Getting Started

part

I

Follow the instructions in this
chapter to set up your computer
and learn the basics.

1 Getting Started

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The illustration on the next page shows all the equipment you will 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.
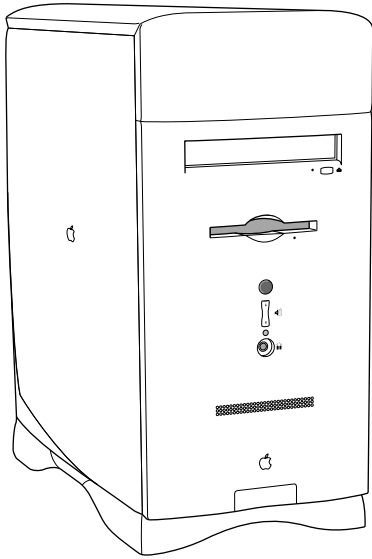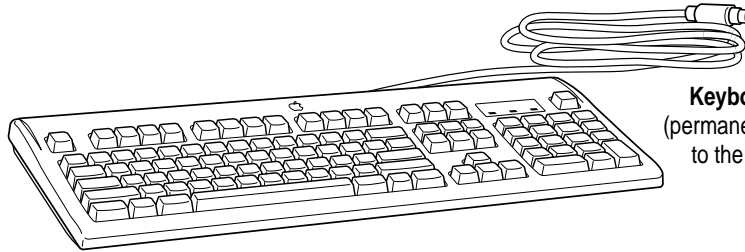
Macintosh computer
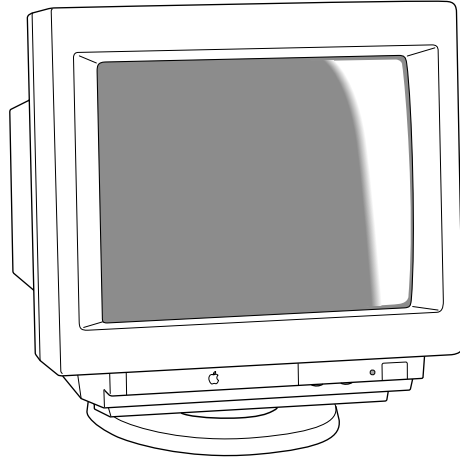
Monitor
(Your monitor may look different from this.)
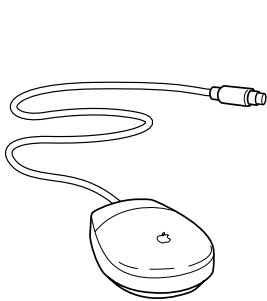
Keyboard cable
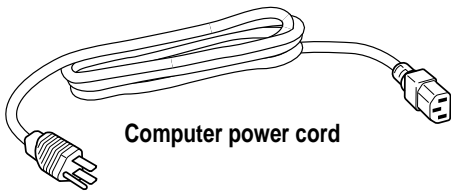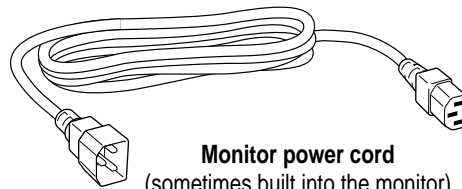(permanently attached
to the keyboard)

Keyboard

Mouse

Monitor power cord
(sometimes built into the monitor)

Computer power cord
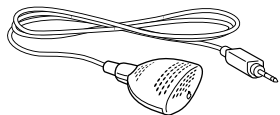
Apple PlainTalk Microphone (optional)
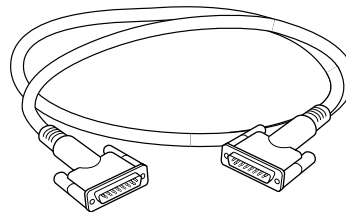
Monitor cable
(sometimes built into the monitor)

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 on how 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 **Place the computer where you want it—either on the floor or on a sturdy desk.**

If your computer came with a modem, you may want to set your computer near a phone jack (if possible) so that you can connect your modem later.

2 **Make sure the voltage switch on the back of the computer is set for the kind of voltage system you will be connecting to.**

The voltage switch must be set correctly to avoid damaging your computer. If you don't know the voltage used in the country you're in, refer to the table "Voltages for Different Locations" later in this chapter.
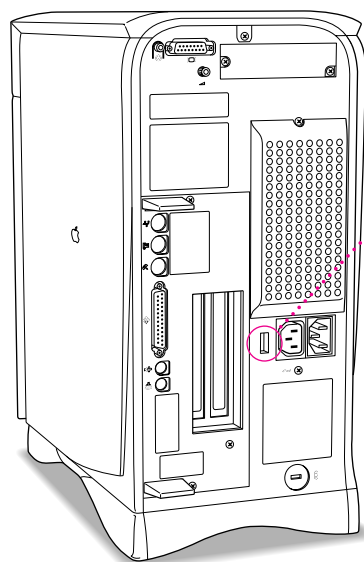
Before you plug your computer in, check to see that the voltage switch on the back is properly set. If you need to change the setting, insert a small screwdriver here and slide the switch.

Set the switch to show "115" for voltages less than 135; set it to show "230" for voltages greater than 180. (Your computer will not operate in the 135–179 volt range.)

Voltages for different locations

For any voltages less than 135 in the chart below, set the voltage switch on the back of your computer to "115." Set the switch to show "230" for a voltage greater than 180.

IMPORTANT In some countries, you may have one of two voltages. If you're not sure which of the two voltages you have, check with your electricity supply company before plugging in your computer.

Country	Voltage
Japan	100
Algeria, Indonesia, Lebanon, Libya, Peru, S. Korea, Vietnam	100 or 220
Ecuador, Jamaica, Philippines, Taiwan	110
Bermuda, Canada, Puerto Rico, United States, Venezuela	120
Colombia, Mexico, Saudi Arabia	127
Brazil	127 or 220
Hong Kong	200
India, South Africa	220–250
Israel, Pakistan, Singapore	230
Australia, Kuwait, Malta, New Zealand, Northern Ireland, Papua New Guinea, Oman, Qatar, United Kingdom	240
Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland	220–230
Bahrain, Chile, China (People's Republic), Czechoslovakia, Egypt, Greenland, Hungary, Iceland, Iran, Jordan, Liechtenstein, Nepal, Paraguay, Poland, Romania, United Arab Emirates, Russia and the Commonwealth of Independent States (CIS),Yemen, Yugoslavia	220

3 **Plug the socket end of the computer's power cord into the recessed power plug on the back of the computer.**

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

Make sure at least one end of the power cord is within reach so that when you need to unplug the computer you can do so easily.
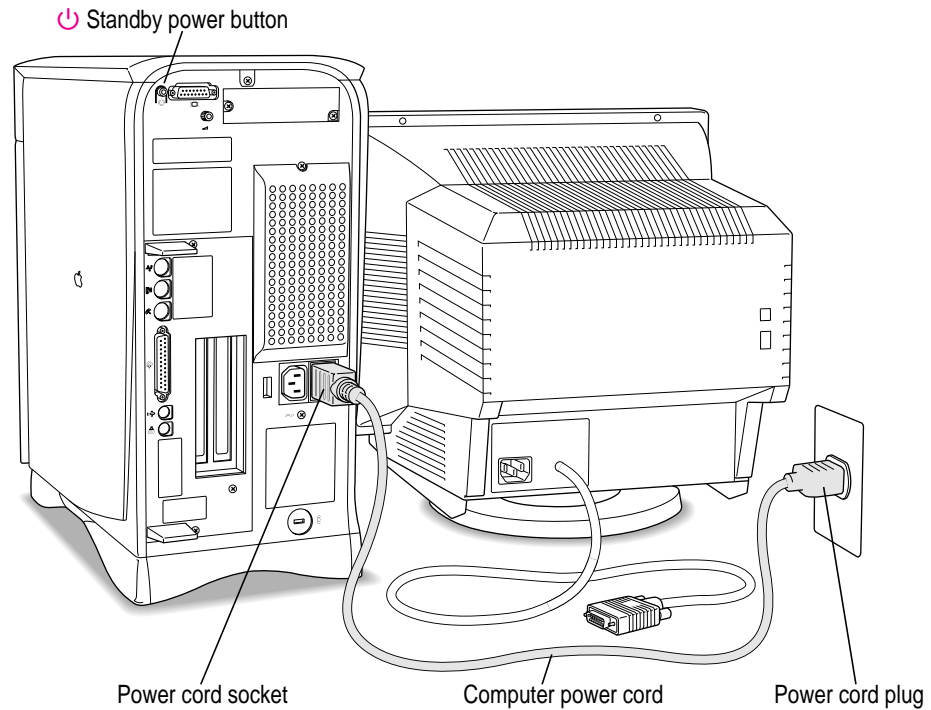
⏻ Standby power button

Power cord socket   Computer power cord   Power cord plug

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!

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 standby power button (⏻) located on the back of the computer to turn it off.

Connecting a monitor

You can connect many types of monitors to your Macintosh. To connect a monitor, refer to the instructions that came with it, in addition to the instructions here.

Connecting the monitor power cord

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

To connect the monitor power cord, follow these steps:

1 **Place the monitor where you'll be using it.**

Keep these considerations in mind:

- Allow 3 or more inches for air circulation around the computer and monitor.

- Position the monitor with the top of the screen at slightly below eye level when you sit at the keyboard.

- Position the monitor to minimize glare and reflections on the screen from overhead lights and windows.

- Consult "Arranging Your Office" 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.**

Some monitor power cords are designed to plug into the back of your computer.

Some monitor power cords must be connected to a grounded electrical outlet, not to the computer. Check the information that came with the monitor.

Monitor power socket   Monitor power cord   Monitor power cord plug
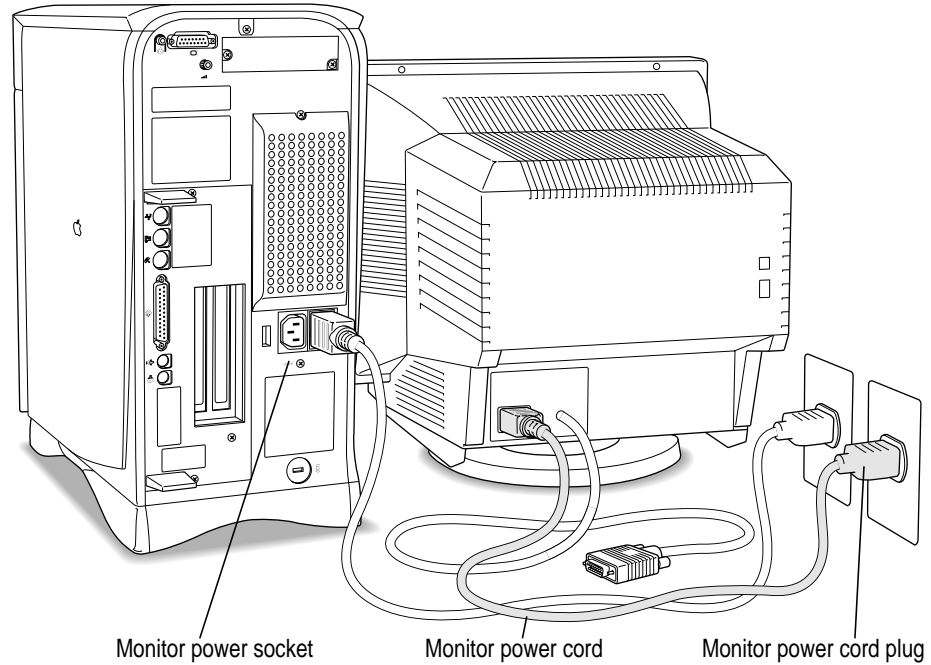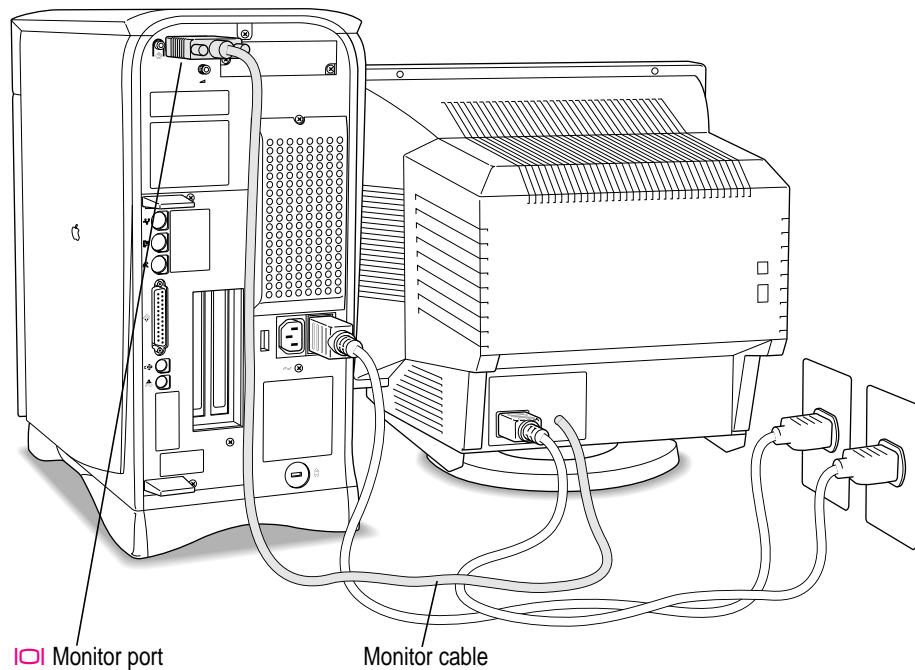
Connecting the monitor cable

After you plug in the monitor power cord, 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 so that it appears as shown in the illustration.

On some monitors, the cable is already attached.

2   Attach the monitor cable to the monitor port on the back of the computer so that it appears as shown in the illustration.

|◻| Monitor port   Monitor cable

If your monitor has a microphone or speakers, you may need to connect additional cables. See the documentation that came with the monitor.
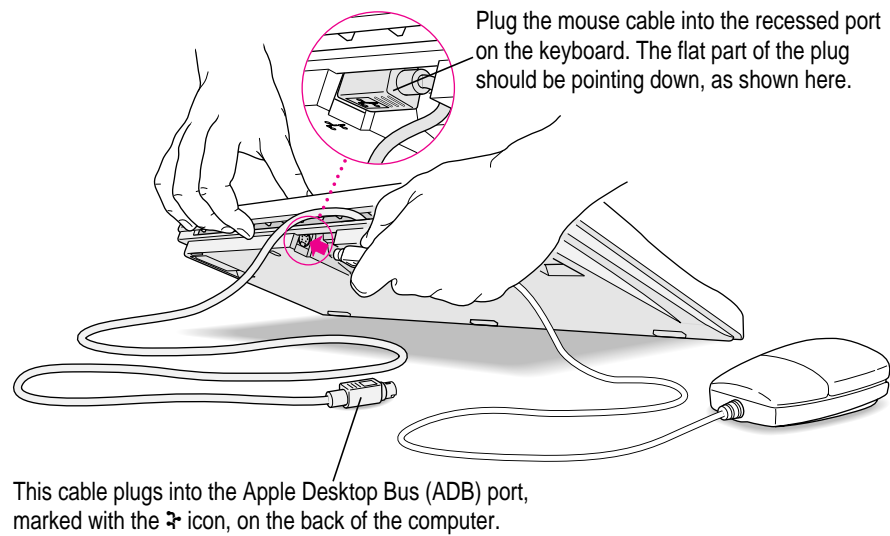
Connecting the mouse and keyboard

If you have a pointing device other than a mouse, you can connect it following the instructions in this section. (Note that some devices require that you install additional software to use them with your computer. For instructions, see the documentation that came with your device.)

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 cable 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, marked with the ⌨ icon, on the back of the computer.
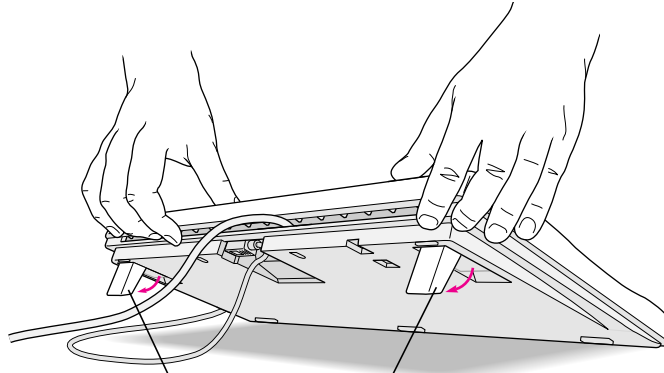
2 **Plug the keyboard cable into the ADB port marked with the ⬩ icon on the back of the computer.**

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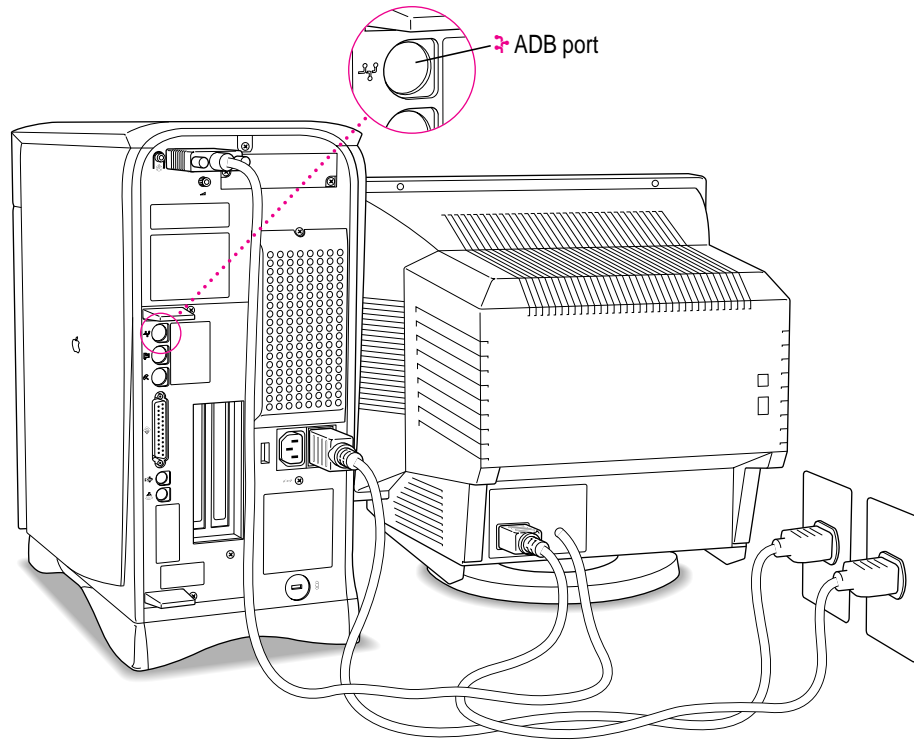
Some monitors also have a port to which you can connect the keyboard or mouse. See the information that came with the monitor.

3 **If you want to adjust the keyboard angle, lower the feet on the keyboard.**

To adjust the keyboard angle, lower the feet until they snap into position.

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 for the first time

To turn the computer on for the first time, follow these steps:

1   Turn on your monitor.

Note: You may not see the monitor power come on until you turn on the computer in the next step. Also, larger monitors can take several seconds to turn on if you have extra DRAM installed in your computer.

See the information that came with your monitor for the location of the power switch. On newer Apple monitors, the power switch is located on the front of the unit.

By the way: Depending on the type of monitor you have, you may only need to turn it on once. Some monitors turn off automatically when you shut down the computer, and turn on automatically when you start up the computer. Other monitors have to be turned on separately each time you turn on the computer.

**2   Press the Power key (marked with a ◁) on your keyboard.**
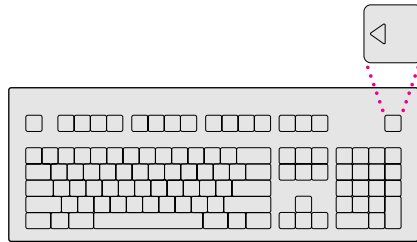
You hear a tone from the computer as it starts up.

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

You see a sequence of messages describing what is happening, followed by the Energy Saver dialog box.

- If you see a blinking question mark, see "Solutions to Common Problems With Your Computer" in Chapter 9.

- If you see anything else on your screen, or if you see nothing at all, see "Problems Turning On Your Computer?", next.

- If you are a beginning Macintosh user, press the Return key on your keyboard when the Energy Saver dialog box appears.
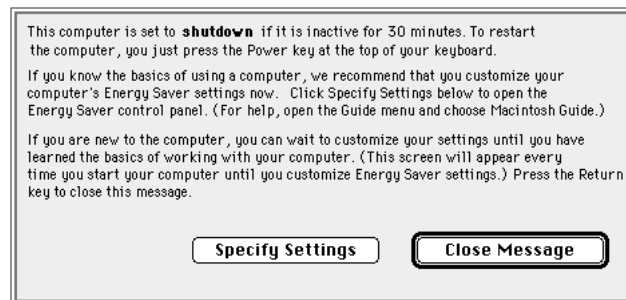
- If you're an experienced Macintosh user, you may want to set your energy-saving options now. For more information, refer to "Saving Energy With the Energy Saver Control Panel," later in this chapter, and to the "Saving Energy" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (❷) menu.

■ If, when you press Return, you see the Macintosh desktop (shown here), your system software is already set up correctly.

Skip now to the section, "What's Next?"
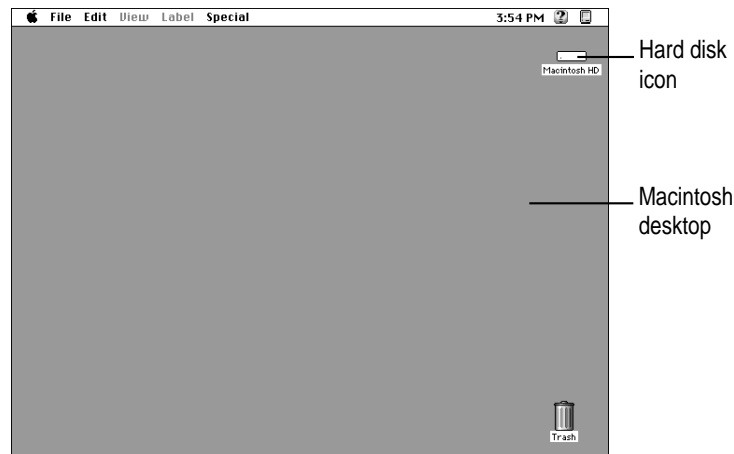
Note: To save energy, your computer is automatically set to put itself to sleep if you don't use it for 30 minutes or more (the computer goes into power-saving mode and the screen turns black). If this happens while you're setting it up, simply press the Power key or any key on the keyboard but Caps Lock to "wake up" the computer (it may take a few seconds). See "Saving Energy With the Energy Saver Control Panel" later in this chapter for more information on setting power-saving options.

Problems turning on your computer?

If the screen is dark, check these items to see if you can identify the problem:
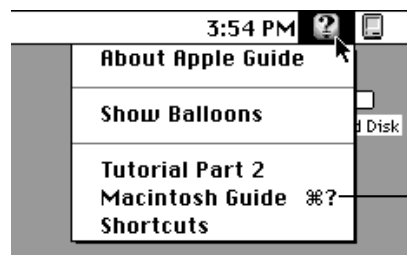
- Is the computer plugged into a power source? If it is plugged into a power strip, is the power strip turned on?

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

- 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—the one connected to the monitor video port (|□|) on your computer—attached firmly to both the monitor and computer?

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

If you see a blinking question mark on the screen, turn to "Solutions to Common Problems With Your Computer" in Chapter 9.

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, see the next section, "Learning the Basics."

- If you are an experienced Macintosh user, turn to Chapter 2, "Getting Help," to learn about onscreen help (called "Macintosh Guide" or "Mac OS Guide"). Or choose Macintosh Guide (or Mac OS Guide) from the Guide menu (❷) in the upper-right corner of your screen and explore it yourself.

```
                    3:54 PM ? ▯
         About Apple Guide  ▶

         Show Balloons              □
                                    d Disk
         Tutorial Part 2
         Macintosh Guide  ⌘?
         Shortcuts
```

What you can't find in this manual you can find in Macintosh Guide (or Mac OS Guide), your main source of information when working with your computer.

- If you want to connect other equipment, such as a printer, to your computer, see Chapter 3, "Expanding Your Computer and Using Its Special Features."

- If you want to install application software on your computer, see Chapter 4, "Installing and Using Application Programs." The chapter contains information on setting up your programs and managing memory. You'll need this information to properly set up any programs specifically designed for computers with PowerPC microprocessors.

- If you want to turn off your computer, see "Turning the Computer Off" later in this chapter.

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.

Before you begin working with your computer, be sure to read the important health and safety information in Appendix A.

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 need to use your computer. To start the tutorial, follow these steps:

1   Slide your mouse along your mouse pad or desk.

Hold the mouse as shown, with the cable pointing away from you. Rest the heel of your palm on the desk and grasp the sides of the mouse between your thumb and fingers. Use your wrist and fingers to slide the mouse around with the index finger resting on the mouse button. 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
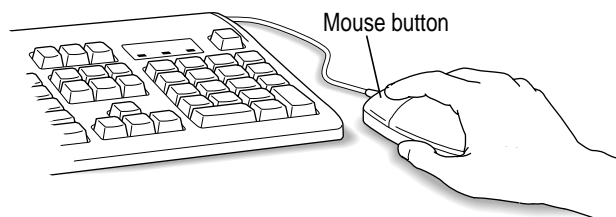
If the arrow doesn't move, make sure that the cables connecting the mouse and keyboard are secure and that your mouse is positioned as shown in the illustration.

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.

4 **While holding down the mouse button, move the arrow until the words "Macintosh Tutorial" are highlighted, then release the 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.
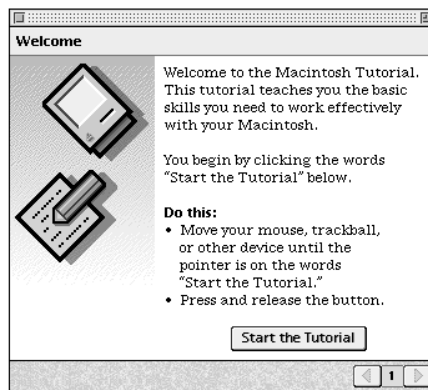
Reviewing the basics

Use the following illustrations to review the elements on your screen with which you work on your computer.
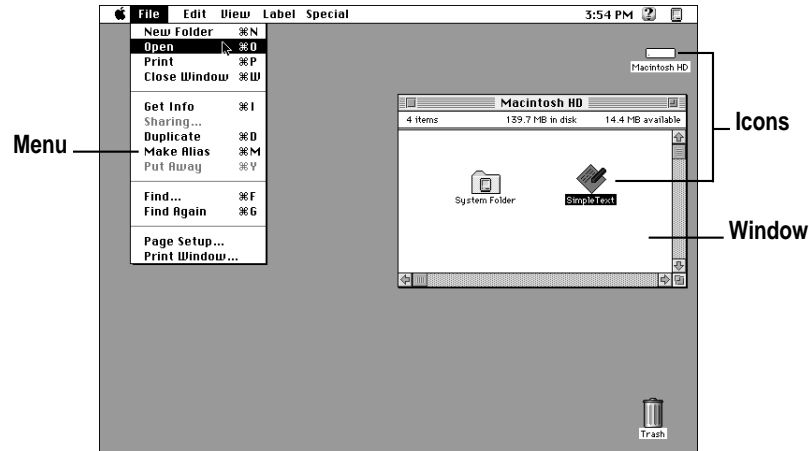
Menus

The strip across the top of the screen is called the menu bar. The symbols and words in it represent "menus" (lists) of commands. To open a menu, place the pointer on the symbol or word for the menu and press the mouse button.

Guide menu
To find an answer to a question, look in the Guide ([?]) menu.

Application menu
You can have several applications open at once. To see which application is active or to switch from one application to another, use this menu.
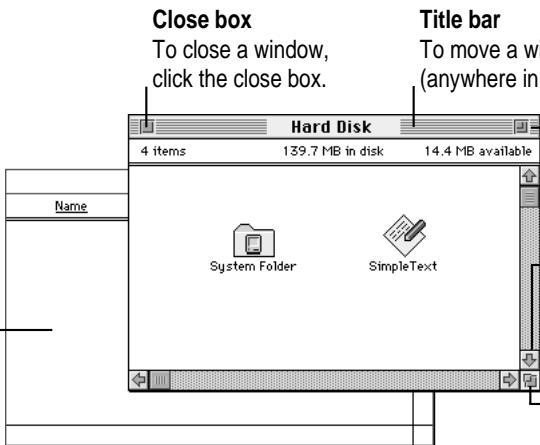
Icons

Icons are small pictures that represent disks, programs, documents, and folders. You can double-click any icon to open it and see what it contains.

Macintosh HD	This icon represents your computer's internal hard disk.
Application	Icons like this one represent application programs, which you use to create documents and do other work.
Document	Icons like this one represent documents, which you can create and edit.
Folder	Icons like this represent folders. A folder contains other icons.
Trash	To throw away an item you no longer want, drag it to the Trash icon and choose Empty Trash from the Special menu.

Windows

Windows are boxes that display text, graphics, and icons. To change the shape or position of a window, or to close the window, use the elements shown here.

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

Title bar
To move a window, drag it by the middle of the title bar (anywhere in the bar except the small boxes on the ends).

Zoom box
To make the window bigger, click once here. Click again to return the window to its original size.

Scroll arrow
To bring hidden portions of a window's contents into view, click one of the four scroll arrows.

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

To bring a partially covered window to the front, click anywhere in it.

Hard Disk
4 items   139.7 MB in disk   14.4 MB available
Name
System Folder   SimpleText

Saving energy with the Energy Saver control panel

When you save energy, you save natural resources and reduce pollution. Your Power Macintosh contains features that automatically save energy. You can increase the energy savings by using the Energy Saver control panel to turn your computer off if you won't be using it for a while—for example, overnight or over the weekend.

The Energy Saver dialog box (shown in step 3 of "Turning the Computer On for the First Time" earlier in this chapter) appears every time you start your computer until you open the Energy Saver control panel. Once you open the control panel, you can keep the preset options shown there, or set your own energy-saving options. If you do not want to set your energy-saving options when the Energy Saver dialog box is displayed, you can click Close Message or press Return (the Energy Saver dialog box continues to appear when you start your computer).

Setting energy-saving options

You can get to the Energy Saver control panel by clicking Specify Settings in the Energy Saver dialog box that appears when you start your computer or by choosing Control Panels in the Apple ( ) menu.

The Energy Saver control panel displays the options you can accept or change, as described next in this section. For more information on using the Energy Saver control panel, see the "Saving Energy" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide ( ) menu.
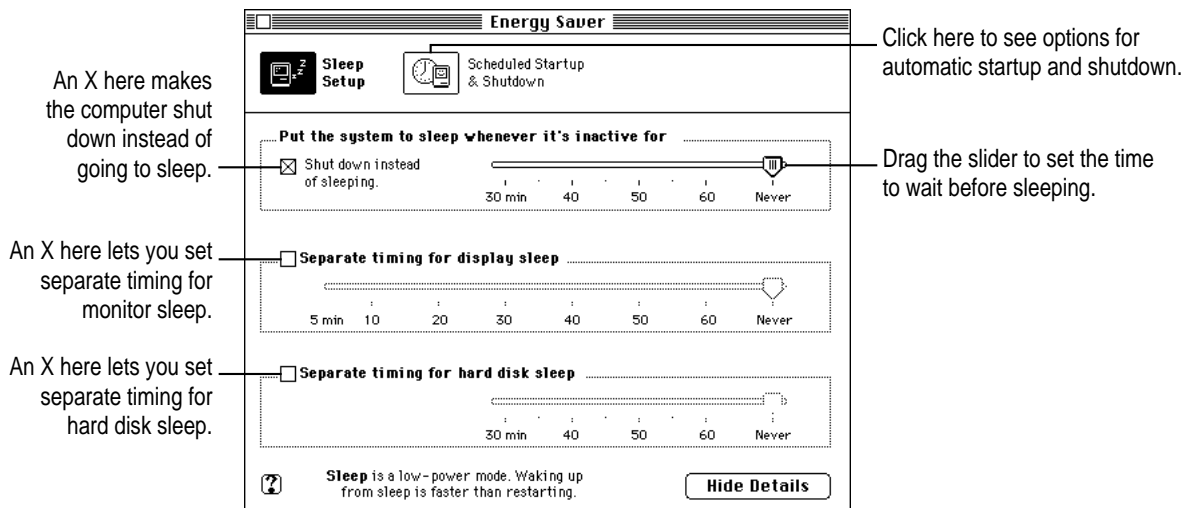
Putting your computer to sleep

Your Power Macintosh is preset to put itself to sleep after 30 minutes of inactivity. When your computer goes to sleep, the screen enters a low-power mode in which it dims and the hard disk stops spinning but remains ready to start back up quickly. (To prevent your computer from overheating, the fan will continue to spin.) If the computer goes to sleep while you have unsaved information on screen, you do not lose any of the information.

To put your computer to sleep right away, choose the Sleep command from the Special menu, or press the Power key on the keyboard to bring up the Shutdown dialog box pictured below.

Are you sure you want to shut down your computer now?

| Restart | Sleep | Cancel | Shut Down |
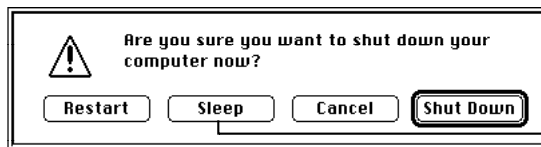
Click here to put your computer to sleep now.

You can set sleep options by clicking Sleep Setup in the Energy Saver control panel, available under Control Panels in the Apple () menu. You click to put an X in a checkbox to indicate that the option is selected. If you want to deselect it, click to remove the X.

Energy Saver

Sleep Setup
Scheduled Startup & Shutdown

Click here to see options for automatic startup and shutdown.

Put the system to sleep whenever it's inactive for

An X here makes the computer shut down instead of going to sleep.

⊠ Shut down instead of sleeping.

30 min 40 50 60 Never

Drag the slider to set the time to wait before sleeping.

An X here lets you set separate timing for monitor sleep.

☐ Separate timing for display sleep

5 min 10 20 30 40 50 60 Never

An X here lets you set separate timing for hard disk sleep.

☐ Separate timing for hard disk sleep

30 min 40 50 60 Never

Sleep is a low-power mode. Waking up from sleep is faster than restarting.

Hide Details

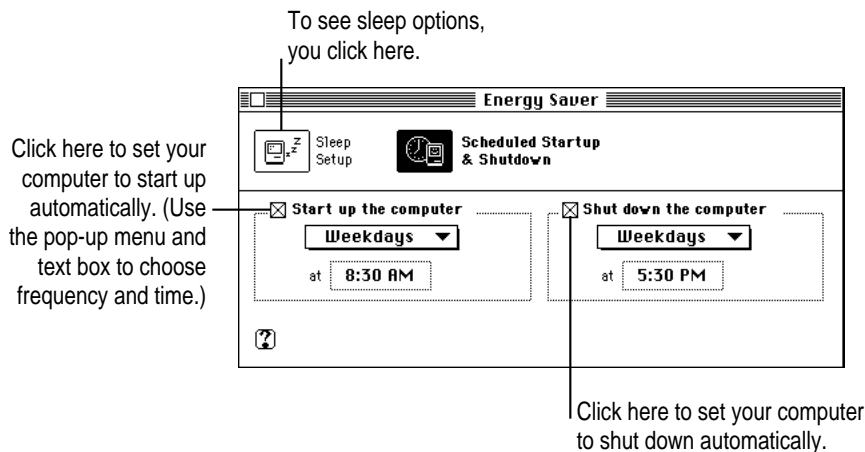## Waking your computer from sleep

To wake the computer from sleep, press any key on the keyboard except Caps Lock. (It may take a moment or two for the computer to awaken.) The documents and application programs you had open when the computer went into sleep are still open and unsaved changes are preserved.

Accessing a sleeping computer over a network

If your computer is being used as a server, other users can still access it over a network while it is asleep if you set server options that prevent the hard disk from going to sleep. (You can set server options using the Preferences menu when the Energy Saver control panel is displayed.) The network connection does not have to be established before the computer goes to sleep. However, if you've chosen to have your computer shut itself down rather than go to sleep, other users will not be able to access it over a network after the computer shuts itself down.

Scheduling automatic startup and shutdown

You can set your computer to start up and shut down at specified times using the Energy Saver control panel. An X in a checkbox means the option is selected. If you want to deselect it, click to remove the X. If there's an unsaved document open on your desktop when the scheduled shutdown time occurs, it is saved automatically in a folder on your startup disk. The folder is named with the date and time of the shutdown.

To see sleep options, you click here.

Click here to set your computer to start up automatically. (Use the pop-up menu and text box to choose frequency and time.)

Energy Saver

Sleep Setup

Scheduled Startup & Shutdown

☒ **Start up the computer**
Weekdays ▼
at 8:30 AM

☒ **Shut down the computer**
Weekdays ▼
at 5:30 PM

Click here to set your computer to shut down automatically.

