



Getting Started With Your PowerBook G4

Includes setup, expansion, and troubleshooting
information for PowerBook G4 computers

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Simultaneously published in the United States and Canada.

Sherlock’s Yellow Pages channel may be known by a different term outside the United States.



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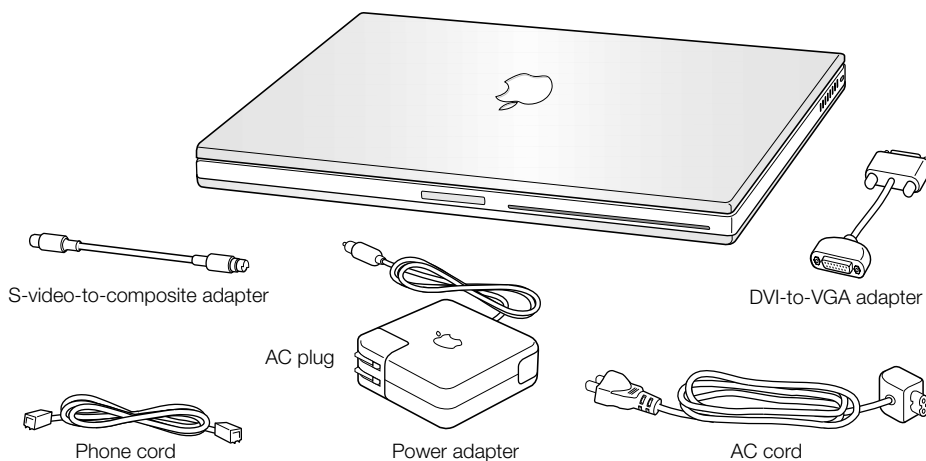
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Getting Started

Your PowerBook has been designed so that you can set it up quickly and start using it right away. If you have never used a PowerBook or are new to Macintosh computers, read this section for instructions on getting started and where to get more information.

If you are an experienced user, you may already know enough to get started. Be sure to look over the information in Chapter 2, “Getting to Know Your Computer,” to find out about the new features of this PowerBook.



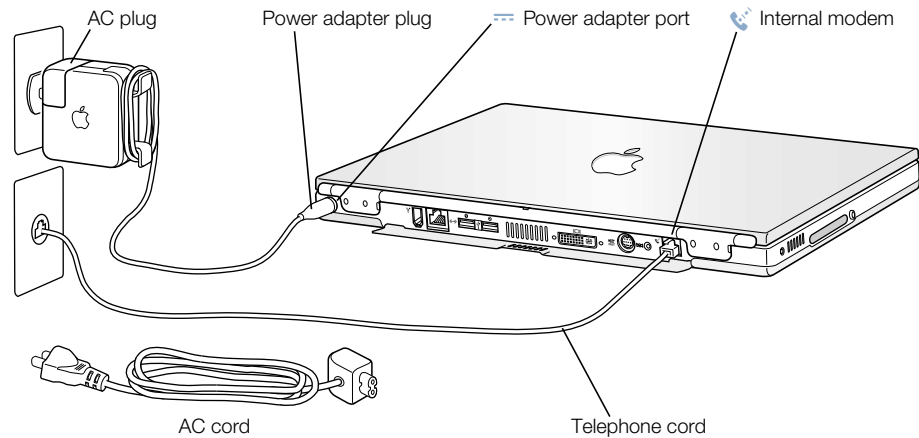
Important Read all the installation instructions and safety information (see page 93) carefully before you plug your computer into a wall socket.


Plugging In the Computer

Plugging in the power adapter provides AC power to the computer and recharges the computer's battery. You should plug in the power adapter in case the battery has been drained during shipping or storage.

Important For optimal performance, use only the power adapter that came with your computer.

- 1 Plug the AC plug on the power adapter into an outlet. You can also remove the AC plug and plug one end of the AC cord into the adapter and the other end into an outlet.



- 2 Plug the power adapter plug into the power adapter port (marked with the icon ) on the back of the computer. You can also remove the AC plug and plug one end of the AC cord into the adapter and the other end into an outlet. Use only the AC cord that came with your power adapter.

A light appears on the power adapter plug. An amber light indicates that the battery is being charged. A green light indicates that the battery is fully charged. Make sure to push the power plug snugly into the power adapter port to ensure it is engaged and power is flowing to the computer. You can monitor the battery level using the battery icon in the menu bar.

You can wrap the extra adapter cable around the clips that open out from the power adapter.

When disconnecting the power adapter from an outlet, pull the plug, not the cord.


Calibrating Your Battery for Best Performance

To get the longest running time from your PowerBook battery, let the battery run down during the first week you have your PowerBook. Then fully charge it one time. Follow these steps:

- 1 Plug in the power adapter and fully charge your PowerBook battery until the battery indicator lights and the onscreen meter (see page 51) indicate that the battery is fully charged.
- 2 Disconnect the power adapter and use your PowerBook until you see the first low battery warning dialog box on the screen.
- 3 Connect the power adapter and leave it connected until the battery is fully charged again.

Important You have to fully discharge and then charge your battery only once to calibrate it. After that, you can connect and disconnect the power adapter when the battery is at any charge level.

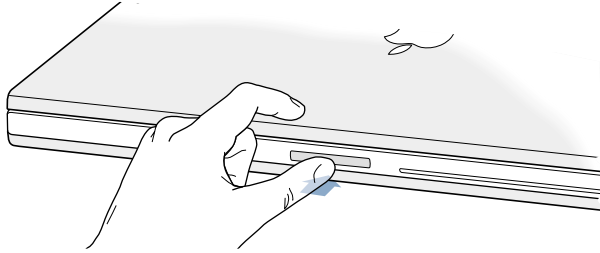
Connecting the Internal Modem

If you want to connect to the Internet right away, connect one end of the phone cord to the internal modem port (marked with the icon ) and the other end to an analog telephone line (the type of telephone line found in most residences).

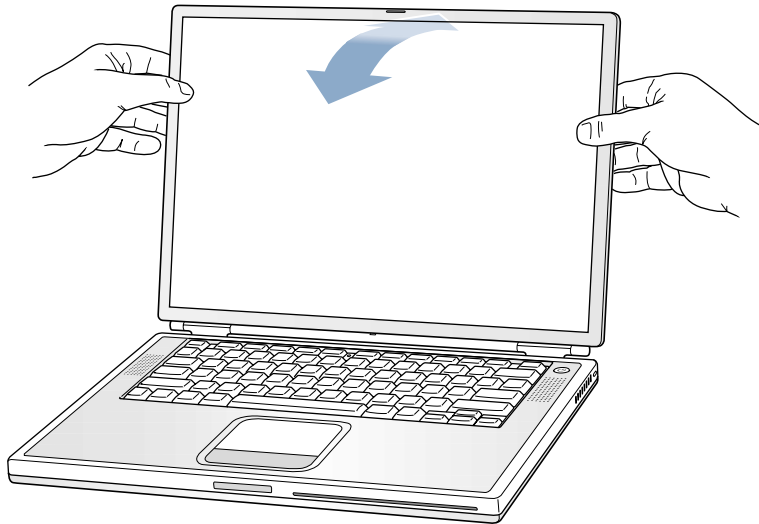
Warning Do not connect a digital telephone line to the modem, because the wrong type of line could damage the modem. Contact your telephone service provider if you are unsure whether you have a digital telephone line.

Opening the Display

- 1 Push the display release button.

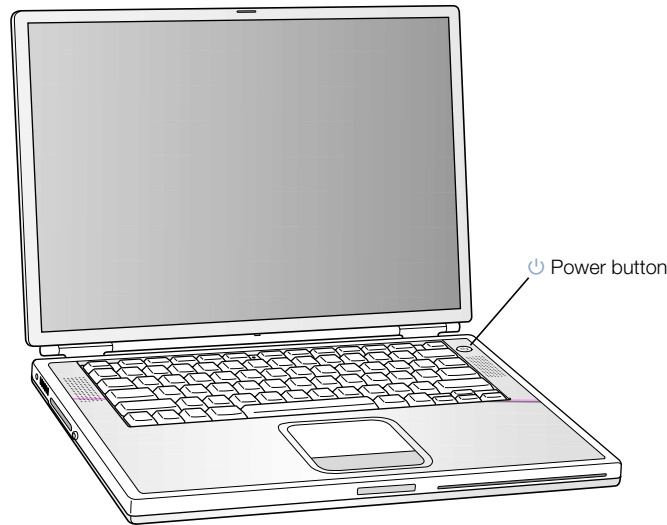


- 2 Open the display and position it at a comfortable viewing angle.



Turning the Computer On

To turn on the computer, press the Power button (⏻). You should hear a tone when you turn on the computer. It takes the computer a few moments to start up. This is normal. When you press the Power button, the PowerBook checks its memory before it starts up. The more memory installed, the longer the delay.



Problems Turning the Computer On?

Nothing happens when you press the Power button.

- Make sure the battery is properly installed. Push the silver button on the battery to check its charge. See “Battery” on page 49.
- The battery may be drained. Make sure that you plugged the power adapter firmly into both the computer and a power source.
- If the computer still doesn’t start up, see page 85 for more troubleshooting suggestions.

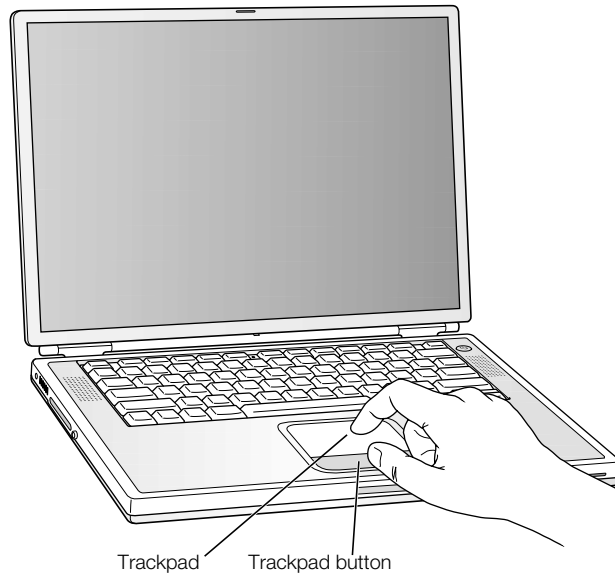
You see a picture of a disk or a folder with a blinking question mark.

- This icon usually means that the computer can’t find system software on the hard disk or any disks attached to the computer. You may need to reinstall system software. See page 85.

Moving Items on the Screen

You use your PowerBook trackpad to move and select items on the screen, much as you use a mouse with a desktop computer. To move the arrow pointer on the screen, slide your finger across the trackpad. To select, click, or double-click an item on the screen, use the trackpad button.

Note: Instead of using the trackpad button, you can click and double-click directly on the trackpad. You turn on this and other trackpad options in the Mouse pane of System Preferences.



The trackpad is sensitive to how quickly you move your finger. To move the pointer a short distance across the screen, move your finger slowly across the trackpad. The faster you move your finger, the farther the pointer moves on the screen.

Tips for Using the Trackpad

For best results when using the trackpad, keep in mind these tips:

- Use only one finger. Using more than one finger may cause erratic pointer behavior.
- Do not use a pen or any other object.
- Keep your finger and the trackpad dry. If the trackpad becomes moist from humidity or condensation, gently wipe it with a clean cloth before you use it.
- Never use any kind of cleaning solution on the trackpad.

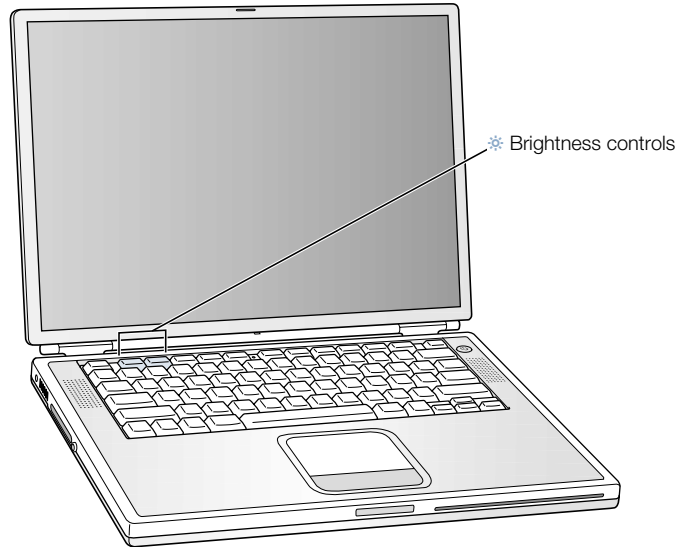
For more information on using the trackpad, see Mac Help, located in the Help menu.

Adjusting the Internal Display

Once you begin working with your new PowerBook, you may need to adjust your display so that items on the screen are easy to see.

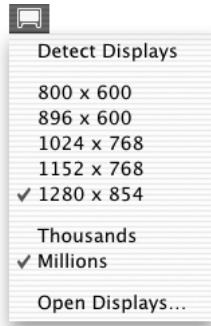
Adjusting the Brightness

Use the keys labeled with the ☼ icon to adjust screen brightness.



Adjusting the Display Resolution

You can increase the size of images on your display by switching from the standard resolution to a scaled resolution. To adjust the resolutions on your display, open the Displays pane of System Preferences. To control your display settings using the Displays icon in the menu bar, click “Show displays in menu bar.”



Resolutions Supported by the Built-in Display

Your PowerBook has a wide-screen display with a native resolution of 1280 x 854 that also supports standard resolutions such as 1024 x 768.

You may want to use a standard resolution when mirroring your display on an external monitor or when using certain applications (such as games or presentation software) that are designed for a standard resolution. Most applications automatically switch to the best resolution for them.

When you use a standard resolution, a black band appears on each side of the display. If you use an application designed for a standard resolution and do not want to see the black bands, you can choose the “stretched” version of the resolution to stretch the image to cover the entire screen and eliminate the black bands.

You can choose a resolution of 1152 x 768 or smaller from the Displays icon menu in the menu bar. These are known as “scaled resolutions.” When you switch to a scaled resolution, items on the screen appear larger, making them easier to see. However, scaled resolutions may not be as sharp as the display’s native resolution.

Where to Go From Here

You've done everything you need to get your PowerBook up and running. The first time you turn your computer on, the Macintosh Setup Assistant takes you through the process of configuring your computer and setting up for the Internet. Internet access usually requires an account with an Internet service provider (ISP). Fees may apply.

If you would like additional information, see the following:

To learn about...	See...
Shutting down your computer or putting it to sleep	"What to Do When You Are Finished Working" on page 16.
What you can do with the hardware and software features of your PowerBook	Chapter 2, "Getting to Know Your Computer."
The additional information available in the onscreen help	"Mac Help—Answers to All Your Macintosh Questions" on page 36.
Using a specific feature of your PowerBook	Chapter 3, "Using Your Computer."
Installing memory	Chapter 5, "Working Inside Your Computer."
What to do if you have a problem with your PowerBook	Chapter 6, "Troubleshooting."

What to Do When You Are Finished Working

When you have finished working with your PowerBook, you have two options.

Put Your PowerBook to Sleep

If you will be away from your PowerBook for only a short time, put the computer to sleep. When the computer is in sleep, you can quickly wake it and bypass the startup process. When the computer is in sleep, its screen is dark and a small white light below the display pulsates.

To put the computer to sleep quickly, do one of the following:

- Close the display.
- In the Apple () menu, choose Sleep.

Warning Wait a few seconds until the sleep light starts pulsating (indicating that the computer is in sleep and the hard disk has stopped spinning) before you move your PowerBook. Moving your computer while the hard disk is spinning can damage the hard disk, causing loss of data or the inability to start up from the hard disk.

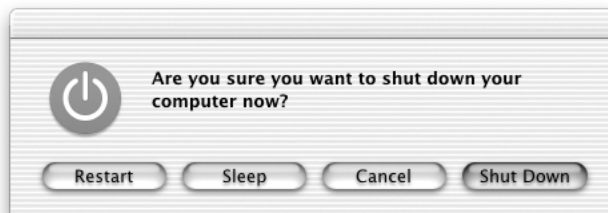
To wake the computer:

- *If the display is closed*, open it. Your PowerBook wakes from sleep when you open the display.
- *If the display is already open*, press the Power button (⏻) or any key on the keyboard.

Shut Down Your PowerBook

If you will not use your PowerBook for a day or two, shut it down. Do one of the following:

- In the Apple () menu, choose Shut Down.
- Press the Power button and click Shut Down in the dialog that appears on the screen.



- If you plan to store your PowerBook for an extended period of time, see “Storing Your PowerBook” on page 93 for additional steps to prevent your battery from draining completely.

Getting to Know Your Computer

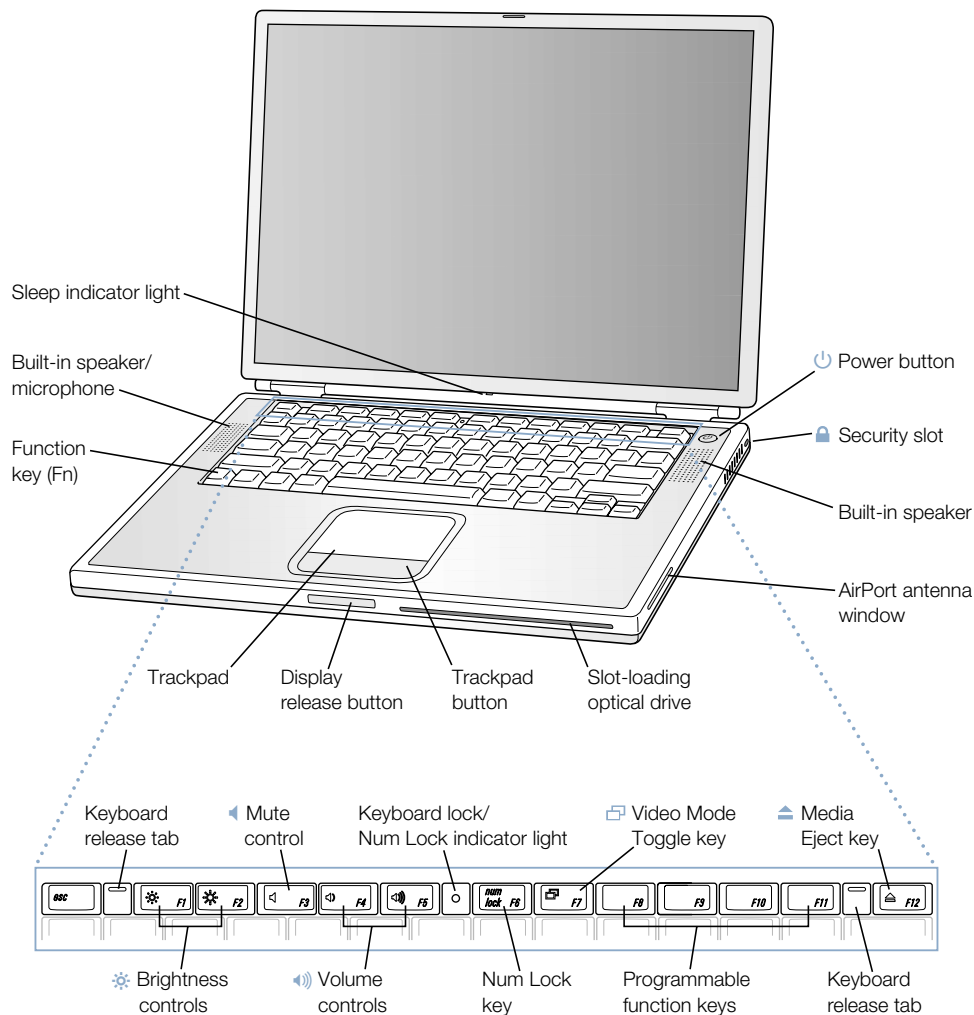
If you're eager to get started and want to try out a few things on your PowerBook, this chapter is for you. It provides an overview of your computer's hardware and software features along with the unique Internet services available to Mac owners.

Your PowerBook is a full-featured notebook computer. It includes the latest in computer technology such as a PowerPC G4 processor; DVI, FireWire, and USB ports; and AirPort wireless Internet and networking. Along with this hardware comes the Mac operating system (OS). Included with the Mac OS are powerful features that allow you to use the Internet to watch video, research information, shop, and update your software automatically.

Your PowerBook comes with several software applications that let you do things like send email, surf the Internet, chat, organize music and digital photos, make movies, and much more. This chapter describes these applications and tells you where to find more information about using them. Read on to learn more.

Note: Because Apple frequently releases new versions and updates to its system software, applications, and Internet site, images shown in this manual may be slightly different from what you see on your screen.

Basic Features of Your PowerBook



**Brightness controls**

Increase or decrease the brightness of your PowerBook display.

**Volume controls**

Increase or decrease the volume of the sound coming from the built-in speakers and sound output port.

Keyboard lock

Protect the internal components of your PowerBook by preventing the keyboard from being easily opened.

Num Lock key

Activate the numeric keypad embedded in the PowerBook keyboard. When the numeric keypad is locked, the keyboard lock glows green.

**Video Mode Toggle key**

Use this key to toggle between dual display mode and video mirroring mode.

**Media Eject key**

Press and hold this key to eject a CD or DVD disc. You can also eject a disc by dragging its desktop icon to the Trash.

**Power button**

Turn your PowerBook on and off or put it to sleep.

Slot-loading optical drive

Your optical drive can read CD-ROM discs, Photo CDs, standard audio discs, DVD-ROM and DVD-R discs, DVD movies, and other kinds of media. It can also write music, documents, and other digital files on CD-R and CD-RW discs. If you have a SuperDrive, you can also write to DVD-R discs.

