



# Macintosh Performa 6100 Series

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Macintosh Performa 6110CD, 6112CD, 6115CD,  
6116CD, 6117CD, 6118CD





## Basics

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Macintosh Performa 6100 Series





## Power Macintosh System Overview

PowerPC microprocessors are a family of processors built on reduced instruction-set computing (RISC) technology. RISC processors streamline the internal workings of computers. Whereas traditional (complex instruction-set computing, or CISC) processors contain a wide variety of instructions to handle many different tasks, RISC processors contain only those instructions that are used most often. When a complex instruction is needed, a RISC processor builds it from a combination of basic instructions.

RISC processors are designed to execute these basic instructions extremely quickly. The performance gains achieved by speeding up the most-used instructions more than compensate for the time spent creating less-used instructions.





Previously, RISC technology had been used only in high-end workstations and commercial database servers. With the introduction of Macintosh PowerPC computers, Apple succeeded in bringing RISC technology to personal computing.

## Key Points

Three key points to remember about a PowerPC processor-based Macintosh system: It's a Macintosh; it's compatible; it offers tremendous performance.

Apple's PowerPC computers feature the same user interface as their 680x0-based predecessors. Users can mix RISC-based and 680x0-based Macintosh systems on the same network and exchange files and disks between them. In addition, users can run both 680x0 and native PowerPC applications on the same Power Macintosh system simultaneously.





Compatibility is not limited just to applications. INITs, CDEVs, drivers, and other Macintosh utility software also work on PowerPC processor-based Macintosh systems. So do AppleTalk devices (such as printers), SCSI devices (such as hard drives and scanners), ADB devices (such as mice, trackballs, and keyboards), and other Macintosh cards and peripherals.

The primary operating system for PowerPC processor-based Macintosh computers is System 7. The operating system has been optimized for the highest performance on the PowerPC processor. This optimization of System 7 benefits applications written for 680x0 systems as well as those developed specifically for PowerPC processor-based systems.

And while PowerPC-based Macintosh systems running native applications offer two to four times the performance





of the fastest 68040- and 80486-based personal computers, the real promise of PowerPC technology is that it enables Apple and other developers to deliver new software capabilities on Macintosh systems that were previously available only on high-end workstations.

## Troubleshooting Tips

When troubleshooting Power Macintosh systems, keep in mind the following:

- 1 If a Power Macintosh system does not power up, you should first attempt to reset the logic board. Instructions are provided in the Additional Procedures chapter.
- 2 With Power Macintosh computers, you must install noncomposite RAM SIMMs only, and the RAM SIMMs must be installed in like pairs (that is, the same size and speed). Additional troubleshooting information is





provided in the Symptom Charts section of the Troubleshooting chapter under the “System” topic heading.

- 3 If a Power Macintosh system has bad RAM SIMMs installed, you will not hear death chimes. Instead, a dialog box will appear alerting you to the fact that a bad RAM SIMM has been detected. Additional troubleshooting information is provided in the Symptom Charts section of the Troubleshooting chapter under the “System” topic heading.
- 4 If the system hangs shortly after installing a new NuBus card, contact the vendor to verify that the card is compatible with the Power Macintosh system or to see if there is a software upgrade available. If the NuBus card is an Apple manufactured product, refer to the Service Tech Info Library for more information.





# Product Configurations

All configurations are at introduction of the product.

## **Performa 6110CD**

- Memory: 8 MB of RAM
- Drives: Internal Apple 1.4 MBSuperDrive, internal 250 MB SCSI hard drive, internal AppleCD 300i Plus drive
- Modem: Teleport send-fax/data modem
- Monitor: Apple Multiple Scan 15 Display

## **Performa 6112CD**

- Memory: 8 MB of RAM
- Storage: Internal Apple 1.4 MB SuperDrive, internal 250 MB SCSI hard drive, internal AppleCD 300i Plus drive
- Modem: Teleport send-fax/data modem
- Monitor: Apple Multiple Scan 15 Display





**Performa 6115CD**

- Memory: 8 MB of RAM
- Drives: Internal Apple 1.4 MBSuperDrive, internal 350 MB SCSI hard drive, internal AppleCD 300i Plus drive
- Modem: Teleport send-fax/data modem
- Monitor: Apple Multiple Scan 15 Display

**Performa 6117CD**

- Memory: 8 MB of RAM
- Storage: Internal Apple 1.4 MB SuperDrive, internal 350 MB SCSI hard drive, internal AppleCD 300i Plus drive
- Modem: Teleport send-fax/data modem
- Monitor: Apple Multiple Scan 15 Display





### **Performa 6118CD**

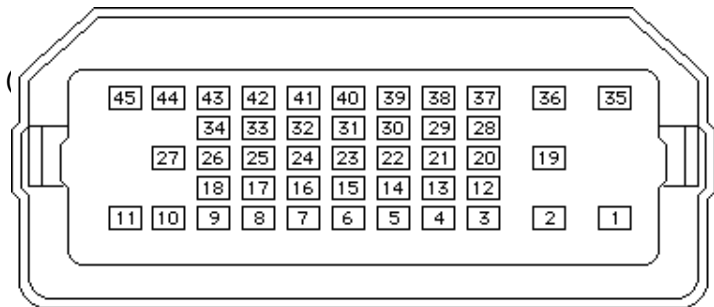
- Memory: 8 MB of RAM
- Storage: Internal Apple 1.4 MB SuperDrive, internal 500 MB SCSI hard drive, internal AppleCD 300i Plus drive
- Modem: Teleport send-fax/data modem





## HDI-45 Pinouts

This section includes an illustration of the HDI-45 video connector and a table containing the pinout descriptions.



**Figure: HDI-45 Video Connector on the Logic Board**



**Table: HDI-45 Pinouts**

<b>Pin</b>	<b>Description</b>
1	Analog audio ground
2	Audio input shield
3	Left channel audio input
4	Right channel audio input
5	Left channel audio output
6	Right channel audio output
7	Reserved
8	Monitor ID sense line 1
9	Monitor ID sense line 2
10	Green ground (shield)





Pin	Description
11	Green video output (75 $\Omega$ )
12	Video input power ground
13	Power for camera +5 V
14	Reserved
15	Reserved
16	Reserved
17	Reserved
18	Monitor ID sense line 3
19	S-video input shield
20	S-video input luminance (Y)
21	S-video input chroma (C)





Pin	Description
22	Reserved
23	Reserved
24	Reserved
25	Reserved
26	Red ground (shield)
27	Red video output (75 $\Omega$ )
28	I <sup>2</sup> C data signal
29	I <sup>2</sup> C clock signal
30	Reserved
31	Monitor ID
32	Monitor ID





<b>Pin</b>	<b>Description</b>
33	Vertical sync signal
34	Composite sync signal
35	ADB power +5 V
36	ADB ground
37	ADB data
38	Keyboard switch
39	Reserved
40	Reserved
41	Monitor ID
42	Horizontal sync signal
43	Video sync ground





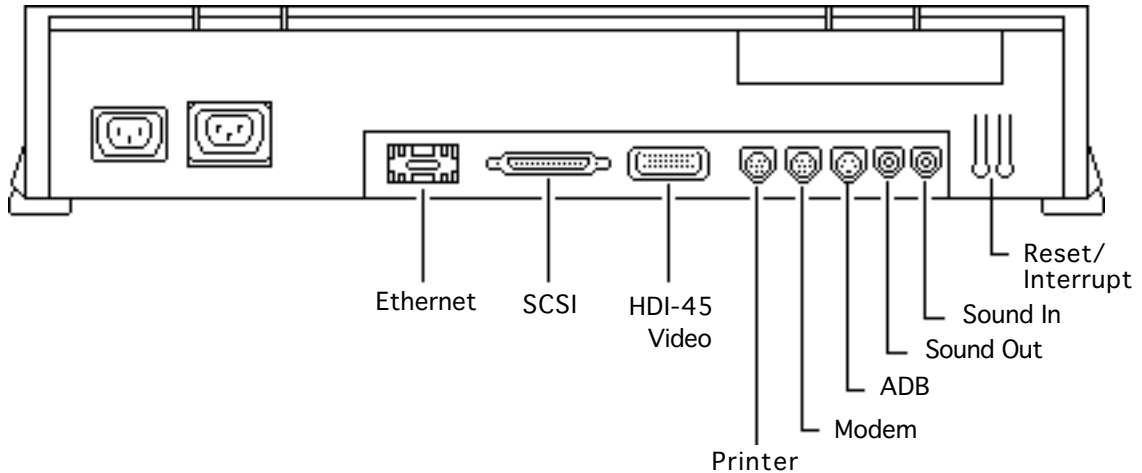
<b>Pin</b>	<b>Description</b>
44	Blue ground (shield)
45	Blue video output (75 $\Omega$ )





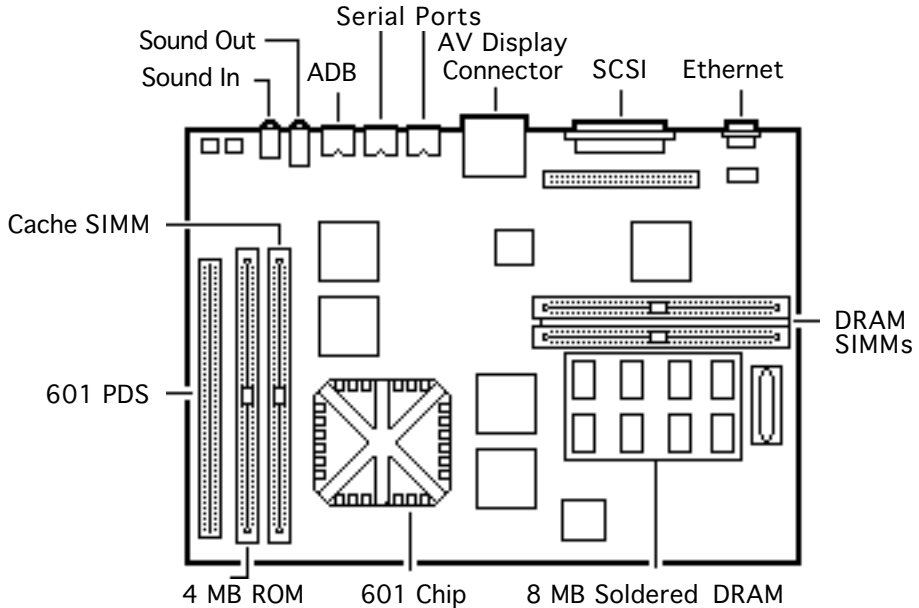


# Rear Panel Connectors





# Logic Board Connectors





# 6100 Screws

**Quadra 610 WGS 60/cent /Quadra660PM 6100 /WGS 6150**

410-1308			450-0032			NuBus Adapter
416-1306			844-0018			Screw Supper Drive
416-1310			922-0401			CD-ROM Carrier
440-6105			922-0995			Cover Thumb Screw