Turning the computer off

You can turn the computer off either by using the Power key on the keyboard or by choosing Shut Down from the Special menu.

Note: If it is open, the tray on your CD-ROM drive automatically closes when you shut down your computer. If you have left a CD-ROM disc in the tray, you may want to open the tray and take the disc out before shutting down.

Using the Power key

To turn the computer off using the Power key on the keyboard, follow these instructions:

1 If the computer is in sleep mode (the monitor is on but the screen is dark), press any key except Caps Lock to wake it.

2 Press and hold down the Power key on the keyboard for about 2 seconds.

The following dialog box appears on the screen:

> ⚠ Are you sure you want to shut down your computer now?
>
> [Restart]   [Sleep]   [Cancel]   [[Shut Down]]
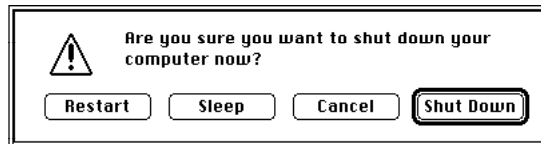
3 Press the Return key on the keyboard (or click the Shut Down button in the dialog box).

Using the Shut Down command

To turn the computer off by choosing Shut Down from the Special menu, follow these instructions:

1 Move the tip of the arrow (▶) to the Special menu at the top of the screen.

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.

```
Special
  Clean Up Window
  Empty Trash

  Eject Disk        ⌘E
  Erase Disk...

  Restart
  Shut Down      ⬉
  
  Sleep
```

If you can't shut down your computer

If a problem with the computer prevents you from using the Power key on the keyboard or choosing Shut Down—for example, if the computer "freezes" so that the pointer does not respond to the mouse—you can turn off the computer by pressing the standby power button (⏻) on the back of the computer.

IMPORTANT You could lose unsaved work if you use the standby power button on the back of the computer to turn it off. Only use the standby power button when there is a problem that prevents the computer from being turned off with the Power key on the keyboard or the Shut Down command. To make sure your work is saved, use the Power key on the keyboard or the Shut Down command.

Turning the computer on

To turn on the computer after you've shut it down (either by pressing the Power key on the keyboard or by choosing Shut Down from the Special menu):

■ **Press the Power key (marked with a ◁) on the keyboard.**

Note: Your monitor may have to be turned on separately each time you turn on the computer. If you have trouble turning on your computer, see the section "Problems Turning On Your Computer?" earlier in this chapter.

Where to find answers

When you have questions about using your Macintosh, there are several places where you can look for answers.
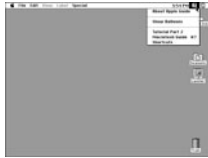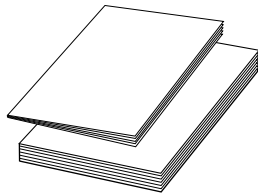
In the Guide menu

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

In this book

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

In other manuals

Some of the programs that came installed on your computer have separate manuals, either in the box with your computer or stored on your computer's hard disk.

From Read Me files

The Apple Extras folder (in your System Folder) on your hard disk contains a SimpleText document, called About Apple Extras, with important information about some of the application programs included with your computer. Similar files called Read Me files can be found inside application folders.

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.

Note: If you have problems with an application program not published by Apple, call the program's publisher.
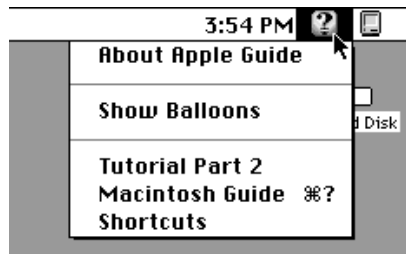
2 Getting Help

The Guide menu contains online help and information and is your main source of information when working with your computer. The menu is identified by a question mark (②) in the upper-right corner of the screen.

Getting answers to your questions

When you have a question while working with your computer, you can get the answer by choosing Macintosh Guide from the Guide menu.

Note: In some versions of system software, Macintosh Guide is called Mac OS Guide. All information in this chapter also applies to Mac OS guide.

1   Open the Application menu (in the upper-right corner of the screen) and choose Finder to make it the active application program.

A checkmark appears beside the Finder command, indicating that the Finder is the active program.

2   Open the Guide menu (marked with the ⍰ icon) and choose Macintosh Guide (or Mac OS Guide, if your computer has this).

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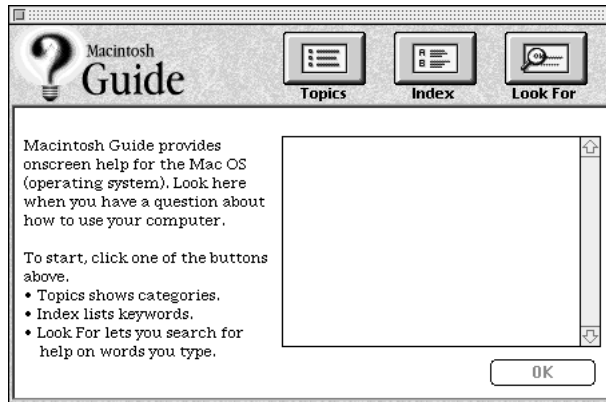
Whenever you use Macintosh Guide, its window remains in front of other windows. If the window gets in your way, you can move it by dragging its title bar (the gray bar across the top of the window).

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 topic areas appears on the left side of the Macintosh Guide window. (Depending on the hardware and software you have, the list of topic areas may look different.)
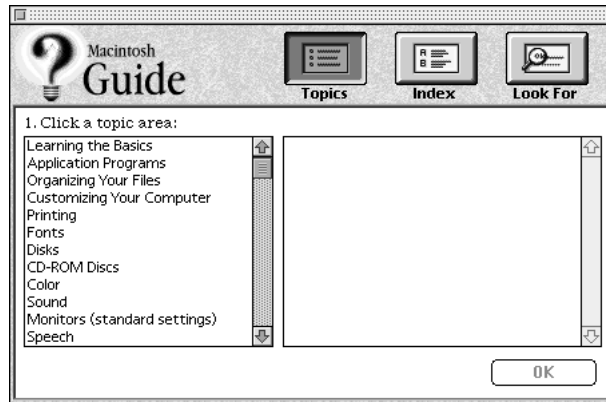
2   **In the list of topics, click "Customizing Your Computer."**

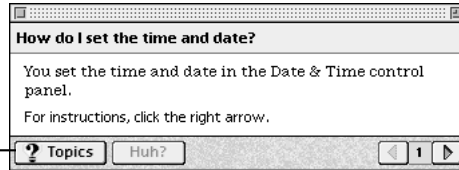When you click any topic area, a list of related phrases and questions appears on the right side of the Macintosh Guide window.
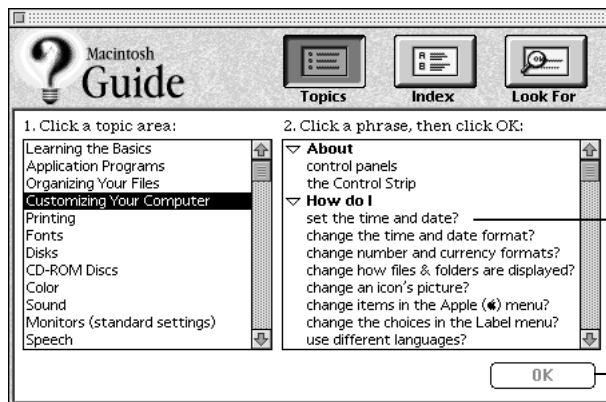
To get instructions, you click a phrase or question...

...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, you click this button.

How do I set the time and date?

You set the time and date in the Date & Time control panel.

For instructions, click the right arrow.

? Topics   Huh?   ◁ 1 ▷

To see the next step (if there is one), you click here.

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 index terms appears on the left side of the window.
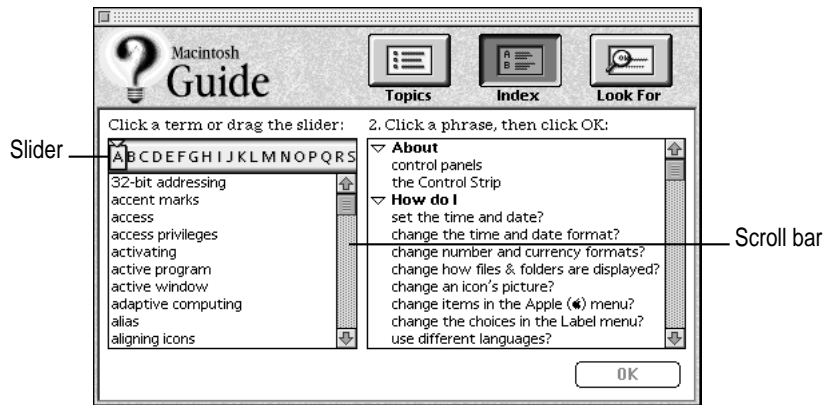
Slider —

Scroll bar

2   Scroll through the alphabetical list until the term "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.
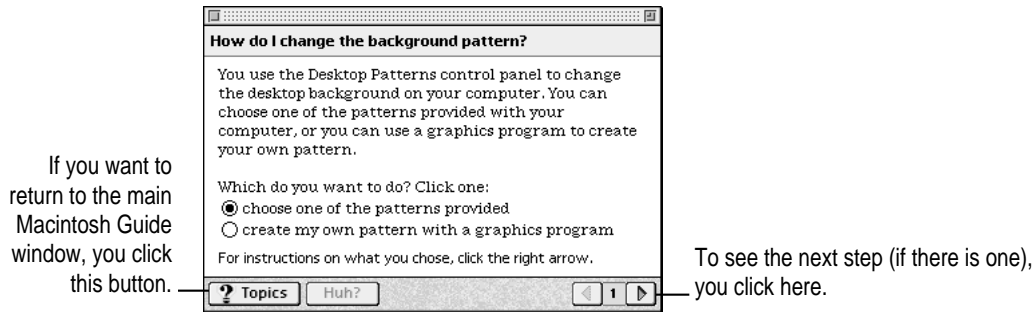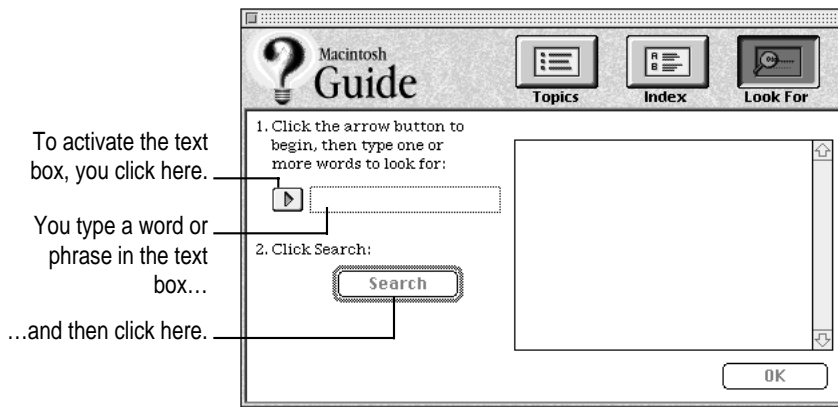
3   Click the term "background pattern" in the alphabetical list.

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

To get instructions, you click a phrase or question…
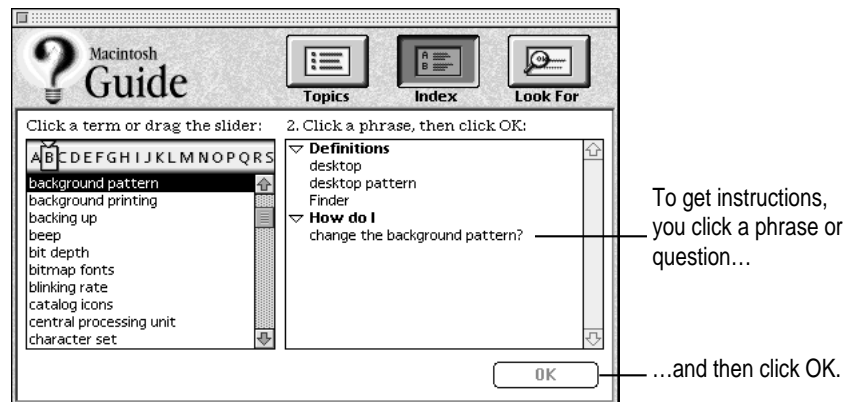
…and then click OK.

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, you click this button.

How do I change the background pattern?

You use the Desktop Patterns control panel to change the desktop background on your computer. You can choose one of the patterns provided with your computer, or you can use a graphics program to create your own pattern.

Which do you want to do? Click one:
- ⦿ choose one of the patterns provided
- ◯ create my own pattern with a graphics program

For instructions on what you chose, click the right arrow.

? Topics   Huh?   ◁ 1 ▷

To see the next step (if there is one), you click here.

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 where you can type text appears on the left side of the window.

To activate the text box, you click here.

You 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 "trash" in the text box, then click Search.**

When you click Search, a list of phrases and questions related to the word or phrase you typed appears on the right side of the Macintosh Guide window.

To get instructions, you click a phrase or question…
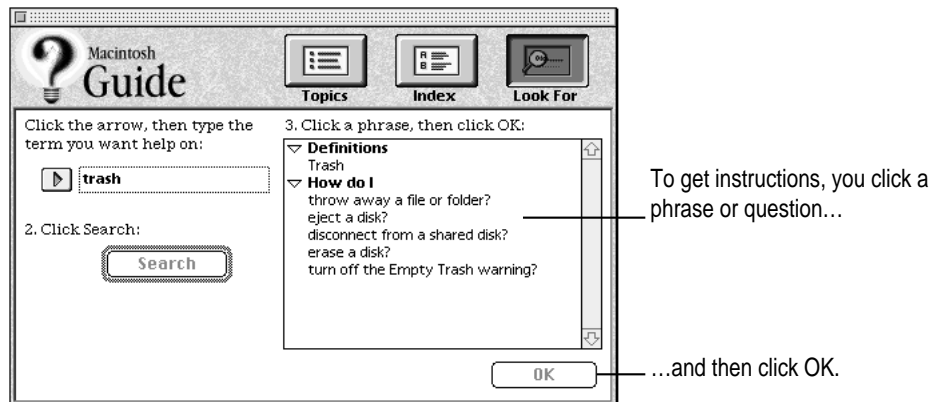
…and then click OK.

4 Click the question "How do I turn off the Empty Trash warning?" 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,
you click here.

How do I turn off the Empty Trash warning?

To prevent you from deleting items by mistake, a
warning appears when you open the Special menu and
choose Empty Trash.

You can turn the warning off in the Trash's Info
window.

For instructions, click the right arrow.

To see the next step (if there is one),
you click here.

? Topics | Huh? | ◁ 1 ▷

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 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 when you are in the Finder—the program that displays 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 in the upper-right corner of the window. 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 a 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 ⎯⎯⎯⎯⎯⎯ Zoom box

How do I set the time and date? ⎯⎯⎯ Title bar

You set the time and date in the Date & Time control panel.

For instructions, click the right arrow.

Topics   Huh?   ◁ 1 ▷ ⎯⎯⎯ Right arrow

Topics button   "Huh?" button
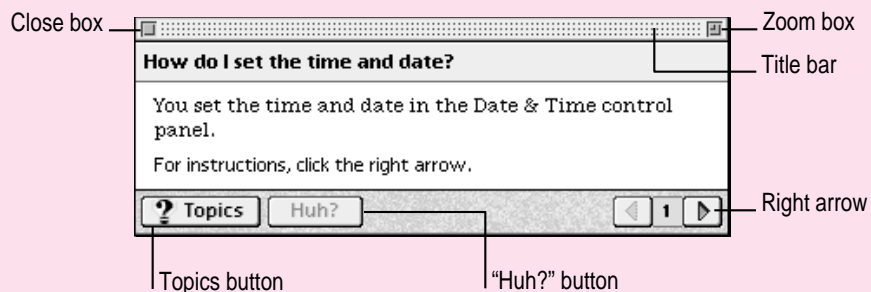
Identifying what's on your computer screen

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.

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

Follow these steps to use Balloon Help:

1 **Open the Guide menu (marked with the ⍰ icon) and choose Show Balloons.**

2 **With your mouse, move the pointer 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.

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, open the Guide menu again and choose Hide Balloons.**

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   **Open the Guide menu (marked with the ⑦ icon) and choose Shortcuts.**

The main Macintosh Shortcuts window appears.
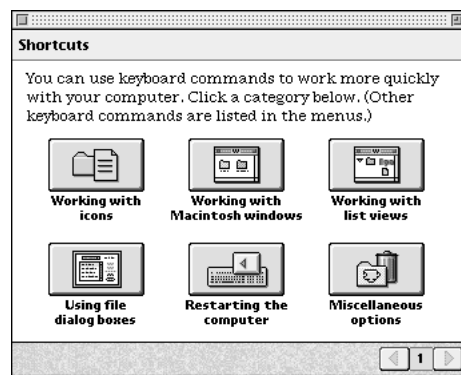
2   **Click one of the category buttons.**

Another window appears, describing shortcuts for that category.

If you want to close the window, you click here.

To return to the main Macintosh Shortcuts window for more categories, you click the Topics button.

To see the next window (if there is one), you click here.
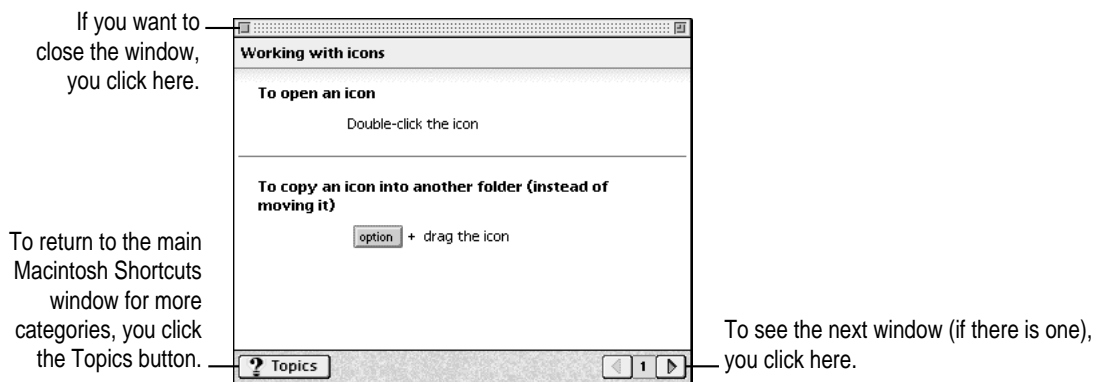
3 **Read about the shortcuts available for the category you selected.**

Click the right arrow in the lower-right corner of the window to see 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 connecting additional equipment to your
computer and using your computer's special
features (such as sound capabilities).

3 Expanding Your Computer and Using Its Special Features

The illustrations on the next pages show the basic computer system you now have. So that you can expand your system's capabilities, your computer has both external ports and internal slots in which you can install or attach additional hardware. Depending on the options your computer came with and the items you install later, you may be able to attach a printer; audio equipment such as a microphone, speakers, or headphones; video equipment such as a second monitor, TV, or VCR; a scanner; or an external hard disk.

Items that go inside the computer can increase its capabilities and performance. Among these items are additional dynamic random-access memory (DRAM) in Dual Inline Memory Modules (DIMMs); a High Performance Module (level 2 cache); and different kinds of expansion cards, such as PCI (peripheral component interconnect) and Ethernet cards. Instructions for installing these internal items are provided in Appendix B, "Installing Expansion Cards or Additional Memory." (Depending on your computer model, some of these items may already be installed.)

WARNING Before you connect any equipment to your computer, make sure that your computer is plugged in (in order to ground the computer) and turned off. If you connect equipment with the computer turned on, you can damage your computer and your equipment. Also, each device you add should be compatible with your computer and must not exceed the maximum power allowance for that device. For more information consult an Apple-authorized dealer, the manufacturer of the equipment you add, or the *Technical Information* booklet that came with your computer.

Expansion bay
Behind the front panel there is an expansion bay for an optional 5.25-inch storage device (1.7 inches high). Your computer may have come with an optional Zip drive installed in this bay as shown here.

CD-ROM drive (optional)   ⏏ **CD-ROM drive Open/Close button**   **Monitor**

◁ **Power key**
Use this key to turn your computer on and off.

Floppy disk drive

Remote control sensor

◀)) **Volume control button**
Use this button to change the volume of the computer's sound.

Power-on light
A green light indicates that the computer is on.

Internal hard disk drive   ∩ **Headphone jack**   **Keyboard**   **Mouse**

Ports and connectors on the back of your computer		
Standby power button	⏻	Turns your computer on or off when you can't use the Power key on the keyboard or the Shut Down command.
Monitor port	|◻|	Connects your monitor to your Macintosh.
Apple Desktop Bus (ADB) port	⛛	Connects your Macintosh to an input device, such as a keyboard or a trackball.
Printer port	🖳	Connects your Macintosh to a printer, LocalTalk network, or GeoPort device.
External modem port	☏	Connects an external modem or GeoPort Telecom Adapter adapter to your Macintosh. (*Note:* If your computer came with an internal modem, this port is covered. Don't remove the cover or connect anything to this port if you have an internal modem.)
SCSI port	⬦	Connects your Macintosh to SCSI equipment, such as external hard disk drives and scanners.
Sound input port	🎤	Connects your Macintosh to another audio source, such as a microphone, compact disc, or audio cassette player.
Sound output port	◀))	Connects your Macintosh to sound output equipment, such as externally powered (amplified) speakers.

Standby power button

|◻| Monitor port

⤲ Apple Desktop Bus (ADB) port

🖳 Printer port

📞 External modem port

⇦ SCSI port

🎤 Sound input port

◀)) Sound output port

TV/FM tuner card (optional)

◀ Subwoofer balance control

Video input card (optional)

∼ Power socket

Monitor power socket

PCI card access covers (2)

Communication card (optional)

Security lock port
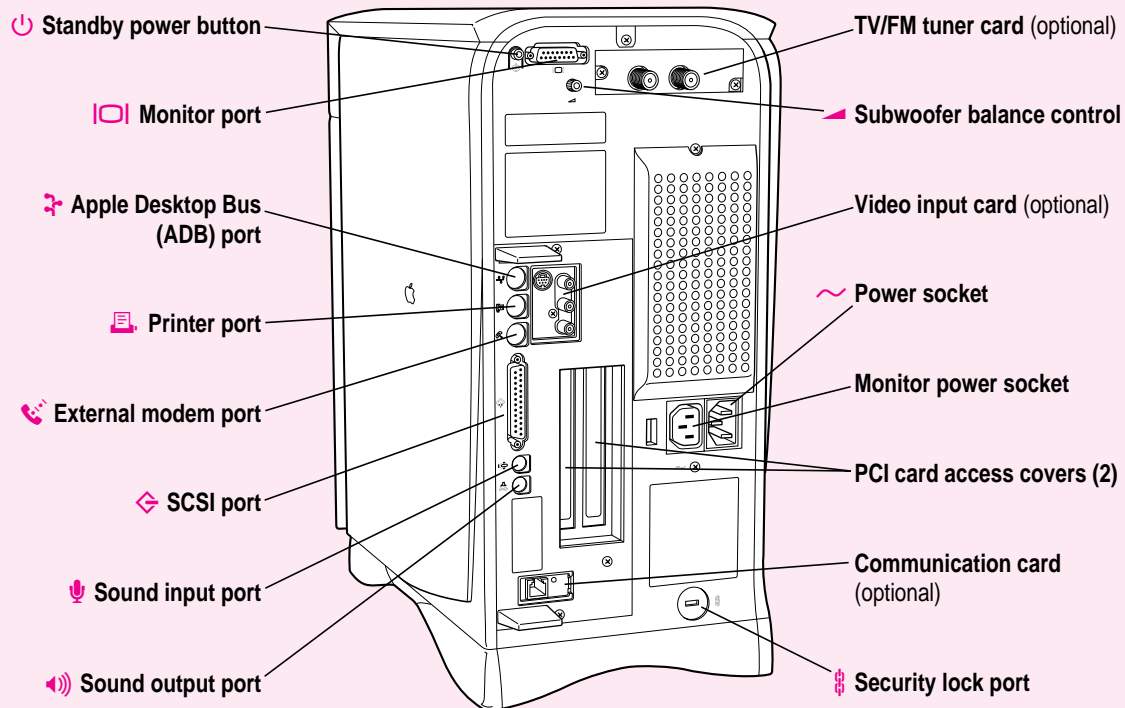
TV/FM tuner card (optional)	Connects your Macintosh to an external TV antenna or cable TV service and FM radio antenna. To install one, purchase the Apple TV/FM Radio System or the Apple TV System.
Subwoofer balance control ◀	Adjusts subwoofer balance in relation to external speakers, if external speakers (including a monitor with built-in speakers) are attached. (If external speakers are not attached, the balance control does not affect the subwoofer volume.)
Video input card (optional)	Connects your Macintosh to a video camera, VCR, or other video input equipment. If you want to install a video input card, purchase the Apple Video System.
PCI card access covers (2)	Cover ports for optional 6.88-inch peripheral component interconnect (PCI) slot expansion cards (such as a video-editing card).
Communication card access cover	Covers port for optional communication card or modem. Most models of your computer come with a twisted pair (10Base-T) Ethernet card installed in this space.
Security lock port	Lets you to attach a security lock to your Macintosh. See your computer products retailer for security lock devices that work with your computer.

Connecting a printer

Your computer has a printer port, which you use to connect a printer to your computer. Follow the instructions that came with your printer when connecting it to your computer.

Printer port
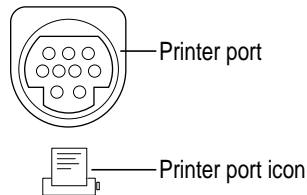
Printer port icon

Although you normally attach the cable that came with your printer to the printer port instead, you can attach the printer cable to your modem port if you already have a printer attached to your printer port.

Even if you have only one printer connected, you need to specify in the Chooser which port you used to connect your printer and choose the printer you want to use. For instructions on choosing a printer (including specifying the port to which it's connected), open the Guide (❷) menu and choose Macintosh Guide (or Mac OS Guide). Then, click the Guide's Index button, and choose "printing" from the Guide's index.

Using your computer's sound features

Your Macintosh can play and record stereo sound from a variety of sources. By connecting audio equipment to the sound input and output ports on the computer, you can listen to or reproduce stereo sound. If it has an internal CD-ROM drive, your computer can also play and record sound from audio compact discs (CDs). For information on using Macintosh system software to choose audio input and output options, record an alert sound, or play audio CDs, see the "Sound" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (❷) menu.

About your computer's sound ports and features

The Sound input port is marked with an icon of a microphone (🎤). The Sound output port is marked with an icon of a speaker (🔊). Your computer's built-in speaker functions as a subwoofer (a loudspeaker that delivers enhanced bass sound) when external speakers or a monitor with built-in speakers is attached. For more information on the subwoofer, see "Using the Built-in Subwoofer" later in this section. For more information on the sound input and sound output ports, see the section "Connecting Audio Equipment."

Subwoofer balance control
Volume control button

Sound input port

Sound output port

Internal speaker
(functions as a subwoofer when
external speakers or a monitor
with built-in speakers is attached)

Headphone jack
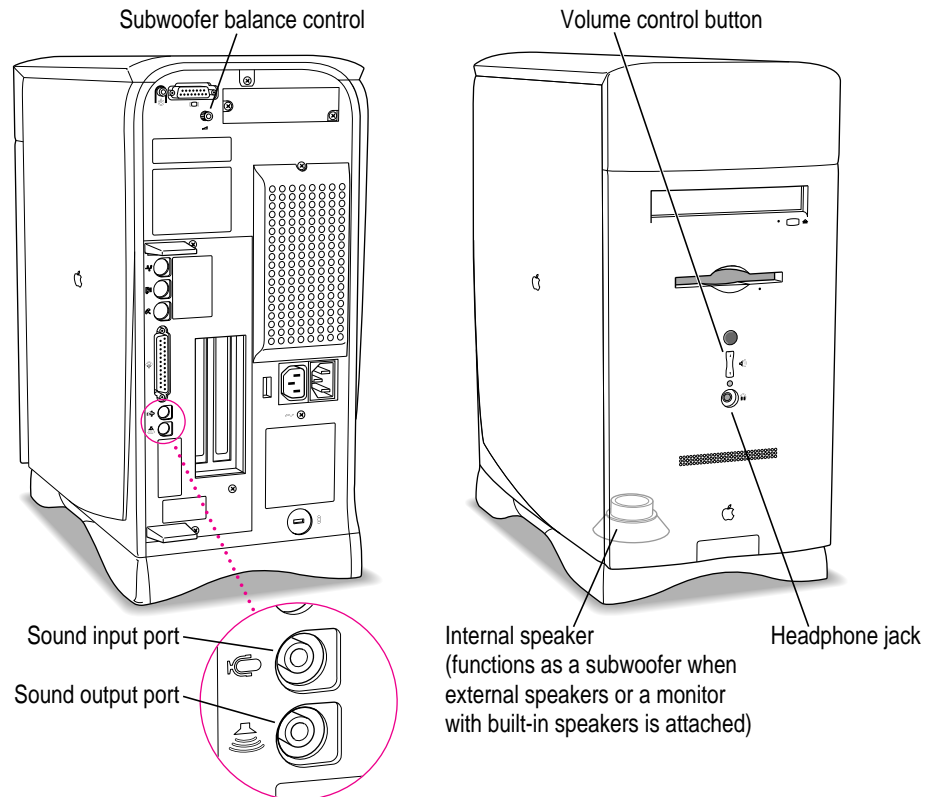
Adjusting volume and sound

There are several ways to adjust the volume on your computer:

- Use the volume control button on the front of the computer (marked with the ◀)) icon, above the power-on light).

- Use the volume controls on the front of your monitor if your monitor comes with them.

- Use the volume control slider in the AppleCD Audio Player program if you are playing an audio CD. The AppleCD Audio Player can be found in the Apple (🍎) menu.

- Use the volume control sliders in the Monitors & Sound control panel, which is in the Control Panels folder in the Apple (🍎) menu. See the "Sound" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (②) menu for more information about using Macintosh system software to control sound.

Tip: You may prefer to set the Sound Out Level slider in the Monitors & Sound control panel to the middle of the slider bar. This makes it easier for you to gauge the adjustments you make with other volume controls.

For more information about sound, see the "Sound" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (②) menu.

Listening with 3D Surround Sound

The SRS(●) 3D Surround Sound technology broadens the sound you hear if you attach external speakers or if your monitor has built-in speakers. 3D Surround Sound makes the speakers sound as if they are set wider apart, and you can hear many "points" of sound around you. (3D Surround Sound may not work through headphones. To turn off 3D Surround Sound, click to remove the X in the checkbox next to "Enabled" in the Monitors & Sound control panel.)

Using a monitor with built-in speakers

If you have a monitor with built-in speakers, you can adjust the amount of bass sound you hear coming from the computer's subwoofer by adjusting the subwoofer balance control (◢) on the back of your computer.

Using the built-in subwoofer

Your computer comes with a built-in speaker that produces full-range, monophonic sound. When you attach external speakers, the computer's built-in speaker changes mode and functions as a subwoofer, adding bass sound to augment the speakers' stereo sound.

You adjust your computer's volume with the volume controls on the front of the computer or with the Monitors & Sound control panel in the computer's software. (For more information, see "Adjusting Volume and Sound" earlier in this chapter.) However, when you attach external speakers (or if your monitor has built-in speakers), you adjust the subwoofer volume independently of the speaker volume. You do this by adjusting the subwoofer balance control (◢) on the back of the computer. (The subwoofer balance control affects the subwoofer volume *only* when external speakers are attached.)

Connecting audio equipment

To play or record sound with your Macintosh, you can attach a microphone, an amplifier, a tape recorder, or a pair of speakers.

You need a cable with one of the 3.5 mm audio connectors shown below to connect a microphone or other equipment to your computer's sound input port (🎤). You need a cable with a stereo miniplug to connect speakers or other equipment to the sound output port (◀»).
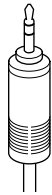
Stereo miniplug
(plugs into sound input port
or sound output port)
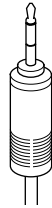
Extended miniplug
(plugs into sound input port)

The stereo miniplug most often comes with stereo equipment such as external speakers. The extended miniplug, which is slightly longer, comes with voice quality microphones such as the Apple PlainTalk Microphone. The extended miniplug works only in your computer's sound input port (🎤). If your equipment has a type of connector that's different from those shown here, you can purchase an adapter at an electronics supply store.

Connecting the Apple PlainTalk microphone

Your computer has a sound input port (🎤), which you can use to connect an Apple PlainTalk Microphone. The Apple PlainTalk Microphone is included with some computer models. If your computer did not include an Apple PlainTalk Microphone, you can purchase one at an Apple-authorized dealer. You cannot connect non-Apple microphones.

Note: The sound input port does not support the Apple Omni microphone (the round microphone shipped with some earlier models of Macintosh) or the attenuated RCA adapter provided with some models of Macintosh.
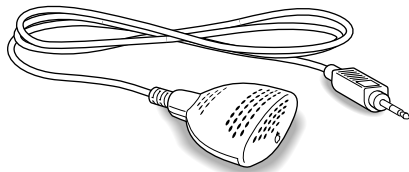
Apple PlainTalk Microphone

To connect and position the external microphone, and then tell the computer to receive its input, follow the steps below.

Note: If you want to record sound using a microphone built into a monitor, see the "Sound" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (❓) menu. Then select the question, "How do I record or remove a sound?"

1 **Shut down your computer.**

2 **Plug the microphone's connector into the (🎤) on the back of the computer.**

3 **Place the microphone at the top center of the monitor, so that the microphone's Apple (🍎) icon is facing you.**
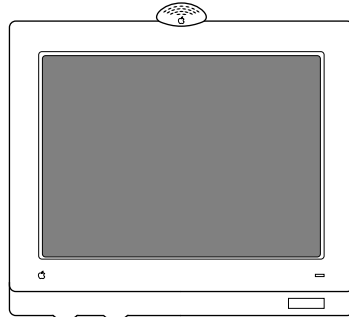
If you can't place it on top of the monitor, position the microphone according to these guidelines:

- The microphone should be between 1 and 3 feet away from you.

- The microphone should be directly in front of you to minimize the effect of background noises.

4 **Turn on the computer.**

5 **Open the Monitors & Sound control panel in the Apple (🍎) menu and click the Sound button to display the sound controls.**

6 **Open the Sound Input pop-up menu and choose "External Microphone."**

7 **Click the close box in the upper-left corner of the Monitors & Sound control panel to close it. (The control panel does not have to remain open while you're recording.)**

You're now ready to begin using your microphone.

See the "Sound" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (②) menu, for instructions on recording.

Connecting external stereo speakers

You can take advantage of your computer's stereo sound output by attaching externally powered (amplified) speakers. When you attach external speakers, the speaker in your computer changes mode and functions as a subwoofer. The subwoofer produces bass sound to complement the stereo sound coming from the speakers.

Subwoofer (internal)

Externally powered speakers
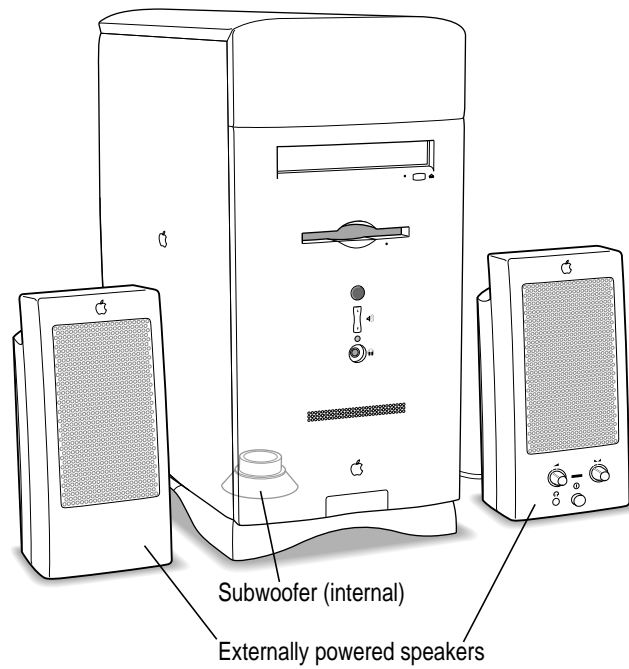
1 Assemble the speakers and the cable you need.

You need a cable with a stereo miniplug at one end to connect one or both speakers to the computer.

Stereo miniplug

Some speakers require a dual-plug adapter, which has two plugs on its end, to plug into Audio In ports on both speakers. Others, like those shown in the next illustration, take a single stereo miniplug and are joined by standard speaker wires. See the documentation that came with your speakers for more information.

