.0 for client Class C IP addresses

  (those between 192.0.0.1 and 223.255.255.254]

- If you will connect to a TCP/IP host through a router, you need to know the IP address for that router.

- The name of your domain name server (for example, server.edu).

- The IP address of your domain name server.

Once you have this information, you can proceed with the installation by following Novell's instructions and answering the on-screen prompts.

Installing NetManage's Chameleon TCP/IP software

IMPORTANT You must not have MacTCP installed when you run DOS TCP/IP software; the two will conflict with one another.

You can use the IPX and TCP protocols at the same time in either the PC environment or the Mac OS, or you can use one protocol in the PC environment and the other protocol in the Mac OS. However, you cannot use the same protocol in both environments at the same time.

If you want to use the IPX protocol in the PC environment and you have previously installed MacIPX in the Mac OS, remove MacIPX from the Control Panels folder or select AppleTalk as your network interface in the MacIPX control panel.

If you want to use the TCP protocol in the PC environment and you have previously installed MacTCP in the Mac OS, remove MacTCP from the Control Panels folder or select an interface other than Ethernet in the MacTCP control panel.

You must have Windows installed before installing the Chameleon TCP/IP software. If you need to reinstall Windows, see "Reinstalling PC Software" in the section "Reinstalling the DOS-Compatibility Software" in Chapter 8.

In addition, you need to know the following information before you start:

- A legitimate, assigned IP address for the machine on which you're installing the TCP/IP software (for example, 222.111.11.1). For connecting to the Internet, your service provider will tell you the correct address. For TCP/IP networking within your company, your network administrator can provide you with an address.
- The name of your domain name server (for example, server.edu).
- The IP address of your domain name server (for example, 111.222.0.0).
- The IP address of your Internet gateway, if any.

Once you have this information, you can proceed.

To install Chameleon from Windows:

1 **In the Program Manager, choose Run from the File menu.**

2 **Type** `A:\SETUP`.

Follow the on-screen instructions and prompts. Near the end of the installation, you will be asked to respond to a series of dialog boxes. Respond as follows:

ADD INTERFACE

Click OK.

INTERNET ADDRESS

Enter the address provided by your network administrator or service provider.

 SUBNET MASK

Click OK. The software will supply the correct mask.

HOST NAME

Select a name for your client machine.

DOMAIN NAME

Enter the name for your domain name server.

3 **Choose Domain Servers from the Services menu.**

4 **Enter the IP address of the domain name server.**

5 **Choose Gateway from the Services menu.**

6 **Enter the IP address of the Internet gateway, if any.**

7 **Save the settings by pressing Alt-F-S.**

If you will be using a dial-up TCP/IP connection, skip to the next section, "Restarting Windows." If not, proceed with step 8.

8 **Go to the C:\NWCLIENT directory**

9 **Copy NET.CFG to NET.OLD. (Save a copy of the existing NET.CFG file.)**

10 **Modify the NET.CFG file.**

A sample modified file is shown below. Note the addition of the Protocol statements in the Link Driver section and the addition of the Protocol TCP/IP section. The frame types and IP addresses used in your environment may be different from this example.

```
Link Driver MACODI
    Protocol IPX E0 ETHERNET_802.2
    Frame ETHERNET_802.2
    Frame Ethernet_II
    ;    Frame Ethernet_802.3
    ;    Frame Ethernet_SNAP
         Protocol RARP 8035 ethernet_ii
    Protocol ARP 806 ethernet_ii
    Protocol IP 800 ethernet_ii
    PORT 300
    INT 10
    ;    node address 12d43
NetWare DOS Requester
    FIRST NETWORK DRIVE = F
Protocol TCPIP
    ip_router    17.131.1.0
    ip_netmask   255.0.0.0
    ip_address   17.131.0.14
    PATH LANG_CFG  C:\NET\LANG
    PATH SCRIPT    C:\NET\SCRIPT
    PATH PROFILE   C:\NET\PROFILE
    PATH LWP_CFG   C:\NET\HSTACC
    PATH TCP_CFG   C:\NET\TCP
Link Support
    Buffers 4 1500
    MemPool 4096
```

Restarting Windows

1   Restart the PC.

2   Start Windows.

You see the Chameleon group window.

Testing the installation

If you will be using a direct connection to a domain name server, you can test the installation by using the Ping application program.

1   Double-click the Custom icon in the Chameleon group to open it.

2   Double-click the Ping icon.

3   Click Start.

4   Enter the name for a domain name server.

You should get a response back within a few seconds.

Using a dial-up service

If you will be using a dial-up service such as Portal, you may need to edit the configuration file to reflect any differences between the default setup and your setup. Click the Custom icon in Windows, open the appropriate .CFG file, and edit the file.

You can test the installation by using Ping. For example, with Portal:

1   Connect using Alt-C.

2   Ping the name news.ip.portal.com.

You should get a response back within a few seconds.

Installing Windows for Workgroups

To support networking with your DOS-compatibility hardware, you need to install software that supports ODI (Open Data-Link Interface) drivers. Follow these steps:

1   Install Windows for Workgroups 3.1.1, electing to not install the networking software.

2   Follow the instructions in "Installing NetWare Client Software," earlier in this appendix.

3   Follow the instructions in "Installing NetManage's Chameleon TCP/IP Software," earlier in this appendix.

Installing Spry's Air Series TCP/IP Software

IMPORTANT You must not have MacTCP installed when you run DOS TCP/IP software; the two will conflict with one another.

You can use the IPX and TCP protocols at the same time in either the PC environment or the Mac OS, or you can use one protocol in the PC environment and the other protocol in the Mac OS. However, you cannot use the same protocol in both environments at the same time.