## Specifications

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Macintosh Performa 6100 Series





## Processor

### CPU

60 MHz PowerPC 601 RISC microprocessor  
Built-in MMU and FPU  
32K of on-chip cache memory  
Requires system software version 7.5 or later





## Memory

<b>RAM</b>	<p>8 MB RAM soldered on board; 2 SIMM sockets on logic board, expandable to 72 MB (a pair of same-size, 80 ns or faster, 72-pin, non-composite SIMMs); 16 MB configuration has two 4 MB SIMMs installed</p> <p><b>Note:</b> SIMMs must be installed in pairs of the same size and speed. Install noncomposite SIMMS only.</p>
<b>ROM</b>	<p>4 MB installed on SIMM socket</p>
<b>Cache</b>	<p>32K of on-chip cache; optional 256K level 2 cache available</p>
<b>Clock/Calendar</b>	<p>CMOS custom chip with long-life lithium battery</p>





## Disk Storage

### **Floppy Drive**

1.4 MB Apple SuperDrive Manual Insert

### **Hard Drive**

Performa 6110 and Performa 6112: 250 MB hard drive

Performa 6115 and Performa 6117: 350 MB hard drive

Performa 6118: 500 MB hard drive

### **CD-ROM**

Internal AppleCD 300i Plus CD-ROM drive





## I/O Interfaces

### **SCSI**

One SCSI port; DB-25 connector

Supports a maximum of six external SCSI devices (five when CD-ROM is installed)

### **Serial**

Two RS-232/RS-422 LocalTalk/GeoPort serial ports; mini DIN-9 connectors (backward compatible with mini DIN-8 connectors)

### **Apple Desktop Bus**

One Apple Desktop Bus (ADB) port; mini DIN-4 connector  
Maximum power draw 500 mA; maximum of three devices total

### **Expansion Slot**

Internal expansion slot supports either a processor-direct slot card or 7-in. NuBus card (with appropriate adapter)





**Ethernet**

One built-in AUUI-15 Ethernet port

**Sound**

16-bit stereo in and out

Sample rates of 48, 44.1, 24, and 22.05 kHz

Input/output line level: 1 V peak-to-peak

Input/output signal-to-noise ratio (SNR): 82 dB with no audible discrete tones

Bandwidth: 20 Hz-20 kHz ( $\pm 2$  dB) at 44.100 kHz sample rate

THD+N (total harmonic distortion plus noise): less than 0.05%, measured 20Hz-20kHz with a 1-Vrms sine wave input

**Video**

One HDI-45 DRAM-based video port on logic board supports direct connection to Apple AudioVision monitors and with HDI-45-to-DB-15 adapter (included) supports 12-inch, 13-inch, 14-inch, 15-inch portrait, 16-inch, and 17-inch monitors.





## I/O Devices

### **Keyboard**

Apple Design Keyboard

### **Mouse**

ADB Mouse II; draws up to 10 mA





## Video Display

### Video Display

Performa 6100 Series computers are bundled with the Apple Multiple Scan 15 display. Performa 6100 Series computers support monochrome, color, VGA, and SVGA formats on the HDI-45 connector, including:

- Macintosh 12-inch Monochrome Display (640 x 480)
- Macintosh 12-inch RGB Display (512 x 384)
- AppleColor High-Resolution RGB 14" Monitor (640 x 480)
- Apple AudioVision 14 Display (640 x 480)
- Macintosh Color Display (640 x 480)
- Macintosh 15-inch Portrait Display (640 x 870)
- Macintosh 16-inch Color Display (832 x 624)





## Electrical

<b>A/C Line Input Voltage</b>	100–240 VAC; RMS single phase, automatically configured
<b>Input Line Frequency</b>	50–60 Hz
<b>Input Power</b>	210 W maximum, not including monitor power
<b>Power Supply DC Output</b>	86 W maximum





## Physical

### **Dimensions**

Height: 3.4 in. (85 mm)

Width: 16.3 in. (415 mm)

Depth: 15.6 in. (399 mm)

### **Weight**

14.0 lb. (6.4 kg), weight varies depending on internal devices installed





## Environmental

**Operating  
Temperature**

10-40° C (50-104° F)

**Storage  
Temperature**

-40 to 47° C (-40 F to 116.6° F)

**Relative Humidity**

5-95% (noncondensing)

**Altitude**

0-3,048 m (0-10,000 ft.)





# Troubleshooting

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## Macintosh Performa 6100 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 in the Troubleshooting tab.

For additional assistance, contact Apple Technical Support.







# Symptom Charts

## Power Supply

System does not  
power up

- 1 Reset logic board. (Refer to Additional Procedures.)
- 2 Reseat ROM SIMM and cache SIMM.
- 3 Replace power supply.
- 4 Replace logic board.





## System

System  
intermittently  
crashes or hangs

- 1 Verify that system software is version 7.5 or later.
- 2 Verify SIMMs are noncomposite and installed in like pairs (same size/speed).
- 3 Verify that software is known-good.
- 4 Verify that software is PowerPC compatible (contact developer).
- 5 Clear parameter RAM. Hold down <Command> <Option> <P> <R> during startup but before “Welcome to Macintosh” appears.
- 6 Replace SIMMs.
- 7 Replace logic board. Retain SIMMs.
- 8 Replace power supply.





## Video

Screen is dark, audio and at least one drive operate, fan is running, and LED is lit

- 1 Adjust brightness on monitor.
- 2 Replace video cable.
- 3 Replace monitor. Refer to appropriate monitor manual to troubleshoot defective monitor.
- 4 Replace logic board. Retain customer's SIMMs.

Screen is dark, audio and drive do not operate, fan is running, and LED is lit

- 1 Reset logic board. (Refer to Additional Procedures.)
- 2 Reseat ROM SIMM and cache SIMM.
- 3 Remove peripherals.
- 4 Replace DRAM SIMMs.
- 5 Replace power supply.
- 6 Replace logic board.





## Video (Continued)

Partial or whole screen is bright and audio is present, but no video information is visible

- 1 Replace video cable.
- 2 Replace monitor. Refer to appropriate monitor manual to troubleshoot defective monitor.
- 3 Replace logic board. Retain customer's SIMMs.

Screen is completely dark, fan is not running, and LED is not lit

- 1 Verify that external power cables are properly connected.
- 2 Remove peripherals.
- 3 Replace power supply.
- 4 Replace logic board. Retain customer's SIMMs.





## Floppy Drive

Audio and video are present, but internal floppy drive does not operate

- 1 Replace internal floppy drive cable.
- 2 Replace internal floppy drive.
- 3 Replace logic board. Retain customer's SIMMs.

Floppy disk ejects, and display shows Mac icon with blinking "X"

- 1 Try a different floppy disk.
- 2 Replace floppy drive cable.
- 3 Replace internal floppy drive.
- 4 Replace logic board. Retain customer's SIMMs.

Floppy disk does not eject

- 1 Switch off system and hold mouse button down while switching on the system.
- 2 Eject disk manually.
- 3 Replace floppy drive cable.
- 4 Replace floppy drive.





## Floppy Drive (Continued)

Floppy drive attempts to eject disk but doesn't

- 1 Push floppy disk completely in.
- 2 Eject floppy disk manually.
- 3 Replace floppy drive.
- 4 Reseat or replace top cover assembly.





## Hard Drive

Internal hard drive runs continuously

- 1 Update driver software of hard drive, using HD-SC Setup.
- 2 Reinstall system software.
- 3 Replace SCSI data cable.
- 4 Replace hard drive.
- 5 Replace logic board. Retain customer's SIMMs.

Internal hard drive does not operate

- 1 Replace SCSI data cable.
- 2 Replace SCSI power cable.
- 3 Replace hard drive.
- 4 Replace logic board. Retain customer's SIMMs.





## CD-ROM Drive

CD-ROM drive does not accept a compact disc

- 1 Exchange disc (if disc is dirty or damaged).
- 2 Replace CD-ROM drive mechanism.
- 3 Replace SCSI data cable.

System does not display CD-ROM drive icon

- 1 Verify that CD-ROM extension is in System Folder.
- 2 Replace CD-ROM drive mechanism.
- 3 Replace SCSI data cable.

Compact disc won't eject from the drive

- 1 Turn off file sharing in Sharing Setup Control Panel.
- 2 Manually eject the compact disc.
- 3 Press the eject button behind the front bezel (if it is accessible).
- 4 Replace CD-ROM drive mechanism.







## Peripherals

Works with internal or external SCSI device, but does not work with both

- 1 Replace external SCSI cables.
- 2 Verify that there is only one terminator on external devices.
- 3 Verify that SCSI select switch on any external device is set differently from any internal SCSI device.
- 4 Verify that hard drive is terminated but optional CD-ROM is not terminated.
- 5 Replace terminator on external hard drive.
- 6 Replace SCSI select cable on external SCSI device.





## Peripherals (Continued)

Cursor does not move

- 1 Reboot computer.
- 2 Verify that mouse is connected properly.
- 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 SIMMs.

Cursor moves, but clicking the mouse button has no effect

- 1 Replace mouse.
- 2 Replace logic board. Retain customer's SIMMs.
- 3 If mouse was connected to keyboard, connect mouse to computer ADB port instead. If mouse works, replace keyboard.





## Peripherals (Continued)

Double-click does not open application, disk, or server

- 1 Remove duplicate system files from hard drive.
- 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 SIMMs.

No response to any key on the keyboard

- 1 Verify that keyboard is connected to ADB port.
- 2 Replace keyboard cable.
- 3 Replace keyboard.
- 4 Replace logic board. Retain customer’s SIMMs.





## Miscellaneous

About This Macintosh reports more memory than is installed

- 1 Verify that RAM SIMMs are installed in matching pairs (same size and speed).
- 2 Replace RAM SIMMs.

About This Macintosh reports less memory than is installed

- 1 Verify that RAM SIMMs are installed in matching pairs (same size and speed).
- 2 Replace RAM SIMMs.