Function (Fn) key

Press and hold this key to activate the function keys (F1 to F12).

Keyboard release tabs

When you need to access the internal memory slots, pull these tabs down to release the PowerBook keyboard.

Microphone

Record sounds directly on your PowerBook hard disk with this built-in microphone (located under the speaker cover).

**Security slot**

Protect your PowerBook by connecting a security cable.

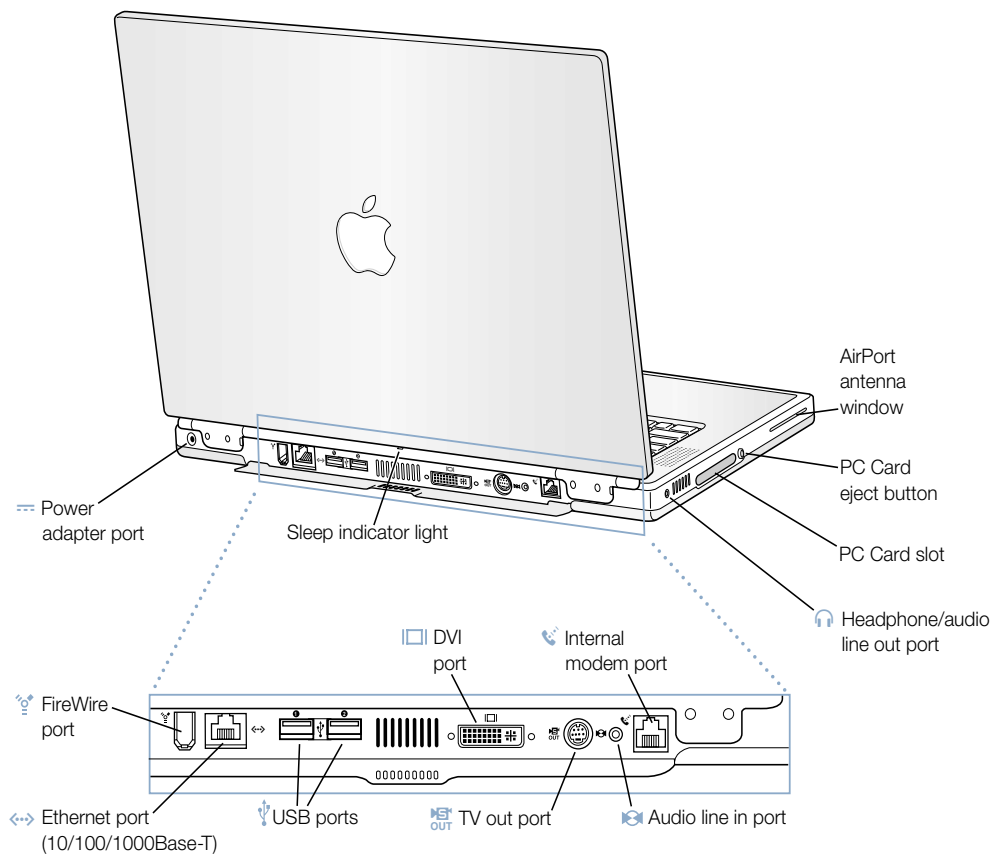
Sleep light indicator

A white light pulsates when the PowerBook is in sleep.

Trackpad

Move the pointer on the PowerBook display.

Additional Features of Your PowerBook



**FireWire port**

Connect high-speed external devices, such as digital video cameras, printers, and external storage devices.

**Ethernet port (10/100/1000Base-T)**

Connect to a high-speed 10/100/1000Base-T Ethernet network or connect to another computer and transfer files. The Ethernet port auto-sensing feature detects other Ethernet devices. You don't need an Ethernet crossover cable to connect to other Ethernet devices.

**Two USB (Universal Serial Bus) ports**

Connect additional equipment to your PowerBook, such as printers, external storage devices, digital cameras, modems, keyboards, and joysticks.

**External monitor (DVI) port**

Connect to an external monitor or projection device that uses a DVI connector, or use the DVI-to-VGA adapter to connect a VGA monitor.

**TV out (S-video out) port**

Connect your PowerBook to a television, VCR, or other video device. You can use TV out for presentations or to play a DVD-Video on your television.

**Audio line in port**

Connect your PowerBook to a line-level microphone or other audio equipment.

**Internal modem port**

Connect a standard phone line directly to the internal modem.

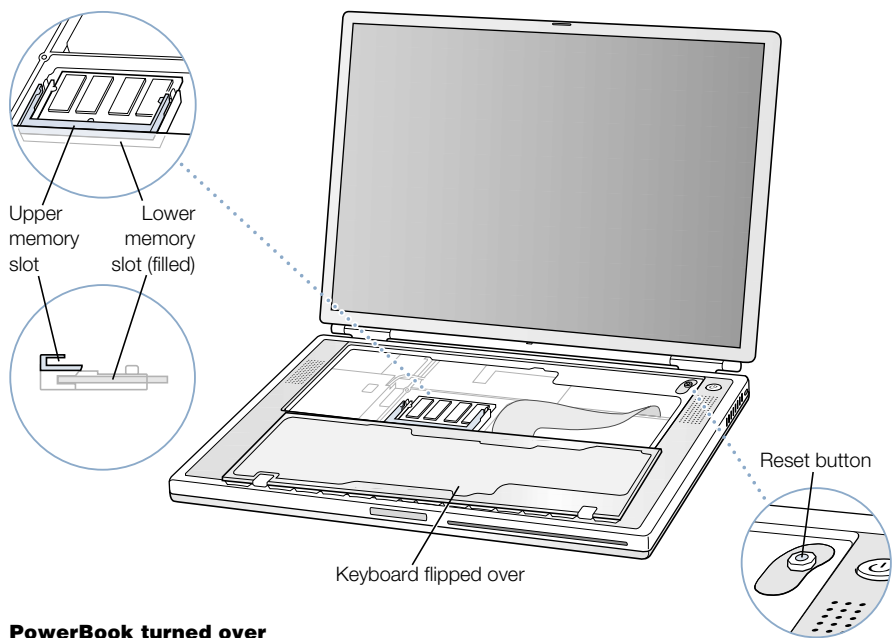
**Headphone/audio line out port**

Connect external speakers, headphones, or other sound output devices.

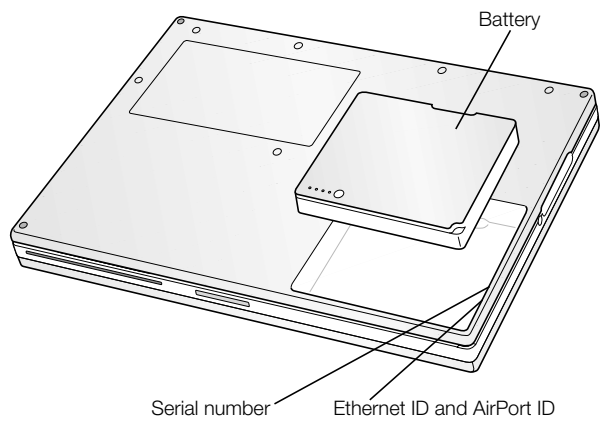
PC Card slot

Expand the capabilities of your PowerBook using the Type II slot that supports both PC Card and CardBus formats.

PowerBook with the keyboard flipped over and internal RAM slot visible



PowerBook turned over



Memory slots

Your PowerBook comes with two memory slots, one above the other. The lower slot contains the memory module that came with your PowerBook. You can install an additional memory module in the upper slot. (If you ordered your PowerBook with additional memory, the upper slot may already be filled.) The maximum amount of RAM you can install in your PowerBook is 1 gigabyte (GB), using a 512 megabyte (MB) memory module in each slot. For instructions, see “Installing Additional Memory” on page 63.

Removable hard disk

You can remove the internal hard disk for service or security. For instructions, see “Removing the Internal Hard Disk” on page 72.

AirPort Card

An AirPort Card in your computer allows access to a wireless network. Your PowerBook may have come with an AirPort Card already installed. If not, you can purchase an AirPort Card and install it yourself. See “Installing an AirPort Card” on page 80.

About Mac OS X



What You Can Do

Mac OS X provides a powerful and elegant user interface for your computer. With Mac OS X, you don't need to worry about how much memory to allot for an application to run efficiently or restarting your computer if there's a problem with one application. In addition to using Mac OS X software, you can still run Mac OS 9 versions of software in Mac OS X using the Classic environment. Chapter 4, "Working With Your Operating System," on page 59 explains the Classic environment in more detail. Mac OS X also supports Java and UNIX-based software.

System Preferences is your command center for all of your computer settings, from changing the appearance of your desktop to setting up network access information. The Finder and Dock provide easy access to folders, applications, documents, and other items on your computer and network.

To Learn More

- For instructions on how to customize your Mac OS X environment and information about using Mac OS X, see the *Welcome to Mac OS X* book that came with your computer.
- For the latest information on Mac OS X, go to the Mac OS website at www.apple.com/macos

.Mac—Internet Services for Mac Users



What You Can Do

.Mac is a new class of Internet services from Apple created exclusively for Mac users. With a .Mac account, you can send email or electronic greeting cards and share photos and movies. You can back up important files, create your own website, and more. To use .Mac, you must have an account with an Internet Service Provider (ISP).

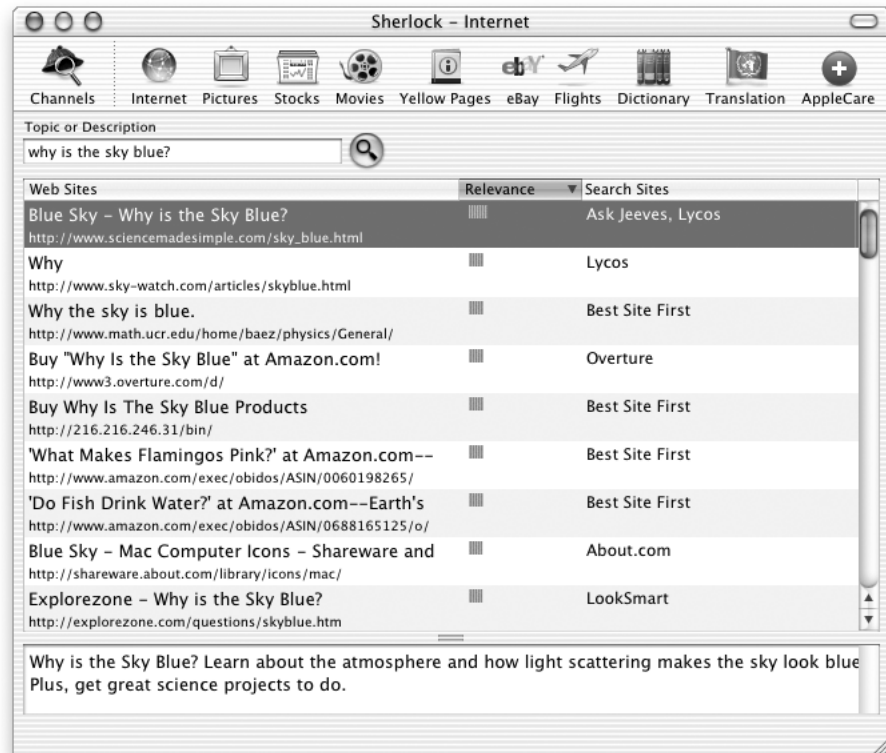
To Learn More

- Go to www.mac.com

To Sign Up

- Open System Preferences and click Internet. Click .Mac and then click Sign Up.

Sherlock—Your Internet Search Detective



What You Can Do

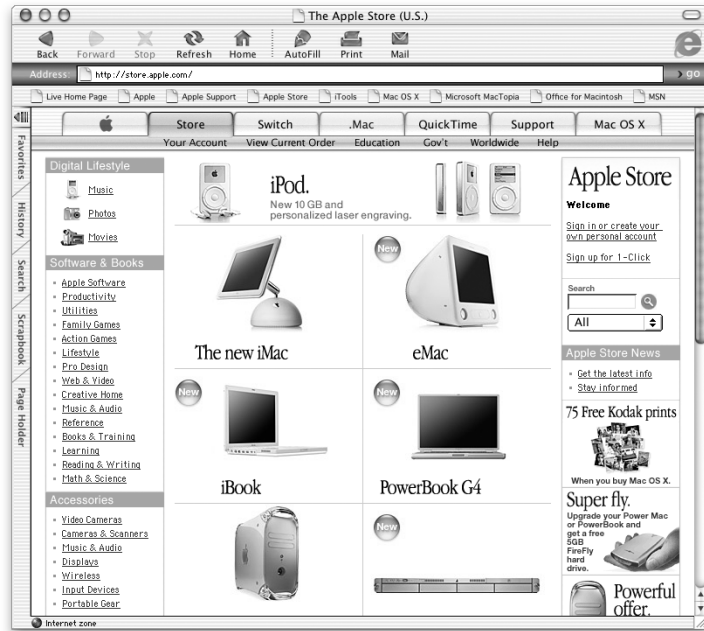
Sherlock is your search detective and personal shopper on the Internet. It provides an easy way to find people, news, and just about anything. Shop for books and music, search auction sites, find the best prices—even check product availability. Look up movie times at your local theaters, watch movie trailers, and buy tickets. Find flight information, stock quotes, phone numbers, and driving directions. Get definitions, news, language translations, and more.

To Learn More

- Open Sherlock and choose Sherlock Help from the Help menu.
- Go to www.apple.com/sherlock

Note: Sherlock's Yellow Pages channel may be known by a different term outside the United States.

Apple.com—Your Starting Place on the World Wide Web



What You Can Do

Whether you're looking for information about Apple products or for services, support, and technical information, Apple websites help you get the most from your computer.

To Learn More

Visit the following websites for more information:

- Apple Store: www.apple.com/store
- Apple Support: www.apple.com/support
- Macintosh Products Guide: www.apple.com/guide
- Mac OS X: www.apple.com/macosx

QuickTime—Audio and Video on the Internet



What You Can Do

In addition to playing video and music files on your Mac, with QuickTime you can watch live and recorded Internet broadcasts.

To Get Started

- 1 Connect to the Internet.
- 2 Open QuickTime Player.
- 3 Click the QuickTime button and select a channel to get the latest video, music, and information over the Internet without having to store files on your hard disk.

To Learn More

Internet video is just one of the things you can do with QuickTime. To learn more:

- Open QuickTime and choose QuickTime Help from the Help menu.
- Go to www.apple.com/quicktime

iMovie—Create and Edit Your Own Digital Movies



What You Can Do

iMovie is an easy-to-use digital video editing program. With iMovie and a digital video camcorder, you can create and edit your own movies. Import video from the camera; edit clips; and add transitions, titles, sound effects, and music.

To Learn More

- See the iMovie Tutorial or iMovie Help.
- Go to the iMovie website at www.apple.com/imovie for the latest on iMovie, including updates, additional plug-ins, and a list of compatible DV camcorders.

iPhoto—Organize, Edit, and Share Your Digital Photographs



What You Can Do

iPhoto lets you import pictures from your digital camera, organize them into albums, edit and enhance them, and share them in a number of different ways. Once you see what iPhoto can do with digital pictures, you may never go back to using a film camera again. Simply plug your digital camera into the USB port on your Macintosh and iPhoto opens, imports your photos, catalogs them, stores them, and displays them on your screen.

To Learn More

- See iPhoto Help.
- Go to the iPhoto website at www.apple.com/iphoto

iDVD—Create and Burn Your Own DVDs



What You Can Do

If your PowerBook came with a SuperDrive, you can use iDVD to burn DVDs on blank DVD-R discs. Turn your iMovies, digital photos, and other QuickTime media files into DVDs that can be played on most standard DVD players.

To Learn More

- See iDVD Help.
- Go to the iDVD website at www.apple.com/idvd

iTunes—Digital Music for Your Mac and iPod



What You Can Do

iTunes lets you import songs from music CDs as MP3 files, create playlists, move music to your iPod or other portable MP3 player, listen to hundreds of radio stations on the Internet, and more. Use iTunes to rearrange music to suit your tastes and create your own audio CDs.

To Learn More

- See iTunes Help.
- Go to the iTunes website at www.apple.com/itunes

Auto Updating—Automatically Keep Your Mac on the Cutting Edge



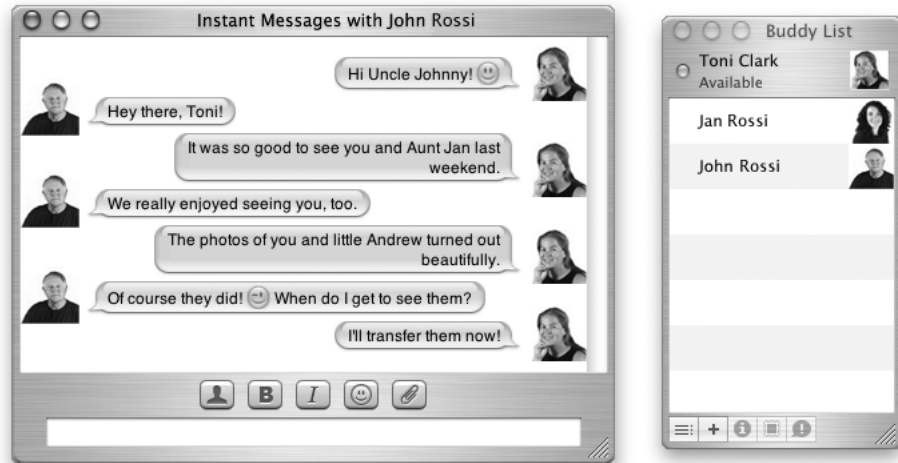
What You Can Do

Connect to the Internet and use Software Update to automatically download and install the latest software versions, drivers, and other enhancements from Apple. Software Update instantly checks Apple's Internet servers to see if any updates are available for your computer. You can set your Mac to check the Apple server periodically and download and install updated software for you.

To Learn More

- For more information, search for "Software Update" in Mac Help.
- For the latest information on the Mac OS, go to the Mac OS website at www.apple.com/macos

iChat—Chat with Friends over the Internet



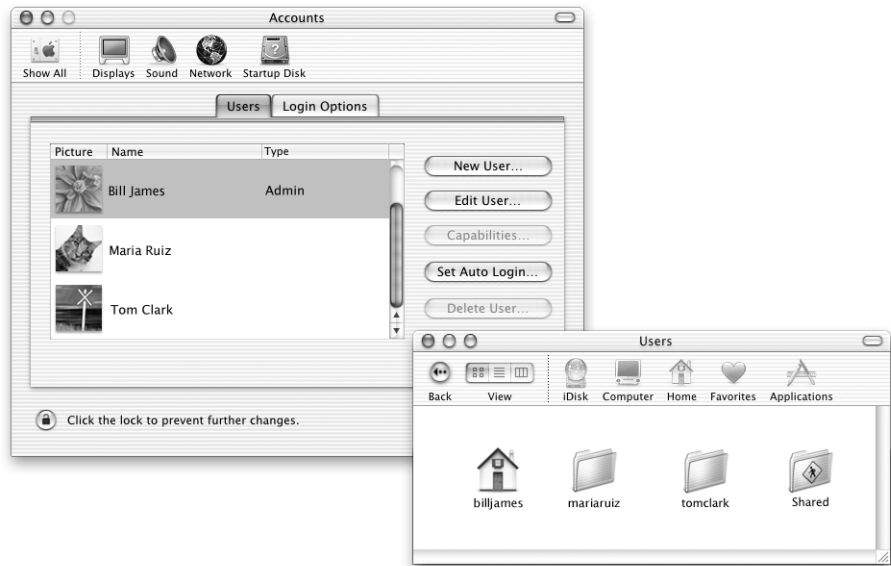
What You Can Do

If you are connected to the Internet, you can use iChat to have real-time text conversations online. Chat with other iChat users and with friends who use AIM (AOL Instant Messenger). You can also easily transfer pictures, documents, and other files while chatting. Log on to iChat using your .Mac user name or your AIM screen name.

To Learn More

- See iChat Help.
- Go to the iChat website at www.apple.com/ichat

Accounts—Turn One Mac Into Many



What You Can Do

Several people can share a single computer by logging in to their individual user accounts. Users can select their own customized settings, such as bookmarks and desktop views, and access their own private storage space, called “Home.” Users sharing the computer also have access to a common Shared folder.

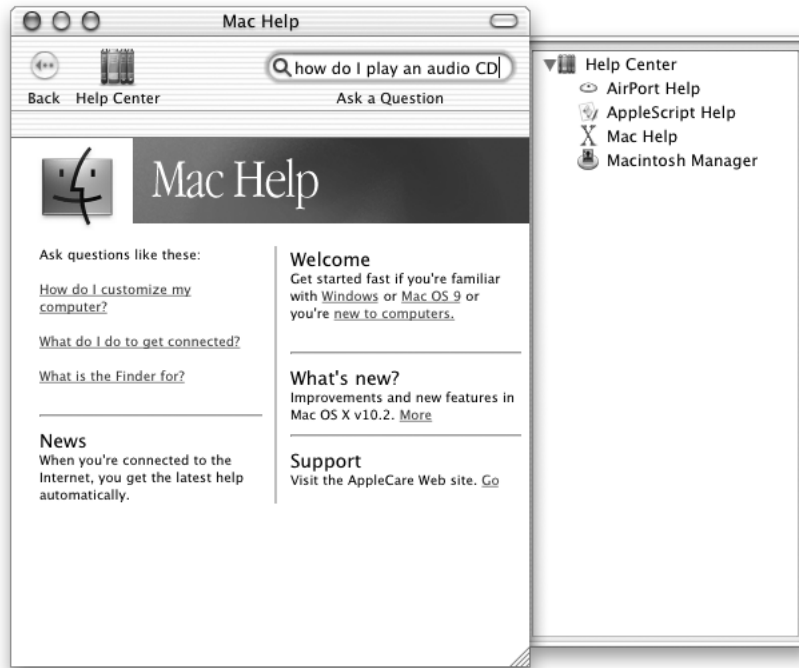
The first user account created on your computer is designated an administrator. Administrators are users with special privileges: they can give new users access to the computer, install software, and change general computer settings.

