



Setting Up Your Workgroup Server 7250

*Includes information about setting up and expanding
your server system; also includes technical specifications*



Setting Up Your Workgroup Server 7250

 Apple Computer, Inc.

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Apple Computer, Inc.
1 Infinite Loop
Cupertino, CA 95014-2084
(408) 996-1010

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Communications regulation information

FCC statement

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

Radio and television interference

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

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

Note: When the 10BASE-T Ethernet is connected, the system complies only with the FCC Part 15, Class A limits and the CISPR 22, Class A limits, and may not be used in a residential area.

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.

DOC statement

DOC Class B Compliance

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

- Move the computer farther away from the television or radio.
- Plug the computer into an outlet that is on a different circuit from the television or radio. (That is, make certain the computer and the television or radio are on circuits controlled by different circuit breakers or fuses.)

If necessary, consult an Apple-authorized service provider or Apple. See the service and support information that came with your Apple product. Or, consult an experienced radio/television technician for additional suggestions.

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

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

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

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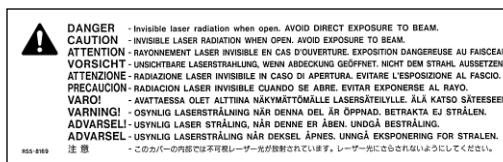
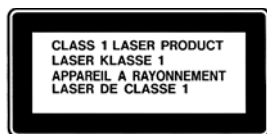
取扱説明書に従って正しい取り扱いをしてください。

Laser information

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

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

If you have an internal Apple CD-ROM drive in your computer, your computer is a Class 1 laser product. The Class 1 label, located in a user-accessible area, indicates that the drive meets minimum safety requirements. A service warning label is located in a service-accessible area. The labels on your product may differ slightly from the ones shown here.



About This Guide

This guide tells you how to set up your Workgroup Server 7250 and connect it to a network. It also provides technical specifications for your server and information about adding internal and external devices to your server. This setup guide is a companion to the *Workgroup Server Administrator's Guide*, which tells you how to configure the system software for use with your Workgroup Server, use application software programs, use your server's built-in CD-ROM drive, and troubleshoot hardware and software problems that you may encounter while using your server.

About your Workgroup Server 7250 and Power Macintosh software

Your Workgroup Server 7250 is powered by the PowerPC™ microprocessor (or “chip”). This microprocessor was designed by Apple Computer, Inc., Motorola, Inc., and IBM Corporation. The PowerPC microprocessor uses Reduced Instruction Set Computer (RISC) technology to deliver very high performance at the lowest possible cost. The PowerPC RISC microprocessor represents the state of the art in microprocessor design.

Your Workgroup Server 7250 will run almost all of your existing Macintosh software, but for best performance and greatest speed, look for software programs designed especially for Power Macintosh computers. You'll find Power Macintosh programs at any software store that carries products for Macintosh.

Who should read this guide

This guide is intended for the person who sets up the server and connects it to an existing network. You need to know some details of your existing network in order to choose the appropriate procedures for connecting the server to your network.

What this guide contains

Here's a brief summary of what you'll find in this guide:

- Chapter 1, “Setting Up Your Server,” provides a graphic overview of the Workgroup Server 7250, and explains how to connect the monitor, keyboard, and mouse, and how to start up your server for the first time.
- Chapter 2, “Connecting to the Network,” describes how to connect the server to an Ethernet or LocalTalk network, and provides information about setting up a high-performance network.
- Chapter 3, “Expanding Your Server and Connecting Other Equipment,” describes how to install an expansion card, add memory to the server, and connect additional external devices to the server.
- Appendix A, “Safety, Maintenance, and Health Information,” suggests how you can create a healthful and safe server environment and keep your server equipment in good working order.
- Appendix B, “Technical Information,” contains technical specifications for your server.

How to use this guide

Familiarize yourself with your server's basic components. See the section “Your Server at a Glance” in Chapter 1.

Consider security issues and placement of your server. Read the section “Security Issues” in Chapter 1 for important information about protecting your server from unauthorized access.

If you want to add memory or an expansion card to the server: Install the internal devices according to the instructions in Chapter 3, “Expanding Your Server and Connecting Other Equipment.” Then return to Chapter 1 to connect the monitor and keyboard.

If you want to connect external peripheral devices to your server: After you connect the monitor and keyboard to the server, as described in Chapter 1, turn to the appropriate instructions in Chapter 3, then return to Chapter 1.

Connect to the network to complete the setup process. See Chapter 2, “Connecting to the Network,” for details.

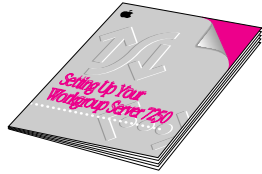
Other reference material

In addition to this guide, you may need to consult the following sources of information.

- After setting up your server’s hardware, see the *Workgroup Server Administrator’s Guide* for details on configuring and using the features of the Mac OS and Macintosh application programs. The *Workgroup Server Administrator’s Guide* also contains information about using your server’s CD-ROM drive, as well as important troubleshooting information for help with problems you may experience while using your server.
- For important late-breaking information about your server and system software, see the Workgroup Server Read Me file, located on the server’s hard disk and on the *Workgroup Server Software* CD-ROM disc.
- For information about server application programs included with your Workgroup Server 7250, such as Apple RAID Software and Retrospect Remote, refer to the documentation for those programs included in the server accessory kit.
- There are a number of network services, such as AppleShare, AppleSearch, and Apple Remote Access, that can be installed on your Workgroup Server 7250. Refer to the documentation included with those services for installation and operation information.
- If you purchased an Apple Internet Server, see the setup booklet included in the Apple Internet Server Solution for the World Wide Web package.
- If you need a better understanding of how to configure your network, the following books from Apple Computer, published by Addison-Wesley, are available at computer bookstores:
 - Understanding Computer Networks* gives an overview of networking basics.
 - Planning and Managing AppleTalk Networks* provides in-depth information on setting up, maintaining, and troubleshooting AppleTalk networks.

Where to find answers

When you have questions about using your server, there are several places you can look for answers.



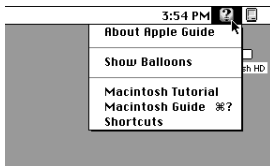
In this book

Use this book to help you set up and expand your server system, and to connect it to a network. Also use this book to check your server's technical specifications.




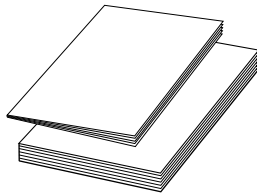
In the *Workgroup Server Administrator's Guide*

Use this book to configure the operating system for your server, to learn about the Mac OS, for troubleshooting information if you experience problems with your server, and to learn about your server's CD-ROM drive.



In the Guide menu

The Guide menu (marked with the  icon) is your main source of information about the Mac OS. To learn how to get different kinds of help from the Guide menu, see Appendix A in the *Workgroup Server Administrator's Guide*.



In other manuals

For answers to questions about other equipment or about application programs you have purchased, see the manuals that came with the equipment or programs.



From Apple's customer support hotline

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

1

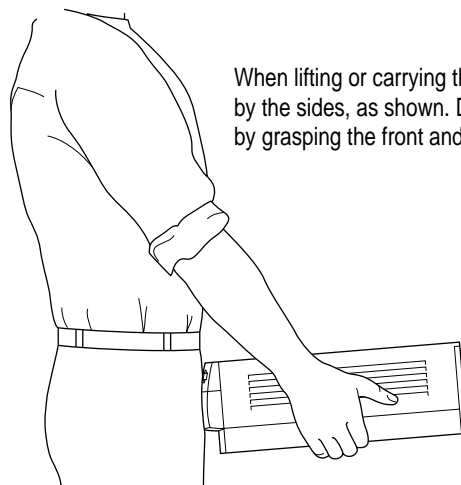
Setting Up Your Server

Setting up your server involves connecting a monitor, mouse, and keyboard, expanding your system to suit your needs, and connecting to the network.

First, acquaint yourself with your server's features, as shown in the next section, "Your Server at a Glance." Also, be sure to read the section "Security Issues" for important information about protecting your server from unauthorized access. Then, if you want to install an expansion card or install other internal devices, see the appropriate sections in Chapter 3 before returning to the setup procedures in this chapter. Once you've connected the monitor, mouse, and keyboard, you may need to refer to Chapter 3 again if you're connecting external devices.

You complete the setup process by connecting your server to the network, as described in Chapter 2. Once your server is connected to the network, see the *Workgroup Server Administrator's Guide* for instructions on configuring your server's system software.

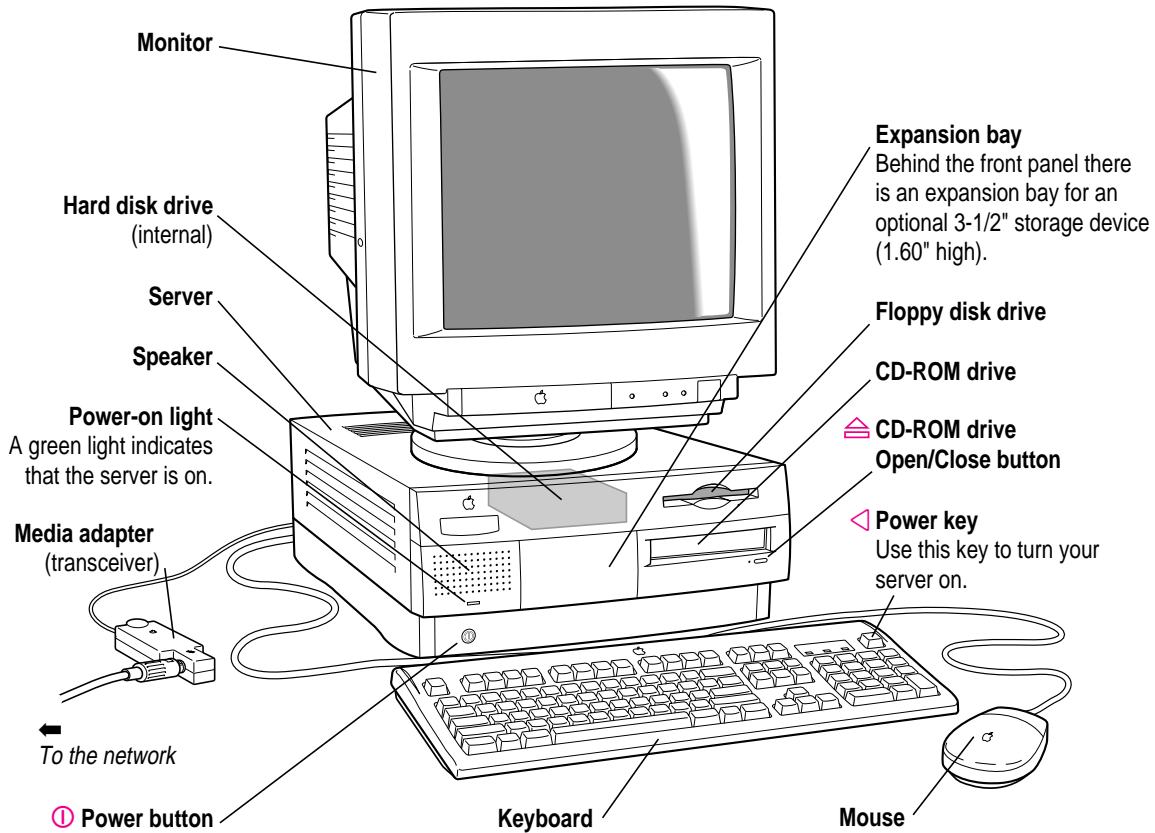
IMPORTANT When picking up your server, be sure to grasp it by the sides. Grasping it by the front or back can cause the server's cover to lift off.



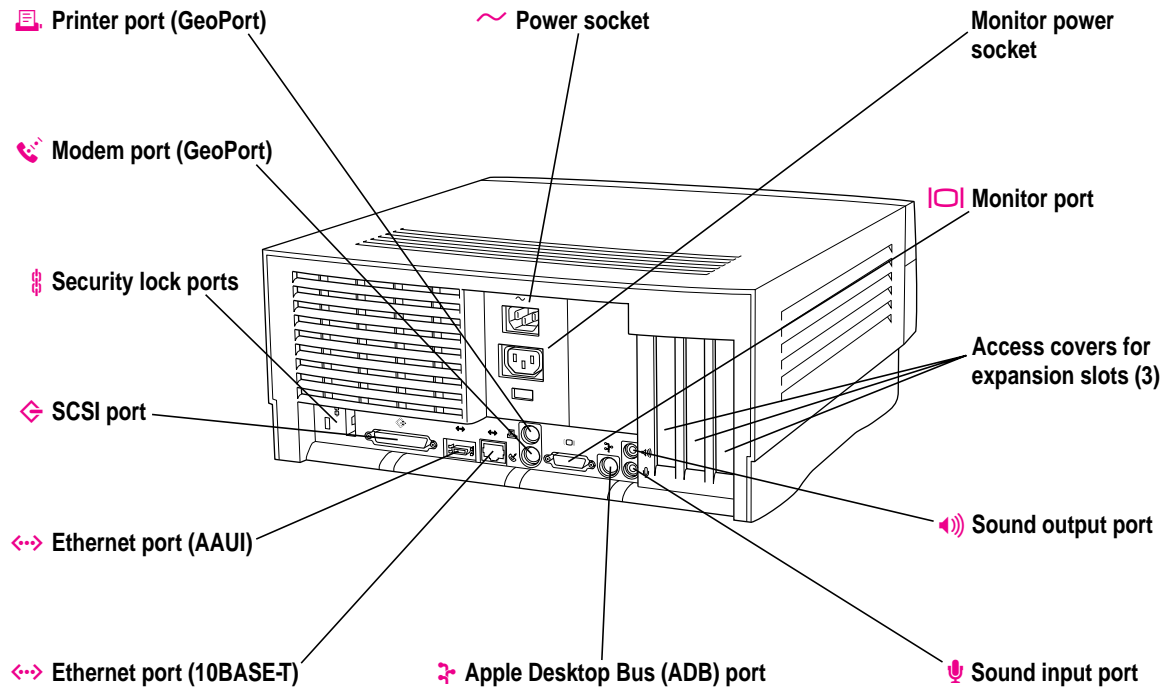
When lifting or carrying the server, always grasp it by the sides, as shown. Do not lift or carry the server by grasping the front and back.

Your server at a glance











The following figure shows the basic components of your Workgroup Server 7250, assembled and connected to a network.



The ports on the back of the Workgroup Server 7250 and the icons that identify them are shown in the following figure. During setup, you'll connect hardware to some of these ports.



Your server's ports and connectors

Printer port (GeoPort)		Connects your server to a printer, LocalTalk network, or GeoPort Adapter.
Modem port (GeoPort)		Connects your server to an external modem, LocalTalk network, or GeoPort Adapter.
Security lock ports		You can attach a security lock to your server. See your server products retailer for security lock devices that work with your server.
SCSI port		Connects your server to SCSI equipment such as external hard disk drives and scanners.
Ethernet port (AAUI)		Connects your server to an Ethernet network using an AAUI adapter.
Ethernet port (10BASE-T)		Connects your server to an Ethernet network using a 10BASE-T connector.
Monitor port		Connects your server to a monitor.
Access covers for slots (3)		Your server supports up to three Peripheral Component Interconnect (PCI) expansion cards.
Sound output port		Connects your server to headphones, externally powered (amplified) speakers, or other audio output equipment.
Sound input port		Connects your server to a professional-quality microphone or other audio input equipment.
Apple Desktop Bus (ADB) port		Connects your server to an input device, such as a keyboard or a trackball.

Security issues

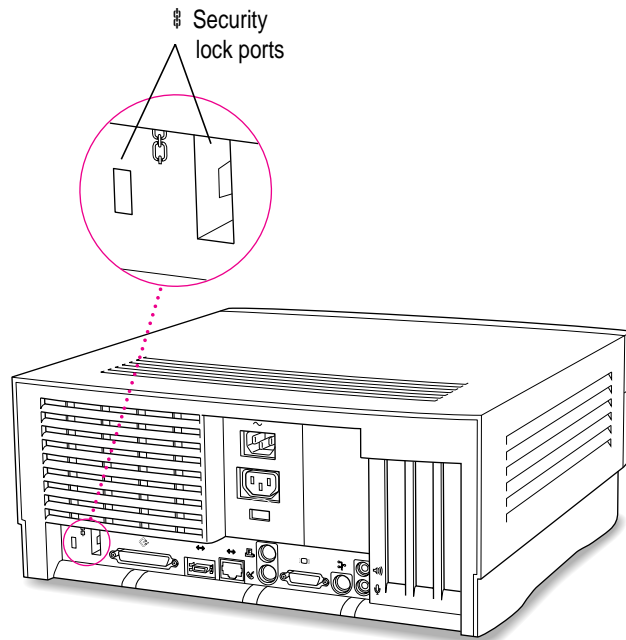
The Workgroup Server 7250 lets you concentrate valuable or sensitive information on one system that can be physically isolated and more carefully monitored than would be possible if that information were stored on personal computers. Before you set up the server, you may want to consider two measures that you can take to secure the hardware components: physically isolating the system and using a locking cable to secure the system.

Physically isolating the system

It is important to note that even if software security features (such as password protection or locking screen savers) are in use on the server, it is still possible to disconnect peripheral devices from your server. There is no better way to protect hardware components than by physically isolating the server system—locking it either in a well-ventilated cabinet or in a room with controlled access. Depending on your security needs, the nature of the data stored on the server and its external drives may warrant the effort.

Using a locking cable

As an alternative to isolating the system completely in an area of controlled access, you can purchase a locking cable and attach it to your server. The back panel has a built-in port for a locking cable. Follow the instructions supplied with the locking cable to secure it to your server.



By itself, a locking cable cannot prevent unauthorized use of the server, but it can prevent the server (and its peripheral devices if they are also secured by locking cables) from being removed.

Installing internal devices

If you purchased additional memory or expansion cards for your server, install them now (see Chapter 3 for instructions). If you don't have internal devices to install, go on to the next section, "Connecting a Monitor."

Connecting a monitor

You can connect many types of monitors (often called displays) to your server, including most standard monitors. See Appendix B, "Technical Information," for a complete list.

This section contains instructions on connecting most types of monitors. Monitors from manufacturers other than Apple may require adapters for their monitor cables and power cords. If you are connecting a non-Apple monitor, also refer to the instructions that came with the monitor.

Connecting the monitor's power cord

Monitors have two cords to connect: a monitor power cord and a monitor cable. To connect the monitor power cord, follow these steps:

1 Place the monitor on top of the server.

Keep these considerations in mind:

- You can place monitors weighing up to 52.3 lbs. (23.72 kg) on top of the server.
- Allow a few inches for air circulation around the server and monitor.
- Make sure that the top of the screen is slightly below eye level when you're sitting at the keyboard.
- Position the monitor to minimize glare and reflections on the screen from overhead lights and windows.
- Consult "Arranging Your Office" in Appendix A for suggestions about locating your server equipment.

2 Connect the monitor power cord to the monitor.

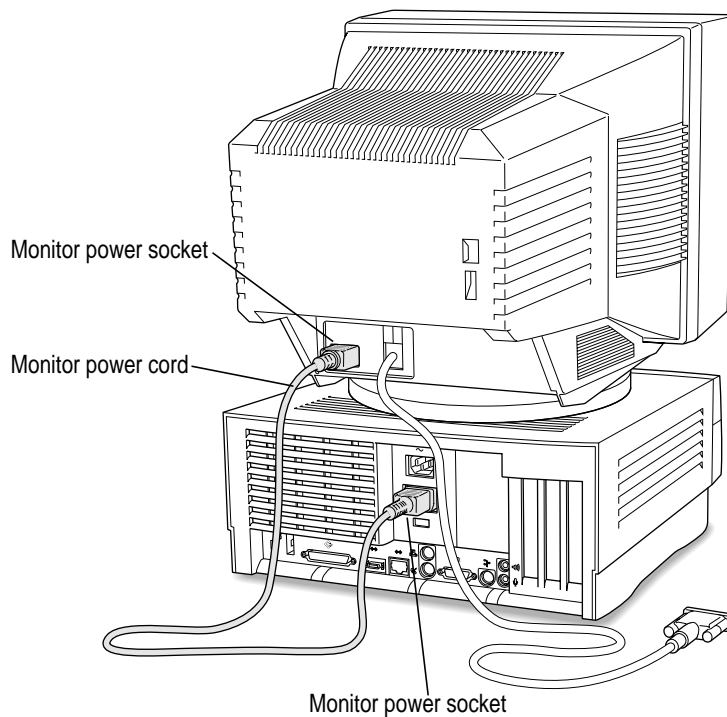
On some monitors, the cord is already attached.