Take Apart

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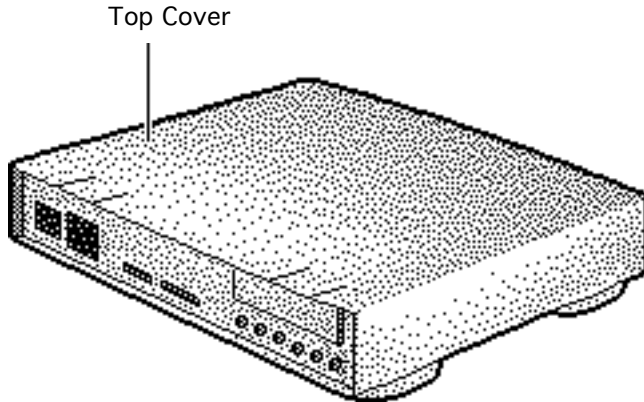
Macintosh Performa 6100 Series





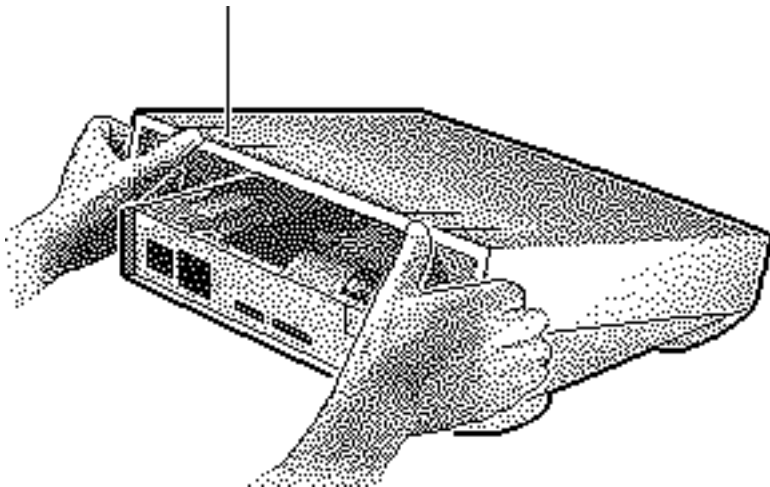
## Top Cover

No preliminary steps are required before you begin this procedure.





Tabs



- 1 Press up on the tabs at the back of the top cover.
- 2 Tilt the back of the top cover and remove the top cover.

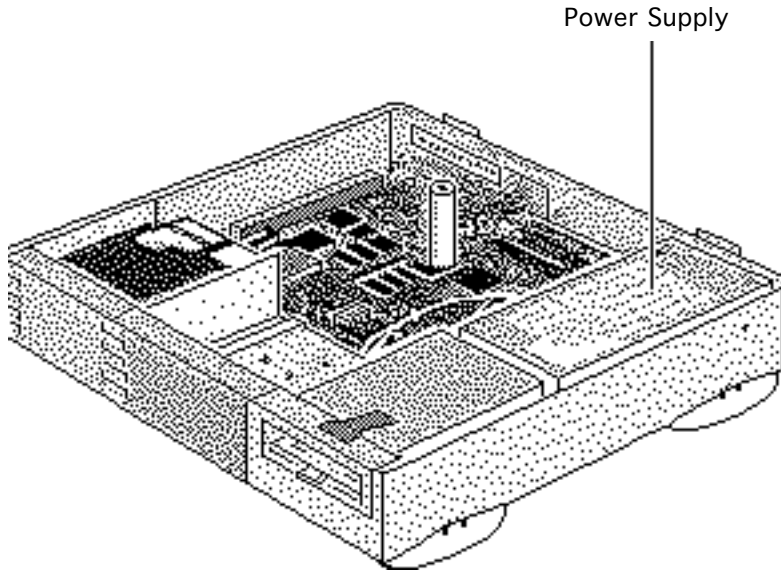




## Power Supply

Before you begin, remove the top cover.

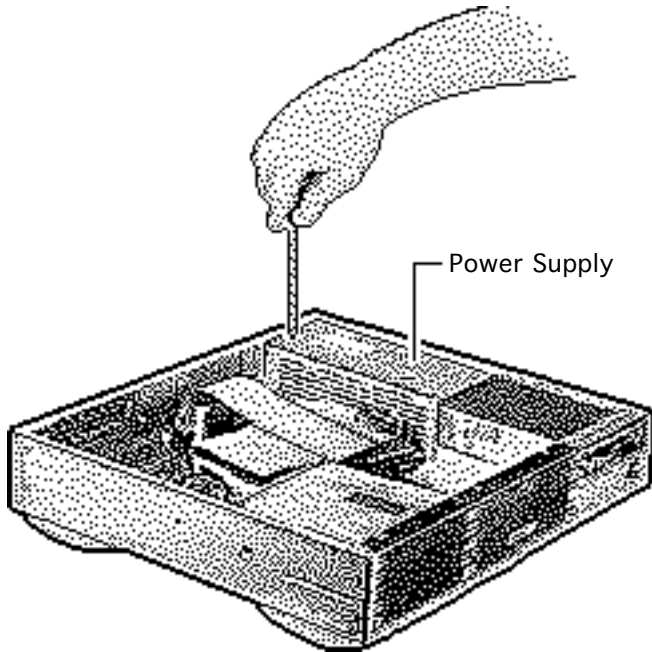
**Caution:** Review the ESD precautions in Bulletins/Safety.

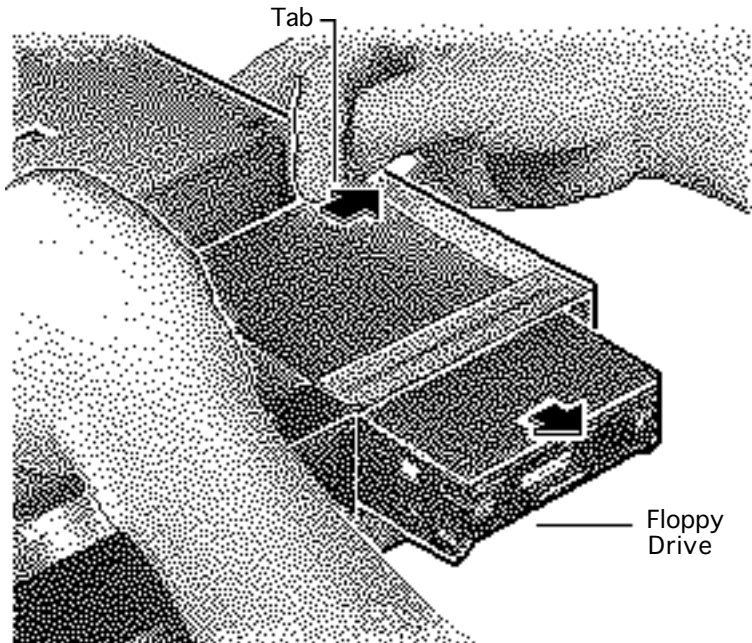






- 1 Remove the screw that secures the power supply.

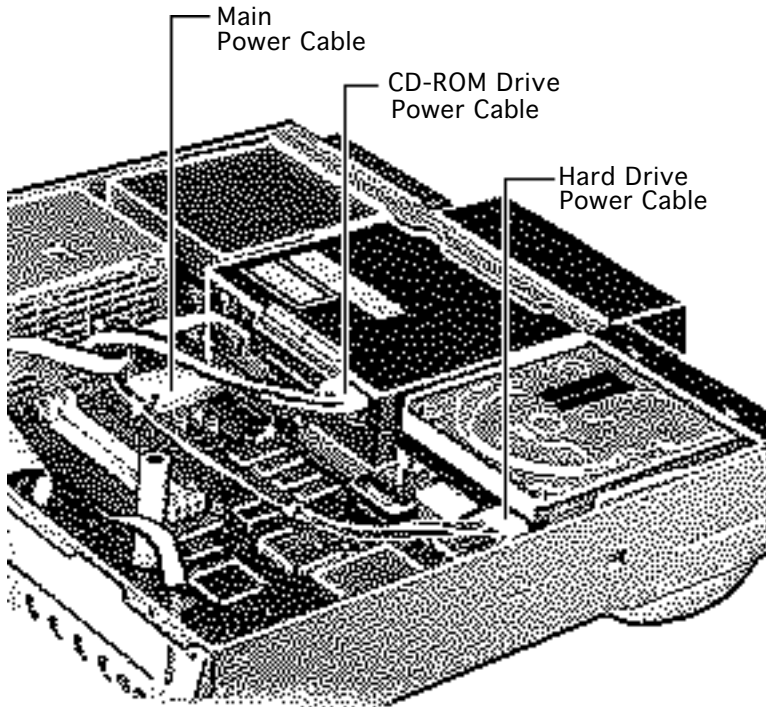




- 2 For easier access to the power supply, release the tabs of the floppy drive and slide the floppy drive forward a few inches.

**Note:** If a CD-ROM drive is present, remove the SCSI data cable and move the CD-ROM drive forward. Refer to the CD-ROM drive topic.



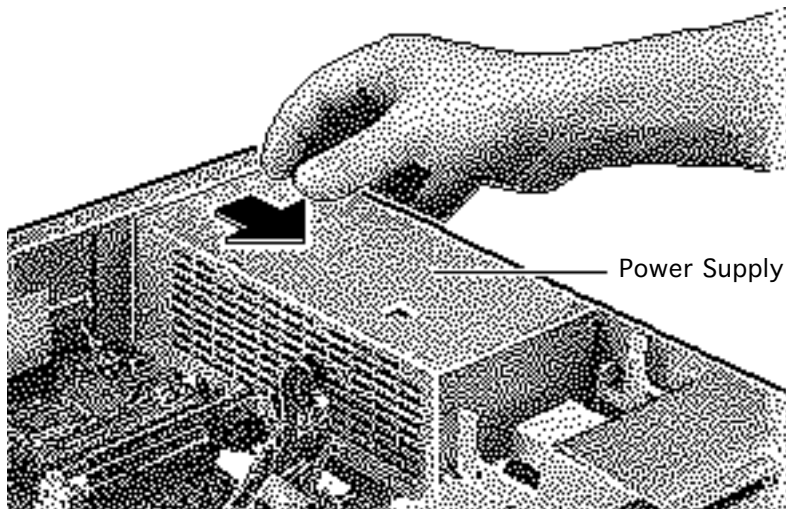


- 3 Disconnect these power supply cables:
- Main power cable
  - Hard drive power cable
  - CD-ROM drive power cable (if installed)





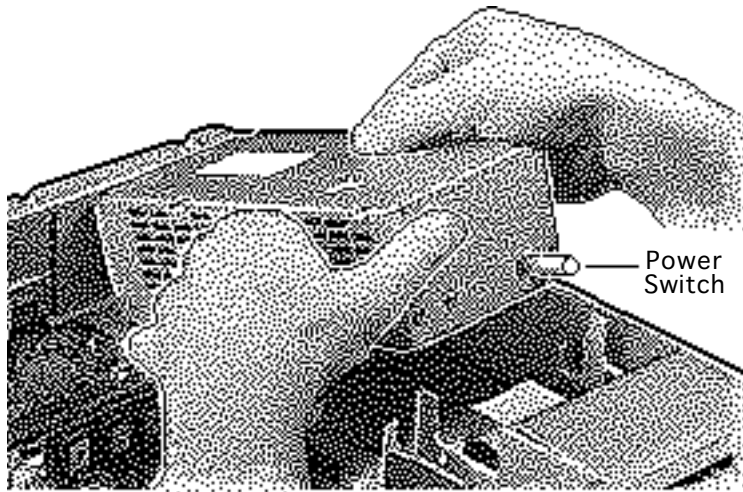
- 4 Slide the power supply forward slightly.