Note: If you forget the administrator password, you can reset it using the *Software Install and Restore* DVD. Start up from the *Software Install and Restore* DVD and choose Reset Password from the Installer menu. Because a user with the *Software Install and Restore* DVD can gain unrestricted access to the computer, you should keep the DVD in a safe place.

To Learn More

For more information on setting up user accounts in Mac OS X, search for “users” in Mac Help.

Mac Help—Answers to All Your Macintosh Questions



To Use Mac Help

- 1 Click the Finder icon in the Dock.
- 2 In the Help menu, choose Mac Help.
- 3 Type a question and press the Return key on your keyboard.
- 4 Double-click an item in the list of Help topics.

Using Your Computer

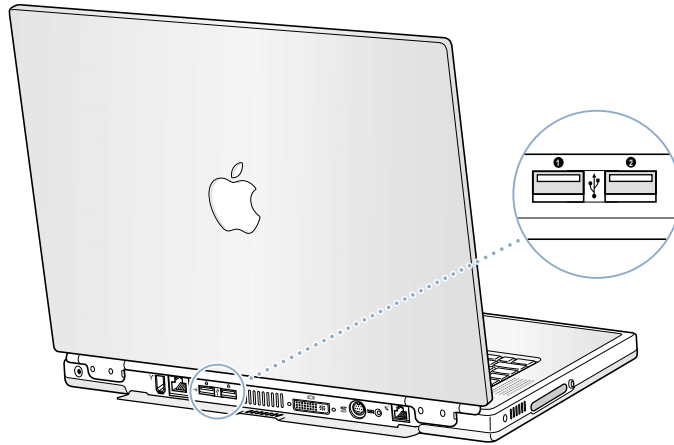
Your PowerBook has many built-in features and expansion capabilities you can use to customize and expand your computer to fit your needs. These include the following:

- Universal Serial Bus (USB) for connecting additional equipment to your PowerBook, such as printers, scanners, joysticks, keyboards, digital cameras, and floppy disk drives.
- FireWire for connecting high-speed equipment, such as digital video cameras and external hard drives.
- The latest in communications technologies, such as a 56K modem, 10/100/1000Base-T Ethernet, and AirPort wireless Internet and networking.
- DVI video output with included DVI-to-VGA adapter gives you the ability to use your PowerBook with an external monitor, video projector, or digital flat panel display, including support for video mirroring and extended desktop (dual display) modes. Use your PowerBook's built-in S-video support to play DVD Video discs on your television.
- A long-lasting battery, one PC Card/CardBus slot, audio line in and out ports, and more.

To learn about what you can do with your PowerBook, start with the information in this chapter. Additional information can be found in Mac Help (see page 36) and on the many Apple Internet websites.

Universal Serial Bus (USB)

Your PowerBook comes with two USB ports, which you can use to connect many types of external devices, including printers, scanners, digital cameras, game pads, joysticks, keyboards, and floppy disk drives. USB makes it easy to connect external equipment. In most cases you can connect and disconnect a USB device while the computer is running. Once you connect the device, it is ready to use. You don't need to restart or reconfigure your computer.



Using USB Devices

To use a USB device with your computer, simply connect the device to the computer. Your computer automatically loads the correct software whenever you attach a new device.

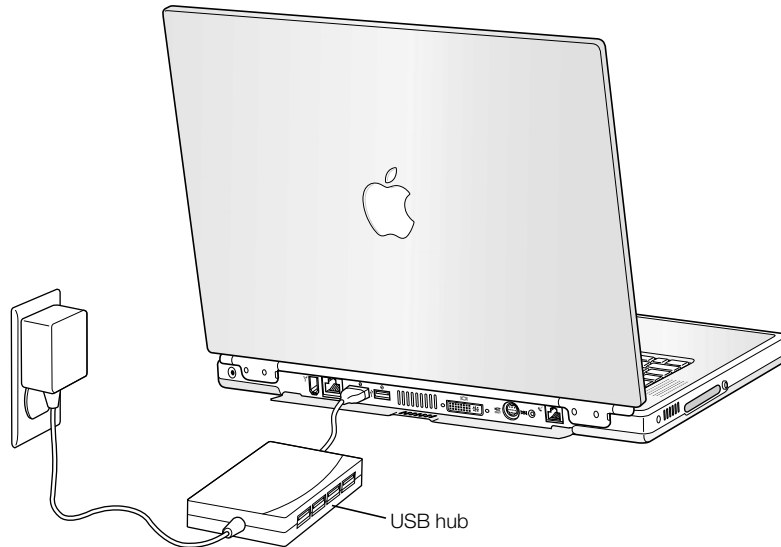
Note: Apple has already included software to work with many USB devices. When you connect a USB device, if your PowerBook cannot find the correct software, you can either install the software that came with the device or follow the onscreen prompts to use the Internet to locate, download, and install the correct software.

USB Devices and Battery Power

USB devices, such as joysticks and keyboards, that get power from the USB connection instead of a separate power adapter can be used with your PowerBook. However, these types of USB devices can cause your PowerBook battery to become depleted faster. If you are going to have a device connected for an extended period, it is a good idea to plug the PowerBook into its power adapter.

Using Multiple USB Devices at the Same Time

Your PowerBook has two USB ports. If you want to use more than two USB devices at the same time, purchase a USB hub. The USB hub connects to an open USB port on your computer and provides additional USB ports (usually four or seven). Most USB hubs also have a power adapter and should be plugged into an outlet.



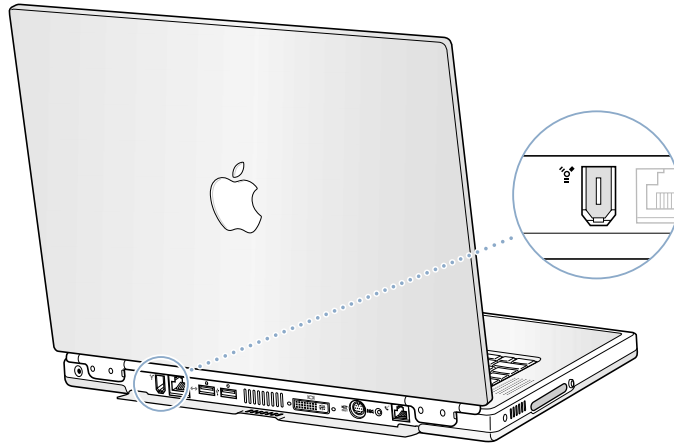
For More Information on USB

Additional information on USB is available in Mac Help (see page 36). Choose Mac Help from the Help menu and search for “USB.” You can also find information on the Apple USB website at www.apple.com/usb

For information on USB devices available for your computer, check the Macintosh Products Guide at www.apple.com/guide

FireWire

Your computer has one FireWire port. FireWire lets you easily connect and disconnect external high-speed devices—such as digital video (DV) cameras, printers, scanners, and hard disks. You can connect and disconnect FireWire devices without restarting your computer.



These are some of the things you can do with FireWire:

- Connect a digital video camera and capture, transfer, and edit high-quality video directly on your computer using video editing software such as iMovie or Final Cut Pro.
- Connect an external FireWire hard disk drive and use it to back up data or transfer files. A FireWire hard disk icon appears on your desktop after you connect the drive to your PowerBook.
- Start up from an external FireWire hard disk. Connect an external FireWire disk (with a valid operating system installed on it) and then open the Startup Disk pane of System Preferences and click the FireWire disk.
- Restart your computer.

Using FireWire Devices

To use a FireWire device with your computer, connect the device to the computer and install any software that came with the device. Your computer automatically senses when you attach a new device.

FireWire Devices and Battery Power

FireWire devices, such as certain external hard drives that get power from the FireWire connection instead of a separate power adapter, can be used with your PowerBook. However, these types of FireWire devices can cause your PowerBook battery to become depleted faster. If a device will be connected for an extended period, it is a good idea to plug the PowerBook into its power adapter.

Note: The FireWire port is designed to support power for FireWire devices (up to 7 watts maximum). You can connect multiple devices to each other and connect the “daisy-chain” of devices to the FireWire port on your computer, but only one device should get power from the computer. The rest of the devices in the daisy-chain should be powered by separate power adapters. Connecting more than one FireWire device that gets power from the computer may cause problems. If a problem occurs, shut down the computer, remove the FireWire devices, and restart your computer.

FireWire Target Disk Mode

If you want to transfer files between your PowerBook and another FireWire-equipped computer, or you have a problem that prevents your computer from starting up, you can use FireWire Target Disk Mode to connect to another computer.

To connect your PowerBook in FireWire Target Disk Mode, follow these steps:

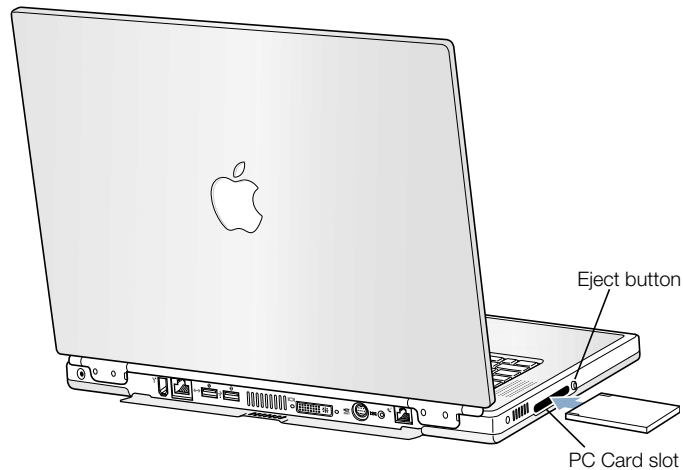
- 1 Make sure that your PowerBook is shut down.
- 2 Use a FireWire cable with a standard 6-pin connector on each end to connect your PowerBook to another FireWire-equipped computer.
- 3 Start up your PowerBook and immediately hold down the T key. Your PowerBook display shows the FireWire logo. The other computer's display shows the PowerBook internal hard disk icon and the icon of a CD or DVD disc in the PowerBook's optical drive.
- 4 When you are finished transferring files, drag the PowerBook hard disk icon and the CD or DVD disc icon to the Trash.
- 5 Press the Power button on the PowerBook to shut it down, and then disconnect the FireWire cable.

For More Information on FireWire

Additional information on FireWire is available in Mac Help (see page 36). Choose Mac Help from the Help menu and search for “FireWire.” You can also find information on the Apple FireWire website at www.apple.com/firewire

PC Cards

You can expand your computer's capabilities using the PC Card slot. Your PowerBook has one PC Card slot that accepts Type I and Type II PCMCIA cards, including CardBus-format cards. You can insert a PC Card when your computer is on, off, or in sleep.



Important The Apple AirPort Card is installed in a slot inside your computer. It does not go in the PC Card slot the way many third-party wireless cards do. The AirPort Card will not work if it is installed in the PC Card slot and will cause your computer to function improperly.

Inserting and Ejecting a PC Card

When inserting a PC Card, make sure the label is facing up and the card is level. You'll feel some resistance as you slide the card in. When the card is firmly seated in the slot, it clicks into place and an icon appears on the desktop. You can eject a PC Card when your computer is on or off, but not when it is in sleep.

To eject a PC Card:

- 1 If the computer is turned on, drag the card's icon to the Trash.
- 2 Push the PC Card eject button once to release the button.
- 3 Push the button again to eject the card.
- 4 Pull the card out of the slot and then push the eject button again to set it flush against the computer.

For More Information on PC Cards

For information on the PC Cards available for your PowerBook, check out the Macintosh Products Guide at www.apple.com/guide

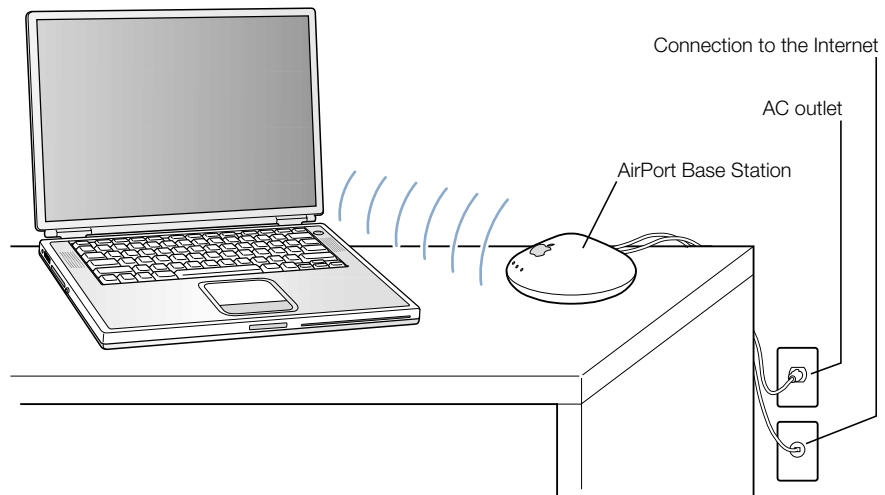
AirPort Wireless Internet and Networking

Your PowerBook is AirPort-ready. It has a built-in antenna, and an AirPort Card may already be installed in it depending on the configuration. AirPort offers an easy and affordable way to provide wireless Internet access anywhere in the home, at work, or in the classroom. Instead of using traditional cables, AirPort uses wireless local area network (LAN) technology to provide wireless communication between multiple computers. Through a wireless network you can set up access to the Internet, transfer files, play multiplayer games, and more.

Note: Wireless Internet access requires an AirPort Card, AirPort Base Station, and Internet access (fees may apply). Some Internet service providers are not currently compatible with AirPort. Range may vary with site conditions.

How AirPort Provides Wireless Internet Access

With AirPort, you set up a wireless connection to a device known as a *base station*, which has a physical connection to the Internet. AirPort technology works like a cordless telephone. The AirPort Card in the computer makes a wireless connection to the base, which is connected to the telephone line or a DSL or cable modem.



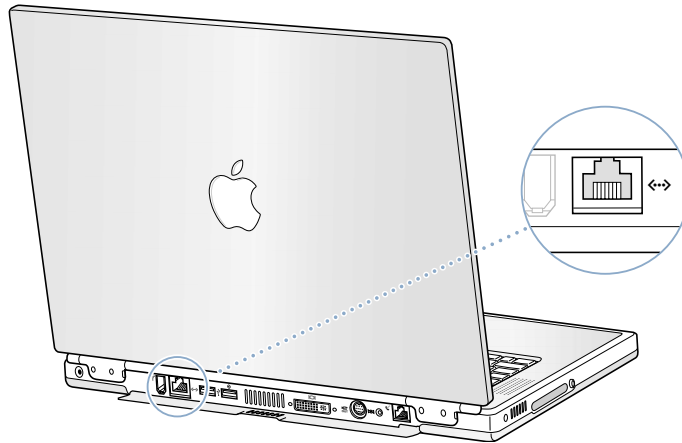
For More Information on AirPort

To purchase an AirPort Base Station, contact your Apple-authorized dealer or go to the Apple Store at www.apple.com/store

Additional information on AirPort is available in AirPort Help. Choose Help Center from the Help menu and click the AirPort Help link. You can also find information on the Apple AirPort website at www.apple.com/airport or the Apple Knowledge Base at kbase.info.apple.com

Ethernet (10/100/1000Base-T)

Your computer comes with built-in 10/100/1000 megabit per second (Mbps) twisted-pair Ethernet networking capability, which you can use to connect to a network, including a Gigabit Ethernet network, or to a cable or DSL modem.



Connecting to a network gives you access to other computers. You may be able to store and retrieve information; use network printers, modems, and electronic mail; or connect to the Internet. You can also use Ethernet to share files between two computers or set up a small network. The Ethernet port on your PowerBook auto-detects other Ethernet devices. You don't need an Ethernet crossover cable when connecting to other Ethernet devices.

- Use 2-pair category 3 Ethernet cables to connect to a 10Base-T Ethernet network.
- Use 2-pair category 5 Ethernet cables to connect to a 100Base-T Ethernet network.
- Use 4-pair category 5 Ethernet cables to connect to a 1000Base-T Ethernet network.

For More Information on Using Ethernet

Additional information, including setting up an Ethernet network and transferring files using Ethernet, is available in Mac Help (see page 36). Choose Mac Help from the Help menu and search for “Ethernet” or “network.”

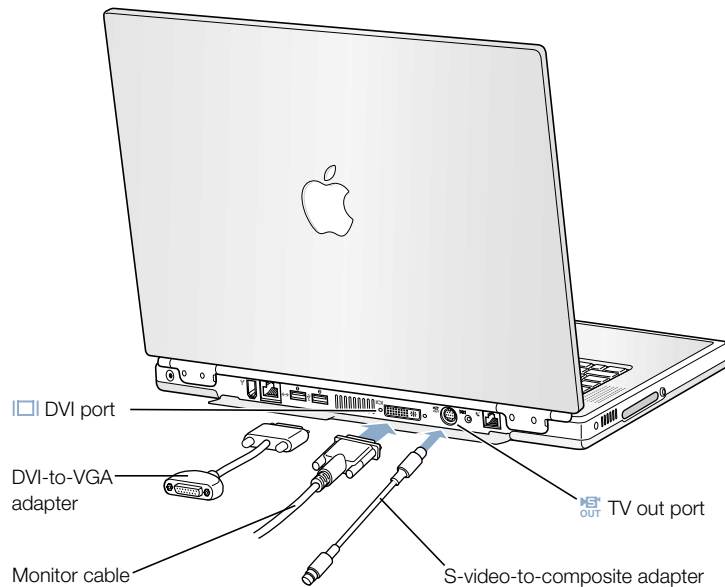
For information on networking products you can use with your PowerBook, check the Macintosh Products Guide at www.apple.com/guide

External Video Support (DVI/VGA and S-Video)

Your computer has a video output port that allows you to directly connect a display or projector with a DVI port. Use the included DVI-to-VGA adapter to connect your PowerBook to monitors and projectors that have VGA output.

The TV out port (also known as an *S-video out port*) on your computer lets you connect to a television, videocassette recorder (VCR), or video projection system using either an S-video or composite video cable (available at your local electronics store). You can use TV out to display images on a television, record computer images on a VCR, or play DVD-Video discs on your television.

If the device you want to connect does not have S-video, you can use the S-video-to-composite adapter that came with your PowerBook.



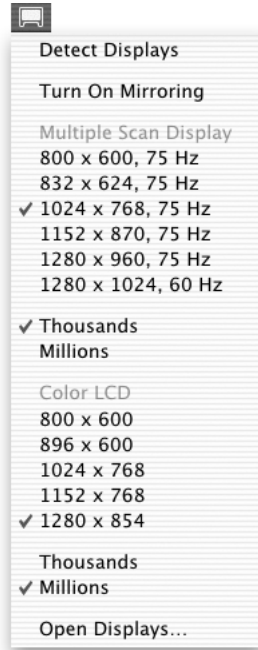
When an external monitor or television is connected, you can either have the same image appear on both the internal display and the external monitor (known as *video mirroring*) or use the external monitor to extend the size of the Mac OS desktop (known as *dual display mode*). By default, your PowerBook starts up in dual display mode. To work in mirroring mode, press the F7 (⌘) key to switch between video dual display and mirroring modes.

Note: Because of the display limitations of most televisions, images displayed on the television screen will be of lower quality than those on the built-in display or an external monitor.

Connecting an External Display or Projector

To connect an external display or projector to your computer with a DVI connection:

- 1 Turn on the external display or projector.
- 2 Connect the monitor cable to your PowerBook. Your PowerBook automatically detects the external display.
- 3 Adjust the resolution on the external display by clicking the Display tab in the Displays pane of System Preferences or use the Displays icon in the menu bar.



To connect an external monitor or projector to your computer with a VGA connection:

- 1 Turn on the external monitor or projector.
- 2 Connect the DVI-to-VGA adapter that came with your PowerBook to the external monitor or projector's VGA port.
- 3 Connect the DVI-to-VGA adapter to your PowerBook. Your PowerBook automatically detects the external monitor.

Important To ensure that your PowerBook automatically detects the external monitor or projector, be sure the DVI-to-VGA adapter is plugged into the external monitor or projector first.

- 4 Adjust the resolution on the external monitor or projector.

For information on the supported external monitor resolutions, see “External Monitor in Dual Display or Video Mirroring Mode” on page 90.

Using Your PowerBook With the Display Closed

You can use your PowerBook with the display closed if the computer is connected to an external monitor, keyboard, and mouse, and the power adapter is plugged into the PowerBook and an outlet.




To operate your computer with an external monitor attached and the display closed, do the following:

- 1 Connect a USB keyboard and mouse to your PowerBook.
- 2 Close the PowerBook display to put the computer to sleep.
- 3 Follow the steps in the previous section to connect your PowerBook to an external monitor.
- 4 Wait a few seconds and then press any key on the external keyboard to wake the PowerBook.

Important Keep the PowerBook’s display open at a 90-degree or greater angle when your PowerBook is attached to an external display and running in dual display or video mirroring mode. This allows for proper air circulation over the keyboard and assists with heat dissipation.

Connecting a Television, VCR, or Other Video Device

To connect a device to the TV out port:

- 1 Connect an S-video cable to the TV out port () on your PowerBook (or use the S-video-to-composite adapter to connect a composite video cable) and connect the other end to your device.
- 2 If you want to send the sound from your PowerBook to the device, connect a miniplug-to-RCA cable (not included) from the headphone port () on your PowerBook to the audio input ports on your device.
- 3 Turn on the external device.
- 4 Hold down the Command () key and press the F2 key to detect the TV monitor.
- 5 To adjust how the images are displayed on the device, use the Displays pane of System Preferences.