3 Plug in the monitor power cord to the server or grounded electrical outlet.

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

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

WARNING To protect your monitor, be sure to use the appropriate adapter or voltage converter, if necessary. Setting the correct voltage for your server does not set the voltage for your monitor even if the monitor's power cord is connected directly to your server. To confirm the voltage requirements for the country in which you are using your server, see the table "Voltages for Different Locations" in the section "Plugging in the Server" later in this chapter.



Connecting the monitor cable

After you plug in the monitor power cord, you connect the monitor cable to the server's monitor port.

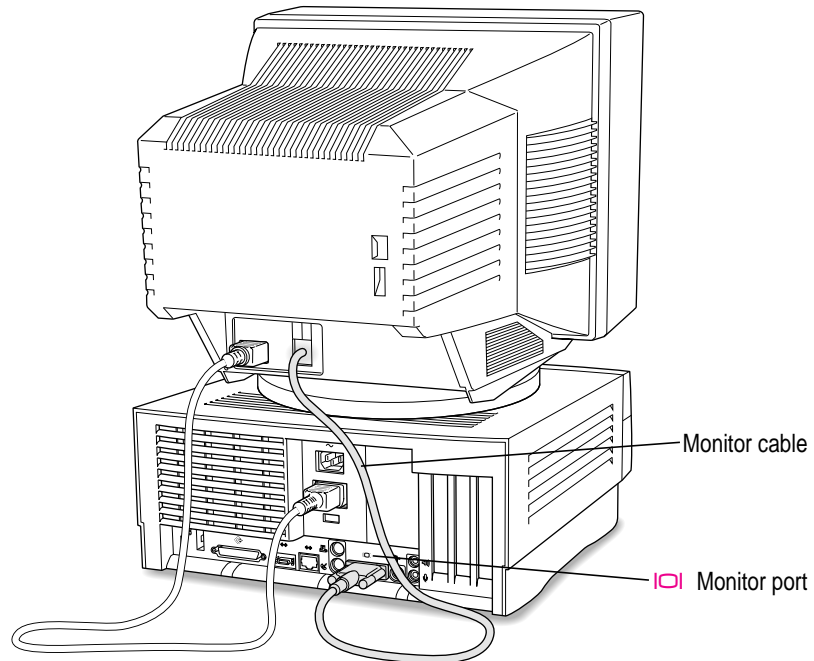
To connect the monitor cable, follow these steps:

- 1 **Attach the monitor cable to the monitor.**

On some monitors, the cable is already attached.

- 2 **Attach the monitor cable to the monitor port on the back panel of the server.**

See the information that came with the monitor to use its special features.



Connecting the mouse and keyboard

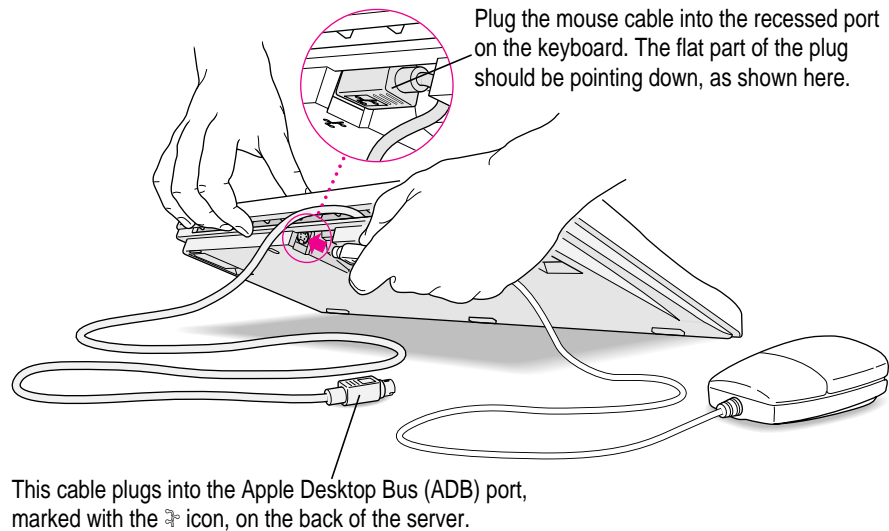
You have a choice of several keyboards for your server. The way you connect the mouse and keyboard depends on whether the keyboard has a separate cable or a built-in cable.

Connecting a keyboard with a built-in cable

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

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

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

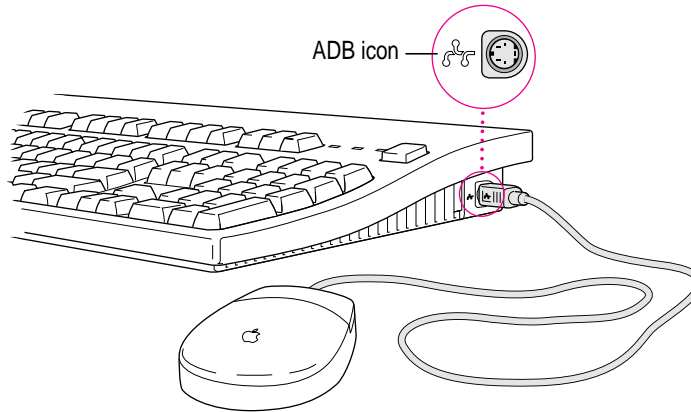


- 2 **Plug the keyboard cable into the port on the back of the server marked with the ⌘ icon.**

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

Connecting a keyboard with a separate cable

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



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

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

Note: The ⌘ port is called the Apple Desktop Bus (ADB) port.

- 2 Plug the keyboard cable (both ends are the same) into the other port on the keyboard.
- 3 Plug the keyboard cable into the port on the back of the server marked with the ⌘ icon.

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

Connecting other external devices

If you want to connect other devices to your server, such as an external hard disk or a printer, follow the instructions in Chapter 3.

Plugging in the server

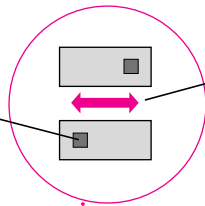
Before you plug your server into a wall socket, carefully read all the setup instructions in this chapter. When you are ready to begin, follow these steps:

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

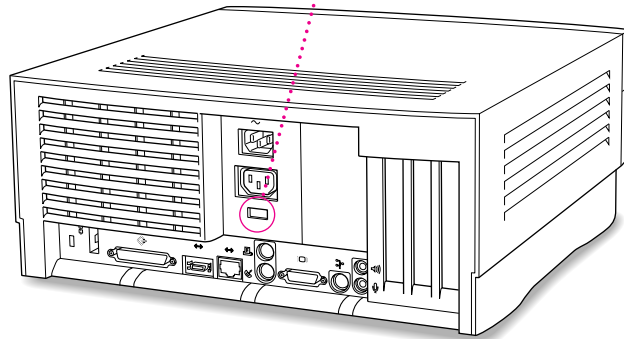
The voltage switch must be set correctly to avoid damaging your server. If you don't know the voltage used in the country you're in, refer to the table "Voltages for Different Locations" on the following page.

WARNING Setting the correct voltage for your server does not set the voltage for your monitor even if the monitor's power cord is connected directly to your server. To protect your monitor, be sure to use the appropriate adapter or voltage converter, if necessary.

Check to see that the voltage switch on the back of your server is properly set before you plug it in. If you need to change the setting, insert a small screwdriver here and slide the switch.



Set the switch to show "115" for voltages in the 100–130V range.
Set the switch to show "230" for voltages in the 220–270V range.

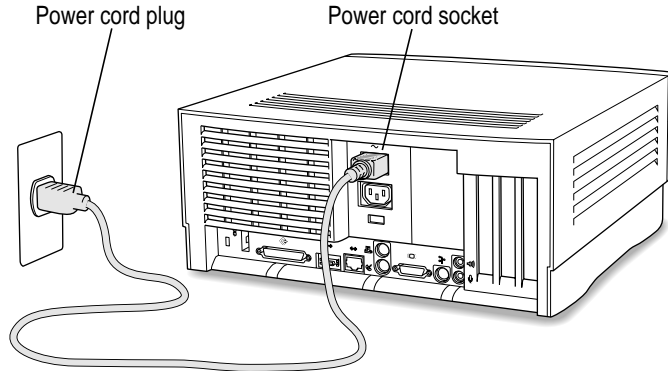


Voltages for different locations

Country	Single voltage
Japan	100
S. Korea	100/220
Jamaica, Taiwan	110
Peru	110/220
Brazil, Lebanon	110–220
Phillipines	115
Bermuda, Canada, Puerto Rico, United States, Venezuela	120
Mexico	127
Saudi Arabia	127/220
Hong Kong	200
India, South Africa	220–250
Israel, Pakistan, Singapore	230
Australia, Kuwait, Malta, New Zealand, Northern Ireland, Papua New Guinea, Oman, Qatar, United Kingdom	240
Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland	220–230
Bahrain, Chile, China (People's Republic), Czech Republic, Egypt, Greenland, Hungary, Iceland, Indonesia, Iran, Jordan, Liechtenstein, Nepal, Paraguay, Poland, Romania, Slovak Republic, United Arab Emirates, Russia and the Commonwealth of Independent States (CIS), Yemen, Yugoslavia	220

- 2 Plug the socket end of the server's power cord into the recessed power socket (marked with the symbol ~) on the back of the server.
- 3 Plug the other end of the power cord into a three-hole grounded outlet or power strip.

WARNING This equipment is intended to be electrically grounded. Your server is equipped with a three-wire grounding plug—a plug that has a third (grounding) pin. This plug will fit only a grounded AC outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact a licensed electrician to replace the outlet with a properly grounded outlet. Do not defeat the purpose of the grounding plug!



IMPORTANT The only way to disconnect power completely is to unplug the power cord. Make sure that at least one end of the power cord is within easy reach so that you can unplug the server when you need to.

Turning the server on

WARNING Before turning on the Workgroup Server 7250 for the first time, be sure that the voltage switch is set correctly for the type of voltage system to which you are connecting. See “Plugging In the Server,” earlier in this chapter, for instructions on setting the voltage switch. If the switch is not set correctly you can damage your server.

To turn on the server for the first time, follow these steps.

1 Turn on the monitor.

See the information that came with your monitor for the location of the power switch. On Apple monitors, the power switch has this icon: ◀.

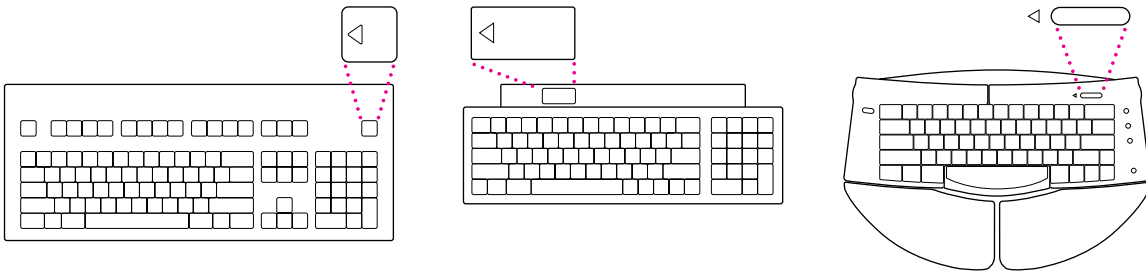
Note: You only need to turn on the monitor once if its power cord is plugged into the server. From now on, the monitor will turn off automatically when you shut down the server, and it will turn on automatically when you start up the server. (If the monitor’s power cord is not plugged into the server, it must be turned on separately each time you turn on the server.)

2 Turn on all external devices.

External devices may include hard disk drives, CD-ROM drives, or tape-backup drives. The server checks only once—at startup—for the presence of external devices, so you need to turn on the devices *before* you turn on the server.

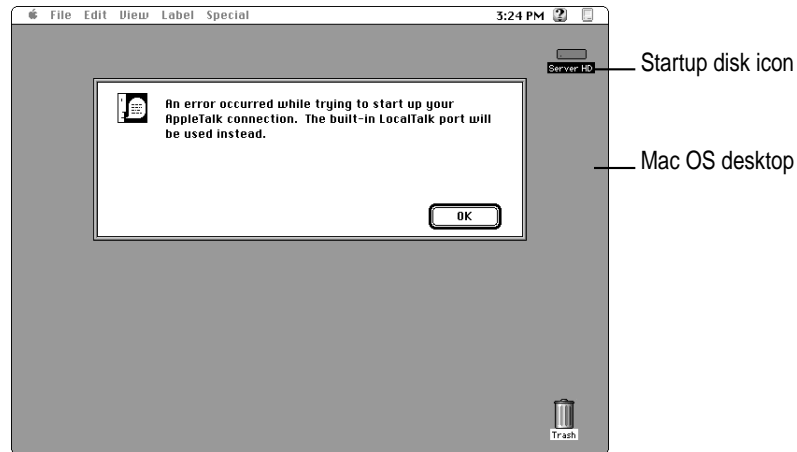
3 Turn on your server by pressing the Power key on the keyboard or pressing the Power button on the front panel of the server.

You’ll find the Power key at the top of the keyboard. You can recognize this key by the triangle outline.



4 Check to see what's on your screen.

- If you see a system message on the desktop, as shown in the following figure, your Mac OS is already set up correctly. Click the OK button to dismiss the dialog box.



Why the message about your network connection? The Workgroup Server is preset for a connection to an Ethernet network. When you start up your server for the first time (before connecting a network cable), you'll see the dialog box shown above alerting you that the system temporarily switched the network connection from built-in EtherTalk (software for Ethernet) to LocalTalk. However, if you shut down the server and connect to an Ethernet network later (as described in Chapter 2), the next time you start up, the system will automatically make the correct network connection for you.

See the *Workgroup Server Administrator's Guide* for information on configuring your server's software.

- If you see a blinking question mark, you need to install system software on the server's hard disk.



To install the Mac OS, see “Installing System Software” in Chapter 4, “Managing Hard Disks,” of the *Workgroup Server Administrator’s Guide*.

- If you see anything else on your screen, or if you see nothing at all, see the next section, “Problems Turning On Your Server?”

Problems turning on your server?

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

- Is the server plugged into a power source? If it is plugged into a power strip, is the power strip turned on?
- Is the power light on the front panel on?
- Are the keyboard and mouse cables connected correctly? (Don’t disconnect the keyboard or mouse cables while your server is on. You could damage your equipment.)
- Is the monitor power cord plugged in?
- Is the monitor turned on? (Check the power light on the front of the monitor.)
- Is the monitor’s cable attached firmly to both the monitor and server?
- Are the brightness and contrast controls on the monitor adjusted correctly? (On Apple monitors, the brightness control is marked with the symbol ✨ and the contrast control is marked with the symbol ●.)

Turning the server off

You need to turn off (shut down) the server to perform the tasks in Chapter 2, “Connecting to the Network.”

IMPORTANT Be sure to shut down the server if you need to do any of the following:

- move the server
- connect other equipment to the server
- unplug the server

You can turn off the server by pressing the Power button (located at the front of the server) or you can use the Shut Down command. Both procedures ready the startup disk for a fast restart the next time you turn on the server.

Using the Shut Down command

- 1 Choose Shut Down from the Special menu.



- 2 Respond to the dialog boxes that may appear.

Applications that are running may display dialog boxes that prompt you to save open files or that ask you to enter a message that is to be displayed to users who are logged in to your server.

2

Connecting to the Network

The Workgroup Server 7250 contains built-in hardware and software for connecting the server to two types of networks: LocalTalk and Ethernet. With the appropriate Peripheral Component Interconnect (PCI) card and software, you can also connect your server to additional networks, including other network types, such as Token Ring, Integrated Services Digital Network (ISDN), Fiber Distributed Data Interface (FDDI), and Fast Ethernet (100BASE-T) networks.

You connect the server to a LocalTalk network through the printer port. The built-in Ethernet ports on the Workgroup Server 7250 let you connect the server to an Ethernet network through either the AAUI (Apple Attachment Unit Interface) Ethernet connector or the 10BASE-T Ethernet interface connector. (Although you can connect cables to both of these Ethernet ports at the same time, you can use only one of these built-in Ethernet connections at a time.)

The Workgroup Server 7250 is preconfigured to use the built-in Ethernet connection. If both 10BASE-T and AAUI networks are connected to the built-in Ethernet ports, your server automatically uses the 10BASE-T connection. See Chapter 2, “Configuring Your Network Connection,” in the *Workgroup Server Administrator’s Guide* for instructions on changing the default network connection for your server.

Although your server is preconfigured to access one network segment at a time, with network server software (such as AppleShare 4.2.1) that supports the multihoming capabilities of Open Transport 1.1 (new communications software that is part of the Mac OS included with your server), you can set up your server to access multiple network segments at the same time. See the section “Building a High-Performance Network” later in this chapter for more information on multihoming.

Connecting to an Ethernet network

The built-in Ethernet capabilities of your Workgroup Server 7250 allow you to connect to any standard Ethernet network using thin coaxial (or “coax”), 10BASE-T twisted-pair, or thick coaxial cables; fiber-optic media; or other standard Ethernet cables.

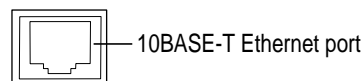
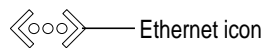
You can connect your server *directly* to an Ethernet network using a 10BASE-T twisted-pair cable. To connect the server to an Ethernet network using coaxial cables, you need one of the following Ethernet media adapters for the type of cables your network uses:

- Apple Ethernet Thin Coax Transceiver
- Apple Ethernet AUI Adapter

See your Apple-authorized dealer for more information on Apple Ethernet media adapters for your Workgroup Server 7250.

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

You can connect an adapter and cable for an Ethernet network directly to the server without installing an expansion card. You can find the Ethernet ports on the back of your server by looking for the Ethernet icon:



Although you can connect cables to both of these Ethernet ports at the same time, you can use only one of these built-in Ethernet connections at a time.

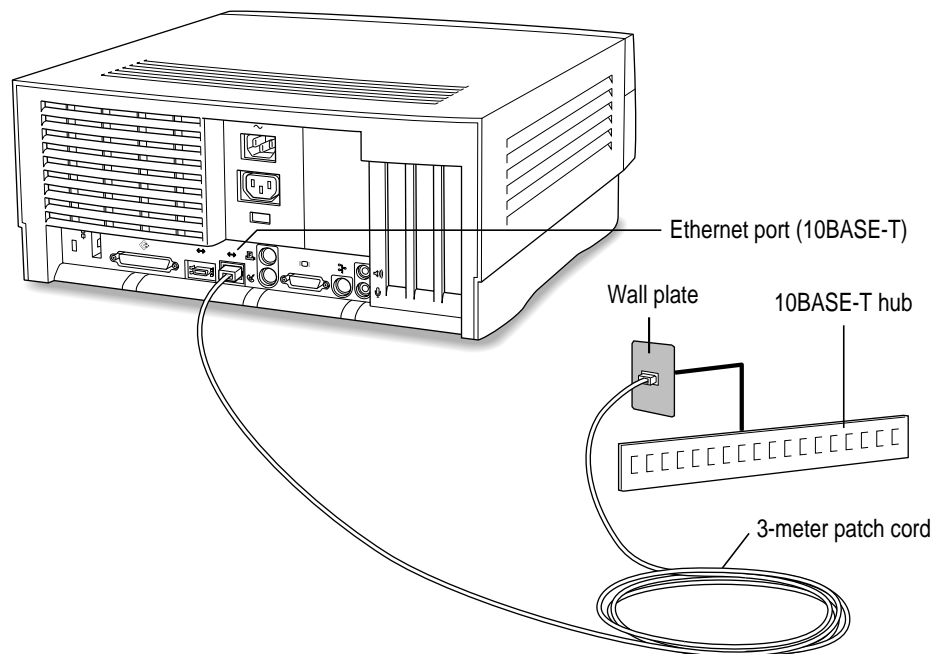
The following sections provide basic instructions for connecting your server to an Ethernet network.

Connecting to twisted-pair Ethernet

Follow this procedure to connect the server to a network that implements Ethernet over twisted-pair cable. The hardware connection requires a twisted-pair patch cord with an RJ-45 telephone-style connector jack. You plug the patch cord into a standard wall plate that is connected to a centralized 10BASE-T hub.

To connect the server to a twisted-pair network:

- 1 **Make sure that the server is turned off.**
- 2 **Plug one end of the twisted-pair patch cord into an RJ-45 wall outlet that supports twisted-pair Ethernet.**



- 3 Plug the other end of the twisted-pair patch cord into the 10BASE-T Ethernet port on the server.**

The server is preset to use the network software connection for Ethernet. You can use network services as soon as you start up the server.