- 5 Tilt the front of the power supply and lift it out of the computer.

**Replacement Note:** Move the floppy drive forward. Press the actuator toward the back of the computer to properly seat the power switch in the actuator.



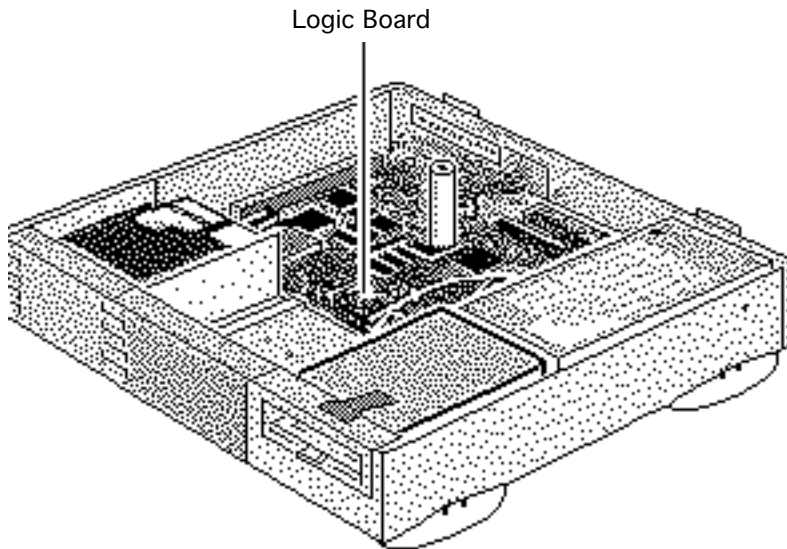


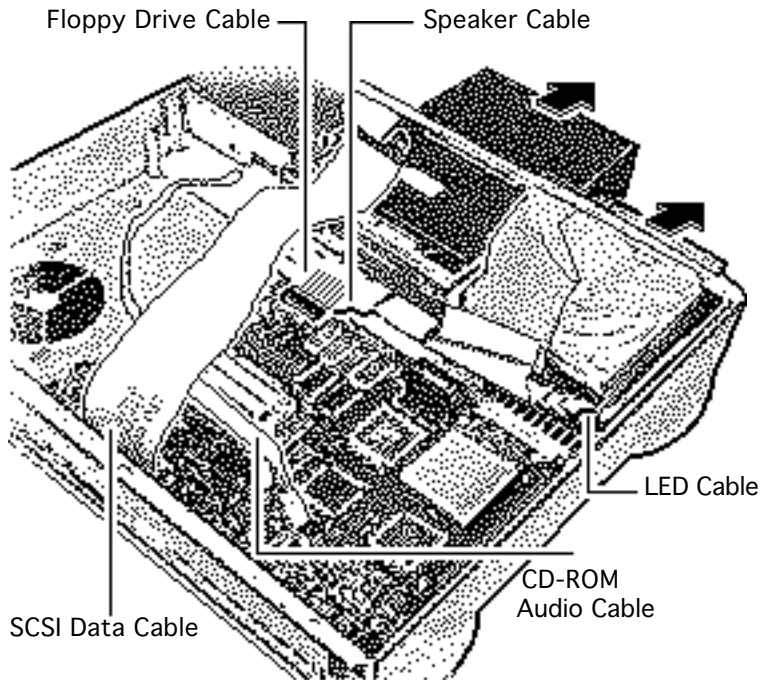
## Logic Board

Before you begin, remove the following:

- Top cover
- Power supply (optional)
- Power Macintosh AV card, if installed (Refer to Expansion Cards in Additional Procedures.)

**Caution:** Review the ESD precautions in Bulletins/ Safety.



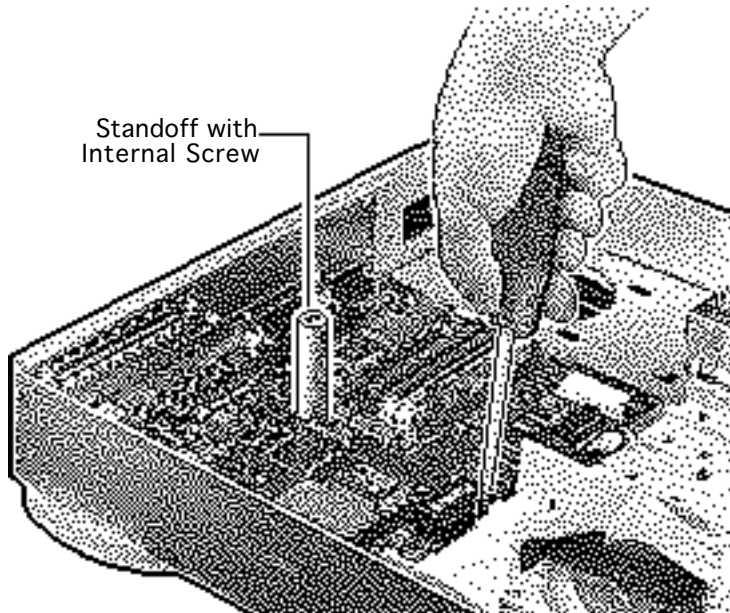


- 1 Disconnect these cables from the logic board:
  - SCSI data cable
  - Speaker cable
  - LED cable
  - CD-ROM audio cable (if present)
  - Floppy drive cable

**Note:** Lift the front edge of the logic board to make removing the floppy drive easier.

- 2 Slide forward the hard drive and CD-ROM drive (if installed).





- 3 **Note:** The logic board is secured with two screws.

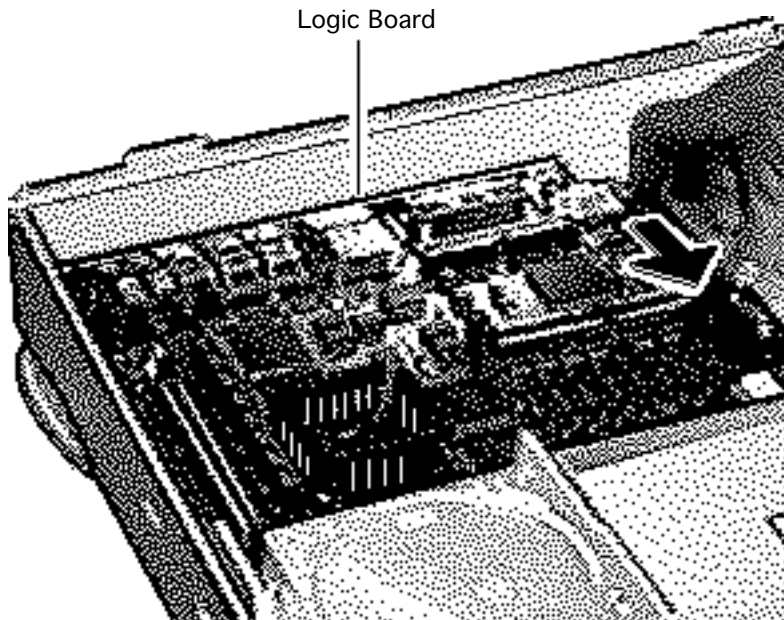
Using a long Phillips screwdriver, remove the screw from the center of the standoff. Remove the standoff.

- 4 Remove the Phillips screw from the front edge of the logic board.
- 5 Remove customer's RAM SIMMs and 256K cache SIMM.

**Note:** Do **not** remove the ROM SIMM.







- 6 Slide the logic board toward the front of the computer. Remove the logic board.

**Replacement Note:** Slide the hard drive and optional CD-ROM drive forward. Connect the floppy drive cable before replacing the logic board.

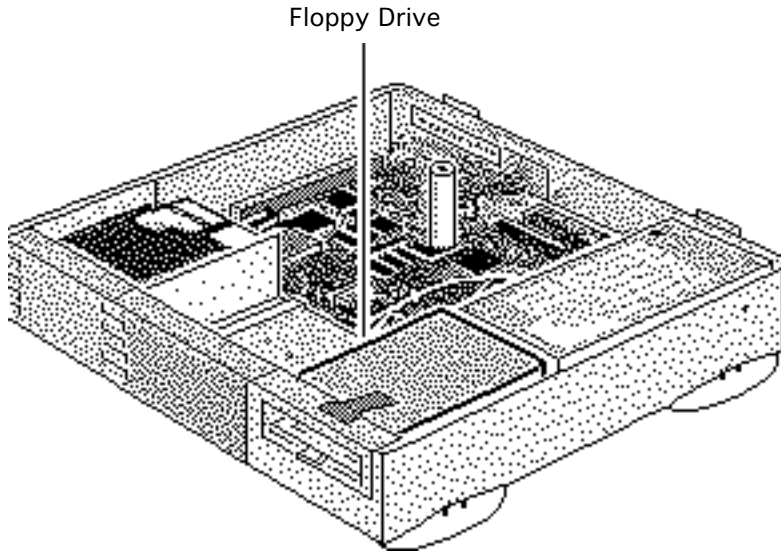




## Floppy Drive

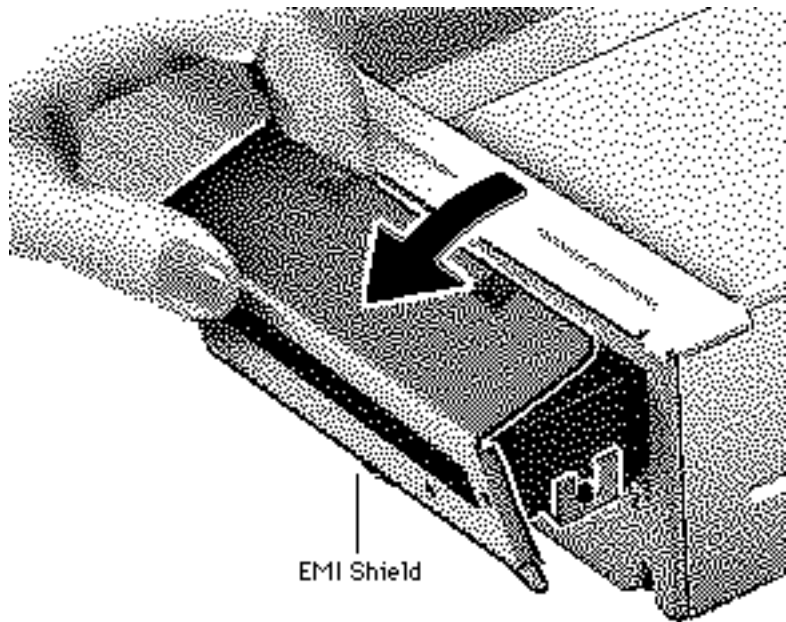
Before you begin, remove the top cover.