2 Turn off the computer.

3 Plug the end of the cable with the stereo miniplug into the Sound output port (◀⑅) on the computer.

4 Plug the other end of the cable into the speakers' Audio In port or ports.

5 Connect the speakers together with speaker wires, if necessary.

Your finished connections should look something like this:

◀ Subwoofer balance control

◀⑅ Sound output port

Externally powered speakers

Audio In port
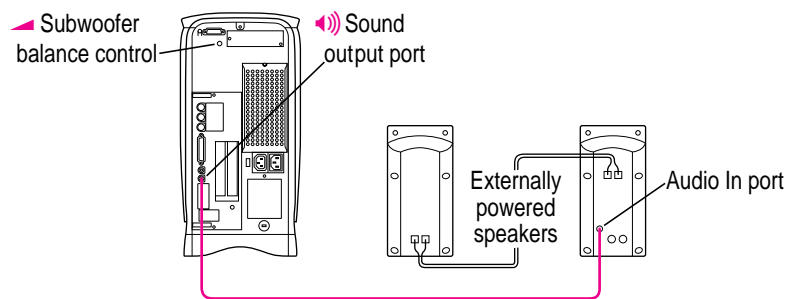
6 **Turn on the computer.**

Now you're ready to hear full-range stereo sound coming from the speakers and bass sound coming from the computer's internal subwoofer.

To adjust the overall volume, use the sound control buttons on the front of the computer or use the Monitors & Sound control panel, which uses software inside your computer to adjust volume. (For more information, see "Adjusting Volume and Sound" in the previous section, "Using Your Computer's Sound Features.")

To adjust the subwoofer volume independently of the speaker volume, use the subwoofer balance control (◢) on the back of the computer. (The subwoofer balance control works only when external speakers or a monitor with built-in speakers is attached.)

Subwoofer balance control
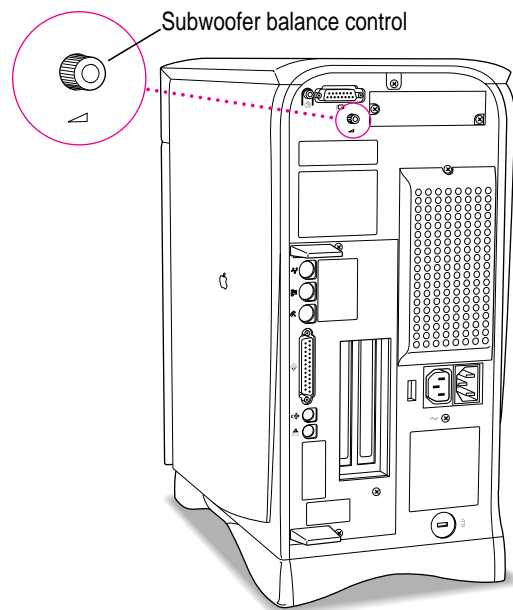
For more information about using speakers attached to your computer, see the "Sound" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (②) menu.

Connecting headphones

You can connect headphones to either the headphone jack (🎧) on the front of the computer, to external speakers, or to your monitor if it has a headphone jack.

Note: To listen through headphones connected to external speakers, you should turn off **SRS**(⬤) 3D Surround Sound. To turn off 3D Surround Sound, open the Monitors & Sound control panel in the Control Panels folder in the Apple (🍎) menu and click the checkbox to remove the X next to "Enabled." Also, if you have connected your headphones to the monitor and notice that the sound quality isn't high, you should either turn off 3D Surround Sound or get updated monitor software from the monitor's manufacturer.

For more information on listening with headphones, see the "Sound" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (②) menu.

Using your computer's video features

Depending on the options that came with it (or options you install later), you can use your computer to display the computer's images on a second monitor or television. You may also be able to display, edit, and store video images from a video camera, video cassette recorder (VCR), or other video input equipment.

The next section describes how to connect a second monitor to your computer to increase screen space. For information about connecting video input equipment such as cameras or VCRs, refer to the manuals that came with your video input card (for example, the Apple Video System manual) and with your video equipment.

Connecting a second monitor to increase display space

If one monitor doesn't provide enough screen space, you can install a PCI expansion card that provides a port for connecting a second monitor. The second monitor gives you a larger continuous desktop area to display windows and other items.

To connect a second monitor, purchase a video card and install it in the computer's PCI expansion slot, or have an Apple dealer install it for you. (If you are installing the expansion card yourself, follow the instructions that came with the card and the instructions in Appendix B of this manual.) Then plug the second monitor into the port provided by the card.

When you connect an additional monitor, make sure that the ventilation openings on the computer and the monitors are clear and unobstructed.

If there is interference on your screens or on a television or radio near your computer, separate or reposition the affected equipment. You may need to move the two monitors further apart so that they don't interfere with each other.

For additional instructions on using two monitors together, choose Macintosh Guide (or Mac OS Guide) from the Guide (②) menu after you have connected two monitors to your computer; click the Guide's Index button, and select "monitors" in the list of index terms.

IMPORTANT Though it is physically possible to install two expansion cards that supply extra monitor ports, you can't connect more than two monitors at a time to your computer.

Connecting external SCSI devices, such as a scanner or external hard disk

Your computer has a port for connecting devices that use the Small Computer System Interface (SCSI, pronounced "skuh-zee"). SCSI devices commonly used with the Macintosh include hard disk drives, CD-ROM drives, scanners, tape or cartridge backup drives, and some printers. The SCSI port permits high-speed communication between the computer and the device. The SCSI icon appears underneath the port on the computer's back panel.

SCSI port

SCSI icon
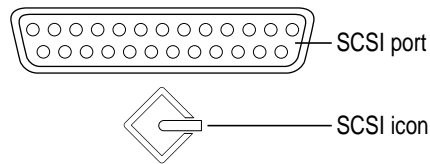
You can connect several SCSI devices to the SCSI port by linking them to create a chain of devices. The first device in the chain plugs into the SCSI port; the second device plugs into the first device, and so on. You can attach up to six external SCSI devices to the SCSI port (or up to five if you have an additional SCSI drive installed in your computer). Each SCSI device connected to this chain must have its own unique ID number (no two devices can use the same ID number). If your computer came with a CD-ROM drive installed, this drive is also part of the SCSI chain and uses SCSI ID number 3. The computer itself (the main logic board inside it) uses SCSI ID number 7.

IMPORTANT The material that follows—"Before You Connect a Device" and "Connecting a SCSI Device"—contains general instructions for attaching SCSI devices to your computer. Make sure you also follow the specific instructions that came with the SCSI device you are connecting to your Macintosh.

Before you connect a device

Before you connect a SCSI device to your Macintosh, be sure to complete the tasks explained in this section.

IMPORTANT This section contains general instructions for attaching SCSI devices to your computer. Be sure also to follow the specific instructions that came with your external hard disk drive or other SCSI device when connecting the device to your Macintosh. The specific instructions that came with the device tell how to change a device's ID number and attach a SCSI cable or terminator to the device.

Make sure each device has a unique ID number

Each SCSI device connected to your computer must have its own, unique ID number from 0 to 6. The SCSI ID number helps the computer keep track of the devices and sort out conflicts when more than one device in the SCSI chain are communicating with the computer simultaneously.

The ID numbers in your computer are assigned as follows:

ID	Device
3	Optional internal Apple CD-ROM drive
5	Optional internal Zip drive
7	Main logic board

Make sure other SCSI devices you add to the chain do not use ID numbers that are already assigned. For example, if your computer came with an internal CD-ROM drive, don't use SCSI ID numbers 3 (which is assigned to the optional CD-ROM drive) or 7 (which is assigned to your computer's main logic board). See the instructions that came with each SCSI device for information on checking and setting its SCSI ID number.

IMPORTANT If you use two or more devices attached to the same SCSI interface with the same ID number, your equipment could malfunction and you could lose data as a result.

The SCSI devices can be in any physical order in the chain; it is not necessary to arrange them in numerical order.

Make sure you use the right type and length of cable

To attach a SCSI device to your computer or to another device in the chain, always use SCSI cables that are double-shielded, such as Apple SCSI cables. Never use printer-type RS232 cables (commonly used with DOS and Windows computers). Poor quality SCSI cables are often the cause of SCSI problems.

Avoid mixing brands, types, or styles of SCSI cables.

If the device is the first or only one you're connecting, use a SCSI system cable to connect it to the computer's SCSI port:

SCSI system cable
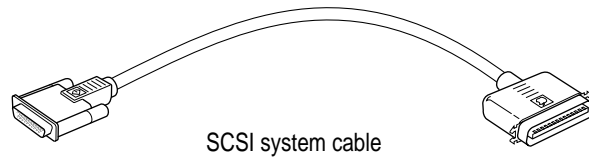
If the device is not the first one, use a SCSI peripheral interface cable to connect it to the last device in the chain:

SCSI peripheral interface cable
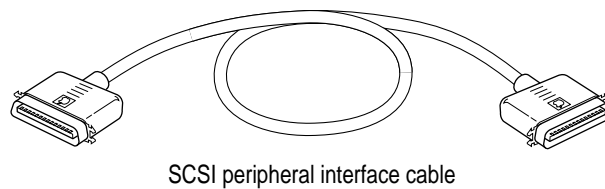
IMPORTANT The total length of the cables in a SCSI chain should not exceed 6 meters (about 20 feet). SCSI cables must have a 110-ohm impedance. For best results, use SCSI cables manufactured by Apple Computer.

Keep the cables between SCSI devices as short as possible. Cables 18 to 24 inches are best. PowerBooks and some SCSI devices (particularly scanners) may not work with cables longer than 24 inches.

Terminate the SCSI chain properly

To ensure accurate transmission of information, a terminator must be at each end of a SCSI chain. There is a built-in terminator at the beginning of the chain. You need to make sure that the last device in the chain has a terminator.

IMPORTANT In most cases, only the first and last devices in the SCSI chain should be terminated (but see the exceptions, below). Make sure that no external SCSI device other than the last one has a terminator.

Exceptions to the "first and last" rule: If the SCSI chain is 18 inches or shorter, the terminator on the last device is not needed. If the total cable length in the chain is greater than 10 feet, the chain may need a third terminator at the 10 foot point. Do not add the third terminator unless you are experiencing a SCSI problem, and check all other possible causes of the problem before adding the third terminator. (See the information on troubleshooting SCSI problems in Part II of this manual.)

To terminate the last device in the chain:

■ If your SCSI device has a built-in terminator, use it as the last device in the chain.

   If you wish to attach two or more SCSI devices that have built-in terminators, an Apple-authorized service provider can remove the extra built-in terminators.

■ If the device at the end of the SCSI chain does not have a built-in terminator, attach an external terminator. You can attach or remove external terminators yourself. (Do not use a black terminator; the black terminators are for Macintosh IIfx computers and certain LaserWriter printers.)
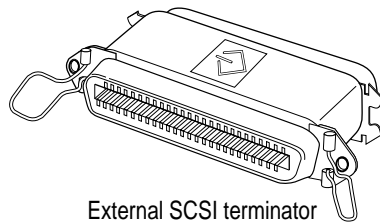
External SCSI terminator

Connecting a SCSI device

Be sure to read the previous section, "Before You Connect a Device," before following the instructions here. Use these general instructions in conjunction with the instructions that came with your SCSI device:

1   **Turn off your computer.**

2   **Make sure the SCSI device is switched off.**

> **WARNING** Do not connect or disconnect any device while the power to the device or to your Macintosh is on. Doing so could damage the device, your computer, or both.

3   **Use a SCSI cable to connect the device either to the computer's SCSI port or to the last SCSI device already in the chain.**

Use the thumbscrews and metal clips on the connectors to create a tight, reliable connection.

IMPORTANT Make sure that the last (or only) device in the SCSI chain has a terminator and that no other external SCSI device has a terminator. Otherwise, the computer may not be able to start up.

4   **Turn on all devices in your SCSI chain.**

IMPORTANT Always turn on any external SCSI devices connected to your computer before turning on the computer itself. Otherwise, your computer won't be able to recognize that the SCSI devices are connected to it and your computer may not be able to start up.

Even if you don't plan to use a device, you must still turn it on to ensure that signals pass properly along the SCSI chain.

5   **Install any necessary device drivers (software that makes a device work with your computer).**

Drivers usually come on a floppy disk with the device. (If no drivers come with the device, contact the device manufacturer.)

Note: If you experience problems after connecting a SCSI device, see the troubleshooting information in Part II for possible solutions.

Replacing or adding internal storage devices

Your Macintosh already comes with up to four internal storage devices—a floppy disk drive, an optional CD-ROM (compact disc read-only memory) drive, an optional zip drive, and a hard disk drive (several capacities are available). If you want to replace any of these internal drives, see your Apple-authorized dealer.

If your computer didn't include a Zip drive, you can also have additional storage devices installed in your computer's expansion bay—the area just above the CD-ROM drive. The expansion bay is available for you to install any optional 5.25-inch storage device (1.7 inches high). Examples of storage devices include a second CD-ROM drive, a tape storage backup system, a second internal hard disk, or a Zip drive. If you want to install another storage device inside your computer, see your Apple-authorized dealer.

**Read this chapter to learn how to work
with application programs and protect
the information on your disks.**

4 Installing and Using Application Programs

Applications that come with your computer are stored in the Apple Extras folder on your hard disk and in the CD Extras folder on the system software CD that came with your computer. Some of the applications that come with your computer include the following:

- *AppleScript,* which allows you to automate actions you perform repeatedly in the Finder. Instructions for using AppleScript are included in the AppleScript folder in the Apple Extras folder.

- *Apple Video Player,* which you use to watch video or TV on your computer, and Apple FM Radio, which you use to listen to FM radio on your computer if you also have the video input and TV/FM tuner cards installed. Your computer has these cards installed if you find the Apple Video System or Apple TV/FM Radio System manuals in the box that came with it. If you don't have these cards installed, you can purchase them from an Apple-authorized dealer.

- *AppleCD Audio Player,* which allows you to play and control audio CD-ROM discs in your computer's CD-ROM drive.

- *SimpleText,* which allows you to create text documents. With your computer's built-in text-to-speech capabilities, you can have your computer speak the text in your SimpleText document aloud.

To find out if an application needs to be installed, look inside its folder for an icon labeled Installer. If you find an Installer icon and want to use that application, double-click the Installer and follow the instructions on the screen. Most application folders also contain Read Me files that provide additional information about the application. To read the contents of a Read Me file, double-click its icon.

Your computer's system software includes additional applications that provide special features or enhanced capabilities for your computer. Included among the system software applications are the following:

■ PC Exchange, which lets you work with DOS and Windows disks as if they were Macintosh disks

■ QuickDraw 3D, which gives your computer the ability to display graphics in three dimensions

■ PlainTalk, which allows your computer to understand spoken commands in English and Mexican Spanish

Installing application programs

You may want to buy and install additional application programs. See the manuals you receive with these applications for instructions on installing and using them.

To use your applications most effectively, follow these guidelines:

■ Read the manuals you received with the application if you have a problem.

■ Put only one copy of each application on your hard disk. Having more than one copy can cause errors.

■ Whenever you copy an application from its disk to your hard disk, be careful not to copy a System Folder.

■ If an application malfunctions consistently, try installing a fresh copy. If that doesn't help, find out from the software manufacturer whether your version of the application is compatible with your computer model and your system software.

Installing applications from a floppy disk

In most cases, you install application programs on your internal hard disk from floppy disks. The following illustration shows how to insert a floppy disk into your computer's floppy disk drive.

Insert the floppy disk, metal end first, into the floppy disk drive of your computer.
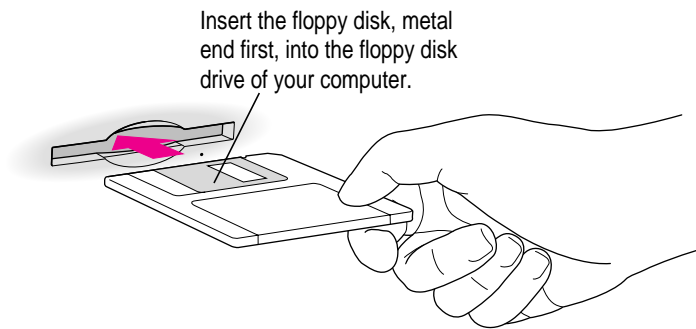
For instructions on how to eject a floppy disk, see the "Disks" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (?) menu.

Note: Be sure you're acting within the terms of the software license agreement that comes with your application program before you install the program on your computer. The license agreement specifies how many copies of the application you can make for yourself and others.

Installing applications from a CD-ROM disc

To install an application program on your internal hard disk from a CD-ROM disc, insert and open the CD-ROM disc. Then look for a ReadMe file or follow the instructions that came with the disc to install the application. (For instructions on using a CD-ROM disc, see "Inserting a CD-ROM Disc" in Chapter 5 and the "CD-ROM Discs" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (❷) menu.)

IMPORTANT Never copy an entire CD-ROM disc to your hard disk by dragging the CD-ROM disc icon to your hard disk. If you do, you may inadvertently copy duplicate system software files onto your hard disk and take up hard disk space with unnecessary files.

Note: Many applications that come on CD-ROM discs require you to have the CD-ROM disc in the drive whenever you use the application even though you've installed the application on your computer's hard disk and opened the copy on the hard disk.

Working with several applications at a time

You can open as many application programs and desk accessories (mini-applications that you usually open through the Apple menu) as your computer's memory allows.

All open applications are listed in the Application menu at the right end of the menu bar. You can find out which application is active and which other applications are open by opening the Application menu. The name of the active application (the one you're using right now) has a checkmark next to it, and its icon appears in the menu bar.
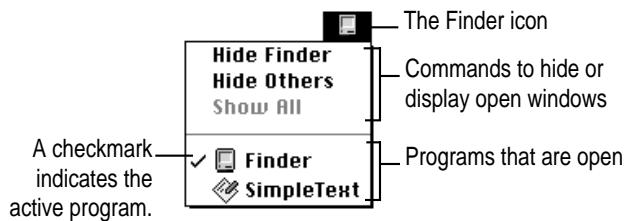
Switching applications

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

If an application's icon is dimmed in the Application menu, that means its windows are hidden. You can still choose the application from the menu, however, to display the application's windows.

You can also switch to another application by clicking in a window that belongs to the other application or by double-clicking its icon.

Hiding and showing windows on the desktop

You can hide all windows except those of the active application by opening the Application menu and choosing Hide Others.

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

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

Increasing memory available to run applications

You can increase the memory available to run your application programs by changing virtual memory settings.

Virtual memory uses space on your computer's hard disk to create extra random-access memory (RAM) to run your applications. Virtual memory allows your computer to run more applications at the same time, and to have more windows open at the same time, but it can result in slightly slower performance. Also, some application programs may not perform optimally when virtual memory is turned on.

To turn virtual memory on or off, use the Memory control panel. See the "Memory" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (2) menu for more information.

Note: If you turn on both virtual memory and the RAM disk in the Memory control panel, don't set both of them at or near their maximum values. Doing so can result in unpredictable or reduced performance by your computer. A RAM disk uses RAM as if it were a hard disk. See the "Memory" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (2) menu for more information.

Backing up your files

When you have a valuable paper document like a birth certificate, you probably make an extra copy of it for safekeeping. Similarly, you should make copies of the documents you create on your computer. The extra copy is called a *backup*, and the process of making the copy is called *backing up*.

Once you have a backup, you're protected from accidentally losing the information on your hard disk. In the unlikely event that something happens to your hard disk, you can easily get the information back.

Follow these tips for making backup copies of the documents on your computer:

- *Regularly* make copies of the documents you create.

- 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 of the same capacity or larger, or by copying it to a hard disk.

- If you need to copy a file onto a floppy disk and it is too large to fit onto a single floppy disk, you can use a commercial backup application to copy the file onto multiple floppy disks.

- You can use a commercial backup application 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 may be able to back up files by copying them to a shared disk on the network.

Tip: A good way to remember where you have stored documents is to print a summary of the items you've stored in a folder. For instructions on printing the contents of a folder, see the "Printing" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (❷) menu.

Using Power Macintosh application programs

Your Power Macintosh is compatible with most application programs intended for use with Macintosh computers, but certain applications are designed especially for Power Macintosh computers. These applications are sometimes called "native" applications and they take best advantage of your computer's speed.

Special memory requirements

Some Power Macintosh applications may be slightly larger than other applications and may take up more memory. If you find that you are running out of memory when you use your Power Macintosh applications, you can use space on your computer's hard disk as additional memory, which is called virtual memory. For instructions on how to use virtual memory, see "Increasing Memory Available to Run Applications," under "Working With Several Applications at a Time" earlier in this chapter, and the "Memory" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (⍰) menu.

You can also add more memory to your computer, as described in Appendix B, "Installing Expansion Cards or Additional Memory."

Using older Macintosh applications

If you experience problems using an older Macintosh application, it may be incompatible with your Power Macintosh. You may be able to use your older application if you turn off Modern Memory Manager. To do this, open the Apple (\u2318) menu, choose Control Panels, and open the Memory control panel. Then turn off Modern Memory Manager.

Using special 3D software

The special design of your computer's logic board allows it to take advantage of QuickDraw 3D, which is special software built into some programs to enhance their 3D graphics. Because of this special design, called "3D Acceleration," your computer renders 3D images with greater speed and fluidity than computers that don't have this feature. As a result, you get enhanced texturing and greater realism when you use programs that support QuickDraw 3D, such as 3D modeling programs and many games. To take advantage of 3D acceleration, your software must support QuickDraw 3D or QuickDraw 3D RAVE.

An example of what you might see is shown in the following illustration.
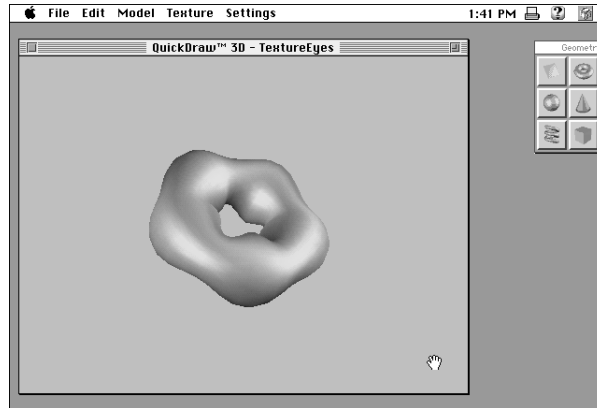
If you want to purchase additional software that supports QuickDraw 3D, see your Apple-Authorized dealer.

IMPORTANT For best video performance, Apple recommends setting your monitor at a resolution of 640 x 480 and a color depth of 16 bits when running use 3D graphics. For more information about setting your monitor's resolution, see Macintosh Guide (or Mac OS Guide) in the Guide (②) menu.

Turning 3D acceleration off and on

If you need to turn off the QuickDraw 3D acceleration (for example, to compare accelerated performance with software-only rendering), follow these steps:

1   Quit all applications that use QuickDraw 3D.

2   Create an empty folder on the desktop.

3   Move the file named "ATI 3D Accelerator" from the Extensions folder (inside the System Folder) into the empty folder. This turns off 3D acceleration.

4   Restart QuickDraw 3D applications.

To turn QuickDraw 3D acceleration back on, follow these steps:

1   Quit all applications that use QuickDraw 3D.

2   Move the file named "ATI 3D Accelerator" back into the Extensions folder.

3   Restart QuickDraw 3D applications.

Removing software

If you have previously installed some or all of the software in the Apple Extras or CD Extras folder, you can remove or deinstall the software if you do not use it. Removing software like this will make more hard disk space available.

To remove software, follow these steps:

1   Start up your computer from the system software CD-ROM disc that came with your computer.

For detailed steps, see "Starting Up From a CD-ROM Disc" under "Initializing a Hard Disk" in Chapter 9.

2   Open the Apple Extras folder on the hard disk or the CD Extras folder on the CD-ROM disc.

3   Open the folder for the software you want to remove.

4   Double-click the Installer icon to open the Installer application.

5 **If the Installer's Welcome screen appears, click OK.**

The Easy Install dialog box appears.

6 **Choose Custom Remove from the pop-up menu.**

The Custom Remove dialog box appears, listing the software components that can be removed.

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

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

8 **Click Remove.**

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

10 **When you see a message reporting that the removal was successful, click Quit.**

11 **Restart your computer.**

The software is removed and your computer is ready to use. If you want to remove more software, you can repeat the steps in this section.

Read this chapter for information
about your computer's built-in
CD-ROM drive.

5 Using the Optional Built-in CD-ROM Drive

This chapter provides information on the optional internal CD-ROM drive (also called a CD-ROM player because you play CD-ROM discs in it). Refer to Appendix A, "Health, Safety, and Maintenance Tips," for information on the proper handling of CD-ROM discs.

With your internal CD-ROM (compact disc read-only memory) drive, you have access to large amounts of information. The CD-ROM drive can read the contents of CD-ROM discs, standard audio compact discs (CDs), and single-session or multisession Photo CDs. However, you cannot use the drive to save information on CD-ROM discs. ROM stands for *read-only memory,* meaning that the drive cannot "write" information onto CD-ROM discs.
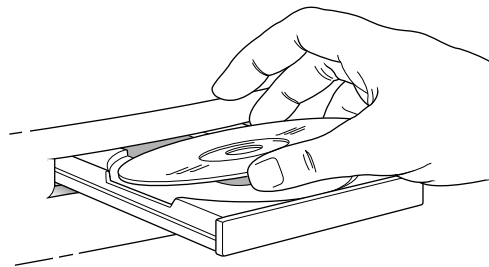
A wide selection of CD-ROM discs is available for entertainment, education, and business. A typical disc can hold over 650 megabytes (MB) of information—the equivalent of 270,000 pages of text, up to 8 hours of speech or music (depending on the sound quality), hundreds of high-resolution images, or any combination of text, sound, and graphics.

Inserting a CD-ROM disc

Follow these instructions to insert a CD-ROM disc into your CD-ROM drive.
Then follow the instructions provided with your disc, as well as the
instructions in this manual.

IMPORTANT Some CD-ROM disc labels have artwork on them that can cause
the disc's weight to be slightly off-center when it's rotating in the drive. This
may cause the computer to vibrate. See the next section, "If Your CD-ROM
Disc Vibrates in the CD-ROM Drive," for more information.

1   Start up your computer, if it's not already on.

2   Press the Open/Close button to open the tray of the CD-ROM drive.

Open/Close button
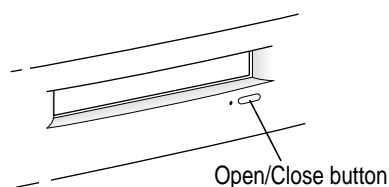
The tray opens.

3   Place a CD-ROM disc in the tray, with the disc label facing up.

Make sure the disc is lying flat and centered in the tray.

If you are using a small (8 cm) disc, make sure the disc is centered within the
inside ring on the tray.
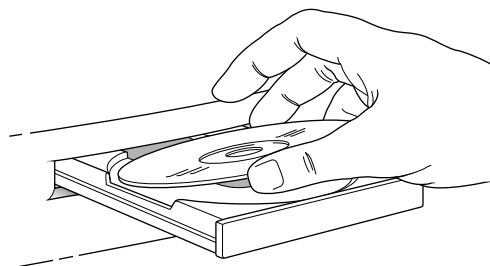
4   **Push the tray in, or press the Open/Close button, to close the tray.**
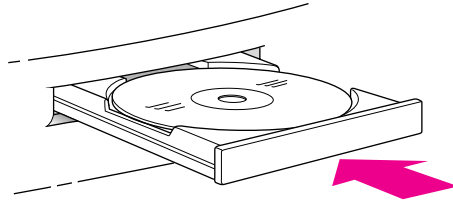
In a few moments, an icon for the CD-ROM disc appears on your screen.

Note: The tray on your CD-ROM drive automatically closes when you shut down your computer. You may want to open the tray and take out your CD-ROM disc before shutting down.

If your CD-ROM disc vibrates in the CD-ROM drive

Some CD-ROM disc labels have artwork or labels on them that can cause the CD-ROM disc's weight to be slightly off-center. Because of the high rotation speed of your CD-ROM drive, these discs can occasionally wobble in the drive and cause your computer to vibrate. If you can feel or hear a CD-ROM disc vibrating, you don't need to do anything special. Just use the CD-ROM disc as you normally would. The vibration damages neither your computer nor the CD-ROM disc itself.

Note: Sometimes removing labels from discs that vibrate eliminates the vibration.

Ejecting a CD-ROM disc

Follow these instructions to open the tray of the CD-ROM drive and eject a CD-ROM disc from your computer.

IMPORTANT You may not be able to eject a disc if it is available to users on other computers (shared). To turn off file sharing, use the Sharing Setup control panel in the Control Panels folder, available through the Apple ( ) menu.

1 **Open the tray.**

There are several ways to open the tray of your CD-ROM drive.

If a CD-ROM disc icon appears on your screen, use one of these methods:

■ Drag the icon to the Trash. (You won't lose information on the CD-ROM disc by dragging its icon to the Trash.)

■ Click the disc icon, then choose the Put Away command in the File menu.

   IMPORTANT Don't click the disc icon and then choose Eject Disk from the Special menu. If you do this, the computer keeps the CD-ROM disc in its memory and continually asks you to reinsert it.

■ If the AppleCD Audio Player window is active, choose Eject CD from the File menu, or simultaneously press the ⌘ and E keys. (AppleCD Audio Player is an application that allows you to play audio CDs and control your CD-ROM drive; it is available in the Apple [ ] menu.)

If no CD-ROM disc icon appears on your screen, try this:

■ Press the Open/Close button of your CD-ROM drive.

2 Take the CD-ROM disc out of the tray.

Store your disc in a safe place, away from heat, dust, and moisture.

3 Push the tray in, or press the Open/Close button, to close the tray.

To avoid possible damage to the tray and the CD-ROM drive, keep the tray closed when you are not using it.

Copying files from CD-ROM discs

To install an application program on your internal hard disk from a CD-ROM disc, insert and open the CD-ROM disc. Then look for a Read Me file or follow the instructions that came with the disc to install the application. (For instructions on using a CD-ROM disc, see "Inserting a CD-ROM Disc" and "Ejecting a CD-ROM Disc" earlier in this chapter.)

IMPORTANT Never copy an entire CD-ROM disc to your hard disk by dragging the CD-ROM disc icon to your hard disk. If you do, you may inadvertently copy duplicate system software files onto your hard disk and take up hard disk space with unnecessary files.

Note: Many applications that come on CD-ROM discs require you to have the CD-ROM disc in the drive whenever you use the application even though you've installed the application on your computer's hard disk and opened the copy on the hard disk.

Types of compact discs you can use

Not all CD-ROM discs store information in the same way. A disc stores and displays information according to a particular file format. Your computer's system software must understand the file format in order to use the contents of the disc.

Standard file formats

You can use CD-ROM discs with these file formats:

■ HFS (Hierarchical File System)—the standard format used by the Macintosh

■ ISO 9660—the International Standards Organization's file format for CD-ROM discs. This format has been adopted by many CD manufacturers to make their discs compatible with a variety of computers. It is also the format that allows you to use Photo CDs in your CD-ROM drive.

■ The High Sierra format, a predecessor of the ISO 9660 format

■ Photo CDs

■ Audio CDs

The software that lets you use discs with these file formats is already installed on your computer.

Other CD-ROM formats

Your CD-ROM drive also works with file formats other than the ones listed above (for example, CD-ROM XA) if you install the appropriate software on your Macintosh. To find out about the availability of Macintosh software for additional file formats, contact the publisher of a particular disc.

Audio CDs

Your CD-ROM drive can play audio CDs and the sound portions of other CD-ROM discs using your computer's built-in speaker. You can also attach headphones or speakers to your computer for stereo sound. For further information, see "Playing Audio CDs" later in this chapter. Also see "CD-ROM Discs" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (🄰) menu.

Photo CDs

With your CD-ROM drive, you can use QuickTime to open digitized images stored on Photo CDs.

For more information on Photo CDs, see "Working With Photo CDs" later in this chapter. Also see the "CD-ROM Discs" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (🄰) menu.

Playing audio CDs

With your CD-ROM drive and your computer's built-in speaker, you can play audio compact discs (CDs) or the sound portions of other CD-ROM discs. You can also attach headphones or speakers to the computer to listen to audio tracks. See Chapter 3, "Expanding Your Computer and Using Its Special Features," for information on connecting sound equipment to your computer.

To start, stop, and otherwise control audio CDs, use the AppleCD Audio Player program, available in the Apple (🍎) menu. Your audio CD software will only play tracks that contain audio information. With the AppleCD Audio Player program, you can listen to audio tracks from CDs while doing other work on your computer. For more information about playing audio CDs, see the "CD-ROM Discs" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (🄰) menu.

Working with Photo CDs

With your CD-ROM drive and software, you can open Photo CD images stored on Photo CDs. A Photo CD image is a digitized version of a standard photograph that you can open and view on your computer screen.

You can do many things with the images on your Photo CDs:

- Open and view the images individually.

- View the images in a series, as you would view a slide presentation.

- Copy and save the images, print them, paste them into word-processing documents or other documents that accept graphics, and edit them with a graphics application program.

  Photo CD images are an excellent source of graphics for desktop publishing, multimedia presentations, business documents, and professional-quality graphic design. For more information on working with Photo CD images, see the "CD-ROM Discs" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (♋) menu.

Obtaining Photo CDs

Your own photographs can be recorded as Photo CD images on a Photo CD. To obtain a Photo CD of your own photographs, take your standard 35-mm film to a photofinisher who has a Photo CD system. The photofinisher develops your film, digitizes the photographs, and gives you back a Photo CD containing your images. A single Photo CD can hold approximately one hundred images.

If your Photo CD isn't full, you can take it back to the photofinisher and have more photos added until the disc is full. Such discs are called *multisession discs* because they contain images added after the first session. Your CD-ROM drive can read both single-session and multisession Photo CDs. (Other CD-ROM drives can read only single-session discs and are unable to read the additional images placed on a multisession disc.)

Before viewing the contents of a Photo CD

Normally, you open Photo CD images with the SimpleText program that came with your computer. If you wish, you can use a graphics or image-editing program instead of SimpleText. For instructions, see the "CD-ROM Discs" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (🄌) menu. If you use SimpleText to view high-resolution images, you should increase the amount of memory that SimpleText uses. For more information on memory, see the "Memory" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (🄌) menu.

A note about resolution

When a Photo CD image is created, it's recorded at five different levels of resolution. The higher the resolution, the more information is recorded about the image, and the sharper the image appears when displayed or printed at larger sizes. However, high-resolution images take up a lot of memory—up to l8 MB of data for one photograph—which affects file size, as well as the amount of time it takes to display or print an image.

It's best to work with a resolution appropriate for your monitor or printer. Some monitors and printers cannot display or print very high-resolution images.

For most work, a resolution of 768 x 5l2 pixels or smaller is suitable. For detailed work or very high-quality reproductions, you may want to use a higher resolution.

Make sure to open high-resolution images with application programs designed to handle large image files. SimpleText cannot open very large files.

Sharing a CD-ROM disc over a network

You can "share" a CD-ROM disc with users of other computers using the file sharing feature of your system software. If your disc has audio portions, you will be able to hear the audio yourself, but other people on the network will not. Likewise, you cannot hear the audio portions of discs you access over a network.

IMPORTANT If file sharing is on and you are having trouble ejecting a disc, turn file sharing off in the Sharing Setup control panel in the Control Panels folder, available through the Apple () menu.

For further information about file sharing, see the "Sharing Files" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide () menu.

6 Connecting Your Computer to a Telephone Line

A world of information is now available online. By connecting your computer to a telephone line (commonly referred to as going "online"), you can access the Internet, send and receive electronic mail (e-mail) and faxes, and connect to online services like America Online and CompuServe. You can also use a telephone line to access another Macintosh or an entire AppleTalk network from a remote Macintosh computer. (For example, you can telecommute by accessing a company computer network from a remote location, such as a home office.)

To get online using a telephone line, you need special equipment and software. This chapter provides a brief introduction to the equipment you need. (It's also possible to get online through a network connection, if the network includes the right equipment.) For information about the software you need to perform online tasks, see Chapter 8, "Using Your Modem to Connect to the Internet or an Online Service."

Types of equipment

There are three types of equipment you can use to get online: a modem, an ISDN line, and shared telecommunications equipment on your network.

Modem: A modem may be the most common way to connect a computer to a phone line, particularly if you are using your computer at home. A modem works with standard analog telephone lines. To add a modem to your computer, you can install a modem card in your computer's communication slot or connect an external modem. For more information about modems, see the next section, "Choosing and Connecting a Modem."

ISDN line: An Integrated Services Digital Network (ISDN) line is a special digital phone line that is about four times faster than the fastest modem used over a standard analog telephone line. However, an ISDN line typically costs more than regular phone service and may not be available in your community. For more information about ISDN, see "Connecting to an ISDN Line" later in this chapter.

Shared Telecommunications Equipment on Your Network: Many models of your computer come with an Ethernet card, allowing you to connect to a network. If your computer is part of a network, there may be shared communications equipment available that will allow you (or anyone else on your network) to get online. Contact your computer network administrator for more information. You can also find general information about networks in Chapter 7, "Connecting Your Computer to a Network."

Choosing and connecting a modem

A modem is a piece of equipment that turns the data from your computer into information that can be transmitted over telephone lines. The modem enables your computer to send and receive telephone calls, connect to the Internet, access online services, and communicate with other computer users. Some modems also allow you to transmit documents on your computer to fax machines as well as receive faxes as documents that you can view on screen or print.

