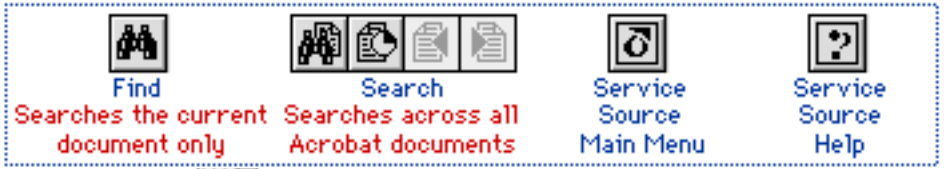
Service Source

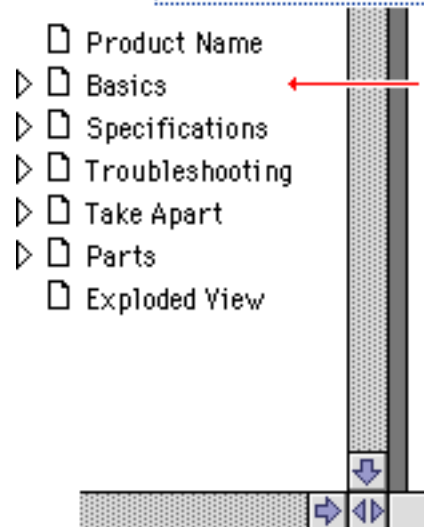
Power Macintosh 8600 and 9600 Series

Power Macintosh 8600/200, 9600/200, and 9600MP/200

Basic Navigation Within Service Source

Plug-Ins:





Basics

Power Macintosh 8600 and 9600 Series

Overview

The Power Macintosh 8600 and 9600 Series computers share the same housing and feature a chassis design that allows you to access the logic board and its components (including the plug-in microprocessor card) simply by removing the side access panel. This flexible design makes the Power Macintosh 8600 and 9600 Series easier to service and upgrade.

Features of the Power Macintosh 8600 include

- A 200 MHz PowerPC™ 604e microprocessor card with built-in FPU
- 32 MB of DRAM, expandable to 512 MB using 168-pin, 60 ns, 64-bit EDO DRAM DIMMs
- 256K Level 2 cache
- 2 MB VRAM, expandable to 4 MB
- 2 GB hard drive
- Two SCSI DMA buses supporting up to eight SCSI devices and transfers up to 10 MB/s (internal bus only)
- Three PCI expansion slots
- Video input and output support via external ports
- Built-in AAUI and 10BASE-T Ethernet
- Two GeoPort serial ports
- CD-ROM drive at 12x-speed
- CD-quality stereo sound in/out
- Mac™ OS system software 7.5.5

Features of the Power Macintosh 9600 include

- A 200 MHz PowerPC™ 604e processor or multiprocessor card with built-in FPU
- 32 MB of DRAM, expandable to 768 MB using 168-pin, 60 ns, 64-bit EDO DRAM DIMMs
- 512K Level 2 cache
- 4 MB VRAM on monitor card
- 4 GB hard drive
- Two SCSI DMA buses supporting up to eight SCSI devices and transfers up to 10 MB/s (internal bus only)
- Six PCI expansion slots
- Built-in AAUI and 10BASE-T Ethernet
- Two GeoPort serial ports
- CD-ROM drive at 12x-speed
- CD-quality stereo sound in/out
- Mac™ OS system software 7.5.50

Configurations

The Power Macintosh 8600/200 comes standard with

- 200 MHz PowerPC 604e microprocessor card
- 32 MB of DRAM
- 256K Level 2 cache DIMM
- 2 GB hard drive
- AppleCD 1800i 12x CD-ROM drive
- 2 MB of VRAM

The Power Macintosh 9600/200 and 9600/200 MP come standard with

- 200 MHz PowerPC 604e microprocessor card
- 32 MB of DRAM
- 512K Level 2 cache

- 4 GB hard drive
- AppleCD 1800i 12x CD-ROM drive

PowerPC 604e Microprocessor

The Power Macintosh 8600 and 9600 Series computers feature the PowerPC 604e RISC microprocessor. The PowerPC 604e microprocessor is installed via a card that plugs into the logic board, allowing for maximum flexibility with future upgrades.

Features of the microprocessor include

- Full RISC processing architecture
- Parallel processing units: one load-store unit, two integer units, one complex integer unit, and one floating point unit
- Separate built-in 32K caches for data and instructions
- Advanced branching techniques for improved throughput
- Bus multiplier up to 5:1

Peripheral Component Interconnect (PCI)

The Power Macintosh 8600 and 9600 Series computers offer a Peripheral Component Interconnect (PCI) expansion bus. Because the PCI bus is an industry standard, most existing PCI 2.0-compliant cards (with the addition of a Mac OS-specific software driver) will work in these computers.

PCI offers significantly higher performance than the NuBus architecture used in previous Macintosh models. Running at 33 MHz, the PCI bus is up to three times faster than NuBus, offering overall enhanced system performance, particularly in the areas of video and networking.

Dual In-Line Memory Modules (DIMMs)

The Power Macintosh 8600 and 9600 Series computers ship with extended data output (EDO) DRAM dual in-line memory modules (DIMMs) instead of DRAM SIMMs. Whereas SIMMs have 72 pins, DIMMs have 168 pins. The extra pins provide a 64-bit data path, compared to a 32-bit data path for SIMMs. In addition, DIMMs do not have to be installed in pairs like the SIMMs on earlier Macintosh models. (However, to take advantage of memory inter-leaving, the DIMMs should be installed in paired slots. See "Memory Configurations" in Basics for more information.)

Important: The Power Macintosh 8600 and 9600 computers use +5 V DIMMs only. Single In-Line Memory Modules (SIMMs) used in previous Macintosh models are NOT compatible with these computers.

Important: The Power Macintosh 8600/200 also uses VRAM DIMMs (112-pin 70 ns or faster) instead of VRAM SIMMs. The VRAM SIMMs used in earlier Power Macintosh models are **not** compatible.

Note: While the Power Macintosh 8600 and 9600 Series ship with EDO DIMMs, the computers' memory controller treats EDO DIMMs like fast-paged DIMMs. You can therefore use either EDO or fast-paged DIMMs in these computers.

Memory Configurations

The Power Macintosh 8600 logic board has eight DRAM DIMM slots, each with a 64-bit data bus. You can increase the computers' DRAM to a total of 512 MB using 5-volt, 64-bit-wide, extended data output (EDO) 168-pin fast-paged mode, 60 ns DIMMs.

The Power Macintosh 9600 logic board has 12 DRAM DIMM slots, each with a 64-bit data bus. You can increase the computers' DRAM to a total of 768 MB using 5-volt, 64-bit-wide, EDO 168-pin fast-paged mode, 60 ns DIMMs.

Note: These computers do not have any main memory soldered to the logic board. At least one RAM DIMM must be present for the computers to operate.

DRAM DIMMs can be installed individually; however, if you wish to take advantage of the computer's interleaving

capability, which provides maximum performance, you must install the DIMMs in matching pairs and in paired slots.

Note: Memory interleaving allows the computer to read or write to its memory while other memory reads or writes are occurring, thus providing for faster performance.

For a pair of DIMMs to function as a single 128-bit wide pair, they must be the same type and size.

Note: DIMMs purchased from different manufacturers can be paired as long as they are the same size and speed.

The drawings on the following pages illustrates where the DRAM slots are located on the Power Macintosh 8600 and 9600 logic boards and how they are numbered.

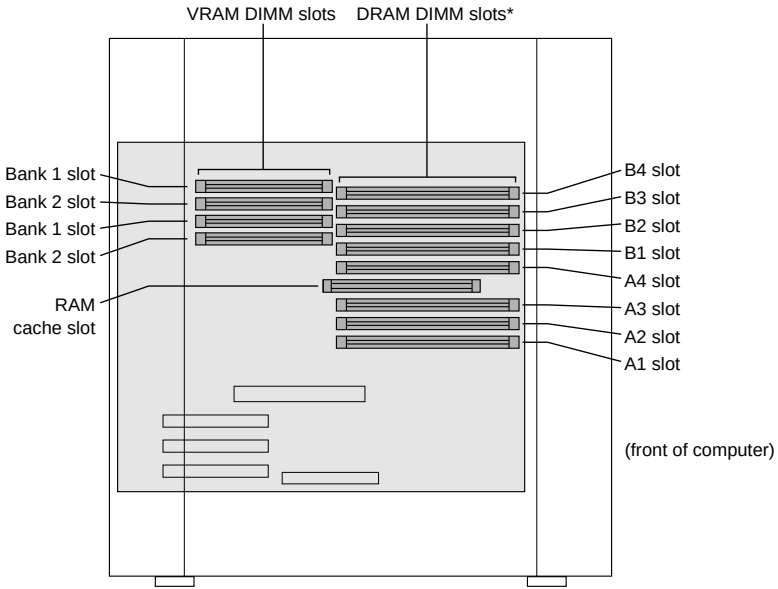


Figure: PM 8600 Series DRAM DIMM Slots

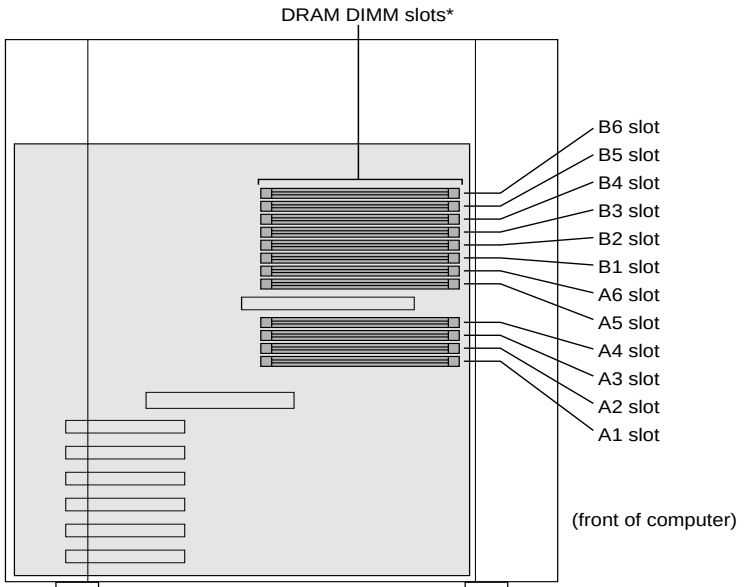


Figure: PM 9600 Series DRAM DIMM Slots

Ethernet Support

There are two Ethernet ports on the Power Macintosh 8600 and 9600 logic boards: an AAUI port and a 10BASE-T port. You can use only one Ethernet port at one time, however. If you have cables plugged into both Ethernet ports, the computer uses the 10BASE-T port by default.

AV Support

The Power Macintosh 8600 comes standard with an AV module that provides support for: composite video input and output, S-video input and output, audio input (left and right), and audio output (left and right).

GeoPort

Geoport is a hardware and software communications architecture that has been optimized for computer-telephony integration. It has three main attributes:

- It lets any computer connect to any telephone (analog or digital, public or private) anywhere in the world.
- Once connected, it supports an arbitrary number of independent data streams up to a total bandwidth of 2 MB/second.
- Unlike traditional asynchronous data communications (such as AppleTalk), GeoPort also supports isochronous data streams (such as real-time voice and video) and provides the real-time Application Program Interfaces (APIs) necessary to hide the implementation details from both the recipient and the sender.

By attaching an Apple GeoPort Telecom Adapter to these computers, you can enjoy all the features of a 33.6 modem, including data, fax, send and receive, and voice capabilities. The GeoPort Telecom Adapter serves as a line interface to standard (analog) telephone lines. The adapter is capable of sending or receiving data at up to 33.6 kbps and faxes at up to 14.4 kbps using the GeoPort Telecom Adapter software.

PC Compatibility Cards

Apple computer offers two PC Compatibility Card upgrade kits that bring full DOS functionality to the Macintosh computer. Two versions of the PC Compatibility card are available: a 7" card and a 12" card. The cards plug into any available PCI slot on the logic board. Refer to the Upgrades chapter in this manual for installation instructions.

The Cuda Chip

The Cuda is a microcontroller chip. Its function is to

- Turn system power on and off
- Manage system resets from various commands
- Maintain parameter RAM (PRAM)
- Manage the Apple Desktop Bus (ADB)
- Manage the real-time clock

Many system problems can be resolved by resetting the Cuda chip (see Symptom Charts for examples). Press the Cuda reset button on the logic board to reset the Cuda chip. (See "Logic Board Diagram" later in this chapter to locate the Cuda reset button.) If you continue to experience system problems, refer to "Resetting the Logic Board" in this Basics chapter.

Resetting the Logic Board

Resetting the logic board can resolve many system problems (refer to "Symptom Charts" for examples). Whenever you have a unit that fails to power up, you should follow this procedure before replacing any modules.

1 Unplug the computer.

2 Remove the battery from the logic board.

3 Disconnect the power supply cable from the logic board and then press the Power On button. (See "Logic Board Diagram" later in this chapter to locate the Power On button.)

4 Wait at least 10 minutes before replacing the battery.

5 Make sure the battery is installed in the correct +/- direction.

6 Reassemble the computer and test the unit.

Note: This procedure resets the computer's PRAM. Be sure to check the computer's time/date and other system parameter settings afterwards.

Note: If this procedure resolves the problem, claim an adjustment on an SRO. If not, replace the defective component and DO NOT claim the adjustment procedure.

Fast SCSI

The Power Macintosh 8600 and 9600 Series computers offer Fast SCSI support on the internal SCSI connector, which provides for significantly enhanced data throughput. The internal SCSI bus on these computers supports transfer rates up to 10 MB/sec.

Rear View Diagram

The Power Macintosh 8600 and 9600 Series computers offer the following external ports: SCSI, AAUI and 10BASE-T Ethernet, serial printer (GeoPort compatible), serial modem (GeoPort compatible), DB-15 video, ADB, sound input and output, composite/S-video input and output (Power Macintosh 8600/200), and left/right audio input and output (Power Macintosh 8600/200).

The drawings on the following pages illustrate the back panels of the Power Macintosh 8600 and 9600 computers.

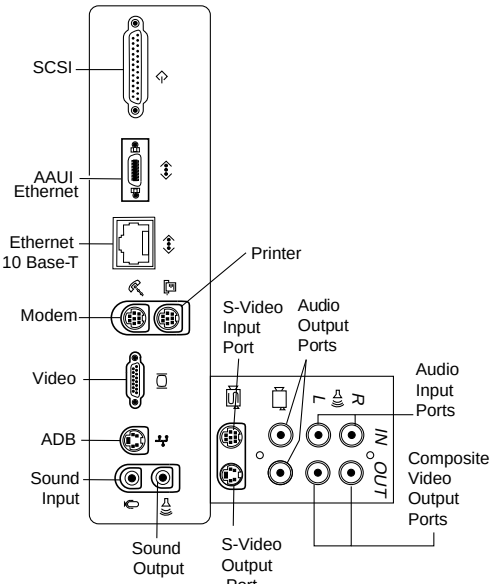


Figure: Power Macintosh 8600 Rear Panel

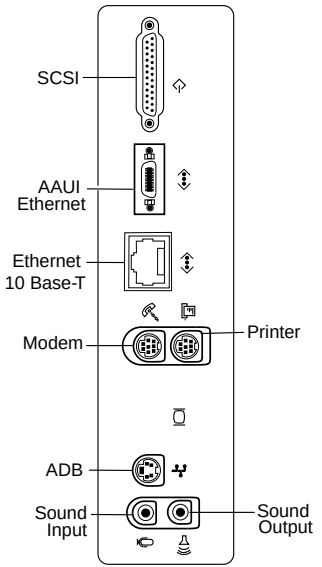


Figure: Power Macintosh 9600 Rear Panel

Logic Board Diagram

The following drawings illustrate the connectors on the Power Macintosh 8600 and 9600 logic boards.

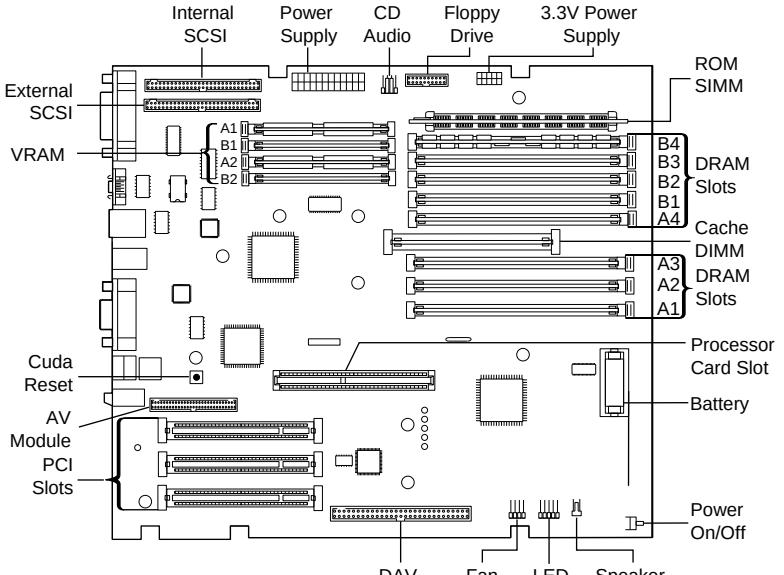


Figure: Power Macintosh 8600 Logic Board

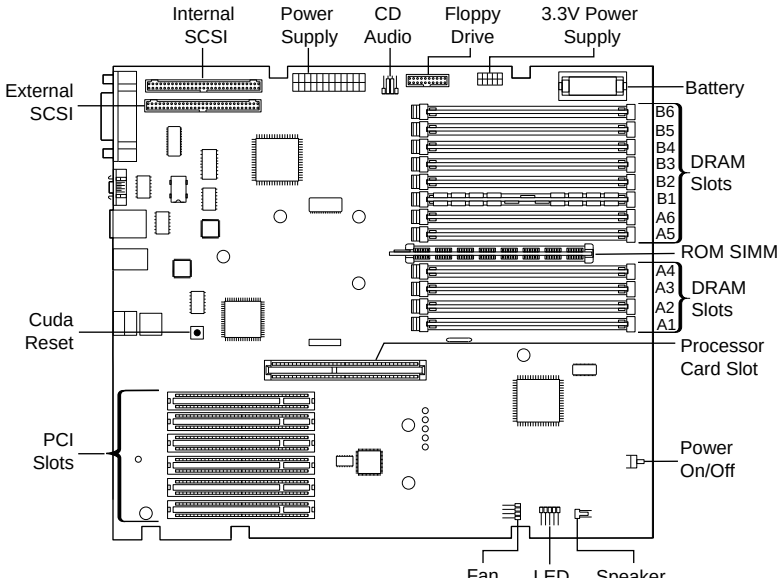


Figure: Power Macintosh 9600 Logic Board

Repair Strategy

Service the Power Macintosh 8600 and 9600 Series computers through module exchange and parts replacement. Customers can request on-site service from an Apple Authorized Service Provider Plus (AASP+) or Apple Assurance. They can also choose carry-in service from an AASP.

Ordering

Apple Service Providers planning to support the Power Macintosh and 9600 Series computers may purchase Service modules and parts to develop servicing capability. To order parts, use the AppleOrder system and refer to the Power Macintosh 8600 or 9600 "Service Price Pages."

Large businesses, universities, and K-12 accounts must provide a purchase order on all transactions, including orders placed through the AppleOrder system. Service providers not enrolled in AppleOrder may fax their orders to Service Provider Support (512-908-8125) or mail them to

Apple Computer, Inc.
Service Provider Support
MS 212-SPS
Austin, TX 78714-9125

If you have further questions, please call Service Provider Support at 800-919-2775 and select option #1.

Warranty and AppleCare

The Power Macintosh 8600 and 9600 Series computers are covered under the Apple One-Year Limited Warranty. The AppleCare Service Plan is also available for these products. Service Providers are reimbursed for warranty and AppleCare repairs made to these computers. For pricing information, refer to "Service Price Pages."

Specifications

Power Macintosh 8600 and 9600 Series

Processor

CPU

PM 8600/200	One PowerPC 604e RISC processor running at 200 MHz Built-in FPU Requires system software version 7.5.5 or later
PM 9600/200	One PowerPC 604e RISC processor running at 200 MHz Built-in FPU Requires system software version 7.5.5 or later
PM 9600MP/200	Two PowerPC 604e RISC processors running at 200 MHz Built-in FPU Requires system software version 7.5.5 or later

Memory

DRAM

PM 8600/200	32 MB MB standard; expandable to 512 MB Uses 168-pin, 64-bit, 60 ns or faster EDO DRAM DIMMs
PM 9600 Series	32 MB standard; expandable to 768 MB Uses 168-pin, 64-bit, 60 ns or faster EDO DRAM DIMMs

ROM

4 MB ROM

VRAM

PM 8600/200	2 MB standard; expandable to 4 MB
PM 9600 Series	4 MB on standard monitor card

Cache

PM 8600/200	256K Level 2 cache DIMM
PM 9600 Series	512K Level 2 cache (soldered to board)

Clock/Calendar CMOS custom circuitry with long-life battery

I/O Interfaces

SCSI	Dual-channel asynchronous SCSI interface; external channel supports up to seven SCSI devices; internal channel supports a hard disk array
Serial	Two RS-232/RS-422 serial ports compatible with LocalTalk and GeoPort cables; mini DIN-8 connectors
ADB	One Apple Desktop Bus port for a keyboard, mouse, etc.
Ethernet	One AAUI and one 10BASE-T Ethernet port (if cables are plugged into both ports, system defaults to 10BASE-T)

Expansion

PM 8600/200	Three PCI expansion slots
PM 9600 Series	Six PCI expansion slots

Sound 16-bit stereo sound input and output ports

Video Built-in DB-15 video connector on logic board

PM 8600/200	24-bit video input and output connectors on AV module

I/O Devices

Keyboard Standard, extended, or adjustable keyboard; keyboard draws 25-80 mA, depending on model type

Mouse ADB Mouse II; mouse draws up to 10 mA

Microphone Apple PlainTalk microphone standard

Disk Storage

Hard Drive

PM 8600/200	2 GB fast internal SCSI hard drive Zip drive
PM 9600 Series	4 GB fast internal SCSI hard drive

Floppy Drive

One Apple SuperDrive 1.4 MB floppy drive

CD-ROM Drive

One internal AppleCD 1800i 12x CD-ROM drive

Electrical

Line Voltage	100–240 VAC, RMS single phase, automatically configured
Frequency	50–60 Hz, single phase
Maximum Power	DC Power: 390 W, not including monitor AC Power: 560 W maximum continuous; 700 W peak input

Physical

Dimensions

Height: 17.3 in. (43.9 cm)
Width: 8.8 in. (22.4 cm)
Depth: 17.3 in. (44.0 cm)

Weight

35 lb. (15.9 kg); weight varies depending on devices installed

Environmental

Operating Temperature	50 to 104° F (10 to 40° C)
Storage Temperature	–40 to 116.6° F (–40 to 47° C)
Relative Humidity	5–95% noncondensing
Maximum Altitude	10,000 ft. (3,048 m)

Troubleshooting

Power Macintosh 8600 and 9600 Series

General

The Symptom Charts included in this chapter will help you diagnose specific symptoms related to your product. Because cures are listed on the charts in the order of most likely solution, try the first cure first. Verify whether or not the product continues to exhibit the symptom. If the symptom persists, try the next cure. (Note: If you have replaced a module, reinstall the original module before you proceed to the next cure.)

If you are not sure what the problem is, or if the Symptom Charts do not resolve the problem, refer to the Flowchart for the product family.

For additional assistance, contact Apple Technical Support.

Cleaning Procedure for Card Connectors

It is possible for residue to build up on the gold edge connector pins on some PCI cards, which could cause a variety of symptoms.

If you are having problems with a PCI card, inspect the connector pins with a magnifying glass. If you find residue, use a pencil eraser to gently clean the pins.