Connecting an Apple Flat Panel Display

You can connect your PowerBook to an Apple Flat Panel display using a DVI-to-ADC adapter, available from your Apple-authorized dealer, an Apple Retail Store, or from the Apple Store at www.apple.com/store

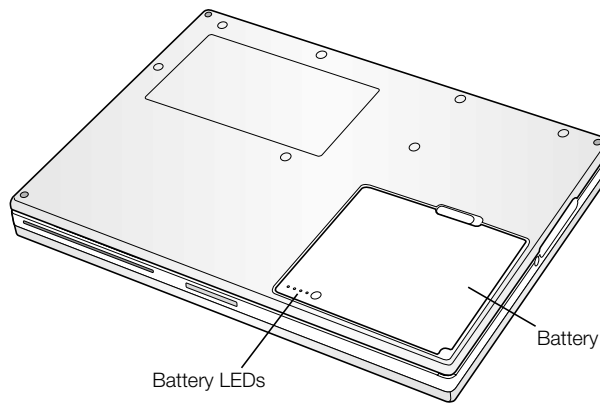
For More Information on Using an External Monitor or TV

Additional information on using and configuring an external monitor is available in Mac Help (see page 36). Choose Mac Help from the Help menu and search for “monitor.”

Battery

When the external power adapter is not connected, your computer draws power from its battery. You can determine the charge left in your battery by looking at the battery level indicator lights on the battery itself. Press the button next to the lights and the lights glow to show how much charge is left in the battery. The indicator lights remain lit for a few seconds after you press the button. You can check the charge with the battery in or out of your PowerBook.

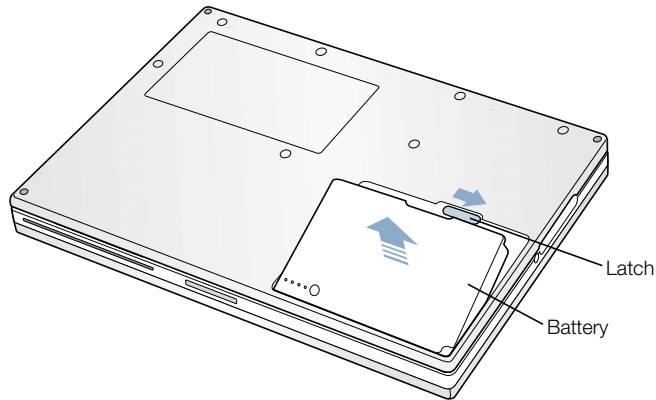
Important If only one flashing light is on, very little charge is left. If no lights are visible, the battery is completely drained and the computer will not start up unless the power adapter is connected. Plug in the power adapter for several hours to let the battery recharge, or replace the drained battery with a fully charged battery (see page 50).



Removing and Replacing the Battery

To remove the battery:

- Shut down or put your PowerBook to sleep. Turn it over, and locate the battery release latch. Slide the latch to the side and gently remove the battery.

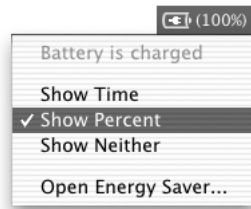


Swapping Batteries While the Computer Is in Sleep

If your battery runs low while you are working, you can put your PowerBook to sleep and replace the battery with a charged one. The internal backup battery provides enough power to maintain the contents of RAM for three minutes while you change the battery.

Charging a Battery

When the power adapter that came with your computer is connected, the battery is recharging whether the computer is off, on, or in sleep. However, the battery will recharge more quickly if the computer is off or in sleep. You can monitor the battery charge level using the battery status icon in the menu bar:



The battery charge level displayed is based on the amount of power left in the battery with the applications, peripheral devices, and system settings (display brightness, Energy Saver settings, and so on) you are currently using. To make more battery power available, close applications and disconnect peripheral devices not in use, and adjust your Energy Saver settings (see “Battery-Conservation Tips” on page 52).

Calibrating a New Battery for Best Performance

To get the longest running time from a new PowerBook battery, let the battery run down within the first week of use and then fully charge it one time. Follow these steps:

- 1 Plug in the power adapter and fully charge your PowerBook battery until the battery indicator lights and the onscreen meter indicate that the battery is fully charged.
- 2 Disconnect the power adapter and use your PowerBook until you see the first low battery warning dialog on your screen.
- 3 Connect the power adapter and leave it connected until the battery is fully charged again.

Important You have to fully discharge and then charge your battery only once to calibrate it. After that, you can connect and disconnect the power adapter when the battery is at any charge level.

Battery-Conservation Tips

The amount of work time your PowerBook battery can provide before you need to recharge depends on the applications and peripheral devices you're currently using with your computer and the steps you take to conserve power while you work.

For the best conservation of battery power, do the following:

- Disconnect bus-powered USB or FireWire devices when they are not in use.
- Quit open applications that you are not using.
- Remove CD and DVD discs when they are not in use.
- Reduce screen brightness using the brightness controls on the PowerBook keyboard.
- If you have an AirPort Card installed, turn AirPort off (use the AirPort status icon in the menu bar).
- Set the hard disk to spin down after a short time.
- Set your PowerBook to sleep after inactivity of five minutes or less.

Select the following options in the Energy Saver pane of System Preferences to save battery power:

- Choose Longest Battery Life from the Optimize Energy Settings pop-up menu, and then click More Options.
- Choose Battery Power from the “Settings for” pop-up menu, and then choose Reduced from the Processor Performance pop-up menu on the Options tab.

For More Information on Your PowerBook Battery

Additional information is available in Mac Help (see page 36). Choose Mac Help from the Help menu and search for “battery.”

Using Your Optical Drive

You can install or run software from CDs using your optical drive. You can play multimedia on CD discs and music from audio CDs. Your optical drive can write music, documents, and other digital files on CD-R and CD-RW discs. You can also play DVD movies and use most DVD discs. SuperDrives can also record information on blank DVD-R (recordable DVD) discs.

Important The optical drive on your PowerBook supports standard circular 12 cm discs. Irregularly shaped discs or discs smaller than 12 cm are not supported. Noncircular discs may become lodged in the drive.

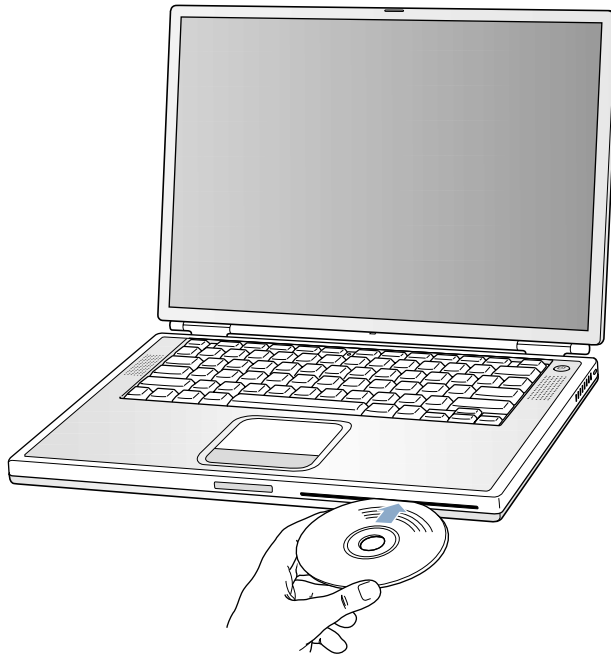
Note: If you have older software that comes on floppy disks, contact the software manufacturer to see if the software is available on a CD or purchase an external USB floppy disk drive for your PowerBook G4 from your Apple dealer or the Apple Store (www.apple.com/store).

Inserting a CD or DVD Disc

To install or use programs from a CD or DVD disc, follow these steps:

- 1 With the computer turned on, insert the disc (with the label facing up) into the drive slot until you feel the drive catch the disc and take it the rest of the way in. The disc may need to be inserted nearly all the way in before the drive takes it in the rest of the way. This is normal.

Note: Some DVD discs are two-sided.



- 2 When the icon for the disc appears on the desktop, the disc is ready to use.

Ejecting a Disc

To eject a disc, do one of the following:

- Drag the disc icon to the Trash.
- Press and hold the Media Eject (⏏) key on the keyboard until the disc ejects.

Allow the disc to fully eject before removing or reinserting it.

If you can't eject the disc, try the following:

- Quit any applications that may be using the disc and try again.
- Restart your computer and hold down the trackpad button during startup until the disc ejects.

Playing DVD Discs

To play a DVD-Video disc on your PowerBook, insert the DVD disc. DVD Player opens automatically and starts playing the disc.

If you use S-video to connect your PowerBook to a TV so that you can watch a DVD-Video on the TV screen, select 720 x 480 NTSC (in the United States) or 720 x 576 PAL (in Europe and other regions) in the Display tab of the Displays pane of System Preferences.

Note: Move the menu bar to the TV screen in the Arrange tab of the Displays pane of System Preferences.

You can easily connect your PowerBook to your stereo system. Use a miniplug-to-RCA cable (not included) to connect the headphone port (🎧) on your PowerBook to the audio input ports on your stereo.

Recording CD-R and CD-RW Discs

You can record music on CD-R or CD-RW discs right from your iTunes library.

- 1 Click the iTunes icon in the Dock.
- 2 Select the playlist you want to record.
- 3 Insert a blank CD-R or CD-RW disc.
- 4 At the top of the iTunes window, click Burn CD.

You can also record data on CD-R and CD-RW discs with Disc Burner.

- 1 Insert a blank disc in the optical drive.
- 2 In the dialog that appears, enter a name for the disc. An icon for the CD appears on the desktop.
- 3 Drag files and folders to the icon.

- 4 In the File menu, choose Burn Disc, or select the disc and drag it to the Burn Disc icon in the Dock.

For More Information

- For information about how to use iTunes to record music files on a CD-R disc, see the onscreen help for iTunes in the Help Center.
- For instructions on using DVD Player, open DVD Player and choose DVD Player Help from the Help menu.

Recording Information on a DVD

If you have a SuperDrive, you can author your own digital movies on a blank DVD-R (DVD-Recordable) disc. You can also record other kinds of digital data, such as backing up files onto DVD-R discs. However, once you record information on a DVD-R disc, it cannot be overwritten.

With applications like iDVD or DVD Studio Pro, you can create your own customized DVD, burn it on a blank DVD-R disc, and play it on most standard DVD players.

When you are finished with an iDVD project, you can write it to a blank DVD-R disc.

- 1 Open iDVD and open your completed DVD project.
- 2 Click the Burn button.
- 3 Insert a new blank DVD-R disc into the drive when prompted.
- 4 Click the Burn button again.

You can also record data on DVD-R discs with Disc Burner.

- 1 Insert a blank DVD-R disc in the drive.
- 2 In the dialog that appears, enter a name for the disc and select the format you want to create. An icon for the DVD appears on the desktop.
- 3 Double-click the DVD icon, then drag files and folders to it.
- 4 In the File menu, choose Burn Disc or select the disc and drag it to the Burn Disc icon in the Dock.

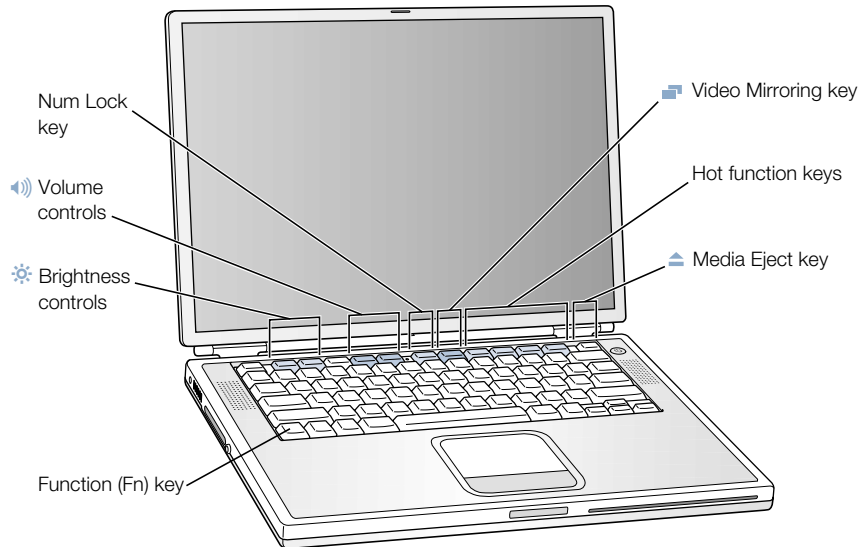
For more information about how to use iDVD, see the online help for iDVD in the Help Center.

Important If your battery runs down when you are burning a DVD, the burn may fail and the DVD disc will not be able to be used again. To avoid this, always use your power adapter when burning a DVD.

Keyboard Controls and Programmable Function Keys

You can quickly adjust settings such as volume and screen brightness and eject a CD or DVD disc using the keyboard controls.

Your PowerBook also has four additional keys that you can set up to open your frequently used applications or documents in Mac OS 9. These keys are known as *programmable* (or *hot*) *function keys*. For example, you can use these keys to open your web browser, word processor, or favorite game. Once applications are open, you can use the keys to switch quickly between them.



Assigning Programmable Function Keys

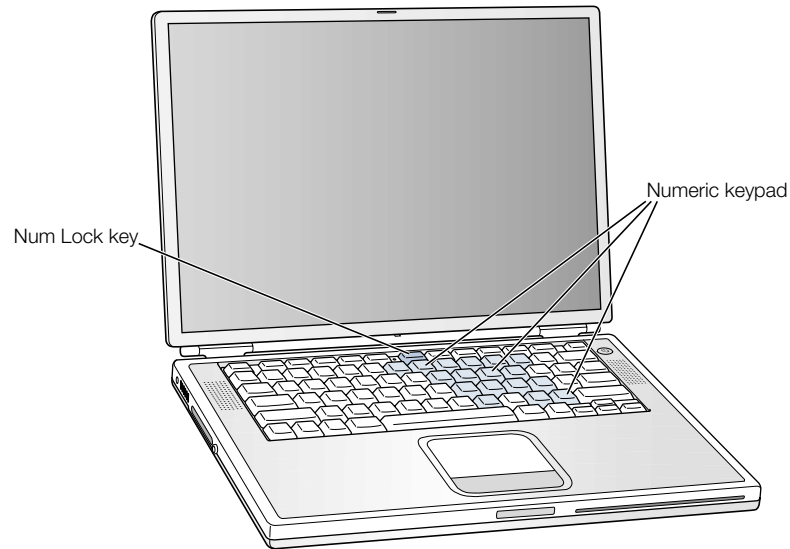
In Mac OS 9, the first time you press one of the function keys, a dialog appears that lets you assign any of the function keys to an application. After that, you can change function key assignments using the Keyboard control panel. This feature is available only in Mac OS 9.

Using the Standard Function Keys

You can quickly change a key from a control or programmable function key to a standard function key by pressing the Fn key while you press the other key. In Mac OS X, use the Keyboard pane of System Preferences to control the function keys. You can also use the Keyboard control panel in Mac OS 9 to reverse the keys so that the standard function keys are primary and the screen controls and programmable function keys are secondary. (You would hold down the Fn key to change the screen brightness, for example.)

Using the Embedded Numeric Keypad

Most desktop computer keyboards have a numeric keypad in addition to the regular keyboard keys. Your PowerBook keyboard has a numeric keypad incorporated in the standard keyboard keys. Keys used for the numeric keypad have a smaller secondary label.



To use the numeric keypad, press the Num Lock key on the keyboard. The light next to the Num Lock key turns on, indicating that the keypad is active. When you're finished, press the Num Lock key again to turn it off.

Note: When the numeric keypad is active, other keys and keyboard equivalents for menu commands (such as ⌘ -Q to quit) are deactivated.

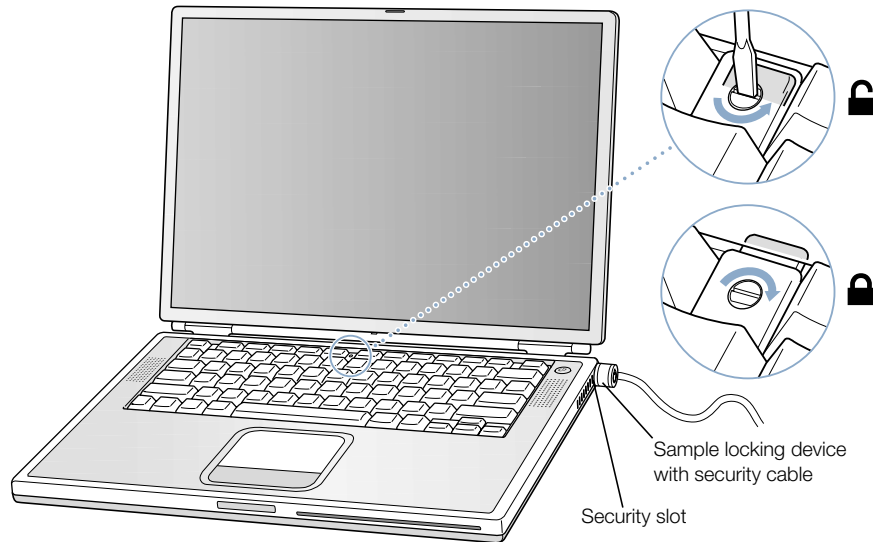
For More Information on Keyboard Controls

Additional information on configuring the keyboard controls and programmable function keys is available in Mac Help (see page 36). Choose Mac Help from the Help menu and search for “keyboard.”

Security Slot and Keyboard Lock

You can purchase a security cable lock to protect your PowerBook. With a lock, you can secure your computer to a desk or table.

Your PowerBook also comes with a keyboard locking mechanism. When the keyboard lock is engaged, the keyboard can't be flipped up for access to the internal components of the computer, including the memory.



The keyboard locking mechanism is in the small plastic tab to the left of the Num Lock key, which also contains the Num Lock indicator light. Your PowerBook comes with the keyboard unlocked.

To lock the keyboard, use a small flathead screwdriver to turn the screw clockwise 1/2 turn. A small tab prevents the keyboard from being removed.

Note: The screw that turns the plastic tab has a small notch on one side that you can use to determine if the keyboard is locked. If the notch in the screw is on the top, the keyboard is unlocked. If the notch in the screw is on the bottom, the keyboard is locked.

For More Information on Security Options

Additional information on the software security features of your PowerBook, including multiple user passwords and file encryption, is available in Mac Help (see page 36). Choose Mac Help from the Help menu and search for “security” or “multiple users.”

Working With Your Operating System

An operating system, or OS, is the environment that defines how the items on your computer's desktop are represented and how you interact with them. Each OS has a different look and feel.

Your computer comes with Mac OS X installed as the default operating system, and with Classic, an environment for using Mac OS 9 applications while the computer is running Mac OS X. The first time you start your computer, it starts up using Mac OS X. Your computer also comes with Mac OS 9. To switch between Mac OS X and Mac OS 9, see “Switching Between Operating Systems” on page 61.

Some software applications have not yet been optimized to work with Mac OS X or Classic. They perform best in Mac OS 9. If you use only Mac OS 9-compatible software and do not need the special features of Mac OS X, you can start up your computer in Mac OS 9. This chapter describes some of the features of Mac OS X and Classic, and how to switch your default operating system from Mac OS X to Mac OS 9.

About Mac OS X

Mac OS X advanced technologies include an elegant new user interface, incredible graphics capabilities, and added system stability and performance. Mac OS X manages your computer processes so you can concentrate on what you want to do. You don't need to restart your computer if something goes wrong with one software application—Mac OS X shuts down only that application so you can keep working without interruption. The Mac OS X virtual memory manager allots the amount of memory your software applications need to run efficiently.

When you're ready to learn more about Mac OS X, read *Welcome to Mac OS X*, a book that introduces the features of Mac OS X and provides tips for using Mac OS X to perform common tasks. If you experience any problems while learning about Mac OS X, see the troubleshooting tips in the back of the book or choose Mac Help from the Help menu in Mac OS X.

Important Because Mac OS X is already installed on your computer, you don't need to follow the installation instructions in *Welcome to Mac OS X*. You need to follow the instructions in *Welcome to Mac OS X* only to log in and begin using Mac OS X.

Information About Software and Mac OS X

For information about the compatibility of software applications with Mac OS X, or to read more about Mac OS X, check the Apple website: guide.apple.com/macosex/

Using Classic in Mac OS X

In addition to using Mac OS X applications, you can continue to use Mac OS 9 applications in the Classic environment. Classic works in the background to access Mac OS 9 features and software applications. When you start up Classic, Mac OS 9 software works in Mac OS X just as it does in Mac OS 9, but doesn't benefit from Mac OS X features such as the look of the new interface. Simply open a Mac OS 9 application or double-click a document created in a Mac OS 9 application. If Classic isn't running, it starts up.

Classic continues to run in the background, even if no Mac OS 9 applications are open, so applications and documents open faster and more easily. You can set your computer to start up Classic automatically when you log in to Mac OS X. In the Apple (🍏) menu, choose System Preferences, click Classic, and select "Start Classic when you log in."

To quit the Classic environment, click Stop in the Classic pane of System Preferences. You can save any unsaved changes to your Classic documents and quit Classic.

Important Do not remove the Mac OS 9 operating system from your computer. For Classic to work, Mac OS 9 must be installed.

Switching Between Operating Systems

Your computer will always start up using Mac OS X unless you set it to use Mac OS 9. Some tasks and software applications may require your computer to start up using Mac OS 9. You can change the Mac OS your computer uses as often as you like.