Connecting to thin coaxial Ethernet

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

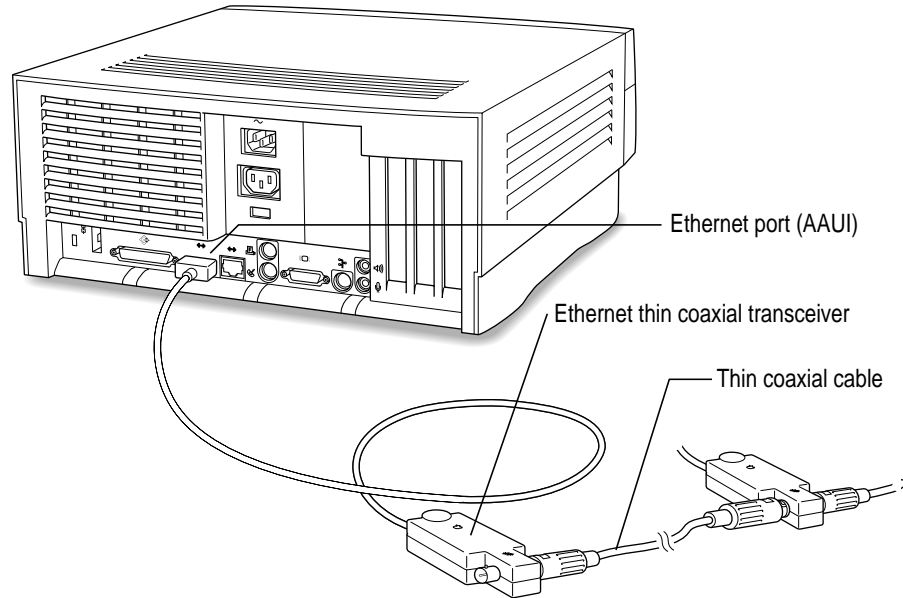
To connect the server to a thin coaxial network:

- 1 Make sure that the server is turned off.**
- 2 Attach one end of a thin coaxial cable to one of the posts on the thin coaxial transceiver.**
- 3 Attach the other end of the cable to the last thin coaxial transceiver on the network.**

A thin coaxial network must be terminated at the endpoints to function. An Apple transceiver is self-terminating. A non-Apple transceiver may require a terminator; check the documentation that came with the transceiver.

Note: You can connect the server anywhere along a network; however, to do so requires that you temporarily disconnect the network, which could disrupt existing network services.

- 4 Plug the connector on the transceiver into the AAUI Ethernet port on the server.



The server is preset to use the network software connection for Ethernet. You can use network services as soon as you start up the server.

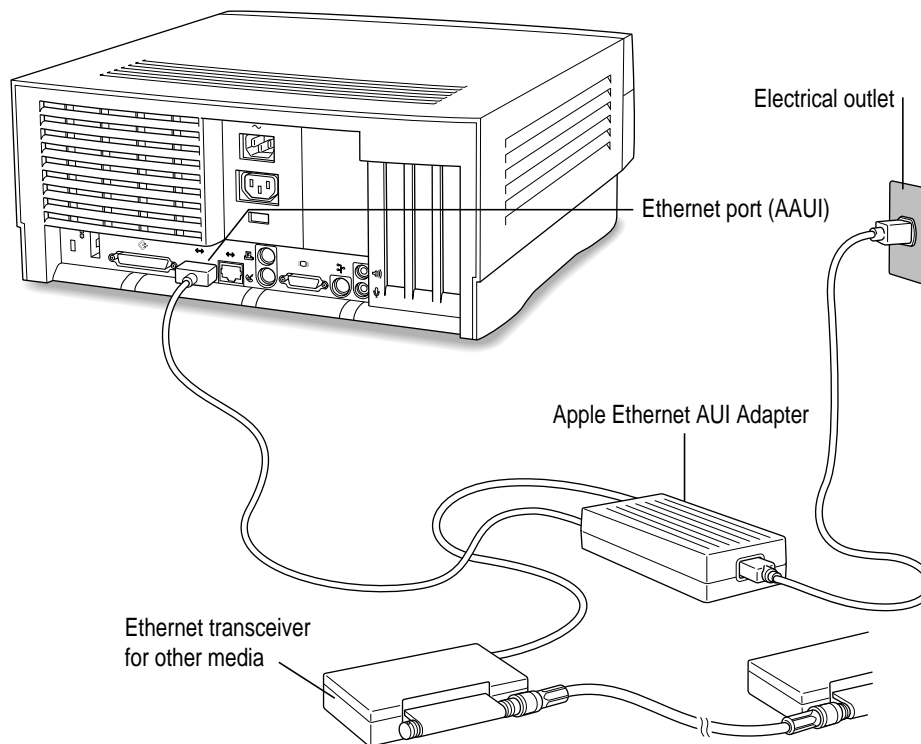
Connecting to other types of Ethernet

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

To connect the server to an Ethernet transceiver for other types of Ethernet media:

- 1 Make sure that the server is turned off.
- 2 Connect the Ethernet transceiver to the network following the instructions in the documentation that came with the transceiver.

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

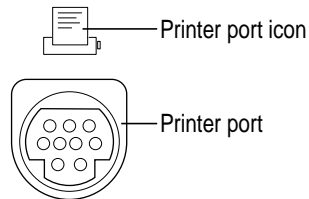


- 4 Plug the adapter's power cord into a power outlet.
- 5 Plug the connector on the Apple Ethernet AUI Adapter into the AAUI Ethernet port on the server.

The server is preset to use the network software connection for Ethernet. You can use network services as soon as you start up the server.

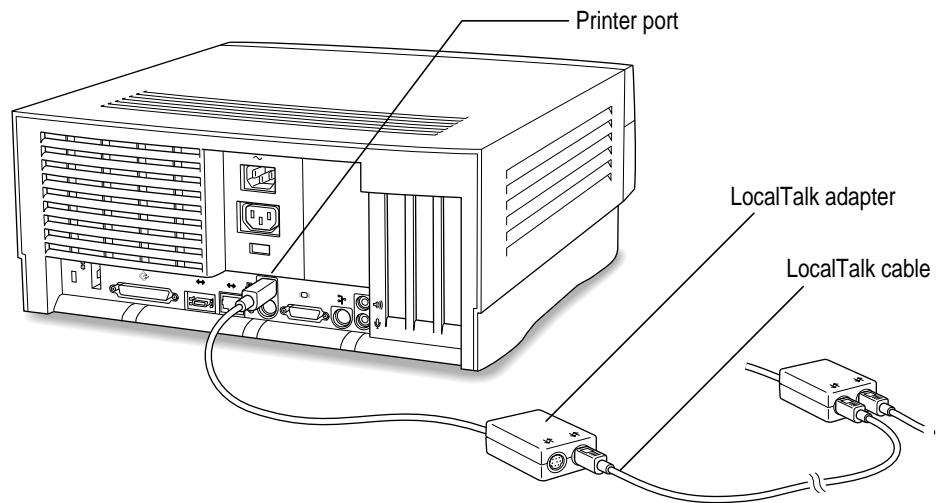
Connecting to a LocalTalk network

To connect your server to a LocalTalk network, you will need LocalTalk cables and a LocalTalk adapter. The Apple LocalTalk Locking Connector Kit DIN-8, available from your Apple-authorized dealer, lets you connect the server to an existing LocalTalk network by means of the printer port.



To connect the server to a LocalTalk network:

- 1 Make sure that the server is turned off.**
- 2 Attach the LocalTalk adapter to the printer port.**
- 3 Plug one end of a LocalTalk cable into the LocalTalk adapter.**
- 4 Plug the other end of the cable into the last LocalTalk adapter on the network.**



Now that you have made the server's physical connection to LocalTalk, you can start up the server.

IMPORTANT After connecting to a LocalTalk network (if you have not also connected to Ethernet), each time you start up the server you'll see a dialog box that indicates an error condition. This dialog box informs you that the system has made a temporary switch from EtherTalk (its preset network software connection) to LocalTalk. You will see this message until you change the default setting in the AppleTalk control panel. Refer to Chapter 2, "Configuring Your Network Connection," in the *Workgroup Server Administrator's Guide* to learn how to switch the setting in the AppleTalk control panel.

Building a high-performance network

Your Workgroup Server 7250 is designed to support a multisegment, high-performance network. Connection devices such as repeaters, bridges, routers, and gateways extend network segments and provide efficient links between a variety of network segments. For information about extending and connecting AppleTalk networks, see *Planning and Managing AppleTalk Networks* (an Apple book published by Addison-Wesley that is available at computer bookstores).

In addition to its built-in Local Talk and Ethernet ports, your server has three expansion slots where you can install PCI cards for connecting additional network segments, including different network types such as Token Ring, Integrated Services Digital Network (ISDN), Fiber Distributed Data Interface (FDDI), and Fast Ethernet (100BASE-T) networks. The multihoming capabilities of Open Transport 1.1, the new networking and communications software that is part of the Mac OS, make it possible for your server to access multiple network segments at the same time.

Creating a high-performance Ethernet segment

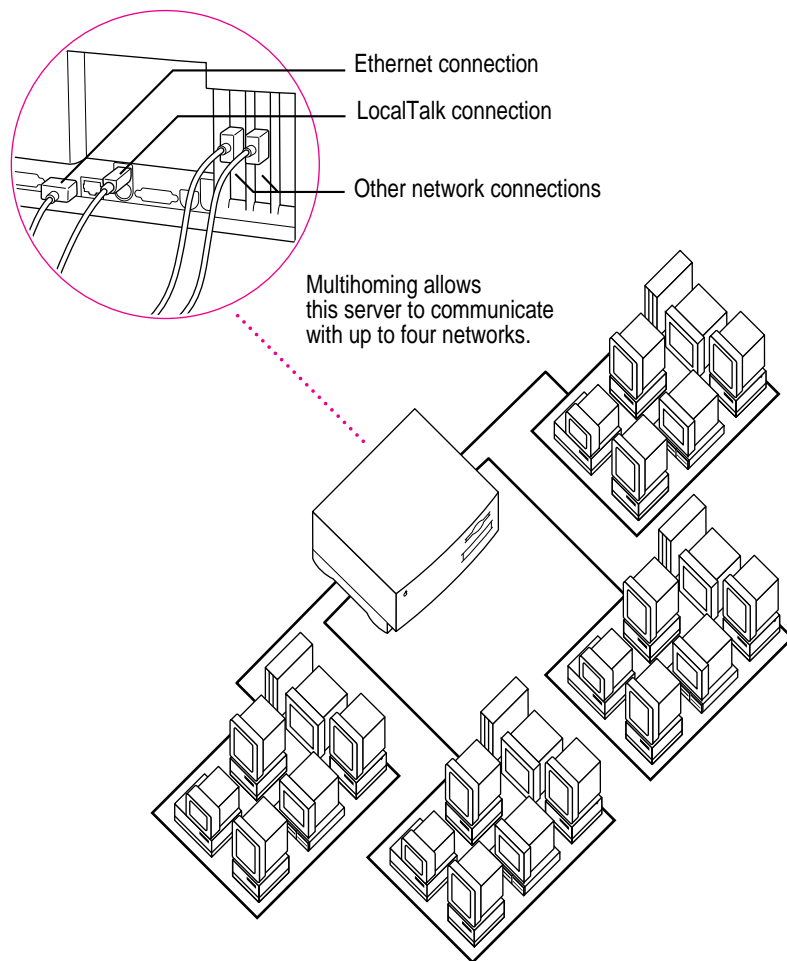
You can increase performance in Ethernet networks by creating subnetworks of devices connected by 10BASE-T Ethernet hubs (repeaters that regenerate signals from one device to another). The Apple Ethernet 10T/5 Workgroup Hub provides a modular, plug-and-play approach to creating and expanding high-performance Ethernet networks. This hub gives you a simple, cost-effective means of connecting together a wide variety of Macintosh and other personal computers, Workgroup Servers, and Ethernet-capable printers.

One of the easiest and most cost-effective ways to increase bandwidth is to connect network devices with *switched Ethernet hubs*. A switched hub connects devices on a 10BASE-T network, but it switches packets between ports, instead of passing them across a shared backbone, allowing each device that is connected to the switched hub to use the entire capacity of the link. In a 10BASE-T network, you may want to dedicate switched hubs to devices that require extra bandwidth, such as file servers. You can create a high-speed (100BASE-T) Ethernet segment by installing a 100 MB Ethernet PCI expansion card in your server (see Chapter 3 for card installation instructions) and using high-performance switched hubs to connect the network devices.

Contact your Apple-authorized dealer for help selecting PCI expansion cards and hubs to optimize performance on your Ethernet networks.

Using multiple network segments

By installing additional PCI network cards (and associated software), you can connect your server to a variety of networks. To use more than one network segment at the same time, you will also need network server software that supports multihoming on PCI-based systems (such as AppleShare 4.2.1). The following illustration is an example of a server that has multihoming enabled on the built-in Ethernet and LocalTalk connections, as well as on two additional network connections provided by PCI network cards.



Setting up multihoming

Follow these steps to set up multihoming capabilities on your server:

- 1 Install PCI network cards (and associated software) for additional network segments that you want to connect to your server.**

Follow the instructions in Chapter 3 of this setup guide.

Note: This step is optional, as you can take advantage of multihoming capabilities even when network segments are connected to just the built-in LocalTalk and Ethernet ports on your server.

- 2 Configure the Open Transport options for your server.**

Follow the instructions for configuring your AppleTalk network connection in Chapter 2, “Configuring Your Network Connection,” of the *Workgroup Server Administrator’s Guide*.

IMPORTANT Each port must be assigned to a different zone.

- 3 Configure your network server software to enable multihoming on your server.**

See the documentation that accompanied your network server software. (For AppleShare version 4.2.1, see the *Addendum to AppleShare Administrator’s Guide*.)

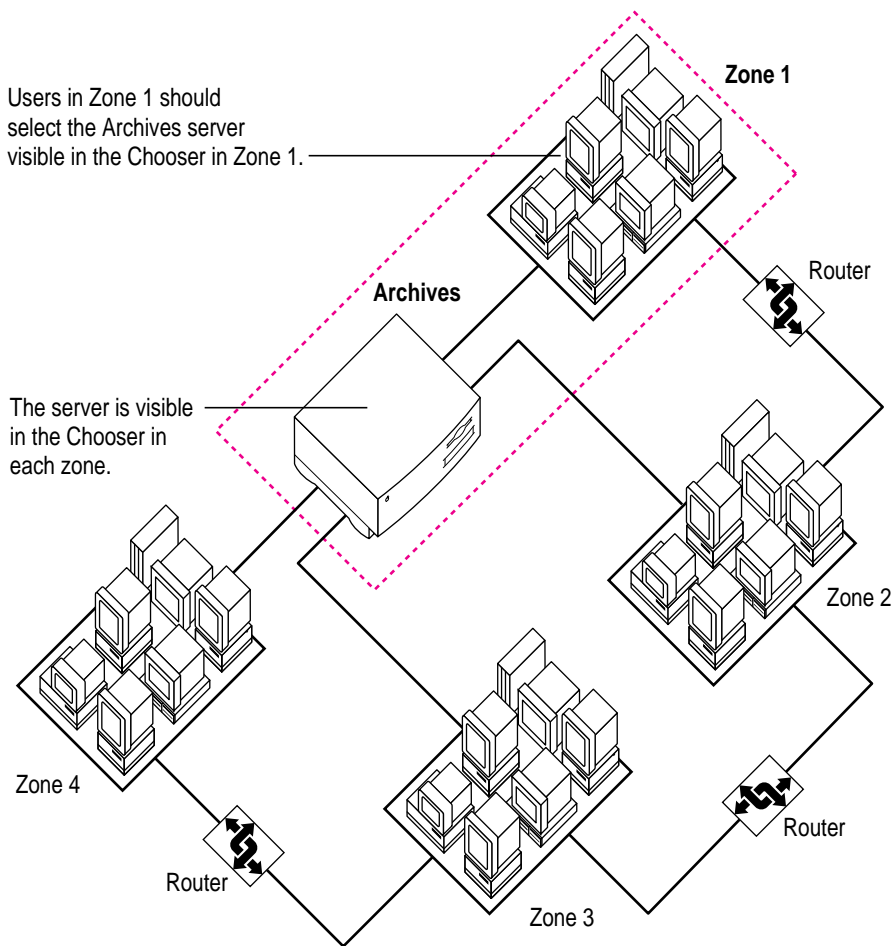
Use a router to connect each network segment

Although users on different multihomed network segments can share and exchange files by using the server as a common storage area, each multihomed network segment is not visible to the other segments without use of a router. For example, suppose there are four multihomed network segments connected to your server (A, B, C, and D). Computers and other network devices such as LaserWriter printers on segment A are not visible to segments B, C, or D unless there’s a router between A and the other three segments.

Have users select the server in their own zone

If network segments connected to your server are connected to each other through routers, users will see the server in all the connected zones (in the Chooser). For best performance, make sure that users log on to the server that resides in the same zone as their own computer.

For instance, in the following illustration, users will be able to see the Archives server in Zones 1, 2, 3 and 4. Users in Zone 1 should select the Archives server in Zone 1.

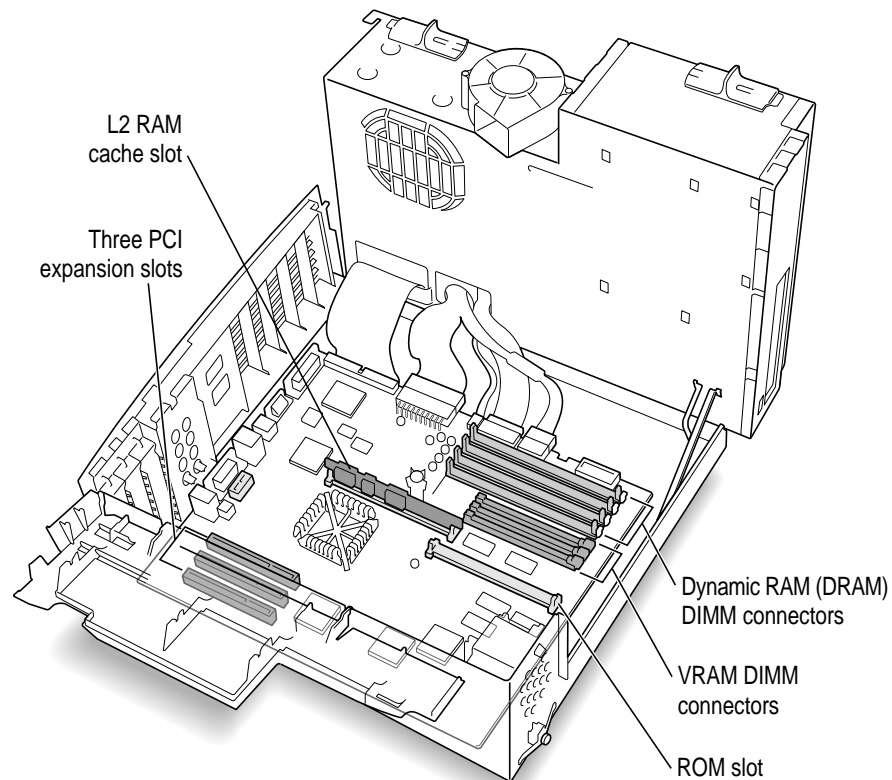


3

Expanding Your Server and Connecting Other Equipment

You can expand the capabilities of your server by installing items internally and by connecting external devices. The following figure shows you the location of the Workgroup Server 7250's internal components. An external view of the server, depicting the ports to which you connect other devices, is shown in the section "Your Server at a Glance" in Chapter 1.

IMPORTANT Make sure each device you add is compatible with your server and does not exceed the maximum power allowance for that device. Turn off your server before connecting a SCSI, ADB, or internal device. For further information, consult your Apple-authorized dealer, the manufacturer of the component you want to add, or Appendix B, "Technical Information."

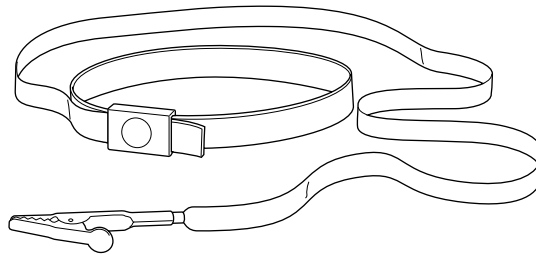


Opening the server safely

WARNING The components in your server, as well as the internal devices that you may install in your server, are very susceptible to damage from electrostatic discharge. When opening your server and while installing internal devices in the server, it is very important to take precautions to protect the server's components from static electricity damage.

You can take the following preventative measures to avoid electrostatic discharge while you are installing internal devices in your server:

- Wear a grounded wriststrap (like the one shown below) while installing internal devices in the server.