To add a modem to your computer, you can install an internal modem card in the communication slot of your computer, or, if the communication slot is already filled with a network card, you can connect an external modem (a separate piece of equipment that sits outside the computer case and connects to it with a cable).

Keep in mind that when your phone and a modem share a single phone line, you will not be able to use both at the same time, even if they are attached to separate phone jacks. While you use a modem, outside callers get a busy signal and you cannot call out. Conversely, when you use your phone, you cannot use the modem. (If you miss phone calls because you often use your modem, you may want to get a second phone line installed or get a phone company message service, which, unlike an answering machine, will record messages even when your phone is off the hook or you are online.)

Also keep in mind that long distance charges accrue when your modem dials long-distance numbers. In most cases, an online service or an Internet service provider will have a local access phone number so that long distance charges do not apply.

Choosing a modem

When selecting a modem, look for one with a high speed of data transfer, a compatible modem cable (if the modem is external), and good bundled software. Remember, if your communication slot is already filled with a network card (many models of your computer come with an Ethernet card in this slot), you'll want to look for an external modem rather than a modem card.

Modem speed

The modem speed determines how fast a modem can *download,* or transfer data from a remote location to your computer. Be sure to purchase the fastest modem that you can afford, particularly if you plan to connect to the World Wide Web. Many Web pages contain graphics, video, and sound that will take longer to download with a slower modem.

The speed of a modem is specified in kilobits per second (Kbps) or bits per second (bps). Faster modems transfer data to and from your computer more quickly than slower ones. The following table describes the current modem speeds that are available.

Modem speed	Usage
33,600 bps (33.6 Kbps)	The fastest modem available (as of this writing) for use with standard analog telephone lines. Suitable for World Wide Web use.
28,800 bps (28.8 Kbps)	Slightly slower than a 33.6 Kbps modem, but still suitable for World Wide Web use.
14,400 bps (14.4 Kbps)	Only half as fast as a 28.8 Kbps modem. May be acceptable for text-oriented applications such as e-mail or terminal emulation.
9600, 4800, and 2400 bps	Too slow for most purposes.

Modem cables (for external modems)

If you purchase an external modem that is designed for use with a Macintosh, it will probably include a Macintosh-compatible modem cable. If you have to purchase a cable separately, make sure it supports *hardware handshaking,* a protocol that controls the flow of data between computers. Also make sure the cable has a rounded connector that will fit the modem port on the back of your computer (labeled with a ✆ icon). A cable designed for use with a Windows- or DOS-compatible computer won't work with your Macintosh.

Bundled software

Many modems include bundled software, such as fax software, a terminal emulation program, and free trial membership software for online services. If you can't decide between two comparably priced modems, pick the one that comes with the best bundled software.

Connecting a modem

To connect an external modem, follow the instructions in the manuals that came with your modem. To install and connect an internal modem card, follow the instructions in Appendix B of this manual for installing communication cards as well as the instructions in the manual that came with the card.

Note: Some modems have a single phone jack, while others have two. If your modem has only one phone jack, consider purchasing a line splitter at an electronics supply store. A line splitter enables you to plug your phone and your internal modem into the same jack at the same time. (By the way, you can keep your answering machine connected to your phone, even if your phone and modem share the same telephone line.)

IMPORTANT When connecting a modem, make sure you connect the modem to an analog phone line—the kind used typically in homes. Connecting to an ISDN line could damage the modem.

IMPORTANT Disconnect your modem from the phone jack during lightning storms. This will prevent a destructive voltage overload from damaging the modem.

Setting up your modem to connect online

Once you have installed and connected your modem, you need to configure the connection so the modem can contact your network or Internet service provider (ISP). The Apple Internet Connection Kit that came on the system software CD-ROM disc can be used to set up your modem connection. Your network administrator or ISP can provide more information about what settings to use to configure your connection. Refer to Chapter 8, "Using Your Modem to Connect to the Internet or an Online Service," for more information about getting your computer online.

Connecting to an ISDN line

If you have a home office, telecommute frequently, or routinely need to send and receive large files, then a 28.8- or 33.6-Kbps modem may not be fast enough for your needs. For faster performance, you may want to consider connecting your computer to an Integrated Services Digital Network (ISDN) digital telephone line, which can transfer data at 128 Kbps, nearly 4.5 times faster than a 28.8 Kbps modem.

ISDN lines are available to most but not all residential and business telephone customers. Check with your local phone company to see if ISDN service is available at your location.

There are fixed monthly charges and per-minute usage fees for ISDN, just like regular phone service. Typically, ISDN costs more than regular phone service, but it is still affordable for many business and residential purposes. Because one ISDN line can support several devices simultaneously—such as a computer, voice phone, and fax machine—you may be able to replace existing extra phone lines with one ISDN line.

Note: Because an ISDN line requires a power source at your location, a phone attached to an ISDN line will not work during a power outage. For emergency use, you should strongly consider keeping your regular analog phone line, which receives power from the phone company.

Setting up an ISDN line

If you're interested in setting up an ISDN line, first contact your local phone company to see if ISDN service is available at your location. Your phone company can also provide specific information about monthly charges and usage fees. (Your phone company may also charge an installation fee, which may be waived or refunded if you agree to keep the ISDN line for a specified amount of time.)

In addition, you also need to purchase and configure an ISDN terminal adapter, which connects to the external modem port on your Macintosh and to the ISDN line. (ISDN terminal adapters are often called "ISDN modems" because they are somewhat similar to modems.)

Some ISDN terminal adapter models may be difficult to configure with the network configuration of your employer or internet service provider. Work closely with your computer network administrator or internet service provider to make sure you purchase a compatible ISDN terminal adapter.

Read this chapter for information about
connecting to other computers
in a local area network.

7 Connecting Your Computer to a Network

Any group of computers and other devices connected in order to
communicate with each other constitutes a network. Some networks connect
all their computers by a particular type of cable. Such networks are called
local area networks (LANs). LANs can be as simple as two computers
connected together or as complex as a business's in-house computer network.
Sometimes groups of networks connect to form a larger network, such as the
Internet. This is called a wide area network (WAN).This chapter discusses
several types of LANs to which you can connect your computer.

Connecting to a network expands the features of your computer by giving you access to the services and resources provided on the network. For example, your computer by itself lets you store, retrieve, and modify information on floppy disks, hard disks, and CD-ROM discs. When your computer is connected to a network, however, you can also store and retrieve information on the hard disks and CD-ROM discs of other computers, use electronic mail, and share computing resources such as printers, modems, and network services.

You can get much of the specific information about the network you want to connect to from the *network administrator*—the person who oversees the network's operation. Before you begin connecting to a network, contact its network administrator.

Your computer can be connected to several kinds of networks, including the following:

■ **LocalTalk** To connect to a LocalTalk network, you connect a LocalTalk cable to either the modem port or the printer port on your computer.

■ **Ethernet** To connect to a high-speed Ethernet network, you need an Ethernet card installed in the communication or PCI (peripheral component interconnect) slot in your computer. Many models of your computer come with a 10Base-T (twisted pair) Ethernet card already installed in the communication slot.

■ **Alternative networks such as Token Ring, ISDN, or Fiber Distributed Data Interface (FDDI)** To connect to any of these networks, you need to install a PCI card for the specific type of network you want to connect to in one of the PCI slots in your computer.

This chapter describes how to connect to and configure your computer on LocalTalk and Ethernet networks. For other network-related information, refer to the appropriate information source

- If your computer is already connected to a network, refer to Macintosh Guide (or Mac OS Guide), available in the Guide (2) menu, for information about printing to a networked printer, accessing information on file servers, and sharing files on your computer with other users. Also, your network administrator can provide information about network software that may be available, such as Internet access and electronic mail.

- If your location does not currently have a network and you are interested in setting one up, refer to a book on Macintosh networking that will help you select and plan a network appropriate for your organization. Many books about networks are available at computer bookstores.

Note: With a modem, you can connect to the Internet and other online services. However, with an Ethernet card or LocalTalk connection (described in this chapter), you can also connect your computer to other computers or servers in a local area network. You may also be able to reach the Internet if you connect to a network that has an Internet link. (By the way, access to the Internet over a network may be noticeably faster than access by a modem. For information on using your modem, see Chapter 6, "Connecting Your Computer to a Telephone Line.")

Connecting to a LocalTalk Network

To connect your Macintosh to a LocalTalk network, you need LocalTalk cables and a LocalTalk adapter. In most cases, the Apple LocalTalk Locking Connector Kit DIN-8, available from your Apple-authorized dealer, contains the components you need to connect your Macintosh to an existing LocalTalk network. If your network uses standard telephone cables for your network wiring, obtain an Apple LocalTalk RJ-ll Connector instead.

Apple LocalTalk Locking Connector Kit DIN-8   Apple LocalTalk RJ-11 Connector

LocalTalk adapter   LocalTalk adapter

LocalTalk cable   Standard telephone cable
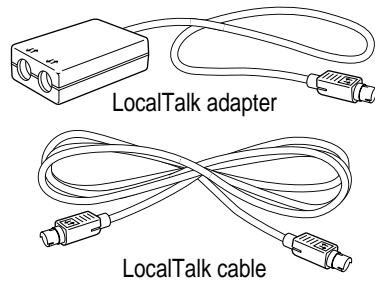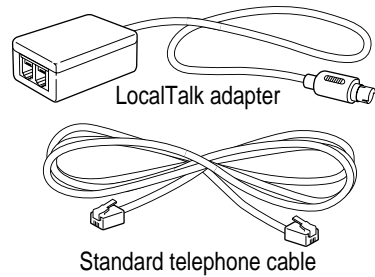
To connect your Macintosh to a LocalTalk network, do the following:

1   Shut down your computer.

2   Attach the LocalTalk adapter to the printer port or modem port on your computer.

Printer port

Printer port icon
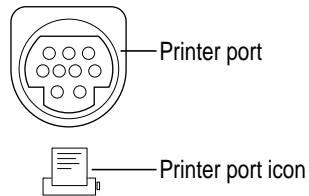
3 **Attach a network cable between the LocalTalk adapter connected to your computer and a LocalTalk adapter on your existing network.**

IMPORTANT While connecting to the middle of the network you may interrupt other users. Check with your network administrator before you connect.

If you connect to the last computer in the network, you need to attach a network terminator to your LocalTalk adapter.

If you are using the Apple LocalTalk Locking Connector Kit DIN-8, use the LocalTalk cable that comes with the kit to connect to a network with LocalTalk cables. If you are using the Apple LocalTalk RJ-11 Connector, use a standard telephone cable with RJ-11 connectors.

Printer port

LocalTalk adapter
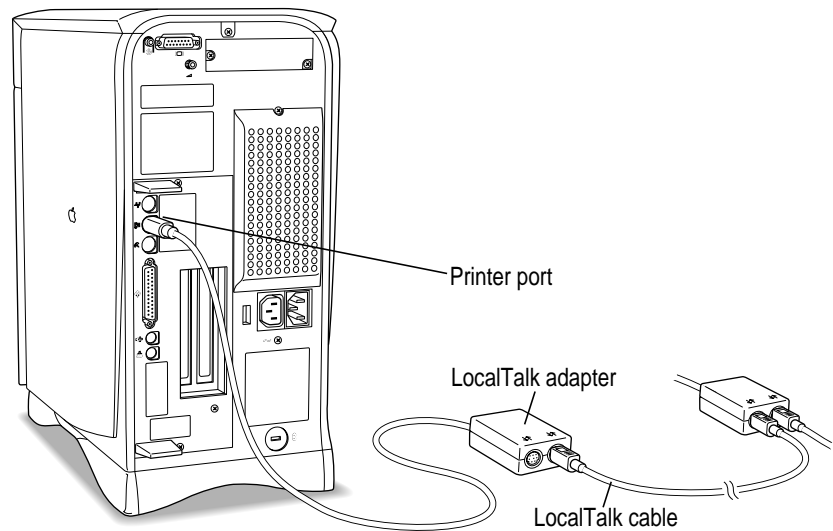
LocalTalk cable

4 **Configure your LocalTalk connection following the advice of your network administrator and the instructions in "Configuring Your Network Connection" later in this chapter.**

Connecting to an Ethernet network

Ethernet is a cable system that lets your computer communicate with other computers much faster than it can with LocalTalk cables. To connect your computer to an Ethernet network, you need to do the following:

■ Find out from your network administrator what kind of Ethernet network you're connecting to.

■ If your computer did not come with the appropriate Ethernet card already installed, buy and install the right kind of Ethernet card and cable. See "Choosing an Ethernet Card," next in this chapter. See Appendix B for instructions on installing cards in your computer.

■ Connect the card to the network. See the instructions later in this chapter for connecting the card to the type of Ethernet network you have.

■ Configure the network connection. See the instructions in "Configuring Your Network Connection," later in this chapter.

Choosing an Ethernet card

Many models of your computer come with an Ethernet card already installed. If your computer didn't include an Ethernet card and you decide to add one, there are two factors that affect what kind of Ethernet card you should purchase for your computer—where the card will be installed in your computer and what kind of network you'll be connecting to. Depending on the type of card you install, you may also need an appropriate media adapter.

Where to install the card

Some kinds of Ethernet cards fit into the computer's communication slot; however, so do internal modem cards. If you install an internal modem card in the communication slot but you also want to connect to an Ethernet network, purchase an Ethernet card that instead uses the computer's PCI (peripheral component interconnect) slot.

> **WARNING** Do not connect cables to the back of your computer when the power is on or you may damage your system.

- If your Ethernet card uses a PCI slot, follow the instructions in "Installing a PCI Card" in the section "Installing an Expansion Card" in Appendix B, and the instructions that came with the card.

- If your Ethernet card uses the communication slot (this type of card is often referred to as an Apple Ethernet Comm II card), follow the instructions in "Installing a Communication Card" in the section "Installing an Expansion Card" in Appendix B, and the instructions that came with the card.

Network type

Find out what kind of network you will be connecting to (your network administrator should be able to provide this information). Depending on the kind of network, you will choose among cards that use one of these types of cables:

- thin or thick coaxial (or "coax") cable, also called 10Base-2

- 10Base-T (twisted pair) cable

- fiber-optic media or other standard Ethernet cable

So for example, if you know that your Ethernet network uses 10Base-T cables, and you want to use your communication slot for a modem card, you would purchase a 10Base-T Ethernet card that fits in a PCI slot.

Media adapters

You can connect *directly* to an Ethernet network using a 10Base-T twisted-pair cable. However, to connect your computer to an Ethernet network using coaxial cables, you need one of the following Ethernet media adapters:

- Apple Ethernet Thin Coax Transceiver
- Apple Ethernet AUI Adapter

See your Apple-authorized dealer for more information on Apple Ethernet media adapters.

Connecting to a twisted-pair Ethernet network

Follow this procedure to connect your Macintosh to an Ethernet network that uses twisted-pair cable. (You can't connect to an Ethernet network unless you have an Ethernet card installed. If your computer didn't come with an Ethernet card already installed, see the information at the beginning of this section, "Connecting to an Ethernet Network.") You need a twisted-pair patch cord with an RJ-45 telephone-style connector, which you plug into a wall plate connected to the existing 10Base-T Ethernet network.

IMPORTANT Be careful not to plug a regular telephone cable into your RJ-45 connector. Although it works very differently, an RJ-45 connector looks very similar to a standard telephone cable. Also, the connectors at the ends of the cables will fit into both telephone and twisted-pair Ethernet ports. Make sure you are using an RJ-45 connector cable.

To connect your Macintosh to a twisted-pair Ethernet network, follow these instructions:

1 Shut down your computer.

2 Plug one end of the twisted-pair patch cord into the 10Base-T Ethernet port on the Ethernet card in your Macintosh.

Status light (lights up when there's a good network connection)

Twisted-pair Ethernet port (10Base-T)
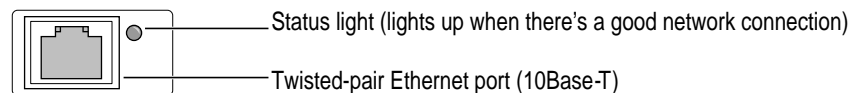
3 **Plug the other end of the twisted-pair patch cord into an RJ-45 wall outlet that is connected to a twisted-pair Ethernet network.**

Ethernet port (twisted-pair)

RJ-45 connector

Wall plate (RJ-45 port)

Twisted-pair cable
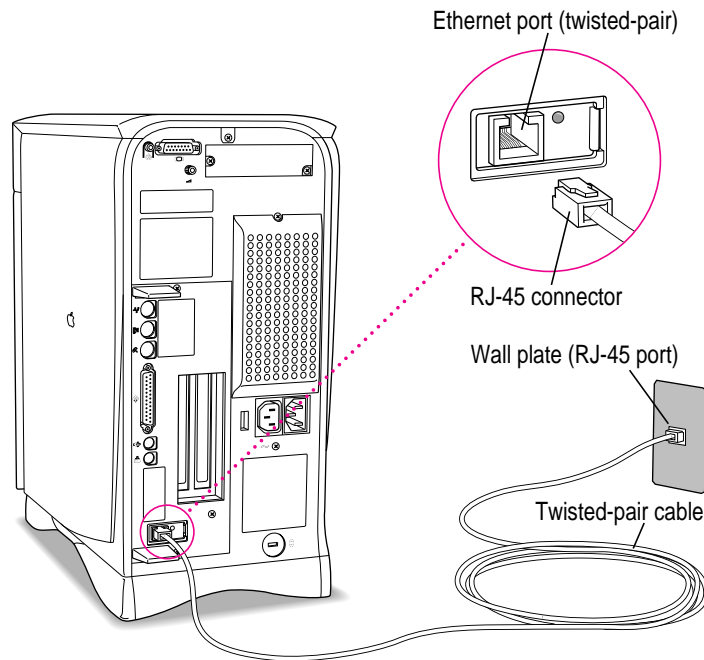
4 **Configure your network connection following the advice of your network administrator and the instructions in "Configuring Your Network Connection" later in this chapter.**

Connecting to a thin coaxial Ethernet network

Follow this procedure to connect your Macintosh to an Ethernet network that uses a thin coaxial cable. The hardware connection requires an Apple (or Apple-compatible) thin coaxial Ethernet card and a thin coaxial cable.

IMPORTANT You can connect your Macintosh anywhere on the network; however, to do so requires that you temporarily disconnect the network, which will interrupt existing network services and activity temporarily. Consult your network administrator before connecting your computer to the network.

WARNING Do not connect the Ethernet cable directly to the coaxial port on the back of the computer. The cable must first be attached to the T-connector and the T-connector must be attached to the coaxial port.

1 Shut down your Macintosh.

2 Attach one end of a thin coaxial cable to the T-connector that came with your card.

Don't attach the T-connector to your computer yet.

3 On the computer closest to your computer, detach the network cable (or terminator) from its T-connector.

This disrupts network services for other users.

4 Lock the free end of your thin coaxial cable to the T-connector on the other computer.

5 If you are adding your computer somewhere in the middle of the network, lock the unattached network cable to your T-connector. Otherwise, lock a terminator to your T-connector.

This restores network services for other users.

6 **Attach your T-connector to the port on your card.**

It may help to use two hands. With one hand, push the T-connector on the port. While still holding the T-connector, use your other hand to twist and lock the connector into place.

Pull the T-connector to make sure it is locked securely onto the port.

Status light (lights up when there's a good network connection)

Thin coaxial Ethernet port (10Base-2)

Ethernet port (thin coaxial)   T-connector

Thin coaxial cable   Thin coaxial cable
(or thin coaxial
Ethernet terminator
if your computer is
the last device on
the network)
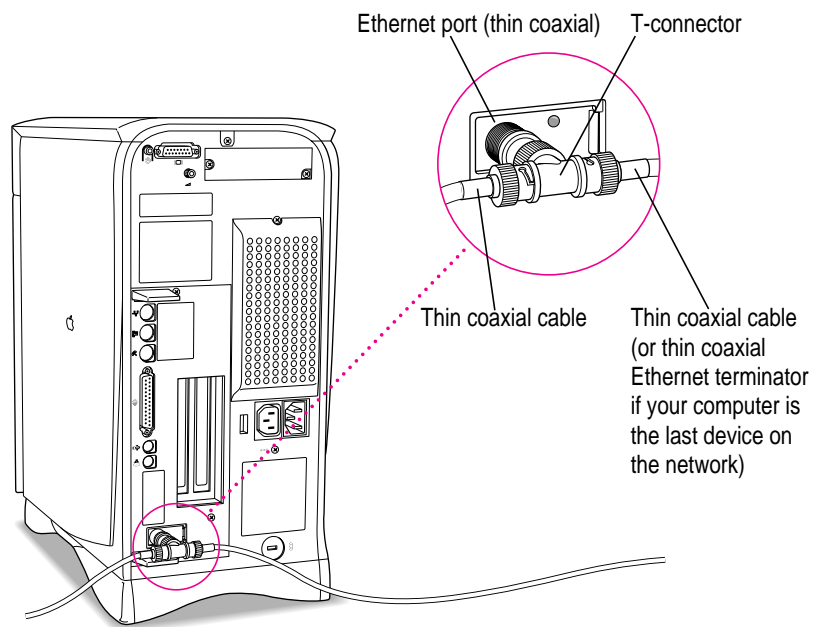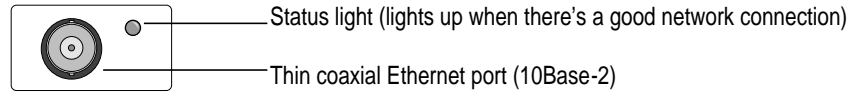
7 **Start up your computer.**

8 **Configure your network connection following the advice of your network administrator and the instructions in "Configuring Your Network Connection" later in this chapter.**

Connecting to other types of Ethernet network

The Apple Ethernet AUI Adapter is a universal adapter that lets you connect your computer to less-common types of industry-standard Ethernet media, such as thick coaxial or fiber-optic cable. If you are using the Apple Ethernet AUI Adapter, you also need an Ethernet transceiver for your specific media type; the transceiver must have a standard AUI port on it.

To connect your computer to an Ethernet transceiver for other types of Ethernet media, follow these instructions:

1 **Shut down your computer.**

2 **Connect the Ethernet transceiver to the network following the instructions that came with the transceiver.**

3 **Plug the transceiver cable from the Ethernet transceiver into the standard AUI port on the Apple Ethernet AUI Adapter.**

Ethernet port (AAUI)

AAUI connector

Electrical outlet

Apple Ethernet AUI Adapter

Ethernet transceiver for other media
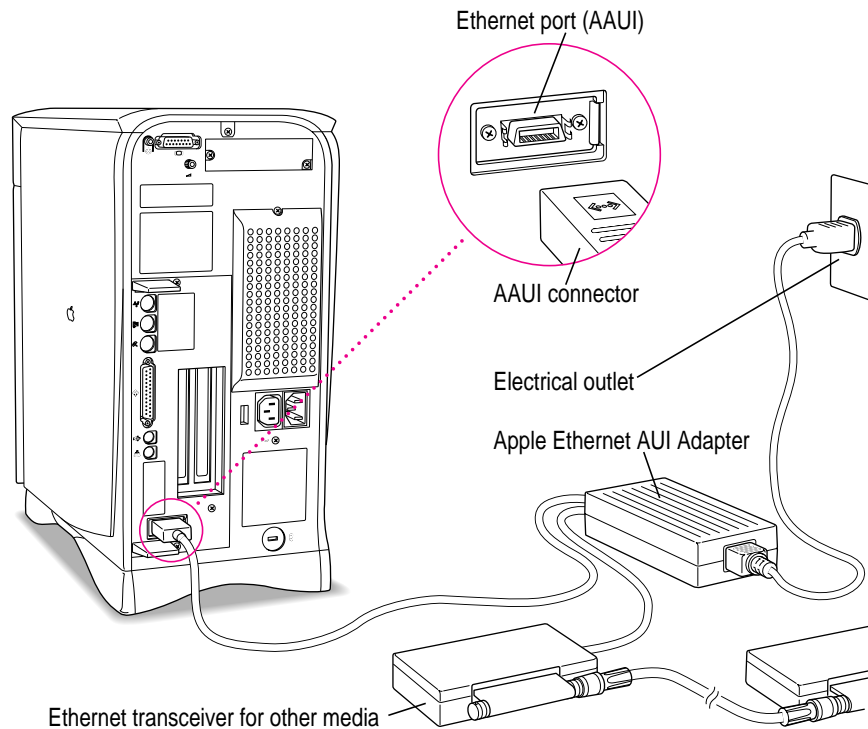
4 Plug the adapter's power cord into an electrical power outlet.

5 Plug the connector on the Apple Ethernet AUI Adapter into the AAUI Ethernet port on your Macintosh.

AAUI Ethernet port
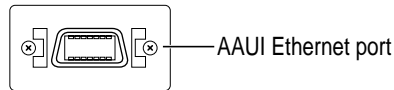
6 Configure your network connection following the advice of your network administrator and the instructions in "Configuring Your Network Connection" next.

Configuring your network connection

After you physically connect your computer to a LocalTalk or Ethernet network, you need to configure your network connection in the AppleTalk control panel, the TCP/IP control panel, or both.

■ You use the AppleTalk control panel to set up your connection to an AppleTalk network (that is, a network using the AppleTalk protocol).

■ You use the TCP/IP control panel to set up your connection to the Internet and to a TCP/IP network. (TCP/IP stands for Transmission Control Protocol/Internet Protocol. It is the set of data communication rules followed by networks to communicate with each other on the Internet.)

You may need additional information about the network to which your computer is connected, or about the service through which your computer is connected to the Internet. To get this information, you may need to contact your network administrator or your Internet service provider (ISP).

Configuring your AppleTalk network connection

To configure your AppleTalk network connection, you must specify the port you use to connect your computer to the network.

Additionally, you may need to select the zone in which your computer is located. Larger networks use zones to create groups of computers, printers, servers, and other network devices. For example, a network might have a zone for each floor in an office building. If your network has more than one zone, you can choose the zone in which your computer is located. The zone you choose is automatically selected in the Chooser (for example, when you select a network printer) and it is the zone in which other network users can find your computer if you turn on file sharing.

To configure your AppleTalk network connection, follow these steps:

1   Choose Control Panels from the Apple menu.

2   Double-click the AppleTalk icon to open it.

The AppleTalk control panel opens.

```
═════════════════ AppleTalk ═════════════════
  Connect via :  [ Printer Port            ▼ ]

 ┌─ Setup ───────────────────────────────────┐
 │                                            │
 │  Current zone :   < no zones available >   │
 │                                            │
 └────────────────────────────────────────────┘
  ②
```
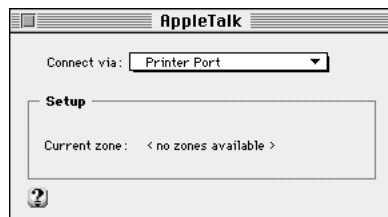
3 **Move the pointer to the "Connect via" pop-up menu (if available), press and hold down the mouse button to open the menu, and choose the port through which your computer is connected to the network.**

You can connect to an AppleTalk network through an Ethernet port, the printer port, the modem port, or any other ports available on expansion cards installed in your computer. (Any additional ports appear automatically in this pop-up menu.)

Note: If you don't see a pop-up menu here, this setting has been locked. Contact your network administrator for assistance. (If you don't have a network administrator, you can use the Administration user mode to unlock this setting. For more information about user modes, click the ⑫ button in the AppleTalk control panel.)

4 **Use the Current Zone pop-up menu (if available) to choose the zone you want.**

If you don't see a pop-up menu here, either your network has no zone, this setting has been locked, or your network is not set up to allow you to choose a zone. Zones are set up by the network administrator.

5 **Click the close box to close the AppleTalk control panel.**

If you have made configuration changes, a message asks if you want to save them.

If you have changed the port, a message also tells you that the change will interrupt any AppleTalk services that are established. This means that your network services, such as printers and e-mail, may be temporarily unavailable, and you may have to choose a printer and connect to your e-mail service again after saving changes.

6 **To save your changes, click the Save button.**

Your changes take effect immediately; you do not have to restart your computer.

Getting more information about the AppleTalk control panel

Macintosh Guide (or Mac OS Guide) contains information about additional capabilities available in the AppleTalk control panel, such as

■ using configurations, a way to save different AppleTalk settings and switch among them as desired—for example, if you use your computer with more than one network

■ using the User Mode command to change the availability of settings in the AppleTalk control panel

■ turning AppleTalk off in order to save RAM in your computer when you are not using an AppleTalk network

For more information about these capabilities, click the ⍰ button in the AppleTalk control panel.

Configuring your TCP/IP network connection

You must properly set up the TCP/IP control panel if your computer is connected to a network that uses TCP/IP standards, such as the Internet.

TCP/IP (Transmission Control Protocol/Internet Protocol) is a set of rules that are applied to data sent and received on the Internet. The rules standardize how data is communicated so that many different kinds of computers can recognize it. TCP/IP protocols can be used with many different types of network equipment and connections. If you don't know whether your network uses TCP/IP, contact your network administrator.

To set up your TCP/IP network connection, you must specify the port you use to connect your computer to the network. TCP/IP networks also require information about your computer's network address. You must enter that information in the TCP/IP control panel, or specify a server on which the information can be found. To get this information, check with your network administrator or Internet service provider.

Before you begin

To properly configure your connection, you need to have information about all the elements involved. Among these are the types of servers used on the network, your Internet Protocol (IP) address, and your subnet mask. Your Internet service provider or network administrator can give you the information you need in order to set up your connection.

Setting up

To set up your TCP/IP network connection, follow these steps:

1 Choose Control Panels from the Apple menu.

The Control Panels window opens.

2 Double-click the TCP/IP icon to open it.

The TCP/IP control panel opens.
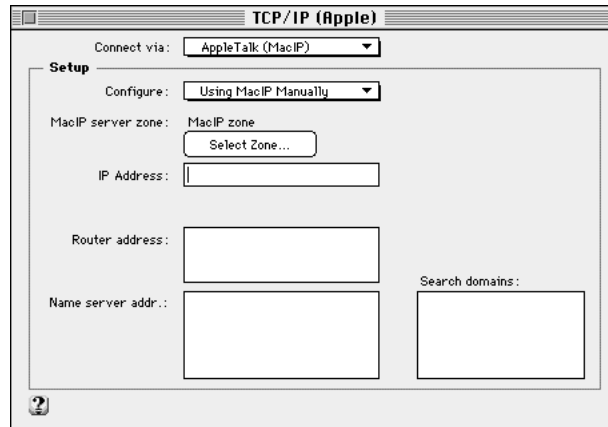
3 Use the "Connect via" pop-up menu to choose the port through which your computer is connected to the network.

Note: If you don't see the pop-up menu or other settings described in this section, the TCP/IP configuration may have been locked. Contact your network administrator for assistance. (If you don't have a network administrator, you can use the Administration user mode to unlock this setting. For more information about user modes in the TCP/IP control panel, click the ⍰ button.)

4 Use the Configure pop-up menu to choose a configuration method.

If you are connected using Ethernet, the pop-up menu looks like this:
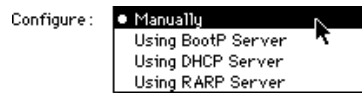
If you are connected using AppleTalk (MacIP), the pop-up menu looks like this:
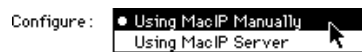
5 If you are configuring your network connection manually, type the information provided by your network administrator or Internet service provider into the appropriate boxes.

You must specify an IP address. You may also need to enter a subnet mask number, router address, and other information.

6 If your network configuration will be provided automatically by a server, do one of the following:

■ If you are using a BootP server or DHCP server, skip to step 7. The server usually provides all the configuration information needed by TCP/IP.

■ If you are using a RARP server, you may need to type additional information provided by your network administrator or Internet service provider into the appropriate boxes. If so, enter the information now.

■ If you are using a MacIP server, click Select Zone. In the dialog box that appears, choose the zone that contains the MacIP server you want to use and then click OK. (Additionally, if you are connecting with Apple Remote Access [ARA], you must open a connection before you can select a zone.)

7   **Click the close box to close the TCP/IP control panel.**

If you have made configuration changes, an alert box asks if you want to save them. If you have changed the port, an alert box also tells you that the change will interrupt any connections to TCP/IP services. For example, you may have to quit and reopen a Web browser or e-mail software after saving changes.

8   **To save your changes, click the Save button.**

Your changes take effect immediately; you do not have to restart your computer.

Getting more information about the TCP/IP control panel

Macintosh Guide (or Mac OS Guide) contains information about additional capabilities available in the TCP/IP control panel, such as

- using configurations, a way to save different TCP/IP settings and switch among them as desired
- using the User Mode command to determine the availability of settings in the TCP/IP control panel
- turning TCP/IP off to save RAM when you are not using a TCP/IP-based network

For more information about these capabilities, click the ⍰ button in the TCP/IP control panel.

8 Using Your Modem to Connect to the Internet or an Online Service

This chapter discusses how you use your Macintosh to connect to the fastest growing organization on Earth: the online community. This community gathers in private places provided by subscriber-only services and in the public space called the *Internet*. With a modem and the right software, you have a couple of options for reaching these meeting places. Once you arrive you can exchange e-mail messages, browse the World Wide Web, gather information on topics of interest to you, participate in discussion groups, download software, and use many other services. This chapter provides some explanations and instructions to help you connect.

About the Internet and its language

The Internet, or "Net" as it's sometimes called, is a loosely knit federation of computer networks that "speak" the same language. The language in this case, is a communications standard known as the *Internet protocol,* or *IP.*

No one individual or company owns the Internet, and the individual computers and the networks of computers knitted into it are located all over the world. Originally created for military purposes, the Internet developed dramatically as universities began using it to share information and data. It has now become an expansive resource for millions of users around the world, catering to virtually every imaginable interest.

Internet users may come upon the term *TCP/IP,* or *Transmission Control Protocol.* TCP/IP is the series of protocols used for sending data across the Internet. Sending a message across the Internet involves a three-step process. First, a network computer breaks up the data that make up the message into several smaller data packages, each of which conforms to a strict set of guidelines. These guidelines are called *TCP.* Once the computer has properly prepared the packages, it sends them out for delivery. The packets' addresses, directions on how to deliver them, and other routing specifications are dictated by the other set of guidelines mentioned earlier, Internet Protocol (IP). Because of the Internet's complexity, the packages may not travel together, even though they are bound for the same address, and may even arrive at different times. Using TCP, the computer at the receiving end unscrambles the packets and sorts the data to recreate the original message.

Using your modem to connect to an Internet Service Provider or an online service

Once you have physically connected your modem to a phone line, you have several choices to make before you can get to the Internet. First, you must connect to and open an account with an electronic service provider. Providers fall generally into two categories: Internet service providers (ISP) and online services. Each has its distinct qualities; both charge a fee for your account. Your Macintosh comes with two software packages that give you the choice of connecting with an ISP or an online service. The software items are the Apple Internet Connection Kit (AICK) and America Online (AOL).

Connecting with the Apple Internet Connection Kit

As the name implies, the facilities of an Internet Service Provider let you use your computer to get onto the Internet. Although some ISPs offer other services, Internet access is their main business. Once you connect with an ISP, you have unlimited access to the Internet because your connection with the ISP actually turns your computer into a part of the network itself.

All the software you need to connect with an ISP is included with your computer in the Apple Internet Connection Kit (AICK). This software package helps you select and set up an account with one of several ISPs and helps you set up your Internet connection software. AICK also contains several other software utilities designed for the Internet. For more information and instructions, see the manual and online help that come with AICK.

Connecting with America Online

Unlike ISPs, online services provide additional services for their members alone. An online service may offer e-mail, updated news, sports scores, and stock price updates, special chat groups, and other services as well as a connection to the Internet. Some, like AOL, also offer their own software for use on the Internet. Online services work differently from ISPs in that they filter and funnel some of the data before you receive it and do not make your computer an actual part of the Internet. This allows such services to tailor the Internet access they provide their members. For example, Internet sites deemed not suitable for children can be placed off limits. You might consider this in deciding whether to select an online service or an ISP.

Your computer includes the software needed to connect with America Online (AOL). Because AOL is very easy to use it may be the best choice if you have never used an online service or the Internet before. You can open the AOL software by double-clicking its icon. Check the onscreen help that comes with the software for assistance on establishing an account with AOL.

What the connection software does

Once you have selected a service that will get you to the Internet, you must first establish a phone link with the service and configure your modem so that it can "speak" with the service's computers. Like the TCP/IP language spoken among computers on the Internet, your modem communicates with the service's computers in an industry-standard language, called *Point-to-Point Protocol,* or *PPP.* The data sent by your computer in PPP is converted by the service's computers into TCP/IP and then is sent out over the Internet. When data arrives from the Internet, the translation process occurs in reverse.

When you use AICK, the Internet Dialer program establishes and configures the PPP connection between your modem and the chosen ISP. A similar piece of software sets up the connection when you use AOL. See the instructions that come with AICK and AOL for more information.

What you can do on the Internet

The complexity of the Internet makes it possible to communicate across it in a variety of ways, including exchanging e-mail, teleconferencing, and retrieving files. Both AICK and AOL provide you with software required for some of these forms of communication. (For more information, refer to the relevant manual and online help for AICK and AOL.)