To set your computer to start up in Mac OS 9:

- 1 In Mac OS X, choose System Preferences from the Apple () menu and click Startup Disk.



- 2 Select the Mac OS 9 folder as your startup system. (If the folder icons are dimmed, click the lock at the bottom of the pane and type the user name and password that you created previously in the Setup Assistant. See *Welcome to Mac OS X* for more information about logging in as an administrator.)
- 3 Restart your computer.

Note: Because Apple frequently releases new versions and updates to its system software, the version number of the Mac OS X and Mac OS 9 operating systems in this manual may be different from those installed on your computer.

To set your computer to start up in Mac OS X:

- 1 In Mac OS 9, choose Control Panels from the Apple (🍏) menu, then choose Startup Disk.
- 2 In the Startup Disk control panel, double-click the hard disk that contains your operating systems and select the Mac OS X System folder as your startup disk. You can click the triangle to the left of the hard disk icon to see the System folders installed on it.



- 3 Restart your computer.

Need Help?

For more information about the features of your Macintosh, choose Mac Help from the Help menu and click any of the blue underlined text. You can also type a question in the Search field and press Return on the keyboard.

Working Inside Your Computer

This chapter provides information and instructions for working inside your computer.

Instructions are provided for the following procedures:

- “Installing Additional Memory” on page 63
- “Removing the Internal Hard Disk” on page 72
- “Installing an AirPort Card” on page 80

Warning Apple recommends that you have an Apple-certified technician install memory or remove the internal hard disk. Consult the service and support information that came with your computer for instructions on how to contact Apple for service. If you attempt any of these procedures and damage your equipment, such damage is not covered by the limited warranty on your computer.

Installing Additional Memory

Your computer comes with two memory slots, one above the other, that you access by removing your PowerBook keyboard. Your computer comes with a minimum of 256 megabytes (MB) of Synchronous Dynamic Random-Access Memory (SDRAM) installed in the lower slot. Both memory slots can accept a SDRAM module that meets the following specifications:

- Small Outline-Dual Inline Memory Module (SO-DIMM) format
- 1.25 inch or smaller
- 256 or 512 MB
- 144-pin
- PC-133 Type RAM

Depending on the configuration of the PowerBook you purchased, both memory slots may already be full.

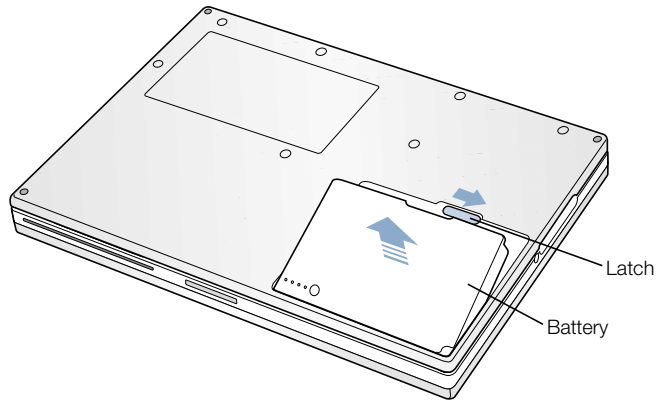
SDRAM from an earlier PowerBook that meets these specifications can be used with your PowerBook.

The maximum amount of RAM you can install in your PowerBook is 1 GB, using 512 MB DIMMs in both the upper and lower RAM slots.

Installing Additional RAM

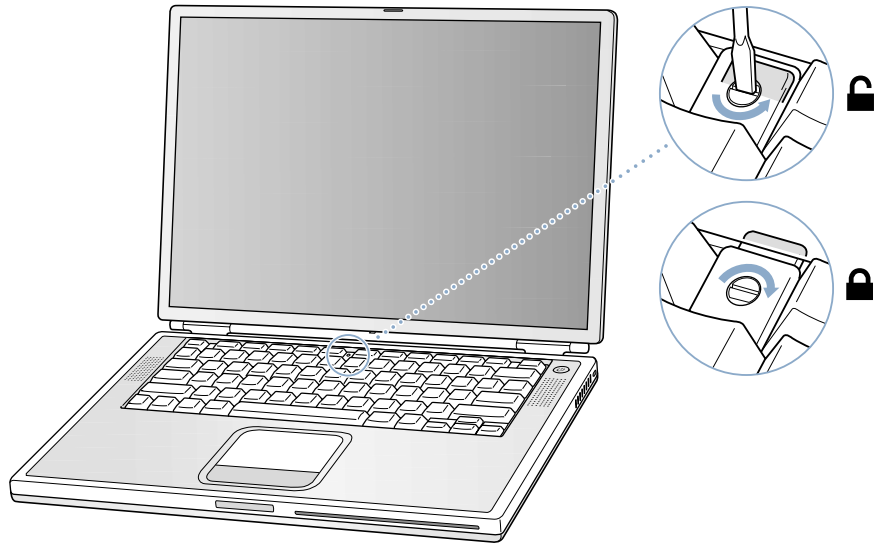
- 1 Shut down your computer. Disconnect the power adapter, phone cord, and any other cables connected to the computer.
- 2 Flip the computer over and remove the battery.

This prevents you from accidentally turning on the computer while installing memory.

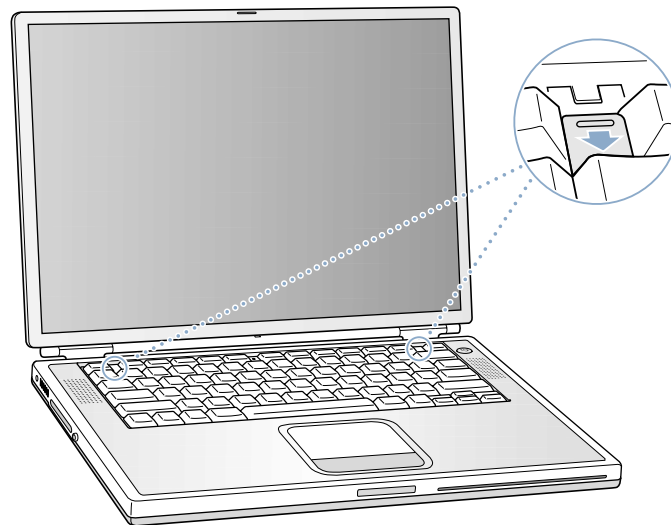


Warning The internal components of your PowerBook may be hot. If you have been using your PowerBook, wait 30 minutes after shutting down your computer to let the internal components cool down before continuing.

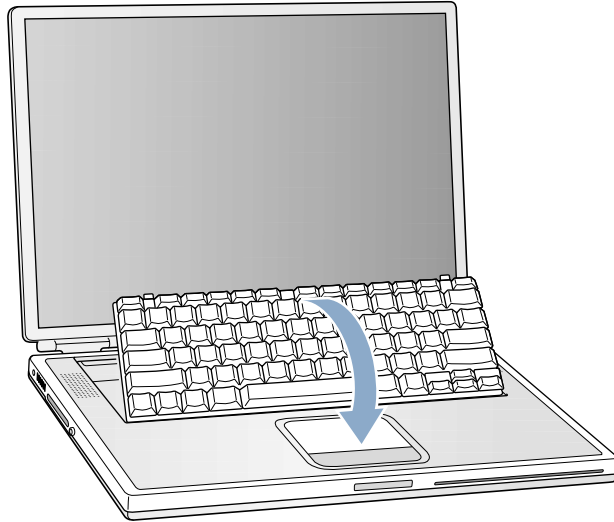
- 3 Make sure that the keyboard locking screw is not in the locked position. Your new PowerBook comes with the keyboard unlocked, so unless you or someone else locked the keyboard, you can skip this step.



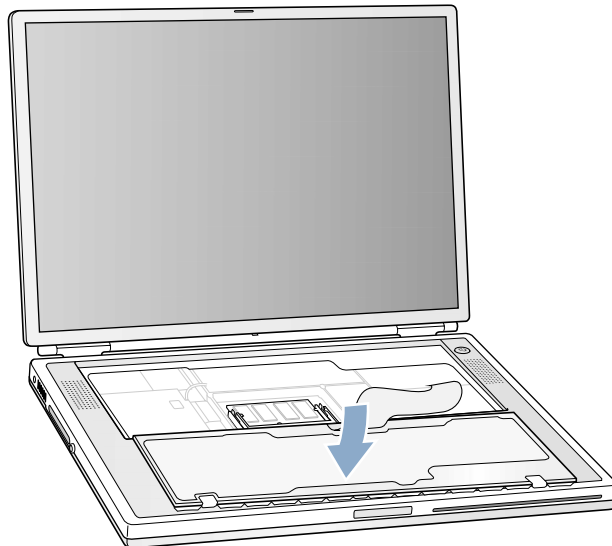
- 4 Release the keyboard by pulling down on the keyboard release tabs (located to the left of the F1 and F12 keys) and then lift the top portion of the keyboard.



- 5 Lift the top portion of the PowerBook keyboard up slightly near the top row of keys and pull it back far enough to displace the small tabs that hold the bottom of the keyboard in place.

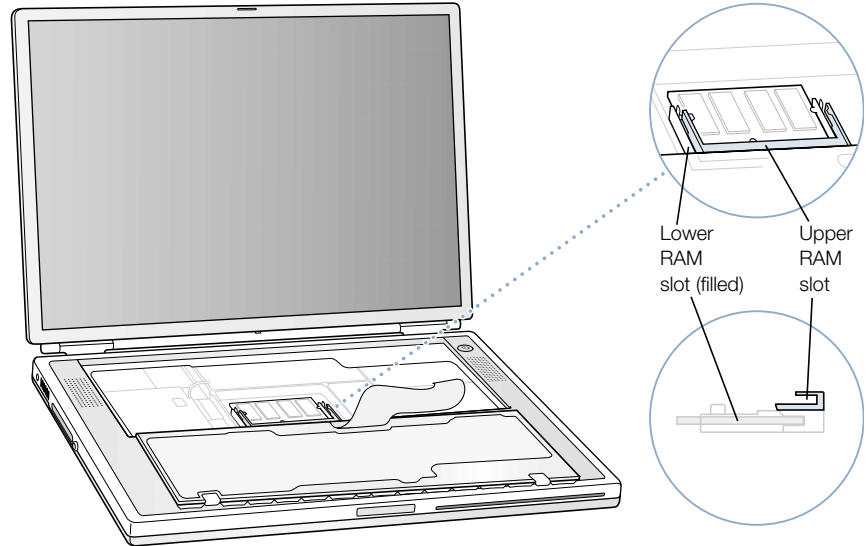


- 6 Flip the keyboard over and lay it on the palm rests and trackpad.

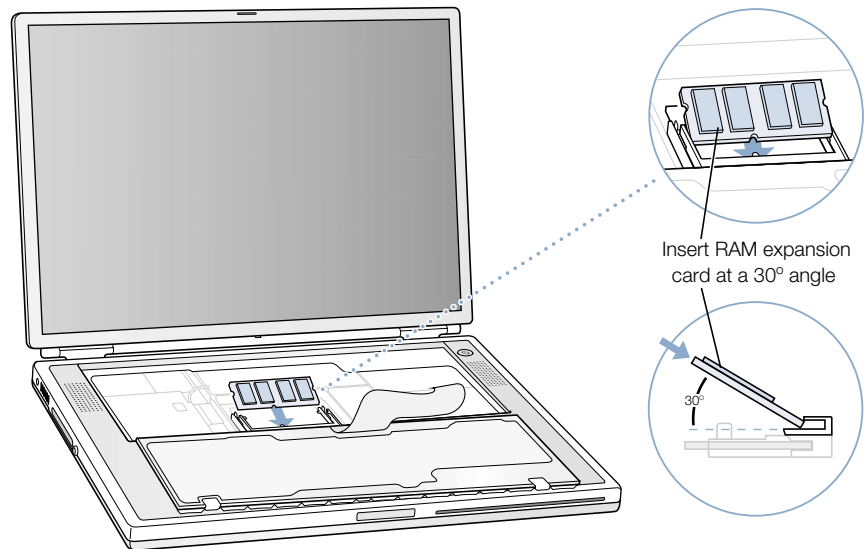


- 7 Touch a metal surface inside the computer to discharge any static electricity.

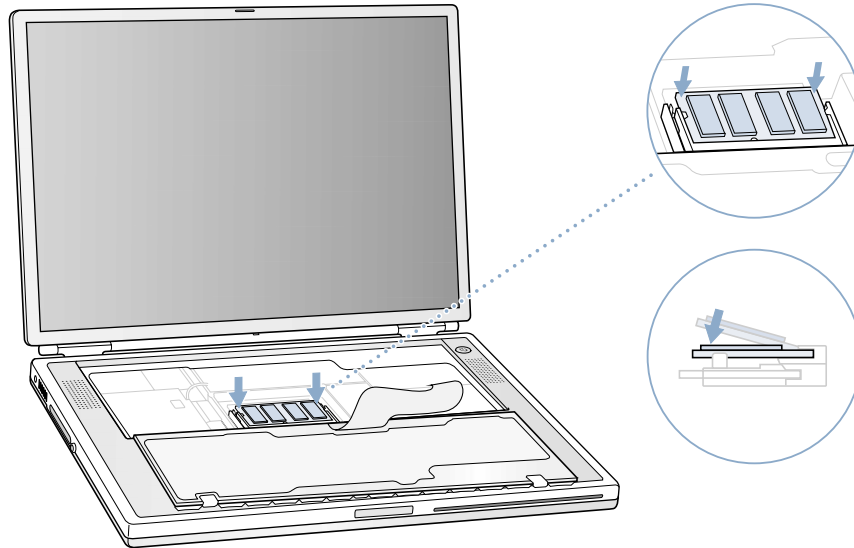
- 8 Locate the RAM expansion slots.



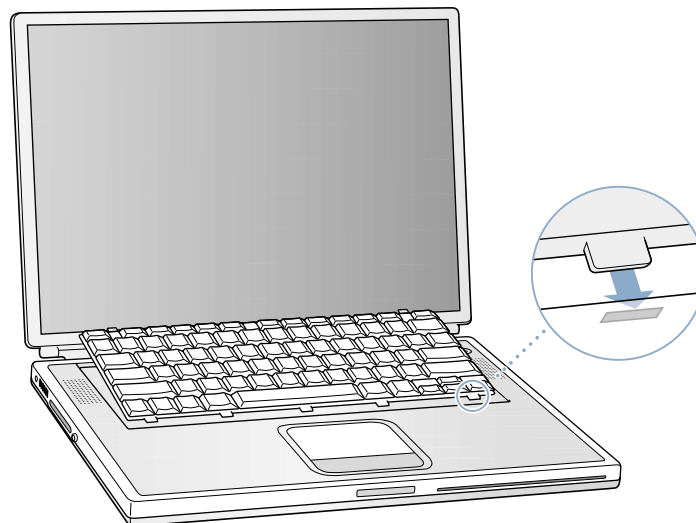
- 9 Hold the RAM expansion card at a 30-degree angle. Line up the notch in the card with the small tab in the RAM expansion slot and slide the card into the slot until the gold edge is almost invisible. Then gently push the RAM expansion card into the expansion slot. You may feel some resistance.



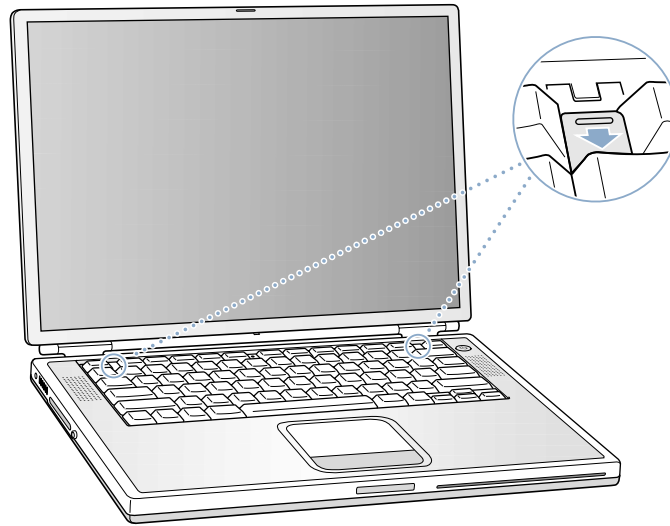
- 10** Gently spread the small tabs in the expansion slot away from the notches and push the RAM expansion card down until the two snaps on either side of the card lock into place.



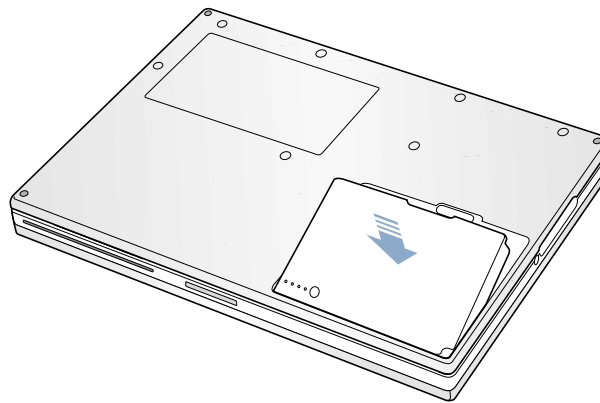
- 11** Flip the keyboard back on top of the opening in your PowerBook and insert the small tabs at the bottom of the keyboard all the way into the openings in the PowerBook case.



- 12** Pull down on the keyboard release tabs (located to the left of the F1 and F12 keys) and then press down on the top portion of the keyboard.



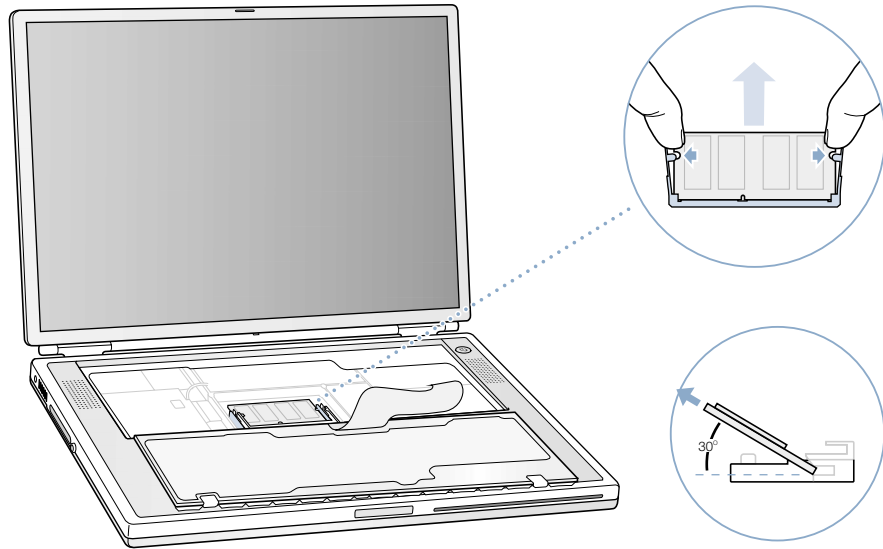
- 13** Let go of the keyboard release tabs to secure the keyboard in place.
- 14** Turn the PowerBook over and replace the battery.



- 15** Reconnect the power adapter and any other cables that were attached.

Removing Memory

- 1 Gently spread the small tabs in the expansion slot away from the notches in the memory card. The memory card should pop up slightly.



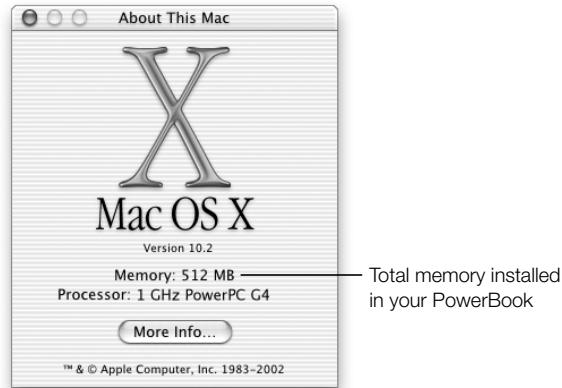
- 2 Lift the memory card to a 30-degree angle and then gently slide the card out of the expansion slot.

You can replace the RAM expansion card in the lower slot, and then add RAM to the upper slot.

Making Sure Your Computer Recognizes the New Memory

After installing additional memory in your PowerBook, check whether the computer recognizes the new memory. Do the following:

- 1 Start up your computer.
- 2 When you see the Mac OS desktop, choose About This Mac from the Apple () menu.



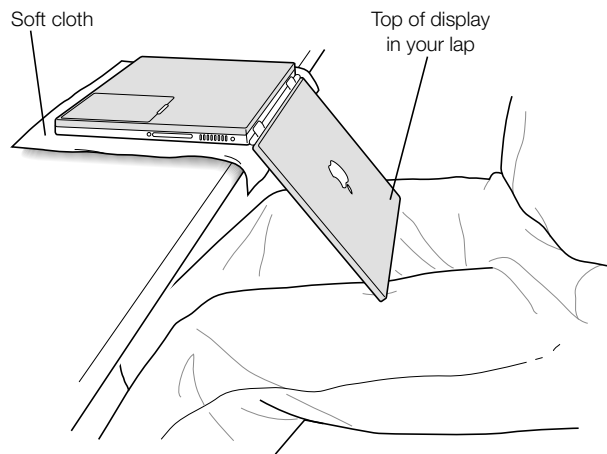
The total includes the amount of memory that originally came with the computer plus the new memory you added. For a more detailed breakdown of the amount of memory installed in your computer, choose Apple System Profiler, located in the Utilities folder in the Applications folder.