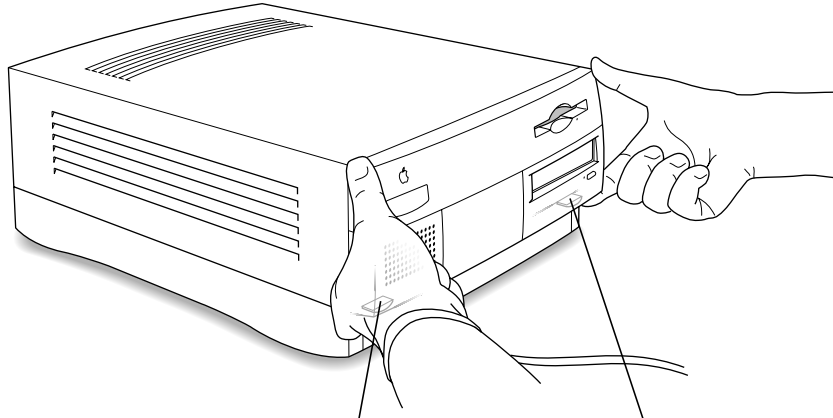


- Carefully follow all instructions for discharging static electricity included in the procedures in this chapter.

Follow these steps to open the server:

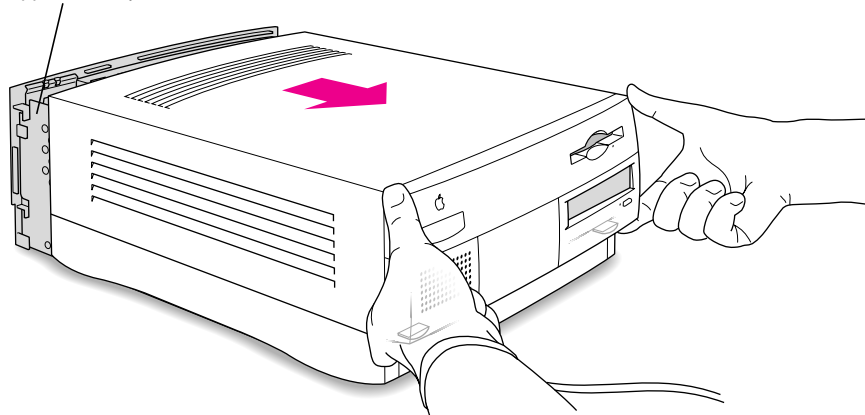
- 1** Make sure that the server is shut down and that any cables (including the power cord) are disconnected from the server.
- 2** Press the Power button to discharge static electricity.

- 3 Press the two release buttons under the front panel and slide the cover toward you approximately two inches.



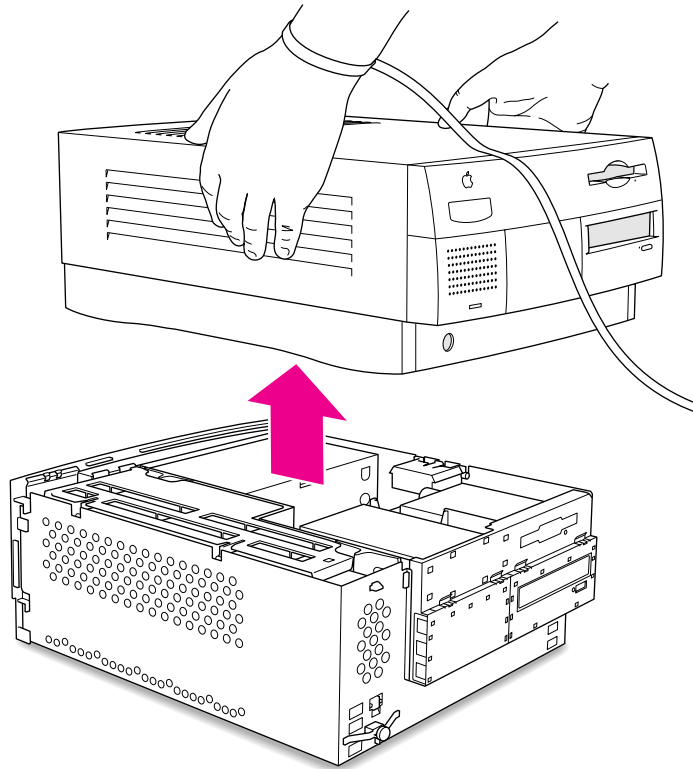
Locate the two release buttons under the front panel ledge with your fingertips.

While pressing the release buttons, pull the top cover forward approximately two inches to release it from the chassis.



4 Remove the cover from the server.

After you've slid the cover forward about two inches, lift it straight up and off the server.



Installing an expansion card

You can install printed circuit boards (called cards) for networking and communications, SCSI acceleration, video and graphics applications, or other purposes. The cards fit into expansion slots inside the computer.

Your Workgroup Server 7250 has three expansion slots, each designed to accept a Peripheral Component Interconnect (PCI) card. Install only expansion cards that come with Mac OS drivers and are compliant with the PCI 2.0 standard. NuBus cards cannot be used in these expansion slots.

WARNING To avoid damaging your server and expansion card, do not attempt to install any expansion card without first checking the documentation for that card. If the documentation specifies that an Apple-certified technician must install the card (usually because the installation requires special training or tools), consult the service and support information that came with your server for instructions on how to contact an Apple-authorized service provider or Apple for assistance. If you attempt to install the card yourself, any damage you may cause to the server or card will not be covered by the limited warranty on your server. If the card is not an Apple-labeled product, check with an Apple-authorized dealer or service provider to see if you can install it yourself.

Power requirements

The combined power consumption of expansion cards must not exceed the limits specified for your Workgroup Server 7250. If you have more than one expansion card installed, check the information that came with your cards to make sure that their power consumption is within the limits specified in Appendix B, “Technical Information.”

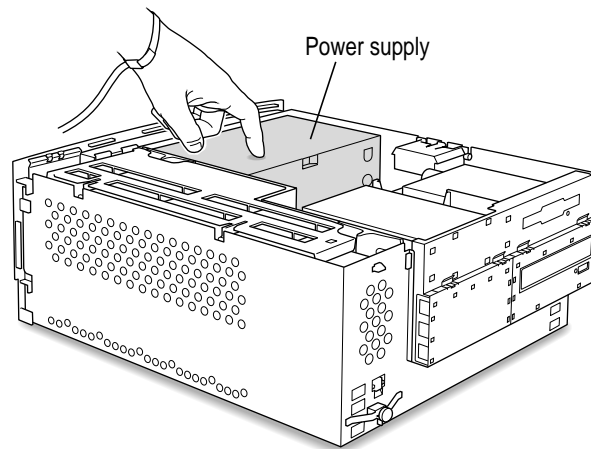
Installing a PCI expansion card

IMPORTANT Some cards may need to be installed by an Apple-authorized service provider. Check the information that came with the card.

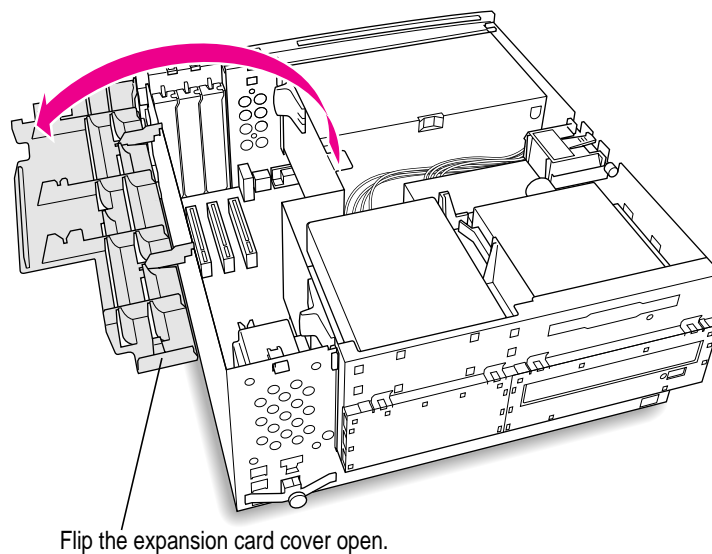
Follow these steps to install an expansion card.

- 1 Carefully follow the instructions in the preceding section for opening the server safely.**
Remember to wear a grounded wriststrap while installing an expansion card.
- 2 Touch the metal part of the power supply case inside the server to discharge static electricity.**

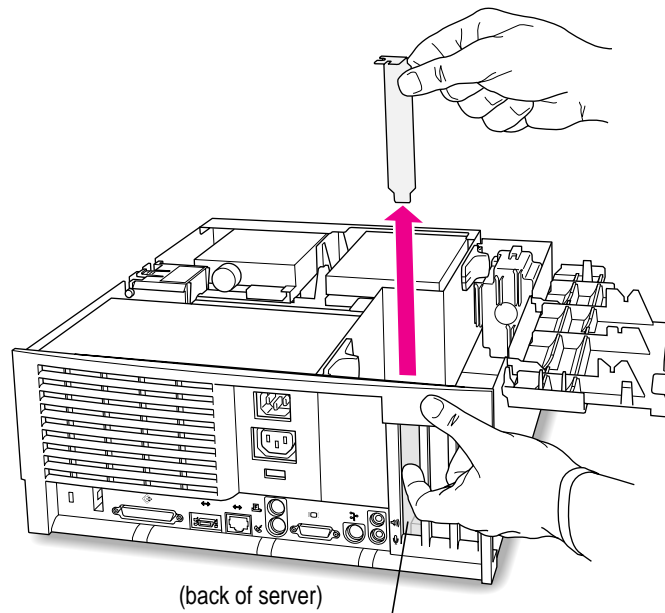
Always do this before you touch any parts, or install any components, inside the server.



- 3 Flip the expansion card cover open.**



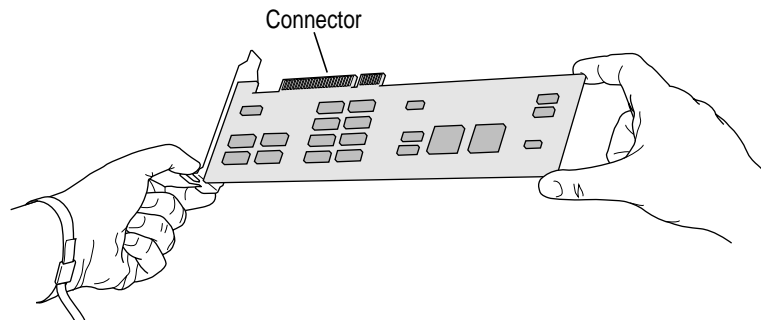
- 4** Being careful not to touch the sharp edges, pull out the port access cover behind the expansion slot you want to use, and set the access port cover aside.



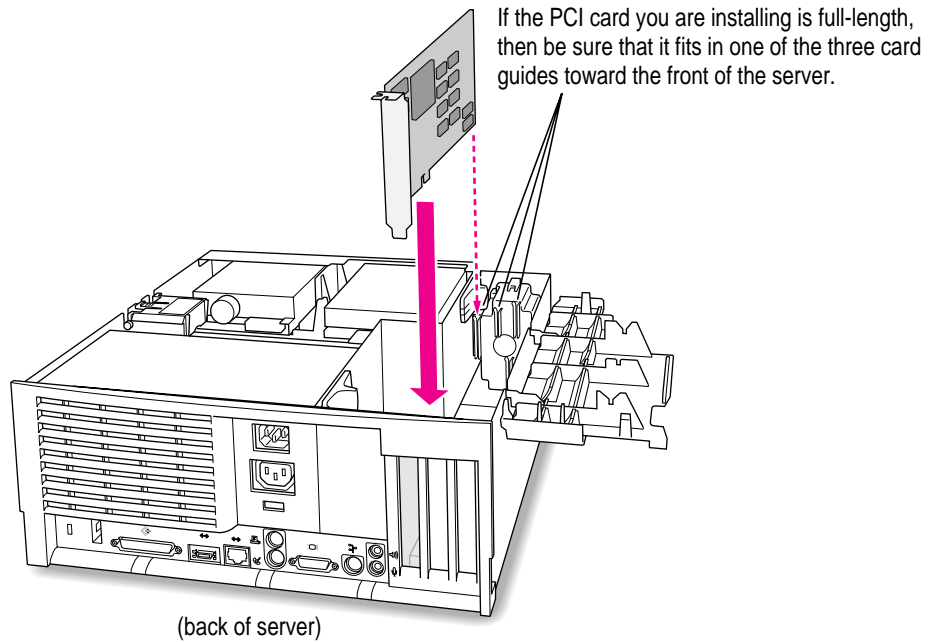
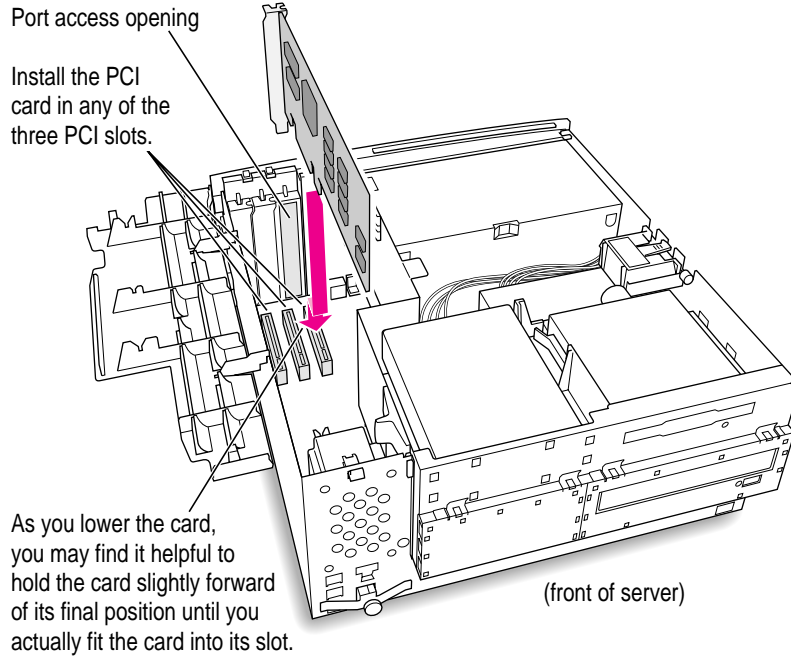
Push the port access cover in gently with the finger of one hand while pulling it straight up with the other hand.

- 5** To protect your card, touch the metal part of the power supply case inside the server to discharge static electricity again, as in step 2, and then remove the expansion card from its static-proof bag.

Hold the card by its edges to avoid touching the connector.



6 Align the connector end of the card with the expansion slot.

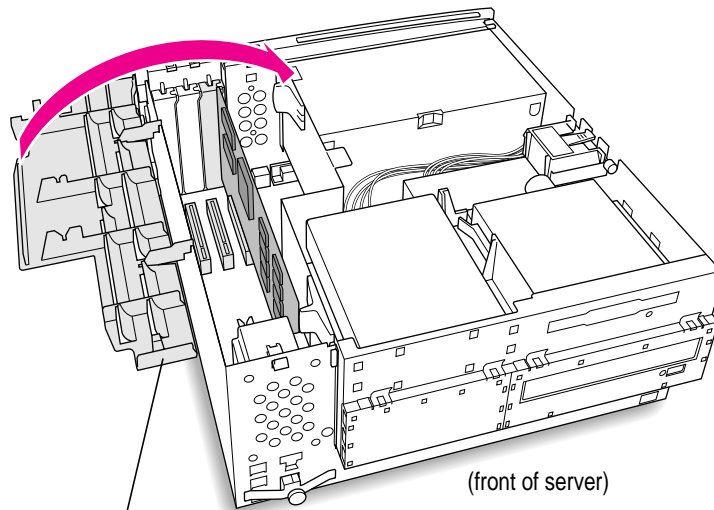


7 Press the card gently but firmly until the connector is fully inserted.

- Don't force the card. If you meet a lot of resistance, pull the card out and try again.
- To see if the card is properly connected, pull it gently. If it resists and stays in place, it's connected. (Make sure you don't pull the card so much that you accidentally disconnect it.)

If you have other cards to install, put them in now by repeating steps 4 through 7.

8 Flip the expansion card cover up and snap it back into place. (Be sure to snap the cover back down on both ends.)

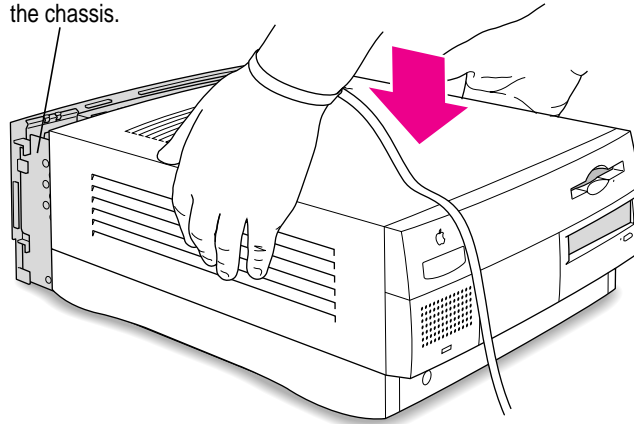


Flip the expansion card cover closed and snap it into place.

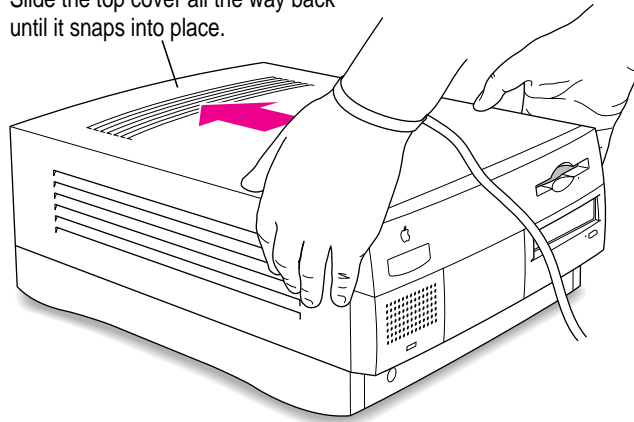
9 Replace the cover on the server.

Lower the cover all the way down onto the case, leaving a two-inch gap. Push the cover back until it snaps into place.

Set the top cover down so that there is about a two-inch gap between the back of the top cover and the back of the chassis.



Slide the top cover all the way back until it snaps into place.



You are now finished installing the card. If a software driver was included with your expansion card (on a floppy disk), after you finish setting up your server and turn it on, you will need to install the driver.

Return to Chapter 1 to complete the steps for setting up and turning on your server, and then, if you need to install driver software, refer to the documentation that accompanied the expansion card and to “Installing Device Drivers” in Chapter 1 of the *Workgroup Server Administrator’s Guide*.

WARNING Never turn on your server unless all of its internal and external parts are in place. Operating the server when it is open or missing parts can be dangerous, and can damage your server.

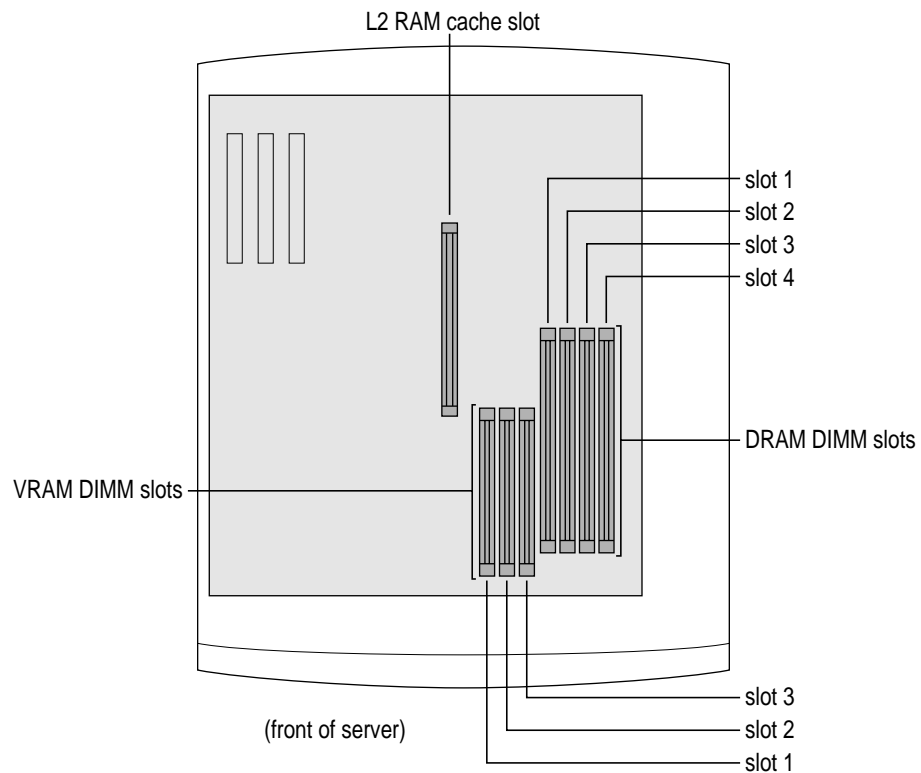
Expanding memory

Additional memory can be installed in your server. Memory for your server is provided in packages called Dual Inline Memory Modules (DIMMs). Appendix B, “Technical Information,” describes how much additional memory can be installed in the server.