Browse the World Wide Web

The World Wide Web (also known as *the Web*) is the fastest growing part of the Internet. You view information on the Web by using software called a *Web browser.* You can view color images, animation, and video, and even hear sound. The "documents" that you view on the Web are known as *Web pages,* a collection of which is called a *Web site.* Web pages and sites contain links to other pages and sites. When you click a word or image that has been designated as a link, your browser automatically displays the contents of the linked page. The following illustration shows is a portion of the "home page" of the Apple Computer web site.

E-mail

You use electronic mail, or e-mail, to exchange information in much the same way that you use paper mail, except that e-mail is faster and more convenient. It is as easy to send a message to a single recipient as it is to send the same message to many recipients. You can also attach entire electronic files to e-mail.

Newsgroups

You can participate in "newsgroups"—worldwide public discussion groups for debating issues and for exchanging information. You can subscribe to a newsgroup for almost any topic imaginable, and you can read, respond to, and create your own messages, usually referred to as articles. Most newsgroups are unmoderated, which means that you can post your articles directly to the newsgroup. Other newsgroups are moderated, which means someone screens the articles and posts only those deemed appropriate for the newsgroup.

FTP

You can use File Transfer Protocol (FTP) software to transfer files to or from other computers on the Internet. Many specialized computers known as *servers* provide Internet users with files through FTP. FTP software comes in handy when you want to download (copy to your computer) software or software updates over the Internet.

Telnet

With Telnet software you can log onto other computers so that you can use their programs and data as if those items were on your own hard disk. Many libraries, for instance, have electronic (online) card catalogs that you can access by using Telnet software. There are a variety of other specialized databases that you can access through Telnet.

Chapter 9   Troubleshooting

part

II
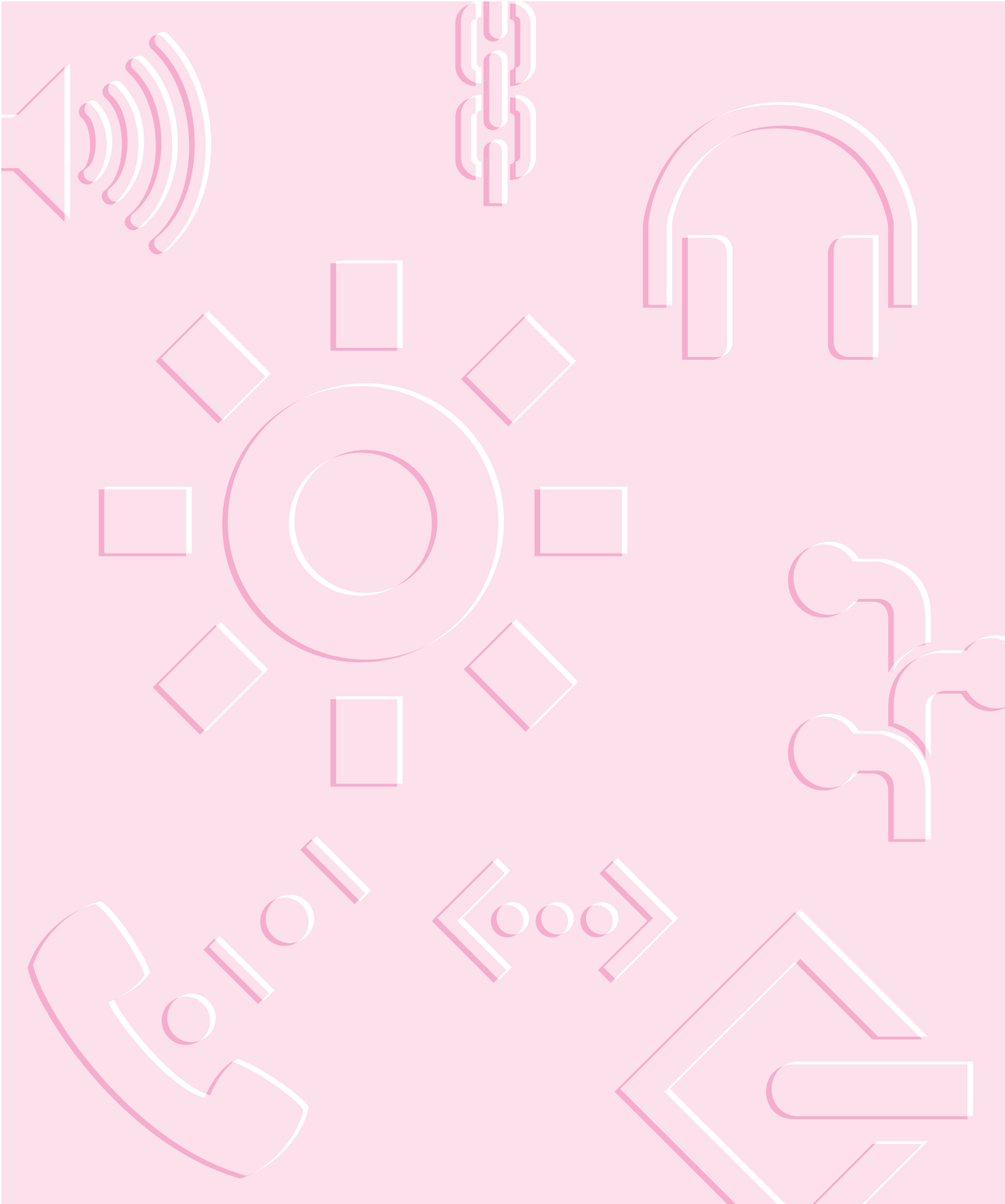
9 Troubleshooting

When you have questions

If you want to know how to do a particular task with your computer, refer to Macintosh Guide in the Guide (⍰) menu.

Note: In some versions of system software, Macintosh Guide is called Mac OS Guide.

For instructions on using Macintosh Guide and Mac OS Guide, see Chapter 2 of this manual, "Getting Help."

If you have trouble

While you're using your computer, you may occasionally see a bomb icon or an error message, or the pointer (▶) may "freeze" 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 (or Mac OS Guide), available in the Guide (②) menu. For additional troubleshooting information and a list of common questions relating to your system software, see the "Troubleshooting" topic area of Macintosh Guide (or Mac OS 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.

WARNING If you have a problem with your computer and nothing presented in this chapter 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 computer yourself, any damage you may cause to the computer will not be covered by the limited warranty on your computer. Contact an Apple-authorized dealer or service provider for additional information about this or any other warranty question.

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 (or Restart) button or turn off the Macintosh.

To help diagnose and correct the problem, follow the suggestions in this subsection. Gather as much information on the situation as you can. Then follow the instructions in the next subsection, "Start Over by Restarting Your Computer."

■ Make a note of exactly what you were doing when the problem occurred. Write down the message on the screen. List the application 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" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide [2] menu.)

■ Check the screen for any clues. Is a menu selected? What applications 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.

If you know the problem is with an application not published by Apple, call the application's publisher. Click the Phone Numbers button in the Service/Support area of the Launcher to get a software publisher's phone number.

Start over by restarting your computer

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 your 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 application in use when the problem occurred; if this works, you can then save the documents open in other applications before restarting. Restart the computer immediately after you save your documents—quitting an application using ⌘-Option-Esc may leave corrupted data in the computer's memory. This corrupted data is erased when you restart the computer.

Note: Use this key combination to force an application to quit only when you can't choose Quit from the File menu.

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 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, press the Power key (marked with a ◁) on the keyboard, then click Shut Down.

3   If the Power key on the keyboard doesn't work, hold down the ⌘ and Control keys while you press the Power key (◁).

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

4   If your computer still doesn't restart, turn it off by pressing the standby power button (⏻) on the back of the computer. Wait at least 10 seconds, and then turn the computer on again by pressing the Power key (marked with a ◁) on the keyboard.

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

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

Rebuilding your desktop can solve a number of problems. For example, when application documents are no longer represented by application-specific icons (and are instead represented by generic icons on the desktop), rebuilding the desktop fixes the problem. Afterward, appropriate icons should appear for all documents.

Some extensions may interfere with rebuilding your desktop. To prevent problems, you'll need to turn off all extensions except Macintosh Easy Open before you rebuild your desktop. When you finish rebuilding the desktop, turn the extensions you normally use back on.

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

1   **Open the Extensions Manager control panel by choosing Extensions Manager from the Control Panels submenu of the Apple () menu.**

2   **From the Sets pop-up menu, choose Save Set.**

3   **In the Save Set dialog box, type a name for your currently selected extensions (for example, "My Extensions") and click OK. The name of your set is added to the Sets pop-up menu.**

This saves your current set of extensions.

4   **Choose All Off from the Sets pop-up menu to turn off all extensions.**

5   **Turn on Macintosh Easy Open by clicking it in the list so that a checkmark appears beside it.**

You can find Macintosh Easy Open by scrolling down the list of extensions. Macintosh Easy Open appears under the heading "Control Panels."

6   Restart your computer while holding down the Command (⌘) and Option keys.

Hold down the ⌘ and Option keys until you see the dialog box that asks if you're sure you want to rebuild your desktop file. When the dialog box appears, you can release the keys.

7   Click OK.

The desktop starts rebuilding.

IMPORTANT Do not stop the desktop-rebuilding process. Doing so could damage your system files.

8   Open the Extensions Manager control panel by choosing Control Panels from the Apple (⌘) menu. When the Control Panels window appears, double-click the Extensions Manager icon.

9   From the Sets pop-up menu, choose the name you gave your set of extensions in step 3.

This turns your original set of extensions back on.

10   Restart your computer to activate the extensions.

Solutions to common problems with your computer

This section contains descriptions of problems you could experience with your computer. Some problems may be caused by your CD-ROM drive, so if you don't find your problem included here, be sure to check the section "Solutions to CD-ROM Problems" later in this chapter.

The computer is turned on but the screen is dark.

One of the following is probably the cause:

■ You have a screen saver application program that darkens the screen when the computer has not been used for a certain period of time.

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

■ Your computer has gone to sleep because it was inactive. Wake it up by pressing the Power key (marked with a ◁) on the keyboard.

■ The monitor's brightness control (☀) is not adjusted properly.

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

■ The monitor's contrast control (◑) is not adjusted properly.

Check the monitor's contrast control and adjust it if necessary.

■ The computer or the monitor is not getting power.

Check that the computer's power cord is firmly connected to the computer and plugged into a grounded electrical outlet, and that the outlet has power. Check that the monitor is plugged in and turned on, and that the monitor cable is firmly connected to both the computer and the monitor.

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

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. Consult the service and support information that came with your computer for instructions on how to contact an Apple-authorized service provider.

WARNING Do not attempt to replace the clock battery yourself. If the clock begins to lose accuracy, have an Apple-authorized dealer or service provider replace the battery. The service provider will dispose of the battery according to the local environmental guidelines.

You inadvertently delete an application from your computer's hard disk.

You can replace any of the software that came with your computer by dragging it from the CD-ROM disc that contains system software to your hard disk. See the section "Copying Files From CD-ROM Discs" in Chapter 5.

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 SCSI (Small Computer System Interface) equipment, such as hard disks, CD-ROM drives, and scanners that you may have connected to your computer.

Shut down your computer, 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 both to the manuals that came with the equipment and Chapter 3 of this manual, which has 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 connected properly. Most printers connect to the printer port, not the SCSI port. 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 CD-ROM disc that contains system software. Do this by inserting the CD-ROM disc into the CD-ROM drive and holding down the C key while you restart the computer. (See the section "Starting Up From a CD-ROM Disc" later in this chapter if you need more help.) 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 System Software" later in this chapter to reinstall system software on your startup hard disk.

A disk icon with an X appears in the middle of the screen and a floppy disk is ejected from the disk drive.

This icon indicates that the floppy disk you tried to start up from is not a startup disk. (When you turn on your computer, it looks first in the floppy disk drive for a disk containing system software. If the disk in the drive does not contain system software, the computer ejects the disk and looks on its internal hard disk for system software.)

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 CD-ROM disc that contains system software. Do this by inserting the CD-ROM disc into the CD-ROM drive and holding down the C key while you restart the computer. (See the section "Starting Up From a CD-ROM Disc" later in this chapter if you need more help.) 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 computer does not start and you have just installed DIMMs, a High Performance Module, or expansion cards.

You may need to press the reset button on the main logic board.

- Open your computer following the instructions in "Opening the Computer," in Appendix B of this manual.

- Press the reset button on the logic board, and then slide the logic board back into the computer.

- Reconnect all cables and then restart your computer.

1 Press the reset button.

2 Gently but firmly push on the vertical plate until the logic board is solidly back in place.
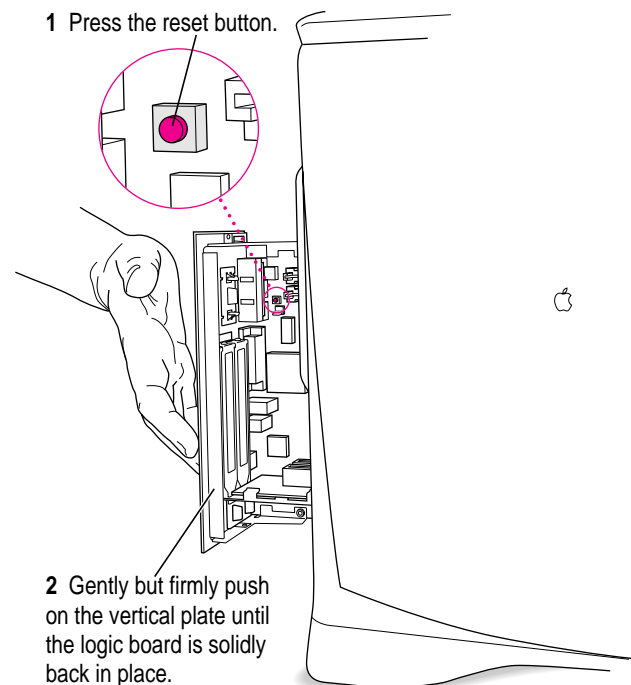
When you press the reset button, some of your computer's software settings change. You should open the control panels for the date and time, keyboard, and mouse to make sure that they are set the way you want them. For more information about working with control panels, see the "Customizing Your Computer" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (②) menu.

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:

■ Use the Drive Setup program to make the disk available. Drive Setup is on the CD-ROM disc that contains system software. For instructions on using Drive Setup, follow the instructions in "Checking for Damage on Your Hard Disk" in the section "Testing and Repairing a Damaged Disk" later in this chapter.

■ 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 (anything connected to the SCSI port [⇔]) connected to your computer. Each SCSI device must have its own unique ID number. If your computer came with the optional CD-ROM drive installed, the CD-ROM drive has SCSI ID number 3. See the manuals that came with your SCSI equipment, in conjunction with Chapter 3 in this manual, for information on setting SCSI ID numbers.

■ If the hard disk is your startup disk, start your computer with the CD-ROM disc that contains system software. Do this by inserting the CD-ROM disc into the CD-ROM drive and holding down the C key while you restart the computer. (See the section "Starting Up From a CD-ROM Disc" later in this chapter if you need more help.) 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 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 disk. For instructions, see "Rebuild Your Desktop" in the section "If You Have Trouble" earlier in this chapter.

If icons do not appear correctly after you rebuild the desktop, try rebuilding a second time.

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—that is, prepare it for use. For instructions, see the "Disks" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (②) menu.

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

■ The disk may have been formatted for use on another kind of computer. You may be able to use an application that lets you work with such disks on your Macintosh.

If you are trying unsuccessfully to use a DOS floppy disk, consider the following:

■ When formatting floppy disks on a DOS computer for use in a Macintosh, you need to format standard double-sided disks as 720K disks and high-density disks as 1440K disks. Double-sided disks formatted in 1440K format and high-density disks formatted in 720K format may not work in a Macintosh.

If you think your DOS floppy disk might have a format that doesn't work in a Macintosh, use a DOS computer to copy the contents of the disk onto a properly formatted disk.

■ Make sure the PC Exchange control panel is in the Control Panels folder (available in the Apple [] menu) and that it is turned on. To turn on PC Exchange, open the Extensions Manager control panel and click the PC Exchange item (under the Control Panels heading) to make a checkmark appear. Then restart your computer.

Your computer starts up and you see large folder-shaped areas, containing labeled pictorial buttons, instead of the usual Macintosh desktop.

■ Your computer may have started up from a CD-ROM disc containing At Ease, an alternative to the Macintosh desktop. You need to have the Macintosh desktop on your screen before you can use any of the software installation instructions in this manual.

To return to the Macintosh desktop, choose Shut Down from the Special menu. When your computer is off, restart the computer, then press the Open/Close button of your CD-ROM drive to open the tray. Remove the CD-ROM disc. Close the tray. Then start up your computer again.

To avoid having the computer start up from a CD-ROM disc, remember to remove any disc in the drive before you shut down your computer.

You can't eject a floppy disk.

For instructions on ejecting any disk (a floppy disk, a CD-ROM disc, or a removable media disk), see the "Disks" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (❷) menu. If you can't eject a floppy disk in the usual way, by selecting the disk's icon and choosing Put Away from the File menu or by dragging the disk's icon to the Trash, 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.

Emergency ejection hole
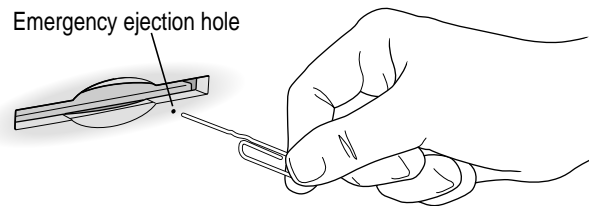
If none of these solutions works, take the computer or disk drive to your Apple-authorized service provider to have the disk removed.

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

```
┌─────────────────────────────────────────────┐
│  ✋   The application "Unknown" has          │
│       unexpectedly quit, because an error of │
│       type 1 occurred.                       │
│                              ┌─────────┐     │
│                              │   OK    │     │
│                              └─────────┘     │
└─────────────────────────────────────────────┘
```
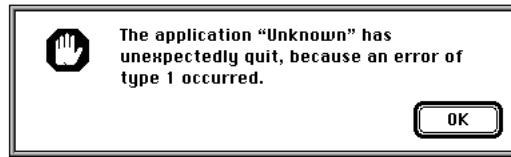
One of the following is probably the cause:

■ The computer ran out of memory.

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

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

■ The program needs more memory.

Use the program's Info window to give it more memory. For more information on increasing an application's memory, see the "Memory" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (⍰) menu.

■ Sometimes incompatible system extensions or control panels can cause software problems. Restart while holding down the Shift key to temporarily turn off all system extensions.

If your program works normally after you do this, use the Extensions Manager control panel (in the Control Panels folder, available in the Apple [] menu) to turn on individual extensions and control panels. Restart after you turn on each extension. This procedure should identify incompatible extensions and control panels. (If you just added new software to your computer, its system extension is the most probable cause of the problem.) For detailed instructions, see the information about managing system extensions in the "Customizing Your Computer" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (⍰) menu.

If your program performs better when a particular extension or control panel is turned off, contact the software's manufacturer for information or an upgrade.

A dialog box with a bomb appears.

```
┌────────────────────────────────────────────────────┐
│                                                    │
│   💣   Sorry, a system error occurred.              │
│                                                    │
│                                                    │
│                                   ┌──────────┐      │
│                                   │ Restart  │      │
│                                   └──────────┘      │
└────────────────────────────────────────────────────┘
```
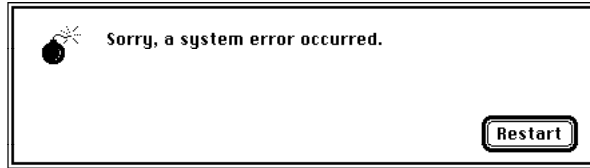
There is a software problem.

■ Write down what you were doing when the message appeared, and write down the text of the message.

■ Restart your computer. (See "Start Over by Restarting Your Computer" in the section "If You Have Trouble" earlier in this chapter.) Most software problems are temporary, and restarting usually corrects the problem.

■ If the problem recurs, 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 (as described in the next paragraph). Reinstalling the system software may correct the problem. See "Installing or Reinstalling System Software" later in this chapter to reinstall system software on your startup hard disk.

■ 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, use the Extensions Manager control panel (in the Control Panels folder, available in the Apple [] menu) to turn on extensions and control panels one at a time. Restart after you turn on each extension. This procedure should identify incompatible extensions and control panels. (If you just added new software to your computer, its system extension is the most probable cause of the problem.) For detailed instructions, see the information about managing system extensions in the "Customizing Your Computer" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide () menu.

If your computer performs better when a particular extension or control panel is turned off, contact the software's manufacturer for information or an upgrade.

- If the problem recurs, you may need to reinstall system software. See "Installing or Reinstalling System Software" later in this chapter to reinstall system software on your startup hard disk.

- If the problem only occurs in one application, try reinstalling the application from the original disks. If reinstalling doesn't solve the problem, contact the manufacturer of the application.

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

One of the following situations is probably the cause.

- There is a software problem. Try the following:

  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 computer. See "Start Over by Restarting Your Computer" in the section "If You Have Trouble" earlier in this chapter for instructions.

- Follow the suggestions in the previous section,"A Dialog Box With a Bomb Appears."

- The mouse or keyboard is not connected properly.

  IMPORTANT Do not connect or disconnect the mouse while the computer is turned on. You may damage your computer.

  Turn off the computer by pressing the Power key (marked with a ◁). Then press the Return key to shut down the computer, If that doesn't work, turn off the computer by pressing the standby power button (⏻) on the back of the computer. With the computer off, check that the mouse and keyboard cables are connected properly. 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 it.

   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 the computer off 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:

- 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).

- If the computer beeps every time you press a key, Easy Access is probably turned on. Open the Extensions Manager control panel in the Control Panels folder in the Apple (◼) menu. Click the checkmark next to Easy Access to remove the checkmark and to turn off Easy Access. Then restart your computer.

- The keyboard is not connected properly.

   Turn off the computer by pressing the standby power button (⏻) at the back of the computer. With the computer off, check that the keyboard cable is connected properly at both ends. Then start up the computer again.

- Some system software features are turned on that affect the way the keyboard works.

   Open Easy Access from the control panels listed under the Apple (◼) menu and turn off Sticky Keys, Slow Keys, and Mouse Keys.

- There is a software problem.

  Restart your Macintosh. For instructions, see "Start Over by Restarting Your Computer" in the section "If You Have Trouble" earlier in this chapter.

  Check the startup disk and application program you were using when the problem occurred. To check that the programs and the system extensions you're using are compatible with the system software, restart while holding down the Shift key; this temporarily turns off all system extensions. If your computer works normally after you do this, use the Extensions Manager control panel to turn on extensions and control panels one at a time. Restart after you turn on each extension. This procedure should identify incompatible extensions and control panels that may be causing the problem. (If you just added new software to your computer, its system extension is the most probable cause of the problem.) For detailed instructions, see the information about managing system extensions in the "Customizing Your Computer" topic area of Macintosh Guide (or Mac OS 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 to reinstall system software on your startup hard disk..

- 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 original keyboard.

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 open a document, or you see a message that an application program can't be found.

- Some documents can be opened by more than one application program. Try starting an application that you think might be able to open the document. Then choose Open from the application'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 your System Folder. Most of the files in your System Folder are used by your computer for internal purposes and are not intended to be opened.

- Rebuild your desktop. Follow the instructions in "Rebuild Your Desktop" in the section "If You Have Trouble" earlier in this chapter.

- If the document is from a DOS computer, use the PC Exchange control panel (in the Control Panels folder, available in the Apple [] menu) to specify which Macintosh program will open the document. For information about working with DOS documents on your Macintosh, see the information about DOS in Macintosh Guide (or Mac OS Guide), available in the Guide () menu.

Your computer won't restart, and a CD-ROM disc is in the CD-ROM drive.

- Your computer may be trying to start up from the CD-ROM disc. Press the Open/Close button of your CD-ROM drive to open the tray, and remove the CD-ROM disc. Close the tray, then restart your computer.

You experience problems using a document from a DOS computer.

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

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

■ Use the PC Exchange control panel (in the Control Panels folder, available in the Apple [🍎] menu) to specify which Macintosh application will open the document.

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

■ Your application may have special procedures for opening and saving documents with different file formats. See the information that came with your application, or call the application's publisher.

■ Try opening the document in another application.

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 on your Macintosh, see the information about using DOS in Macintosh Guide (or Mac OS Guide), available in the Guide (②) menu.

You see a message that your application can't be opened because a file can't be found.

Macintosh applications designed specifically for the PowerPC microprocessor (also called "native" applications) use special files called *shared libraries*. Any necessary shared libraries should be installed automatically when you install these special Macintosh applications.

Follow the directions that came with your application to reinstall the application. If the shared library is still missing, contact the software application's manufacturer for assistance.

You experience problems using an older Macintosh application.

Some older Macintosh applications are not completely compatible with
Macintosh computers that have the PowerPC microprocessor.

- Open the Memory control panel (in the Control Panels folder available in
  the Apple [] menu) and turn off Modern Memory Manager.

- If that doesn't work, contact the application's publisher to see if an upgrade
  is available.

**You plug headphones into your monitor, but still hear sound coming out of your
computer.**

- Plug your headphones into the headphone jack () on the front of the
  computer.

- If you want to keep the headphones connected to the monitor, manually
  turn down the subwoofer. Turn the knob in the subwoofer balance control
  port () counterclockwise to turn off the subwoofer volume. Remember to
  turn it back up the next time you want to hear the subwoofer.

You're listening through headphones, but the sound is odd.

You may have **SRS(●)** 3D Surround Sound turned on. To turn it off, open
the Monitors & Sound control panel, which can be found in the Apple ()
menu, and click the Sound icon. Then click the checkbox to remove the
checkmark next to "Enabled." 3D Surround Sound doesn't work well
through headphones.

**The subwoofer balance control () on the back of your computer is not affecting
the volume.**

The subwoofer balance control affects the subwoofer volume only when there
are external speakers plugged into the jack on the back of the computer, or
the computer's monitor has built-in speakers. Otherwise, the subwoofer
balance control () has no effect on your computer's overall volume. Adjust
your computer's volume with the sound controls on the front of the computer
or monitor, with the volume control sliders in the Monitors & Sound control
panel (in the Apple [] menu), or with the volume controls in AppleCD
Audio Player (if you're listening to an audio CD).

You can't record sound using an external microphone or the microphone built in to your monitor.

■ Any time you want to record sound using an external microphone, you need to make sure your sound input source is set to "External Microphone." Open the Monitors & Sound control panel in the Control Panels folder, available in the Apple (■) menu, click the Sound icon, and choose "External Microphone" from the Sound Input pop-up menu.

■ If you're using your monitor's built-in microphone to record, use the Monitors & Sound control panel to make the monitor's speakers mute. In the same control panel, make sure that the sound input is set to the monitor's built-in microphone.

For additional help, see the "Sound" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (②) menu in the upper-right corner of your screen.

Your screen displays a right-angle-bracket prompt (>).

If you inadvertently press the ⌘ key and the Power key (marked with a ◁) at the same time, you may see a right-angle-bracket prompt (>) on your screen. To return to the Macintosh desktop, type the letter G and press Return.

Solutions to CD-ROM problems

Problems using the optional CD-ROM drive

The CD-ROM drive icon does not appear on the screen.

■ If you have SCSI devices (anything connected to the SCSI port [⇔]) attached to your computer, make sure that each device has a unique SCSI ID number (your CD-ROM drive has SCSI ID 3). Refer to the documentation that came with your SCSI devices if you need to reset SCSI ID numbers.

■ If you reinstalled the CD-ROM software, make sure to restart your computer afterward.

- Make sure that the Apple CD-ROM extension is turned on in the Extensions Manager control panel. Open the Extensions Manager control panel in the Control Panels folder, available in the Apple (🍎) menu. Click to put a checkmark next to "Apple CD-ROM." Then restart your computer.

- If you installed a CD-ROM drive after you bought your computer, make sure the CD-ROM software that came with the drive is installed. See the manual that came with the CD-ROM drive for software installation instructions. (The CD-ROM software is already installed on Macintosh computers that come with CD-ROM drives.)

You've just ejected a CD, but the computer keeps asking you to reinsert it.

- The right way to eject a CD-ROM disc is either to select the CD-ROM disc and choose Put Away from the File menu or to drag the CD-ROM disc's icon to the trash. If you select the CD-ROM disc and choose Eject Disk from the Special menu, the computer keeps the CD-ROM disc in its memory and continually asks you to reinsert it. Reinsert the CD-ROM disc, then drag its icon to the Trash. (You won't lose information on the CD-ROM disc by dragging its icon to the Trash.)

Your computer starts up and you see large folder-shaped areas, containing labeled pictorial buttons, instead of the usual Macintosh desktop.

- Your computer may have started up from a CD-ROM disc containing At Ease, an alternative to the Macintosh desktop. You need to have the Macintosh desktop on your screen before you can use any of the software installation instructions in this manual.

  To return to the Macintosh desktop, choose Shut Down from the Special menu. After your computer has shut down, restart it. Then press the Open/Close button of your CD-ROM drive to open the tray. Remove the CD-ROM disc, close the tray, and start up your computer again.

To avoid having the computer start up from a CD-ROM disc, remember to remove any disc in the drive before you shut down your computer.

The tray of your CD-ROM drive won't open.

If a CD-ROM disc icon appears on your screen, use one of these methods:

- Select the disc icon on your screen and drag the icon to the Trash. You won't lose information on the CD-ROM disc by dragging its icon to the Trash.

- Select the disc icon and choose the Put Away command in the File menu.

- If the AppleCD Audio Player window is active, choose Eject CD from the File menu, or simultaneously press the ⌘ and E keys. (AppleCD Audio Player is an application that allows you to play audio CDs and control your CD-ROM drive; it's available in the Apple [] menu.)

  If you see a message that a disc can't be put away because it is being shared, turn off file sharing. Then try again to put away the disc.

If no CD-ROM disc icon appears on your screen, do this:

- Press the Open/Close button of your CD-ROM drive.

- If the tray still doesn't open, turn off your computer, then do the following: Locate the small pinhole to the lower right of the CD-ROM tray opening. Insert the end of a large straightened paper clip firmly and horizontally into the pinhole and push gently until the tray is released. Then carefully pull the tray open. Do not force the tray open; wait until the paper clip has released it or you may break the front of the tray.

> **WARNING** Turn off your computer before you attempt to eject the tray using a paper clip. If you don't, you may damage the CD-ROM drive.

If neither of these suggestions works, your CD-ROM drive may be damaged. Contact an Apple-authorized service provider or Apple for further assistance.

Your computer won't restart, and a CD-ROM disc is in the CD-ROM drive.

- Your computer may be trying to start up from the CD-ROM disc. Press the Open/Close button of your CD-ROM drive to open the tray, and remove the CD-ROM disc. Close the tray, then restart your computer.

You can't eject a CD-ROM disc by pushing the Open/Close button on the drive

- When a CD-ROM disc is mounted (there is a disc in the drive and its icon appears on your desktop), you must eject it by dragging its icon to the Trash or clicking its icon and choosing Put Away from the File menu.

Problems using CD-ROM discs

You insert a CD-ROM disc, but its icon doesn't appear on the Macintosh desktop.

- Make sure that the disc label is facing up and the disc is centered in the tray. If you are using a small (8 cm) disc, make sure your computer is as level as possible and the disc is centered within the inside ring on the tray.

- Make sure the tray is closed all the way.

- Try restarting your computer.

- Try starting your computer from the CD-ROM disc that contains system software while holding down the C key. (See the section "Starting Up From a CD-ROM Disc" later in this chapter). If only the hard disk icon appears on the desktop, then there may be a hardware problem with your CD-ROM drive. If the CD-ROM disc icon appears above the hard disk icon, reinstall your CD-ROM software. The easiest way to do this is by reinstalling your system software following the instructions later in this chapter, "Installing or Reinstalling System Software."

  CD-ROM software is already installed on Macintosh computers that come with CD-ROM drives. You can reinstall it by reinstalling your system software, following the instructions later in this chapter, "Installing or Reinstalling System Software."

- Make sure that the Apple CD-ROM extension is turned on in the Extensions Manager control panel. Open the Extensions Manager control panel in the Control Panels folder, available in the Apple (🍎) menu. Click to put a checkmark next to "Apple CD-ROM," then restart your computer.

- If you installed the CD-ROM drive after you bought your computer, make sure the CD-ROM software is installed. Refer to the documentation that came with the CD-ROM drive. (The CD-ROM software is already installed on Macintosh computers that come with CD-ROM drives.)

- If file sharing is on and you are having trouble ejecting a disc, turn file sharing off in the Sharing Setup control panel in the Control Panels folder, available through the Apple (🍎) menu.

Your computer displays the message "This is not a Macintosh disk: Do you want to initialize it?" when you insert a CD-ROM disc in the CD-ROM drive.

■ Make sure that the Foreign File Access and Audio CD Access CD-ROM extensions are installed and turned on. You can find them in your Extensions folder in the System Folder on your hard disk. If they are not turned on, use the Extensions Manager control panel in the Control Panels folder, available in the Apple ( ) menu to turn them on. (Click to put checkmarks beside them.) Then restart your computer.

■ Make sure the CD-ROM software is installed. (The CD-ROM software is already installed on Macintosh computers that come with CD-ROM drives.) If you installed a CD-ROM drive after buying your computer, see the manual that came with the drive.

■ The disc may use a format that the computer cannot recognize. Ask the disc's manufacturer for a disc that a Macintosh can recognize.

Your computer unexpectedly ejects a CD-ROM disc without giving you any error message.

■ Make sure the disc is flat in the tray and the disc label is facing up.

   IMPORTANT If you're using a small (8 cm) disc, make sure it's centered within the tray's inner ring and the computer is absolutely level. An improperly seated small disc in your computer may result in damage to the disc, the CD-ROM drive, or both.

■ The disc may need to be cleaned. (See "Handling CD-ROM Discs" in the section "Handling Your Computer Equipment" in Appendix A.) If there are visible scratches on the shiny side of the disc, you may be able to remove them with a CD-ROM disc polishing kit (available from your audio CD dealer). If the scratches can't be removed, you need to replace the disc.

■ The disc may be damaged. Try another disc in the drive, and try the original disc in another drive. If the original drive reads other discs or if the original disc also doesn't work in another drive, the disc is probably damaged. You need to replace it.

You can't open a document on a CD-ROM disc.

■ Try opening the application program first; then open the document.

■ Read the manual that came with your CD-ROM disc. Some discs come with software that you need to install on your computer's hard disk before using the CD-ROM disc.

You can't save changes you make to information on a CD-ROM disc.

■ A CD-ROM disc is a read-only medium. This means that information can be read (retrieved) from it, but not written (stored) on it. You can save the changed information on a hard disk or floppy disk.

Problems using ISO 9660 or High Sierra discs

You cannot access files on a CD-ROM disc that uses the ISO 9660 or High Sierra format.

■ Discs in the ISO 9660 and High Sierra disc formats have version numbers attached to file names. Some application programs need these version numbers in order to work with files. To make the version numbers available to applications on your computer, follow these instructions.

Drag the CD-ROM disc icon to the Trash. When the tray opens, hold down the Option key while you push the tray back in. Continue to hold down the Option key until the disc icon reappears on the screen, then release the Option key. The application you are using should now be able to locate file names on that CD-ROM disc.

■ Make sure that Foreign File Access, ISO 9660 File Access, and High Sierra File Access are present in the Extensions folder in your System Folder on your hard disk.

Problems playing audio CDs

You don't hear any sound when you play an audio CD using the AppleCD Audio Player.

- If you have headphones or speakers connected to the computer, adjust the connectors to make sure they are firmly connected. Make sure the volume control on your headphones or speakers is not turned down too low.

- If you do not have headphones or speakers connected to the computer, make sure that nothing else is plugged into the sound output port (◀)) on the back of your computer.

- If you are trying to play an audio CD over a network, you won't be able to hear it. Play audio CDs in your computer's CD-ROM drive.

- Make sure the volume is turned up in the AppleCD Audio Player. With the Audio Player open, drag the volume control slider up, use the volume controls on your computer, or press the Up arrow key on your keyboard.

- The CD may have been paused. Click the Play/Pause button in the AppleCD Audio Player once or twice.

- If your CD-ROM drive was installed after you bought your computer, make sure the audio cable is properly connected. See the documentation that came with the CD-ROM drive.

While playing an audio track on a CD-ROM disc that combines audio tracks and data, you double-click the disc icon and the audio track stops playing.

- You can't open data files on a CD-ROM disc and listen to audio tracks on that disc at the same time.

You are unable to record sound from an audio CD.

- Check your computer's sound input port to see if a microphone or other device is connected.

- You may need to reset the sound options in the Monitors & Sound control panel. Refer to the "Sound" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (⍰) menu.

You insert an audio CD-ROM disc and it begins playing immediately.

- Your computer is set to automatically begin playing audio CDs when they are inserted. To turn off this feature, use the QuickTime Settings control panel available under the Apple [] menu to change the automatic play setting.