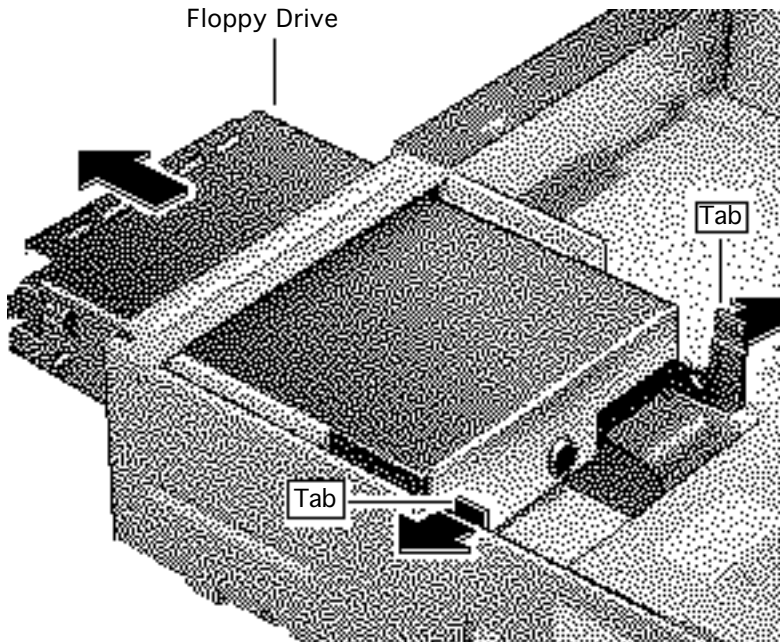
**Caution:** Review the ESD precautions in Bulletins/Safety.





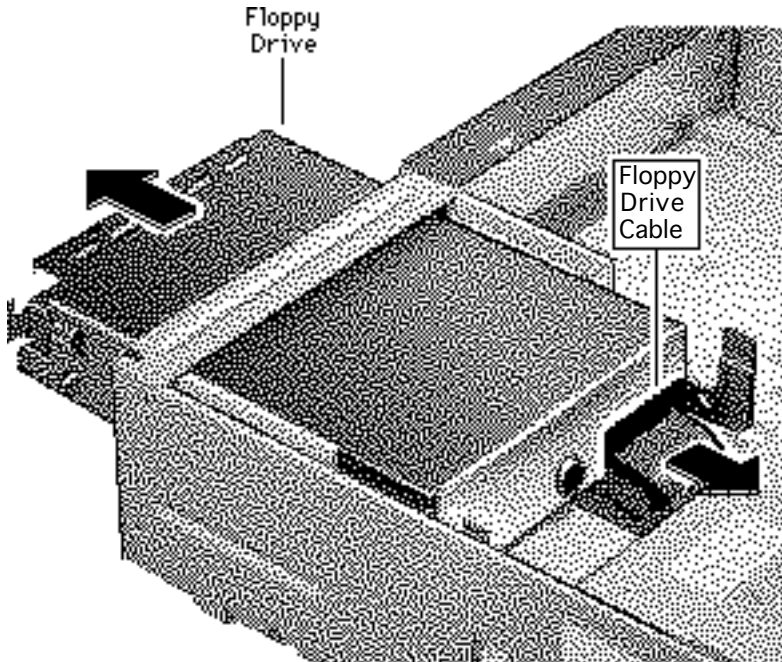
- 1 Remove the EMI shield from the front of the floppy drive.





- 2 Press the tabs outward and slide the floppy drive forward a few inches.





- 3 Disconnect the floppy drive cable.

**Note:** You can easily reach the floppy drive cable connector when the floppy drive is forward.

- 4 Slide out the floppy drive.

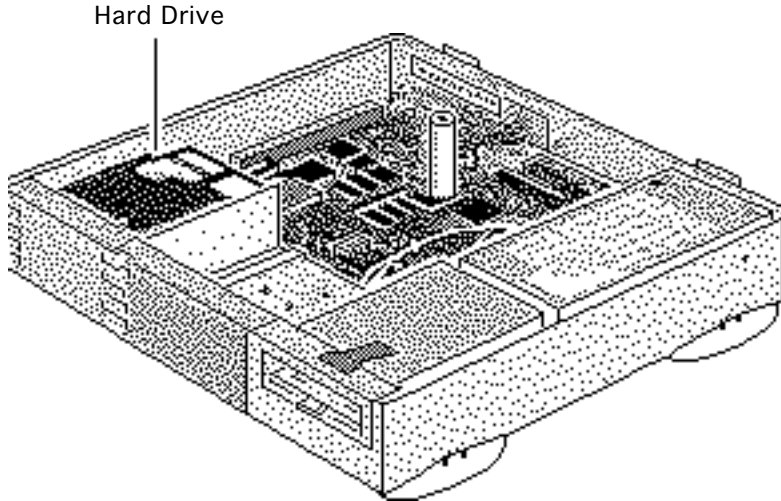




## Hard Drive

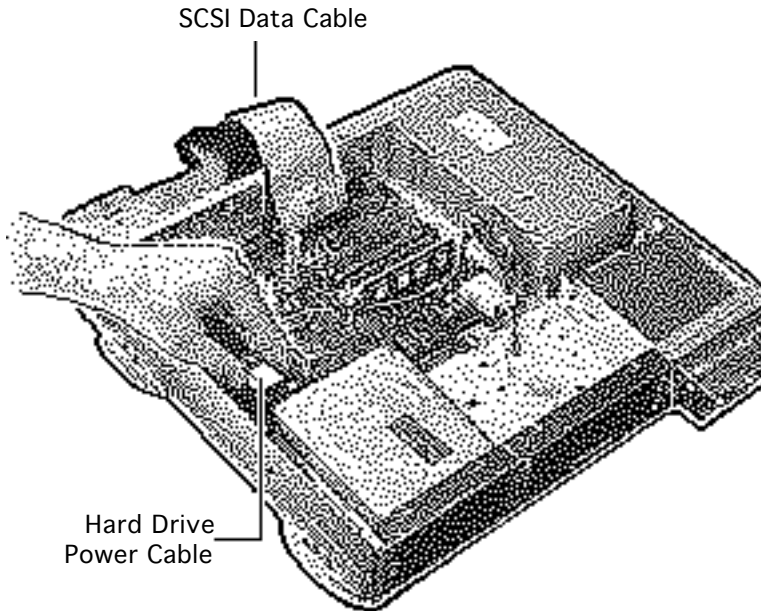
Before you begin, remove the top cover.

**Caution:** Review the ESD precautions in Bulletins/Safety.



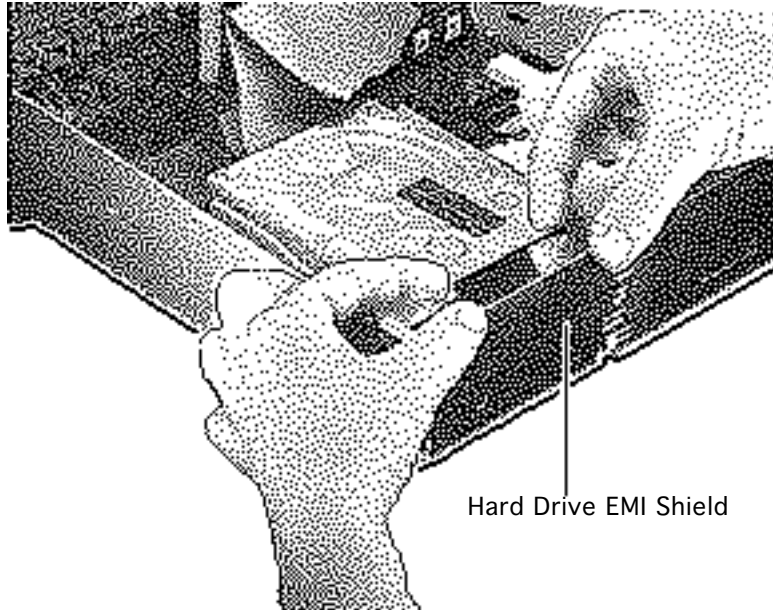


- 1 Disconnect the SCSI data and hard drive power cables from the hard drive.





- 2 Remove the hard drive EMI shield.



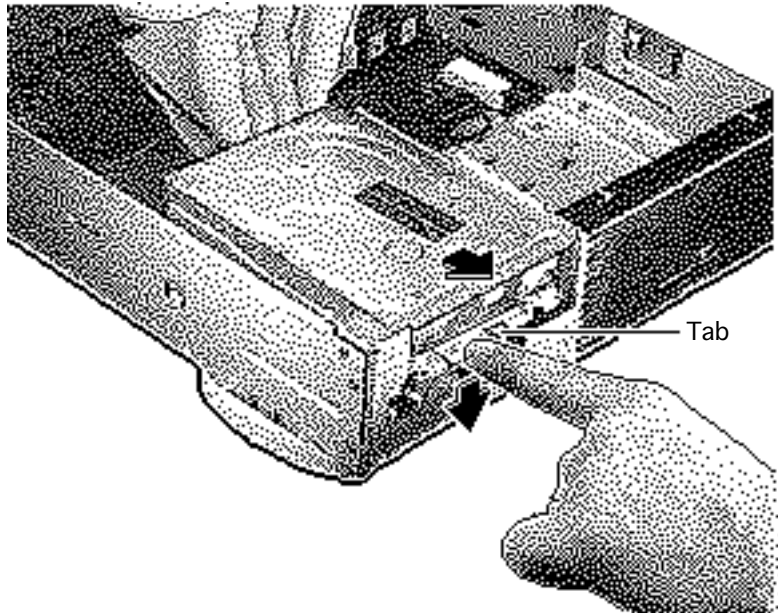
Hard Drive EMI Shield







- 3 Press down on the tab and slide out the hard drive.