Adding dynamic random-access memory (DRAM) DIMMs increases your server’s memory. The DIMMs must be the correct type for your server, and can be installed one at a time. You can also improve your server’s performance by upgrading the Level 2 (L2) cache with a higher-capacity cache DIMM. (The L2 cache stores the most frequently used portions of memory in high-speed RAM.) The memory used to display images on the screen (called video RAM, or VRAM) can also be expanded by installing DIMMs.

It is very important that the DIMMs be correctly installed in your Workgroup Server 7250. Incorrect installation can result in errors, unpredictable results, and damage to your equipment and data.

WARNING Although instructions for installing DIMMs are provided in this manual, Apple Computer recommends that you have an Apple-certified technician install additional DRAM, VRAM, or cache. Consult the service and support information that came with your computer for instructions on how to contact an Apple-authorized service provider or Apple for service. If you install additional DIMMs yourself, you risk damaging your equipment, and this damage would not be covered by the limited warranty on your computer. See an Apple-authorized dealer or service provider for additional information about this or any other warranty question.



DRAM, VRAM, and cache DIMMs are installed as follows:

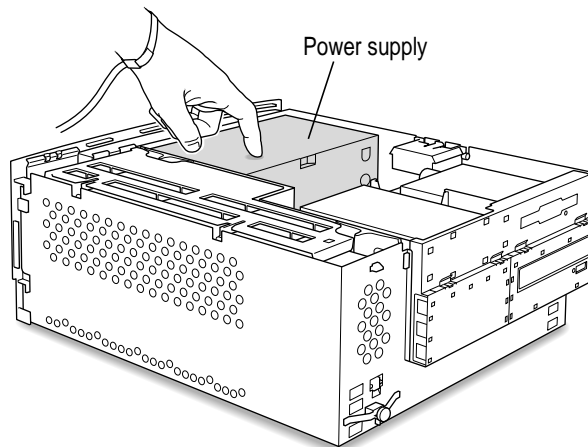
- 1 **Open the server by carefully following the instructions in the section “Opening the Server Safely” earlier in this chapter.**

Remember to wear a grounded wriststrap while installing DIMMs.

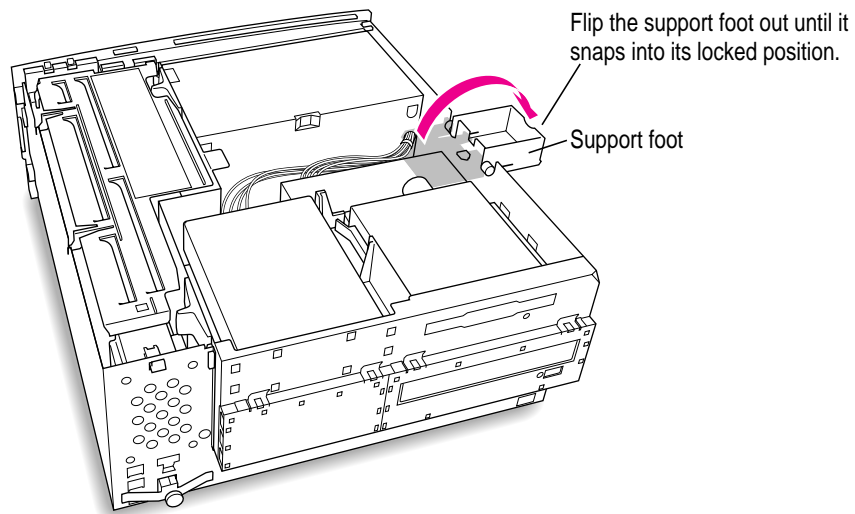
IMPORTANT Both DIMMs and the components inside your server can be damaged by static electricity. Be sure to follow the procedure given here for discharging static electricity. To avoid damaging DIMMs, handle them only by the edges—never touch the connectors.

- 2 **Touch the metal part of the power supply case inside the server to discharge static electricity.**

Always do this before you touch any parts, or install any components, inside the server.

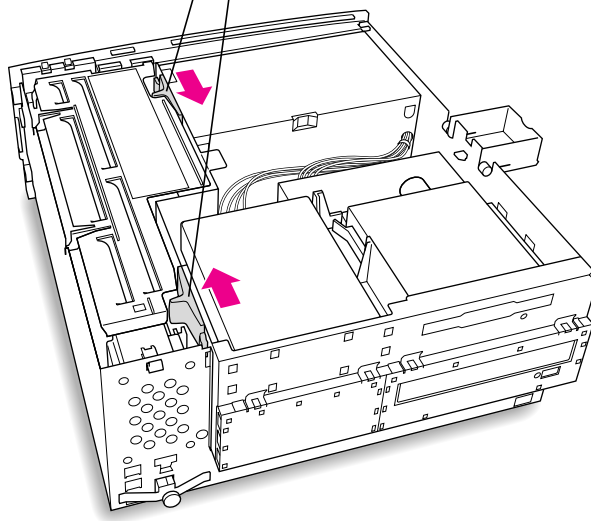


3 Flip out the support foot.



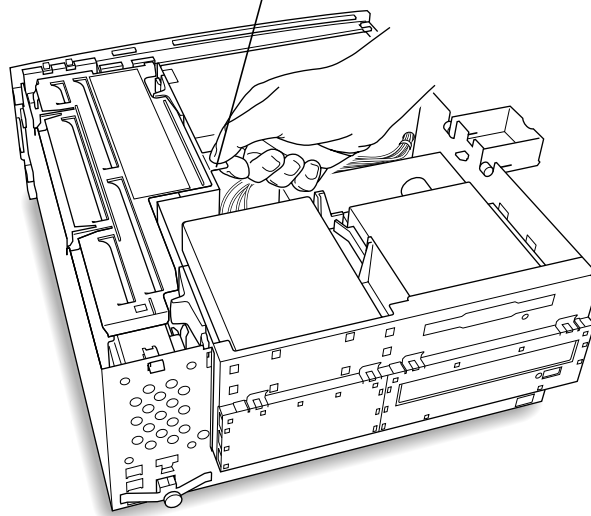
4 Unlock the top chassis by pressing the release switches toward the inside of the server.

Move the release switches toward the inside of the server to unlock the top chassis.



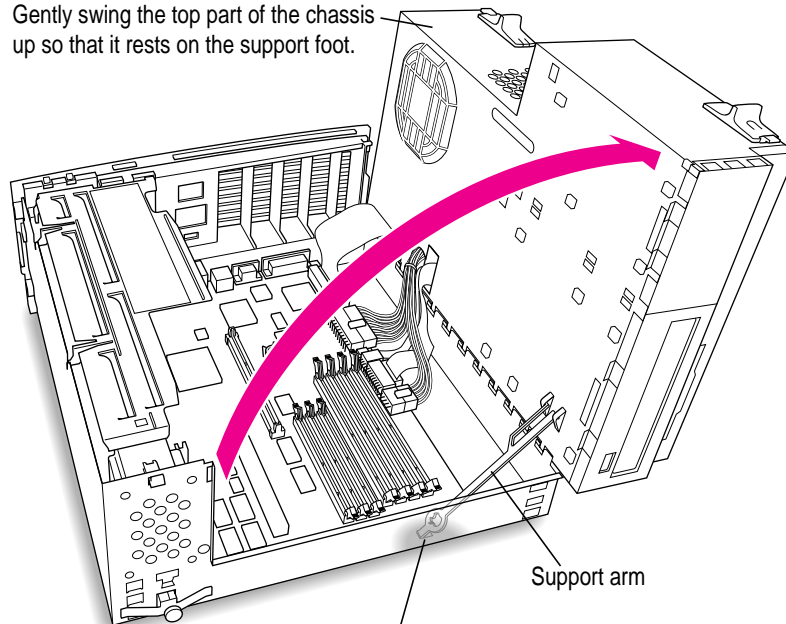
- 5** Using the tab shown below, lift the top chassis up to reveal the DRAM, VRAM, and L2 cache slots.

You can use this tab to lift the top chassis.



- 6** Swing the chassis up and insert the support arm in the hole as pictured below.

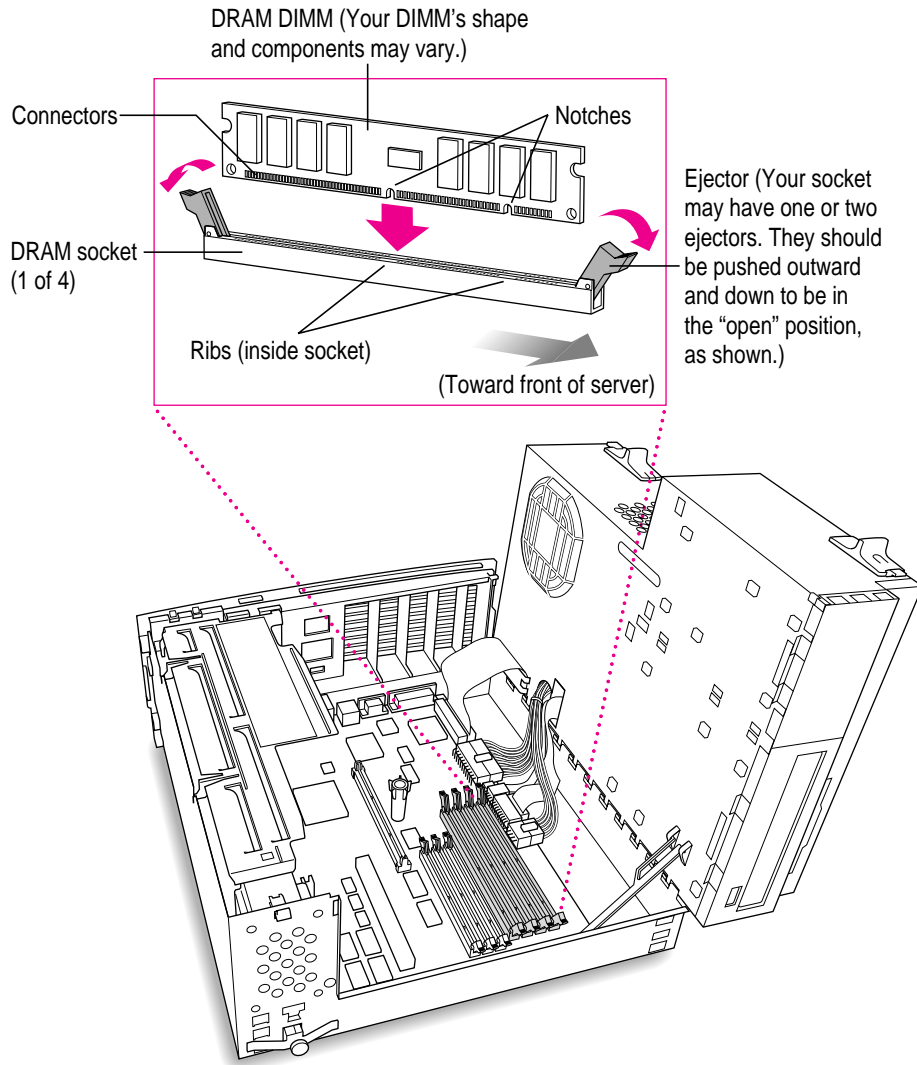
Gently swing the top part of the chassis up so that it rests on the support foot.



Be sure that the support arm engages this hole on the floor of the bottom chassis so that the top chassis is locked in place.

7 If you're installing DRAM DIMMs, align them in the DRAM sockets as pictured.

The DRAM DIMM is designed to fit into the socket only one way. Be sure to align the notches in the DIMM with the small ribs inside the socket. With the ejector(s) in the "open" position (as shown), push down on the DIMM until it snaps into place. The ejector(s) will automatically "close."

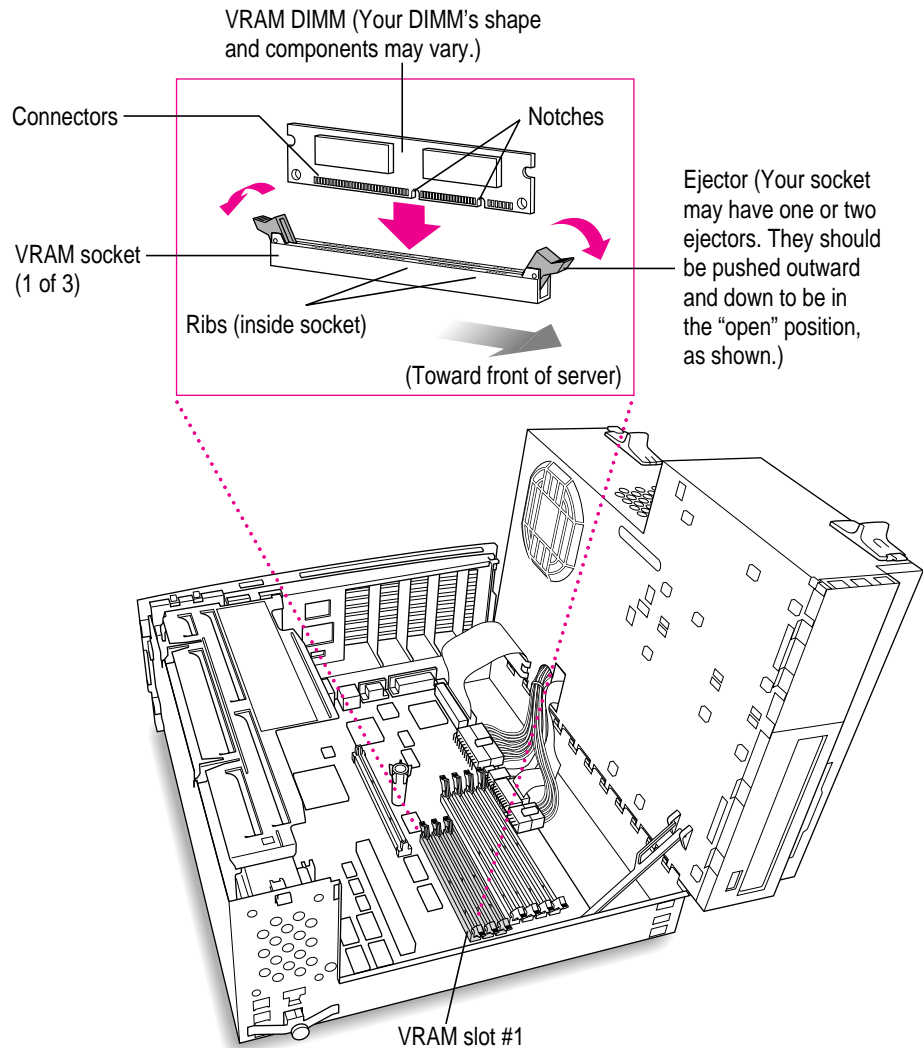


8 If you're installing VRAM DIMMs, place them in the VRAM sockets as illustrated below.

To upgrade VRAM to 2 MB, the DIMM should be placed in VRAM slot #1.

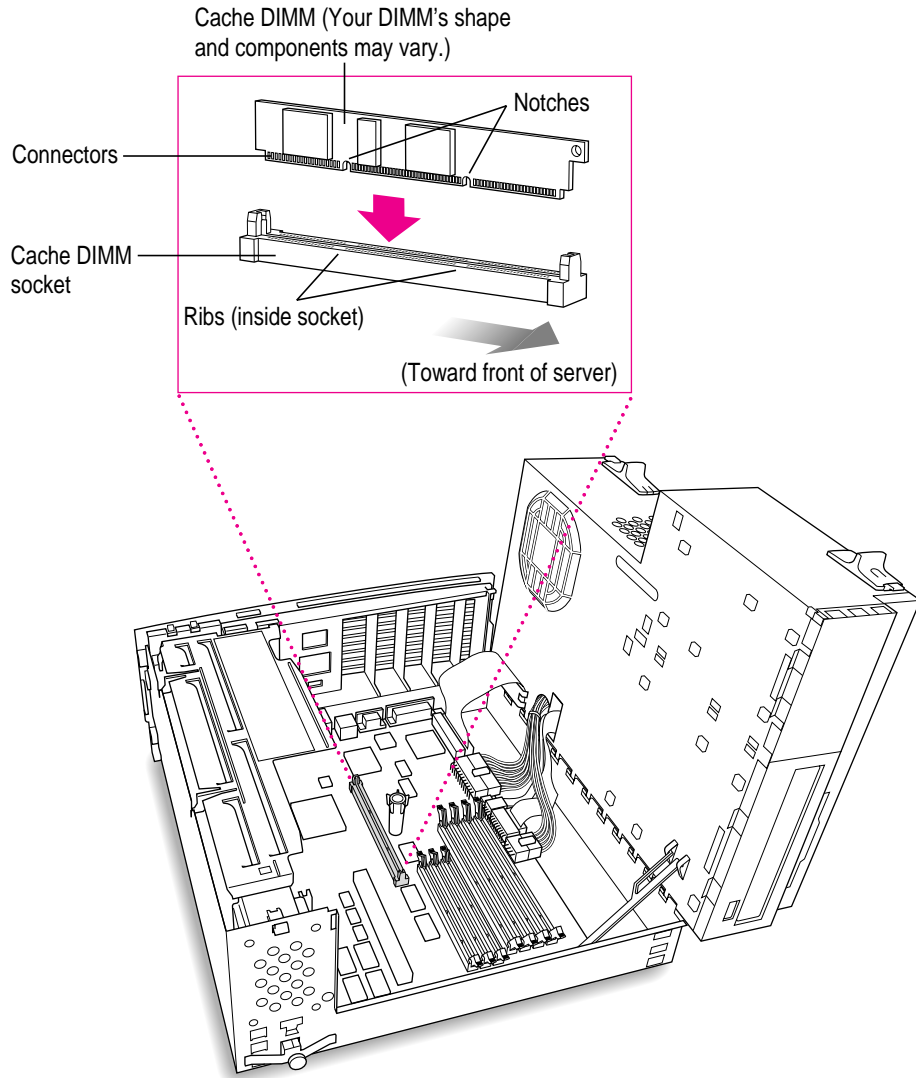
To upgrade to 4 MB, fill all VRAM slots with DIMMs.

The VRAM DIMM is designed to fit into the socket only one way. Be sure to align the notches in the DIMM with the small ribs inside the socket. With the ejector(s) in the "open" position (as shown), push down on the DIMM until it snaps into place. The ejector(s) will automatically "close."

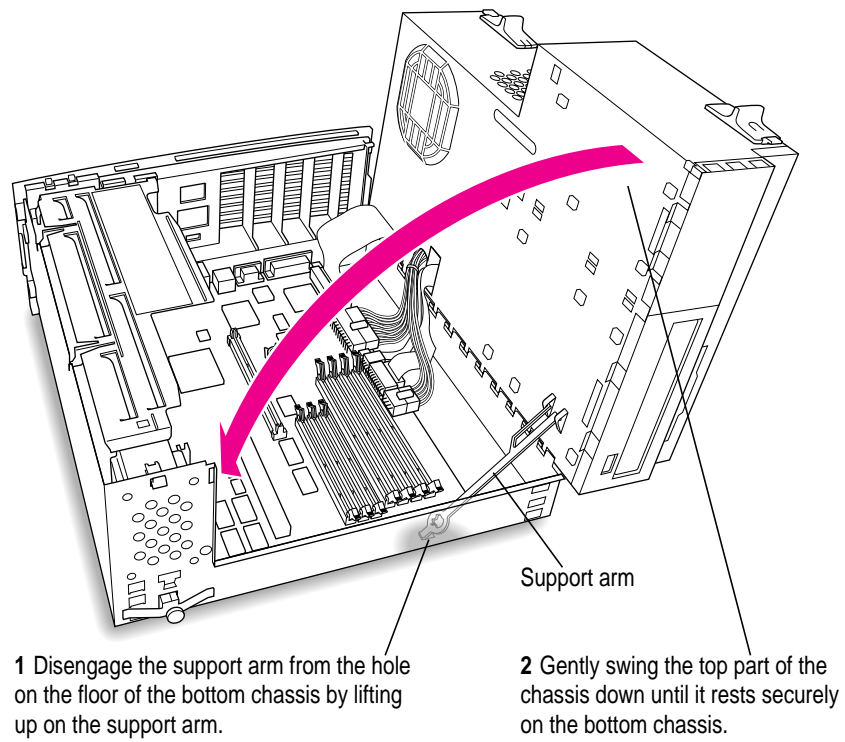


9 If you're installing an L2 cache DIMM, insert the DIMM as illustrated below.

The cache DIMM is designed to fit into the socket only one way. Be sure to align the notches in the DIMM with the small ribs inside the socket.