Symptom Charts

Power Supply

System doesn't power up	1 Reseat processor card and ROM SIMM (if present). 2 Reset Cuda chip. (Refer to The Cuda Chip in Basics for instructions.) 3 Reset logic board. (Refer to Resetting the Logic Board in Basics for instructions.) 4 Replace power supply. 5 Replace processor card. 6 Replace logic board.

Error Chords

One-part error chord sounds during startup sequence	1 Disconnect SCSI data cable from hard drive and reboot system. If startup sequence is normal, initialize hard drive. Test unit again with SCSI data cable connected. If error chord still sounds, replace hard drive. 2 Disconnect floppy drive cable from floppy drive and reboot system. If startup sequence is normal, replace floppy drive. 3 Reseat processor card. 4 Replace processor card. 5 Replace logic board. Retain customer's DIMMs.
Eight-part error chord (death chimes) sounds during startup sequence	1 Replace DRAM DIMMs one at a time to test DRAM. Replace any faulty DIMMs. 2 Replace logic board.

System

Does not power on, screen is black, fan is not running and LED is not lit	1 Check power cables. 2 Plug monitor directly into wall socket, and verify that monitor has power. 3 Reseat ROM SIMM (if present) and processor card. The logic board must have a processor card installed to operate. 4 Reset Cuda chip. (Refer to The Cuda Chip in Basics for instructions.) 5 Reset logic board. (Refer to Resetting the Logic Board in Basics for instructions.) 6 Replace power cord. 7 Replace power supply. 8 Replace processor card. 9 Replace logic board. Retain customer's DIMMs.

Clicking, chirping, or thumping	1 Remove all PCI cards and test the unit. If problem does not occur with cards removed, begin replacing them one at a time to determine which card is causing the problem. Replace problem card with known-good card. 2 Remove hard drive. If problem no longer occurs, replace hard drive with a known-good drive. 3 Replace power supply. 4 Replace processor card. 5 Replace logic board. Retain customer's DIMMs. 6 Replace floppy drive cable. 7 Replace floppy drive.

System shuts down intermittently	1 Make sure air vents are clear. Thermal protection circuitry may shut down system. After 30 to 40 minutes, system should be OK. 2 Make sure power cord is firmly plugged in. 3 Replace power cord. 4 Check battery. 5 Reset Cuda chip. (Refer to The Cuda Chip in Basics for instructions.) 6 Reset logic board. (Refer to Resetting the Logic Board in Basics for instructions.) 7 Replace power supply. 8 Replace processor card. 9 Replace logic board. Retain customer's DIMMs.

System intermittently crashes or hangs	1 Verify system software is version 7.5.5 or later. 2 Verify DIMMs are noncomposite. 3 Verify software is known-good. Do a clean install of the system software. 4 Verify software is Power Macintosh compatible (contact developer). Also, try booting with extensions off to determine if there are system init problems. 5 Clear parameter RAM. Hold down <Command> <Option> <P> <R> during startup but before "Welcome to Macintosh" appears. 6 Remove all DRAM DIMMs and try replacing them one at a time to test. Replace any bad DIMMs. 7 Replace processor card. 8 Replace logic board. Retain DIMMs.

During startup, following message is displayed, "This startup disk will not work on this Macintosh model...."

1 Verify that startup disk is good.
2 Verify system software is version 7.5.5 or later.
3 Do a clean install of the system software.

Video

Screen is black, boot tone is present, drive operates, fan is running, and LED is lit	1 Adjust brightness on monitor. 2 Clear parameter RAM. Hold down <Command> <Option> <P> <R> during startup but before "Welcome to Macintosh" appears. 3 Reset Cuda chip. (Refer to The Cuda Chip in Basics.) 4 Reset logic board. (Refer to Resetting the Logic Board in Basics.) 5 Replace monitor cable. 6 Remove all DRAM DIMMs and try replacing them one at a time to test. Replace any bad DIMMs. 7 Test with known-good monitor. Replace monitor if necessary. Refer to appropriate monitor manual to troubleshoot defective monitor. 8 Replace processor card. 9 Replace logic board. Retain customer's DIMMs.

Screen is black, no boot tone and drive does not operate, but fan is running and LED is lit	1 Reset Cuda chip. (Refer to The Cuda Chip in Basics for instructions.) 2 Reset logic board. (Refer to Resetting the Logic Board in Basics for instructions.) 3 Remove all DRAM DIMMs and try replacing them one at a time to test. Replace any bad DIMMs. 4 Replace processor card. 5 Replace logic board. Retain customer's DIMMs. 6 Replace power supply.

Boot tone is present and screen lights up, but nothing is displayed on screen	1 Reset Cuda chip. (Refer to The Cuda Chip in Basics for instructions.) 2 Reset logic board. (Refer to Resetting the Logic Board in Basics for instructions.) 3 Replace monitor cable. 4 Test with known-good monitor. Replace monitor if necessary. Refer to appropriate monitor manual to troubleshoot defective monitor. 5 Replace processor card. 6 Replace logic board. Retain customer's DIMMs.

Floppy Drive

Internal floppy drive does not operate	1	Replace floppy disk with known-good disk.
	2	Replace floppy drive cable.
	3	Replace floppy drive.
	4	Replace processor card.
	5	Replace logic board. Retain customer's DIMMs.
During system startup, disk ejects; display shows icon with blinking "X"	1	Replace disk with known-good system disk.
	2	Replace floppy drive cable.
	3	Replace floppy drive.
	4	Replace processor card.
	5	Replace logic board. Retain customer's DIMMs.

Does not eject disk	1	Switch off computer. Hold mouse button down while you switch computer on.
	2	Replace floppy drive cable.
	3	Replace floppy drive.
	4	Replace processor card.
	5	Replace logic board. Retain customer's DIMMs.
Attempts to eject disk, but doesn't	1	Reseat floppy drive bezel and drive so bezel slot aligns correctly with drive.
	2	Replace floppy drive.
Internal floppy drive runs continuously	1	Replace disk with known-good floppy disk.
	2	Replace floppy drive cable.
	3	Replace floppy drive.
	4	Replace processor card.
	5	Replace logic board. Retain customer's DIMMs.

MS-DOS drive does not recognize a disk formatted on a 1.4 MB drive	To read and write files with either MS-DOS or 1.4 MB drive, format all disks with MS-DOS drive first.

Hard Drive

Single internal hard drive does not operate; drive doesn't spin	1 Replace hard drive power cable. 2 Replace hard drive. If problem resolved, reinstall SCSI device driver and system software. 3 Replace power supply.
No internal SCSI drives operate	1 Verify there are no duplicate SCSI device addresses. 2 Disconnect external SCSI devices and check for proper termination. Only last device in SCSI chain should be terminated. 3 Replace SCSI data cable. 4 Replace power supply. 5 Replace processor card. 6 Replace logic board. Retain customer's DIMMs.

Drive does not appear on the desktop	1 Verify there are no duplicate SCSI device addresses. 2 Update the SCSI device driver using Drive Setup. Run Disk First Aid to verify the condition of the drive's directory structure. 3 Replace the SCSI hard drive cable. 4 If drive is not initialized, use Drive Setup to initialize. 5 Replace with known-good hard drive. 6 If the hard drive still doesn't work, switch back to the original hard drive and replace the logic board.
Works with internal or external SCSI devices but not with both	1 Verify there are no duplicate SCSI device addresses. 2 Replace terminator on external SCSI device. 3 Verify that SCSI device at end of internal SCSI data cable is only device terminated. 4 Refer to appropriate manual to troubleshoot defective external device.

Peripherals

Cursor does not move	1	Check mouse connection.
	2	Inspect inside of mouse for buildup of dirt or other contaminants. Clean mouse if necessary.
	3	If mouse was connected to keyboard, connect mouse to computer ADB port instead. If mouse works, replace keyboard.
	4	Replace ADB cable.
	5	If mouse does not work in any ADB port on computer, replace mouse.
	6	Replace processor card.
	7	Replace logic board. Retain customer's DIMMs.
Cursor moves, but clicking mouse button has no effect	1	Boot from floppy or bootable CD.
	2	Replace mouse.
	3	Replace logic board. Retain customer's DIMMs.

Double-click doesn't open application, disk, or server	1	Remove duplicate system folders.
	2	Clear parameter RAM. Hold down <Command> <Option> <P> <R> during startup but before "Welcome to Macintosh" appears.
	3	If mouse was connected to keyboard, connect mouse to computer ADB port instead. If mouse works, replace keyboard.
	4	If mouse does not work in any ADB port on computer, replace mouse.
	5	Replace logic board. Retain customer's DIMMs.
No response to any key on keyboard	1	Check keyboard connection to ADB port.
	2	Replace keyboard cable.
	3	Replace keyboard.
	4	Replace logic board. Retain customer's DIMMs.

Known-good serial printer does not work	1	Verify you have correct version of system software.
	2	Verify that Chooser is set correctly.
	3	Reinstall correct printer drivers.
	4	Do clean install of system software.
	5	Replace printer interface cable.
	6	Replace logic board. Retain customer's DIMMs.
Known-good network printer does not print	1	Check network connections.
	2	Verify you have correct version of system software.
	3	Verify that Chooser is set correctly.
	4	Does printer show up in Chooser? If so, do clean install of system software and/or network and printer software.
	5	Replace logic board. Retain customer's DIMMs.

CD-ROM Drive

CD-ROM drive does not work	1	Try using known-good compact disc.
	2	Replace CD-ROM drive mechanism.
Macintosh does not display CD-ROM icon once CD is inserted in drive	1	Verify that CD-ROM software is installed.
	2	Replace CD-ROM drive mechanism.
	3	Replace SCSI data cable.

Miscellaneous

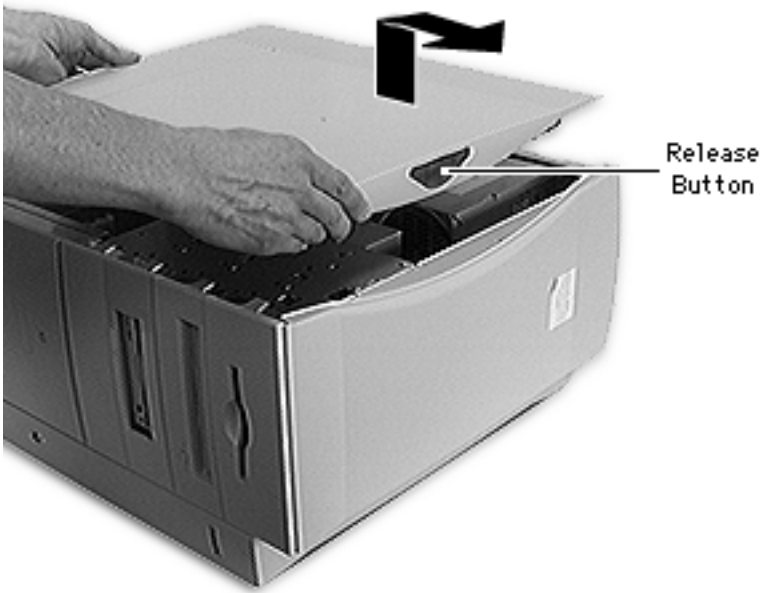
No sound from speaker	1 Verify that volume setting in Control Panel is 1 or above. 2 Clear parameter RAM. Hold down <Command> <Option> <P> <R> during startup but before "Welcome to Macintosh" appears. Verify speaker is plugged into logic board. 3 Replace speaker. 4 Replace logic board. Retain customer’s DIMMs.

Take Apart

Power Macintosh 8600 and 9600 Series

Side Access Panel

No preliminary steps are required before you begin this procedure.

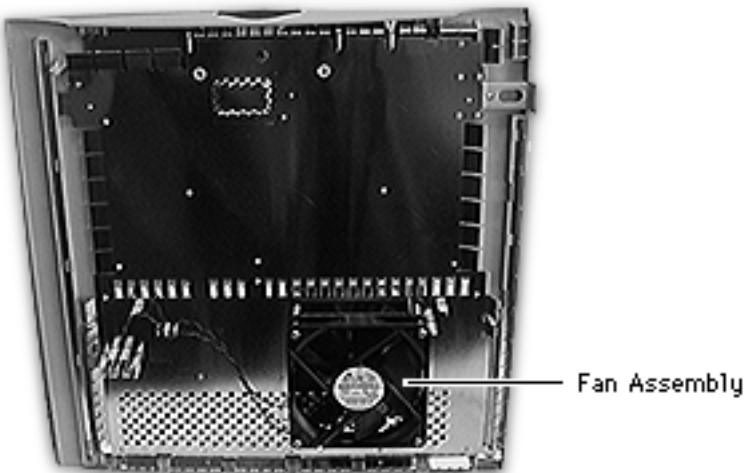


1 Carefully lay the computer on its side.

2 Press the release button and lift up the side access panel a few inches.

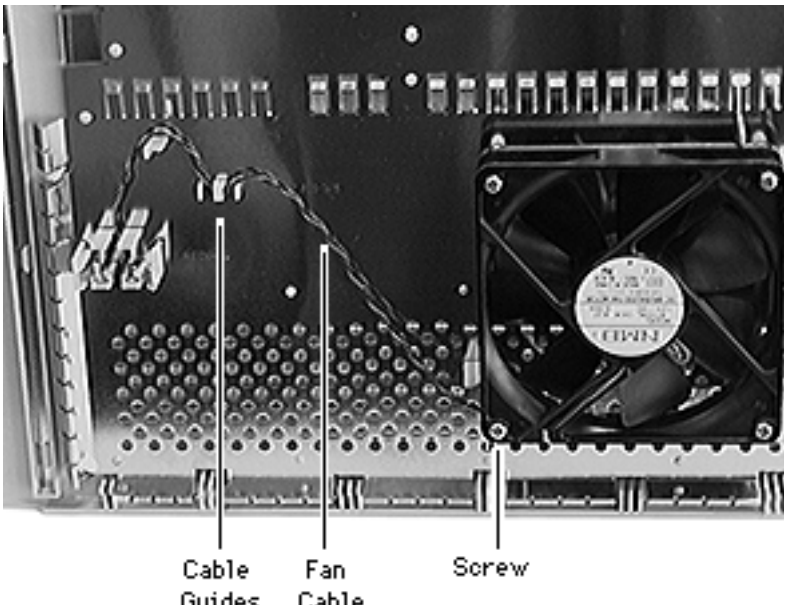
3 Slide the panel to the right and lift it off.

Fan Assembly



Note: The fan assembly is mounted to the inside of the side access panel.

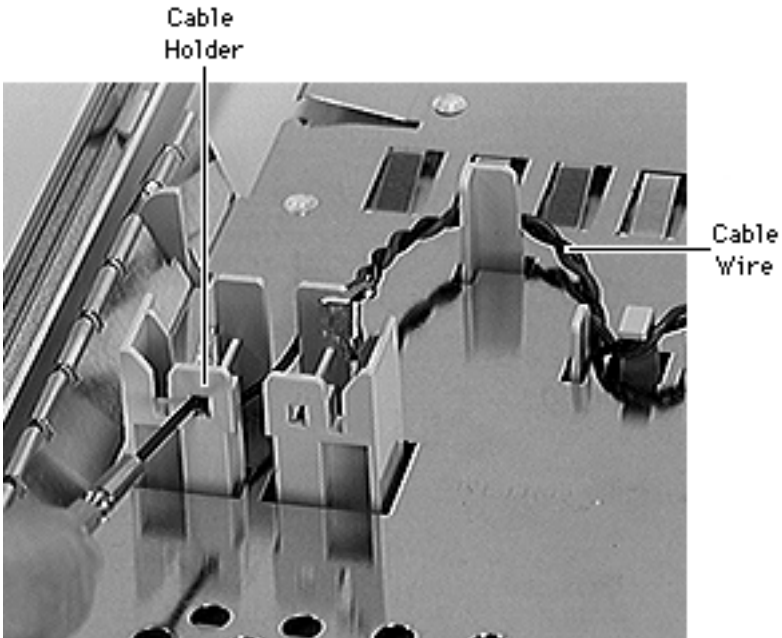
Before you begin, remove the side access panel.



1 Using a Phillips screwdriver, remove the four fan mounting screws.

2 Remove the fan cable from the cable guides.

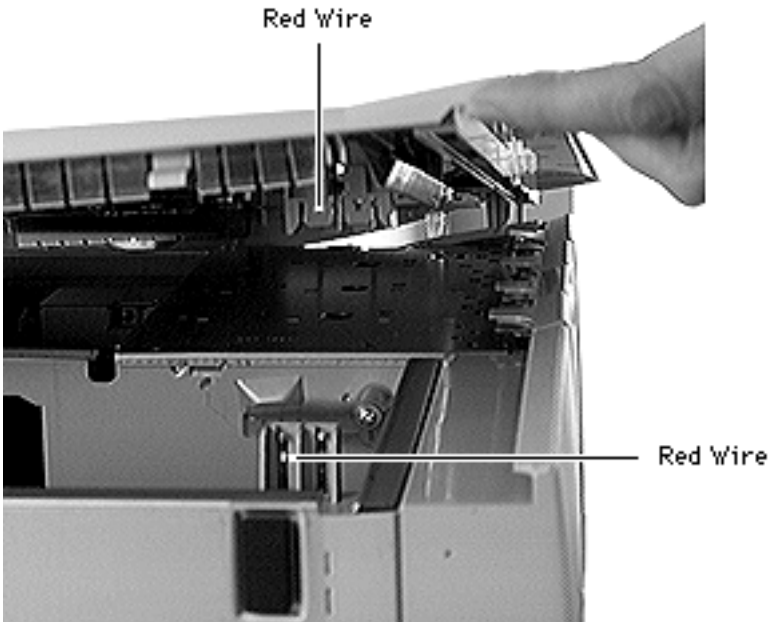
Replacement Note: Be sure to route the fan cable around the guides, as shown.



3 Insert a jeweler's screwdriver into the right slot on the plastic cable holder and release the metal end of the right fan cable wire. Slide the wire up and out of the holder.

4 Repeat for the left fan cable wire.

5 Lift the fan off the side access panel.

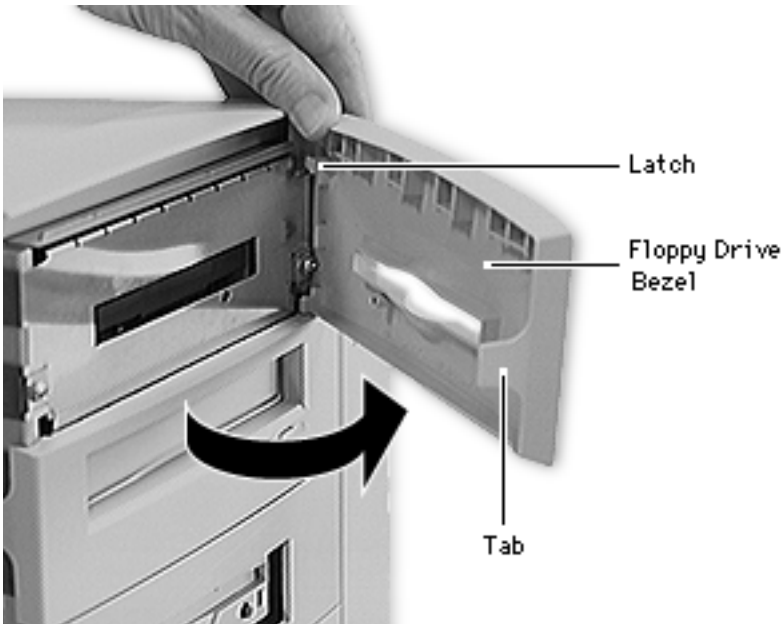


Replacement Caution: Make sure the red fan cable wire in the speaker housing matches up with the red fan cable wire in the side access panel.

Floppy Drive

Note: This topic includes instructions for removing the floppy drive bezel, floppy drive shield, front drive carrier, and floppy drive.

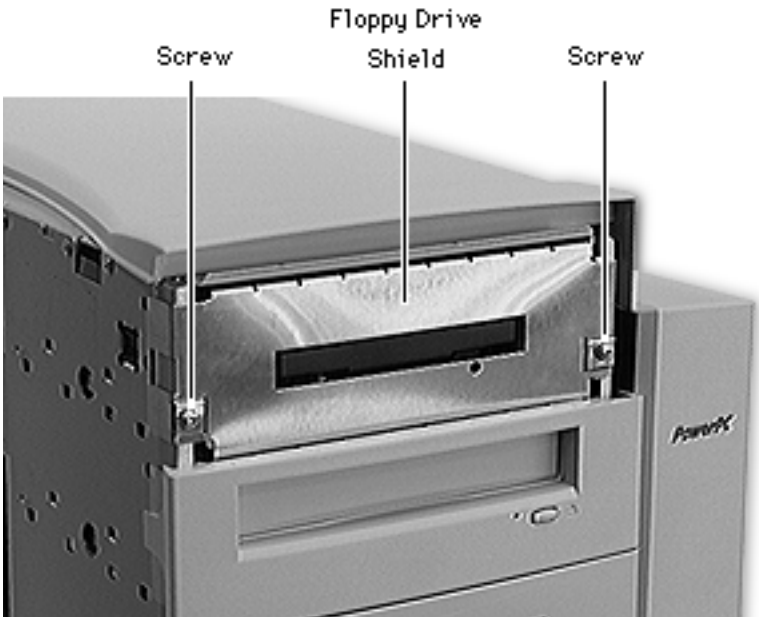
Before you begin, remove the side access panel.



1 Place the computer in its upright position.

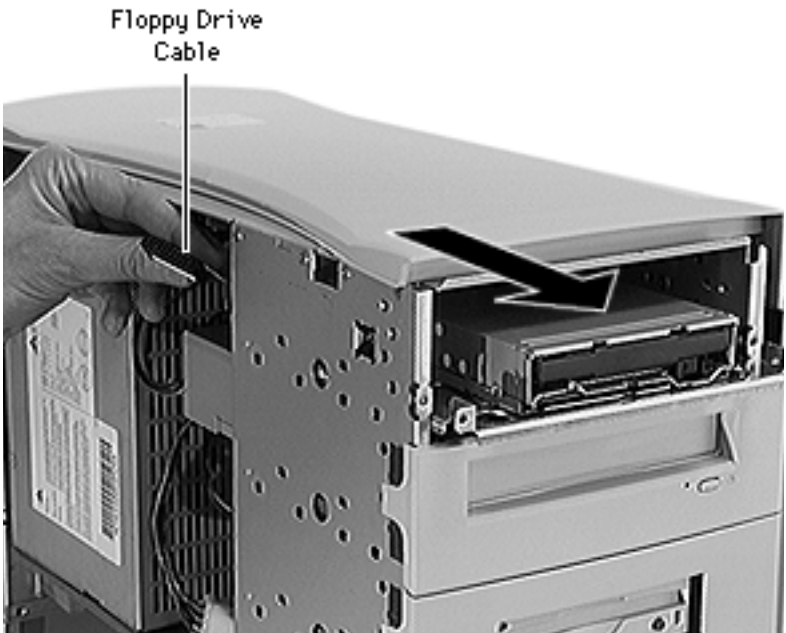
2 Gently pry up the tab on the left side of the floppy drive bezel, swing the bezel open, and remove the bezel from the right edge of the floppy drive.

Replacement Note:
Place the two latches on the right side of the bezel into the two slots in the right side of the bezel shield before connecting the bezel to the left edge of the drive.