Problems using Photo CDs

You insert a Photo CD disc, but its icon doesn't appear on the desktop.

■ Reinstall the CD-ROM and QuickTime software. The easiest way to do this is by reinstalling your system software, following the instructions later in this chapter in "Installing or Reinstalling System Software."

Your computer does not display color icons for individual images on a Photo CD.

■ Your computer may be low on memory. To view color icons, restart your computer and then reopen the Photos folder. See the "Memory" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (❷) menu, for more information on managing memory.

After you open an image file on a Photo CD, the image is scrambled, colors are displayed incorrectly, or no image appears in the window.

■ The application you are using may not be designed to work with large (high-resolution) image files. You can open the image with another application or you can assign more memory to the application. (See the "Memory" topic area of Macintosh Guide [or Mac OS Guide], available in the Guide [❷] menu, for more information on managing memory.)

After you open an image on a Photo CD, your system is "frozen" and does not respond to any input, or you have a "bomb" message on your screen.

■ Restart your computer. (If you need help restarting your computer, see "Start Over by Restarting Your Computer" in the section "If You Have Trouble" at the beginning of this chapter.) The application you are using may not be designed to work with large (high-resolution) image files. You can open the image with another application or you can assign more memory to the application. See the "Memory" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (❷) menu, for more information on managing memory.

If your computer's performance decreases

If you notice a decrease in your computer's speed and general performance after you install special software (a control panel, system extension, or custom utility), it may be because the software is not compatible with Macintosh computers built with the PowerPC microprocessor.

■ To find out if a system extension or control panel is the problem, hold down the Shift key while you restart the computer. This temporarily turns off control panels and extensions. If the computer performs better without these software items, one of them is likely to be the problem. (If you just added new software, its system extension, control panel, or custom utility is potentially the cause of the problem.)

To find out which software is the problem, use the Extensions Manager control panel (in the Control Panels folder, available in the Apple [] menu) to turn off a system extension or set of extensions and then restart your computer. (If you just added new software to your computer, its system extension is the most probable cause of the problem.) For detailed instructions, see the information about managing system extensions in the "Customizing Your Computer" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide () menu. If the computer performs better when an extension is turned off, contact the extension's manufacturer for information or an upgrade.

■ Use the Memory control panel to turn off virtual memory. For more information on virtual memory, see the "Memory" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide () menu.

If you still do not notice an improvement, you may want to reinstall system software on your startup hard disk. See the instructions later in this chapter in "Installing or Reinstalling System Software."

If you typically use several application programs at the same time, your computer's performance will increase if you install more RAM (random-access memory). See Appendix B, "Installing Expansion Cards or Additional Memory."

Troubleshooting 3D acceleration

The performance advantage of any 3D accelerator varies depending on the type of scene being rendered. You may find that some applications show the benefits of acceleration more than others.

3D rendering does not appear to be accelerated.

Check the following items:

- Make sure that your monitor resolution is set to 640 x 480 at 16 bit (thousands of colors). Refer to the *Technical Information* booklet for modes that support 3D acceleration. (Note: 3D acceleration is not enabled in 8-bit [256 color] mode.

- Make sure that your application uses QuickDraw 3D. Some older 3D applications don't use QuickDraw 3D for rendering, and cannot be accelerated.

- If the control strip is overlapping or touching the 3D window, hide the control strip or move the window.

- Some applications allow you to turn hardware acceleration on or off. Check your application's documentation to be sure that hardware acceleration is turned on.

- Check that the following files are in the Extensions folder, which is in the System Folder:

  - ATI 3D Accelerator

  - ATI Graphics Accelerator

  - ATI Video Memory Manager

Your 3D application appears to have performance problems.

- Turn off virtual memory.

Apple Computer recommends turning off virtual memory whenever you use 3D applications.

When you try to start an application that uses QuickDraw 3D you get the message, "The application 'application name' could not be launched because QuickDraw 3D could not be found."

■ Make sure that the following files are in the Extensions folder, inside the System Folder:

  ■ QuickDraw 3D

  ■ QuickDraw 3D RAVE

  ■ QuickDraw 3D Viewer

  ■ QuickDraw 3D IR

If the files are there and you still get the message, it means that you don't have enough memory to run the application. You may be able to open the application if you try one or more of the following:

■ Quit other open applications.

■ Reduce the amount of memory allocated to the application. Follow these steps:

1 **Select the application's icon in the Finder.**

2 **Choose Get Info from the File menu.**

3 **Type a lower number in the boxes for Minimum Size and Preferred Size.**

■ Install more memory (RAM).

Solving printer problems

The following suggestions should work for all printers. (*Note:* Also refer to the manual that came with the printer.)

■ Make sure that the printer driver for your printer is turned on in the Extensions Manager control panel (in the Control Panels folder, available in the Apple [] menu). To find out the name of the printer driver—for example, *LaserWriter*—refer to the documentation that came with your printer. The printer driver should appear in the Extensions list and have a checkmark beside it. (Click to put a checkmark beside it, and then restart your computer.)

■ Check your printer settings in the Chooser (available in the Apple [] menu), making sure you have selected the correct printer. If you are using a printer that is shared by other computer users (a printer on a local network), make sure that AppleTalk (in the lower-right corner of the Chooser) is active. If you are using your own printer (a serial printer connected to your computer), make sure that AppleTalk is inactive.

■ Turn off the computer and printer and check the printer cable connections.

■ If none of these suggestions solves the problem, you may need to reinstall the printer driver that came with your printer. Refer to the manual that came with your printer.

Note: If you have an Apple printer, you need to determine which printer driver to reinstall—the one that came on a floppy disk with your printer or the driver that comes on the system software CD-ROM disc (both drivers must have identical names). You should install the driver that has the most recent date. You can see the date of a driver file by inserting its disk and choosing to view its contents by Name (select "by Name" from the View menu). To install the printer driver from the CD-ROM disc, drag it to the System Folder on your hard disk and then click OK. To install the printer driver that came on a floppy disk with your printer, refer to the manuals that came with the printer for instructions.

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 the CD-ROM disc containing system software that came with the computer.

To start up the computer using the CD-ROM disc, either use a control panel to set the CD-ROM drive as your startup drive, or follow these steps:

1 Turn your computer on.

2 Immediately press the Open/Close button on your CD-ROM drive, quickly insert the CD-ROM disc containing system software into the drive, and close the tray.

3 Immediately press 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 into the drive 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 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. Usually, you start up using the built-in CD-ROM drive (if you have one). However, if you can't use the CD-ROM drive for some reason, you can also start up the computer from the floppy drive using the *Disk Tools* floppy disk. (Note that the *Disk Tools* floppy disk is created from files that are on the CD-ROM disc that contains system software—if you cannot use your CD-ROM drive, you'll need to find another Macintosh with a CD-ROM drive that you can use.)

Disk Tools is available as a disk image file on the CD-ROM disc that contains system software. (A disk image file is a file that contains a compressed version of a floppy disk's contents.) To create a *Disk Tools* floppy disk, insert the CD-ROM disc that contains system software and a floppy disk, then double-click the *Disk Tools* disk image file on the CD-ROM disc. This launches an application called Disk Copy that carries out the process of creating the floppy disk from the disk image file. Refer to the Disk Copy Read Me file for more information about using Disk Copy.

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

1   **Shut down or turn off your computer.**

2   **Insert the *Disk Tools* floppy disk into the disk drive.**

3   **Restart or turn on the computer.**

Testing and repairing a damaged 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 and neither of the two previous suggestions help, start up with a different startup disk. (See the previous section, "Starting Up From a CD-ROM Disc.")

  If, after you start up from a different disk, your hard disk's icon appears on your desktop, reinstall system software on the hard disk. (See the instructions later in this chapter in "Installing or Reinstalling System Software.")

- Check the ID numbers of all SCSI equipment (anything connected to the SCSI port [⇔]) on your computer. Each device must have a unique ID number. The computer itself (the main logic board inside it) has the ID number 7, the internal CD-ROM drive (if you have one) has the ID number 3, and the optional internal Zip drive has the ID number 5. The ID numbers 0, 1, 2, 4, and 6 are available for additional SCSI devices.

  Also check that the chain of devices is terminated properly. For information on setting SCSI ID numbers and terminating a SCSI chain, see both the manuals that came with your SCSI equipment and Chapter 3 of this manual.

- If none of these suggestions solves the problem, test the disk by following the instructions given in "Checking for Damage on Your Hard Disk," next.

Checking for damage on your hard disk

You can test a hard disk for damage with the Drive Setup application, which is on the CD-ROM disc that contains system software, and came with your computer.

1   Start up your computer from the CD-ROM disc that contains system software.

See "Starting Up From a CD-ROM Disc" earlier in this chapter.

2   Double-click the Drive Setup icon.

You may need to look in a folder called Disk Tools to find Drive Setup.

Drive Setup

3   In the List of Drives, click the disk you want to test.

Volume Name(s)	Type	Bus	ID	LUN
Macintosh HD	IDE	0	0	0
Karlina's	SCSI	0	4	0

This disk can be initialized.

Initialize...
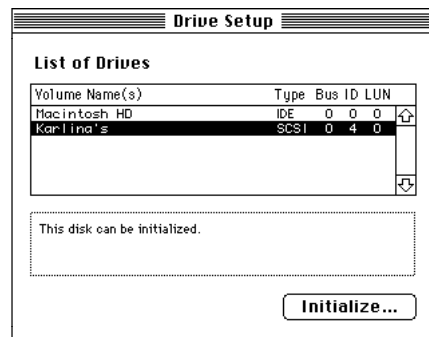
4   From the Functions menu, choose Test Disk.

5   When a message tells you that the 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 application (see the instructions that are next in this section), or you may need to reinitialize the disk (see "Initializing a Hard Disk" later in this chapter). Consult an Apple-authorized service provider for assistance if necessary. If you had a hard disk from another manufacturer installed after you bought your computer, use the software that came with the disk or contact the disk manufacturer to get the latest version of software.

How to repair a hard disk or floppy disk

You can repair some types of disk damage by using the Disk First Aid application, which is on the CD-ROM disc that contains system software, that came with your computer.

1   Start up your computer from the CD-ROM disc that contains system software.

See "Starting Up From a CD-ROM Disc" earlier in this chapter.

2   Double-click the Disk First Aid icon.

You may need to look in a folder called Disk Tools 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.
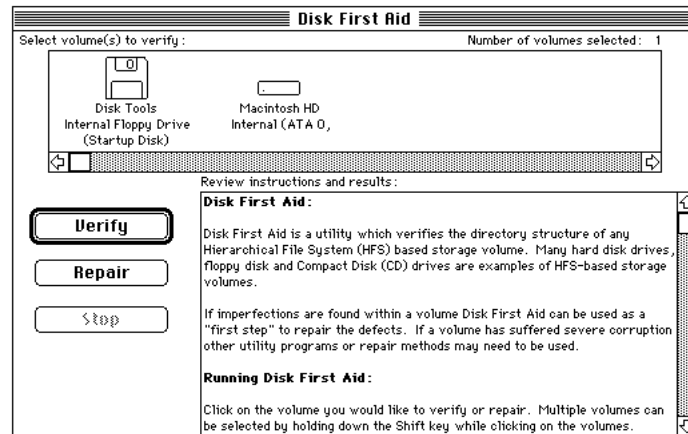
4 **Click Repair to begin testing and repairing the disk.**

You can't repair the startup disk or the disk that contains the Disk First Aid application, but you can test these disks by clicking Verify. If the application 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 done, 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 application. Some disk repair applications let you recover information from a damaged disk.

■ Consult an Apple-authorized service provider for help.

■ If you can't repair the disk, you'll need to reinitialize it, which erases all the information on it. Before you reinitialize, be sure you recover all the information you can and back it up. Then erase (reinitialize) the disk. For instructions on reinitializing a floppy disk (that is, preparing it for use), see the "Disks" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (⍰) menu. For instructions on reinitializing a hard disk, see the next section, "Initializing a Hard 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). Bring the CD-ROM disc that contains system software which you received with your computer, with you to the service provider.

Initializing a hard disk

The hard disk inside your computer was initialized (formatted for use) at the factory, so you shouldn't need to initialize it. You need to initialize a hard disk only if one of the following is true:

■ You purchase an uninitialized hard disk from another manufacturer.

■ Your hard disk is damaged and can't be repaired.

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

You initialize your internal hard disk using an application called Drive Setup, which is on the CD-ROM disc that contains system software and came with your computer.

> **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" earlier in this chapter.

1   Start up your computer from 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 Drive Setup icon.

You may need to look in a folder called Disk Tools to find Drive Setup.

Drive Setup

3   In the List of Drives, click the disk you want to initialize.

To initialize a disk, you click it to select it...

...then click Initialize.
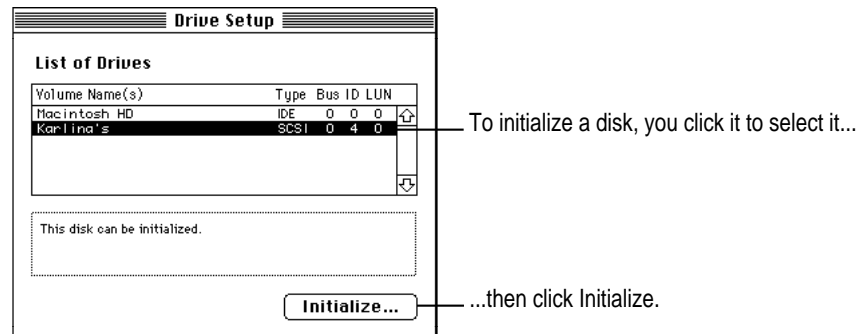
4   Click Initialize to initialize the hard disk.

5   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.

Installing or reinstalling system software

System software is the set of applications and other files that your computer uses to start itself up, keep track of your files, and run the application applications you use. System software is kept in 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, though another hard disk, a floppy disk, or a compact disc (CD) 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 computer came with all the necessary system software installed on its internal hard disk. 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, you need to install system software. Follow the instructions in "Installing System Software" later in this section.

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 "How to Repair a Hard Disk or Floppy 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 "Installing System Software," next, 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 hard disk icon appears when you start up, see "Initializing a Hard Disk" earlier in this chapter for instructions on doing that.

To do a normal installation, follow these steps:

1   Start up your computer from the CD-ROM disc that contains system software (or from the *Disk Tools* disk, if your computer does not have a CD-ROM drive).

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

2   Find and open the Disk First Aid icon.

You may need to look in a folder called Disk Tools 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   Open the Drive Setup application.

You use the Drive Setup application to update your hard disk.

5   In the list of drives, click your startup disk.

6   Choose Update Driver from the Functions menu.

7   When the update process is finished, quit Drive Setup.

8   Shut down your computer.

9   Start up your computer from the CD-ROM disc that contains system software (or from the *Disk Tools* disk, if your computer does not have a CD-ROM drive).

See "Starting Up From a CD-ROM Disc" or "Starting Up From a Floppy 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 application.

10   Click Continue.

The Easy Install dialog box appears.

```
═════════════════ System 7.5.5 Installation ═══════════════
┌──────────────────────┐                      ┌──────────┐
│ Easy Install      ▼ │                      │   Help   │
└──────────────────────┘                      └──────────┘

  Click the Install button to update to System Software version
  7.5.5 on the selected disk. This installation will include all of the
  updated System Software for this Macintosh.



─Destination Disk──────────────────────      ┌──────────┐
                      ┌────────────┐          │   Quit   │
     ┌────┐           │ Eject Disk │          └──────────┘
     └────┘           └────────────┘          ┌──────────┐
    Hard Disk         │ Switch Disk│          │ Install  │
                      └────────────┘          └──────────┘
```

11   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.

12 Click Install.

13 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.

14 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.)

IMPORTANT If your computer has an internal Zip drive, you must also install the Zip drive software from the system software CD-ROM disc. It is not installed by the main System Software Installer.

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 application. If you notice that a certain extension or application was not installed, install it separately by dragging it to your hard disk. You can find these additional extensions and applications on the CD-ROM disc that contains system software. (System extensions or application programs from other manufacturers can be reinstalled from their installation disks.) 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

This section outlines what is commonly called a "clean" installation of system software. A clean installation allows you to discover which item in your System Folder is causing a problem. A clean installation creates a brand new System Folder and saves everything in your original System Folder in a different location. You can then follow the instructions in "Replacing Your Special Software" later in this section to reinstall system extensions, control panels, and other special software one at a time from the old System Folder to the new System Folder. This procedure allows you to determine which item in the old System Folder was the source of the problem.

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.

To do a clean installation, follow these steps:

1   Start up your computer from the CD-ROM disc that contains system software .

See "Starting Up From a CD-ROM Disc" earlier in this chapter.

2   Find and open the Disk First Aid icon.

You may need to look in a folder called Disk Tools 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   Open the Drive Setup icon.

You use the Drive Setup application to update your hard disk.

5   In the list of drives, click your startup disk.

6   Choose Update Driver from the Functions menu.

7   When the update process is finished, quit Drive Setup.

8   Shut down your computer.

9   Start up your computer from the CD-ROM disc that contains system software.

See "Starting Up From a CD-ROM Disc" 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 application.

10   Click Continue.

The Easy Install dialog box appears.

```
═══════════════ System 7.5.5 Installation ═══════════════

 Easy Install      ▼                              Help

 ┌─────────────────────────────────────────────────────┐
 │ Click the Install button to update to System Software version │
 │ 7.5.5 on the selected disk. This installation will include all of the │
 │ updated System Software for this Macintosh.          │
 │                                                      │
 │                                                      │
 └─────────────────────────────────────────────────────┘

 ┌Destination Disk──────────────────────────┐
 │                    Eject Disk        Quit │
 │   ▭                                       │
 │ Hard Disk          Switch Disk      Install │
 └───────────────────────────────────────────┘
```
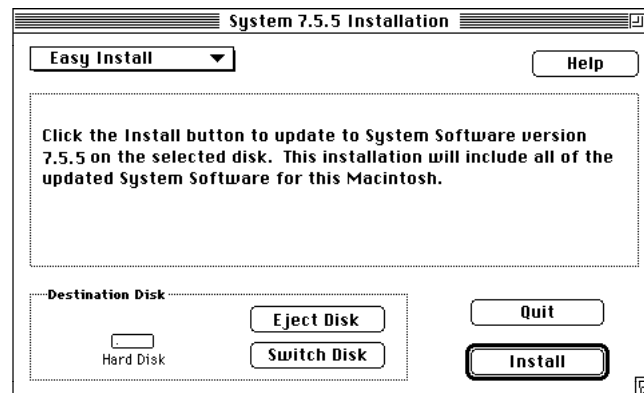
11   Make sure that the hard disk named in the Destination Disk box is the one on which you want to install system software.

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

12 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   ]
```

13 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.

14 Click Clean Install.

15 Follow the instructions that appear on the screen.

It takes a few minutes to complete the installation.

16 When the installation is complete you see a message reporting that the installation was successful.

If a Restart button appears, click it to restart your computer.

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

IMPORTANT Certain system extensions or application programs that were originally on your hard disk may not be installed with the Installer application. If you notice that a certain extension or application was not installed, install it separately by dragging it to your hard disk. You can find these additional extensions and applications on the CD-ROM disc or the set of floppy disks that contains system software. (System extensions or application programs from other manufacturers can be reinstalled from their installation disks.) 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 for assistance.

Reinstalling your special software

Special software consists of items such as control panels, system extensions, custom utilities, fonts, or Apple menu items that you may have added to your old System Folder. To make sure that special software does not create any conflicts with other applications on your computer, follow this procedure to safely add back these items in your new System Folder:

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.**

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 **Start up your computer from the CD-ROM disc that contains system software.**

See "Starting Up From a CD-ROM Disc" earlier in this chapter.

2   **Click OK.**

The Easy Install dialog box appears.

```
┌────────────────── System 7.5.5 Installation ──────────────────┐
│  ┌─────────────────┐                            ┌──────────┐   │
│  │ Easy Install  ▼ │                            │   Help   │   │
│  └─────────────────┘                            └──────────┘   │
│  ┌─────────────────────────────────────────────────────────┐  │
│  │ Click the Install button to place System Software        │  │
│  │ version 7.5.5 on the selected disk. This installation    │  │
│  │ will include all of the recommended System Software      │  │
│  │ for this Macintosh.                                      │  │
│  │                                                          │  │
│  └─────────────────────────────────────────────────────────┘  │
│  ┌Destination Disk─────────────────┐   ┌──────────┐            │
│  │              ┌──────────────┐   │   │   Quit   │            │
│  │   ┌────┐     │  Eject Disk  │   │   └──────────┘            │
│  │   │    │     └──────────────┘   │   ┌──────────────┐        │
│  │  Hard Disk   ┌──────────────┐   │   │ Clean Install│        │
│  │              │  Switch Disk │   │   └──────────────┘        │
│  └─────────────────────────────────┘                          │
└───────────────────────────────────────────────────────────────┘
```
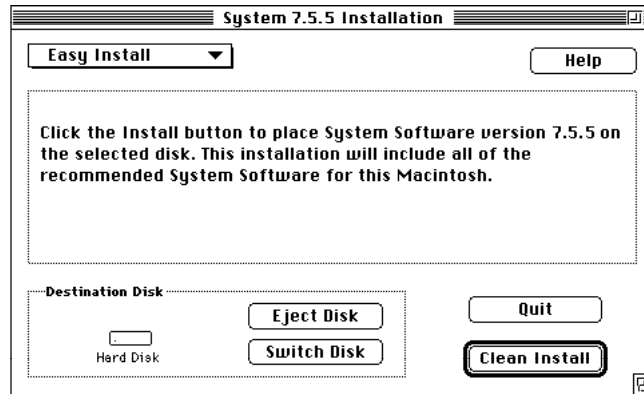
3   **Choose Custom Install from the pop-up menu at the upper-left corner of the dialog box.**

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

```
┌────────────────── System 7.5.5 Installation ──────────────────┐
│  ┌─────────────────┐                            ┌──────────┐   │
│  │ Custom Install ▼│                            │   Help   │   │
│  └─────────────────┘                            └──────────┘   │
│  Check features to be installed                                │
│  ▷ ☐ System Software                              ⓘ           │
│  ▷ ☐ Printing                                     ⓘ           │
│  ▷ ☐ Networking Software                          ⓘ           │
│  ▷ ☐ Utility Software                             ⓘ           │
│  ▷ ☐ Multimedia Software                          ⓘ           │
│  ▷ ☐ Compatibility Software                       ⓘ           │
│  ▷ ☐ Fonts                                        ⓘ           │
│  ▷ ☐ Apple Menu Items                             ⓘ           │
│     Disk space available: 38,259K      Selected size: zero K   │
│  ┌Destination Disk─────────────────┐   ┌──────────┐            │
│  │              ┌──────────────┐   │   │   Quit   │            │
│  │   ┌────┐     │  Eject Disk  │   │   └──────────┘            │
│  │   │    │     └──────────────┘   │   ┌──────────────┐        │
│  │  Hard Disk   ┌──────────────┐   │   │   Install    │        │
│  │              │  Switch Disk │   │   └──────────────┘        │
│  └─────────────────────────────────┘                          │
└───────────────────────────────────────────────────────────────┘
```
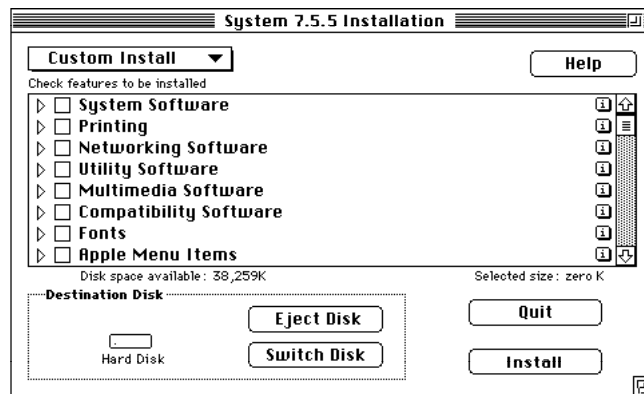
4   **Scroll through the list of components, clicking the checkbox next to each component you want to install.**

To get additional information about each component listed, 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. Don't forget to eject the CD-ROM disc containing system software when you are finished.

Installing or reinstalling CD-ROM software

CD-ROM software is a set of applications and files that allows your CD-ROM drive to work correctly with your computer and allows it to play different kinds of CDs, such as Photo CDs or audio CDs. The CD-ROM software is part of system software and was preinstalled for you on your computer's hard disk. (It is also available on the CD-ROM disc that came with your Macintosh.)

When should you install or reinstall CD-ROM software?

You don't need to install the CD-ROM software unless you encounter problems. (See "Solutions to CD-ROM Problems" earlier in this chapter for descriptions of the kinds of problems you might encounter.)

Installing or reinstalling CD-ROM software

1 **Start up your computer from the CD-ROM disc that contains system software**

See "Starting Up From a CD-ROM Disc" earlier in this chapter.

The Installer's Welcome screen may appear. If not, you may have to double-click the System Software Installer icon to open the Installer application.

2 **Click OK.**

The Easy Install dialog box appears.

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

```
═══════════════════ System 7.5.5 ══════
 ┌─────────────────────────┐
 │ ✓Easy Install           │
 │  Custom Install         │..........
 │  Custom Remove          │
 └─────────────────────────┘
```

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