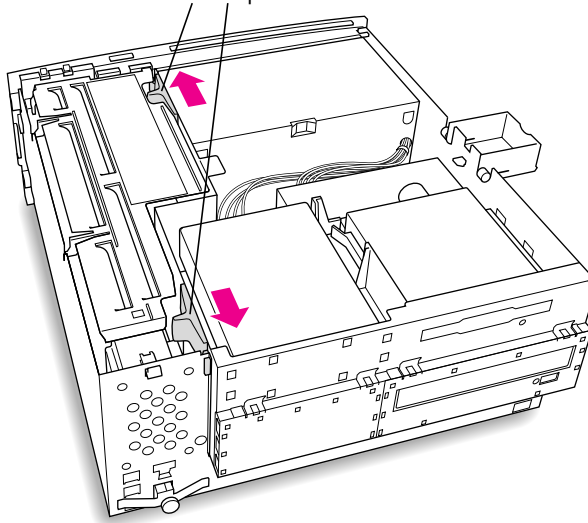


- 10** Replace the chassis by disengaging the support arm and gently swinging the chassis back into place.

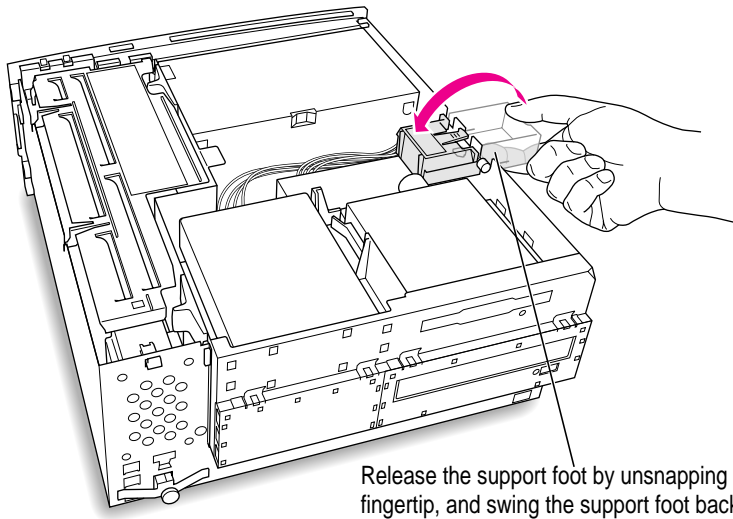


- 11 Lock the chassis back into place by pressing the release switches toward the outside of the server.**

Move the release switches toward the outside of the server to lock the top chassis.



- 12 Unsnap the support foot and swing it back inside the server housing.**

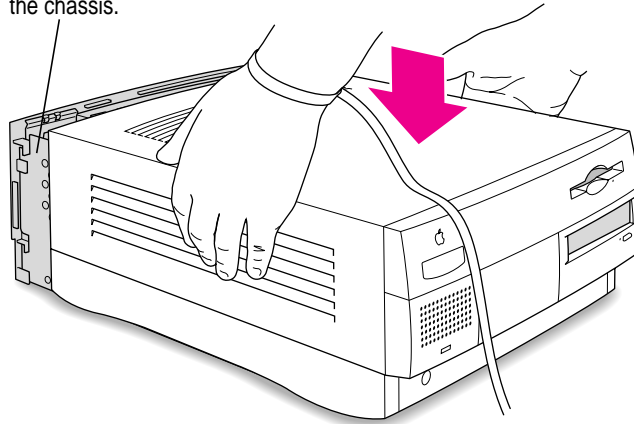


Release the support foot by unsnapping the catch with your fingertip, and swing the support foot back inside the chassis.

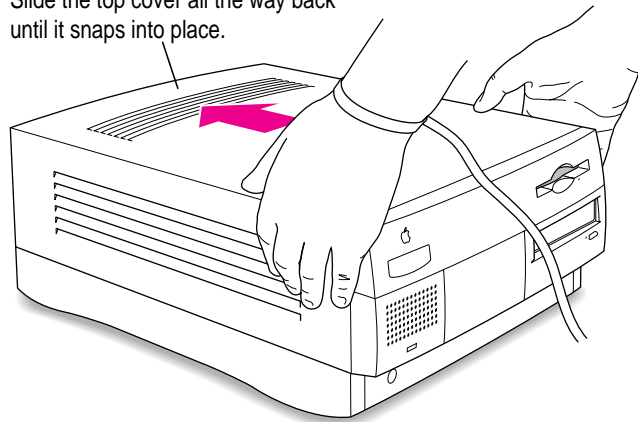
13 Replace the cover on the server.

Lower the cover all the way down onto the case. Push the cover back until it snaps into place.

Set the top cover down so that there is about a two-inch gap between the back of the top cover and the back of the chassis.



Slide the top cover all the way back until it snaps into place.



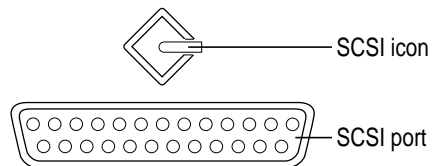
Connecting hard disks and other SCSI devices

Your server has a bus for connecting devices that use the Small Computer System Interface (SCSI, pronounced “skuh-zee”). The SCSI connection permits high-speed communication between the server and the device. SCSI devices commonly attached to the Workgroup Server 7250 include hard disks, CD-ROM drives, scanners, printers, and tape-backup drives.

IMPORTANT Before connecting a device to your server, be sure that the server (and any other device already connected to it) is turned off. Read the instructions in this section and the instructions that came with your hard disk or other SCSI device before connecting it to your server.

Your server’s SCSI bus (identified as *Bus A*) is an internal/external SCSI-1 bus (5 MB per second) to which a total of seven devices can be connected. The internal hard disk and the built-in CD-ROM drive that came with your server are connected to the bus. An Apple-authorized dealer or service provider can attach an additional internal SCSI device to the bus.

Your server has a port for connecting additional external SCSI devices to the SCSI bus. The SCSI icon appears above the port on the server’s back panel.



You can connect external SCSI devices to the SCSI port in a chain. The first device in the chain plugs into the SCSI port; the second device plugs into the first device, and so on.

You can have a total of seven internal or external SCSI devices connected to your server's SCSI bus. For example, with the factory-installed hard disk drive and CD-ROM drive attached, you could add either one internal drive and four external SCSI devices, or five external devices.

All devices connected to the SCSI bus must have their own unique ID number. Certain SCSI ID numbers are already reserved for the internal hard disk drive and built-in CD-ROM drive, as well as the server itself. Other ID numbers are available for assignment to SCSI devices that are added after you buy your server. See the table in step 2 of the following section, "Setting the SCSI ID Number."

Setting up a SCSI device to use with your server involves

- setting the device's SCSI ID number
- physically connecting the device to your server (including appropriate termination)
- installing any necessary device drivers (and restarting your system)

Setting the SCSI ID number

If you have a SCSI device not sold by Apple, see the instructions that came with that device for information on setting its SCSI ID number.

WARNING Each SCSI device connected to your server must have its own, unique SCSI ID number. Using two or more devices with the same ID number (on the same SCSI bus) can cause your equipment to malfunction.

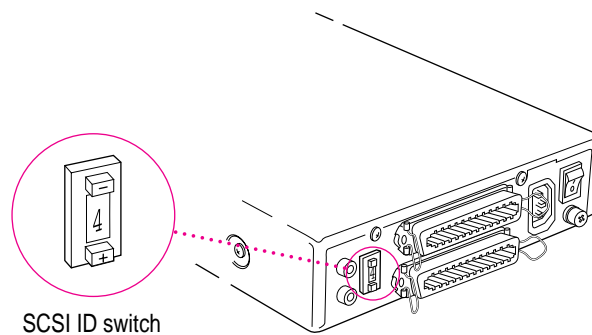
If you have an Apple SCSI device, set the SCSI ID number as follows:

- 1 **Make sure your server is shut down and the SCSI device is turned off.**
- 2 **Choose a number between 0 and 6 that doesn't duplicate the ID of any other SCSI device connected to your server on the same SCSI bus.**

The following table shows the server's default SCSI ID numbers as well as the SCSI ID numbers available for you to use on the internal/external bus.

SCSI ID number	Device
0	factory-installed hard disk
1	available
2	available
3	factory-installed CD-ROM drive
4	available
5	available
6	available
7	server CPU

- 3 **Locate the ID number switch on the back of your SCSI device.**



- 4 **Push the ID switch repeatedly until the number you want appears.**

On some SCSI devices, the ID number switch is inside a small hole. Insert a straightened paper clip to push the switch.

Connecting a SCSI device

To connect a SCSI device to your server:

- 1 **Make sure that the server and SCSI device are turned off.**

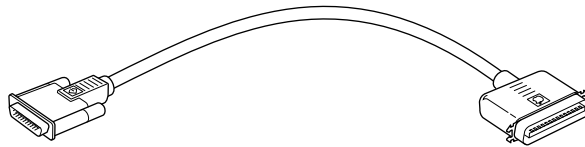
WARNING Do not connect or disconnect any device while the device or your server is turned on. Doing so could damage the device, your server, or both.

- 2 **Check that the device has its own, unique ID number between 0 and 6.**

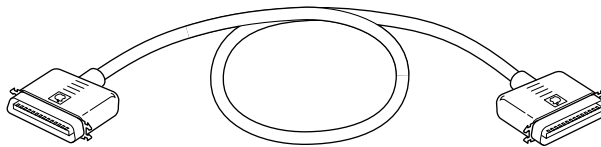
See the section “Setting the SCSI ID Number” earlier in this chapter for details.

- 3 **Use a SCSI cable to connect the device either to the server’s SCSI port or to the last SCSI device already in the chain.**

If the device is the first or only one you’re connecting, use a SCSI system cable to connect it to the server’s SCSI port.



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

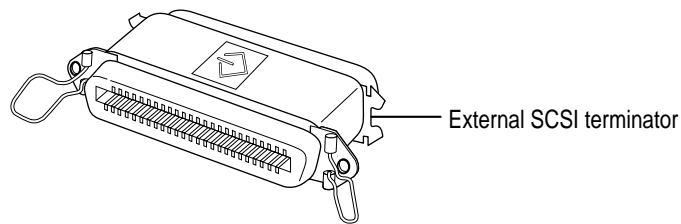


IMPORTANT To get the best results with SCSI devices, be sure to use high-quality SCSI cables and check that the total length of the cables in a SCSI chain does not exceed 6 meters (20 feet). Use SCSI cables manufactured by Apple Computer or those of similar quality.

- 4 **Make sure that only the last device in the SCSI chain has a terminator and that no other external SCSI device has a terminator.**

To ensure accurate transmission of information, a terminator must be at each end of a SCSI chain. Your internal hard disk, which is the first device in the chain, has a built-in terminator.

Some external SCSI devices from manufacturers other than Apple have a built-in terminator. (Check the information that came with the device.) If the device at the end of the SCSI chain does not have a built-in terminator, you need to attach an external terminator.



If your SCSI device has a built-in terminator, you may choose to use it as either the only device or the last device in the chain, or you may have your Apple-authorized service provider remove any extra built-in terminators. You can attach or remove external terminators yourself.

Note: If only one external device has a built-in terminator, rearrange the SCSI chain so that device is at the end.

IMPORTANT Always turn on any external SCSI devices connected to your server before turning on the server itself. Otherwise, your server cannot recognize the SCSI devices.

Installing a device driver

A SCSI device driver is software that lets the server communicate with a particular SCSI device.

Note: If you have set up your server and connected additional devices, but not yet turned the server on, return to the section “Plugging In the Server” in Chapter 1 before installing a device driver.

To install a driver:

- **Start up your server, if necessary, and drag the driver icon to the System Folder icon on your startup disk.**

Any drivers needed for a SCSI device are usually on a floppy disk that comes with the device. (If no drivers come with the device, then it doesn't need any.) You may have to restart your server to activate the driver.

Do you need to initialize a hard disk?

You need to initialize a hard disk only in the following cases:

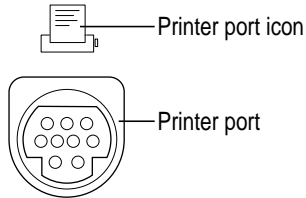
- *The disk is new and uninitialized.* Your internal hard disk and most external hard disks are initialized at the factory and do not have to be initialized again. If you are adding a new non-Apple hard disk to your server, check your owner's manual to see if it needs to be initialized.
- *You've experienced repeated errors using this disk.* If problems persist after you reinitialize the disk, the disk is in need of servicing.

You can use the Apple Drive Setup program to initialize and name a hard disk. Apple Drive Setup is provided as part of your system software and can be found in the Utilities folder on the server's hard disk as well as on the *Workgroup Server Software* CD-ROM disc. See Chapter 4, “Managing Hard Disks,” in the *Workgroup Server Administrator's Guide* and the instructions for preparing a disk for use in the “Disks” topic in Macintosh Guide, available in the Guide (⌘) menu.

If you are using the Apple RAID Software that accompanied your Workgroup Server, you may want to use the Apple RAID Setup program to reinitialize your hard disk(s) to optimize your server's performance. See the *Apple RAID Administrator's Guide* for instructions.

Connecting a printer

Your server has a printer port, which you use to connect a printer to your server.



The printer port accepts either a direct cable connection (to printers such as the StyleWriter II) or a network cable connection (to printers such as a LaserWriter Pro or LaserWriter Select).

Follow the instructions that came with your printer when connecting it to your server.

A printer can also be connected to the modem port.

Note: You use the Chooser program to indicate the port you used to connect your printer. (See “Choosing a Printer” in Chapter 1 of the *Workgroup Server Administrator’s Guide* and the “Printing and Fonts” topic in Macintosh Guide, available in the Guide (🔑) menu, for more information on using the Chooser and printing.)

A Geoport Telecom Adapter, or similar device, can also be connected to the printer port.

Connecting an additional monitor

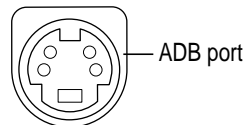
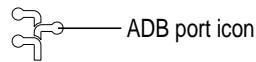
You can use an additional monitor with your server if you install a video expansion card. See “Installing an Expansion Card” earlier in this chapter for instructions.

When you connect an additional monitor:

- Make sure that the ventilation openings on the server and the monitors are clear and unobstructed.
- If necessary, configure the monitor options. See the documentation that accompanied the monitor and “Configuring Your Monitor” in Chapter 1 of the *Workgroup Server Administrator’s Guide*.
- If there is interference on your screens or on a television or radio near your server, reposition or separate the affected equipment.

Connecting a trackball or other input device

Your server has an Apple Desktop Bus (ADB) port, which you use to connect the mouse, the keyboard, and other input devices such as a trackball, a bar-code reader, or a graphics tablet.

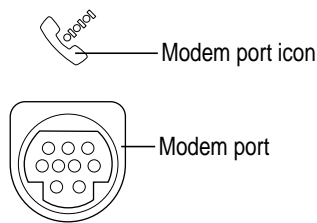


You can usually connect up to three ADB devices in a chain to a single port. The exact number depends on how much power the devices require.

IMPORTANT The total power used by all ADB devices connected to your server must not exceed 500 milliamperes (mA). Information about the power requirements of the mouse and keyboard are in Appendix B, “Technical Information.” Check the information that came with your other ADB device for power requirements.

Connecting a modem or GeoPort Telecom Adapter

Your server has a port, called the modem port, which is a serial port designed for use with modems and devices such as the GeoPort Telecom Adapter. These devices, when used with appropriate telecommunications software, take advantage of the server's built-in modem capabilities. The GeoPort Telecom Adapter comes with communications and fax software and can be purchased from Apple-authorized dealers.



You can connect a standard modem to the modem port, using a standard modem cable. To connect an adapter or modem to your server, follow the instructions that came with your adapter or modem.

A GeoPort Telecom Adapter can also be connected to the printer port.

You can also connect a printer to the modem port.

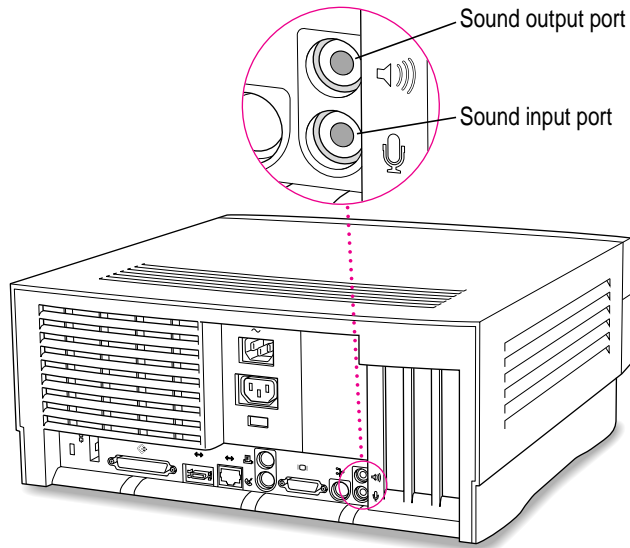
Connecting audio equipment

Your server can play and record stereo sound from a variety of sources. You can listen to or reproduce stereo sound by connecting audio equipment to the sound input and output ports on the server. You can use your internal CD-ROM drive to play and record sound from audio compact discs (CDs).

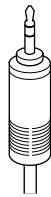
For information on using the Mac OS to choose sound input and output options, to record an alert sound, or to play audio CDs, see “Choosing Sound Devices and Alert Sounds” in Chapter 1 of the *Workgroup Server Administrator's Guide* and the “Sound” topic of Macintosh Guide, available in the Guide (⌘) menu.

About your server's sound ports

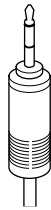
The sound input port is marked with an icon of a microphone. The sound output port is marked with an icon of a speaker.



The server's sound ports accept these 3.5 mm connectors:



Stereo miniplug



Extended miniplug

The smaller connector (a “stereo miniplug”) is found most often on stereo equipment. The slightly longer connector is found on the Apple PlainTalk Microphone and other voice quality microphones. If your equipment has a different type of connector, you can purchase an adapter at an electronics supply store.

Connecting most audio equipment

To play or record sound with your server, you can attach a microphone, amplifier, tape recorder, headphones, or a pair of speakers. (When you have headphones connected, you don't hear beeps or other server sounds through the built-in speaker.)

For specific instructions on connecting a microphone, skip to the next section, “Connecting and Positioning a Microphone.” For specific instructions on connecting speakers, see “Connecting External Stereo Speakers” later in this chapter.

Follow these steps to connect most audio equipment to the server:

- 1 Make sure that the audio equipment has a cable with a stereo miniplug (or extended miniplug) connector.**



- 2 Place the audio equipment near the server.**
- 3 Shut down the server and turn off the audio equipment.**
- 4 Attach the cable to the audio equipment and to the appropriate sound port on the server.**

To hear or record incoming sound on the server using a cable with a stereo miniplug, connect the audio equipment to the sound input port (Ⓜ).

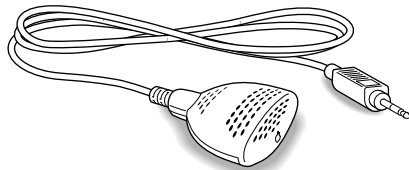
To record the sound produced by the server or play that sound through external speakers using a cable with a stereo miniplug, connect the audio equipment to the sound output port (Ⓜ).

- 5 Turn on the server and the audio equipment.**

You're now ready to begin listening to and working with sound. For more information on setting sound options, see “Choosing Sound Devices and Alert Sounds” in Chapter 1 of the *Workgroup Server Administrator's Guide* and the “Sound” topic of Macintosh Guide, available in the Guide (🔍) menu.

Connecting and positioning a microphone

With appropriate software, you can use an Apple PlainTalk Microphone (or a compatible line-level microphone) to give spoken commands to your server and to record your voice or other sounds.

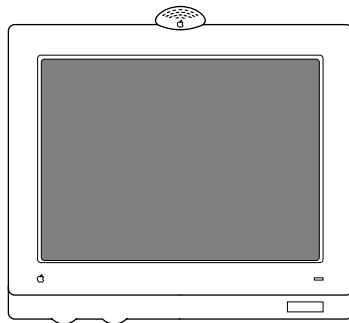


Apple PlainTalk Microphone

Do not use the round omnidirectional microphone supplied with some other Macintosh models.