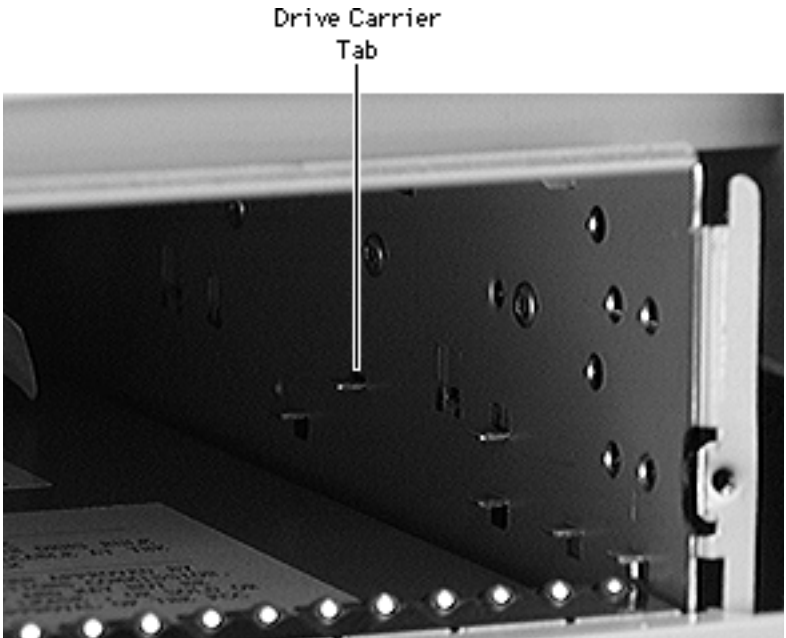
3 Using a Phillips screwdriver, remove the two floppy drive shield screws.

4 Remove the floppy drive shield.

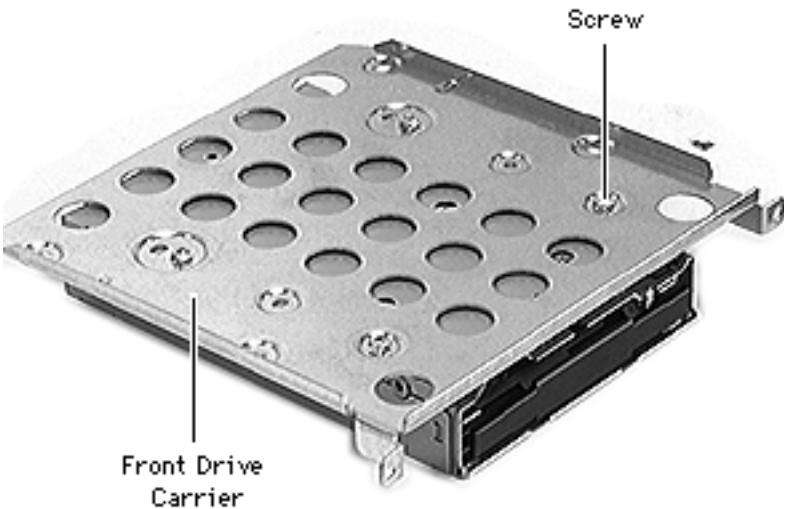


5 Disconnect the floppy drive cable from the back of the floppy drive.

6 Slide the floppy drive carrier and drive out of the front of the computer.



Replacement Note: When inserting the drive into the computer, make sure the drive carrier aligns with the carrier guides. The carrier should slide between five metal tabs below and two metal tabs above the left and right edges of the carrier.

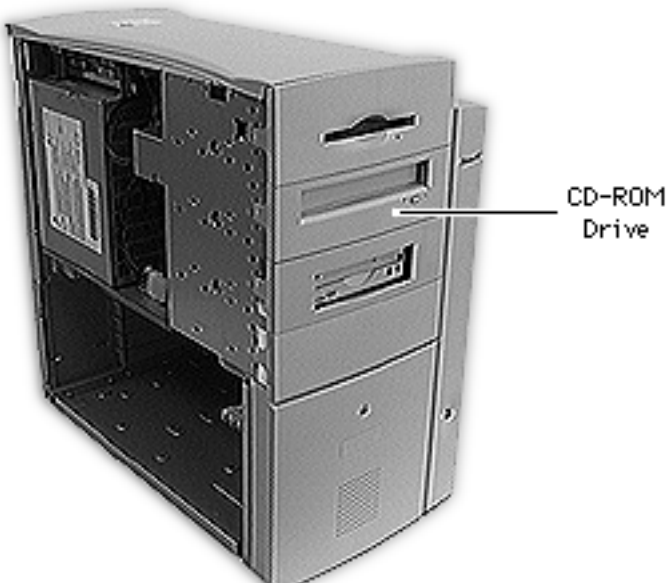


Note: Perform the following procedure if you are replacing the floppy drive.

7 Using a Phillips screwdriver, remove the four carrier mounting screws.

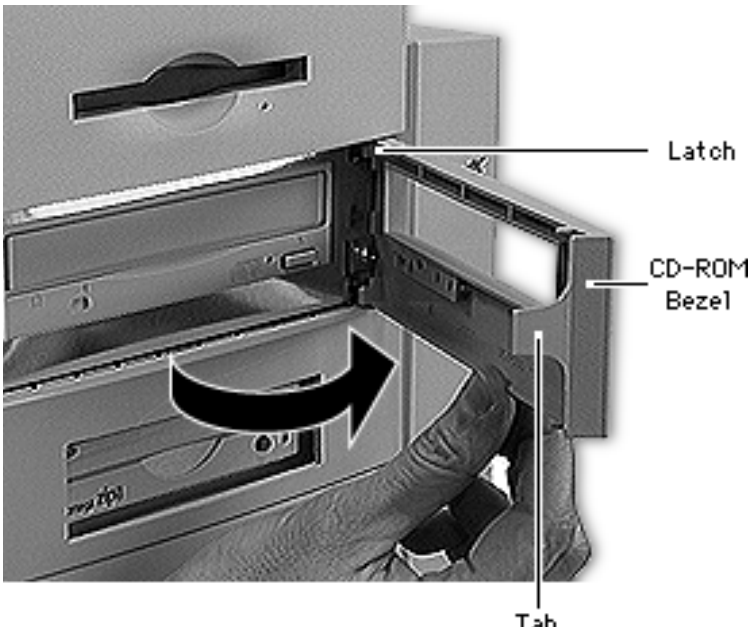
8 Lift the drive off the carrier.

CD-ROM Drive



Note: This topic includes instructions for removing the CD-ROM drive bezel, CD-ROM drive shield, front drive carrier, and CD-ROM drive.

Before you begin, remove the side access panel.



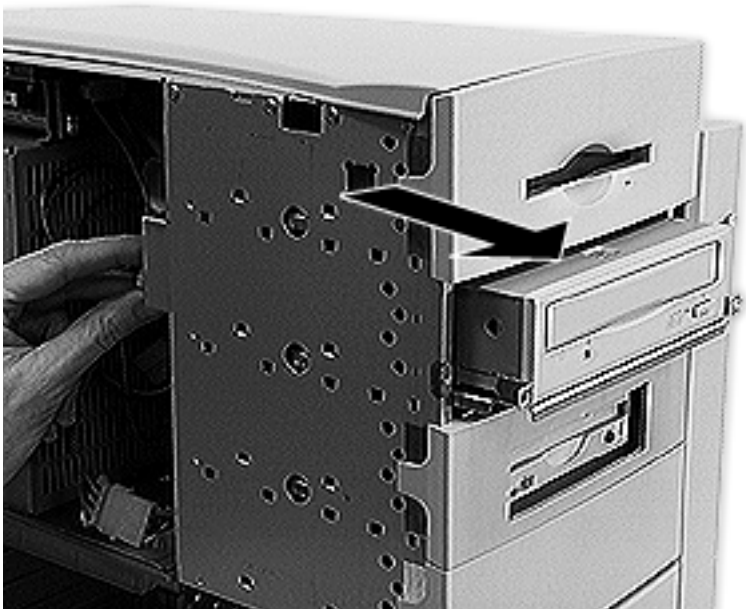
1 Place the computer in its upright position.

2 Gently pry up the tab on the left side of the CD-ROM drive bezel, swing the bezel open, and remove the bezel from the right edge of the CD-ROM drive.

Replacement Note: Place the two latches on the right side of the bezel into the two slots in the right side of the bezel shield before connecting the bezel to the left edge of the drive.

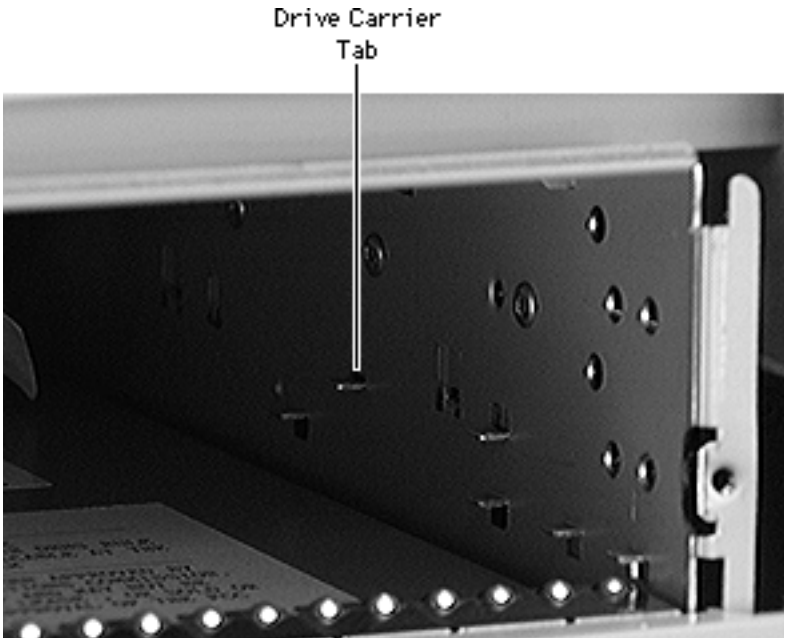
3 Using a Phillips screwdriver, remove the two CD-ROM drive shield screws.

4 Remove the CD-ROM drive shield.

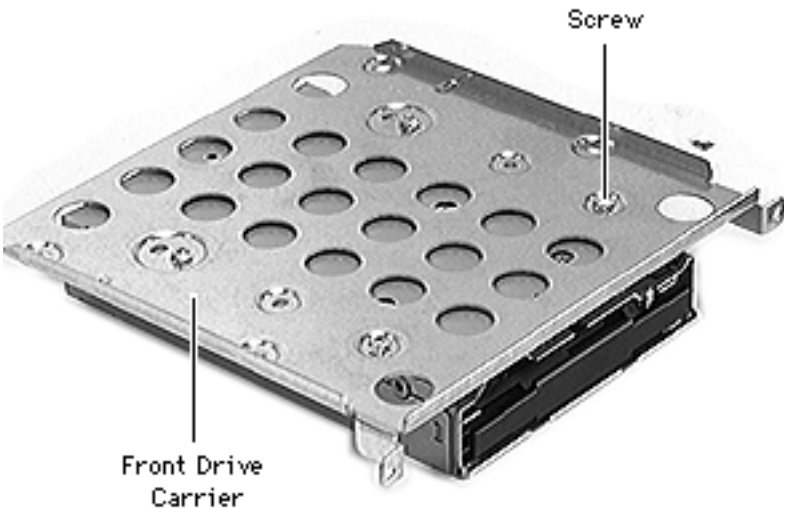


5 Disconnect the following cables from the back of the CD-ROM drive:
- Power cable
- SCSI cable
- CD audio cable

6 Slide the CD-ROM drive and carrier out of the computer.



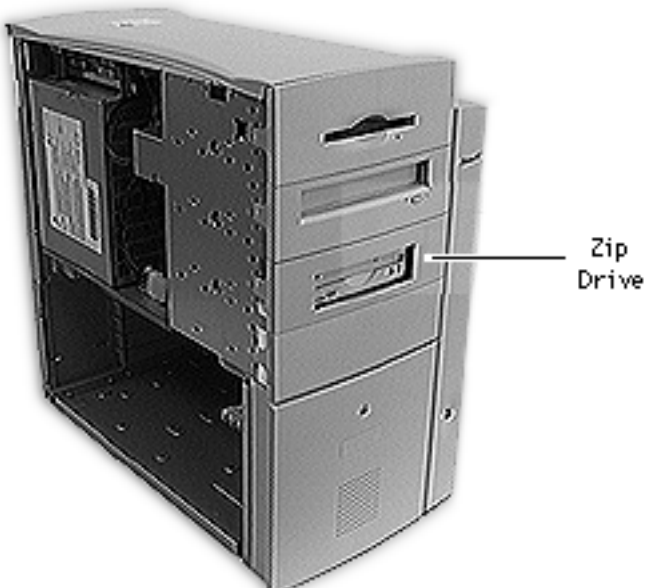
Replacement Note: When inserting the drive into the computer, make sure the drive carrier aligns with the carrier guides. The carrier should slide between five metal tabs below and two metal tabs above the left and right edges of the carrier.



Note: Perform the following procedure if you are replacing the CD-ROM drive.

7 Using a Phillips screwdriver, remove the four carrier mounting screws.

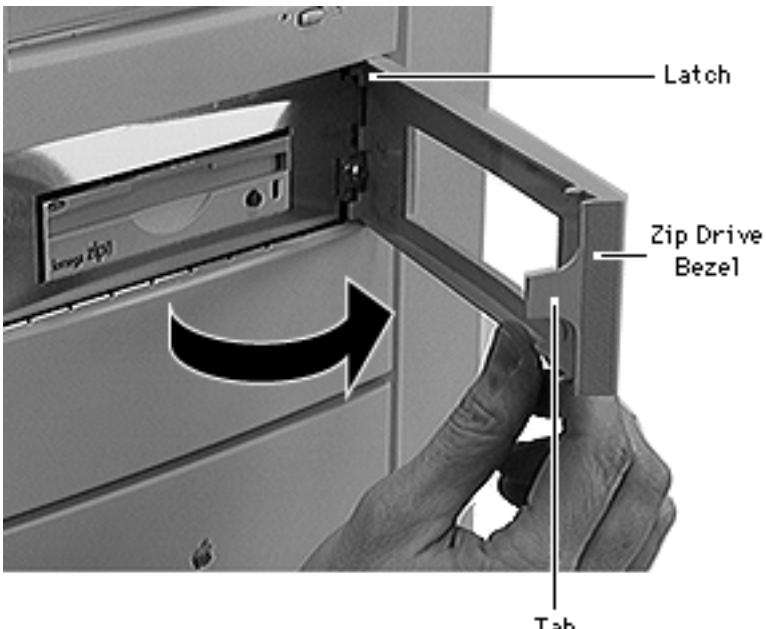
8 Lift the drive off the carrier.



Zip Drive (PM 8600/200)

Note: This topic includes instructions for removing the Zip drive bezel, Zip drive shield, front drive carrier, and Zip drive.

Before you begin, remove the side access panel.



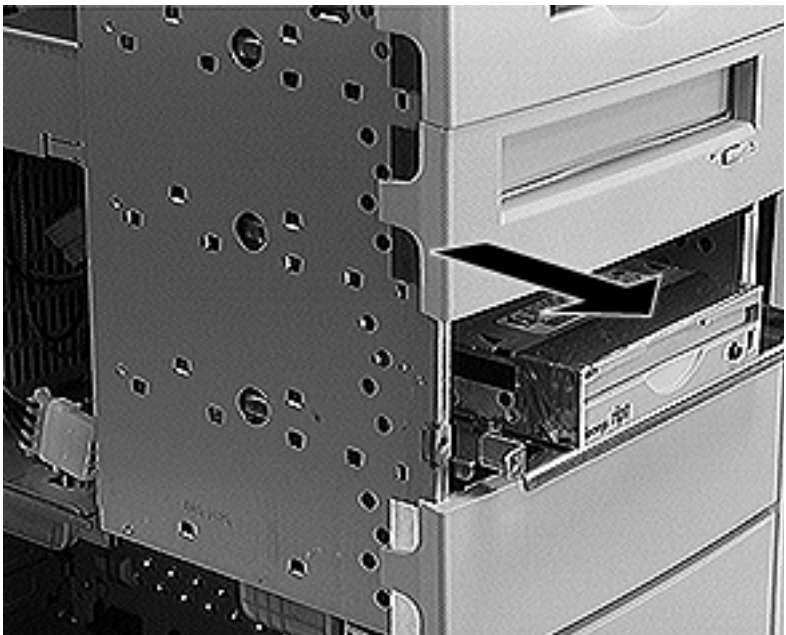
1 Place the computer in its upright position.

2 Gently pry up the tab on the left side of the Zip drive bezel, swing the bezel open, and remove the bezel from the right edge of the Zip drive.

Replacement Note:
Place the two latches on the right side of the bezel into the two slots in the right side of the bezel shield before connecting the bezel to the left edge of the drive.

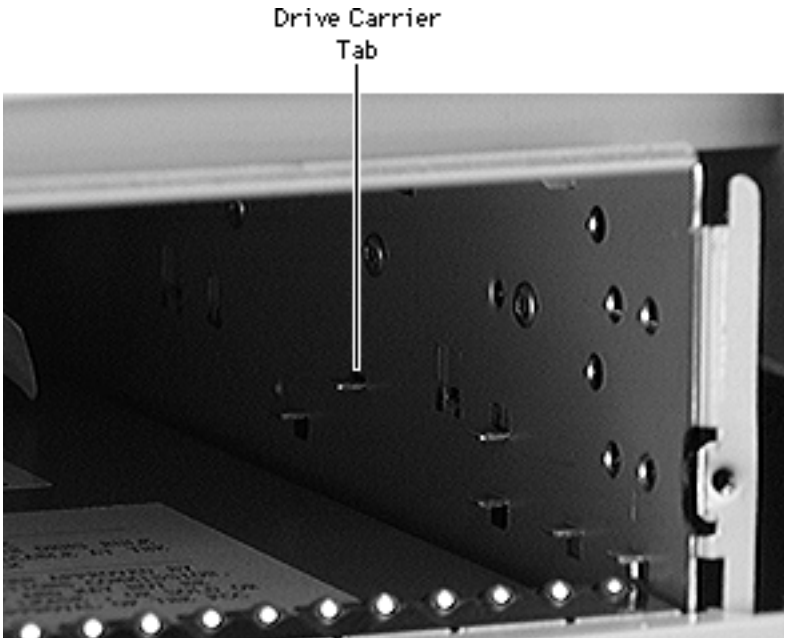
3 Using a Phillips screwdriver, remove the two Zip drive shield screws.

4 Remove the Zip drive shield.

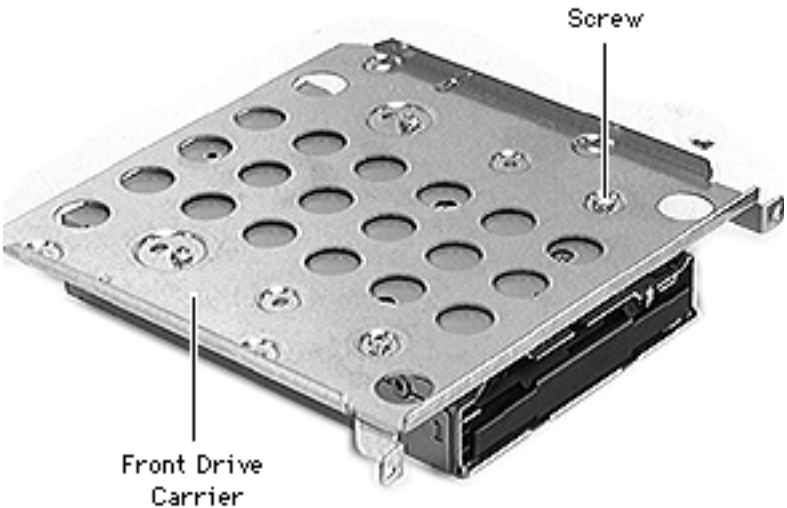


5 Disconnect the power cable and SCSI cable from the back of the Zip drive.

6 Slide the Zip drive carrier and drive out of the front of the computer.



Replacement Note: When inserting the drive into the computer, make sure the drive carrier aligns with the carrier guides. The carrier should slide between five metal tabs below and two metal tabs above the left and right edges of the carrier.



Note: Perform the following procedure if you are replacing the Zip drive.

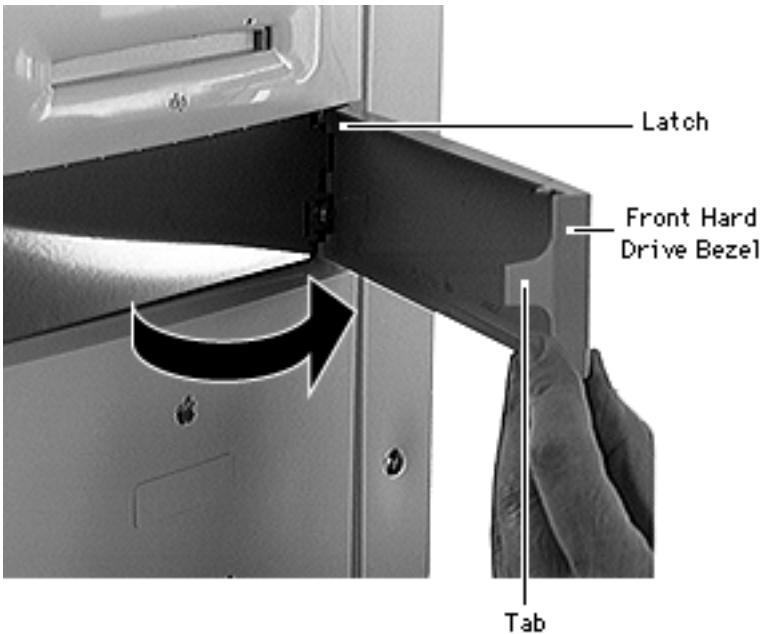
7 Using a Phillips screwdriver, remove the four carrier mounting screws.

8 Lift the drive off the carrier.

Front Hard Drive

Note: This topic includes instructions for removing the front hard drive bezel, front hard drive shield, front drive carrier, and front hard drive.

Before you begin, remove the side access panel.



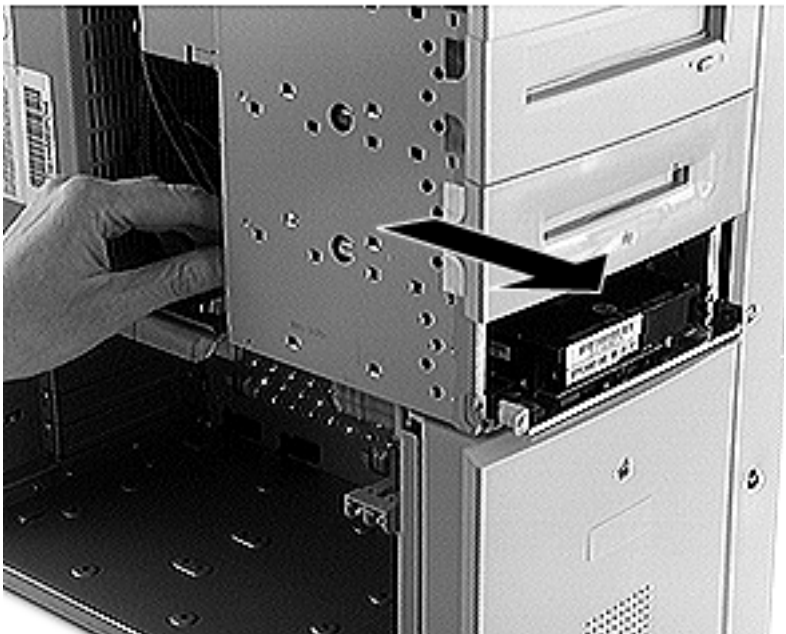
1 Place the computer in its upright position.

2 Gently pry up the tab on the left side of the hard drive bezel, swing the bezel open, and remove the bezel from the right edge of the hard drive.

Replacement Note:
Place the two latches on the right side of the bezel into the two slots in the right side of the bezel shield before connecting the bezel to the left edge of the drive.