If you want to use the IPX protocol in the PC environment and you have previously installed MacIPX in the Mac OS, remove MacIPX from the Control Panels folder or select AppleTalk as your network interface in the MacIPX control panel.

If you want to use the TCP protocol in the PC environment and you have previously installed MacTCP in the Mac OS, remove MacTCP from the Control Panels folder or select an interface other than Ethernet in the MacTCP control panel.

You must have Windows installed before installing Spry's Air Series TCP/IP software. If you need to reinstall Windows, see "Reinstalling PC Software" in the section "Reinstalling the DOS-Compatibility Software" in Chapter 8.

If your PC is using a VGA driver, and your Air Series software is version 3.0, you need to make the following change. (These instructions assume that you have Windows installed in the C:\WINDOWS directory. If Windows is elsewhere, type the actual Windows location.)

1 **Make sure the Air Series Setup disk is *not* read-only.**

2 **Place the disk in drive A.**

3 **Type the following at the DOS prompt:**

```
A: <return>

COPY SETUP.BMP SETUP.OLD <return>

COPY C:\WINDOWS\RIVETS.BMP A:SETUP.BMP <return>
```

In addition, you will need to know the following information before you start:

- Your Internet e-mail address.

- A legitimate, assigned IP address for the machine on which you're installing the TCP/IP software (for example, 222.111.11.1). For connecting to the Internet, your service provider will tell you the correct address. For TCP/IP networking within your company, your network administrator can provide you with an address.

- If you are on a network with a subnet mask, the IP address for that mask, for example:

  255.0.0.0 for client Class A IP addresses

  (those between 0.0.0.1 to 127.255.255.254),

  255.255.0.0 for client Class B IP addresses

  (those between 128.0.0.1 and 191.255.255.254), and

  255.255.255.0 for client Class C IP addresses

  (those between 192.0.0.1 and 223.255.255.254).

- If you will connect through a gateway, the IP address for that device.

- The name of your domain name server (for example, server.edu).

Once you have this information, you can proceed.

To install Air Series from Windows:

1 **In the Program Manager, open the File menu and choose Run.**

2 **Type** `A:\SETUP`.

Follow the instructions you see on the screen.

3 **When the installation asks you to select the Ethernet card manufacturer and type, choose anything.**

Note the name of the adapter you select (for example, 3Com is 3C5x9). The Apple driver is not on the list, so you will need to edit the AUTOEXEC.BAT file after completing the installation.

4 **When the installation asks if you want to update the AUTOEXEC.BAT file, select YES.**

5 **Once the installation is complete, exit Windows.**

6 **Edit the AUTOEXEC.BAT file as follows. (You can use any convenient text editor, such as EDIT in the DOS directory.)**

- Comment out the line

  `CALL C:\NWCLIENT\STARTNET.BAT`

- Change the line

  `C:\AIR\BIN\<driver you selected>`

  to

  `C:\AIR\BIN\MACODI`

- If you are are on a NetWare local area network and using the Novell VLM redirector, add the line

  `C:\NWCLIENT\VLM`

  after the line

  `C:\AIR\BIN\TCPIP`

- If you are using NETx, add the line

  `C:\NWCLIENT\VLM`

  before the line

  `C:\AIR\BIN\TCPIP`

7 **Restart the PC.**

8 **Log into the network and start Windows.**

You should now see the Air Series group window.

Testing the installation

To test the installation:

1 **Double-click the Air Telnet icon to open it.**

An Open Telnet Session dialog box appears.

2 **Double-click the name of your domain name server.**

You see a VT100 window with a login prompt.

Installing Mosaic

IMPORTANT You must not have MacTCP installed when you run DOS TCP/IP software; the two will conflict with one another.

You can use the IPX and TCP protocols at the same time in either the PC environment or the Mac OS, or you can use one protocol in the PC environment and the other protocol in the Mac OS. However, you cannot use the same protocol in both environments at the same time.

If you want to use the IPX protocol in the PC environment and you have previously installed MacIPX in the Mac OS, remove MacIPX from the Control Panels folder or select AppleTalk as your network interface in the MacIPX control panel.

If you want to use the TCP protocol in the PC environment and you have previously installed MacTCP in the Mac OS, remove MacTCP from the Control Panels folder or select an interface other than Ethernet in the MacTCP control panel.

You must have Windows installed before installing the Mosaic software. If you need to reinstall Windows, see "Reinstalling PC Software" in the section "Reinstalling the DOS-Compatibility Software" in Chapter 8.

In addition, you must have already installed

■ A TCP/IP software package.

■ Win32s, which allows Windows to run 32-bit applications. Win32s is freeware and can be found on a number of on-line services.

To install Mosaic:

1 **In the Program Manager, choose Run from the File menu.**

2 **Type** C:\WIN32\DISK1\SETUP.

3 **Answer all the dialog boxes to complete the installation.**

4 **After Win32s is installed, a Group window labeled Win32 Applications appears.**

5 **Press Alt-F-New to create an icon for Mosaic.**

6 **In the New Program Object dialog box, select Program Item.**

7 **Fill in the Program Item Properties dialog box as follows:**

Description: Mosaic

Command Line: C:\MOSAIC\MOSAIC.EXE

Working Directory: C:\MOSAIC

8 **Click OK.**

A Mosaic icon appears in the Win32 Applications Group window.

9 **Copy the C:\MOSAIC\MOSAIC.INI directory to the C:\WINDOWS\ directory.**

You are now ready to use Mosaic.

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