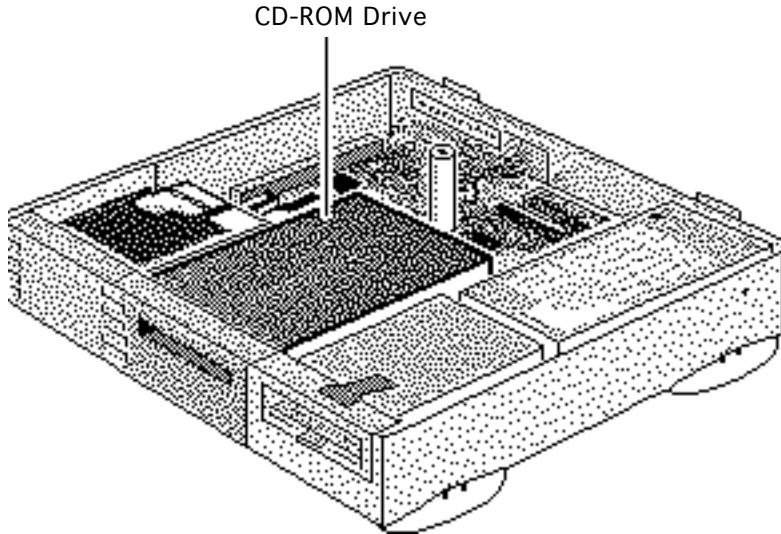




## CD-ROM Drive

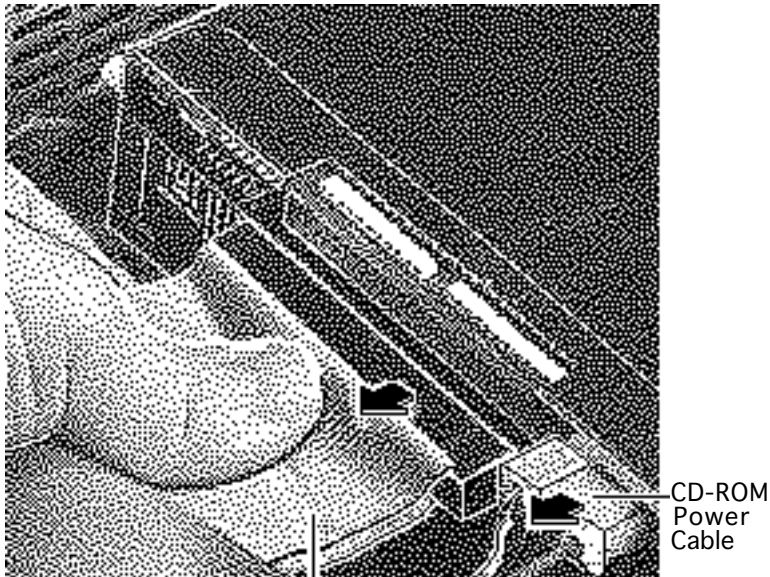
Before you begin, remove the top cover.

**Caution:** Review the ESD precautions in Bulletins/Safety.





- 1 Disconnect the SCSI data cable and CD-ROM drive power cable from the CD-ROM drive.
- 2 Disconnect the CD-ROM audio cable.



SCSI Data Cable

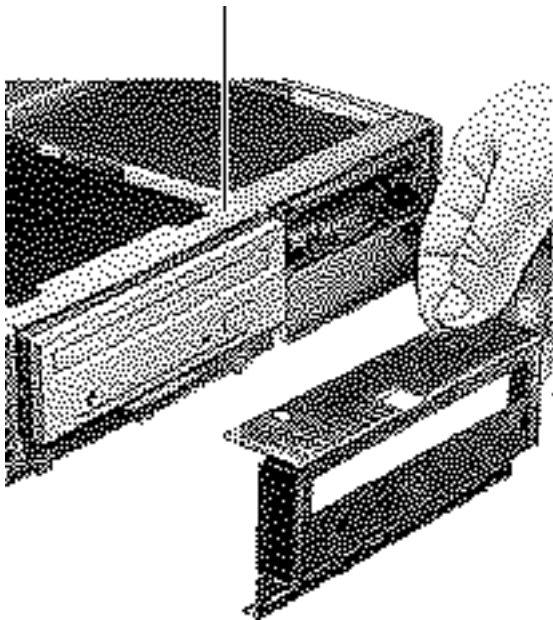
CD-ROM Power Cable





- 3 Remove the CD-ROM drive EMI shield.

Bottom Cover



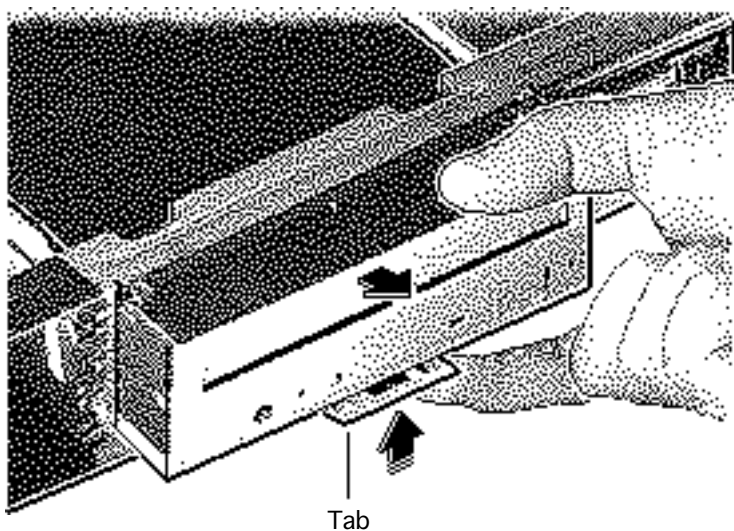
CD-ROM  
EMI Shield





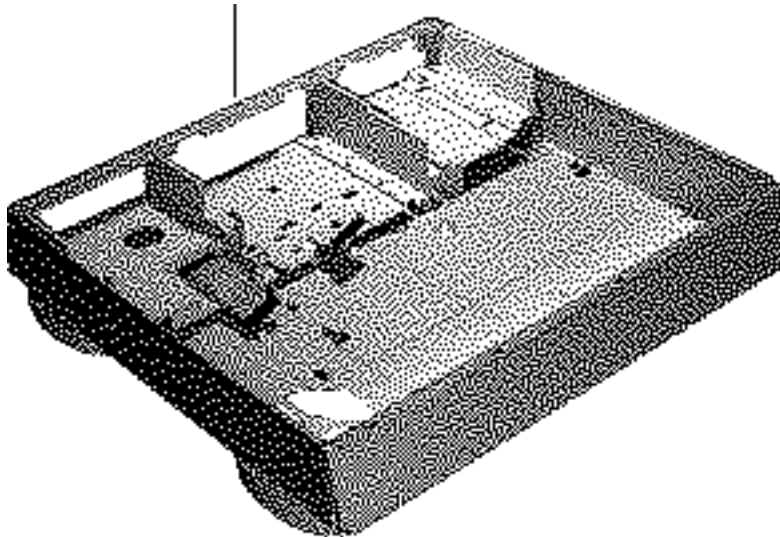
- 4 Press up on the tab and slide out the CD-ROM drive.

**Replacement Note:** Be sure to remove the CD-ROM drive from the carrier prior to returning the drive to Apple.





Bottom Housing Assembly



## Bottom Housing Assembly

Before you begin, remove the following:

- Top cover
- Power supply
- Floppy drive
- Hard drive
- CD-ROM drive (if installed)
- Logic board

**Caution:** Review the ESD precautions in Bulletins/ Safety.





**Note:** Once you have removed all the parts listed above, the bottom housing assembly is what remains. It includes the floppy drive cable, LED cable, speaker, and internal chassis.



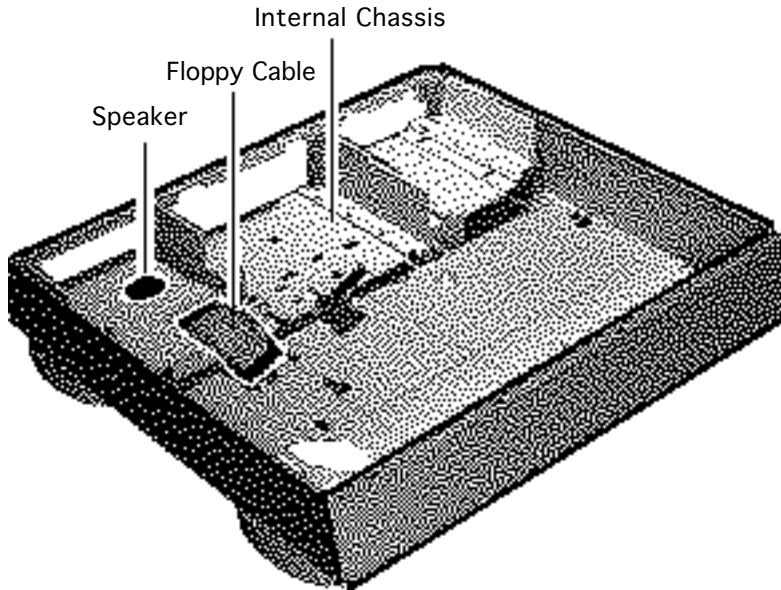


## Speaker and Floppy Cable

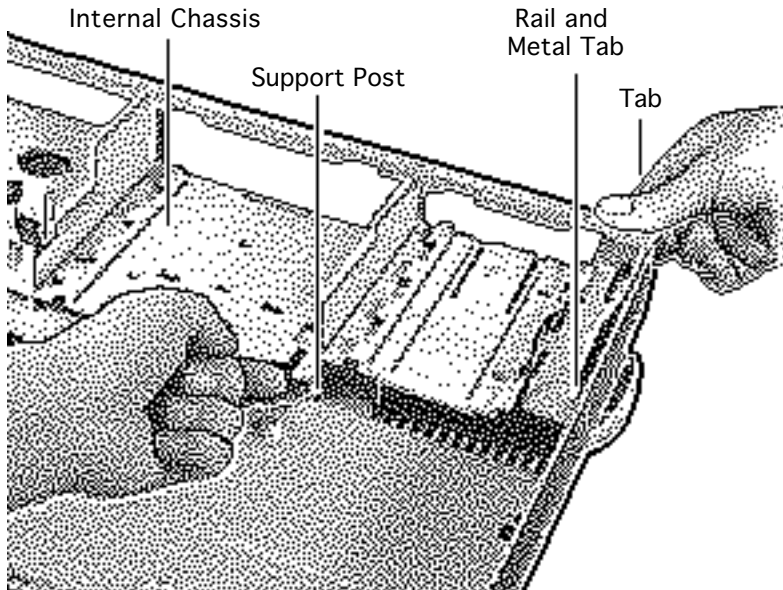
Before you begin, remove the following:

- Top cover
- Power supply
- Floppy drive
- Hard drive
- CD-ROM drive (if installed)
- Logic board

**Caution:** Review the ESD precautions in Bulletins/ Safety.







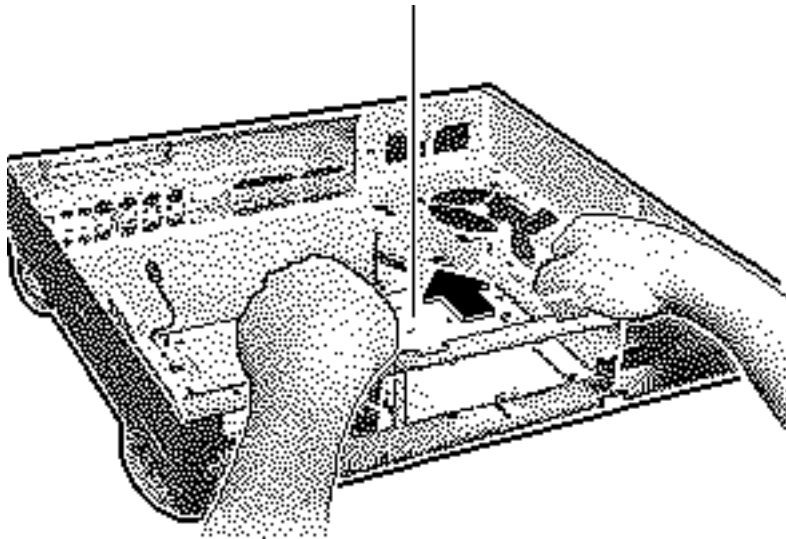
**Note:** The chassis is secured to the bottom cover by two tabs at the front of the unit, two rail and tab sets at the sides of the unit, support posts at the back of the chassis, and hidden brackets that slide into the bottom cover.

- 1 Press up on one of the front tabs while lifting the support post.
- 2 Repeat this step on the other side until the internal chassis slides easily toward the back of the computer.



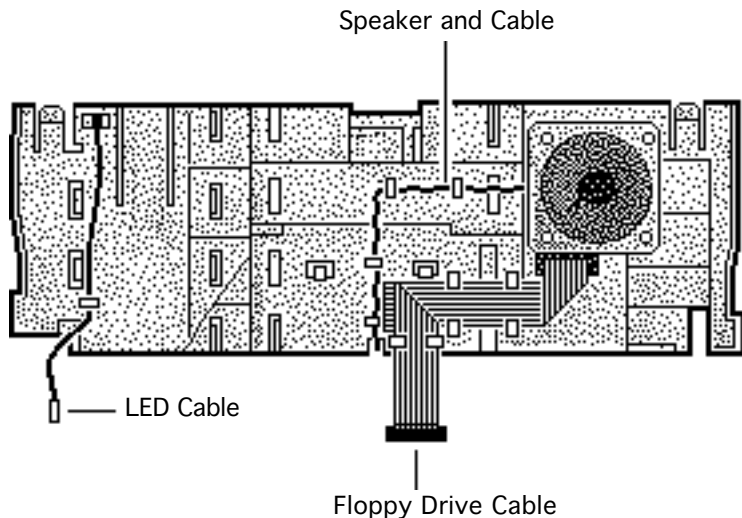


Internal Chassis



- 3 Press down and slide the chassis toward the back of the computer.
- 4 Remove the chassis.

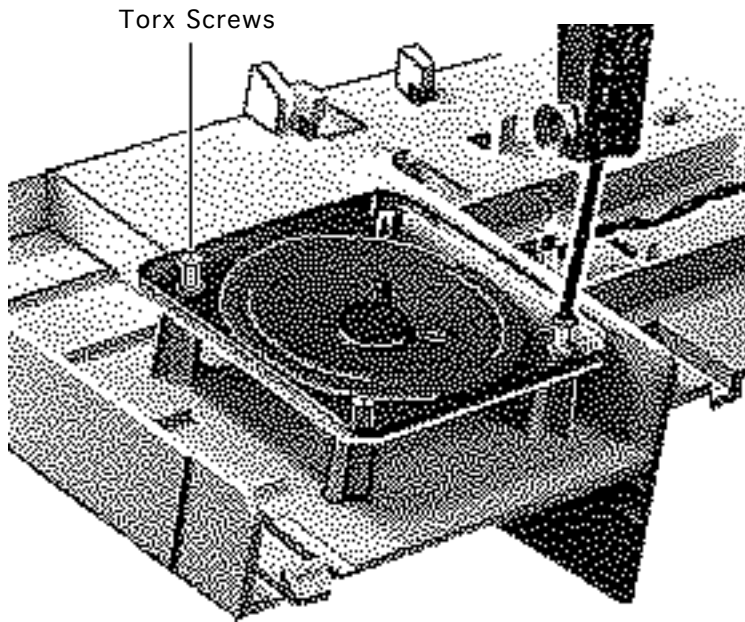




**Note:** The LED cable, floppy drive cable and speaker are part of the internal chassis assembly.

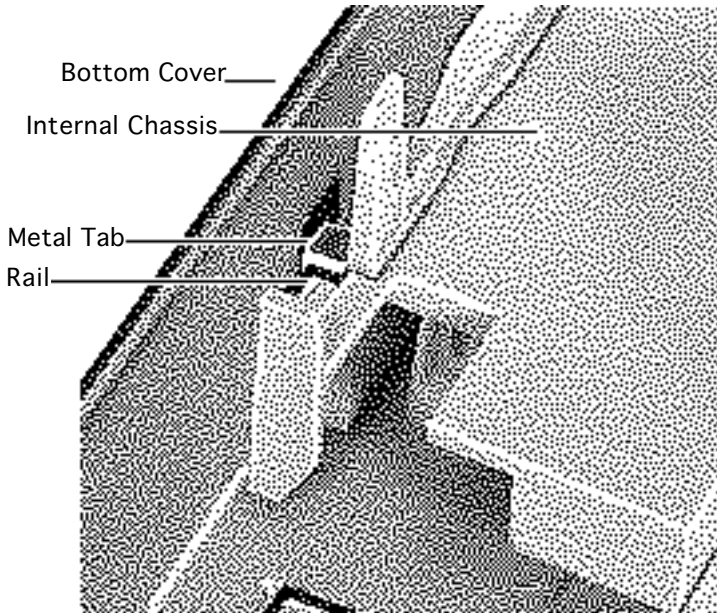
- 5 Turn the chassis over.
- 6 Remove the floppy drive cable and the LED cable.





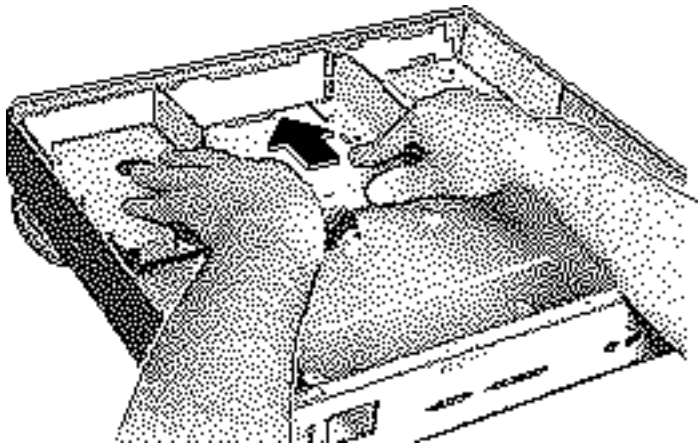
- 7 Remove the two torx screws from the speaker.
- 8 Remove the speaker cable from its routing guides.
- 9 Lift out the speaker.





**Replacement Note:** To replace the chassis, carefully slide rails at the side of the chassis under the metal tabs.





**Replacement Note:** After carefully aligning the side rails, push down firmly on the chassis and slide it toward the front of the unit. The tabs will snap in place.