```
═══════ System 7.5.5 Installation ═══════
┌──────────────────┐            ┌──────────┐
│ Custom Install ▼ │            │   Help   │
└──────────────────┘            └──────────┘
Check features to be installed
 ▷ ☐ System Software              ⓘ⇧
 ▷ ☐ Printing                     ⓘ≣
 ▷ ☐ Networking Software          ⓘ
 ▷ ☐ Utility Software             ⓘ
 ▷ ☐ Multimedia Software          ⓘ
 ▷ ☐ Compatibility Software       ⓘ
 ▷ ☐ Fonts                        ⓘ
 ▷ ☐ Apple Menu Items             ⓘ⇩
  Disk space available: 38,259K   Selected size : zero K
┌─Destination Disk────────────────────────
│                   ┌──────────┐  ┌──────────┐
│                   │Eject Disk│  │   Quit   │
│   ┌──┐            └──────────┘  └──────────┘
│   └──┘            ┌──────────┐  ┌──────────┐
│   Hard Disk       │Switch Disk│ │ Install  │
└───────────────────└──────────┘  └──────────┘
```
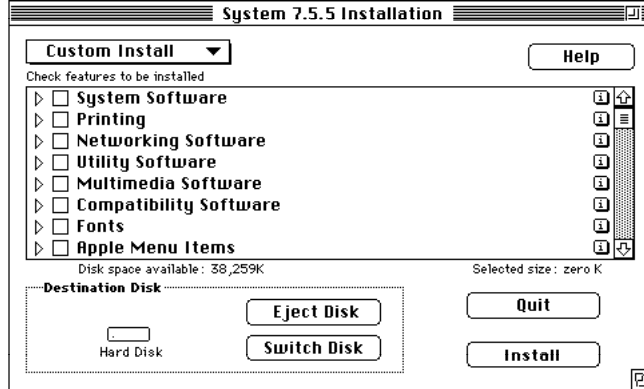
4 **Select Multimedia Software by clicking the checkbox next to it.**

To get additional information about each component listed, 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 CD-ROM software is reinstalled and your computer is ready to use. Don't forget to eject the CD-ROM disc containing system software when you are finished.

part

III
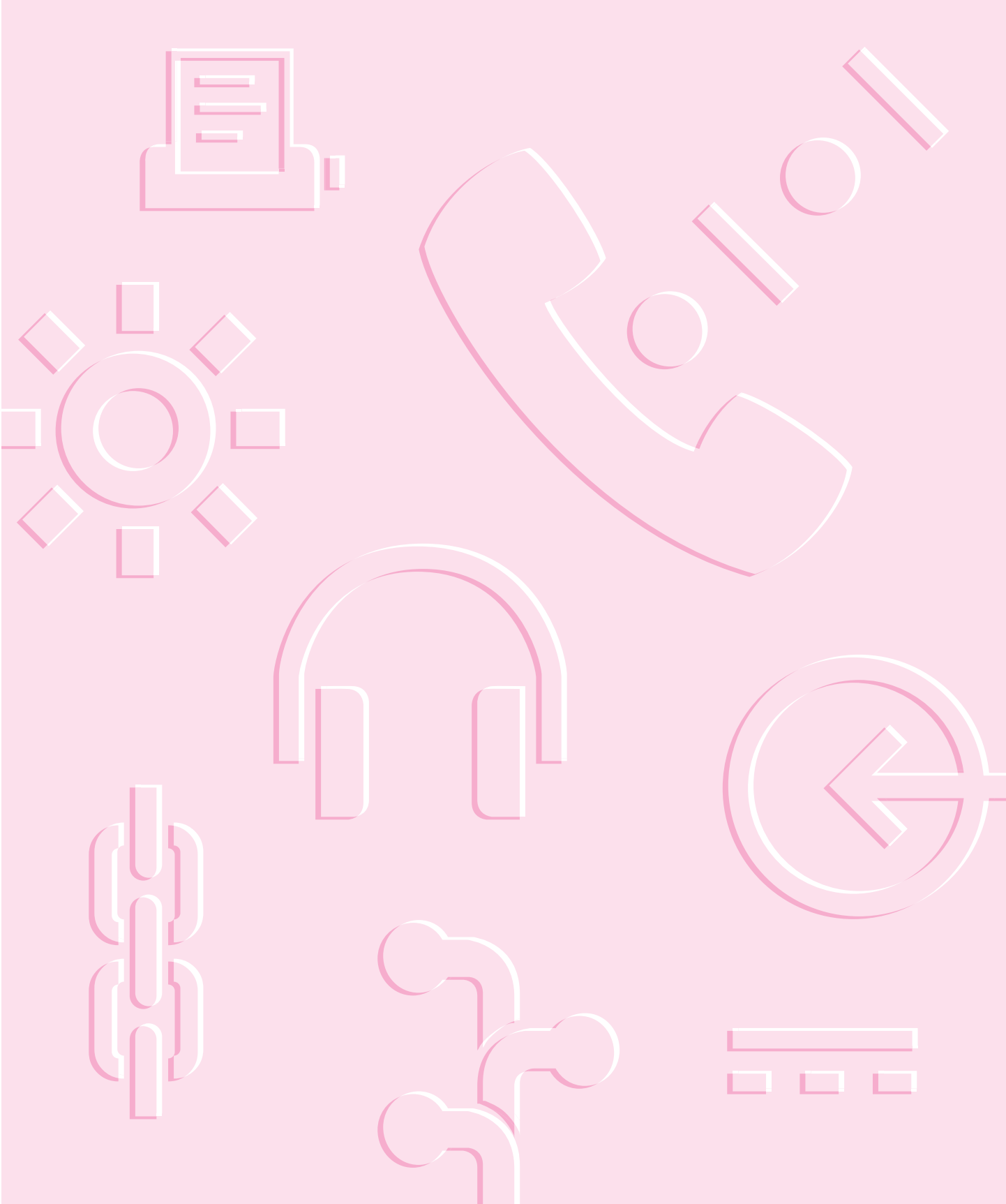
Read this appendix for important
health and safety instructions,
as well as tips on keeping your
computer in good working order.

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 work space 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 computer to minimize glare and reflections on the screen from overhead lights and windows.

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
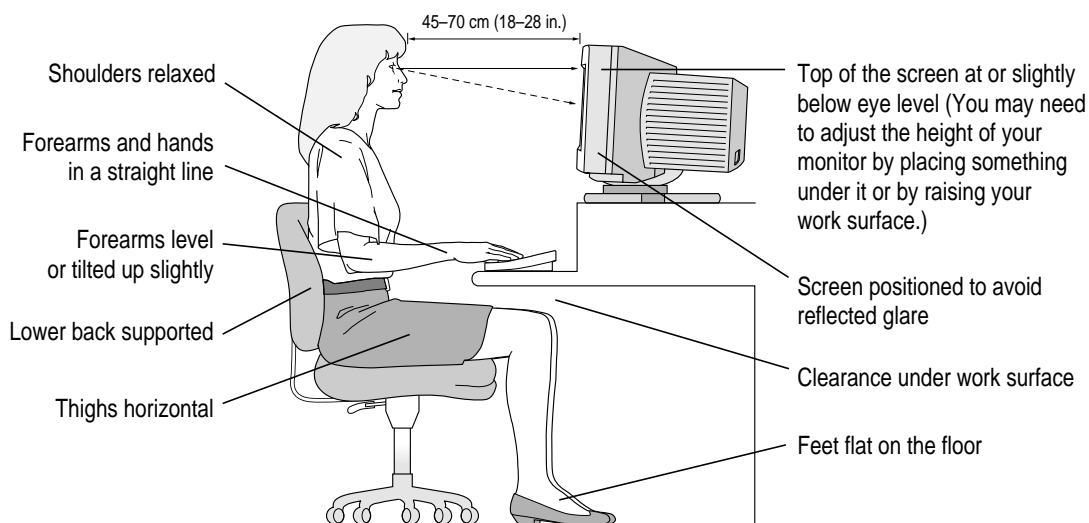
Avoiding fatigue

■ 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 workspace 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 exist:

- 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 washbasins, 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 the 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 the Energy Save control panel, available in Control Panels under the Apple [] menu to set computer sleep and energy-saving options.)

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 the vents on the computer are clear and unobstructed.

■ 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, turn off your computer, 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 your Apple-authorized service provider for repair.

■ If you spill liquid that is greasy, sweet, or sticky, unplug the keyboard and take it to your 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.
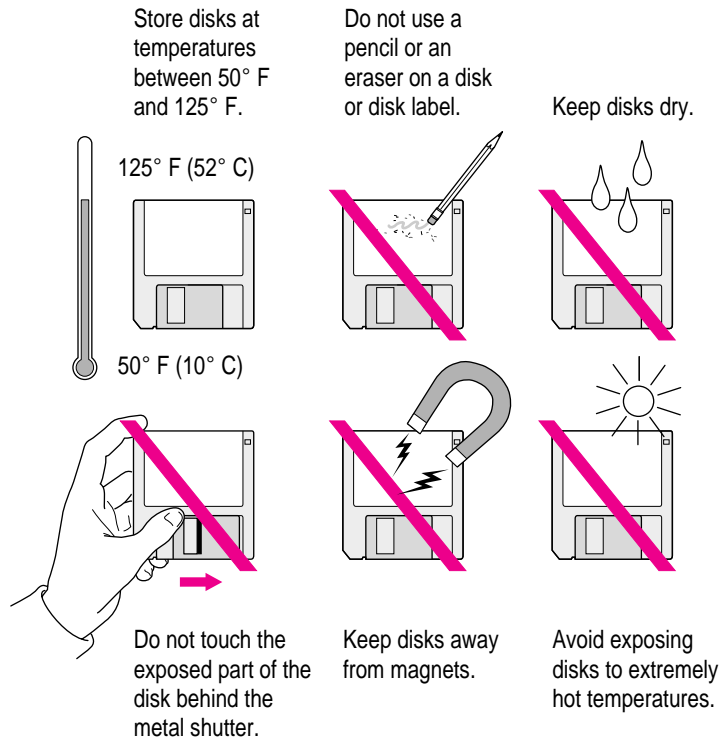
Handling CD-ROM discs

Keep these important safety instructions in mind as you use CD-ROM discs:

- Hold a disc by the edges or by one edge and the center hole. Do not touch
  the disc surface.

- To clean discs, wipe the shiny surface with a soft damp cloth, working in
  straight lines from center to edge. Do not use any form of cleaning agent.

■ To avoid damage to your discs, keep these points in mind:
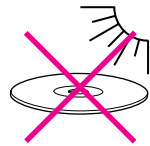
Do not expose discs to direct sunlight.
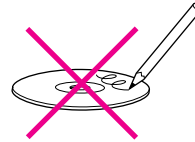
Do not write on discs.
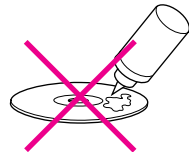
Do not spill liquids on discs.
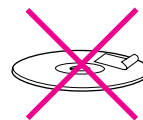
Do not put tape on discs.
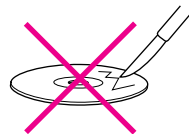
Do not scratch discs.

Do not get dust on discs.

Other important safety instructions to keep in mind as you use your CD-ROM drive:

■ Position your computer so that when the tray opens, it doesn't bump into anything.

■ Do not leave the disc tray open. If dust gets on the lens of the CD-ROM drive, the drive may have problems reading your compact discs.

■ Do not put anything (for instance, a cup) on top of the tray when it is open.

■ Do not force the tray open by hand.

■ Do not wipe the lens with a paper towel or other abrasive surface. If you need to clean the lens, see an Apple-authorized service provider for a lens cleaner.

■ Never transport your computer with a disc inside the CD-ROM drive.

■ Keep your computer equipment away from any source of liquid (such as wash basins, bathtubs, and shower stalls). If you drink coffee or other beverages while you're at your computer, take care not to spill.

■ Avoid exposing your equipment to damp or wet weather. If your system is near a window, be sure the window is closed in rainy weather.

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.

WARNING: To protect the power supply from damage, make sure the voltage switch on the back of the computer is set correctly before you plug the computer into a power outlet. Refer to Chapter 1 for instructions on setting the voltage switch.

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 cord. (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.
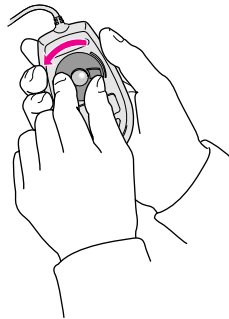
If the mouse is locked, see the next section, "Locking and Unlocking the Mouse," for instructions on how to unlock it.

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.
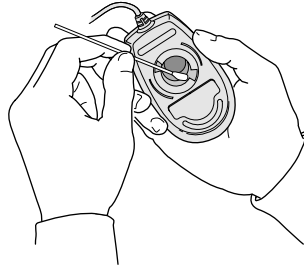
5 **Wipe the mouse ball with a clean, soft, dry, and lint-free cloth.**

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

Some mouse devices can be locked so that 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.)
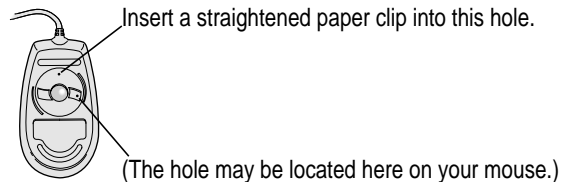
2   Press down on the paper clip while you turn the ring clockwise.
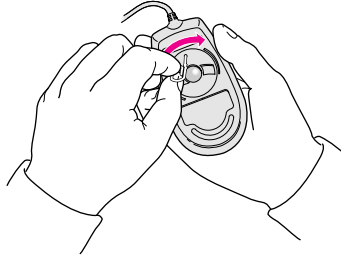
Turn the ring a very short distance, until it stops. When the recessed area on the ring is *not* lined up with the recessed area surrounding the ring, the mouse is locked.
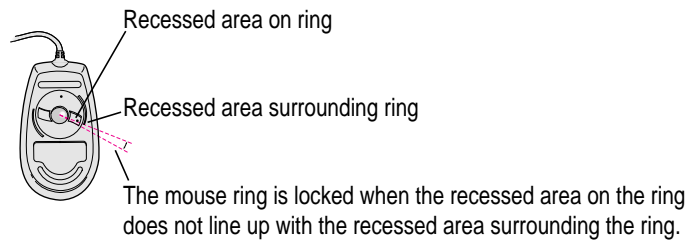
Recessed area on ring

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.)
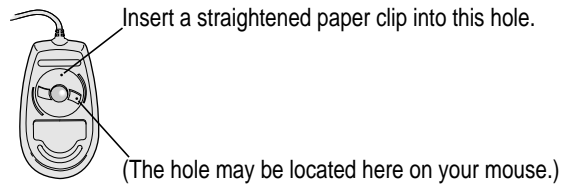
2   **Press down on the paper clip while you turn the ring counterclockwise.**
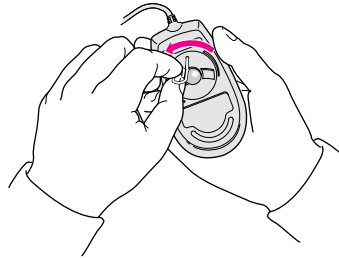
Turn the ring a very short distance. When the recessed area on the ring is lined up with the recessed area surrounding the ring, the mouse is unlocked.

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.
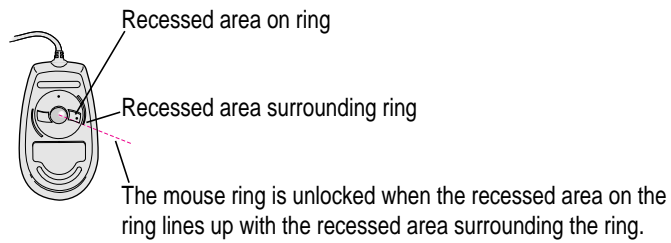
Read this appendix for instructions
on installing expansion cards or
additional memory in your computer.

Appendix B
Installing Expansion Cards or Additional Memory

This appendix provides information about expansion cards and memory modules (including an optional High Performance Module, also known as a level 2 cache) and explains how to install them.

Installing an expansion card or memory involves three procedures that are described in this appendix:

■ opening the computer

■ inserting the expansion card or memory module into a specific slot

■ closing the computer

About expansion cards

Expansion cards are printed circuit boards that can be installed in your computer to give it special features, such as enhanced video capabilities, networking and communications capabilities, and additional processing power. Your computer has slots available for three different kinds of expansion cards:

■ two PCI (peripheral component interconnect) slots for 6.88-inch PCI cards

■ a communication slot for an internal modem or Ethernet card (You may already have a card installed in this slot.)

■ a video-in slot for a video input card that brings signals into the computer from a videocassette recorder (VCR), laser disc player, video camera, or similar device (The video input card is sold by your Apple-authorized dealer under the name *Apple Video System.*)

Communication slot

PCI slots (2)

Video-in slot
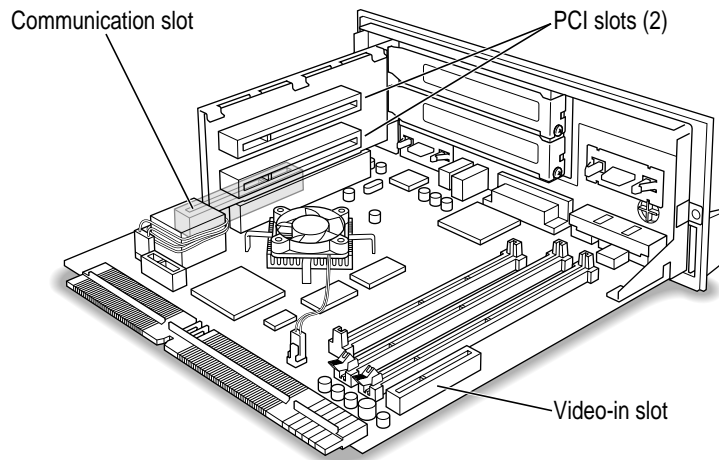
You can also install the following additional expansion cards in your computer:

■ the Apple External Video Connector kit that allows video mirroring on an external monitor

■ a TV or TV/FM tuner card that allows you to watch and to record TV and videos and to listen to FM radio on your computer (TV and TV/FM tuner cards you can install include the Apple TV/FM Radio System and the Apple TV System.)

Other video cards that let you perform video editing and other functions may also be available for your computer.

This appendix contains instructions for installing a PCI card or a communication card. To install a video input card or a TV or TV/FM tuner card, follow the instructions that came with the kit or card.

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 your 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.

About memory

You can install additional memory—dynamic random-access memory (DRAM)—in your computer. DRAM allows you to work with more programs and larger documents. Additional memory comes in packages called Dual Inline Memory Modules, or DIMMs. Altogether, you can install a maximum of 128 megabytes (MB) of DRAM in this Macintosh model. For additional processing power, you can also install an optional High Performance Module (256K level 2 cache) in the cache slot in your computer.

For more information about memory, see the "Memory" topic area of Macintosh Guide (or Mac OS Guide), available in the Guide (2) menu.

Apple recommends that you have an Apple-certified technician install additional DRAM for you. However, you may feel comfortable installing DRAM yourself.

- If you want to install additional DRAM yourself, you must purchase the memory chips, or DIMMs, from an Apple-authorized dealer. Then follow the instructions in this appendix.

- If you want an Apple-certified technician to install additional DRAM for you, see 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.

Cache slot for installing a High Performance Module for additional processing power. (You may have a module installed already.)

DRAM DIMM slots (2) for installing additional DRAM. (You may have an additional DRAM DIMM installed already.)
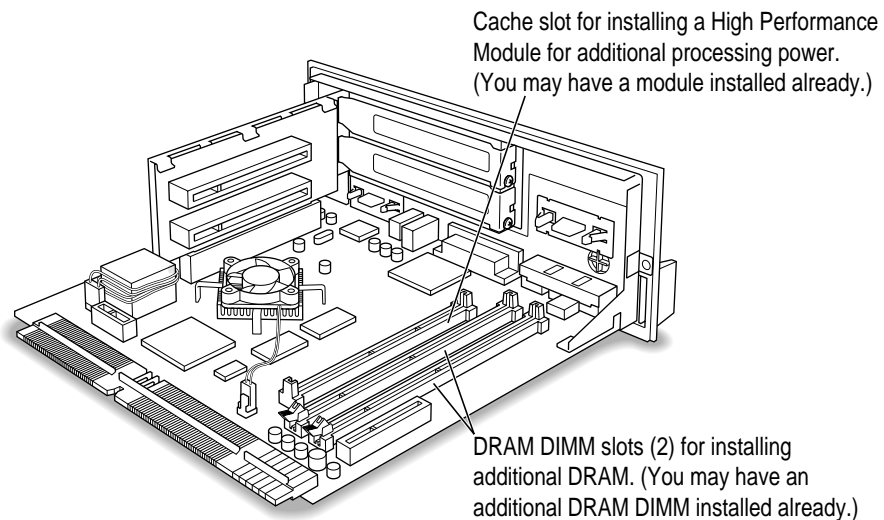
DRAM configurations

Your computer can use any DRAM configuration with DIMMs of these sizes: 8 MB, 16 MB, 32 MB, or 64 MB. The exact configuration depends on the density of the DRAM chips that are mounted on the DIMMs. (The DIMMs must support a 1K or 2K refresh count.)

Your computer comes with 32 megabytes (MB) of dynamic random-access memory (DRAM) preinstalled in one of the Dual Inline Memory Module (DIMM) sockets. One DIMM slot remains for installing an additional 8 MB, 16 MB, 32 MB, or 64 MB DIMM. If you want to install the maximum amount of memory, you need to replace the preinstalled 32 MB DIMM with a 64 MB DIMM, then install a second 64 MB DIMM in the remaining slot, for a total of 128 MB of DRAM.

IMPORTANT The DIMMs should be 64-bit wide, 168-pin 5-volt (V) Extended Data Output (EDO) DIMMs, with 60-nanosecond (ns) RAM access time or faster and a 1K or 2K refresh count. The Single Inline Memory Modules (SIMMs) from older Macintosh computers are not compatible with your computer and should not be used. 3.3-V DIMMs and DIMMs that require a 4K refresh count also should not be used

If you decide to have additional DRAM installed in your computer, the DIMMs can be installed one at a time in any order in either of the memory slots.

Instructions for installing DIMMs are in the section "Installing DIMMs or a High Performance Module" later in this appendix.

High Performance Module configurations

A High Performance Module (256K level 2 cache) provides an overall increase in your computer's performance. Although the computer's processor speed stays the same when you install a High Performance Module (see your *Technical Information* booklet for the exact speed), your computer performs tasks significantly faster. If your computer did not come with one already installed, you can add a High Performance Module on the main logic board.

IMPORTANT Be sure to use a 50 Mhz High Performance Module designed specifically for your computer. The 40 Mhz modules used in other Macintosh computers will not work in your computer.

Instructions for installing a High Performance Module are in the section "Installing DIMMs or a High Performance Module" later in this appendix.

Opening the computer

IMPORTANT To avoid generating static electricity from your body that may damage components, do not walk around the room until you have completed the installation of the expansion card and closed the computer. Additionally, move the logic board as little as possible while it is outside the computer case.

1 Shut down your computer by choosing Shut Down from the Special menu.

You can also press the Power key (marked with a ◁) on the keyboard, then press the Return key when the Shutdown dialog box appears.

2 Unplug all the cables except the power cord from the computer (including the cable that connects your keyboard to the computer).

Leaving the power cord plugged in helps protect the computer from electrostatic discharge damage. (You'll unplug the power cord later.)

3 With a screwdriver, remove the two screws shown here from the computer's back panel.

Remove these two screws.

Do not remove this screw.

Leave the power cord plugged in for now. You'll unplug it later.
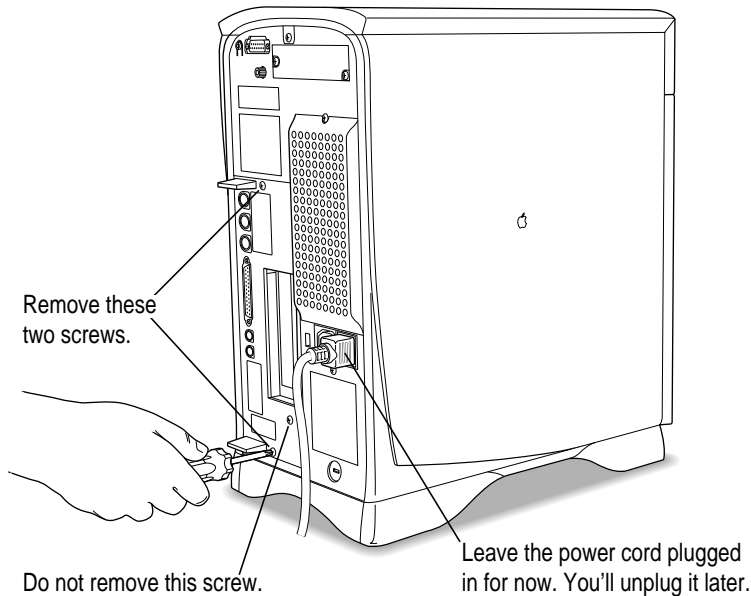
4 **Touch the recessed metal parts in the back panel to discharge static electricity from your body.**

Always do this before you touch any parts or install any components inside the computer. This discharges static electricity from your body and helps protect components inside the computer.

Touch the metal parts inside the recessed area.
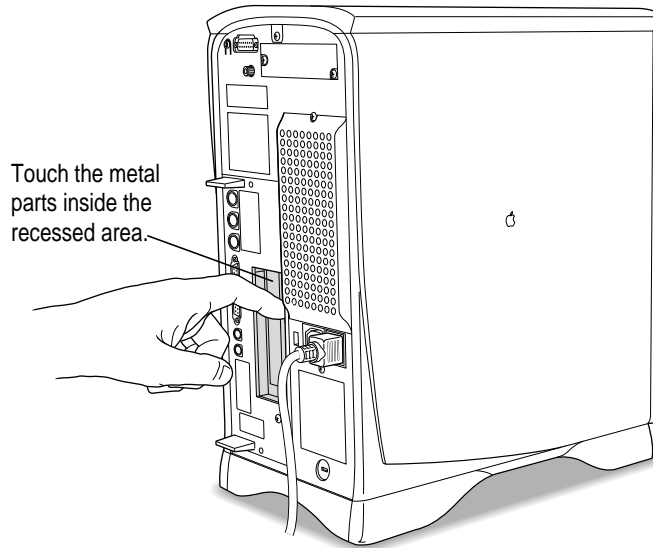
5   **Unplug the power cord from your computer.**

You can unplug the power cord now because you discharged static electricity
in the previous step.

Unplug the power
cord from the back
of the computer.
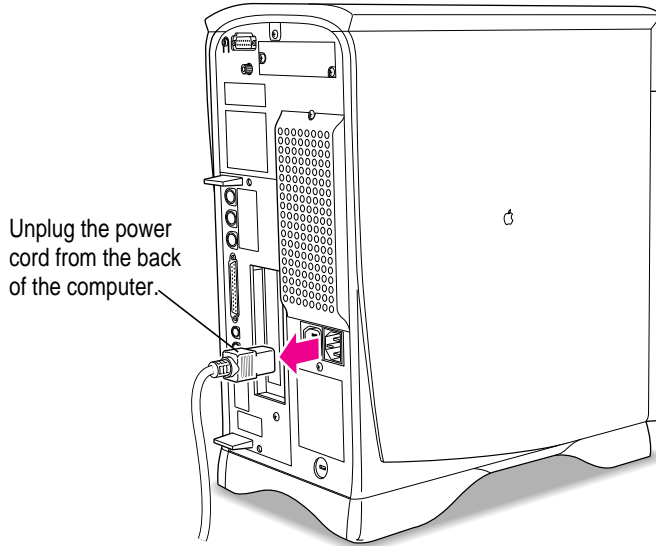
6   **Grasping the two plastic tabs, gently pull the logic board all the way out of the computer.**

Gently but firmly
pull the logic board
all the way out of
the computer.
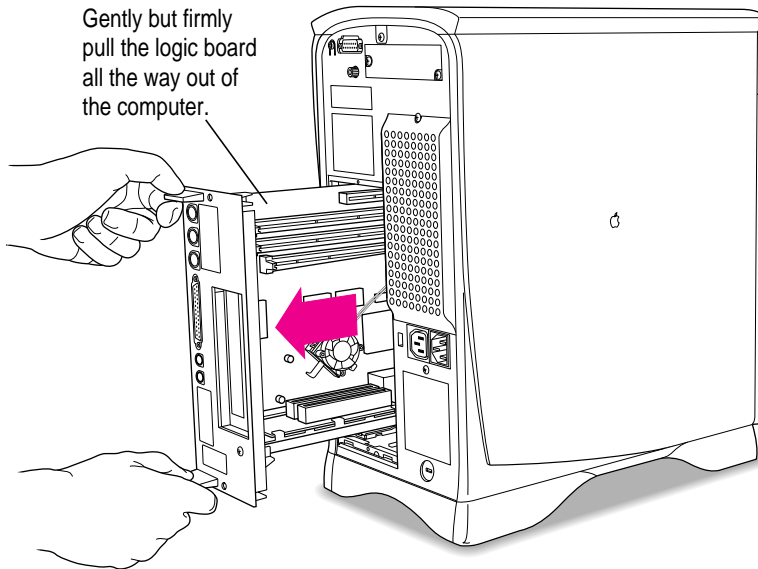
7 **Once the logic board is out, set it on a clean, flat, stable surface. Rest the end of it on a thick magazine or a thin book to protect the components underneath.**

Rest the logic board on a clean, flat, stable surface. Place a thick magazine under this end of the logic board to help protect the components underneath.
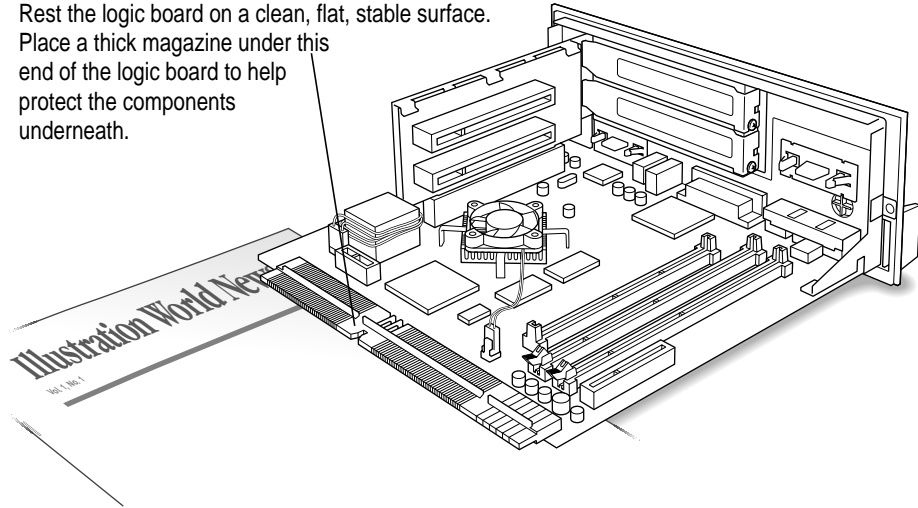
What you do next depends on whether you're installing an expansion card, memory, or a High Performance Module. Skip ahead to the the instructions that describe the installation you want to perform later in this appendix.

Installing an expansion card

This section contains instructions for installing a peripheral component interconnect (PCI) card or a communication card. (To install a video input card or a TV or TV/FM tuner card, follow the instructions that came with the card.)

Installing a PCI card

This section contains instructions for installing a PCI card. PCI cards for your computer must be no longer than 6.88 inches.

Use these instructions in conjunction with the instructions that come with your PCI card:

1 **If you have a video input card already installed in your computer and you're going to install a PCI card in the lower PCI slot, remove the video input card temporarily to give yourself more room while you install the PCI card. Remove the screw from the vertical plate that holds the video input card in place and remove the card as shown. (You'll reinstall the card later.)**

Skip this step if there is not a video input card installed on your logic board or if you're installing the PCI card in the uppermost PCI slot.

Video input card

If you have a video input card installed, you may need to remove it to give yourself room to install a PCI card in the lower PCI slot.

Video-in slot

Screw

Vertical plate
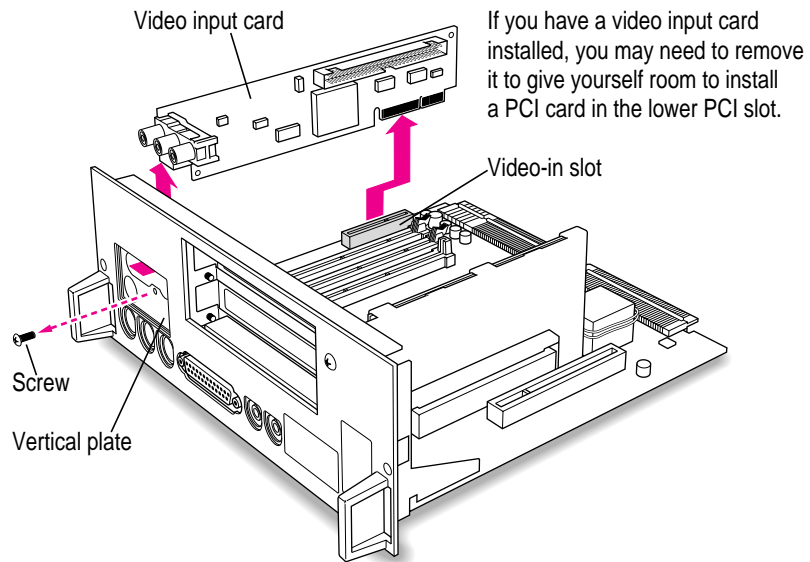
2 **Remove the screw that holds the port cover in place. Hold your finger under the screw to catch it and the port cover when they come loose.**

Try not to let the port cover or the screw fall onto the logic board.

Remove the screw that holds the port cover in place.
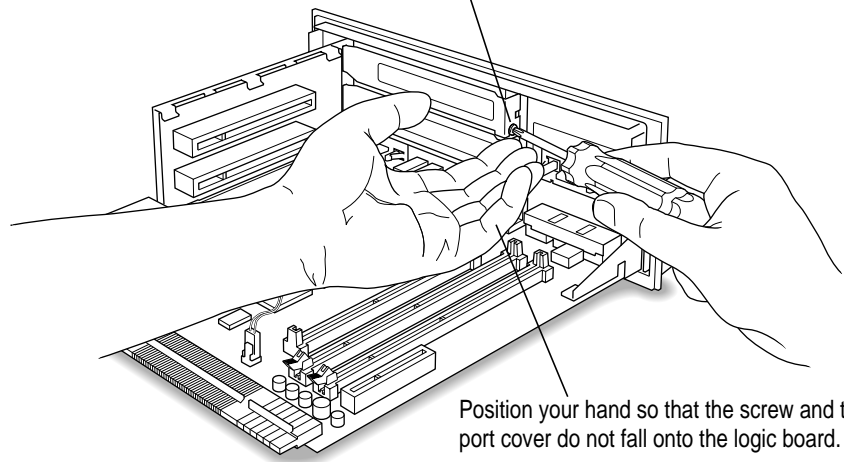
Position your hand so that the screw and the
port cover do not fall onto the logic board.

3 **Remove the port cover and set it aside.**

You won't need the port cover for the rest of these instructions, but save it in
case you ever remove the PCI card and need to cover the port again.

Remove the port cover.
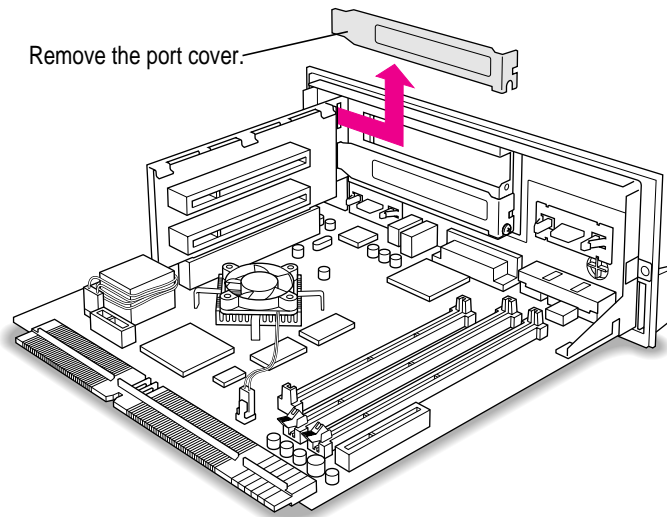
4 Remove the PCI card from its static-proof bag.

Hold the card by its upper edges to avoid touching any connectors.

Connectors
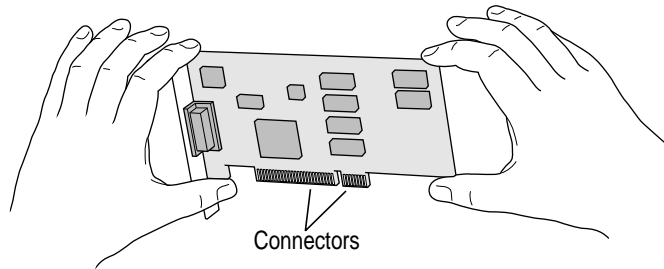
5 Supporting the adapter fence with one hand, insert the card into the PCI slot so that the card fence matches up with the opening where the port cover was and slides through the slot in the adapter fence.

PCI slot   Slot in adapter fence   Card fence
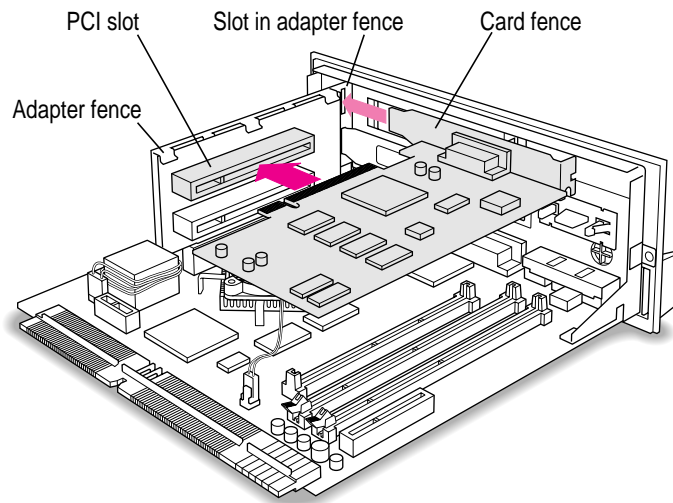
Adapter fence

6 **Supporting the adapter fence with one hand, push the card with the other hand until it snaps into 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, make sure its metal fence is flush with the side of the adapter fence.

Card fence

Adapter fence
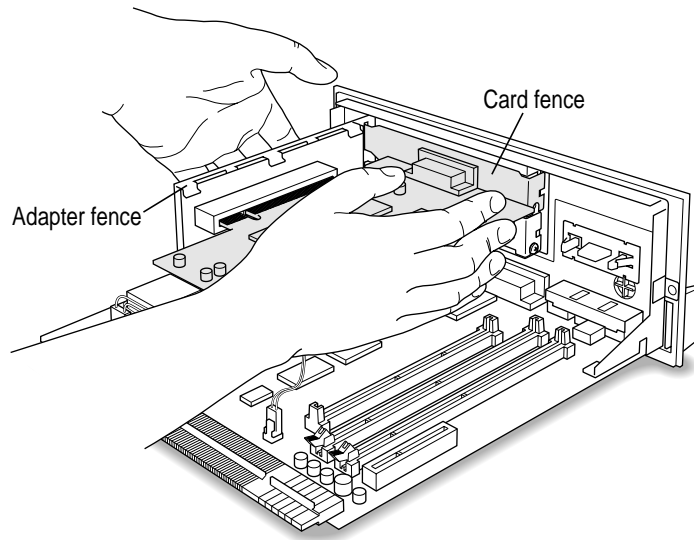
7 **Reinsert the screw into the PCI card fence and tighten it.**

To help insert the screw, push the PCI card fence forward with your thumb so the screw holes align. Insert the screw until it's somewhat steady, hold your thumb underneath it (to prevent it from falling), and tighten it with the screwdriver.

You may find it helpful to support the screw with the thumb of your other hand.
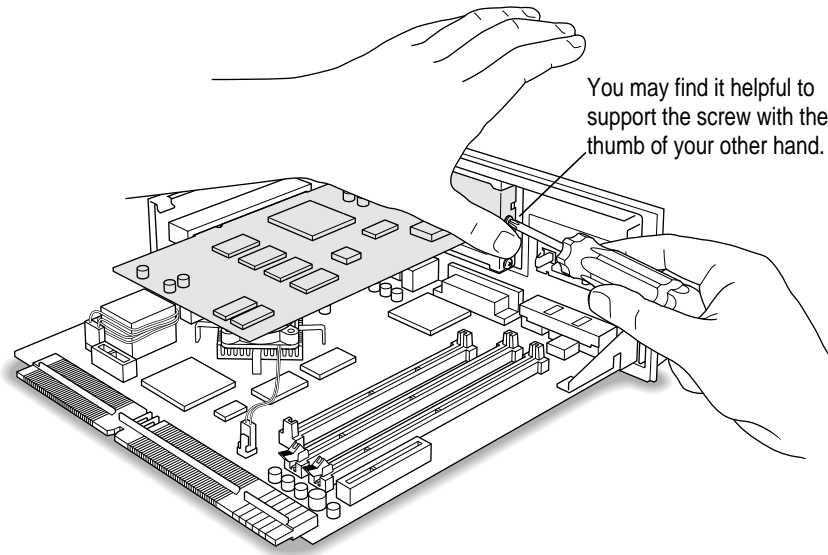
8 **If you removed a video input card from the logic board in step 1, reinsert it now in the video-in slot.**

Video input card

If you removed a video input card in step 1, reinstall it.

Video-in slot

Screw
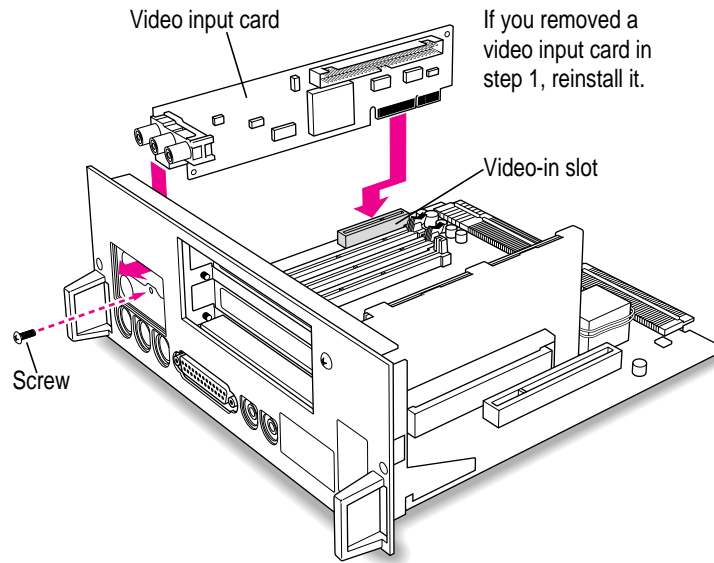
9 **If you have a communication card, DIMMs, or a High Performance Module to install, go to the instructions for those installations later in this appendix. If you are finished installing items in your computer, proceed to "Closing the Computer."**

Installing a communication card

This section contains instructions for installing an Ethernet or internal modem card in the communication slot in your computer. You use an Ethernet card to communicate with other computers through a local area network (LAN). For example, you can print on a shared printer and access documents on a server (a centralized computer that provides shared resources to other computers on a network). You use an internal modem card to connect to online services or the Internet.

Note: If you install an internal modem card in the communication slot and also want to connect to an Ethernet network, buy and install the kind of Ethernet card that goes in your computer's PCI slot, then follow the instructions in "Installing a PCI Card" earlier in this section.

Some communication cards designed for other communication slots are not compatible with your computer and cannot be installed here. You can tell by examining the placement of the notches on the card. Use the following illustration as a guide if you're not sure you have the correct type of card for the slot.
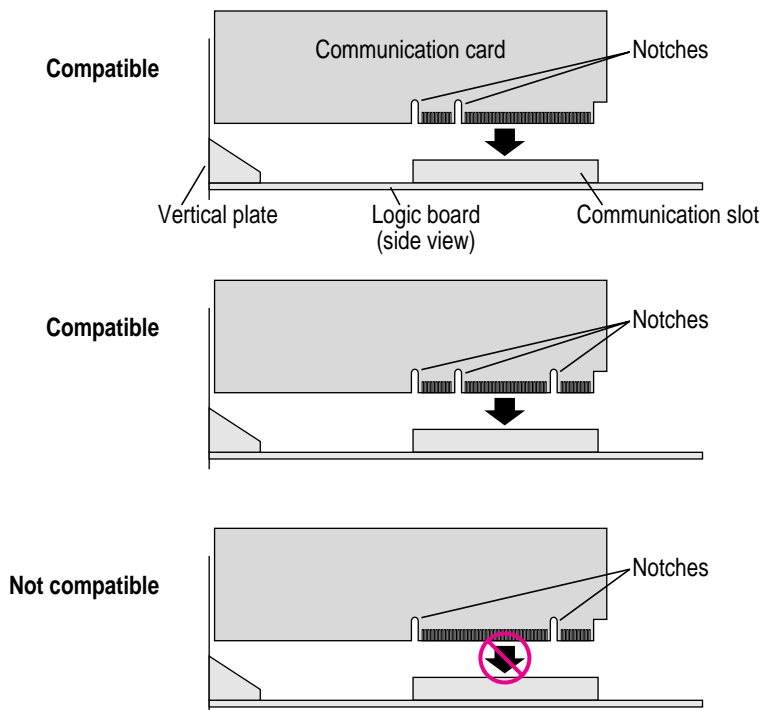
To install a communication card, follow these steps:

1   **Remove the plastic access cover from the vertical plate.**

Save the access cover—if you ever remove the communication card from your computer, you'll need to cover the open port again.

Push the two plastic tabs apart and pull off the metal retainer so the access cover can come off.

Metal retainer
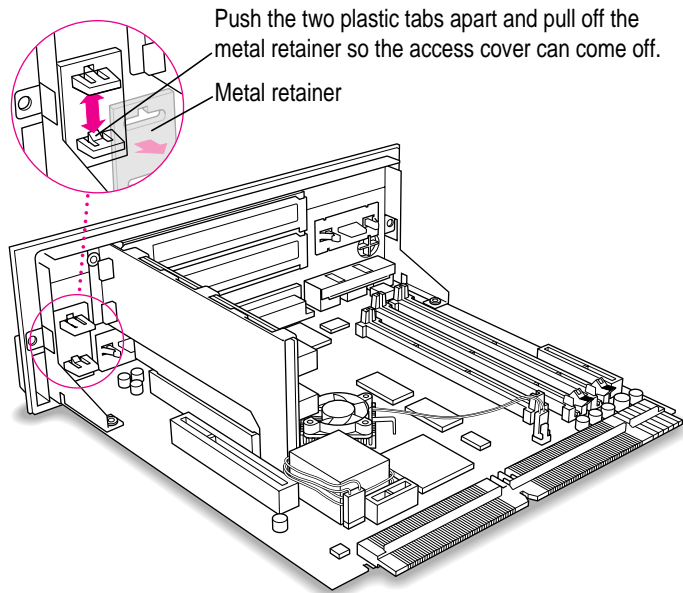
2   **Remove the communication card from its static-proof bag.**

Hold the card by its upper edges to avoid touching its connectors.

3   **Align the card over the communication slot.**

The communication slot is the rightmost slot on the logic board as you face
the vertical plate.

4   **Check the external connector on your card, see which of the following two illustrations
matches the card you have, and install the card according to the illustration.**

■ If the card has a hook, make sure it catches between the layers of the
vertical plate before you push the card into the slot. Press down on the card
until the connector is solidly in place.

Don't force the card. If you meet resistance, pull it out and try again.

1 If your communication card
has a hook on it (as shown here),
be sure that the hook engages
the sheet metal on the inside
of the vertical plate.

2 Push down on the back
end of the communication
card until it is firmly seated
in the communication slot.

Communication card

Communication slot

Vertical plate

External connector
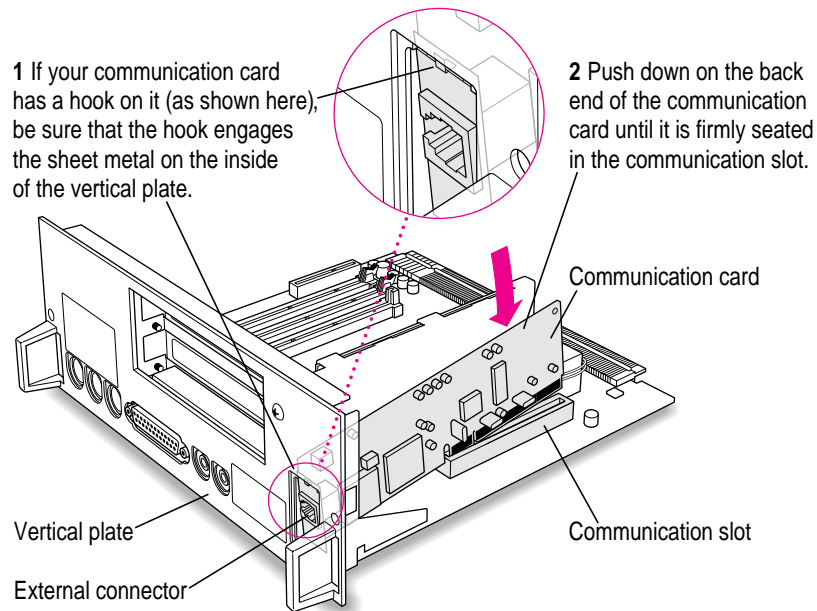
■ If the card does not have a hook, simply pass the external connector through the opening in the vertical plate as shown. (Some cards have an external connector that protrudes through the opening; others, like the one shown here, have a flatter external connector.) Insert the card into the communication slot. Press down on the card until the connector is solidly in place.