If the memory is not recognized or your computer does not start up correctly, shut down your PowerBook and check the instructions again to make sure that the memory you installed is compatible with this PowerBook and that it is installed correctly. If you still have problems, remove the memory and consult the support information that came with the memory or contact the vendor who provided the memory.

Removing the Internal Hard Disk

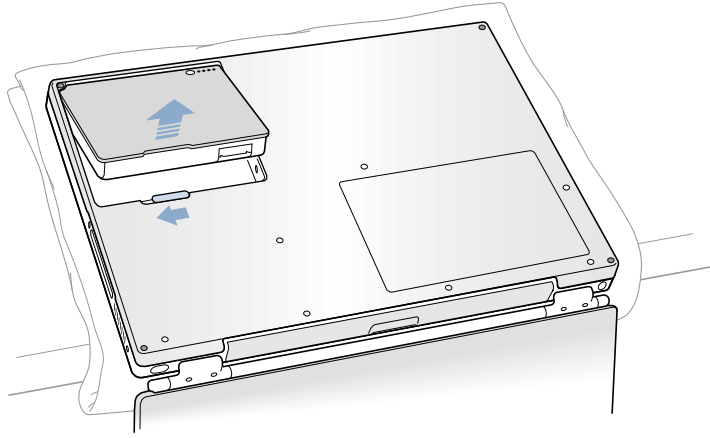
When the computer is shut down, the internal hard disk can be removed for security or maintenance.

- 1 Shut down your computer. Disconnect the power adapter, phone cord, and any other cables connected to the computer.
- 2 Place a towel or soft cloth on a table in front of you. The towel or cloth will protect the keyboard and display of the PowerBook when you flip it over. Make sure that it covers an area large enough for your PowerBook and that it hangs over the edge of the table.
- 3 With the display open, carefully flip the PowerBook over and rest it on the edge of a table. Make sure the weight of the computer is on the table and not on the display.



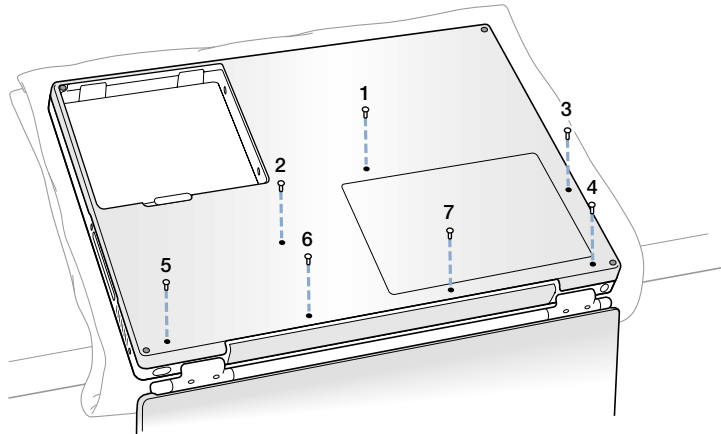
Important Do not open the display further than the angle shown above.

- 4 Remove the battery by sliding the latch to the left. Make sure to return the battery latch fully to the right.

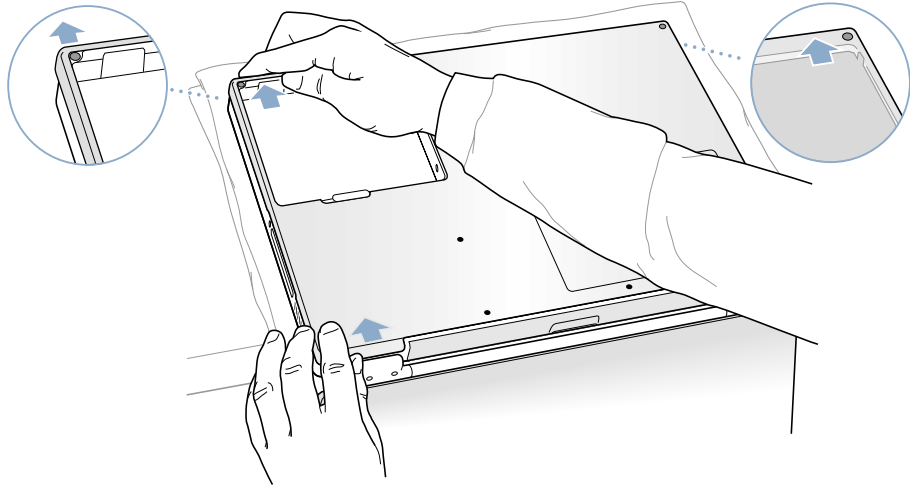


Warning The internal components of your PowerBook may be hot. If you have been using your PowerBook, wait 30 minutes after shutting down your computer to let the internal components cool down before continuing.

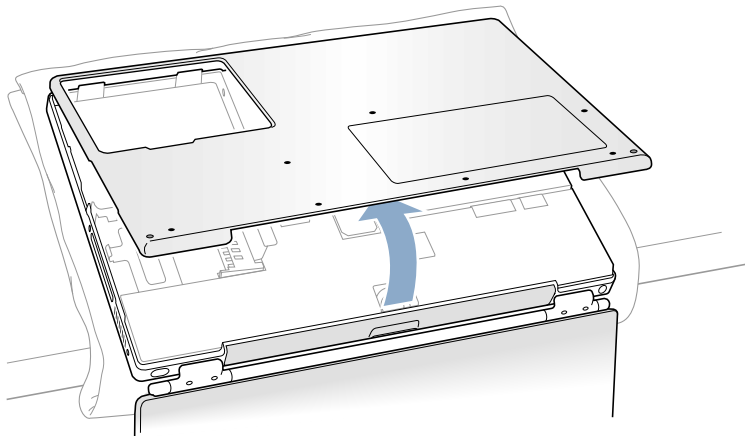
- 5 Using a Torx T-8 screwdriver, remove the seven screws that secure the bottom case of the PowerBook, in the order shown in the illustration below.



- 6 Carefully slide the bottom case away from you.



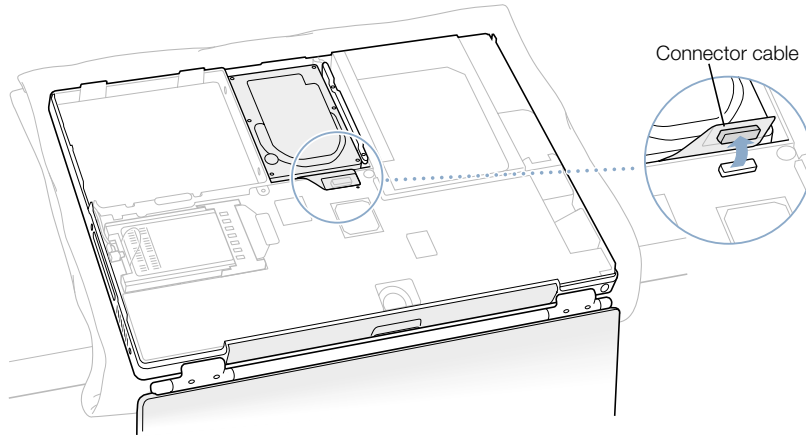
- 7 Pivot the bottom case up as shown in the illustration below.



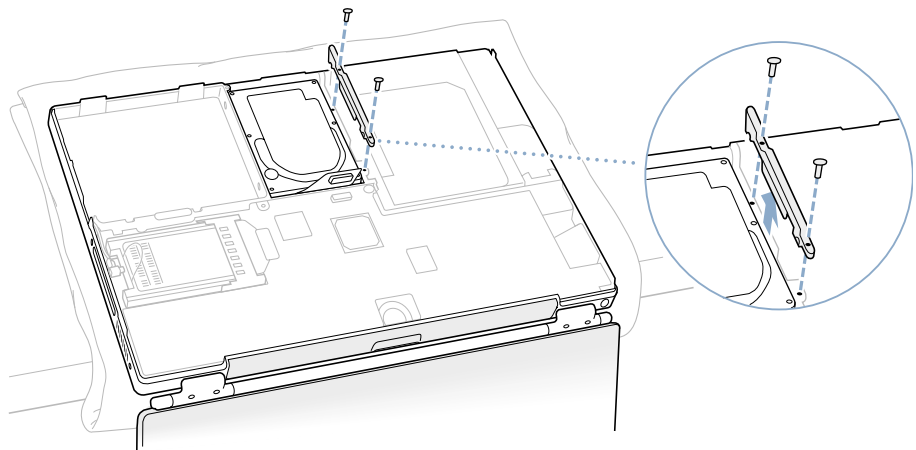
Important Do not twist the case from side to side. Slide the bottom case forward completely before lifting it up. If you feel any resistance when lifting the bottom case, double-check to make sure the bottom case is slid all the way forward and releases from the optical drive slot.

- 8 Touch a metal surface inside the computer to discharge any static electricity.

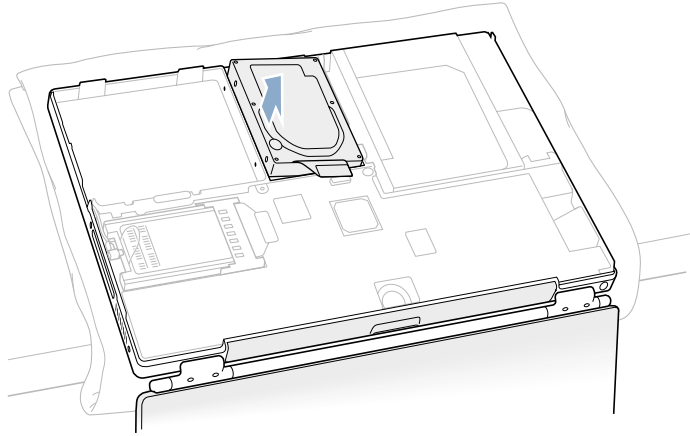
- 9** Disconnect the connector cable from the logic board.



- 10** With a Torx T-8 screwdriver, remove the two screws that secure the hard disk mounting bracket.



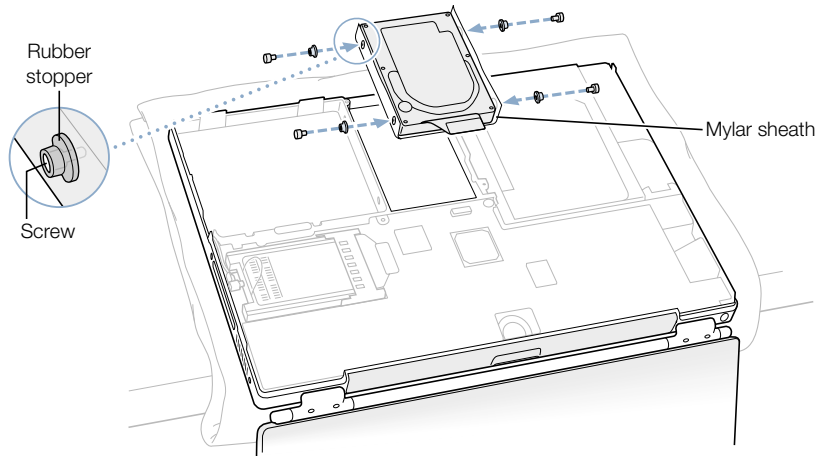
- 11 Lift out your hard disk.



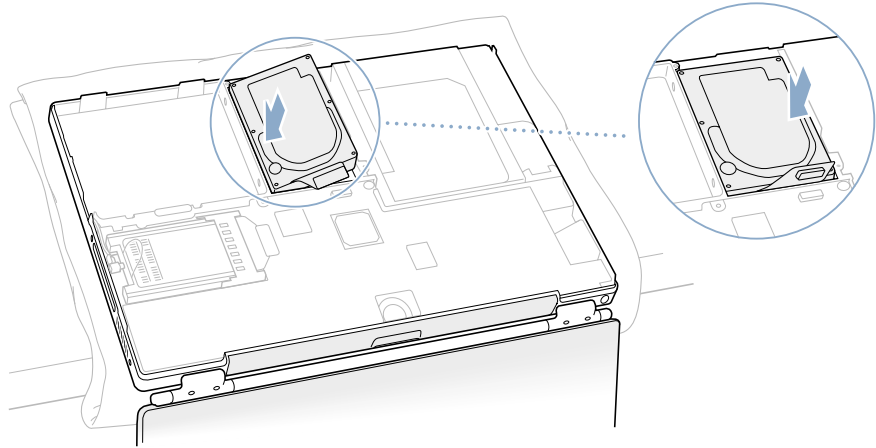
Replacing the Hard Disk and Bottom Case

Follow the steps in this section to replace the hard disk.

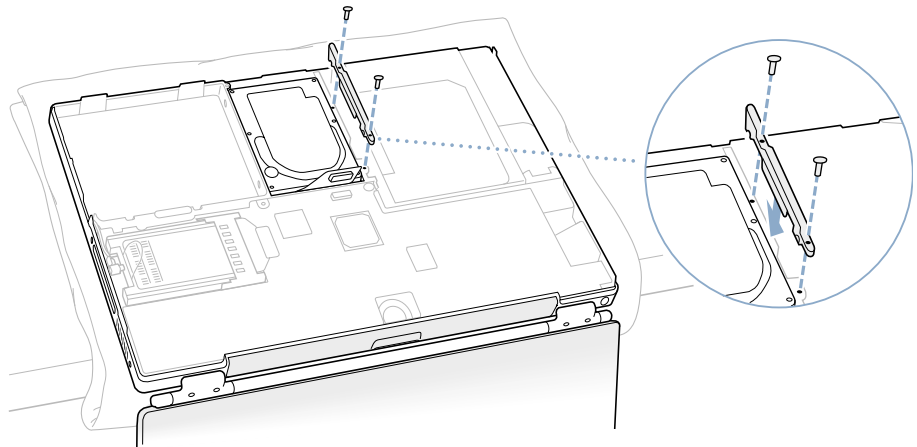
- 1 Make sure the screws and rubber stoppers are in place on the sides of the drive. Then make sure that the bottom and left and right sides of the drive are covered by the Mylar sheath.



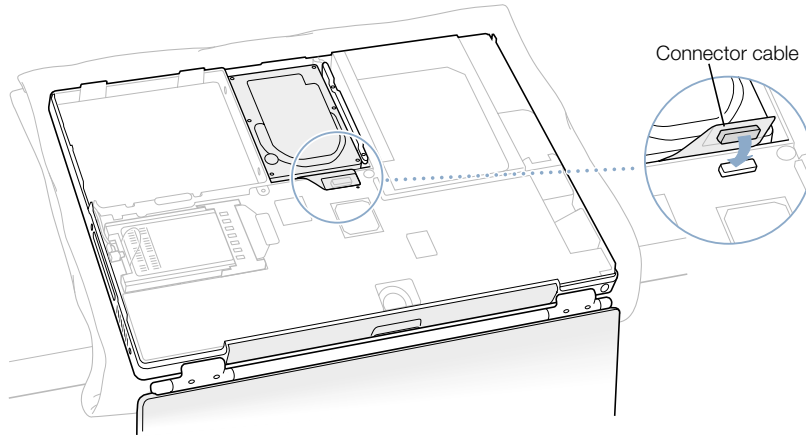
- 2** Insert the left side of the disk first, then insert the right side of the disk.



- 3** With a Torx T-8 screwdriver, replace the two screws that secure the hard disk to the mounting bracket.

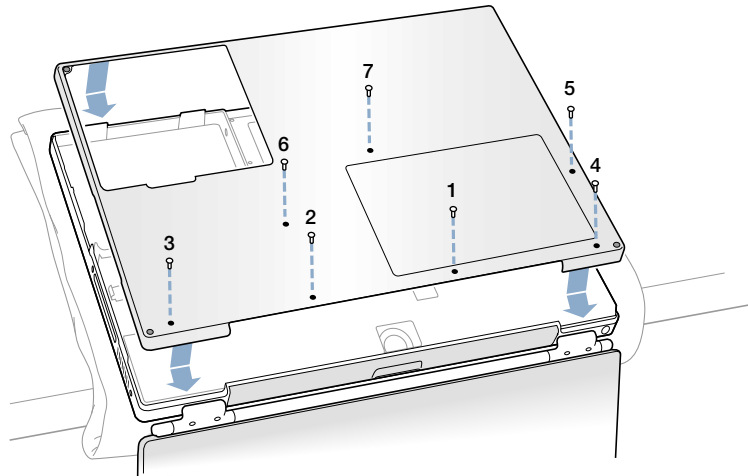


- 4 Connect the hard disk connector cable to the logic board.

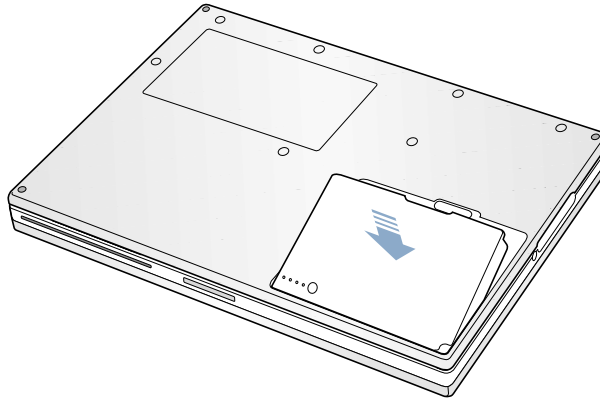


- 5 Attach the bottom case to the computer and replace the seven screws in the order shown in the illustration below.

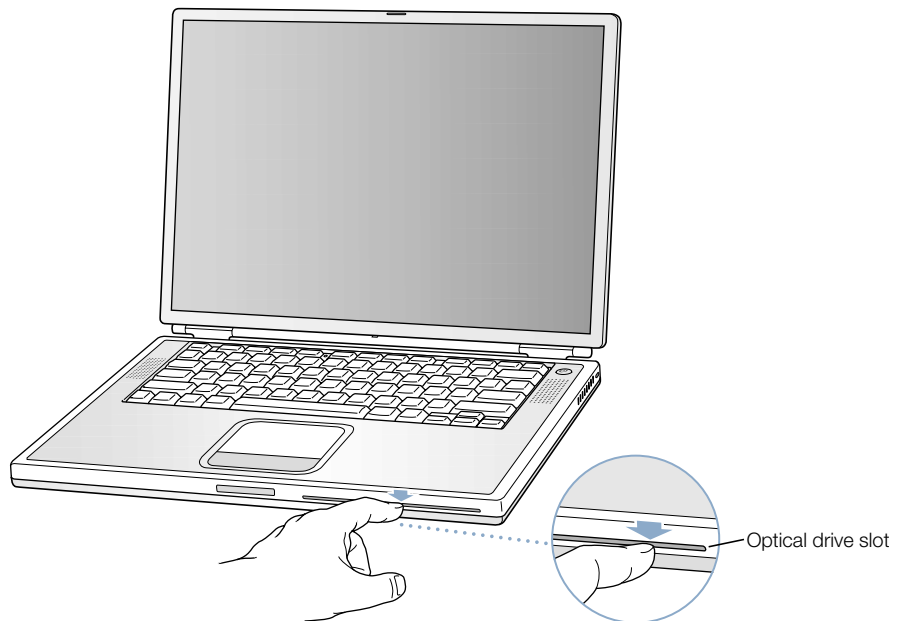
Line up the notches on the right and left sides of the case. Then press down slightly to secure the case. Make sure the seams between the bottom case and the frame are closed. Check the outside edges and around the battery bay. Check the alignment of the seven screw holes to make sure the bottom case is properly positioned.



- 6 Replace the battery and turn the computer over.



- 7 Look at the optical drive slot to make sure that the case is properly secured. If a gap exists below the optical drive slot, gently pull the bottom of the optical drive slot toward you to secure the optical drive to the bottom case and remove the gap.



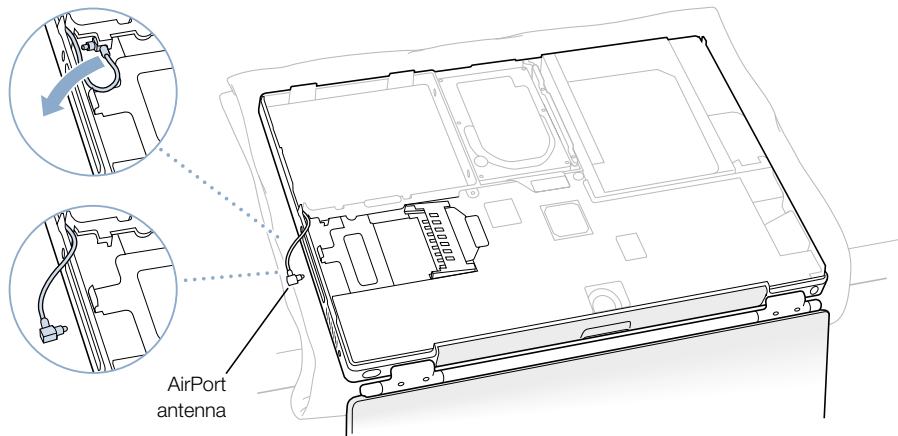
- 8 Reconnect the power adapter and any other cables that were attached.

Installing an AirPort Card

If your computer did not come with an AirPort Card, you can purchase one from your Apple-authorized dealer or from the Apple Store at www.apple.com/store and install it yourself or have it installed by an Apple-authorized service provider.