Follow these steps to connect and position the microphone:

- 1 Shut down the server.**
- 2 Plug the microphone's connector into the sound input port (🎧) on the back of the server.**
- 3 Place the microphone at the top center of the monitor, so that the microphone's Apple (🍏) icon is facing you.**



If you can't place the microphone on top of the monitor, position the microphone according to these guidelines:

- The microphone should be between 1 and 3 feet away from you.
- The microphone should be directly in front of you to minimize the effect of background noises.

4 Turn on the server.

You're now ready to begin using your microphone.

You may want to install software that enables you to give spoken commands to the server, get computer-voice feedback to your spoken commands, and have the server read text to you. For information about installing software on your server, see Chapter 3, "Using Application Software," in the *Workgroup Server Administrator's Guide*. To set the sound options for your microphone, see "Choosing Sound Devices and Alert Sounds" in Chapter 1 of the *Workgroup Server Administrator's Guide*. For further instructions on how to use speech software, see the "Speech" topic of Macintosh Guide, available in the Guide (🔍) menu.

Connecting external stereo speakers

You can take advantage of your server's stereo sound output by attaching externally powered (amplified) speakers.

1 Assemble the speakers and the cable you need.

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

2 Turn off the server.

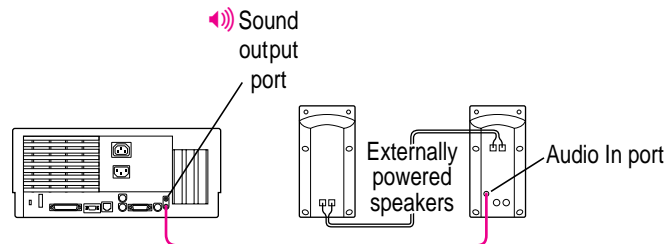
3 Plug a stereo miniplug into the sound output port (🔊) on the server.

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

If the speakers take a dual-plug cable, connect both plugs.

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

Your finished connections should look something like this:



6 Turn on the server.

Now you hear the server's sound through the external speakers. (You may also need to set options in the Sound & Displays control panel in order to hear sound through your speakers. To set sound options, see "Choosing Sound Devices and Alert Sounds" in Chapter 1 of the *Workgroup Server Administrator's Guide*. Refer to the "Sound" topic of Macintosh Guide, available in the Guide (⌘) menu for more information.)

Note: Use the Sound & Displays control panel to control volume and to set other options for playing sound through the external speakers. If you are playing an audio CD, you may also need to adjust the volume control in the program you're using to play CDs.

Appendix A Safety, Maintenance, and Health Information

Important server safety instructions

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

Turn off the server and disconnect the power plug (by pulling the plug, not the cord) if any of the following conditions exists:

- The power cord or plug becomes frayed or otherwise damaged.
- You spill something into the case.
- Your server is exposed to rain or any other excess moisture.
- Your server has been dropped or the case has otherwise been damaged.
- You suspect that your server needs service or repair.
- You want to clean the case (use only the recommended procedure described later in this section).

For additional safety:

- If you ever need to remove the cover of your server, replace it before you use the server.
- Never turn on your server with any of the internal parts removed.
- Never turn on your server with any parts of the external closure removed.

Be sure that you always do the following:

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

WARNING Electrical equipment may be hazardous if misused. Operation of this product, or similar products, must always be supervised by an adult. Do not allow children access to the interior of any electrical product and do not permit them to handle any cables.

To clean the case, do the following:

- 1 Turn off the server and then disconnect the power plug. (Pull the plug, not the cord.)**
- 2 Wipe the surfaces lightly with a clean, soft cloth dampened with water.**

IMPORTANT If you have a problem with your server and nothing in the manuals that came with the server solves the problem, consult the service and support information that came with your server for information on how to contact an Apple-authorized service provider or Apple for assistance.

Handling your computer equipment

Follow these guidelines for handling your server and its components:

- When setting up your server, place components on a sturdy, flat surface, and carefully follow all setup instructions.
- When connecting or disconnecting a cable, always hold the cable by its connector (the plug, not the cord).

- Turn off your server and all its components before connecting or disconnecting any cables to add or remove any component. Failure to do so could seriously damage your equipment.
- Never force a connector into a port. If the connector and port do not join with reasonable ease, they probably don't match. Make sure that the connector matches the port and that you have positioned the connector correctly in relation to the port.
- Take care not to spill any food or liquid on the server, keyboard, mouse, or other components. If you do, turn your server off immediately and unplug it before cleaning up the spill. Depending on what you spilled and how much of it got into your equipment, you may have to bring your equipment to an Apple-authorized service provider.
- Protect the server and its components from direct sunlight and rain or other moisture.
- Keep all ventilation openings clear and unobstructed. Without proper air circulation, components can overheat, causing damage or unreliable operation.

Handling the monitor

Follow these procedures for handling a monitor:

- Turn down the screen brightness control if you leave the server turned on for extended periods. If the brightness is not turned down, the image on the screen could “burn in” and damage the screen.

You can also use a “screen-saver” program, which dims or varies the image on the screen when the server has been idle for a specified period of time. These programs are available from independent suppliers and user groups.

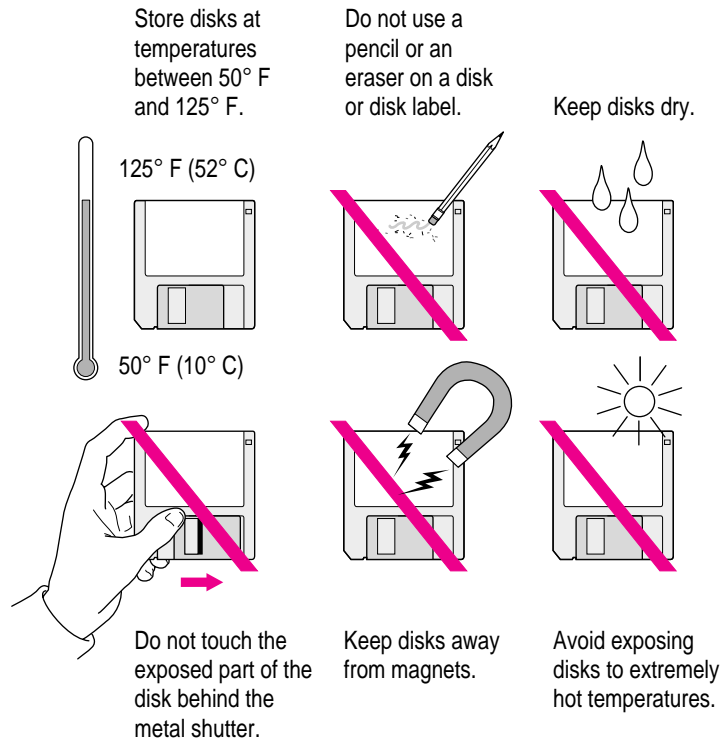
- Make sure that the ventilation openings on the server and the monitor are clear and unobstructed.
- If there is interference on the monitor's screen or on a television or radio near your server, move the affected equipment farther away.

Handling the keyboard

Take care not to spill any liquid on the keyboard. If you do, turn off your server immediately.

- If you spill liquid that is thin and clear, unplug the keyboard, turn it upside down to let the liquid drain out, and let it dry for 24 hours at room temperature. If, after you take these steps, the keyboard doesn't work, take it to an Apple-authorized service provider for repair.
- If you spill liquid that is greasy, sweet, or sticky, unplug the keyboard and take it to an Apple-authorized service provider for repair.

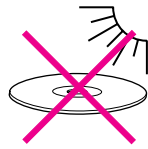
Handling floppy disks



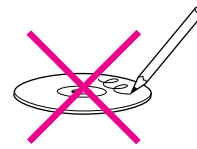
Handling CD-ROM discs

Keep these important safety instructions in mind as you use CD-ROM discs:

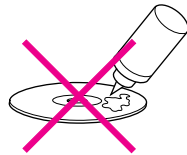
- Hold a disc by the edges or by one edge and the center hole. Do not touch the disc surface.
- To clean discs, wipe the shiny surface with a soft damp cloth, working in straight lines from center to edge. Do not use any form of cleaning agent.
- To avoid damage to your discs, keep these points in mind:



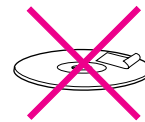
Do not expose discs to direct sunlight.



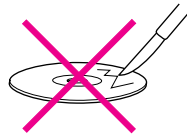
Do not write on discs.



Do not spill liquids on discs.



Do not put tape on discs.



Do not scratch discs.



Do not get dust on discs.

Other important safety instructions to keep in mind as you use your CD-ROM drive.

- Position your server so that when the tray opens, it doesn't bump into anything.
- Do not leave the disc tray open. If dust gets on the lens of the CD-ROM drive, the drive may have problems reading your compact discs.
- Do not put anything (for instance, a cup) on top of the tray when it is open.
- Do not force the tray open by hand.
- Do not wipe the lens with a paper towel or other abrasive surface. If you need to clean the lens, see an Apple-authorized service provider for a lens cleaner.
- Never transport your server with a disc inside the CD-ROM drive.

- Keep your computer equipment away from any source of liquid (such as wash basins, bathtubs, and shower stalls). If you drink coffee or other beverages while you're at your server, take care not to spill.
- Avoid exposing your equipment to damp or wet weather. If your system is near a window, be sure the window is closed in rainy weather.

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

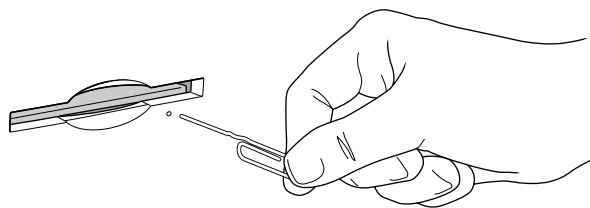
Ejecting a disk

For instructions on ejecting a floppy disk, a CD-ROM disc, or a removable media disk, see the “Disks” topic of Macintosh Guide, available in the Guide (⌘) menu.

If you can't eject a floppy disk

If you can't eject a floppy disk in the usual way, try the following, in order:

- Hold down the ⌘ (Command) and Shift keys and press the number 1 key on your keyboard to eject a disk in the internal disk drive.
- Shut down the server. If the disk isn't ejected, then hold down the button on your mouse or other pointing device while you restart the server.
- Locate the small hole near the disk drive's opening, and carefully insert the end of a large straightened paper clip into it. Push gently until the disk is ejected. Do not use excessive force.



If nothing works, take the server or disk drive to your Apple-authorized service provider to have the disk removed.

Power supply

The power supply in your server is a high-voltage component and should not be opened for any reason, even when the server is off. If the power supply needs service, contact your Apple-authorized dealer or service provider.

Cleaning your equipment

Follow these general rules when cleaning the outside of your server and its components:

- Use a damp, soft, lint-free cloth to clean the server's exterior. Avoid getting moisture in any openings.
- Don't use aerosol sprays, solvents, or abrasives.

Cleaning the server case

To clean the case, do the following:

- 1 **Turn off the server and disconnect the power plug. (Pull the plug, not the cord.)**
- 2 **Wipe the surfaces lightly with a clean, soft cloth dampened with water.**

Cleaning the monitor

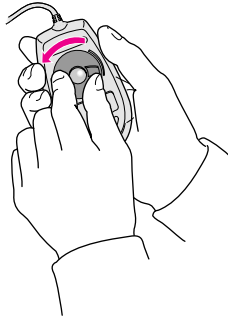
To clean the screen, put household glass cleaner on a soft cloth and wipe the screen. Don't spray the cleaner directly on the screen, because the liquid might drip into the monitor or server.

Cleaning the mouse

The mouse contains a small ball that must roll smoothly for the mouse to work properly. You can keep this ball free of dirt and grease by using the mouse on a clean, lint-free surface and cleaning it occasionally.

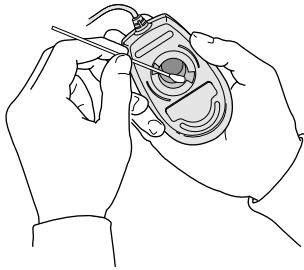
You need a few cotton swabs and a clean, soft, lint-free cloth.

- 1 Turn off your server.**
- 2 Turn the mouse upside down and turn the plastic ring on the bottom counterclockwise to disengage it.**



If you have an older mouse, you may need to press the plastic ring (rather than turn it) to disengage it.

- 3 Turn the mouse right side up with one hand and catch the ring and the ball with your other hand.**
- 4 Clean the three small rollers inside the mouse with a cotton swab moistened with water. Rotate the rollers to clean all around them.**



- 5 Wipe the mouse ball with a clean, soft, dry, and lint-free cloth.**
- 6 If necessary, wash the mouse ball with warm soapy water (use a mild soap such as a dishwashing liquid) and then dry the mouse ball thoroughly.**
- 7 Gently blow into the mouse case to remove any dust that has collected there.**

8 Put the ball and the ring back in place.

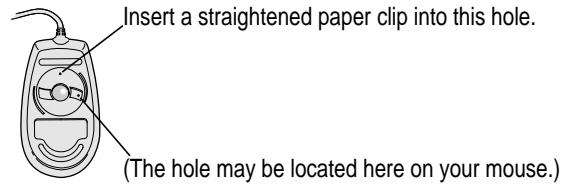
Your mouse should roll smoothly across your mouse pad or desk. If it doesn't, repeat these instructions carefully.

Locking and unlocking the mouse

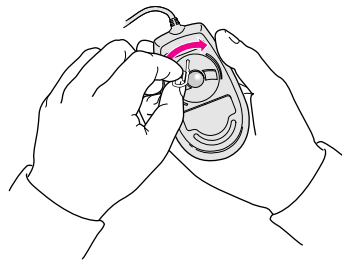
Some mouse devices can be locked so that the ball can't be removed. A locking mouse has a small hole on the plastic ring.

To lock the mouse, follow these steps:

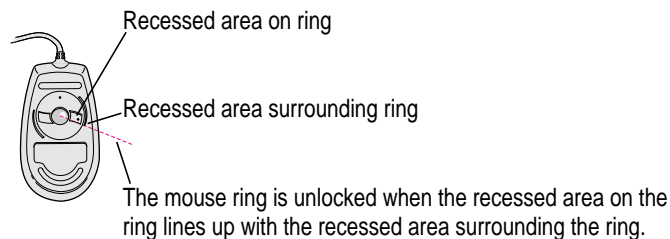
1 Insert a straightened paper clip into the hole on the plastic ring.



2 Press down on the paper clip while you turn the ring clockwise.

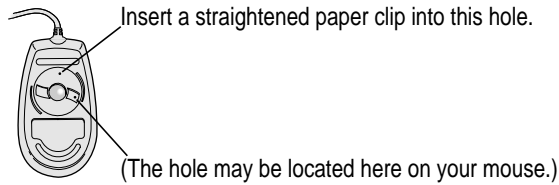


Turn the ring a very short distance, until it stops. When the recessed area on the ring is *not* lined up with the recessed area surrounding the ring, the mouse is locked.

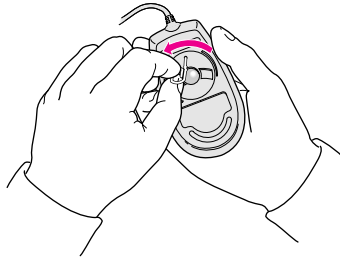


To unlock the mouse, follow these steps:

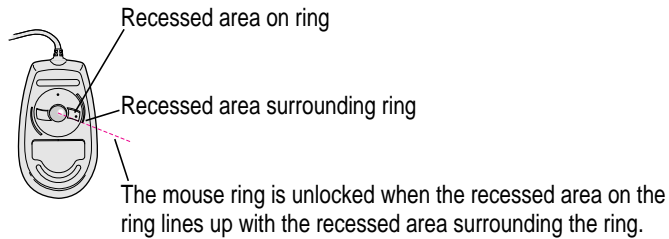
- 1 Insert a straightened paper clip into the hole on the plastic ring.**



- 2 Press down on the paper clip while you turn the ring counterclockwise.**



Turn the ring a very short distance. When the recessed area on the ring is lined up with the recessed area surrounding the ring, the mouse is unlocked.



Health-related information about computer use

Muscle soreness, eye fatigue, and other discomforts and injuries sometimes associated with using computers can occur from performing any number of activities. In fact, misuse of the same muscles during multiple activities can create a problem that might not otherwise exist. For example, if you engage in nonwork activities that involve repetitive stress on the wrist—such as bicycling—and also use your computer keyboard improperly, you may increase your likelihood of developing wrist problems. Some individuals are at greater risk of developing these problems because of their health, physiology, lifestyle, and general exposure to stress. Work organization and conditions, such as workstation setup and lighting, also play a part in your overall health and comfort. Preventing health problems is a multifaceted task that requires careful attention to the way you use your body every hour of every day.

The most common health effects associated with using a computer are musculoskeletal discomfort and eye fatigue. We'll discuss each area of concern below. For information about electric and magnetic emissions, look in the reference material that came with your server.

Musculoskeletal discomfort

As with any activity that involves sitting for long periods of time, using a computer can make your muscles sore and stiff. To minimize these effects, set up your work environment carefully, using the guidelines that follow, and take frequent breaks to rest tired muscles. To make working with your computer more comfortable, allow enough space in your work area so that you can change position frequently and maintain a relaxed posture.

Another type of musculoskeletal concern is repetitive stress injuries (RSIs), also known as cumulative trauma disorders (CTDs). These problems can occur when a certain muscle or tendon is repeatedly overused and forced into an unnatural position. The exact causes of RSIs are not totally understood, but in addition to awkward posture, such factors as the amount of repetition, the force used in the activity, the individual's physiology, workplace stress level, and lifestyle may affect the likelihood of experiencing an RSI.

RSIs did not suddenly arise when computers were invented; tennis elbow and writer's cramp, for example, are two RSIs that have been with us for a long time. Although less common than other RSIs, one serious RSI discussed more often today is a wrist problem called carpal tunnel syndrome, which may be aggravated by improper use of computer keyboards. This nerve disorder results from excessive pressure on the median nerve as it passes through the wrist to the hand.

This section offers advice on setting up your work area to enhance your comfort while you use your computer. Since the effects of repetitive movements associated with using a computer can be compounded by those of other work and leisure activities to produce or aggravate physical problems, proper use of your computer system must be considered as just one element of a healthy lifestyle.

No one, of course, can guarantee that you won't have problems even when you follow the most expert advice on using computer equipment. You should always check with a qualified health specialist if muscle, joint, or eye problems occur.

Eye fatigue

Eye fatigue can occur whenever the eyes are focused on a nearby object for a long time. This problem occurs because the eye muscles must work harder to view an object that's closer than about 20 feet (6 meters). Improper lighting can hasten the development of eye fatigue. Although eye fatigue is annoying, there's no evidence that it leads to permanent damage.

Whenever you're engaged in an activity that involves close-up work—such as reading a magazine, doing craft work, or using a computer—be sure to have sufficient glare-free lighting and give your eyes frequent rest breaks by looking up and focusing on distant objects. Remember to have your eyes examined regularly.

To prevent discomfort and eye fatigue:

- Arrange your workspace so that the furniture is properly adjusted for you and doesn't contribute to an awkward working posture.
- Take frequent short breaks to give your muscles and eyes a chance to rest.

Arranging your office

Here are some guidelines for adjusting the furniture in your office to accommodate your physical size and shape.

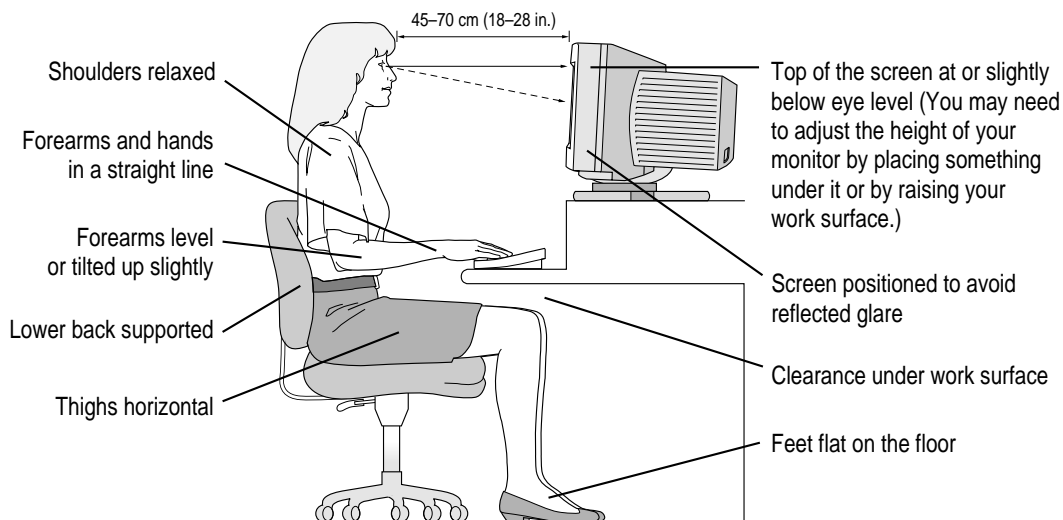
- An adjustable chair that provides firm, comfortable support is best. Adjust the height of the chair so that your thighs are horizontal and your feet flat on the floor.