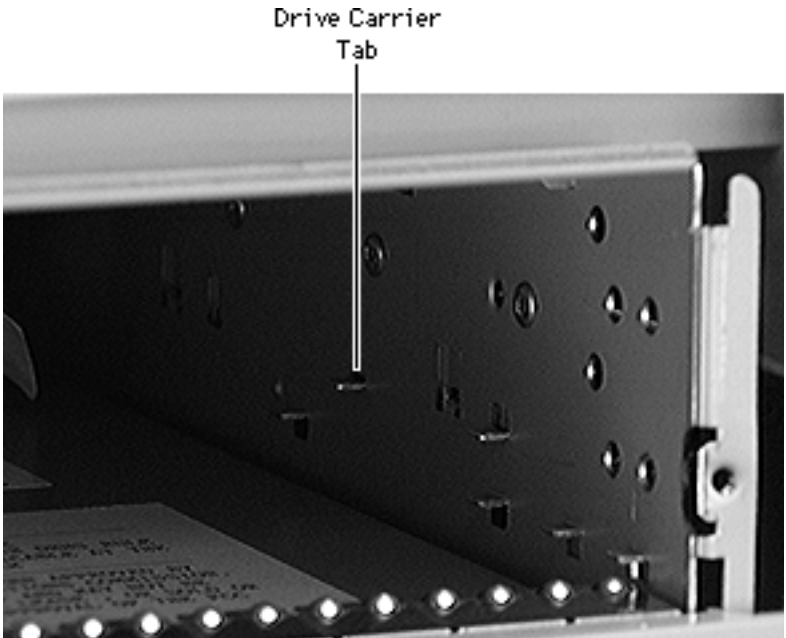
3 Using a Phillips screwdriver, remove the two front hard drive shield screws.

4 Remove the front hard drive shield.

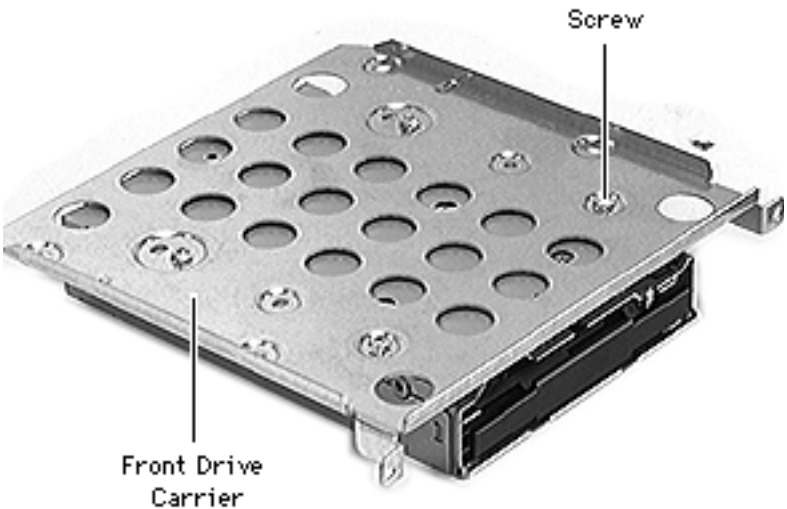


5 Disconnect the power cable and SCSI cable from the back of the hard drive.

6 Slide the hard drive carrier and drive out of the front of the computer.



Replacement Note: When inserting the drive into the computer, make sure the drive carrier aligns with the carrier guides. The carrier should slide below the four metal tabs on the left and right sides of the drive bay.



Note: Perform the following procedure if you are replacing the front hard drive.

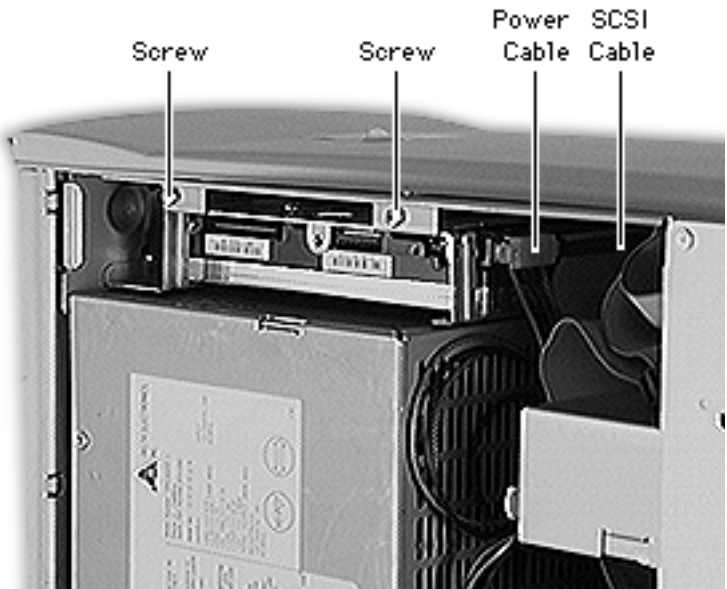
7 Using a Phillips screwdriver, remove the four carrier mounting screws.

8 Lift the drive off the carrier.

Rear Hard Drive

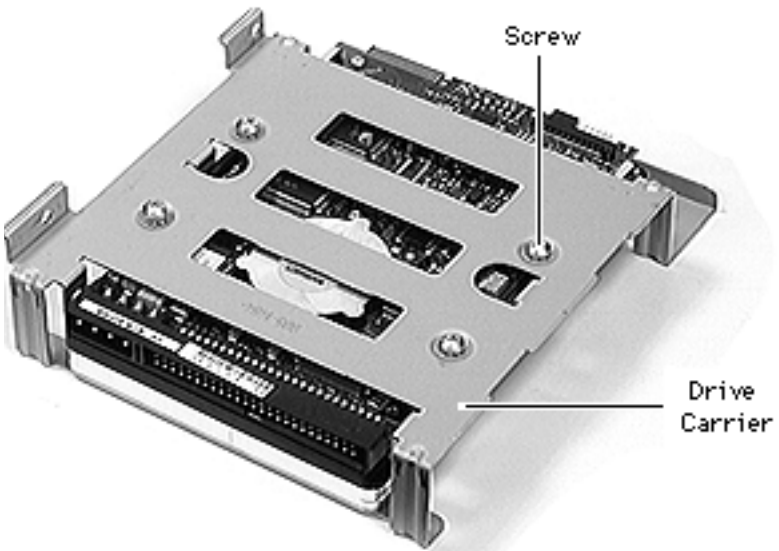
Note: This topic includes instructions for removing the rear drive carrier and rear hard drive.

Before you begin, remove the side access panel.



1. Place the computer in its upright position.
2. Using a Phillips screwdriver, remove the two rear hard drive screws.
3. Disconnect the power cable and SCSI cable from the back of the hard drive.
4. Slide the rear hard drive carrier and drive out of the computer.

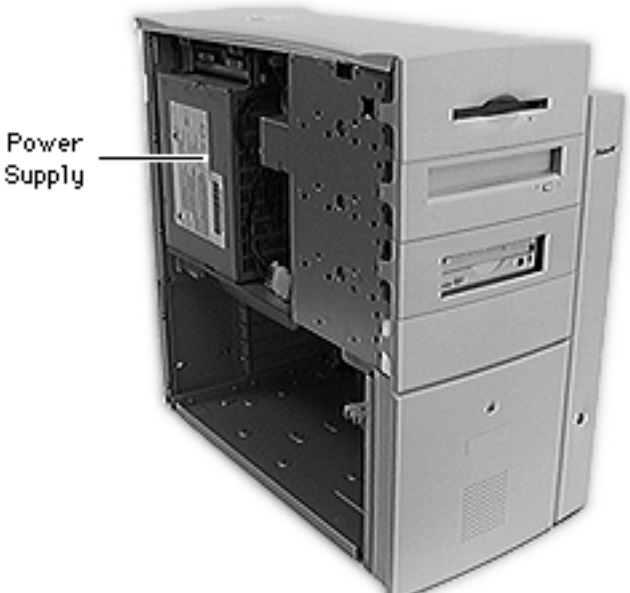
Replacement Note: When inserting the drive into the computer, make sure the drive carrier aligns with the metal tabs in the drive bay.



Note: Perform the following procedure if you are replacing the rear hard drive.

5 Using a Phillips screwdriver, remove the four carrier mounting screws.

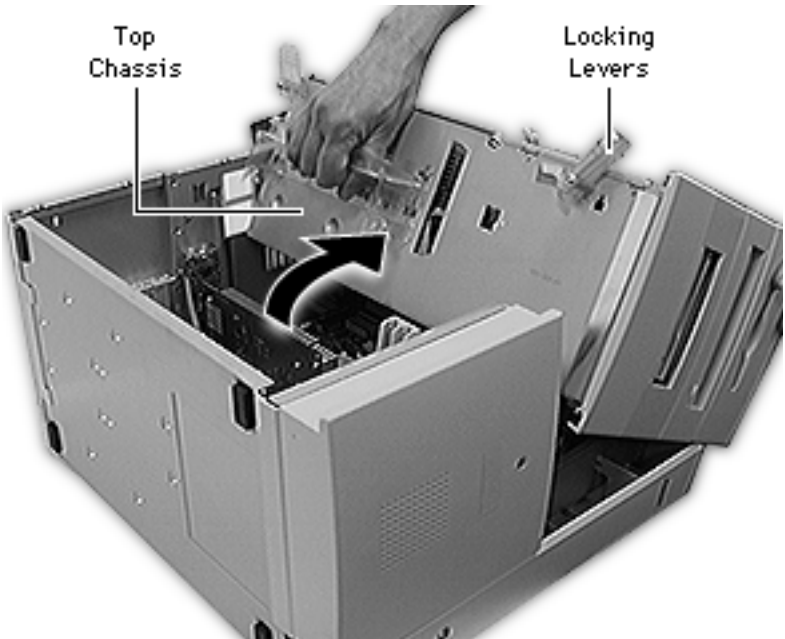
6 Slide the drive forward out of the carrier.



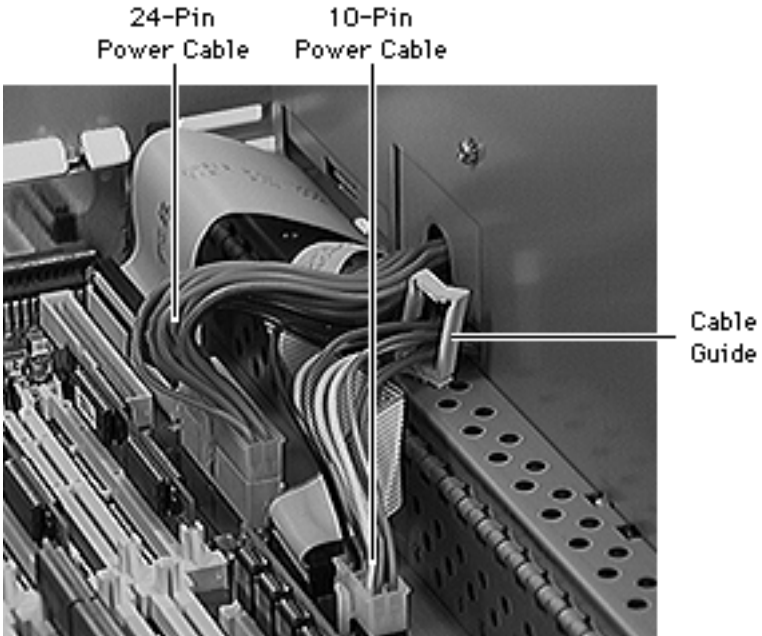
Power Supply

Before you begin, remove the following:

- Side access panel
- Rear hard drive

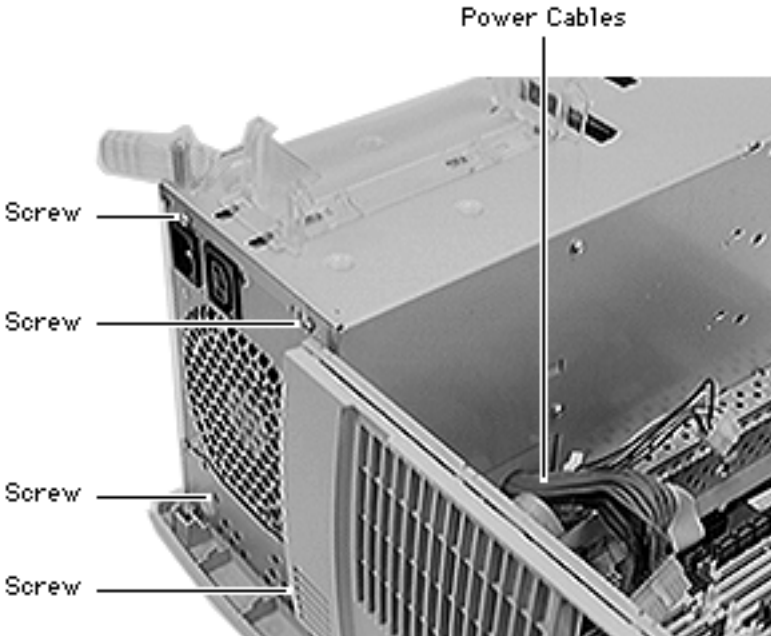


1. Carefully lay the computer on its side.
2. Unlock the top chassis by moving the two green locking levers upward and outward.
3. Using the green handle, gently swing the top chassis to the right until it rests firmly on the work surface.



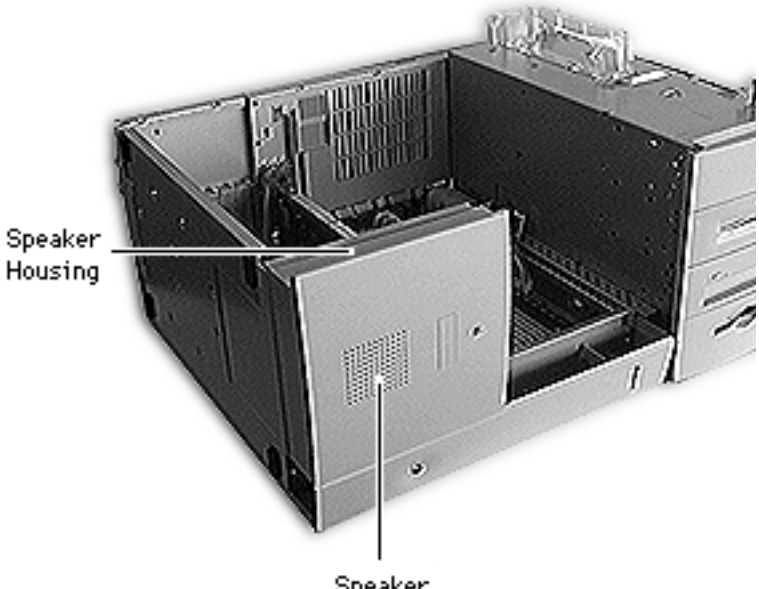
4 Disconnect the 24-pin and 10-pin power cables from the logic board.

5 Release the 10-pin power cable from the cable guide.



6 Using a Phillips screwdriver, remove the four power supply mounting screws.

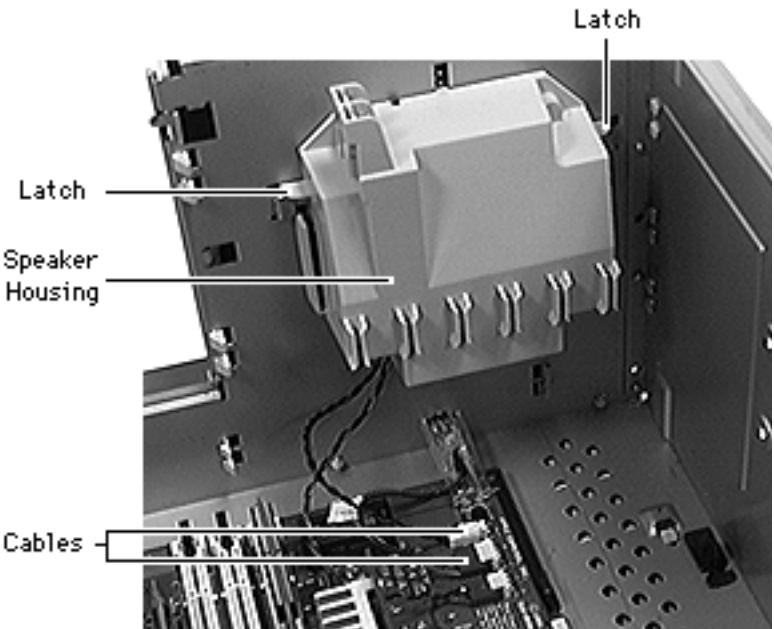
7 Thread the power cables through the opening in the top chassis and lift the power supply from the computer.



Speaker Housing and Speaker

Note: This topic includes instructions for removing the speaker housing, speaker, and fan cable.

Before you begin, remove the side access panel.

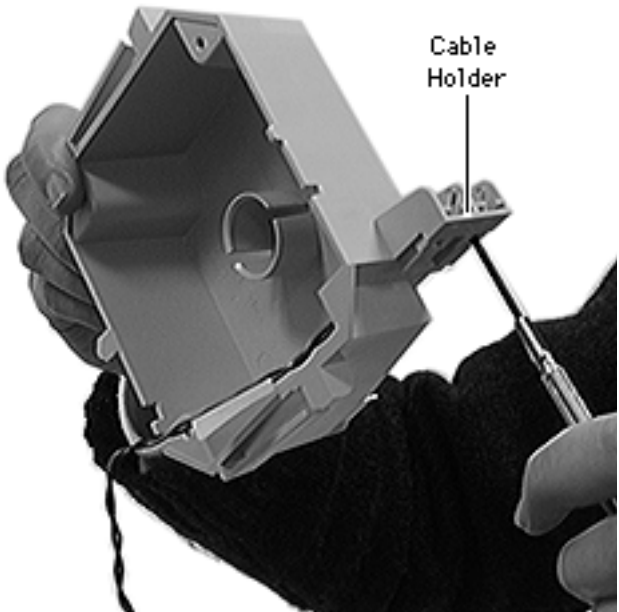


1. Carefully lay the computer on its side.
2. Disconnect the speaker and fan cables from the logic board.
3. Press in the two latches on the sides of the speaker housing and slide the housing straight up out of the computer.

Note: Perform the following step if you are replacing the speaker.

4 Using a flat-blade screwdriver, gently pry the edges of the speaker from the housing and remove the speaker.

Replacement Caution: Be sure the fan and speaker cables are lined up with the notch in the housing before inserting the speaker into the housing.

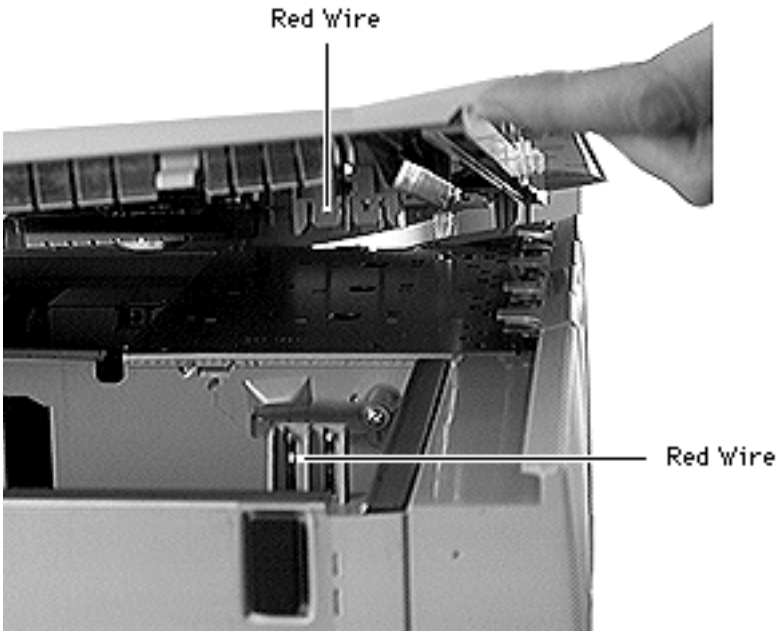


Note: Perform the following steps if you are replacing the fan cable.

5 Insert a jeweler's screwdriver into the right slot on the housing cable holder and release the metal end of the right fan cable wire. Slide the wire up and out of the holder.

6 Repeat for the left fan cable wire.

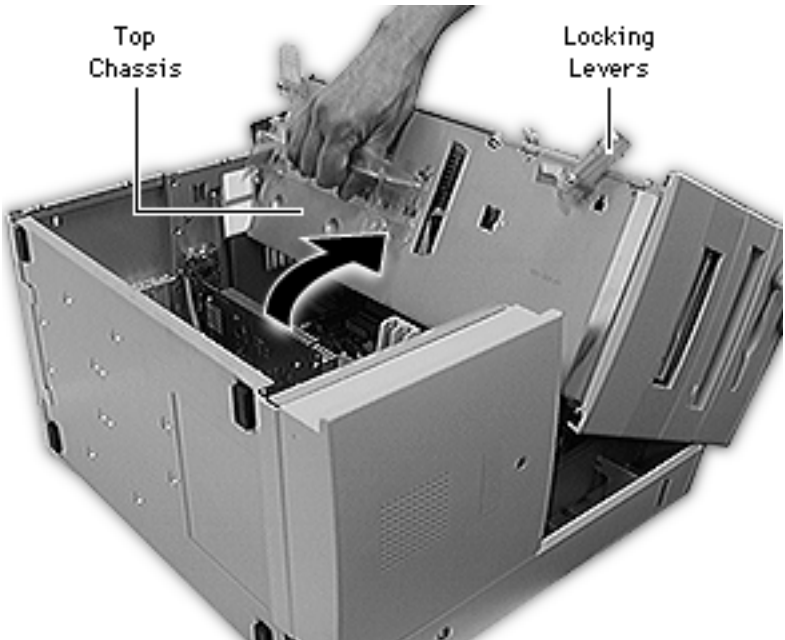
7 Gently pull the fan cable out through the opening in the speaker housing.



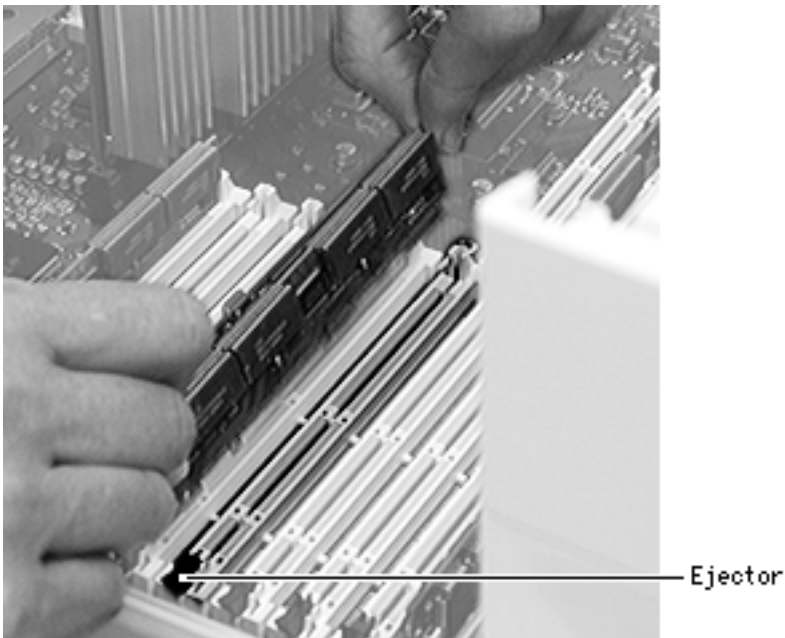
Replacement Cation: Make sure the red fan cable wire in the speaker housing matches up with the red fan cable wire in the side access panel.

DRAM DIMMs

Before you begin, remove the side access panel.