Don't force the card. If you meet resistance, pull it out and try again.

External connector   Communication card

Vertical plate   Communication slot

Opening in vertical plate
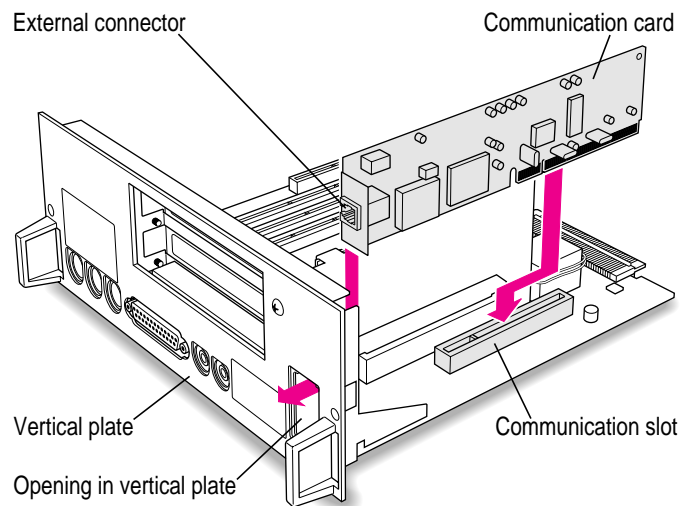
5   To see if the card is properly connected, lift it gently. If it resists and stays in place, it's connected.

Note: After you have finished these installation instructions and turned on your computer, you may need to install software for your communication card. If you installed an Ethernet card, you may also need to change the network connection in the AppleTalk control panel. See both the manual that came with the card and Chapter 7, "Connecting Your Computer to a Network" for more information.

6   If you have DIMMs or a High Performance Module to install, go to those instructions next in this appendix. If you are finished installing items, proceed to "Closing the Computer."

Installing DIMMs or a High Performance Module (level 2 cache)

There are specific types of DIMMS and High Performance Modules that work in your computer. Refer to the information provided earlier in this appendix and to the *Technical Information* booklet that came with your computer for information about the kinds of DIMMs and High Performance Module you can use in your computer model.

WARNING Although instructions for installing DRAM DIMMs and a High Performance Module (level 2 cache) are provided in this manual, Apple Computer strongly recommends that you have an Apple-certified technician install them. 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 install additional DIMMs yourself, you risk damaging your equipment, and this damage is not 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.

Removing a DRAM DIMM

To upgrade your computer to the maximum amount of memory, you may want to replace the DRAM DIMM that comes preinstalled in your computer with one of a higher capacity. To do this, you'll need to remove the existing DIMM following the instructions provided in this section, then install a higher capacity DIMM following the instructions in "Installing a DRAM DIMM," next in this appendix.

To remove a DRAM DIMM, follow these instructions:

1 **Press down on the ejector to release the DRAM DIMM from its slot as pictured in the following illustration.**

When the ejector releases, pull the DIMM straight up and out of the slot.

DRAM DIMM (Your DIMM's shape and components may vary.)

While holding the DIMM along its side edges, press down on the ejector as shown. The DIMM will be released from its slot, and you can then pull the DIMM straight up and out of the slot.

Connectors   Notches

DRAM slot (1 of 2)
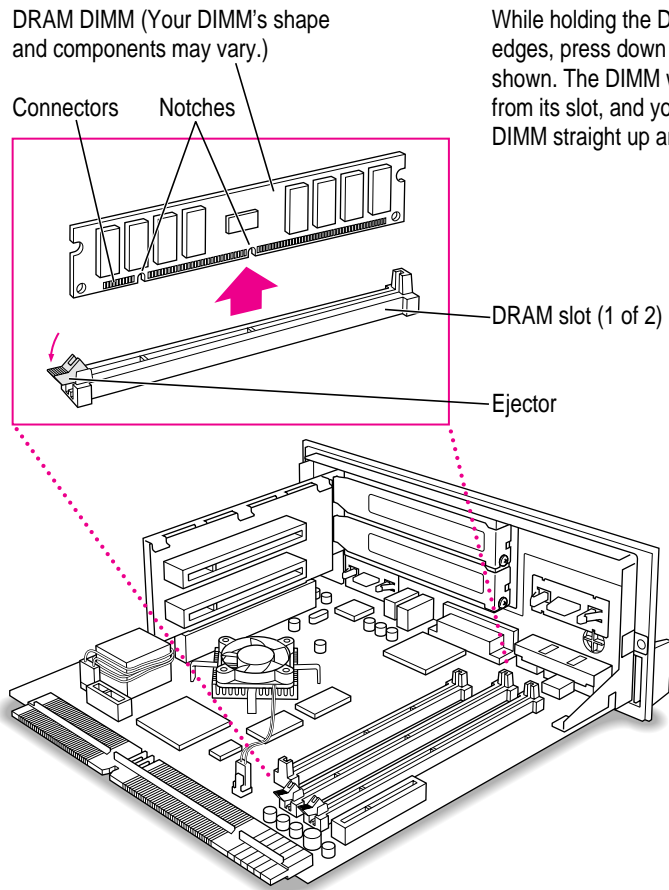
Ejector

Installing a DRAM DIMM

1 **Push the ejector on the DRAM slot outward and down to open it.**

Push the ejector outward and down to open it.

DRAM slot (1 of 2)
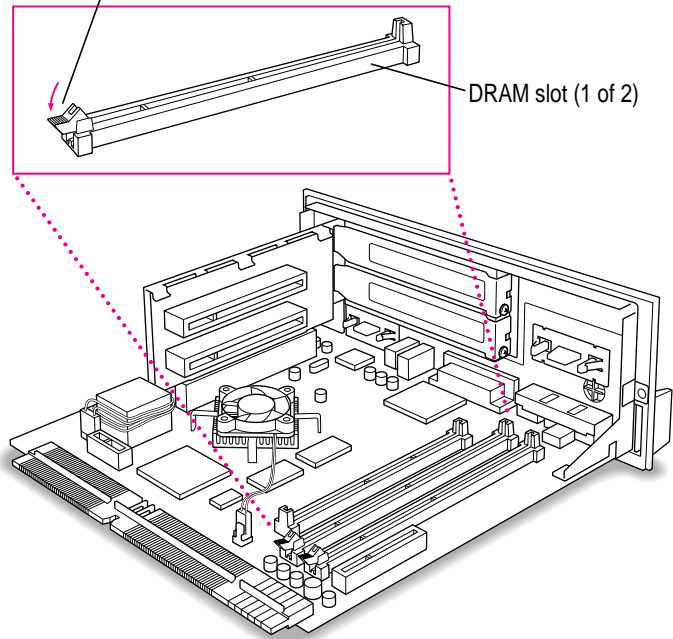
2 **With the ejector in the "open" position, align the DRAM DIMM in one of the DRAM slots as pictured.**

IMPORTANT Do not touch the DIMM's connectors. Handle the DIMM only by the upper edges.

DRAM DIMM (Your DIMM's shape and components may vary.)

The DRAM DIMM is designed to fit into the slot only one way. Be sure to align the notches in the DIMM with the small ribs inside the slot.

Connectors   Notches

DRAM slot (1 of 2)

Ribs (inside slot)
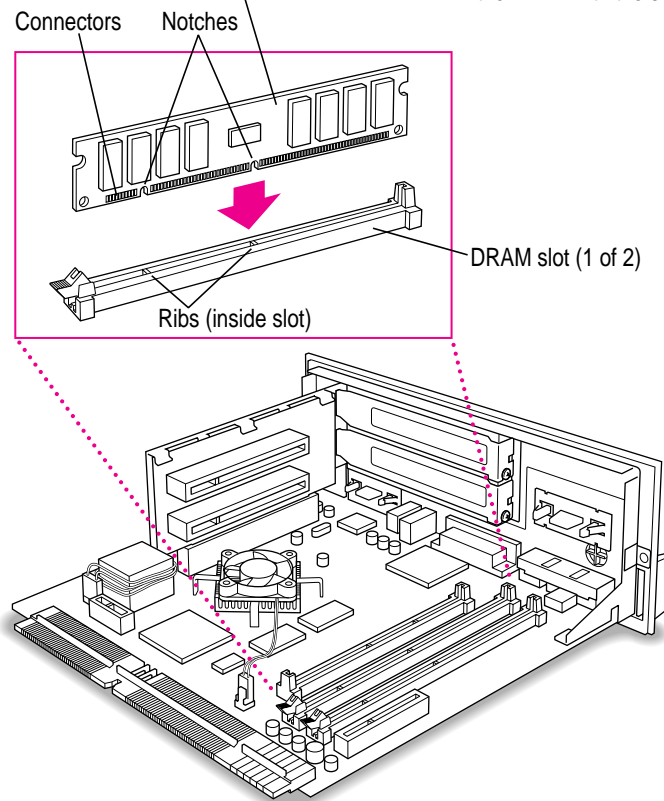
3 **Push down on the DIMM until it snaps into place.**

The ejector closes automatically.

4 **Repeat steps 1–3 if you need to install another DRAM DIMM into the other slot.**

5 **If you have a High Performance Module to install, proceed to the next section, "Installing a High Performance Module into the Cache Module Slot." If you are finished installing items in your computer, proceed to "Closing the Computer."**

Installing a High Performance Module (level 2 cache)

1 **Aligning the notches in the module with the small ribs inside the cache module slot, insert the module in the slot as pictured.**

The module is designed to fit into the slot only one way. Be sure to align the notches in the module with the small ribs inside the slot.

IMPORTANT Do not touch the module's connectors. Handle the module only by the upper edges.

Cache module slot

High Performance Module
(Your module's shape and components may vary.)

The module is designed to fit into the slot only one way. Be sure to align the notches in the module with the small ribs inside the slot.

Connectors

Notches

Ribs (inside slot)
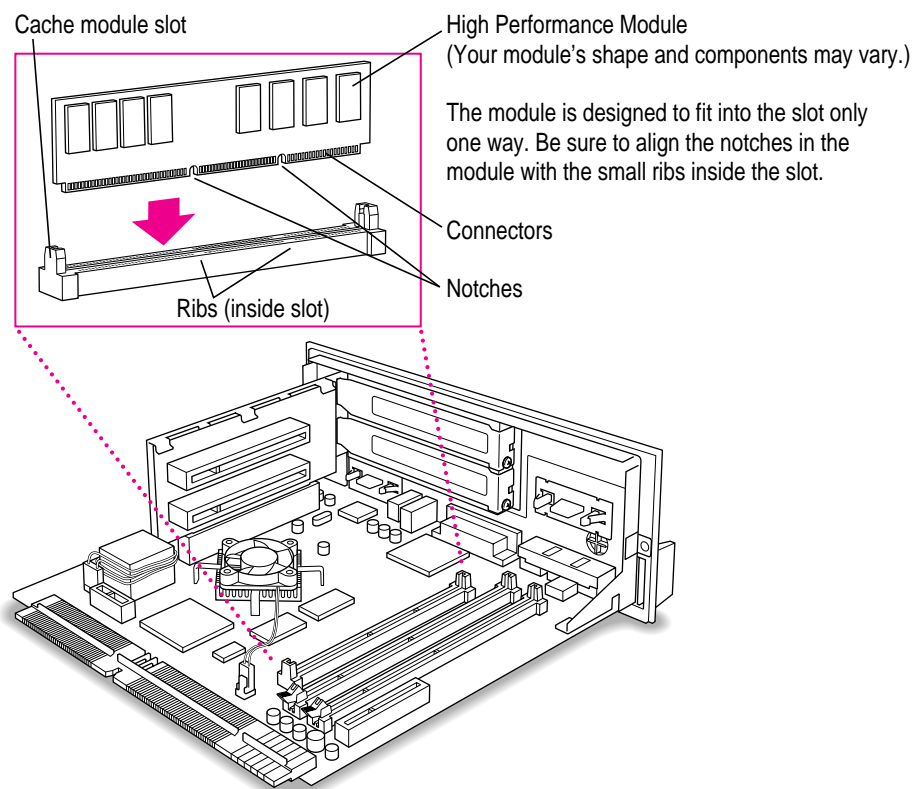
2 **If you are finished installing items in your computer, proceed to "Closing the Computer."**

Closing the computer

1 **Grasping the plastic tabs on the vertical plate, orient the logic board vertically and slide it into the guide rails on the left inside of the computer.**

Align and insert the logic board so that it engages the guides on the top and bottom of the computer chassis.
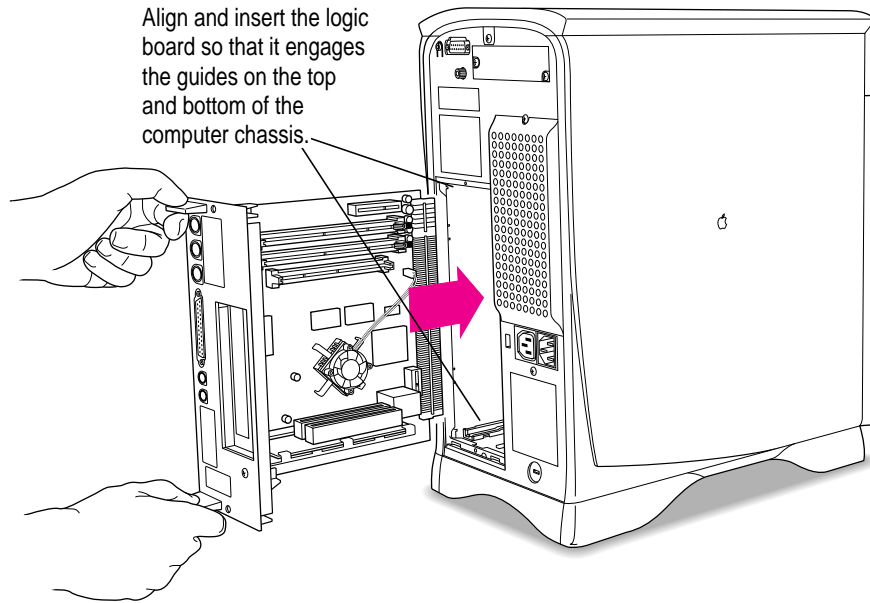
2 **Push the logic board until it is back inside the computer case.**

Gently but firmly push on the vertical plate until the logic board is solidly back in place.
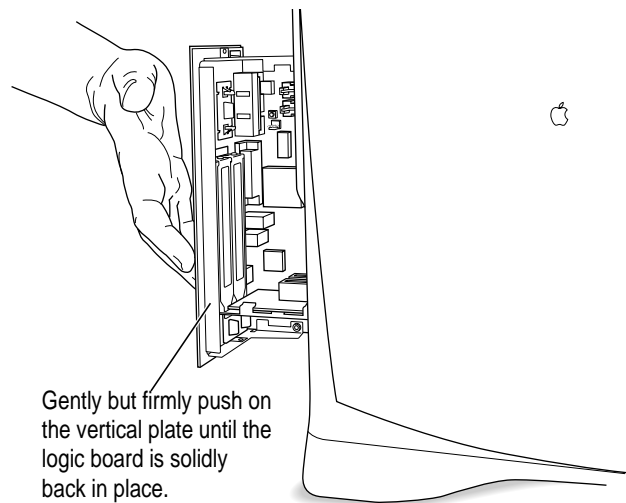
3 Reinsert the two screws.

Reinsert these
two screws.
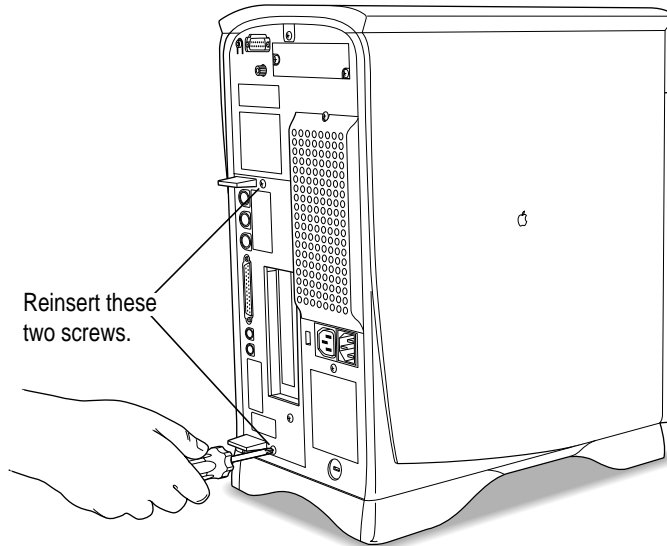
4 Plug all the cables except the power cord back into the computer.

5 Reconnect the power cord.

Plug the power
cord into the back
of the computer.
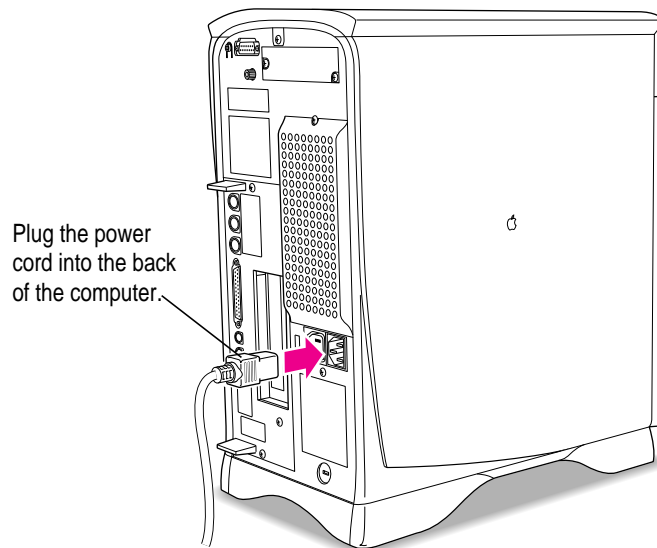
WARNING To ensure reliable and safe operation of your system, never turn on your computer unless all of its internal and external parts are in place.

Note: If your computer will not start after you've installed an expansion card, DRAM, or the High Performance Module, you may need to press the reset button on the main logic board. See the instructions listed under the problem "The computer does not start and you have just installed DIMMs, a High Performance Module, or expansion cards" in "Solutions to Common Problems With Your Computer" in Chapter 9 of this manual.

Read this appendix for information
about your computer's optional
built-in Zip drive.

Appendix C
Using the Optional Built-in Zip Drive

The optional internal Zip drive in your Macintosh accepts Zip disks, each of which can hold 100 megabytes (MB) of information. The Zip drive is a SCSI device—if your computer came with one installed, it uses SCSI ID number 5.
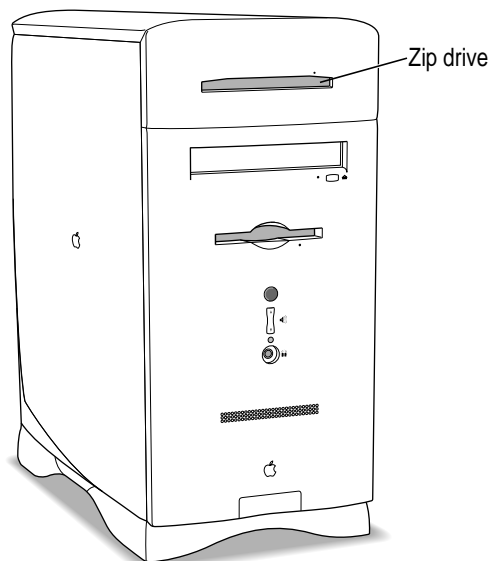
Zip drive

With a Zip drive and Zip disks, you can do the following:

- **Extend your hard disk** Zip disks give you increased storage and easy access to information. They are good for storage-hungry image, sound, and video files that otherwise would take up space on your hard disk.

- **Move information** Zip disks offer complete mobility and can be moved and used wherever you have another Zip drive.

- **Back up your hard disk** Zip disks provide a convenient way to back up your hard disk and archive important records.

- **Secure sensitive files** To keep sensitive or confidential information safe, you can store it on a Zip disk and use the Tools application to assign a password that must be used in order to read or write information on the disk.

This appendix contains basic information about working with Zip disks in the internal Zip drive. Additional information is also available online in the Iomega folder on your hard disk or on the CD-ROM disc that came with your computer.

Inserting a Zip disk

Follow these instructions to insert a Zip disk into the Zip drive.

1 **Turn on your Macintosh.**

2 **Gently insert the disk into the drive.**

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

The Zip disk is properly seated in the drive when the end of the disk is flush with the drive opening.
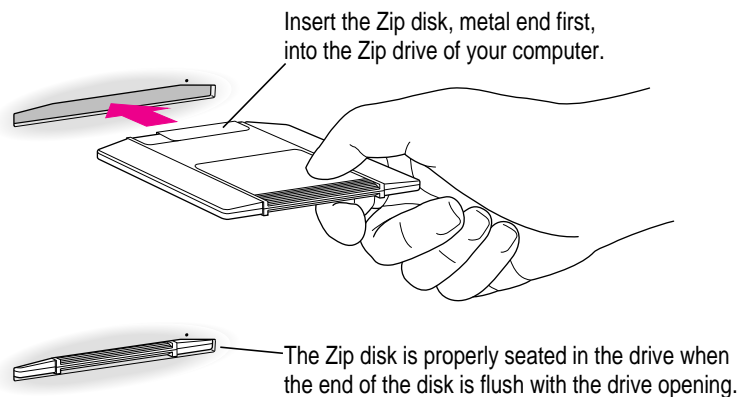
In a moment, an icon for the Zip disk appears on your screen. You can store and copy files to and from the Zip drive using the same methods you use for other drives on your system.

Zip 100

WARNING Never force a Zip disk into or out of the drive, or use either ordinary 3.5-inch disks or floppy head-cleaning disks in your Zip drive. They will damage it.

If the icon for the Zip disk does not appear on your screen, refer to the troubleshooting information in the online manuals and online help located in the Iomega folder on your hard disk or on the CD-ROM disc that came with your computer. (You may need to reinstall the Iomega Driver from the Iomega folder.)

Ejecting a Zip disk

You eject a Zip disk the same way you eject a floppy disk, as follows:

1 **On the desktop, click the Zip disk icon to select it.**

2 **Choose Put Away from the File menu.**

The disk is ejected from the drive.

3 **Store the Zip disk in its protective case.**

Note: You can also eject a Zip disk by dragging its icon to the Trash.

Problems ejecting a Zip disk?

If you cannot eject a Zip disk as described above, try the following:

- If your system appears to be frozen, restart your computer. For instructions, see the troubleshooting information in your user's manual.

- To eject a Zip disk manually during a power failure, insert the end of a large straightened paper clip into the small hole near the disk drive's opening. Push gently until the disk is ejected. Do not use excessive force.

Emergency ejection hole
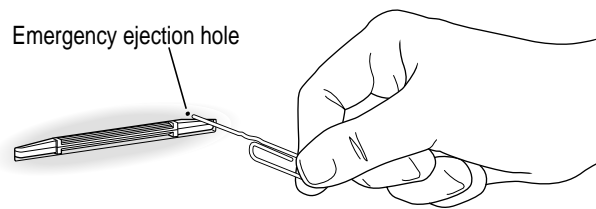
WARNING Do not use this manual disk-ejection procedure while the computer is turned on, or you may damage the Zip drive or the data on the Zip disk.

Using the Tools application

The Tools application is located in the Iomega folder on your hard disk or on the CD-ROM disc that came with your computer. You can use it to erase Zip disks, set read/write protection options for Zip disks, and set other options.

The read/write protection features in the Tools application let you do the following:

- Write-protect a Zip disk to prevent anyone from overwriting critical data. When a disk is write-protected, no one can save files on the disk.
- Write-protect a Zip disk and assign a password that must be used to remove the write protection.
- Read-protect a Zip disk so that it cannot be read from or written on, unless the user enters the password you assign. (Use this option when you want to protect sensitive information.)

For complete information about the Tools application, refer to the files for onscreen help and onscreen manuals in the Iomega folder (available on your computer's hard disk or on the CD-ROM disc that contains system software).

IMPORTANT Do not forget your password, particularly for a read-protected disk. If you forget a password for a read-protected disk, the data on the disk cannot be recovered, even by Apple or Iomega.

Handling Zip disks

Store disks at temperatures between -8° F and 122° F.
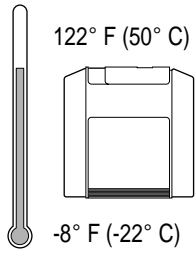
Do not use a pencil or an eraser on a disk or disk label.
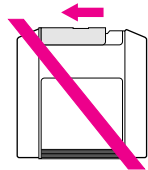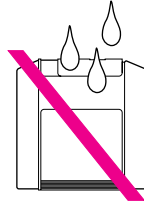
Keep disks dry.

122° F (50° C)

-8° F (-22° C)

Do not touch the exposed part of the disk behind the metal shutter.
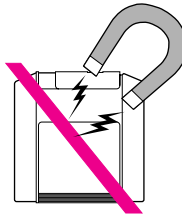
Keep disks away from magnets.
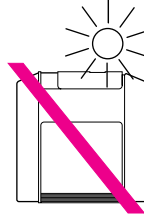
Avoid exposing disks to extremely hot temperatures.

Read this appendix to learn
how to use the special
keys on your keyboard. ▶

Appendix D
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 lets you quit a program.
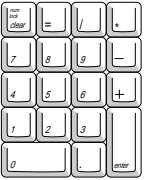
The following table describes what you can do with the special keys on your keyboard. Special keys on your keyboard vary the model of keyboard you have; some keyboards do not have all the keys listed.

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.

Special keys on Apple keyboards *(continued)*

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.
Numeric keys	num lock / clear = / * 7 8 9 – 4 5 6 + 1 2 3 0 enter	Use to produce numbers and mathematical symbols; some programs use these keys as function keys to initiate actions.
Option key	alt option	Use in combination with other keys to produce special characters or modify 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).
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).
Other special keys	ins help / home / page up / del ⊠ / end / page down	The function of these keys depends on the operating system and program you're using.

Typing special characters and symbols

You can type a variety of international and other special symbols and characters (including characters with diacritical marks, such as accents) by pressing combinations of keys.

The Key Caps program, which is installed with your system software, shows you the characters produced when you type certain keys and key combinations in the fonts available on your computer. Choose Key Caps from the Apple (◢) menu, then choose the font from the Key Caps menu.

Characters appear here when you press keys on the keyboard or click them in the window.

Characters available in the Chicago font
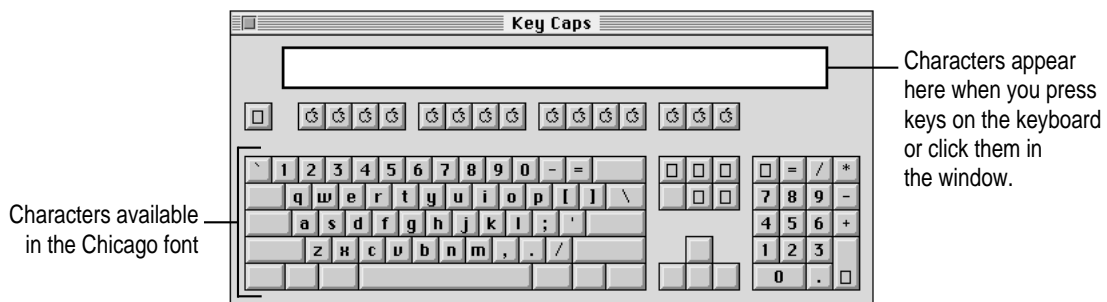
To have Key Caps show more options for special characters, press each of these keys or key combinations: Option, Shift, Shift-Option, Shift-⌘, and Option-⌘.

Characters available in the Chicago font when the Option key is pressed

The highlighted key represents the key held down on the keyboard— in this case, the Option key.
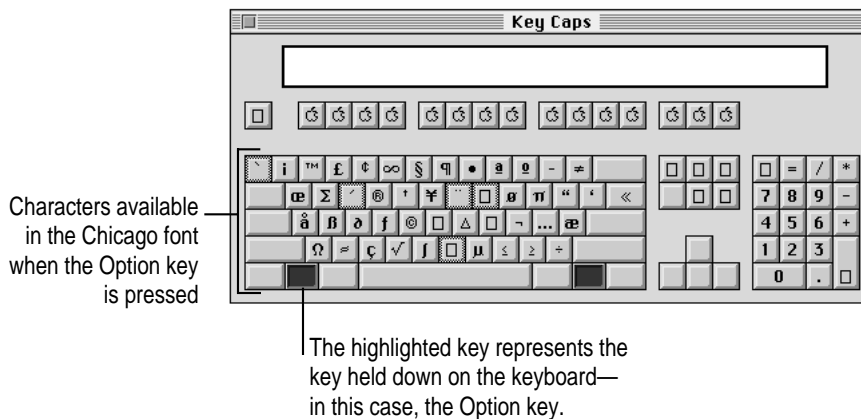
If you press the Option key, Key Caps outlines lightly the keys that you can use in combination with letter keys to type letters with accents or other diacritical marks.

Note: If you see rectangles instead of diacritical marks on some of the pictures of keys in Key Caps, try pressing Option-⌘ to see the diacritical marks. However, use the Option key (not Option-⌘) in combination with the other keys to type letters with diacritical marks.

If you press the Option key at the same time as a key for a specific diacritical mark and then release both keys, Key Caps outlines in bold the keys for letters that can be typed with that mark. (You'll see that most key combinations for diacritical marks can be used with the Space bar as well as letter keys—producing the mark without a letter.)

The most common diacritical marks and how to create them are summarized next.

Diacritical mark	Key combination
Grave accent (`)	Option–`, then type the character
Acute accent (´)	Option–e, then type the character
Circumflex (^)	Option–i, then type the character
Tilde (~)	Option–n, then type the character
Umlaut (¨)	Option–u, then type the character
The letter "c" with a cedilla (ç)	Option–c

■ **To type a letter or a space with a specific diacritical mark, press the Option key and the key for the mark simultaneously. Then type the letter that needs the mark.**

If you are having trouble getting a mark and letter to appear together, try again. Be sure to press the Option key before (or at the same time as) the key for the mark; then, after you release both keys, type the letter to be marked.

Special key combinations

If difficulties with your mouse or computer don't allow you to use standard methods of quitting a program or restarting your computer, you can try using these special key combinations.

To do this …	… press this key combination
Force a program to quit	⌘-Option-Esc
Force the computer to restart	⌘-Control–Power key
Start the computer from a CD-ROM disc	C key (while starting up)
Ignore the selected startup device	⌘-Option-Shift-Delete
Turn off system extensions	Shift key (while starting up)
Start the Extensions Manager	Space bar (while starting up)
Rebuild the desktop	Option-⌘ (while starting up)

Index

• • • • • • •

turning the computer off with 26
turning the computer on with 14, 27
waking the computer with 16
power-on light 44
PowerPC microprocessor xi
power plug 6
power socket for monitor 45
power strip 7
power supply, safety precautions for 187
power switch
on the computer. *See* standby power
button
on the monitor 14
PPP. *See* Point-to-Point Protocol
printer
connecting 46
troubleshooting 128, 153
printer cable 46
printer port 44, 45, 46
printer port icon 46
problems. *See* troubleshooting
processor xi
programs. *See* application programs
protocols, Internet 114

Q

question mark icon
as Guide menu indicator 29
blinking at startup 128, 162
QuickDraw 3D program 64, 70–72, 152
quitting applications
forcing to quit 124, 231
shortcut for 231
unexpectedly 134
when problems occur 124

R

radio. *See also* TV/FM tuner card
interference on viii, 56, 184
listening to on your computer 194
RAM, increasing 68. *See also* memory

RAM disk 68
RARP server 110
Read Me files 28, 64
rebuilding desktop 125–126, 231
recording sound 46, 50, 142
reflections on screen 8, 180, 181
reinitializing disks 160
reinstalling
CD-ROM software 171–173
system software 162–171
remote control sensor 44
removing
application programs 72–73
computer cover 198–201
DRAM DIMMs 212–213
repairing
computer 123
hard or floppy disks 158–160
repetitive stress injuries 178
replacing internal storage devices 62
reset button on main logic board
130, 219
resolution 84
Restart command (Special menu) 124
restarting the computer
after Shut Down 27
forcing the computer to restart 231
problems restarting 124, 139
using restart to solve problems 124
Return key 228
right-angle-bracket prompt 142
RJ-45 connector 100
ROM 75

S

"sad Macintosh" icon 129
safety precautions 182–187. *See also*
health-related information
CD-ROM discs 186
CD-ROM drive ix, 186
connecting equipment 43
electrical hazards, avoiding 7, 182

Power Macintosh

User's Manual

Includes setup, troubleshooting, and important health-related
information for Power Macintosh 6500 series computers

Contents

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Communications regulation information

FCC declaration of conformity

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. 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.

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.

Responsible party: Robert Steinfeld, Apple Computer, Inc., 1 Infinite Loop, Cupertino, CA 95014-2084, 408-974-2618.

Industry Canada statement

This Class B device meets all requirements of the Canadian interference-causing equipment regulations.

Cet appareil numérique de la Class B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

VCCI Class 2 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、情報処理装置等電波障害自主規制協議会(VCCI)の基準に基づく第二種情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
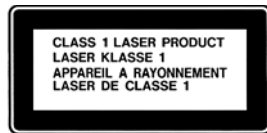
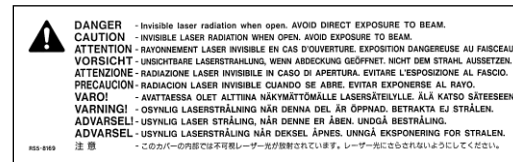取扱説明書に従って正しい取り扱いをしてください。

Laser information

WARNING Making adjustments or performing procedures other than those specified in your equipment's manual may result in hazardous radiation 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 in a user-accessible area, indicates that the drive meets minimum safety requirements. A service warning label is located in a service-accessible area. The labels on your product may differ slightly from the ones shown here.

CLASS 1 LASER PRODUCT
LASER KLASSE 1
APPAREIL A RAYONNEMENT
LASER DE CLASSE 1

DANGER   - Invisible laser radiation when open. AVOID DIRECT EXPOSURE TO BEAM.
CAUTION   - INVISIBLE LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO BEAM.
ATTENTION - RAYONNEMENT LASER INVISIBLE EN CAS D'OUVERTURE. EXPOSITION DANGEREUSE AU FAISCEAU.
VORSICHT - UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET. NICHT DEM STRAHL AUSSETZEN.
ATTENZIONE - RADIAZIONE LASER INVISIBILE IN CASO DI APERTURA. EVITARE L'ESPOSIZIONE AL FASCIO.
PRECAUCION - RADIACION LASER INVISIBLE CUANDO SE ABRE. EVITAR EXPONERSE AL RAYO.
VARO!   - AVATTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.
VARNING! - OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD. BETRAKTA EJ STRÅLEN.
ADVARSEL! - USYNLIG LASER STRÅLING, NÅR DENNE ER ÅBEN. UNDGÅ BESTRÅLING.
ADVARSEL - USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES. UNNGÅ EKSPONERING FOR STRALEN.
RSS-8169 注 意   - このカバーの内部では不可視レーザー光が放射されています。レーザー光にさらされないようにしてください。

Class 1 label   Service warning label

Welcome to Power Macintosh

Congratulations on the purchase of your new Macintosh. Your computer is designed to give you the highest performance combined with real ease of use. It's also easy to set up and easy to expand. This book guides you through the setup procedure, tells you how to expand your Macintosh, and provides many tips on using your new system.

Your Macintosh computer is powered by the **PowerPC**™ microprocessor (or "chip"). This microprocessor was designed by Apple Computer, Inc., Motorola, Inc., and IBM Corporation. The **PowerPC** microprocessor uses Reduced Instruction Set Computing (RISC) technology to deliver very high performance at the lowest possible cost. The **PowerPC** RISC microprocessor represents the state of the art in microprocessor design.

Your new Macintosh will run almost all of your existing Macintosh software, but for best performance and greatest speed, look for the new software programs designed especially for computers that contain the **PowerPC** microprocessor. You'll find **PowerPC** microprocessor–compatible programs (also called "native" applications) at any software store that carries products for the Macintosh computer.