The back of the chair should support your lower back (lumbar region). Follow the manufacturer's instructions for adjusting the backrest to fit your body properly.

- When you use the computer keyboard, your shoulders should be relaxed. Your upper arm and forearm should form an approximate right angle, with your wrist and hand in roughly a straight line.

You may have to raise your chair so that your forearms and hands are at the proper angle to the keyboard. If this makes it impossible to rest your feet flat on the floor, you can use a footrest with adjustable height and tilt to make up for any gap between the floor and your feet. Or you may lower the desktop to eliminate the need for a footrest. Another option is to use a desk with a keyboard tray that's lower than the regular work surface.

- Position the mouse at the same height as your keyboard. Allow adequate space to use the mouse comfortably.



- Arrange the monitor so that the top of the screen is slightly below your eye level when you're sitting at the keyboard. The best distance from your eyes to the screen is up to you, although most people seem to prefer 18 to 28 inches (45 to 70 cm).
- Position the monitor to minimize glare and reflections on the screen from overhead lights and windows. You may want to use a tiltable monitor stand. The stand lets you set the monitor at the best angle for viewing, helping to reduce or eliminate glare from lighting sources you can't move.

Avoiding fatigue

- Change your seated position, stand up, or stretch whenever you start to feel tired. Frequent short breaks are helpful in reducing fatigue.
- Use a light touch when typing or using a mouse and keep your hands and fingers relaxed.
- Some computer users may develop discomfort in their hands, wrists, or arms after intensive work without breaks. If you begin to develop chronic pain or discomfort in your hands, wrists, or arms, consult a qualified health specialist.
- Allow adequate workspace so that you can use your keyboard and mouse comfortably. Place papers or other items so that you can view them easily while using your computer. A document stand may make reading papers more comfortable.
- Eye muscles must work harder to focus on nearby objects. Occasionally focus your eyes on a distant object, and blink often while you work.
- Clean your screen regularly. Keeping the screen clean helps reduce unwanted reflections.

What about electromagnetic emissions?

There has been recent public discussion of the possible health effects of prolonged exposure to extremely low frequency (ELF) and very low frequency (VLF) electromagnetic fields. Such fields are associated with electromagnetic sources such as television sets, electrical wiring, and some household appliances—as well as computer monitors.

Apple has reviewed scientific reports and sought the counsel of government regulatory agencies and respected health organizations. Based on the prevailing evidence and opinions, Apple believes that the electric and magnetic fields produced by computer monitors do not pose a health risk.

In response to those customers who wish to reduce their exposure to electromagnetic fields, Apple has lowered the emission levels of our products. We are also actively encouraging further scientific research so we can continue to promote the health and safety of our customers and employees.

Appendix B Technical Information

This appendix contains the following technical information about your Workgroup Server 7250:

- Expanding your server
- Specifications

Expanding your Workgroup Server 7250

Your Workgroup Server 7250 was designed to grow with your needs—you can add new capabilities or improve its performance as you wish. You can plug in a number of external devices into its ports. You or your dealer can also install a number of enhancements within the case that houses the server. However, you must make sure that each component you add is compatible with your server and does not exceed its maximum power allowance. Follow the specifications in this appendix carefully. Your dealer or the manufacturer of a component can also provide compatibility details.

Apple recommends that you have the following equipment installed by an Apple-authorized dealer:

- any additional internal 3.5- or 5.25-inch device, such as a digital audio tape (DAT) drive or hard disk

You can install the following yourself:

- up to three PCI cards, such as a specialized communications card
- additional dynamic random-access memory (DRAM), up to a total of 256 megabytes (MB)
- additional video RAM (VRAM), up to a total of 4 MB
- additional L2 cache memory, up to a total of 1 MB

See Chapter 3, “Expanding Your Server and Connecting Other Equipment,” for instructions on adding components to your server.

Specifications

The hardware specifications for the Workgroup Server 7250 are listed below.

Main unit

Processor

A PowerPC 601 processor with the following features:

- 120 megahertz (MHz) clock speed
- 40 MHz system bus
- built-in floating point unit (FPU)

Memory

- 16 MB DRAM, expandable to a maximum of 256 MB with additional DIMMs
- 1 MB of VRAM on the main logic board, expandable to a maximum of 4 MB with additional DIMMs
- 4 MB of read-only memory (ROM)
- 8 kilobytes (K) of nonvolatile parameter memory
- 256K of static RAM (SRAM) supplied in a removable DIMM, used as an L2 cache for the PowerPC microprocessor, expandable to a maximum of 1 MB

DRAM, VRAM, and cache configurations

You can have memory—dynamic random-access memory (DRAM) or video random-access memory (VRAM)—added to your server in packages called Dual Inline Memory Modules, or DIMMs. You can also upgrade your server's L2 cache by installing a DIMM.

DRAM configurations

Your server can use any DRAM configuration with DIMMs of these sizes: 8, 16, 32, or 64 MB.

You can increase your server's DRAM to up to 256 MB. The main logic board has four slots (each with a 64-bit data bus) where DIMMs can be installed. To increase DRAM to the maximum of 256 MB, have an Apple-authorized dealer or service provider fill all four slots with 64 MB DIMMs. You can also fill slots with 8, 16, or 32 MB DIMMs.

Note: 128 MB DIMMs are available and can fit in the server's memory slots to increase DRAM to as much as 512 MB. These DIMMs have not been tested for use with Workgroup Server 7250 systems, however.

IMPORTANT The DIMMs should be 64-bit-wide, 168-pin fast-paged mode, with 70-nanosecond (ns) RAM access time or faster. The Single Inline Memory Modules (SIMMs) from older Macintosh computers are not compatible with your server and cannot be used.

If you decide to have additional DRAM installed in your server, the DIMMs can be installed one at a time in any order in any of the memory slots.

VRAM configurations

You can add additional VRAM to your server. VRAM, like standard DRAM, is also provided in DIMMs. Your server comes with 1 MB of VRAM on the main logic board. You can increase VRAM to 2 MB by installing one 1 MB DIMM in the first VRAM slot, or to 4 MB by filling all three VRAM slots with 1 MB DIMMs.

IMPORTANT The VRAM DIMMs must be 112-pin fast-paged mode, with 70 ns RAM access time or faster. Do not use 256K VRAM SIMMs.

Cache configurations

Your server has a 256K L2 cache. You can upgrade the L2 cache to a maximum of 1 MB by replacing the existing 256K cache DIMM with a higher-capacity cache DIMM.

Graphics modes

The table below shows the image size for monitors (also called *displays*) that can be connected to the monitor port, along with the number of colors or grays supported with 1 MB of VRAM and with the optional expansion to 2 or 4 MB of VRAM. (You can place monitors weighing up to 52.3 lbs. on top of your server.)

There are also many special monitor cards that can support other monitors and special video requirements. See your Apple-authorized dealer for information.

Note: On some monitors from manufacturers other than Apple, the connector pinout designates one pin for both green video and timing synchronization. These “sync on green” monitors are not compatible with the Workgroup Server 7250. If you’re not sure what type of monitor you have, check with your dealer.

Colors or grays supported

Monitor	VIS*	Resolution	1 MB VRAM	2 MB VRAM	4 MB VRAM	Screen refresh rates	
			maximum colors**	maximum colors**	maximum colors**	Vertical	Horizontal
12" RGB	N/A	512 by 384	Millions	Millions	Millions	60 Hz	24.5 kHz
12" Monochrome	N/A	640 by 480	256	256	256	67 Hz	35 kHz
13" RGB Hi-Res	N/A	640 by 480	Millions	Millions	Millions	67 Hz	35 kHz
14" RGB Hi-Res	11.5"	640 by 480	Millions	Millions	Millions	67 Hz	35 kHz
14" AudioVision	11.5"	640 by 480	Millions	Millions	Millions	67 Hz	35 kHz
VGA	***	640 by 480	Millions	Millions	Millions	60 Hz	31.5 kHz
		800 by 600	Thousands	Millions	Millions	60 Hz	37.9 kHz
		800 by 600	Thousands	Millions	Millions	72 Hz	48.1 kHz
		800 by 600	Thousands	Millions	Millions	75 Hz	46.9 kHz
		1024 by 768	256	Thousands	Millions	60 Hz	48.4 kHz
		1024 by 768	256	Thousands	Millions	72 Hz	60 kHz
		1024 by 768	256	Thousands	Millions	75 Hz	80 kHz
		1280 by 1024	Not supported	256	Millions	75 Hz	79.976 kHz
Full-page Monochrome	N/A	640 by 870	256	256	256	75 Hz	68.9 kHz
Full-page RGB	***	640 by 870	Millions	Millions	Millions	75 Hz	68.9 kHz
16" color	14.8"	832 by 624	Thousands	Millions	Millions	75 Hz	49.7 kHz
19" color	***	1024 by 768	256	Thousands	Millions	75 Hz	60.24 kHz
Two-page Monochrome	N/A	1152 by 870	256	256	256	75 Hz	68.7 kHz
Two-page RGB	11.5"	1152 by 870	256	Thousands	Millions	75 Hz	68.7 kHz
Multiple Scan 15	13.3"	640 by 480	Millions	Millions	Millions	67 Hz	35 kHz
		832 by 624	Thousands	Millions	Millions	75 Hz	49.7 kHz
Multiple Scan 17	16.1"	640 by 480	Millions	Millions	Millions	67 Hz	35 kHz
		832 by 624	Thousands	Millions	Millions	75 Hz	49.7 kHz
		1024 by 768	256	Thousands	Millions	75 Hz	60.24 kHz
Multiple Scan 20	19.1"	640 by 480	Millions	Millions	Millions	67 Hz	35 kHz
		832 by 624	Thousands	Millions	Millions	75 Hz	49.7 kHz
		1024 by 768	256	Thousands	Millions	75 Hz	60.24 kHz
		1152 by 870	256	Thousands	Millions	75 Hz	68.7 kHz
		1280 by 1024	Not supported	256	Millions	75 Hz	79.976 kHz
		1280 by 960	Not supported	256	Millions	75 Hz	68.7 kHz
21" color	***	1152 by 870	256	Thousands	Millions	75 Hz	68.7 kHz
NTSC (underscan)	—	512 by 384	Millions	Millions	Millions	60 Hz	15.7 kHz
NTSC (overscan)	—	640 by 480	Millions	Millions	Millions	60 Hz	15.7 kHz
PAL (underscan)	—	640 by 480	Millions	Millions	Millions	50 Hz	15.625 kHz
PAL (overscan)	—	768 by 576	Thousands	Millions	Millions	50 Hz	15.625 kHz

*Viewable Image Size

**256=image depth of 8 bits, thousands=image depth of 16 bits, millions=image depth of 32 bits.

***Refer to the manual that came with your monitor to determine VIS.

N/A=not available

Internal disk drives

The following drives have already been installed in your server at the factory:

- Apple SuperDrive 1.4 MB high-density floppy disk drive
- Apple SCSI hard disk drive
- Built-in CD-ROM drive (5.25-inch, 1/2-height 4X-speed)

You can have additional internal drives installed by an Apple-authorized dealer or service provider.

Clock/calendar

- CMOS custom circuitry with long-life lithium or alkaline battery

Keyboard

- Supports all Apple ADB keyboards

Mouse

- Supports all models of the Apple ADB mouse

Interfaces

- One Apple Desktop Bus (ADB) port supports a keyboard, mouse, and other devices daisy-chained through a low-speed, synchronous serial bus (recommended maximum of three devices).
- Monitor port supports color and grayscale monitors of various sizes and resolutions. (See “Graphics Modes” earlier in this appendix.)
- Internal expansion card slots support three Peripheral Component Interconnect (PCI) expansion cards. Install only expansion cards that come with Mac OS drivers and that are compliant with the PCI 2.0 standard. NuBus cards cannot be used in these expansion slots.
- Two RS-232/RS-422 serial GeoPort-compatible serial ports, 230.4 Kbit per second maximum (up to 2.048 Mbit per second if clocked externally).
- One built-in Ethernet 10BASE-T connector for direct connection to 10BASE-T networks. (If both AAUI and 10BASE-T connectors are plugged in, the server uses the 10BASE-T connector by default.)

- One built-in Ethernet AAUI connector for connecting to high-speed Ethernet networks. Requires the appropriate AAUI transceiver adapter (10BASE-T, thin coaxial, or thick coaxial).
- One 3.5 mm sound output port for headphones or line-level devices.
- One 3.5 mm sound input port for stereo sound input. The sound input port supports the Apple PlainTalk Microphone that comes with some Macintosh computers. The sound input port also supports a standard stereo (miniplug-to-RCA) cable adapter for connecting stereo equipment to your server. It does not support the omnidirectional microphone (the round microphone shipped with some earlier models of Macintosh) or the attenuated RCA adapter provided with some models of Macintosh.
- One SCSI-1 (5 MB per second) interface that supports up to seven internal or external SCSI devices. The internal hard disk and CD-ROM drive are connected to this interface. An additional internal SCSI device can be connected to this interface by an Apple-authorized dealer or service provider.

IMPORTANT Some older SCSI devices may require updated drivers. (A “driver” is special software that is installed in your System Folder.) Contact the device manufacturer for information on obtaining driver software.

IMPORTANT The factory-installed internal hard disk is terminated. If another SCSI device is attached to the SCSI interface, it must not be terminated. The SCSI interface can contain only one terminated device; if you attach more than one terminated device to the internal SCSI interface, damage to the server’s main logic board can occur.

Audio system

- Custom sound circuitry, including stereo generator (digital-to-analog converter, or DAC)—capable of driving stereo miniplug headphones or audio equipment—and stereo sampling hardware (analog-to-digital converter, or ADC) for recording stereo sound
 - 16-bit stereo input and output
 - Sample rates of 44.1 and 22.05 kilohertz (kHz)
 - Input line level: 2 volts peak-to-peak nominal, into 6.5-Kilohm ($k\Omega$) impedance
 - Output line level: 2.2 volts peak-to-peak nominal, into 1 $k\Omega$ impedance
 - Input through output SNR*: >74 decibels (dB) typical
 - Bandwidth: 10 Hz–19 kHz (+/- 2 dB) at 44.100 kHz sample rate
 - THD+N*: Less than 0.06%; measured 30 Hz–16 kHz with a 2-V_{pp} sine wave input
- *SNR is signal-to-noise ratio; THD+N is total harmonic distortion plus noise.

AC line input

WARNING To avoid damage to the server, the voltage switch on the back of the server must be set for the type of voltage system it will be connected to. See “Plugging in Your Server” in Chapter 1 for instructions on setting the voltage.

- Line voltage: 100–130 volts AC and 220–270 volts AC, RMS single phase, manually configured
- Frequency: 50–60 Hz
- Power: 215 watts maximum continuous; 300 watts peak input

AC line output

- Output receptacle: 100–270 volts (V) alternating current (AC), RMS (determined by actual input voltage); 3 ampere (A) maximum

DC power

- Continuous output: 150 watts
- Peak output (for 12 seconds at startup): 189 watts

Current type	Total
+5 V 20 A*	20 A*
+5 V (trickle)	0.1 A
+3.3 V	10 A*
+12 V	2.7 A*
–12 V	0.75 A

*Note: These items are interrelated—the maximum power available depends on the maximums used by other items. Combined power usage cannot be more than 20–25 A.

For example, you could have power output divided as shown in any of the three cases in the table below:

+3.3V	+5V	+5V (trickle)	+12V	–12V	Total power consumption
0.0 A	20.0 A	0.10 A	3.375 A	0.75 A	150 W
0.0 A	16.1 A	0.10 A	5.0 A	0.75 A	150 W
10.0 A	15.0 A	0.10 A	2.70 A	0.75 A	150 W

Power requirements for devices you can connect

Apple Desktop Bus

- Mouse draws up to 10 mA.
- Keyboard draws 25–80 mA (varies with keyboard model used).
- Maximum current available for all ADB devices: 500 mA.

Note: The ADB port can support up to three ADB devices.

Audio and telecommunications devices

Power allowances for external devices connected to input ports:

Device	Voltage	Current	Power
Microphone	+5 V	20 mA	100 mW
GeoPort Telecom Adapter	+5 V	500 mA	2.5 W

Expansion cards and devices

If you add a PCI expansion card, a 5.25-inch storage device, or a 3.5-inch storage device to your Workgroup Server 7250, make sure the component's power requirements don't exceed the maximum power allowances allocated to it by the server.

The maximum power allowances for expansion cards in your server can accommodate three 15-watt or two 25-watt cards. Detailed guidelines are presented in the following table.

Device	Voltage	Current	Power
Expansion card (15 watts)* (PCI)	+5 V	3 A	15 W
	+3.3 V	2 A	6.6 W
Expansion card (25 watts)** (PCI)	+5 V	5 A	25 W
	+3.3 V	2 A	6.6 W
Storage device (such as a CD-ROM drive)	+5 V	9 A	45 W

*15-watt expansion cards should not consume more than 15 watts of power total.

**25-watt cards should not consume more than 25 watts of power total.

Assigning SCSI ID numbers

Your server has a SCSI chain that can be used to connect one additional internal SCSI device and several additional external SCSI devices. All devices on the same SCSI chain must have unique ID numbers.

The drives that were installed in your server at the factory, as well as the server itself, have already reserved certain SCSI ID numbers. Other ID numbers are available for assignment to SCSI devices that are added after you buy your server, as described in the following table.

SCSI ID number	Device
0	factory-installed hard disk
1	available
2	available
3	factory-installed CD-ROM drive
4	available
5	available
6	available
7	server CPU

Size and weight

Weight	Height	Width	Depth
Main unit			
10 kg*	156 mm	365 mm	430 mm
22 lb.*	6.15 in.	14.37 in.	16.93 in.
Mouse			
0.11 kg	33 mm	61 mm	107 mm
4 oz.	1.3 in.	2.4 in.	4.2 in.

*Weight varies depending on type of hard disk and may be greater if a 5.25-inch device, such as a CD-ROM drive, is installed.

Maximum supportable monitor weight

- 52.3 lbs. (23.72 kg)

Environment

Operating temperature

- 10° C to 40° C (50° F to 104° F)

Storage temperature

- -40° C to 47° C (-40° F to 116.6° F)

Relative humidity

- 5% to 95% (noncondensing)

Altitude

- 0 to 3048 m (0 to 10,000 ft.)

CD-ROM specifications

- Disc diameter 120 millimeters (5.25 inches) and 80 mm
- Scanning velocity 1.2–1.4 meters per second
- Rotation speed
Normal speed ~530 to 230 rpm
Double speed ~1060 to 460 rpm
Quadruple speed ~2120 to 920 rpm
- Latency (average)
Normal speed ~55 to 130 milliseconds (ms)
Double speed ~27.5 to 65 ms
Quadruple speed ~13.75 to 32.5 ms
- Blocks per rotation ~8.4 to 19.5 variable
- Average access time (typical)
Normal speed 380 ms
Double speed 270 ms
Quadruple speed 200 ms

Data

- Data capacity 656 megabytes (MB), Mode 1
748 MB, Mode 2
- Number of blocks per disc 336,150
- Data per block 2048 bytes, Mode 1
2336 bytes, Mode 2
- Address description Minutes, seconds, blocks

Audio capacity

- Playing time 74 minutes, 42 seconds

Modes supported

- Audio CD
- CD-ROM Modes 1 and 2
- CD-ROM XA Mode 2, Forms 1 and 2
- CD-I Mode 2, Forms 1 and 2
- Photo CD Single session and multisession
- Video CD

Data streaming and transfer rates

- Blocks per second
 - Normal speed 75
 - Double speed 150
 - Quadruple speed 300
- User kilobytes (K) per second
 - Normal speed 150K, Mode 1
171.1K, Mode 2
 - Double speed 300K, Mode 1
342.2K, Mode 2
 - Quadruple speed 600K, Mode 1
684.4K, Mode 2
- SCSI bus burst rate (typical)
 - Asynchronous 5.0 MB per second
 - Synchronous 5.0 MB per second

Power consumption (typical)

+5V DC 360 milliamperes (mA)

+12V DC 620 mA

Laser

- Type: Semiconductor GaAlAs laser
- Wavelength: 790 ± 25 nanometers
- Output power: 0.2 to 0.6 milliwatts
- Beam divergence: 55°

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