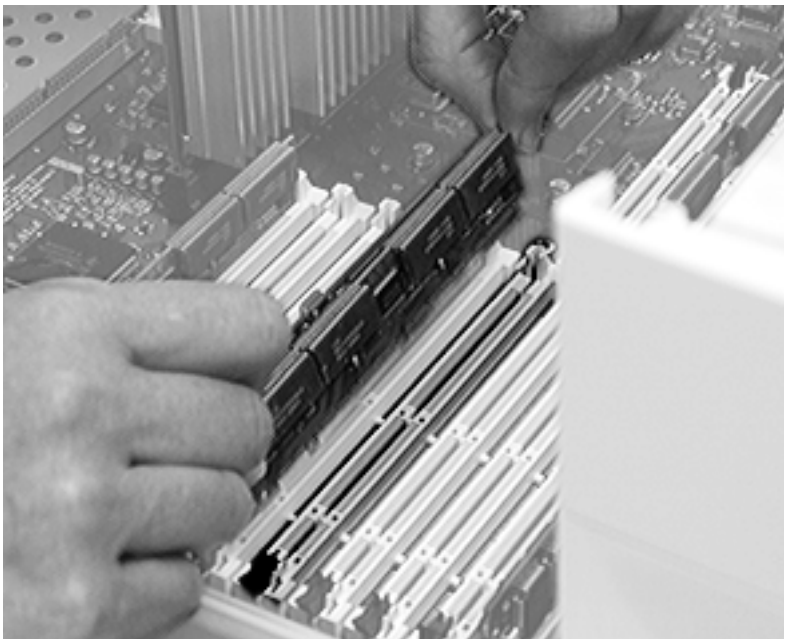
1. Carefully lay the computer on its side.
2. Unlock the top chassis by moving the two locking levers upward and outward.
3. Using the handle, gently swing the top chassis to the right until it rests firmly on the work surface.



4 Open the DIMM ejector by pushing it outward and down.

5 **Caution:** Hold the DIMM by the edges, not the chips.

Pull straight up on the DIMM and remove it.

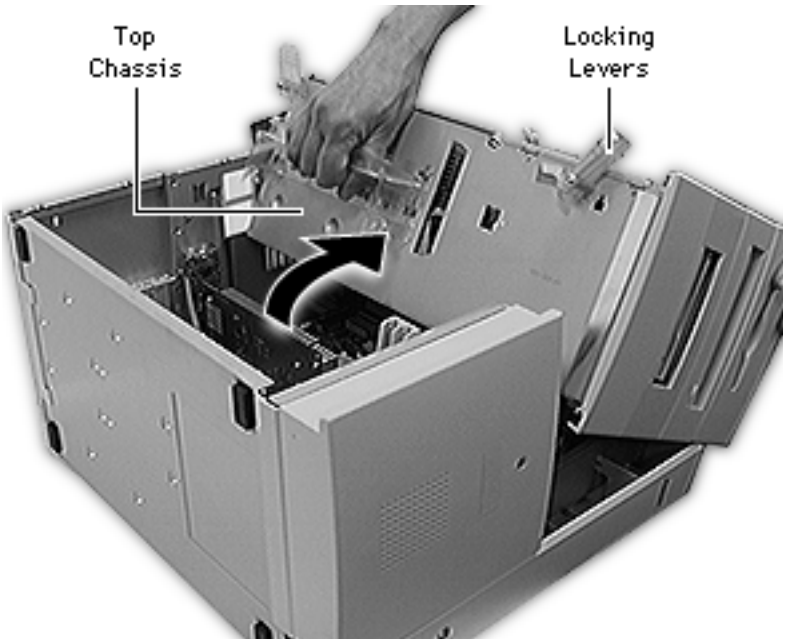


Replacement Caution: The DIMM is keyed so that it fits into the DIMM slot only one way. Be sure to align the notches in the DIMM with the small ribs inside the slot.

Replacement Note: Push down firmly and evenly on the DIMM until you hear it snap into place.

VRAM DIMMs (PM 8600/200)

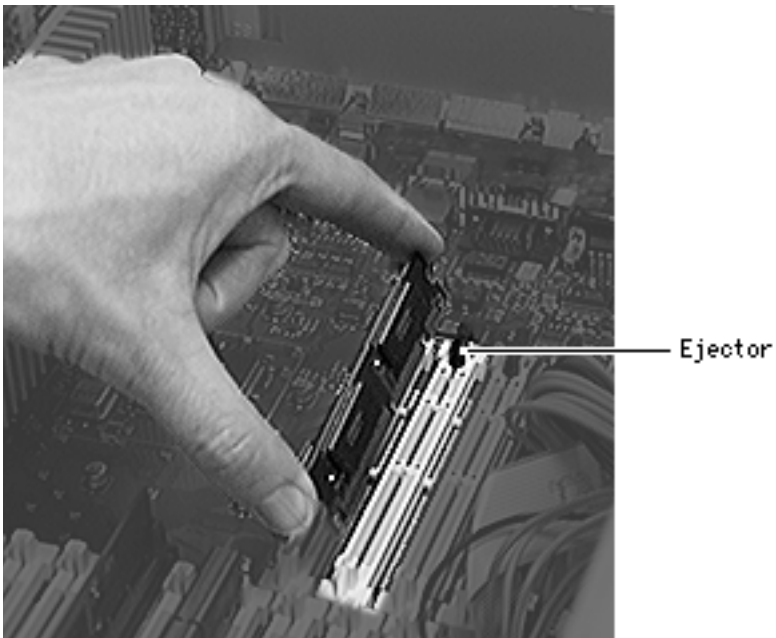
Before you begin, remove the side access panel.



1 Carefully lay the computer on its side.

2 Unlock the top chassis by moving the two green locking levers upward and outward.

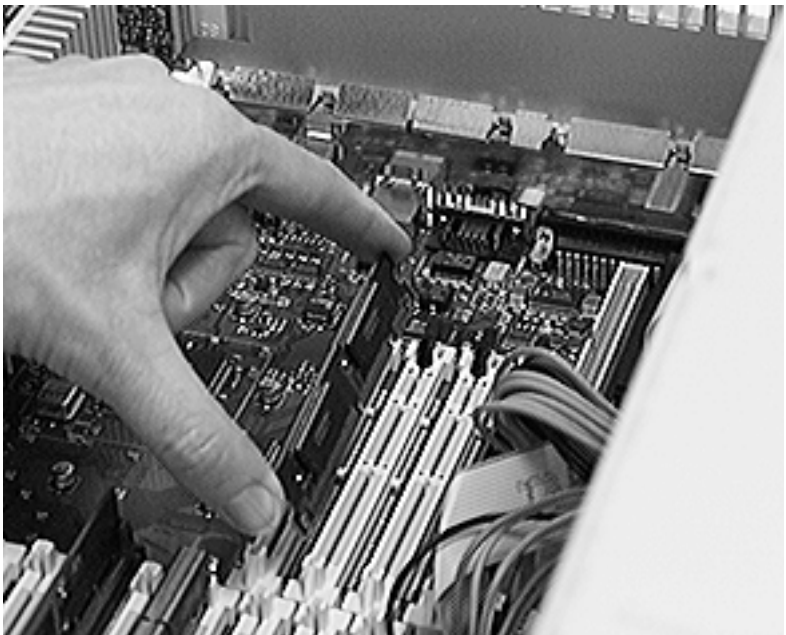
3 Using the green handle, gently swing the top chassis to the right until it rests firmly on the work surface.



4 Open the DIMM ejector by pushing it outward and down.

5 **Caution:** Hold the DIMM by the edges, not the chips.

Pull straight up on the DIMM and remove it.

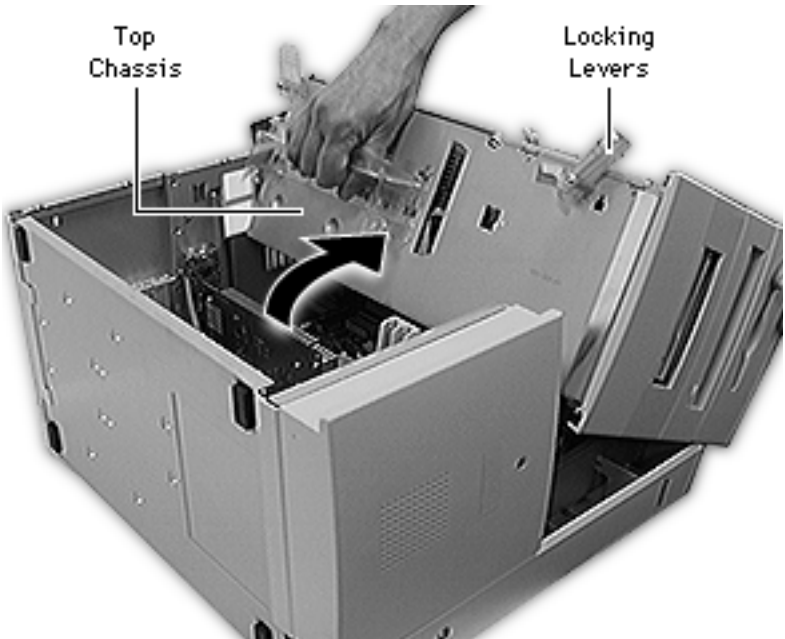


Replacement Caution: The DIMM is keyed so that it fits into the DIMM slot only one way. Be sure to align the notches in the DIMM with the small ribs inside the slot.

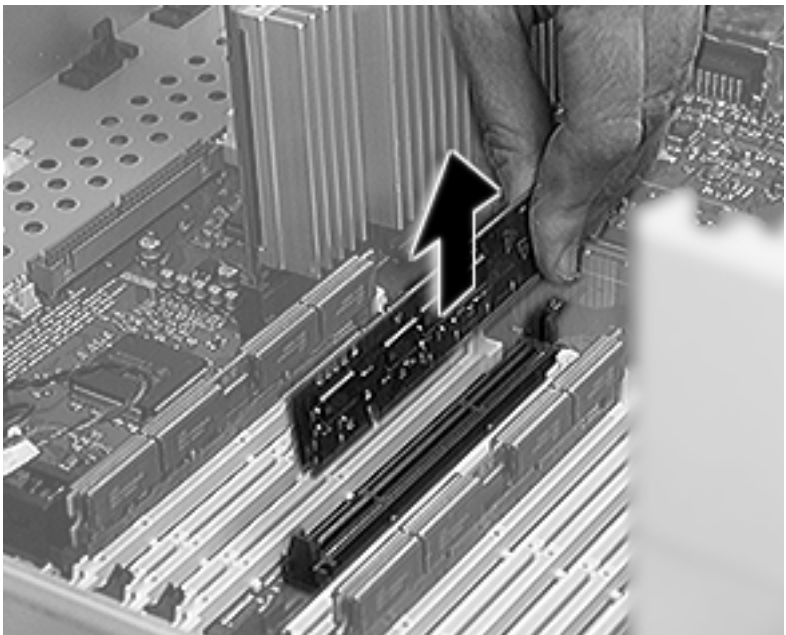
Replacement Note: Push down firmly and evenly on the DIMM until you hear it snap into place.

Cache DIMM (PM 8600/200)

Before you begin, remove the side access panel.



1. Carefully lay the computer on its side.
2. Unlock the top chassis by moving the two green locking levers upward and outward.
3. Using the green handle, gently swing the top chassis to the right until it rests firmly on the work surface.



4 **Caution:** Hold the DIMM by the edges, not the chips.

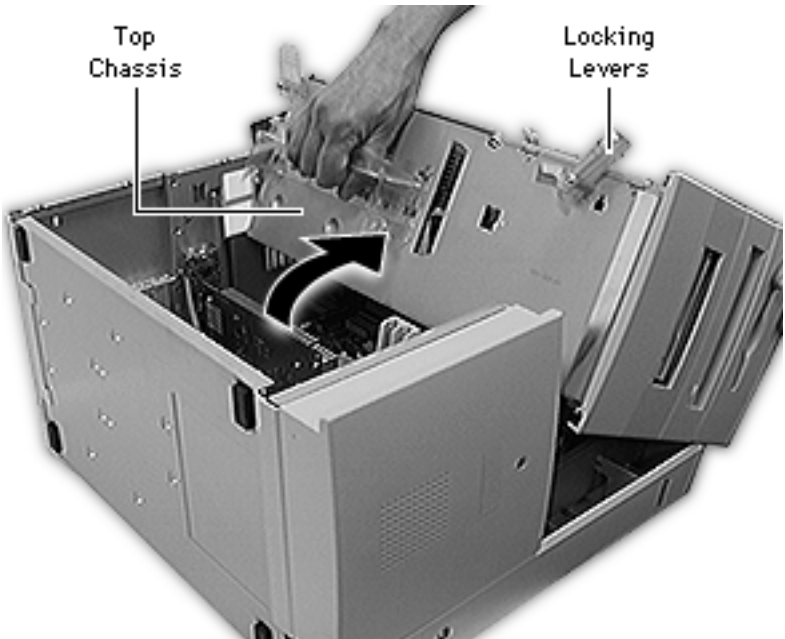
Pull straight up on the DIMM and remove it.

Replacement Caution: The DIMM is keyed so that it fits into the DIMM slot only one way. Be sure to align the notches in the DIMM with the small ribs inside the slot.

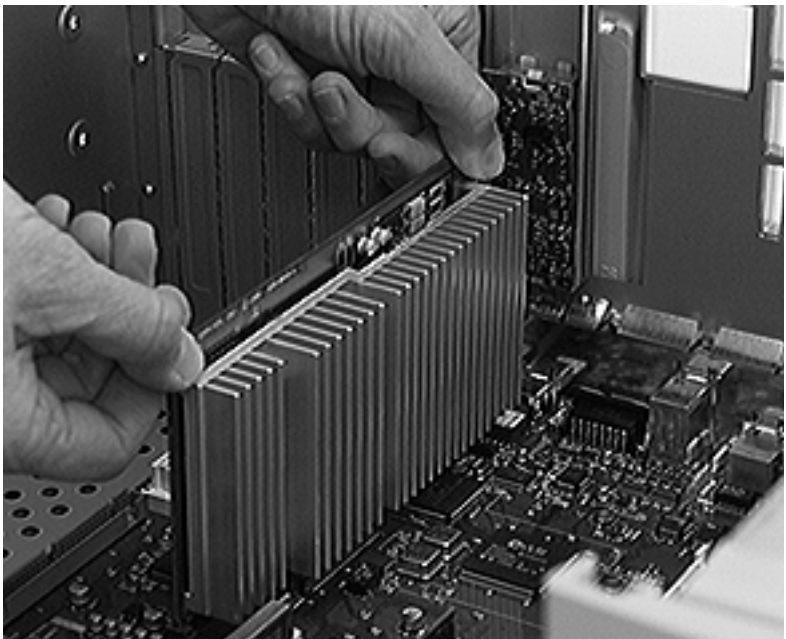
Replacement Note: Push down firmly and evenly on the DIMM until you hear it snap into place.

Processor Card

Before you begin, remove the side access panel.



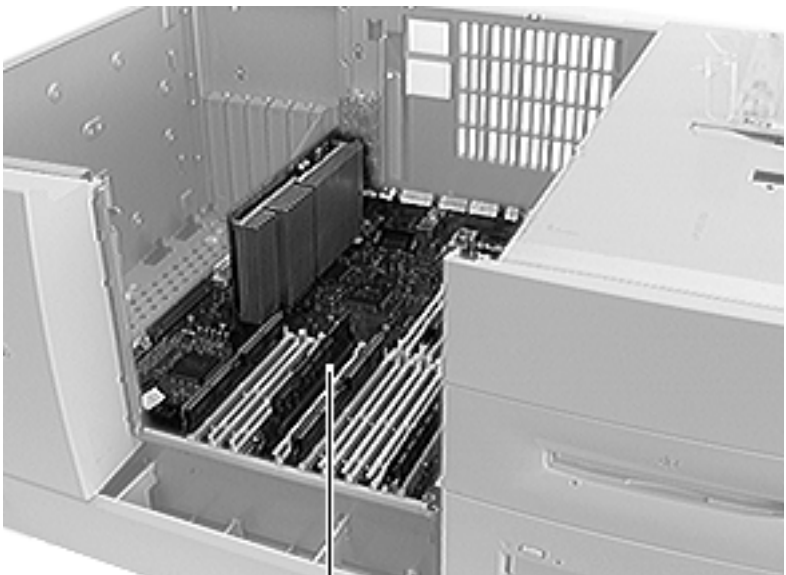
1. Carefully lay the computer on its side.
2. Unlock the top chassis by moving the two green locking levers upward and outward.
3. Using the green handle, gently swing the top chassis to the right until it rests firmly on the work surface.



Warning: The heat sink may be hot to the touch.

4 Using two hands, grip the processor card by the corners and pull straight up to remove it.

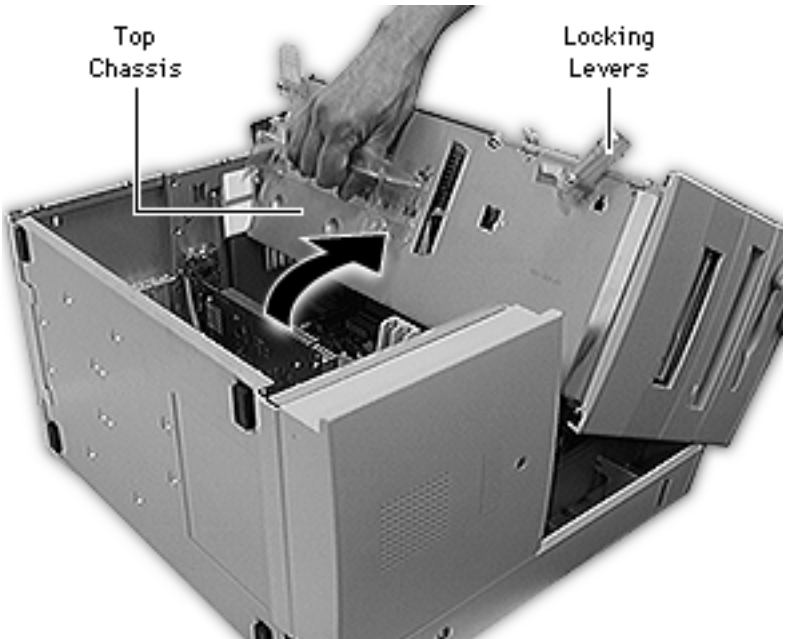
Replacement Note: Position the card in the plastic guides and press down on the card. Do not force the card or you may damage it. Look at the processor connector to make sure no gold fingers on the connector show. Press down on the card again if necessary.



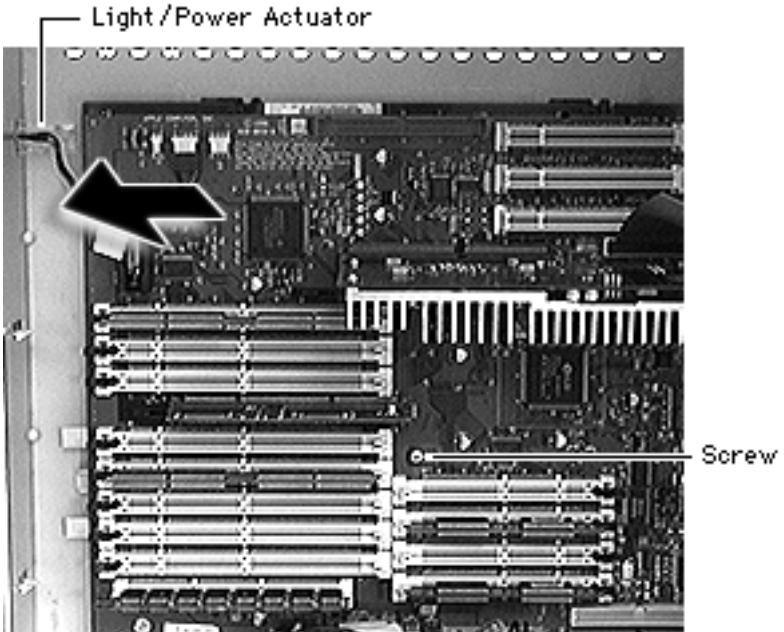
Logic Board

Before you begin, remove the following:

- Side access panel
- PCI cards (if present)
- Speaker housing



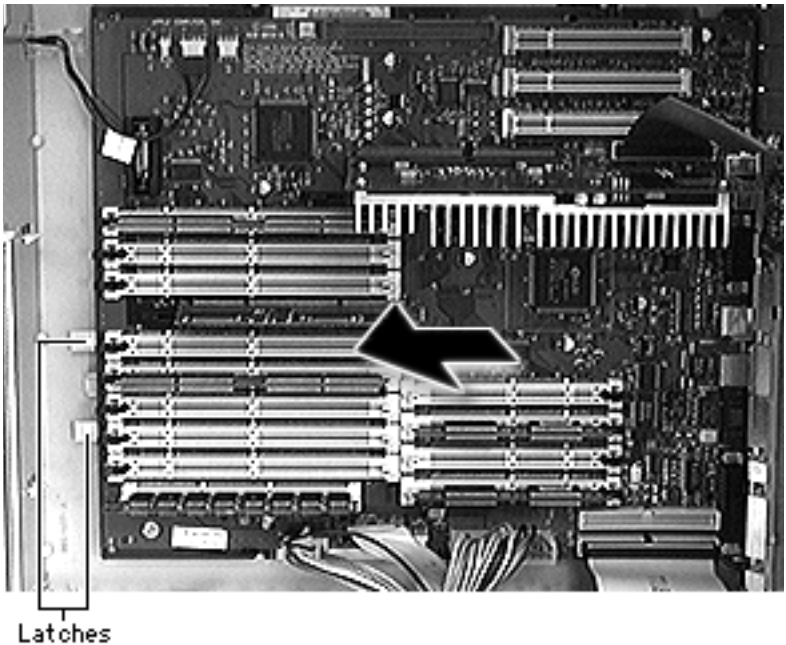
1. Carefully lay the computer on its side.
2. Unlock the top chassis by moving the two green locking levers upward and outward.
3. Using the green handle, gently swing the top chassis to the right until it rests firmly on the work surface.



4 Disconnect all cables from the logic board.

5 Using a Phillips screwdriver, remove the logic board mounting screw.

6 Slide the light/power actuator forward as far as it will go.



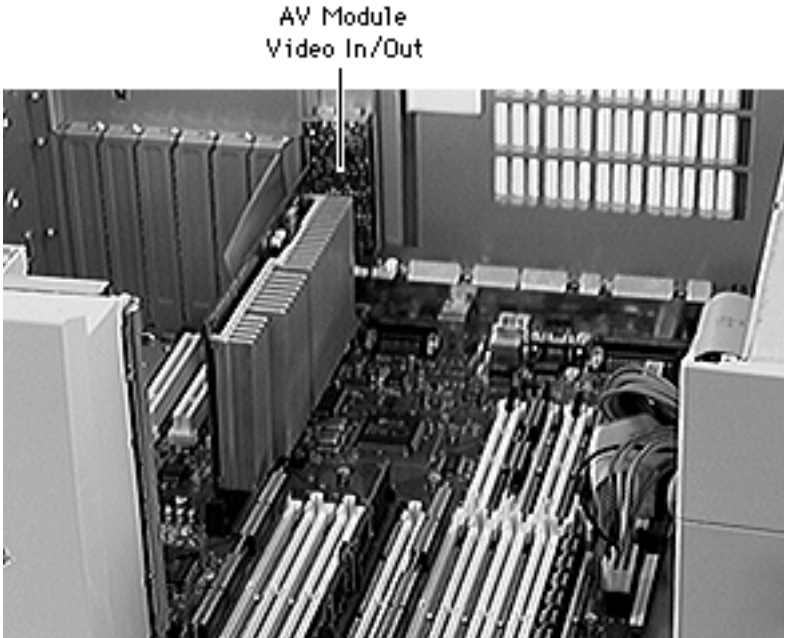
7 Release the two plastic latches on the front of the logic board.

Replacement Note: Make sure the latches re-engage the logic board.