## Upgrades

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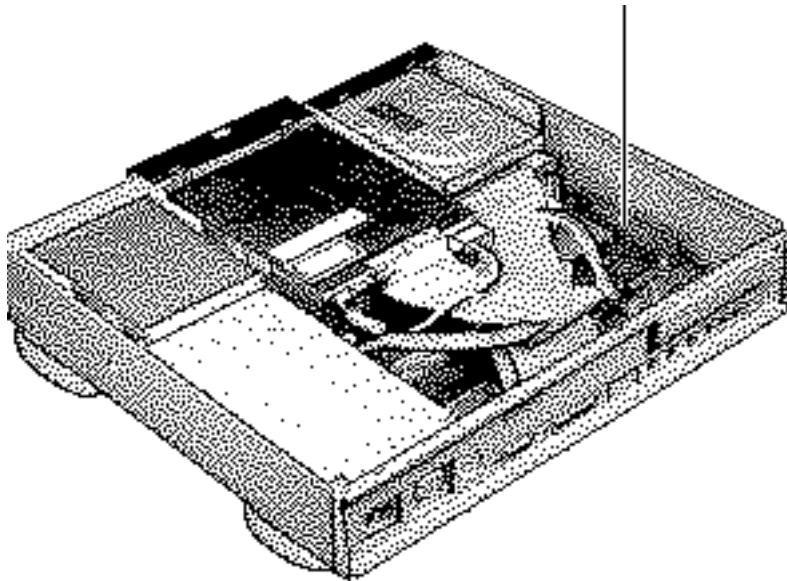
Macintosh Performa 6100 Series





## Expansion Cards

Expansion Card Slot



Before you begin, remove the following:

- Top cover
- SCSI hard drive cable

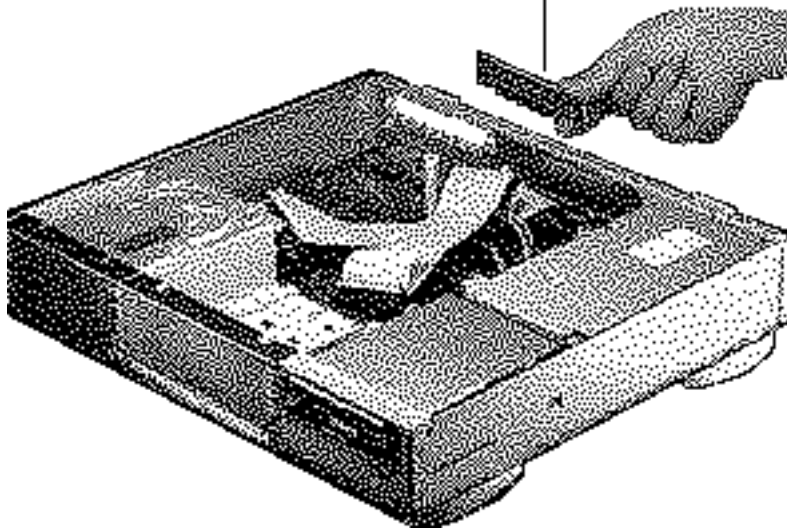
**Caution:** Review the ESD precautions in Bulletins/Safety.







Expansion Port  
Cover

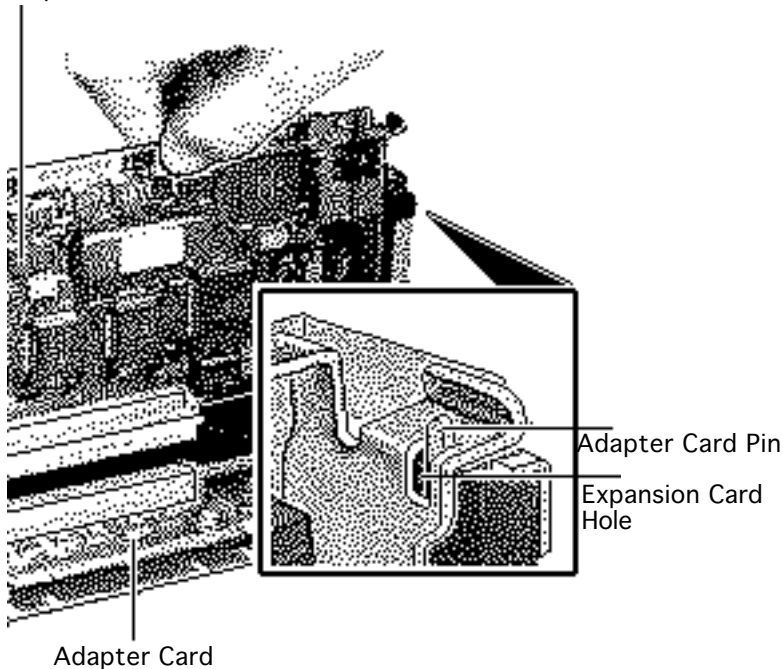


- 1 Remove the expansion port cover from the back panel.





## Expansion Card



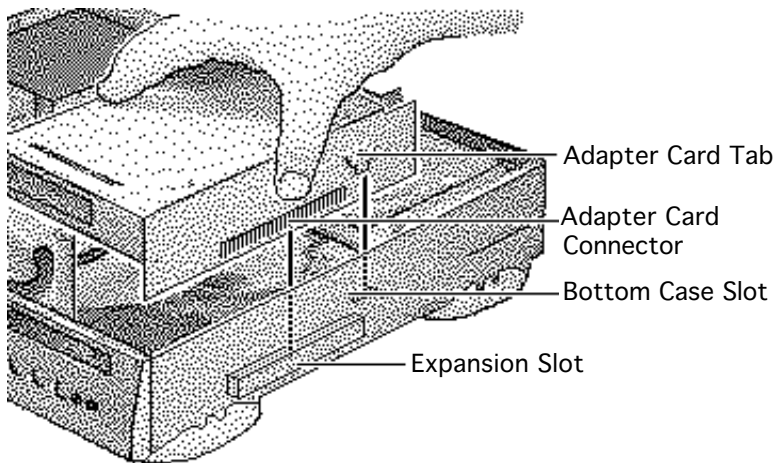
- 2 Loosely connect the expansion card connector to the adapter card connector.
- Note:** Be sure to fit the adapter card pin into the expansion card hole.
- 3 Gently press the connectors together.

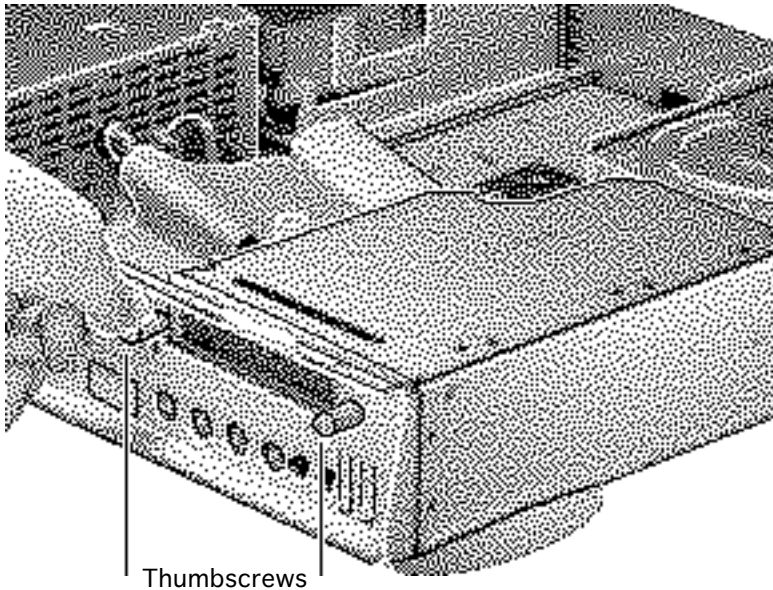




- 4 Insert the connector on the bottom of the adapter card into the expansion slot.

**Note:** Make sure that the tab on the side of the adapter card slides into the slot on the side of the bottom case.





- 5 Attach the thumbscrews.
- 6 Reconnect the SCSI hard drive cable making sure you run the cable over the expansion card.





Exploded View

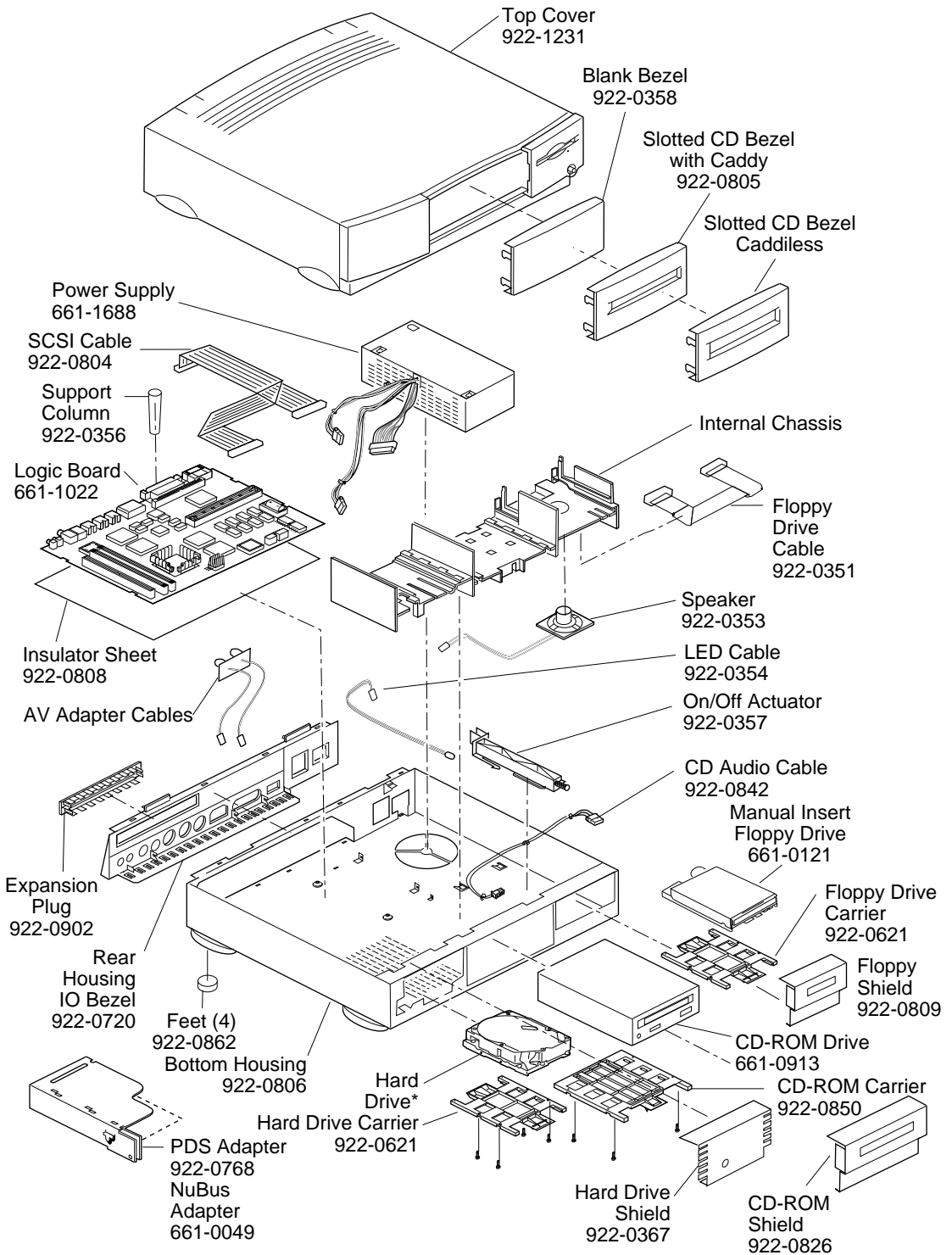
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# Exploded View



**Product family configurations may vary. For parts with asterisk, refer to parts list.**