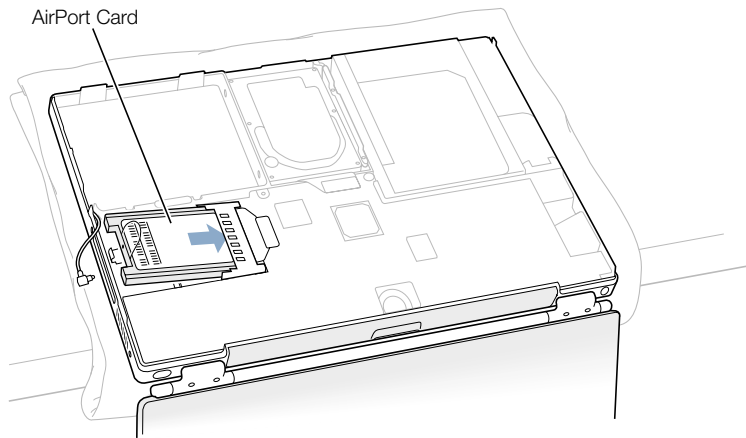
To install an AirPort Card in your PowerBook, remove the back of your computer. Follow the instructions in the previous section, “Removing the Internal Hard Disk” on page 72, then follow these steps:

- 1 If your AirPort Card came with the AirPort adapter, remove the metal clip and pull the AirPort Card from the adapter. (The adapter and metal clip are not used with your PowerBook.)
- 2 Touch a metal surface inside the computer to discharge any static electricity.
- 3 Disconnect the AirPort antenna from its holder.



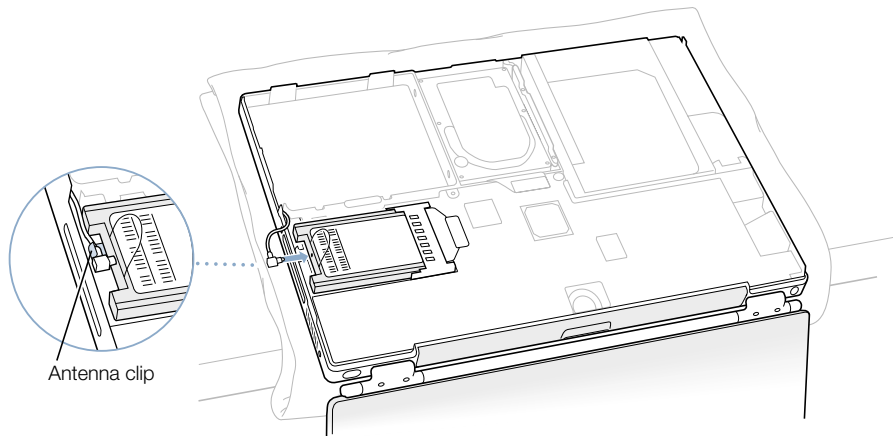
- 4 Position the AirPort Card with the AirPort ID numbers and bar code visible and slide the card into the connector.

Make sure to slide the card all the way in until you feel that the card is securely attached to the connector.



- 5 Connect the AirPort Card to the end of the antenna cable.

Make sure that the connector on the end of the antenna cable is straight before inserting it into the card. When it is connected, make sure the end of the antenna cable is secured by the small clip shown in the illustration below.



- 6 Fold the plastic tab on the AirPort Card over the top of the card.

Important The plastic tab must be folded over the card. If the tab is not folded over, you will not be able to securely attach the bottom case to the computer.

Attach the bottom case to the computer. Follow the instructions in the previous section, “Replacing the Hard Disk and Bottom Case,” beginning on page 76.

Troubleshooting

Occasionally you may have problems while working with your PowerBook. Usually it's because your software isn't properly configured or you're using applications or software extensions that are not compatible with the version of the Mac OS (system software) installed on your computer. Other less likely sources include problems with the Mac OS (usually fixed by reinstalling your computer's system software or through a software update) and problems with your computer's hardware, such as the memory or hard disk.

When you experience a problem with your computer, it is important to remember that there is usually a simple and quick solution. When you encounter a problem, be aware of the conditions that led up to the problem. Making a note of things you did before the problem occurred will help you narrow down the possible causes of the problem and then find the answers you need. Things to note include

- the applications you were using when the problem occurred (Problems that occur only with a specific application may indicate that the application is not compatible with the version of the Mac OS installed on your computer.)
- any software that you recently installed, especially any software that may have added items to the System folder (Certain applications install extensions that may not be compatible with the version of the Mac OS installed on your computer.)
- any new hardware (such as additional memory or a peripheral) that you installed

Information in This Chapter

This chapter contains solutions to problems that prevent you from working with your computer, such as a system freeze or a computer that will not start up. You can find more troubleshooting information in Mac Help (see page 36), on the Apple Support website at www.apple.com/support, and in the Apple Knowledge Base at kbase.info.apple.com

Problems That Prevent You From Using Your Computer

If the computer won't respond or the pointer won't move

- Press the Command (⌘) and period keys at the same time and, if a dialog appears, click Cancel.
- If that doesn't work, hold down the Option and Command (⌘) keys and then press the Esc key. If a dialog box appears, click Force Quit. Then save your work in any open applications and restart the computer to be sure the problem is entirely cleared up.
- If you are unable to force the application to quit, press and hold the Power button (⏻) for a few seconds to shut down the computer.
- If the computer still doesn't respond, try to restart it by simultaneously pressing the Command (⌘) and Control keys on your keyboard and the Power button (⏻).

If the problem occurs frequently, choose Mac Help from the Help menu. Look at the information on how to prevent and solve problems. You may need to check for extension conflicts or reinstall your computer's system software. If the problem occurs only when you use a particular program, check with the program's manufacturer to see if it is compatible with your computer.

If the computer freezes during startup or you see a flashing question mark

If you have replaced your computer's hard disk, make sure that all connectors have been firmly reattached.

If you are using Mac OS 9 or the Classic environment in Mac OS X, you might have an incompatible extension. Mac OS X does not use system extensions. To turn off extensions, do the following:

- *In Classic:* Open System Preferences, click Classic, click the Advanced tab, and choose Turn Off Extensions from the pop-up menu. Click Restart Classic.
- *In Mac OS 9:* Turn off your system extensions by starting up your computer while holding down the Shift key.

If that does not work, start up your PowerBook while holding down the C key and at the same time insert the *PowerBook G4 Software Install and Restore* DVD. (Make sure the Caps Lock key is not engaged.)

After the computer starts up, choose Mac Help from the Help menu. Look at the information on how to prevent and solve problems. You may need to check for extension conflicts or reinstall your computer's system software.

If using your *Software Install and Restore* DVD is the only way you can start up your PowerBook, you need to reinstall your computer's system software. For instructions, look in Mac Help or open the software installation or restore program and follow the onscreen instructions.

If the computer won't turn on or start up

- Make sure the power adapter is plugged into the computer and into a functioning power outlet.
- Your battery may need to be recharged. Press the small button on the battery (see page 49). You should see one to four lights indicating the battery's level of charge.
- If that does not work, press the Power button (⏻) and immediately hold down the Command (⌘), Option, P, and R keys until you hear the startup sound a second time.
- If you recently installed additional memory, make sure that it is correctly installed and that it is compatible with your computer. See whether removing it allows the computer to start up (see page 70).
- If you are still unable to start up your computer, see the service and support information that came with your PowerBook for information on contacting Apple for service.

If the display suddenly goes black or if your system freezes while you are working

You will need to restart your system.

- 1 Unplug any devices that are connected to your PowerBook ports except the power adapter.
- 2 Hold down the Command (⌘) and Control keys and press the Power button (⏻) to restart the system.
- 3 Let the battery charge to at least 10 percent before plugging in any external devices and resuming your work. To see how much the battery has recharged, look at the battery status icon in the menu bar.

Restoring Your Computer's Software

Use the *Software Install and Restore* DVD that came with your computer to install Mac OS X, Mac OS 9, and the applications that came with your computer.

To install Mac OS X

- 1 Back up essential files, if possible.
- 2 Insert the *Software Install and Restore* DVD that came with your computer.
- 3 Click the Install Mac OS X icon.
- 4 Follow the onscreen instructions.
- 5 After selecting the destination disk for installation, click Options and continue following the onscreen instructions.

To install Mac OS 9 and applications that came with your computer

- 1 Back up essential files, if possible.
- 2 Insert the *Software Install and Restore* DVD that came with your computer.
- 3 Click the “Install Applications and Mac OS 9” icon.
- 4 Follow the onscreen instructions.



Note: iPhoto, iTunes, and iMovie are part of Mac OS X. To install them you must follow the directions for installing Mac OS X.

Other Problems

If you have a problem with an application

- For problems with software from a manufacturer other than Apple, contact the manufacturer. Software manufacturers often provide updates to their software on their websites. You can configure your PowerBook to automatically check for and install the latest Apple software using the Software Update control panel in Mac OS 9 or the Software Update pane of System Preferences in Mac OS X. For more information, choose Mac Help from the Help menu and search for “software update.”

If you have problems with your Internet connection

- Make sure your telephone line or network cable is connected and functioning properly.
- If you are using a dialup Internet connection, make sure that your telephone cord is plugged into the modem port (marked with the icon ) and not the Ethernet port (marked with the icon ).
- In the Help menu, choose Mac Help. There you will find how to locate your Internet settings and the contact information for your Internet service provider (if you used the Setup Assistant to get your Internet account).

If you have a problem using your computer or working with the Mac OS

- If the answers to your questions are not in this manual, look in Mac Help for instructions and troubleshooting information.
- Check the Apple Support website at www.apple.com/support for the latest troubleshooting information and software updates.

If you suspect a problem with your computer hardware

- You can use the Apple Hardware Test CD to help determine if there is a problem with one of your computer’s components, such as the memory or processor.

Locating Your Product Serial Number

The serial number for your PowerBook is located on the inside wall of the battery bay. For instructions on removing the battery, see “Removing and Replacing the Battery” on page 50. The serial number is also on the System Profile tab of Apple System Profiler, located in Applications/Utilities in Mac OS X, and in the Apple (🍏) menu in Mac OS 9.

Specifications

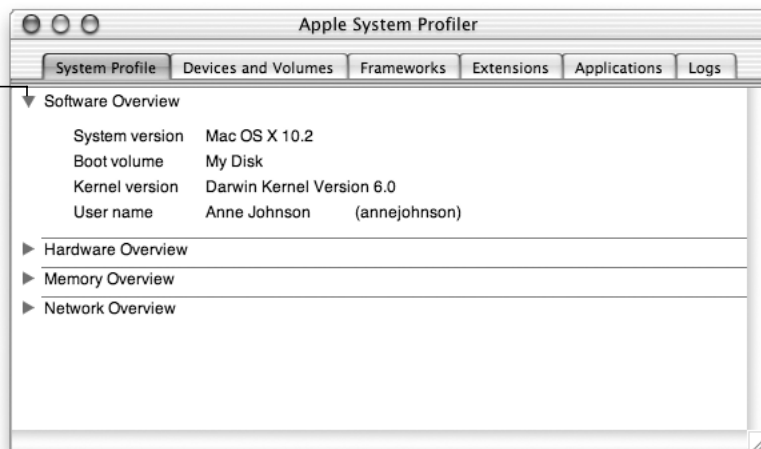
This section provides basic product specifications. Additional information is available in Apple System Profiler on your hard disk and on the Internet at www.apple.com/powerbook and www.apple.com/support

Apple System Profiler

You can use Apple System Profiler to find out detailed information about your specific model of PowerBook, such as the amount of built-in memory, hard disk size, devices connected, and the product serial number.

To access the information in Apple System Profiler, open Apple System Profiler, located in Applications/Utilities.

Click the triangles in the window to show and hide information in the different categories.



PowerBook Specifications

Processor, Memory, and Hard Disk

- *Processor:* PowerPC G4 processor with a minimum of 867 megahertz (MHz)
- *Memory:* Minimum of 256 megabytes (MB); maximum of 1 gigabyte (GB)
- *Hard disk:* Minimum 40 GB

Video Memory and Graphics

- *Video memory:* A minimum of 32 MB DDR SDRAM
- *Graphics controller:* ATI Mobility Radeon 9000

Modem

- *Modem standards:* K56flex and V.92

Note: Appropriate ISP and telephone services required. Your ISP may not support all v.92 features. Modem will function according to v.90 standards if v.92 services are not available. Actual modem speeds lower; speed depends on connection rate and other factors.

- *Modem speed:* 56 kilobits per second (Kbps)

Note: Download speeds vary with line conditions and the modem capabilities of your Internet service provider (ISP). FCC regulations limit ISP transmission speeds to 53 Kbps in the United States.

AirPort Card

- *Wireless data rate:* Up to 11 megabits per second (Mbps)
- *Range:* Up to 150 feet (45) meters in typical indoor use (varies with building)
- *Frequency band:* 2.4 gigahertz (GHz)

Power Adapter

- *Input:* AC 100–240 volts (V), 50/60 hertz (Hz)
- *Output:* DC 24.5 V, 2.65 A

Battery

- *Output:* DC 14.4 V
- *Capacity:* 4230 milliampere-hours (mAh)

External Monitor in Dual Display or Video Mirroring Mode

With the display set to 1280 x 854 and millions of colors, an external VGA monitor or digital display can be supported at the following resolutions up to millions of colors:

- 640 x 480, 640 x 870, 800 x 600, 832 x 624, 1024 x 768, 1152 x 870, 1280 x 960, 1280 x 1024, 1600 x 1200, 1792 x 1344, 1856 x 1392, 1920 x 1440, and 2048 x 1536

Note: Some external DVI displays from other manufacturers may not support all resolutions.

Choosing a resolution greater than 1280 x 854 in video mirroring mode causes the image on the external monitor to scale down (not take up the entire screen) to match the 1280 x 854 resolution of the internal display.

External Monitor in Display Closed Mode

When the PowerBook display is closed, an external VGA monitor can be supported at the following resolutions up to millions of colors:

- 640 x 480, 640 x 870, 800 x 600, 832 x 624, 1024 x 768, 1152 x 870, 1280 x 960, 1280 x 1024, 1600 x 1200, 1792 x 1344, 1856 x 1392, 1920 x 1440, and 2048 x 1536

Note: Some external DVI displays from other manufacturers may not support all resolutions.

External S-Video or Composite Television (NTSC)

An external NTSC video device or TV can be supported at the following resolutions up to millions of colors:

- 640 x 480, 720 x 480 (NTSC only), 800 x 600, 832 x 624, and 1024 x 768 at 60 Hz

External S-Video or Composite Television (PAL)

An external PAL video device or TV can be supported at the following resolutions up to millions of colors:

- 640 x 480, 720 x 576, 800 x 600, 832 x 624, and 1024 x 768 at 50 Hz

Size and Weight

- *Height:* 1.0 in. (26 mm)
- *Width:* 13.4 in. (341 mm)
- *Depth:* 9.5 in. (241 mm)
- *Weight:* 5.4 lb. (2.4 kg)

Note: Weight varies depending on configuration and manufacturing process.

Operating Environment

- *Operating temperature:* 50° F to 95° F (10° C to 35° C)
- *Storage temperature:* -13° F to 140° F (-25° C to 60° C)
- *Altitude:* 3048 m (10,000 ft.) maximum
- *Shipping altitude:* 10668 m (35,000 ft.) maximum
- *Relative humidity:* 20% to 80% noncondensing

Care, Use, and Safety Information

Cleaning Your PowerBook

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 Your PowerBook Display

To clean your PowerBook screen, do the following:

- Shut down your PowerBook.
- Dampen a clean, soft, lint-free cloth or paper with water only and wipe the screen. Do not spray liquid directly on the screen.

Carrying Your PowerBook

If you carry your PowerBook in a bag or briefcase, make sure that there are no loose items (such as paper clips or coins) that could accidentally get inside the computer through the slot for the optical drive.

Storing Your PowerBook

If you are going to store your PowerBook for an extended period of time, do one of the following to prevent your PowerBook battery from becoming completely depleted:

- Keep the power adapter connected.
- Fully charge your PowerBook battery before storing the computer.
- Fully charge and then remove your PowerBook battery when storing your computer (especially important when storing your computer for longer than 5 months).

Safety Instructions for Setting Up and Using Your Computer

Plugging in the Power Adapter

Always leave space around your power adapter. Do not use this equipment in a location where airflow around the power adapter or computer is confined. Always disconnect the power adapter and remove the battery before opening the computer to perform procedures such as installing memory or removing the hard disk.

Warning Use only the power adapter that came with your PowerBook computer. Adapters for other electronic devices (including other PowerBook models and other portable computers) may look similar, but they may damage your computer.

Connecting a Phone Line to the Internal Modem

Always disconnect the phone cord before opening the computer to perform procedures such as installing memory or removing the hard disk.

Warning Do not connect a digital telephone line to the modem, because the wrong type of line could damage the modem.

Using Your PowerBook

When using your PowerBook or when charging the battery, it is normal for the bottom of the case to get warm. The bottom of the PowerBook case functions as a cooling surface that transfers heat from inside the computer to the cooler air outside. The bottom of the case is raised slightly to allow airflow that keeps the unit within normal operating temperatures.

Warning Do not place your PowerBook on a pillow or other soft material when it is on, as the material may block the airflow vents and cause the computer to overheat. Never place anything over your keyboard before closing the display. This can cause your computer to cycle on and off which may create excessive heat and drain your battery. Never turn on your computer unless all of its internal and external parts are in place. Operating the computer when it is open or missing parts can be dangerous and can damage your computer.

Important Keep the PowerBook's internal display open at a 90-degree or greater angle when your PowerBook is attached to an external display and running in dual display or video mirroring mode. This allows for proper air circulation over the keyboard and assists with heat dissipation.

General Safety Instructions

For your own safety and that of your equipment, always take the following precautions.

Disconnect the power plug (by pulling the plug, not the cord), remove the main battery, and disconnect the phone cord if any of the following conditions exists:

- You want to remove any parts (leave the cords disconnected as long as the keyboard is open)
- The power cord or plug becomes frayed or otherwise damaged
- You spill something into the case
- Your computer is exposed to rain or any other excess moisture
- Your computer has been dropped or the case has been otherwise damaged
- You suspect that your computer needs service or repair
- You want to clean the case (use only the recommended procedure described earlier)

Important The only way to disconnect power completely is to unplug the power cord and phone cords, and remove the battery. Make sure at least one end of the power cord is within easy reach so that you can unplug the computer when you need to.

Warning Your power adapter came equipped with a three-wire grounding plug (a plug that has a third grounding pin). This plug will fit only a grounded AC outlet. If you are unable to insert the plug into an outlet because the outlet is not grounded, contact a licensed electrician to replace the outlet with a properly grounded outlet. Do not defeat the purpose of the grounding plug.

Be sure that you always do the following:

- Keep your computer away from sources of liquids, such as drinks, washbasins, bathtubs, shower stalls, and so on.
- Protect your computer from dampness or wet weather, such as rain, snow, and so on.
- Read all the installation instructions carefully before you plug your computer into a wall socket.
- Keep these instructions handy for reference by you and others.
- Follow all instructions and warnings dealing with your system.

Important 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.

Warning Never push objects of any kind into this product through the openings in the case. Doing so may be dangerous and result in fire or a dangerous electric shock.

Apple and the Environment

Apple Computer, Inc., recognizes its responsibility to minimize the environmental impacts of its operations and products.

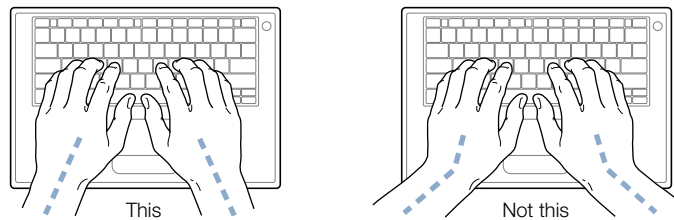
For more information

Go to www.apple.com/about/environment

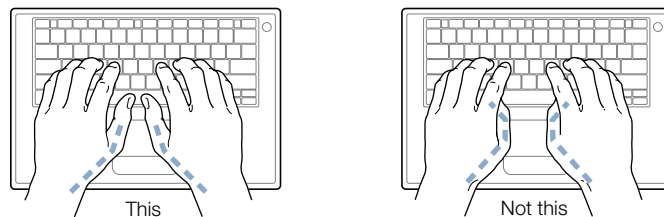
Ergonomics

Keyboard and trackpad

When you use the keyboard and trackpad, your shoulders should be relaxed. Your upper arm and forearm should form an angle that is slightly greater than a right angle, with your wrist and hand in roughly a straight line.



Use a light touch when typing or using the trackpad and keep your hands and fingers relaxed. Avoid rolling your thumbs under your palms.



Change hand positions often to avoid fatigue. 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.

Chair

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.

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.

External mouse

If you use an external mouse, position the mouse at the same height as your keyboard and within a comfortable reach.

Built-in display

Adjust the angle of the display to minimize glare and reflections from overhead lights and windows. Do not force the display if you meet resistance. The display is not meant to open past 120 degrees.

You can adjust the brightness of the screen when you take the computer from one work location to another, or if the lighting in your work area changes.

For more information

Go to www.apple.com/about/ergonomics

Connecting to the Internet

It's best to configure your network and Internet connection using Setup Assistant when you first set up Mac OS X. The assistant helps you enter your Internet configuration information, set up your networking software, and sign up for an Internet service provider (ISP) if you don't already have one.

If you did not already use the Setup Assistant to configure your Internet connection, you may be able to use it now. Open the Utilities folder (in the Applications folder) and double-click the Setup Assistant icon. If you don't want to use the Setup Assistant or if there is no Setup Assistant icon in the Utilities folder, you can use the information in this appendix to set up your connection.

Whether you connect through a dialup modem, cable modem, digital subscriber line (DSL), or an Ethernet local area network (LAN), you need specific setup information from your ISP or network administrator before you begin.

Note: For instructions on connecting to the Internet in Mac OS 9, open Mac Help, available in the Help menu, and click “Internet and Networking.”