8 Slide the logic board forward far enough for the ports to clear the openings in the I/O panel.

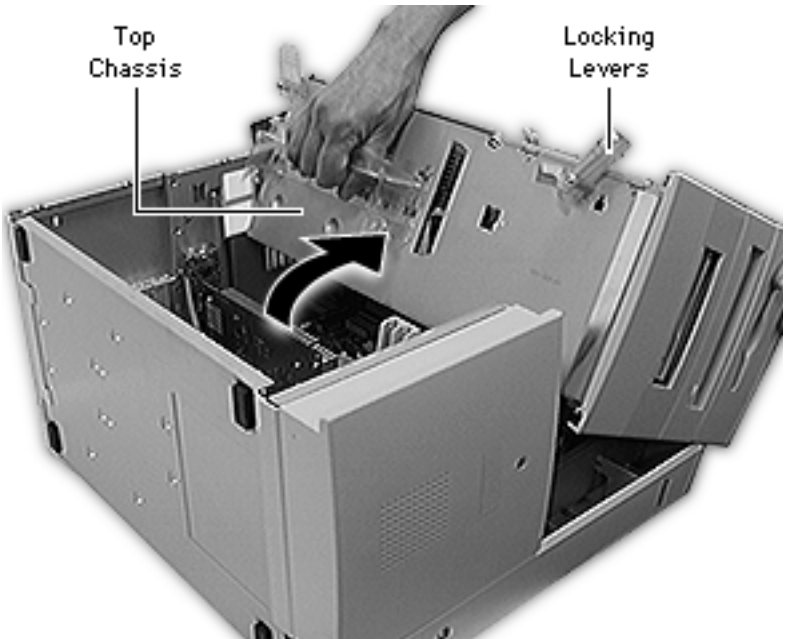
9 Lift the board out of the computer.

Note: Remove the processor card and DRAM, VRAM (Power Macintosh 8600/200), and cache DIMMs (Power Macintosh 8600/200) before returning the board to Apple. Do NOT remove the ROM SIMM. Refer to the Module ID folder to identify the ROM SIMM and DRAM, VRAM, and cache DIMMs.

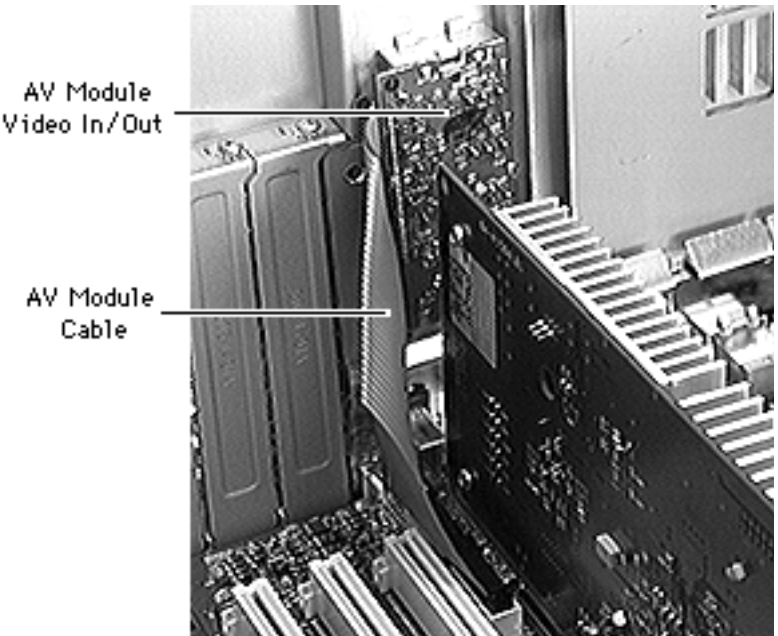


AV Module Video In/Out (PM 8600/200)

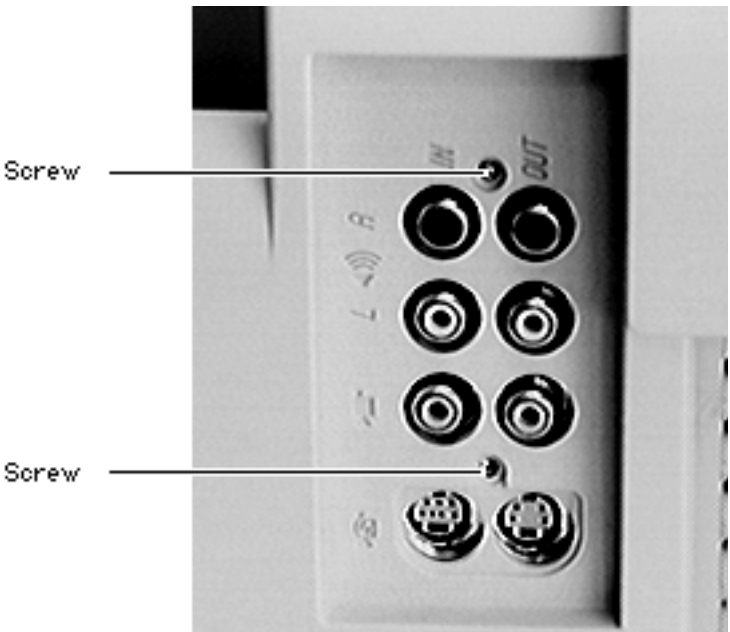
Before you begin, remove the side access panel.



1. Carefully lay the computer on its side.
2. Unlock the top chassis by moving the two green locking levers upward and outward.
3. Using the green handle, gently swing the top chassis to the right until it rests firmly on the work surface.



4 Disconect the AV module cable from the logic board.

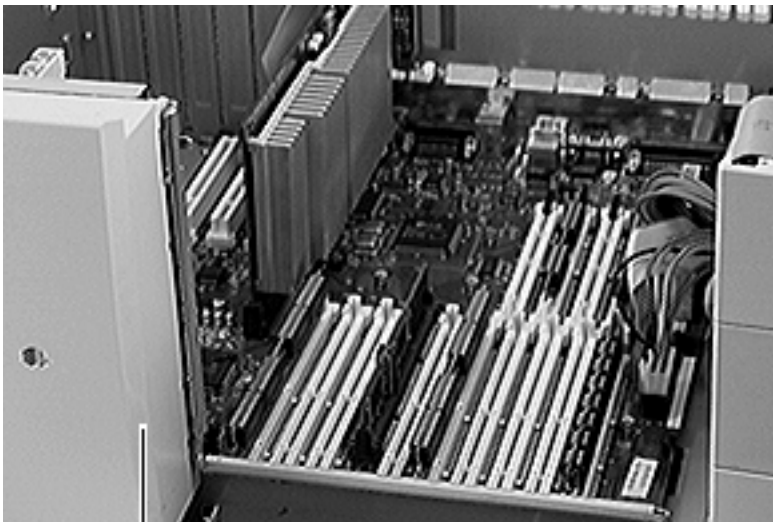


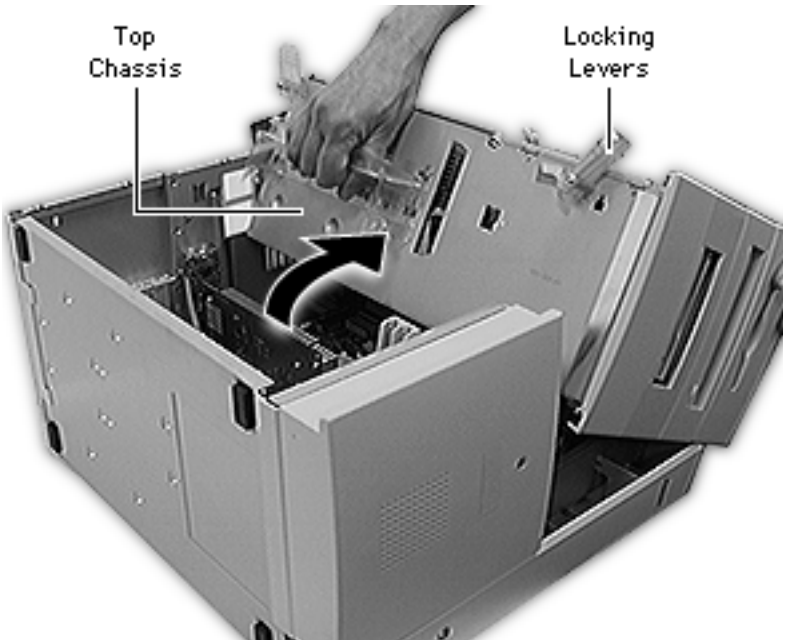
5 Using a T-8 torx screwdriver, remove the two AV module mounting screws.

6 Remove the AV module from the computer.

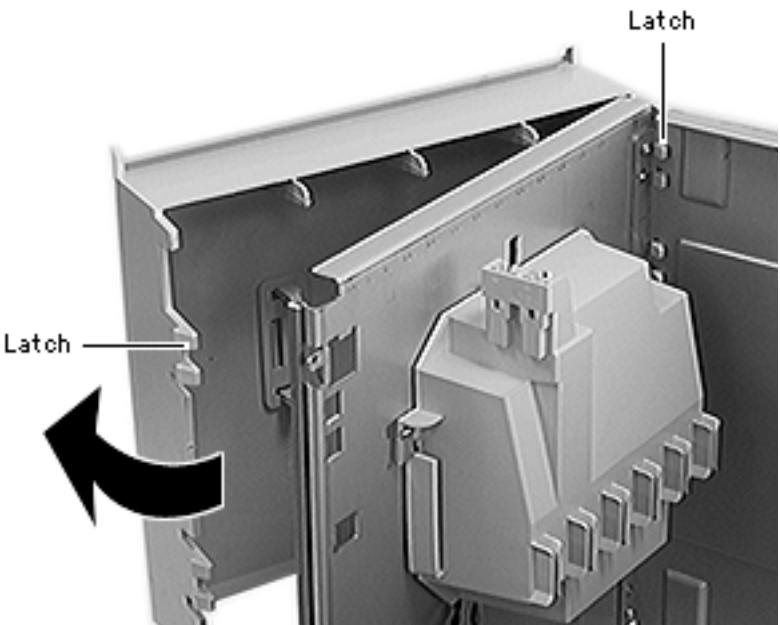
Speaker Bezel

Before you begin, remove the side access panel.





1. Carefully lay the computer on its side.
2. Unlock the top chassis by moving the two green locking levers upward and outward.
3. Using the green handle, gently swing the top chassis to the right until it rests firmly on the work surface.

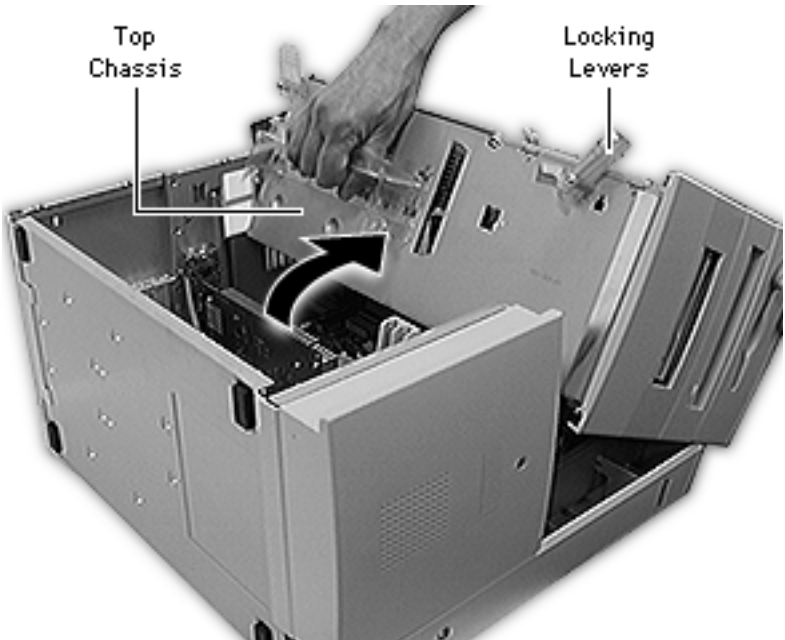


4 Gently pry up the four latches on the right side of the speaker bezel and swing it open.

5 Release the eight latches on the left side of the speaker bezel and remove the bezel from the computer.

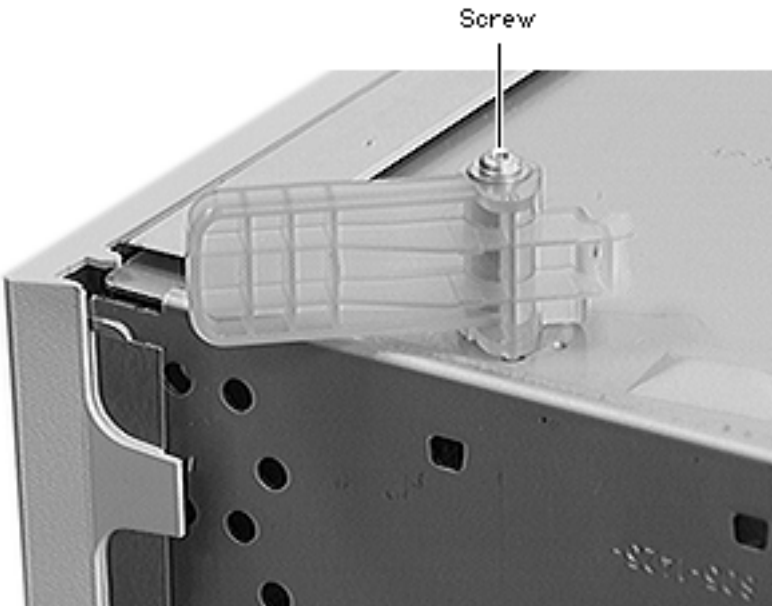
Locking Lever

Before you begin, remove the side access panel.



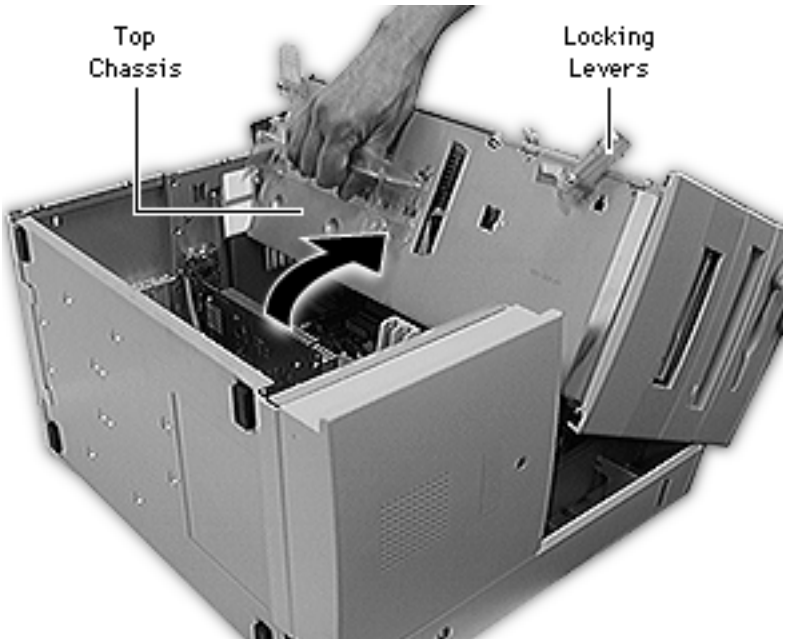
1. Carefully lay the computer on its side.
2. Unlock the top chassis by moving the two green locking levers upward and outward.
3. Using the green handle, gently swing the top chassis to the right until it rests firmly on the work surface.

4 Remove the screw and washer and remove the lever.

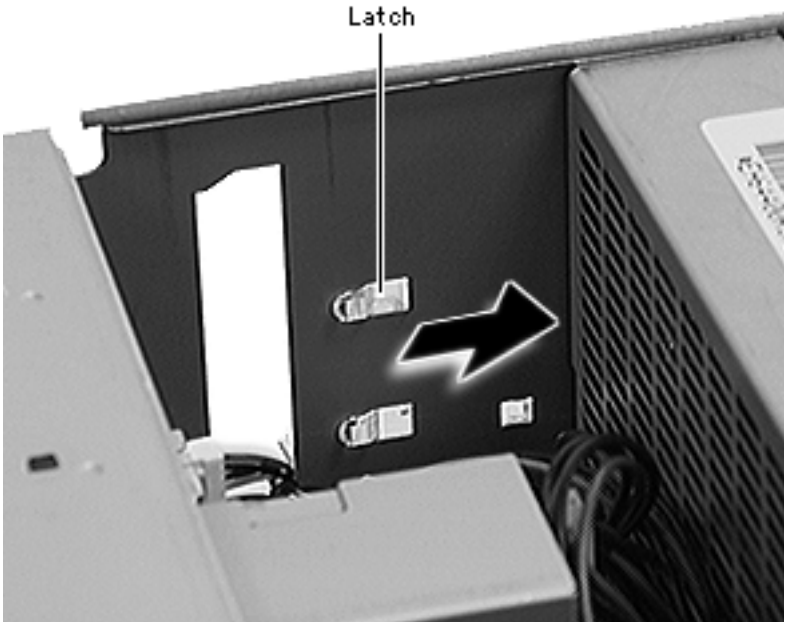


Chassis Handle

Before you begin, remove the side access panel.



1. Carefully lay the computer on its side.
2. Unlock the top chassis by moving the two green locking levers upward and outward.
3. Using the green handle, gently swing the top chassis to the right until it rests firmly on the work surface.



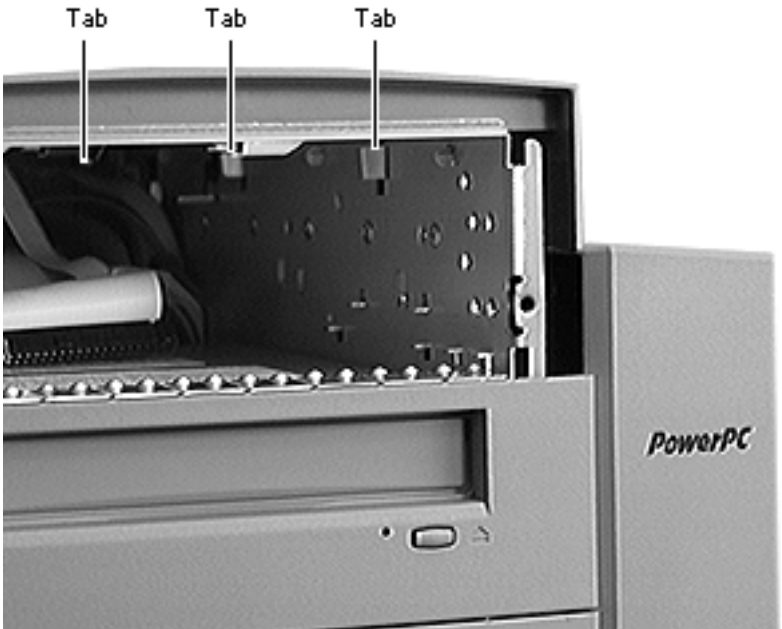
4 Using a flat-blade screwdriver, release the latch on the underside of the handle.

5 Slide the handle toward the back of the computer and lift it off the top chassis.

Top Cover

Before you begin, remove the following:

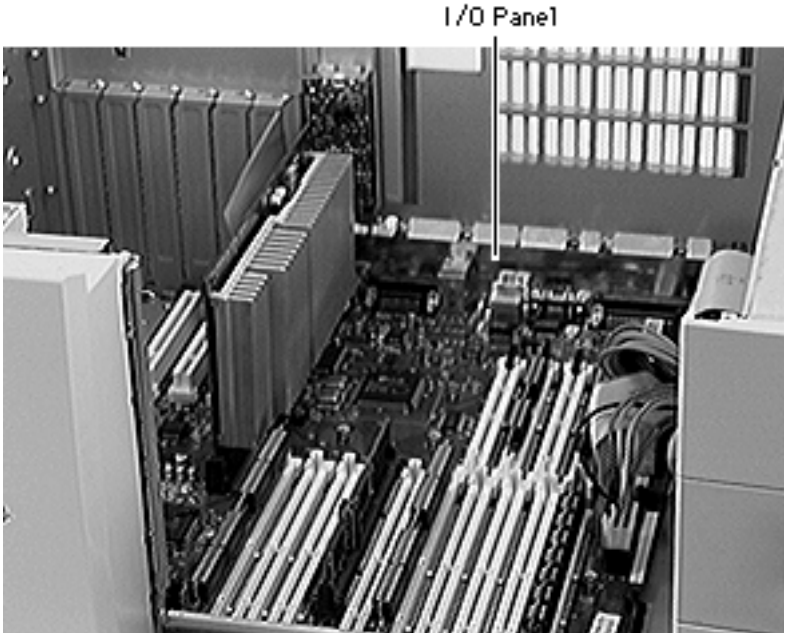
- Side access panel
- Floppy drive
- Rear hard drive



1 Release the front two latches and then the rear latch holding the top cover to the chassis.

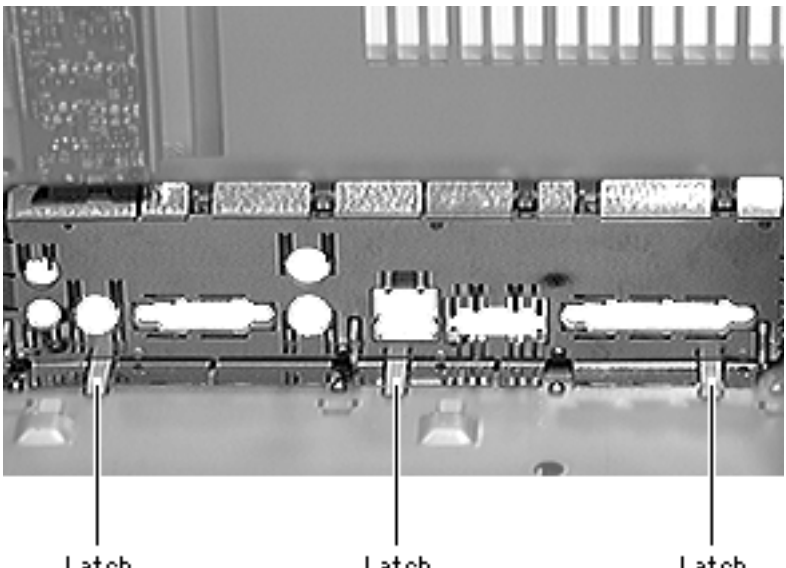
2 Lift off the top cover.

I/O Panel



Before you begin, remove the following:

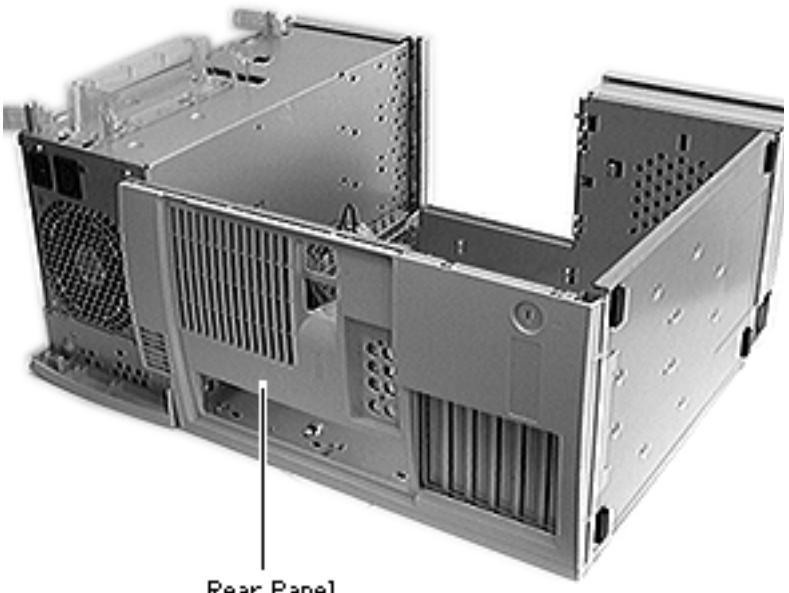
- Side access panel
- PCI cards (if present)
- Logic board



1 Using a flat-blade screwdriver, release the bottom three latches on the I/O panel.

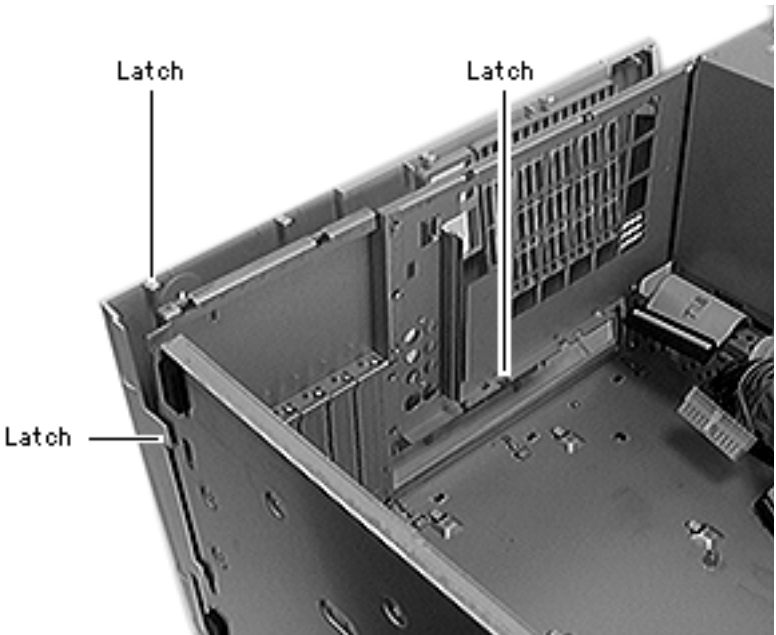
2 Swing the panel up, release the top two tabs, and remove the I/O panel and shield from the computer.

Rear Panel



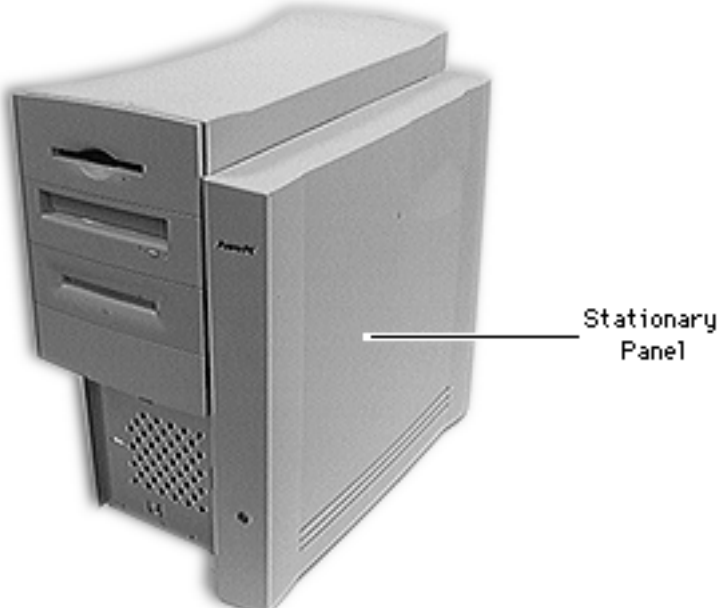
Before you begin, remove the following:

- Side access panel
- PCI cards (if present)
- Logic board
- I/O panel
- AV module video in/out



1 Using a flat-blade screwdriver, release the top five latches, two side latches, and two bottom latches on the rear panel.

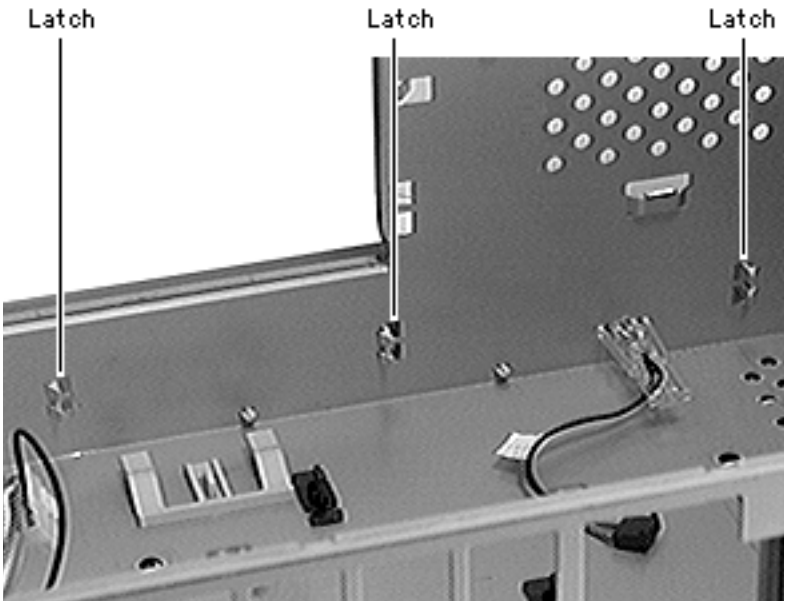
2 Remove the rear panel from the computer.



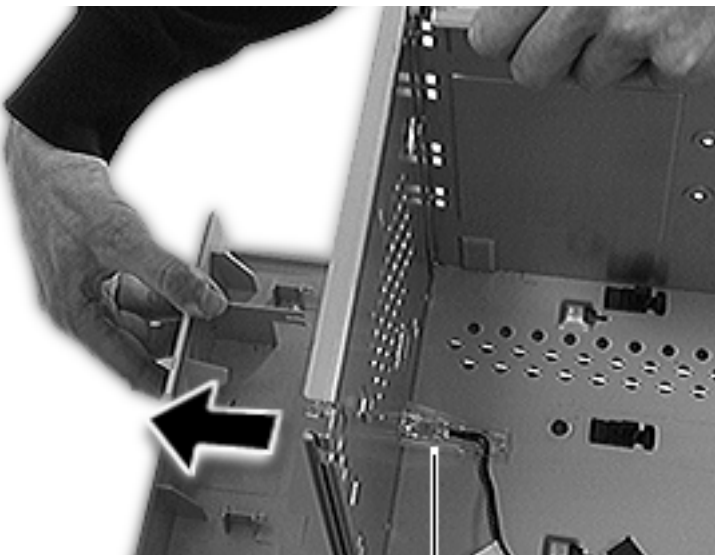
Stationary Panel

Before you begin, remove the following:

- Side access panel
- PCI cards (if present)
- Logic board
- I/O panel
- AV module video in/out
- Rear panel
- Speaker bezel



1 Using a flat-blade screwdriver, release the six latches holding the stationary panel to the chassis.

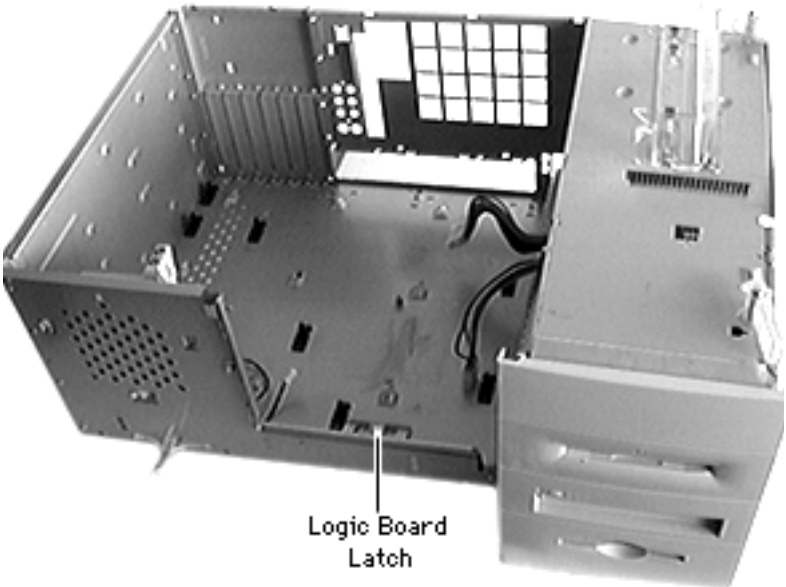


2 Lift the chassis slightly and slide the stationary panel forward.

3 Push the light/power actuator in toward the case so that it is released from the stationary panel.

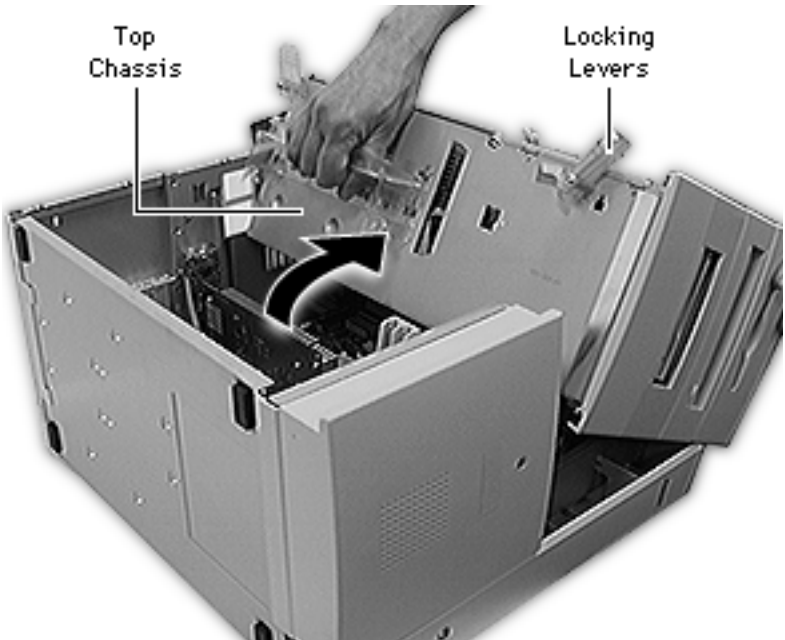
4 Remove the panel from the computer.

Logic Board Latch



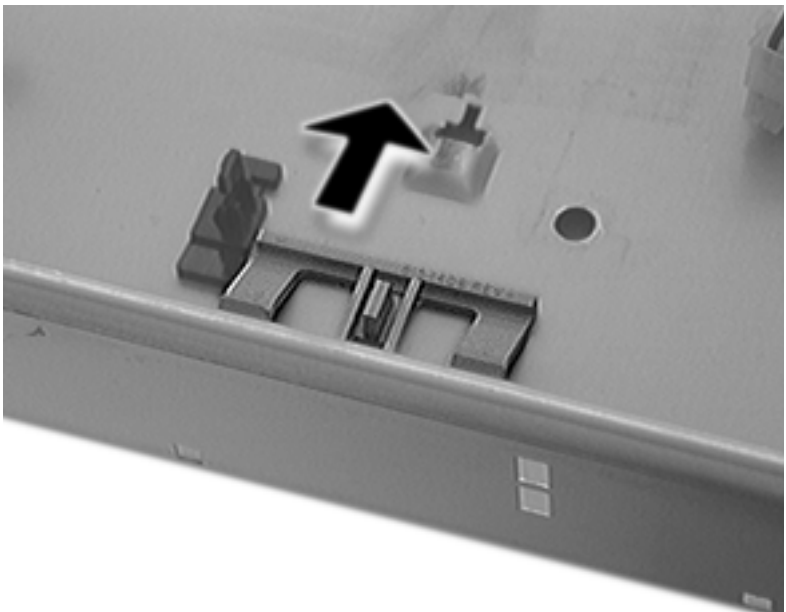
Before you begin, remove the following:

- Side access panel
- PCI cards (if present)
- Logic board
- I/O panel
- AV module video in/out
- Rear panel
- Speaker bezel
- Stationary panel

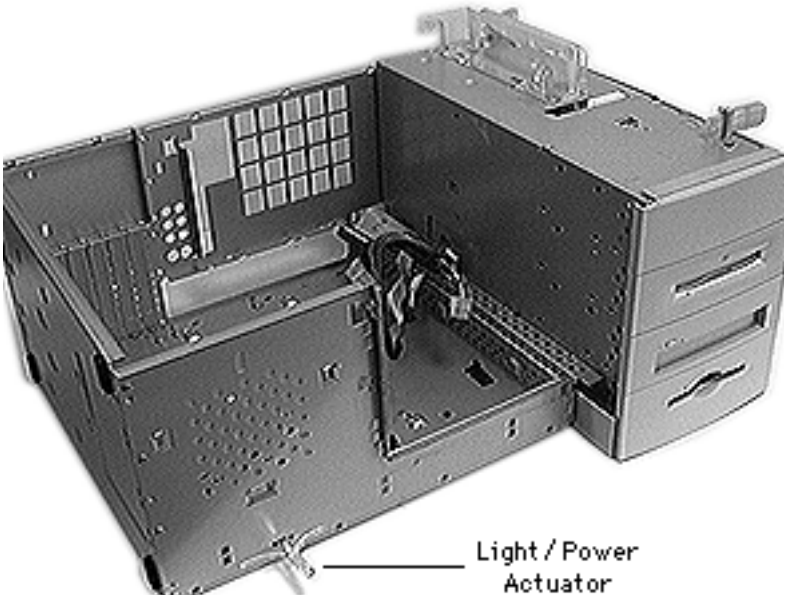


1. Carefully lay the computer on its side.
2. Unlock the top chassis by moving the two green locking levers upward and outward.
3. Using the green handle, gently swing the top chassis to the right until it rests firmly on the work surface.

4 Using a flat-blade screwdriver, release the tab holding the logic board latch to the underside of the chassis.



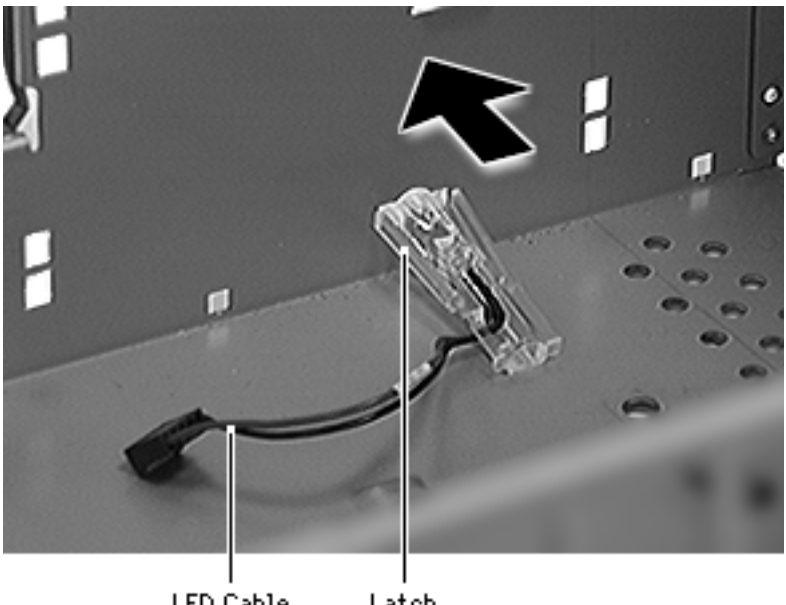
5 Slide the logic board latch forward and remove it from the computer.



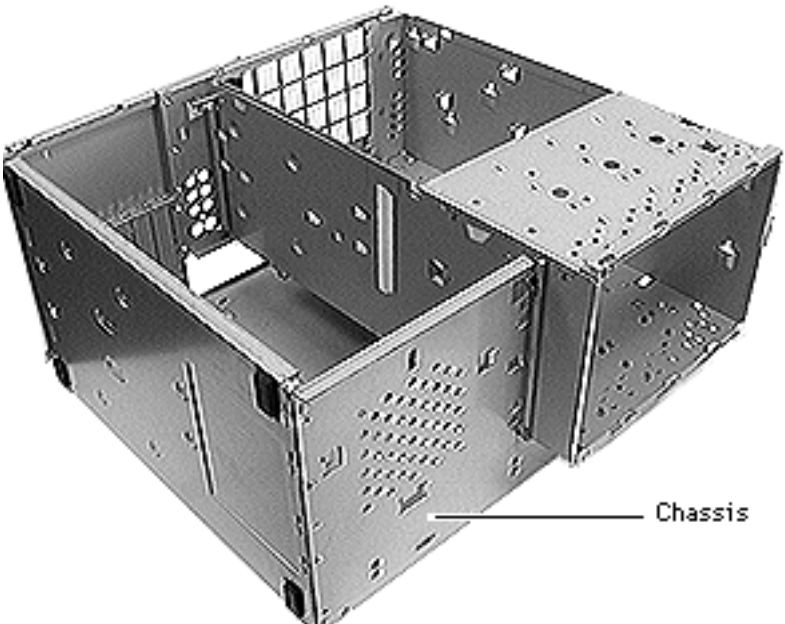
Light/Power Actuator

Before you begin, remove the following:

- Side access panel
- PCI cards (if present)
- Logic board
- I/O panel
- AV module video in/out
- Rear panel
- Speaker bezel
- Stationary panel



1. Lift the end of the LED cable slightly and remove it from the light/power actuator.
2. Press in the two latches on the sides of the actuator and slide it forward out of the chassis.



Chassis

Remove the following:

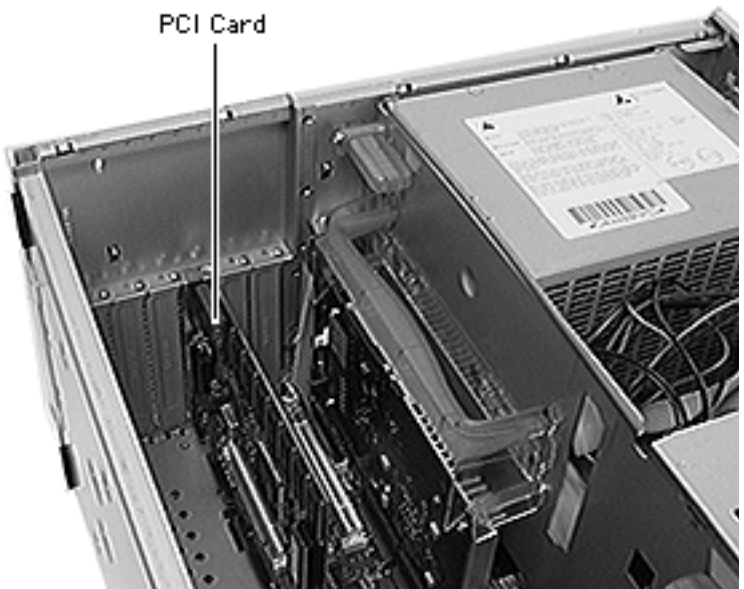
- Side access panel
- PCI cards (if present)
- Logic board
- I/O panel
- AV module video in/out
- Rear panel
- Speaker bezel
- Stationary panel
- Light/Power actuator
- Speaker housing
- Floppy drive
- CD-ROM drive
- Zip drive
- Front hard drive
- Rear hard drive

- Bottom drives
- Power supply
- Locking levers
- Chassis handle

Upgrades

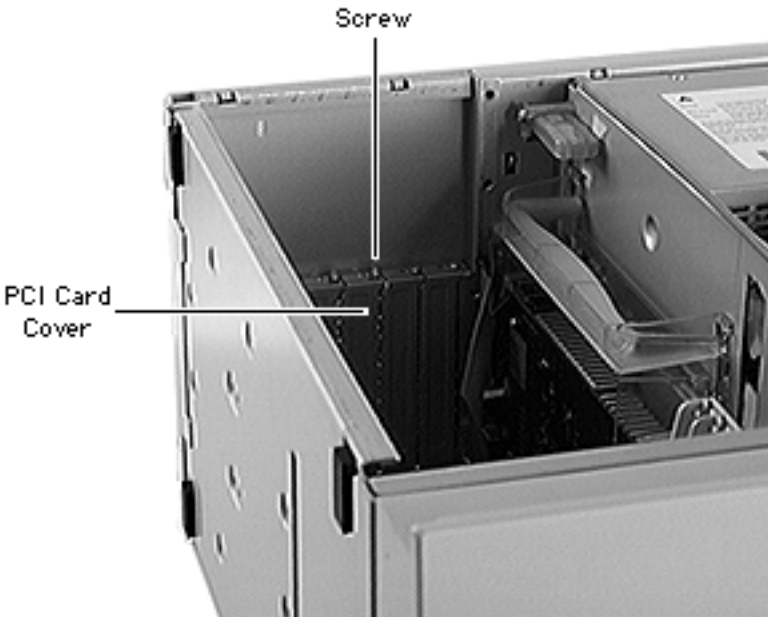
Power Macintosh 8600 and 9600 Series

PCI Card



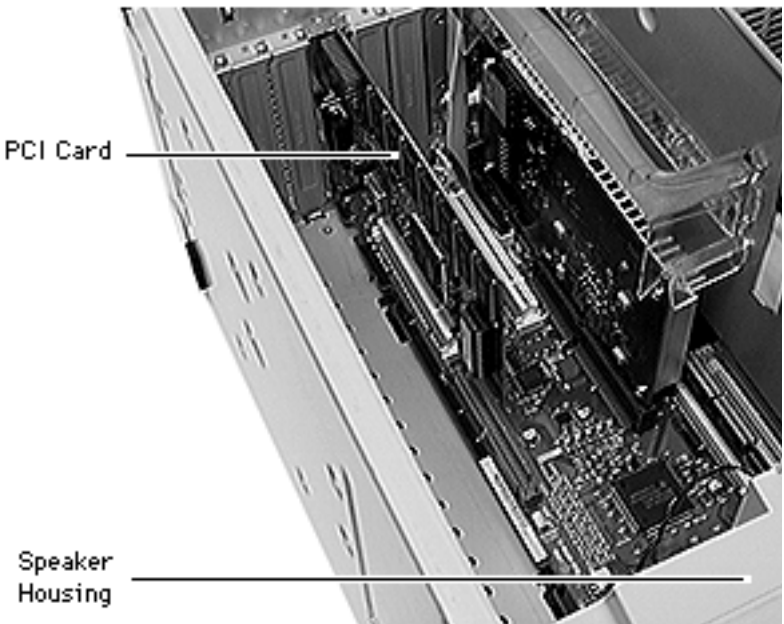
Note: This procedure explains how to install a PCI card.

Before you begin, remove the side access panel.



1 Carefully lay the computer on its side.

2 Using a Phillips screwdriver, unscrew the PCI card cover and remove it.

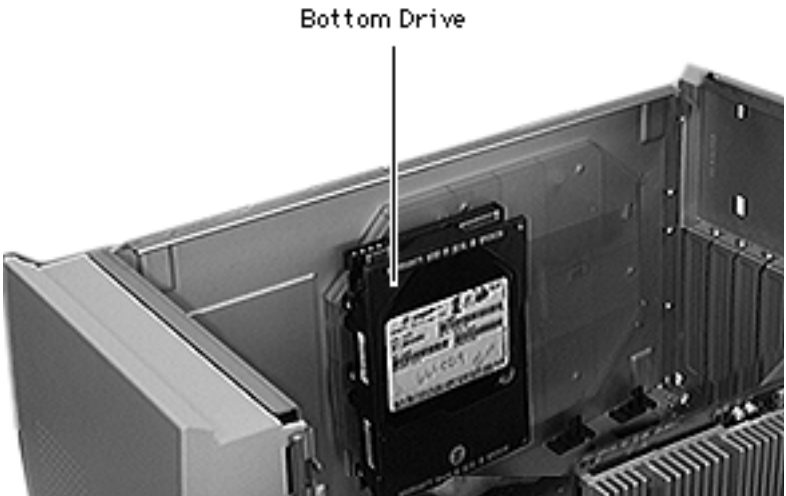


3 **Note:** For longer PCI cards, slide the end of the card opposite the connector into the appropriate slot in the speaker housing.

Align the PCI card with the expansion slot and press in firmly until the connector is seated.

Note: Refer to the PCI card manual for additional cable connections.