If you are connecting for the first time, changing your settings, or adding a new configuration, follow the steps that correspond to your connection method:

- Dialup modem with Point-to-Point Protocol (PPP) connection
- Cable modem, DSL, or LAN connection using these configurations:
 - Manual
 - DHCP
 - PPPoE

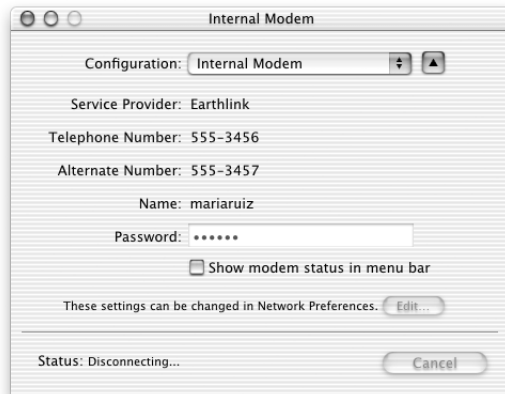
Important To set up your AirPort Base Station, use the AirPort Setup Assistant, located in Applications/Utilities.

Dialup (PPP) Connections

The most common way to connect to the Internet is through a dialup modem. You connect your modem to a phone line using a telephone cable (included with most Macintosh computers). Your modem uses Point-to-Point Protocol (PPP) to connect you to an ISP.

If you have an external modem, follow the setup instructions that came with your modem. If you have an internal modem, gather the following information from your ISP and have it available as you configure your network:

- Service provider name
- Telephone number
- Alternate number
- Account name
- Your password



To set up your network preferences for the Internal Modem port:

- 1 In the Apple (🍏) menu, choose System Preferences.
- 2 Click Network.
- 3 In the Show pop-up menu, choose Network Port Configurations and select Internal Modem.



- 4 Drag Internal Modem to the top of the Port Configurations list to make it the preferred, or primary, network interface.
- 5 In the Show pop-up menu, choose Internal Modem and click the PPP tab.

- 6 Enter the information from your ISP and click Apply Now.



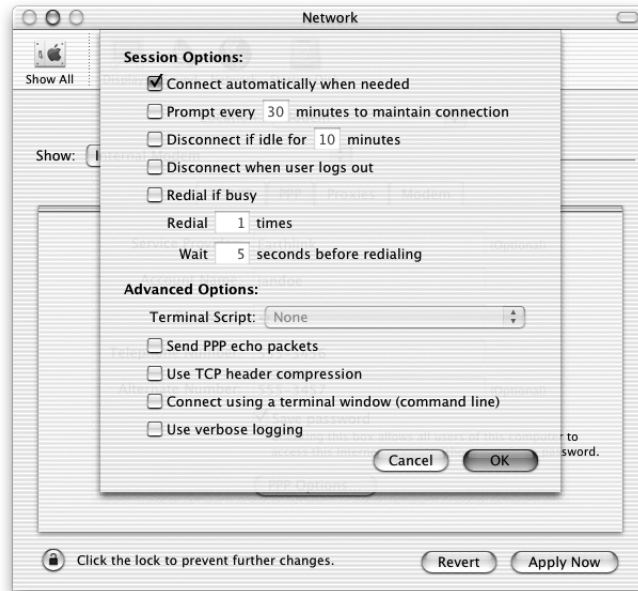
To test your Internet configuration, dial up your ISP and establish a connection:

- Open the Internet Connect application (in the Applications folder).
- Click Connect.

To connect automatically when you start a TCP/IP application, such as a web browser or email, do the following:

- 1 Click PPP Options (in the PPP pane of Network preferences).

- 2 Select the “Connect automatically when needed” checkbox.



- 3 Click OK and Apply Now.

DSL, Cable Modem, or LAN Internet Connections

If you connect to the Internet through a DSL, cable modem, or LAN, ask your ISP or network administrator whether you should

- configure your connection manually. With a manual configuration, your ISP or network administrator provides a static IP address and other information that you enter in Network preferences.
- use the Dynamic Host Configuration Protocol (DHCP). With a DHCP configuration, the DHCP server automatically enters the information for you.
- use Point-to-Point Protocol over Ethernet (PPPoE). If you use a DSL modem and need a user name and password to connect to the Internet, you may need to configure your network to use PPPoE.

Obtain the following information and have it available as you configure your network:

- Domain name server (DNS) addresses, if necessary
- DHCP or manual IP address configuration
- IP address
- Router address
- Subnet mask

Note: If your ISP or local network does not provide DNS addresses, it may have a method of providing this information automatically.

First, set up your network preferences for the built-in Ethernet port:

- 1 In the Apple () menu, choose System Preferences.
- 2 Click Network.
- 3 In the Show pop-up menu, choose Network Port Configurations.
- 4 Select Built-in Ethernet.



- 5 Drag Built-in Ethernet to the top of the Port Configurations list to make it the preferred, or primary, network interface.

Next, follow the instructions to configure your network manually, using DHCP, or using PPPoE, as instructed by your ISP or network administrator.

Manual Configuration

For a manual configuration, have your static IP address, router address, and subnet mask from your ISP ready as you do the following:

- 1 In the Apple (🍏) menu, choose System Preferences.
- 2 Click Network.
- 3 In the Show pop-up menu, choose Built-in Ethernet.
- 4 Click the TCP/IP tab, if necessary.
- 5 In the Configure pop-up menu, choose Manually.



- 6 Type the other information into the corresponding fields.
- 7 Click Apply Now.

Once you configure your network, your connection is ready. Open your web browser (or another TCP/IP application) to test your Internet connection.

DHCP Configuration

After you set up a DHCP configuration, the DHCP server automatically provides your network information.

To set up a DHCP configuration:

- 1 In the Apple (🍏) menu, choose System Preferences.

- 2 Click Network.
- 3 In the Show pop-up menu, choose Built-in Ethernet.
- 4 Click the TCP/IP tab, if necessary.
- 5 In the Configure pop-up menu, choose Using DHCP.



- 6 Click Apply Now.

Open your web browser (or another TCP/IP application) to test your Internet connection.

Note: Unless your ISP instructs you to do otherwise, ignore the DHCP Client ID field and the Search Domains field.

PPPoE Configuration

Some DSL-based ISPs use Point-to-Point Protocol over Ethernet (PPPoE). Check with your ISP to determine if you should connect using PPPoE. If you use a DSL modem and need a user name and password to connect to the Internet, follow these instructions.

- 1 Obtain this information from your ISP:
 - User name and password
 - Domain name server (DNS) address

Note: Your ISP may not require you to enter a DNS server address.

- 2 In the Apple () menu, choose System Preferences.

- 3 Click Network.
- 4 In the Show pop-up menu, choose Built-in Ethernet.
- 5 Click the PPPoE tab and select “Connect using PPPoE.”



- 6 Type your user name in the Account Name field and your password in the Password field. If you want all users of your computer to use the same connection method, select “Save password.”

Note: To connect automatically when you start a TCP/IP application, such as a web browser or email, click PPPoE Options, then select “Connect automatically when needed.”

- 7 Click the TCP/IP tab and in the Configure pop-up menu, choose either PPP or Manually, as instructed by your ISP. If you have a static IP address from your ISP, choose Manually and type the address in the IP address field.

- 8 Type the Domain Name Server (DNS) addresses in the corresponding field.



- 9 Click Apply Now.

Once you configure your network, your Internet connection is ready. You can open your web browser or other TCP/IP application to test your connection.

Important If you did not select the option to automatically connect, then you will need to open the Internet Connect application, choose the correct configuration, and then click Connect. See Internet Connect Help in the Help menu for more information.

Troubleshooting Your Connection

Cable Modem, DSL, and LAN Internet Connections

If you can't connect to the Internet using your cable modem, DSL, or local area network (LAN), see the following steps.

Important Instructions that refer to modems do not apply to LAN users. LAN users may have hubs, switches, routers, or connection pods that cable and DSL modem users do not. LAN users should contact their network administrator rather than an ISP.

Check the cables and power supplies

Make sure all modem cables are firmly plugged in, including the modem power cord, the cable from the modem to the computer, and the cable from the modem to the wall jack. Check the cables and power supplies to Ethernet hubs and routers.

Cycle the power and reset the modem hardware

Cycle the power on your DSL or cable modem by turning it off for a few minutes then turning it back on. Some ISPs recommend that you unplug the modem's power cord. If your modem has a reset button, you can press it either before or after cycling the power.

PPPoE Connections


If you are unable to connect to your Internet service provider using PPPoE, first check the cables and power supplies, then cycle the power and reset the modem hardware.

Check System Preferences settings

Use System Preferences to verify that you've selected PPPoE and to verify your

- account information
- TCP/IP settings
- primary network interface is set to "Built-in Ethernet"

Next, follow these steps:

- 1** In the Apple () menu, choose System Preferences.
- 2** Click Network.
- 3** In the Show pop-up menu, choose Network Port Configurations.
- 4** Drag Built-in Ethernet to the top of the Port Configurations list.
- 5** In the Show pop-up menu, choose Built-in Ethernet.
- 6** Click the PPPoE tab.
- 7** Select "Connect using PPPoE."
- 8** Check the Account Name field to be sure you have entered the correct information from your ISP.
- 9** Retype your password if you chose to save your password, to be sure it is correct.
- 10** Click the TCP/IP tab. Follow your ISP's instructions for setting up this pane.
- 11** Click Apply Now.

Network Connections

If you have two or more computers attempting to share an Internet connection, be sure that your network is set up properly. You need to know if your ISP provides only one IP address or if it provides multiple IP addresses.

If only one IP address is used, then you must have a router capable of sharing the connection, also known as network address translation (NAT) or “IP masquerading.” For setup information, check the documentation provided with your router or ask the person who set up your network. The AirPort Base Station may be used for this routing function. For information on using the AirPort Base Station, check the onscreen help or visit the Apple AirPort website at www.apple.com/airport

If you cannot resolve the issue using these steps, contact your ISP.

Communications Regulation Information

FCC Compliance Statement

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

This computer equipment 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 EMC compliance and negate your authority to operate the product.

This product was tested for EMC 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 (contact for FCC matters only): Apple Computer, Inc. Product Compliance, 1 Infinite Loop M/S 26-A, Cupertino, CA 95014-2084, 408-974-2000.

Industry Canada Statement

Complies with the Canadian ICES-003 Class B specifications. Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada. Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

VCCI Class B 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）の基準に基づくクラス B 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下さい。

European Community

Complies with European Directives 72/23/EEC and 89/336/EEC.

Laser Information

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

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, DVD-ROM, or DVD-RAM 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 label



Service warning label

Laser Specifications for Combo Drive

Laser on pickup unit when reading a DVD:

- *Type*: Semiconductor laser GaAs / In(GaAl)P/InGaP
- *Wavelength*: 655 ± 15 nm
- *Power out of objective lens*: 0.33 mW
- *Beam divergence*: $20^\circ \sim 35^\circ$ (Typical 27°)

Laser on pickup unit when reading a CD:

- *Type*: Semiconductor laser AlGaAs / GaAs
- *Wavelength*: 784 ± 8 nm
- *Power out of objective lens*: Read = 1.0 mW, Write = 54.0 mW
- *Beam divergence*: $15^\circ \sim 19^\circ$ (Typical 17°)

Laser Specifications for SuperDrive

Laser on pickup unit when reading a DVD:

- *Type*: Semiconductor laser AlGaInP
- *Wavelength*: 655 ~ 664 nm (Typical 662 nm)
- *Power out of objective lens*: Read = 1.25 mW, Write = 22.4 mW
- *Beam divergence*: $18.5^\circ \sim 25^\circ$ (Typical 23°)

Laser on pickup unit when reading a CD:

- *Type*: Semiconductor laser AlGaAs
- *Wavelength*: 779 ~ 791 nm (Typical 785 nm)
- *Power out of objective lens*: Read = 1.0 mW, Write = 42.4 mW
- *Beam divergence*: $14.5^\circ \sim 19.5^\circ$ (Typical 17°)

Exposure to Radio Frequency Energy

The radiated output power of the optional AirPort Card is far below the FCC radio frequency exposure limits. Nevertheless, it is advised to use the wireless equipment in such a manner that the potential for human contact during normal operation is minimized.

Mouse and Keyboard Information

The Apple optical mouse is a Class 1 LED product. This product complies with the requirements of European Directives 72/23/EEC and 89/336/EEC.

It also complies with the Canadian ICES-003 Class B Specification.

High-Risk Activities Warning

This computer system is not intended for use in the operation of nuclear facilities, aircraft navigation or communications systems, or air traffic control machines, or for any other uses where the failure of the computer system could lead to death, personal injury or severe environmental damage.

ENERGY STAR® Compliance

As an ENERGY STAR® partner, Apple has determined that standard configurations of this product using the Mac OS X and Mac OS 9 operating systems meet the ENERGY STAR® guidelines for energy efficiency. The ENERGY STAR® program is a partnership with office product equipment manufacturers to promote energy-efficiency. Reducing energy consumption of office products saves money and reduces pollution by eliminating wasted energy.

Telephone and Apple 56K Modem Information

Notify Your Telephone Company

Some telephone companies require that you notify the local business office when you hook up a modem to their lines.

Information You Need in the United States

The internal modem complies with Part 68 of the FCC rules. On the back of this equipment is a label that contains, among other information, the FCC registration number and ringer equivalence number (REN). If requested, provide this information to your telephone company.

- *Ringer equivalence number (REN):* 0.68 The REN is useful to determine the quantity of devices you may connect to your telephone lines and still have all those devices ring when your telephone number is called. In most, but not all areas, the sum of the RENs of all devices connected to one line should not exceed five (5.0). To be certain of the number of devices you may connect to your line, as determined by the REN, you should contact your local telephone company to determine the maximum REN for your calling area.
- *Telephone jack type:* USOC, RJ-11 An FCC-compliant telephone cord and modular plug are provided with this equipment. This equipment is designed to be connected to the telephone network or premises wiring using a compatible modular jack that complies with Part 68 rules. See the installation instructions for details.

Telephone Line Problems

If your telephone doesn't work, there may be a problem with your telephone line. Disconnect the modem to see if the problem goes away. If it doesn't, report the problem either to your local telephone company or to your company's telecommunications people.

If disconnecting the modem eliminates the problem, the modem itself may need service. See the service and support information that came with your Apple product for instructions on how to contact Apple or an Apple-authorized service provider for assistance.

If you do not disconnect your modem when it is adversely affecting the telephone line, the telephone company has the right to disconnect your service temporarily until you correct the problem. The telephone company will notify you as soon as possible. Also, you will be informed of your right to file a complaint with the FCC.

The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of your equipment. If this happens, the telephone company will provide advance notice in order for you to make the necessary modifications to maintain uninterrupted service.

The internal modem will not work with party lines, cannot be connected to a coin-operated telephone, and may not work with a private branch exchange (PBX).

Telephone Consumer Protection Act

The Telephone Consumer Protection Act of 1991 makes it unlawful for any person to use a computer or other electronic device to send any message via a telephone fax machine unless such message clearly contains, in a margin at the top or bottom of each transmitted page or on the first page of the transmission, the date and time it was sent and an identification of the business or other entity, or individual sending the message and the telephone number of the sending machine of such business, entity, or individual.

Information You Need in Canada

The Industry Canada (IC) label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements. The Department does not guarantee the equipment will operate to a user's satisfaction.

Before installing this equipment, make sure that you are permitted to connect to the facilities of the local telecommunications company. Be sure you use an acceptable method of connection to install the equipment. In some cases, you may extend the company's internal wiring for single-line individual service by means of a certified telephone extension cord. Be aware, however, that compliance with these conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any equipment malfunctions or repairs or alterations that you make to this equipment may cause the telecommunications company to request that you disconnect the equipment.

In Canada, contact Apple at: 7495 Birchmount Road, Markham, Ontario, L3R 5G2, 800-263-3394

Warning Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority or electrician.

- **Load number:** 0.2 The load number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to the telephone loop that is used by the device, to prevent overloading. The termination of a loop may consist of any combination of devices, subject only to the requirement that the sum of the load numbers of all devices does not exceed 100.
- **Telephone jack type:** CA-11

Informations Destinées aux Utilisateurs Canadiens

L'étiquette d'Industrie Canada identifie un matériel homologué. Cette étiquette certifie que le matériel est conforme à certaines normes de protection, d'exploitation et de sécurité des réseaux de télécommunications. Le Ministère n'assure toutefois pas que le matériel fonctionnera à la satisfaction de l'utilisateur.

Avant d'installer ce matériel, l'utilisateur doit s'assurer qu'il est permis de le raccorder au réseau de l'entreprise locale de télécommunication. Le matériel doit également être installé en suivant une méthode acceptée de raccordement. Dans certains cas, le câblage appartenant à l'entreprise utilisé pour un service individuel à ligne unique peut être prolongé au moyen d'un dispositif homologué de raccordement (cordon prolongateur téléphonique).

L'abonné ne doit pas oublier qu'il est possible que la conformité aux conditions énoncées ci-dessus n'empêche pas la dégradation du service dans certaines situations. De fait, les entreprises de télécommunication ne permettent pas que l'on raccorde un matériel aux prises d'abonnés, sauf dans les cas précis prévus par les tarifs particuliers de ces entreprises.

Les réparations de matériel homologué doivent être effectuées par un centre d'entretien canadien autorisé désigné par la fournisseur. La compagnie de télécommunications peut demander à l'utilisateur de débrancher un appareil suite à des réparations ou à des modifications effectuées par l'utilisateur ou en raison d'un mauvais fonctionnement.

Veuillez contacter Apple pour des informations supplémentaires:

Apple Canada, Inc.

7495 Birchmount Road

Markham, Ontario

Canada L3R 5G2

Service à la clientèle d'Apple Canada : 800-263-3394

Pour sa propre protection, l'utilisateur doit s'assurer que tout les fils de mise à la terre du secteur, des lignes téléphoniques et les canalisations d'eau métalliques, s'il y en a, soient raccordés ensemble. Cette précaution est particulièrement importante dans les régions rurales.

Avertissement L'utilisateur ne doit pas tenter de faire ces raccordements lui-même; il doit avoir recours à une service d'inspection des installations électriques ou à un électricien, selon le cas.

- **Numéro de charge :** 0.2 L'indice de charge (IC) assigné à chaque dispositif terminal indique, pour éviter toute surcharge, le pourcentage de la charge totale qui sera raccordée à un circuit téléphonique bouclé utilisé par ce dispositif. La terminaison du circuit bouclé peut être constituée de n'importe quelle combinaison de dispositifs pourvu que la somme des indices de charge de l'ensemble des dispositifs ne dépasse pas 100.
- **Type de prise téléphonique :** CA-11

Information You Need in the United Kingdom

This terminal equipment is intended for direct connection to the analogue Public Switched Telecommunications Network and is approved for use within the United Kingdom with the following features:

- Modem facility
- Autocalling facility
- Autoanswer facility
- DTMF signaling

Operation in the absence of proceed indication or upon detection of proceed indication

This product is in conformity with relevant regulatory standards following the provisions of European Council Directives 73/23/EEC (Low Voltage Directive) and 89/336/EEC amended by 92/31/EEC (EMC Directive).

Informationen für Deutschland

Diese Modem-Karte ist als Endeinrichtung vorgesehen und muss an ein TAE mit F-Kodierung angeschlossen werden. Diese Endeinrichtung ist in Konformität gemäß Niederspannungsrichtlinie 73 / 23 / EWG sowie EMC-Richtlinien 89 / 336 / EWG und 92 / 31 / EWG.

Informations pour la France

Ce matériel est conforme aux normes applicables de sécurité électrique d'après la directive 73 / 23 / CEE et aux normes applicables de compatibilité électromagnétique d'après la directive 89 / 336 / CEE, modifié par la directive 92 / 31 / CEE.

Information You Need in Australia

All telecommunications devices are required to be labelled as complying to the Australian telecommunications standards, ensuring the health and safety of the operator and the integrity of the Australian telecommunications network. To provide compliance with the Australian Communications Authority's technical standards, please ensure that the following AT commands are maintained:

- ATB0 (ITU/CCITT operation)
- AT&G0 (no guard tone)
- AT&P1 (33/66 pulse dial make/break ratio)
- ATS0 = 0 or ATS0 = 1 (no answer or answer greater than one ring)
- ATS6 = 95 (DTMF period between 70–255 ms)
- ATS11 = 95 (DTMF period between 70–255 ms)

For calls that are automatically generated, a total of three call attempts are allowed to a telephone number, with a minimum period between calls of 2 seconds. If the call does not connect after three attempts, 30 minutes must expire before automatic redialing may be initiated. Failure to set the modem (and any associated communications software) to the above settings may result in the modem being non-compliant with Australian telecommunications standards. Under these circumstances a user could be subject to significant penalties under the Telecommunications Act 1997.

This modem must be properly secured in order for you to use it. Telecommunications network voltages exist inside the computer and the telecommunications line connection must be removed before opening the computer.

Information You Need in New Zealand

This modem is fully approved to operate on the New Zealand telecommunications network under Telepermit number PTC 211/01/096. All telecommunications devices are required to hold a Telepermit and be labelled accordingly with the approved Telepermit number to comply with the New Zealand telecommunications standards, ensuring the health and safety of the operator and the integrity of the New Zealand telecommunications network. To ensure compliance, all calls that are automatically generated should not make more than 10 call attempts to the same number within any 30 minute period with a minimum period between calls of 30 seconds. Failure to adhere to these standards may result in the modem being non-compliant with New Zealand Telecom standards. Under these circumstances a user could be subject to significant penalties.

Important The grant of a Telepermit for any item of terminal equipment indicates that only Telecom has accepted that the item complies with minimum conditions for connection to its network. It indicates no endorsement of the product by Telecom, nor does it provide any sort of warranty. Above all, it provides no assurance that any item will work correctly in all respects with another item of Telepermitted equipment of a different make or model, nor does it imply that any product is compatible with all of Telecom's network services.