4 Replace the screw that you removed from the expansion card cover.

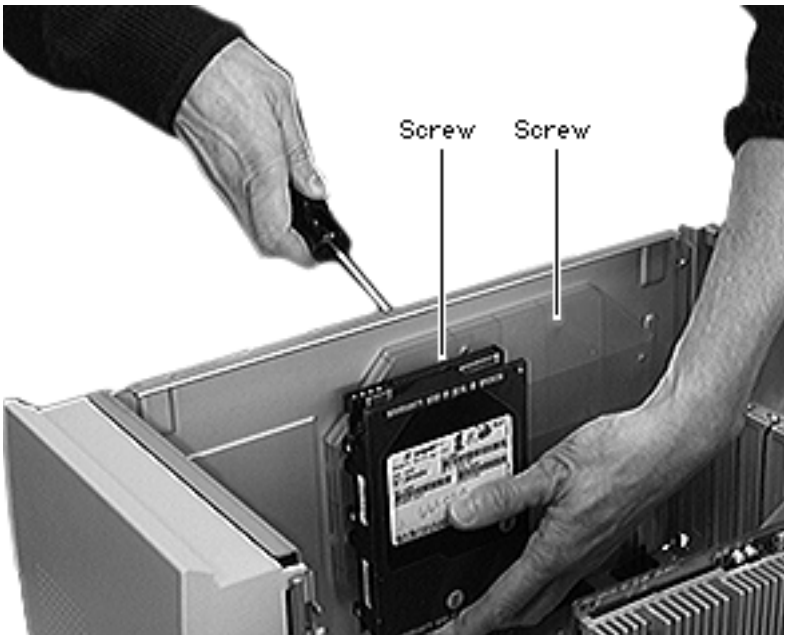


Bottom Drives

Note: This procedure explains how to install drives and the bottom drive carrier in the bottom of the computer.

Note: To operate the bottom drives, you must also install a RAID PCI card. Consult the card's installation manual for instructions on how to connect the hard drives to the card.

Before you begin, remove the side access panel.



1 Carefully lay the computer on its side.

2 Using four screws for each drive, install the hard drives on the bottom carrier.

3 Slide the four latches on the bottom carrier into the four slots on the bottom of the chassis.

4 Using the two bottom carrier screws, install the carrier in the chassis.

Parts

Power Macintosh 8600 and 9600 Series

Actuator, Power, Light Pipe **922-2588**

AV Module, Video In/Out **922-1740**

Bezel, Blank **922-2596**

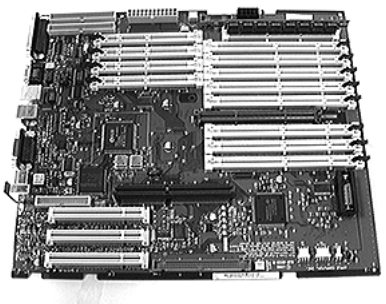
Bezel, CD-ROM Drive, Trayloading, Pkg. of 5 **922-2595**

Bezel, Floppy Drive, Manual Insert, Pkg. of 5 **922-2594**

Bezel, Speaker **922-2604**

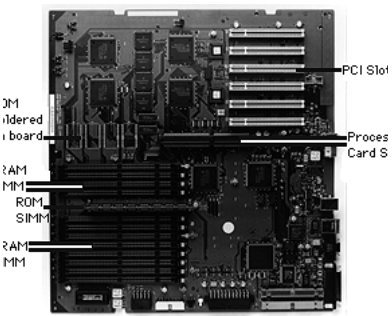
Bezel, ZIP Drive, Pkg. of 5 **922-2624**

Board, Logic, PM 8600, 24-Pin **661-1220**

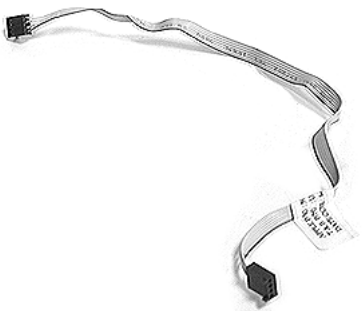


Board, Logic, PM 9600, 24-Pin

661-1221



Cable, CD Audio, Pkg. of 5 **922-2592**



Cable, Fan, Pkg. of 5 **922-2619**

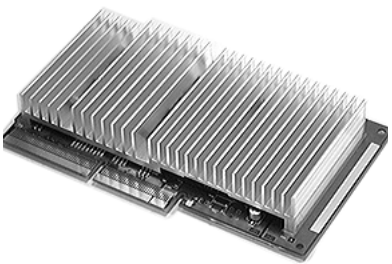
Cable, Floppy Drive **922-2591**

Cable, LED **922-2589**

Cable, LED, 6-Slot, PM 9600 **922-2638**

Cable, SCSI **922-2590**

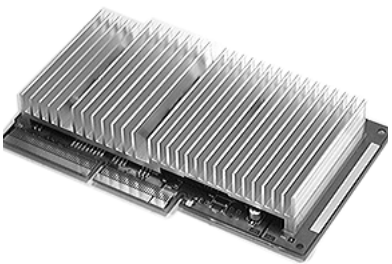
Card, 604e Multiprocessor, 200 MHz **661-1269**



Note:
The assembly part number 630-2125, 630-2259, or 630-2262 identifies this particular version of the 200MP MHz card. When ordering a replacement card, use the assembly part number to determine the correct service part number.

Install this card by aligning the it above the processor card slot and pushing straight down. Verify the card is firmly seated along the connector, pushing down again if necessary. Do NOT attempt to remove the microprocessor's heatsink.

Card, 604e Processor, 200 MHz **661-1307**



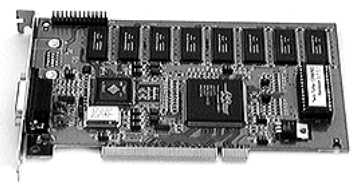
The assembly part number 630-2201, 661-2204, 630-2250, 630-2480, 630-2481, or 630-2486 identifies this particular version of the 200 MHz card. When ordering a replacement card, use the assembly part number to determine the correct service part number.

A limited number of the first Power Macintosh 7300, 7600/200, 8600, and 9600 systems were shipped with 200 MHz processor cards incorrectly labeled with a use restriction label that says “8500/9500 only.” If the assembly number on the card matches one of the numbers listed above, disregard the use restriction label, as it is incorrect.

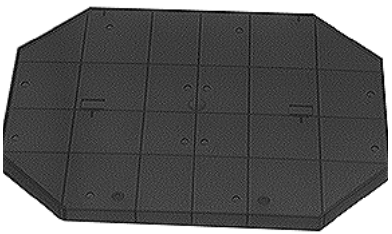
Note that service providers ordering a 200 MHz replacement card may also receive a part that is incorrectly labeled.

Install this card by aligning the it above the processor card slot and pushing straight down. Verify the card is firmly seated along the connector, pushing down again if necessary. Do NOT attempt to remove the microprocessor's heatsink.

Card, Video, IMS **661-1409**

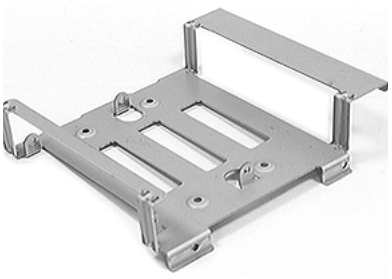


Carrier, Bottom Drives, Pkg. of 5 **922-2993**



Carrier, Front Drive, Pkg. of 5 **922-2599**

Carrier, Rear Drive, Pkg. of 5 **922-2600**



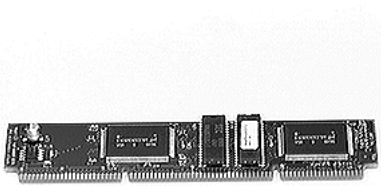
CD-ROM Drive, AppleCD 1800i **661-1415**

Chassis **922-2631**

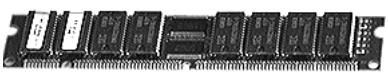
Cover, Blank, PCI Card, Pkg. of 10 **922-2605**

Cover, Top **922-2602**

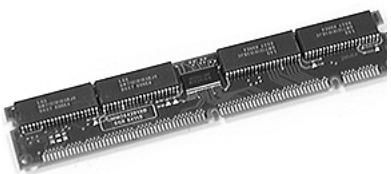
DIMM, Cache, 256K, 11 ns, 160-Pin, 5 V **661-1345**



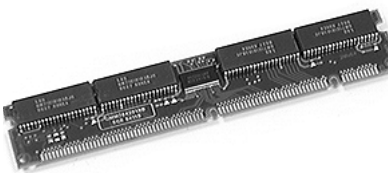
DIMM, DRAM, 8 MB, 70 ns, 168-Pin, EDO **661-1314**



DIMM, DRAM, 16 MB, 70 ns, 168-Pin, EDO **661-1315**



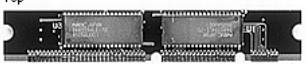
DIMM, DRAM, 32 MB, 70 ns, 168-Pin, EDO **661-1316**



DIMM, VRAM, 1 MB, 70 ns, 112-Pin

661-1036

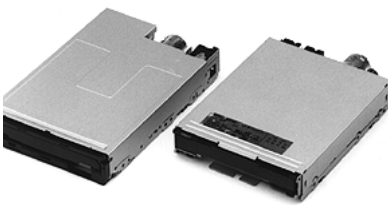
Top



Bottom

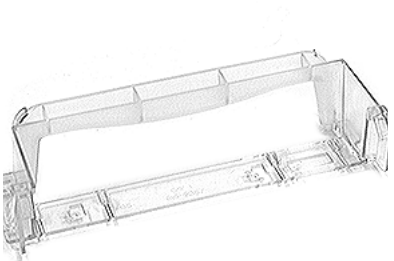
Fan Assembly **922-2608**

Floppy Drive, Apple SuperDrive, 1.4 MB, Manual Insert **661-0121**



Foot, Rubber, Pkg. of 10 **922-2611**

Handle, Drive Chassis **922-2684**

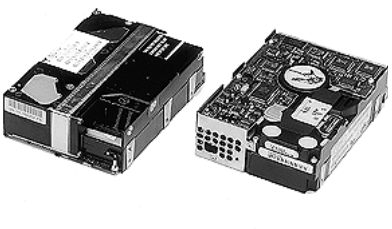


Hard Drive, 2 GB, SCSI, 3.5" **661-0180**

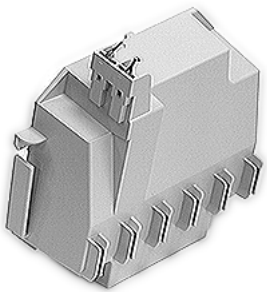
Note:
This drive should only be exchanged “like-for-like.” This drive is NOT interchangeable with part number 661-0892 (HDA, 2 GB, 3.5’’ SCSI, Unhoused).

Return the hard drive without the HDA frame, LED cable, and SCSI select cable. Warranty: The drive warranty will be void and Apple will return the module to the service provider without repair if the drive bar code label, manufacturer identification label, Apple capacity or EPROM label, or labels that say “Warranty Void if Seal Broken” have been tampered with or removed. APPLE REQUIRES SPECIAL PACKAGING; failure to comply with these requirements may result in a packaging noncompliance charge.

Hard Drive, 4 GB, SCSI, 3.5" **661-0951**



Housing, Speaker **922-2632**



Keyboard, AppleDesign **922-2832**

Keyboard, AppleDesign (Discontinued and Replaced by 922-2832 **661-0310**

The US version of this keyboard must now be ordered as 922-2832. Orders are no longer accepted for 661-0310. Do not return this keyboard to Apple. The international versions of this keyboard (661-0310 B/D/F/E/S/T) are still valid part numbers and should be returned to Apple for replacement.

Keyboard, AppleDesign, British **B661-0310**

Keyboard, AppleDesign, French Canadian **C661-0310**

Keyboard, AppleDesign, French **F661-0310**

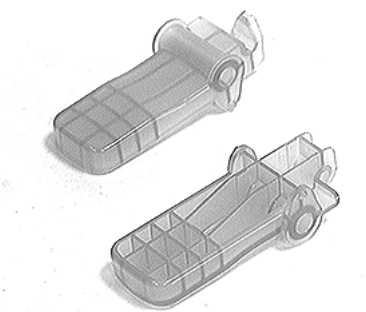
Keyboard, AppleDesign, Italian **T661-0310**

Keyboard, AppleDesign, Spanish **E661-0310**

Keyboard, AppleDesign, German **D661-0310**

Label, FCC, Power Macintosh 8600/9600, Pkg. of 10 **922-2697**

Latch, Drive Chassis, Pkg. of 5 **922-2685**



Latch, Logic Board, Pkg. of 10 **922-2686**

Mouse II, Apple Desktop Bus, Version B **661-0104**
(Discontinued and Replaced by 922-2733)

P/N 661-0104 and P/N 661-0763 are similar. To differentiate the two, check the connector at the end of the cable. P/N 661-0763 has a number printed on the connector; P/N 661-0104 has no number. The retainer for P/N 661-0104 is available with or without a small locking hole. There are two versions of the retainers with holes: version M, P/N 922-1242, and version L, P/N 922-1109. If the product label on the bottom of the mouse begins with “M,” and the retainer has a hole, order P/N 922-1242; if the product label begins with “L,” and the retainer has a hole, order P/N 922-1109. Note: The retainers are not interchangeable; be sure to order like for like.

Mouse II, Apple Desktop Bus, Version B 922-2733

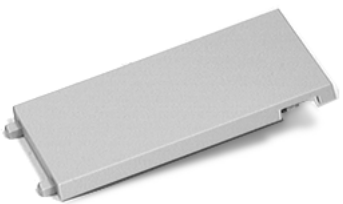
P/N 922-2733 and P/N 661-0763 are similar. To differentiate the two, check the connector at the end of the cable. P/N 661-0763 has a number printed on the connector; P/N 922-2733 has no number. The retainer for P/N 922-2733 is available with or without a small locking hole. There are two versions of the retainers with holes: version M, P/N 922-1242, and version L, P/N 922-1109. If the product label on the bottom of the mouse begins with “M,” and the retainer has a hole, order P/N 922-1242; if the product label begins with “L,” and the retainer has a hole, order P/N 922-1109. Note: The retainers are not interchangeable; be sure to order like for like.

Nameplate, Power Macintosh 8600/200, Pkg. of 5 **922-2653**

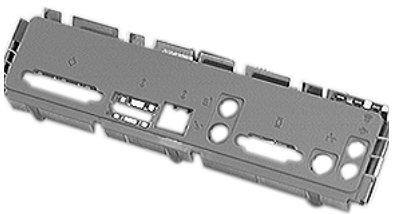
Nameplate, Power Macintosh 9600/200 MP, Pkg. of 5 **922-2626**

Nameplate, Power Macintosh 9600/200, Pkg. of 5 **922-2625**

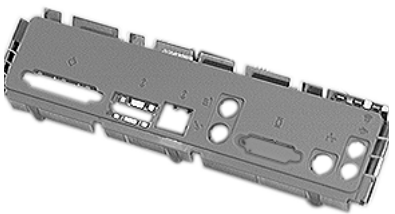
Panel, Blank, AV Module, Pkg. of 5 **922-1722**



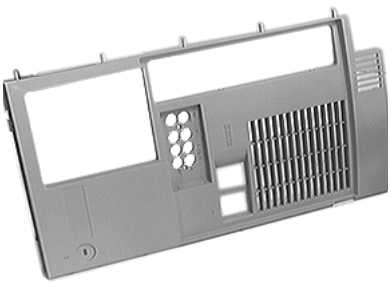
Panel, I/O, PM 8600 **922-2607**



Panel, I/O, PM 9600 **922-2606**



Panel, Rear **922-2603**



Panel, Side Access **922-2634**

Panel, Side, Stationary **922-2601**

Power Supply, 390W **661-1242**

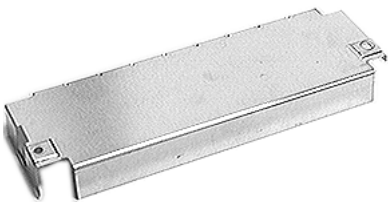
Screw, Pan Head, 3.5x6, Pkg. of 10 **922-2687**

Screw, Pan, M3.5x6x6mm, Pkg. of 10 **922-2610**

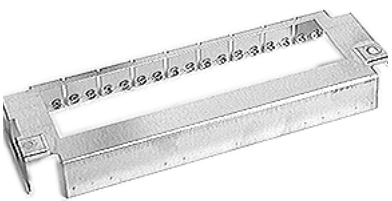
Screw, Sems, 6-32 x .250, Pkg. of 10 **922-2224**

Screw, Tap, Pan, Torx, M4x35, Pkg. of 10 **922-2609**

Shield, Blank **922-2978**



Shield, CD-ROM Drive, Pkg. of 5 **922-2598**



Shield, Floppy Drive, Pkg. of 5 **922-2597**

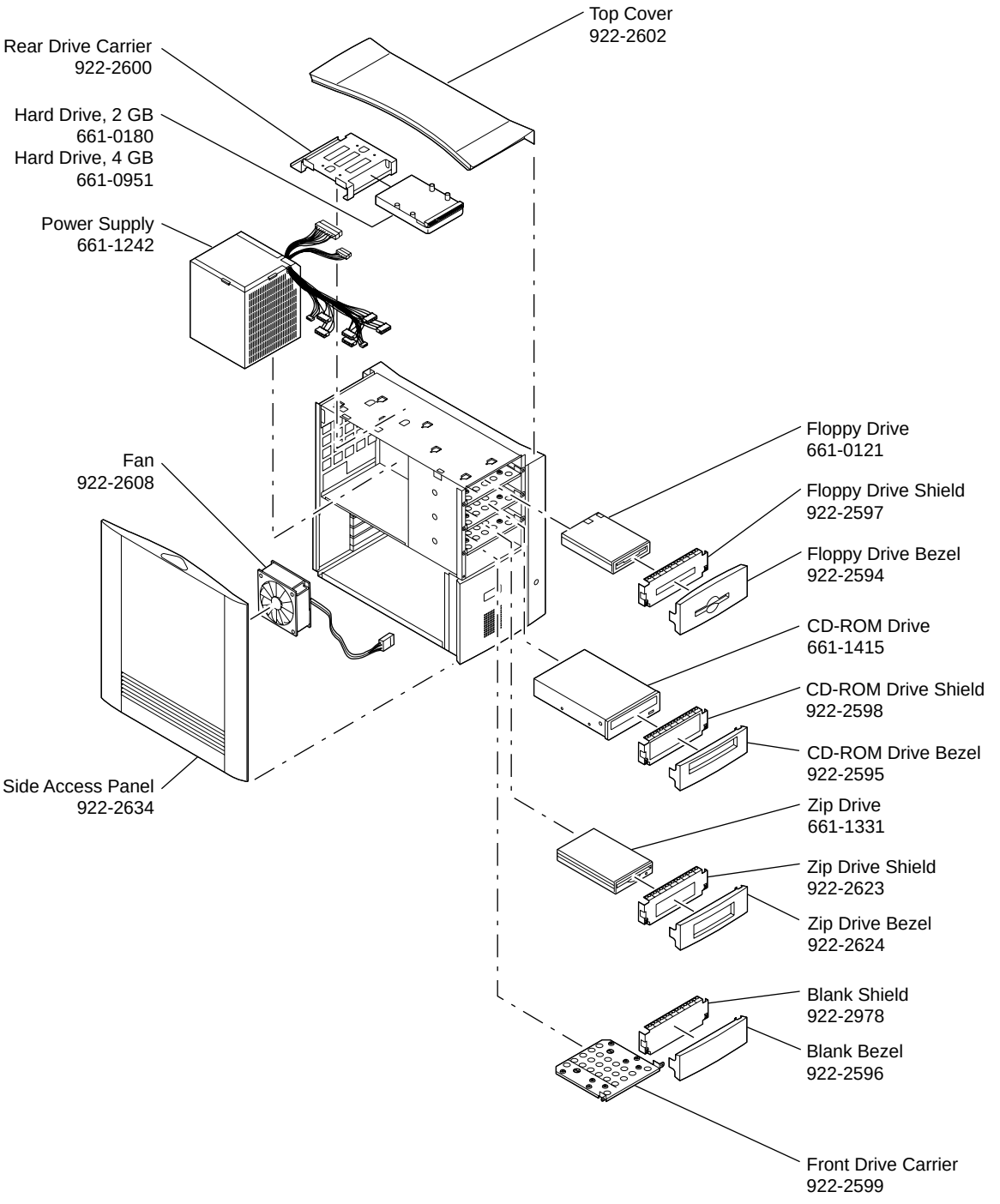
Shield, ZIP Drive, Pkg. of 5 **922-2623**

Speaker, 16 Ohm, 2 Watts **922-2633**

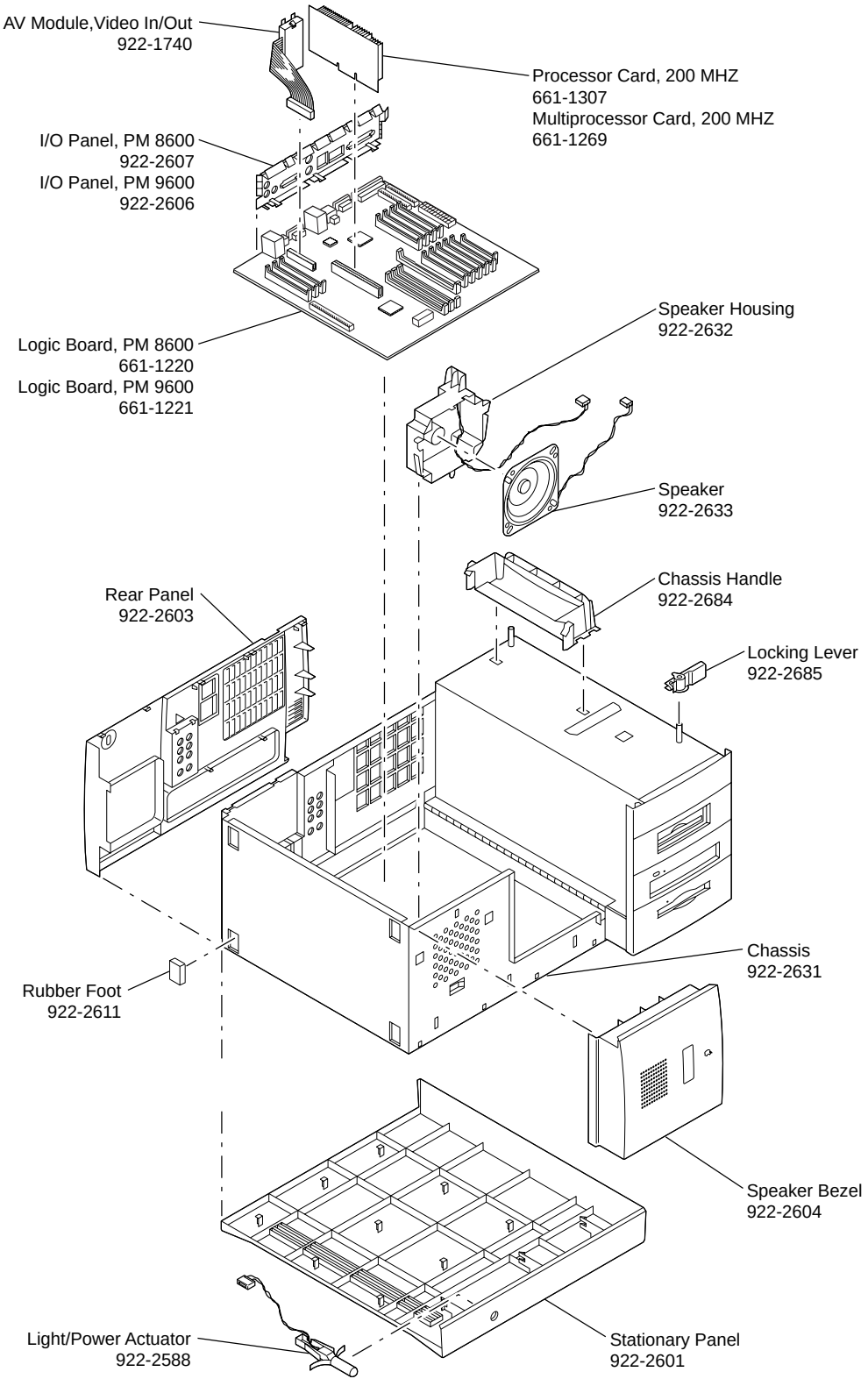
ZIP Drive **661-1331**

Exploded View

Power Macintosh 8600 and 9600 Series



Power Macintosh 8600 and 9600 Exploded View



Power Macintosh 8600 and 9600 Exploded View