



Performa 6200/6300 Series

Performa 6200, 6205CD, 6214CD, 6216CD, 6218CD,
6220CD, 6230CD, 6290,
6300CD, 6320, 6320CD, 6360





Basics

Performa 6200/6300 Series





General Information

Overview

The Macintosh Performa 6200 and 6300 Series computers feature the PowerPC 603 processor and include slots for

- Video-in card
- LC-processor-direct slot (LC-PDS) card (not on Performa 6360)
- Ethernet or modem card
- Peripheral component interconnect (PCI) card (Performa 6360)

The 6200 Series computers ship with an IDE hard drive, an internal 14.4 Global Village modem, and a 600i CD-ROM drive (optional).





User Controls

User controls include

- Soft power-on control from the keyboard
- Front panel sound-control pushbuttons
- Optional infrared remote control





Internal Expansion Connections

The following expansion slots are included on the logic board:

- DRAM SIMM expansion slot (1 or 2 slots), DRAM DIMM expansion sockets on the Performa 6360
- LC PDS slot (already populated in the LC 630 DOS-Compatible, no PDS slot on 6360)
- PCI slot on the Performa 6360
- Communications slot for modems and Ethernet
- Video-in slot for real-time video display, capture, and overlay

In addition to expansion slots on the logic board, an expansion ribbon connector for an optional TV tuner card also is included. The TV-tuner connector provides NTSC and PAL input from an external TV antenna or cable.





Performa 6320CD and 6300CD

The Performa 6320CD supersedes the Performa 6300CD. The Performa 6320CD has a 603e processor at 120 MHz, while the Performa 6300CD has a 603e processor at 100 MHz. All other hardware features are the same as the 6300CD.





Performa 6360

The Performa 6360 differs from previous models in this computer family with these features:

- PowerPC 603e processor with a 160 MHz processor clock
- 16 MB of DRAM expandable to 136 MB in two DIMM sockets
- PCI expansion slot
- GeoPort-compatible serial ports





Open Transport

Open Transport 1.1 does not work on 6200 or 6300 Series computers. These computers require Open Transport 1.1.1. When version 1.1.1 is installed on these computers, a dialog box may appear indicating that a hardware issue was detected. This message means that Open Transport can't be installed until the cache/ROM DIMM is replaced.

The required repairs are covered under the Apple Repair Extension Program. The models included in this program are Macintosh Performa 6200, 6205, 6214, 6216, 6218, 6220, 6230, 6290, and 6300. Look for repair program instructions in the REA Procedures chapter.





Processor-Direct Slot (PDS)

The LC-processor direct slot (LC-PDS) is compatible with the PDS in the Macintosh LC family of computers, but it is not a true PDS. While this expansion slot supports many PDS cards designed to operate with the MC68030 bus, some of those cards do not work. PDS cards designed to interact with the main processor—to provide, for example, a RAM cache or an FPU—will not work in the I/O expansion slot.





Peripheral Component Interconnect (PCI)

The Performa 6360 offers 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).





Video-In Card

The video-in card is an optional card included with the Apple TV/Video System. It allows users to digitize video from the TV tuner, and external composite or S-video input. It accepts NTSC, PAL, or SECAM format video and also provides stereo audio input.





TV Tuner Module

The TV tuner, an optional module included with the Apple TV/Video System, turns the computer into a television receiver. The TV tuner requires the video-in card, which is also included with the Apple TV/Video System.

The TV tuner receives incoming television signals from cable or antenna television input and then sends the information to the video-in card, which converts the data for display on the screen. In the United States, only NTSC is supported, but PAL and SECAM are available internationally.





GeoPort (Performa 6360)

GeoPort is a hardware and software communications architecture that has been optimized for computer-telephony integration. It has the following attributes:

- It allows users to connect any GeoPort-compatible computer 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.





Dual In-Line Memory Modules (DIMMs)

The Performa 6360 uses DRAM Dual In-Line Memory Modules (DIMMs) instead of DRAM Single In-Line Memory Modules (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.

Important: The SIMMs used in previous Macintosh models are **not** compatible with the Performa 6360.





DRAM DIMMs can be installed individually. However, to take advantage of the computer's interleaving capability (which provides maximum performance), you must install the DIMMs in matching pairs. Memory interleaving allows the computer to read or write to its memory while other memory reads or writes are occurring, providing faster performance.

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





Intelligent Device Electronics (IDE) Drive

The internal hard drive uses Intelligent Device Electronics (IDE) technology, commonly used in DOS-compatible systems. The internal IDE hard drive functions the same as a typical SCSI hard drive. You must replace IDE drives like-for-like.

The IDE drive does not affect SCSI ID selections or SCSI-termination schemes. Seven external SCSI devices may be daisy-chained through the external SCSI port.





Plastic Panel Design

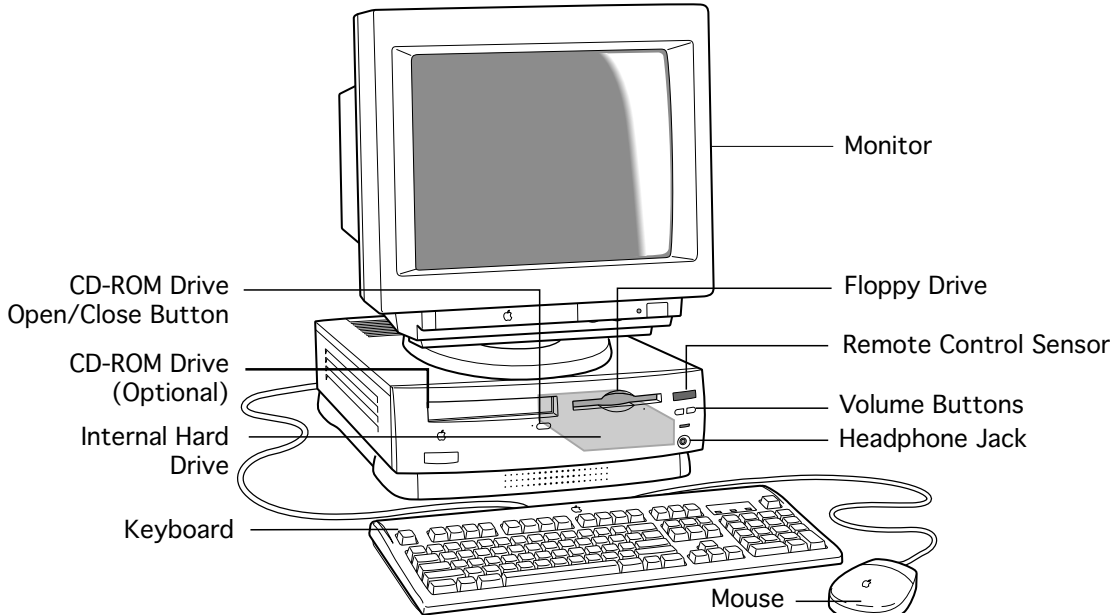
The computer is designed for easy service. Plastic panels cover the metal bottom case, the metal top cover shield, and the left, right, and rear sides of the metal case.

To service the logic board, remove the rear plastic panel and slide out the logic board. To access the drives, remove the front plastic panel.



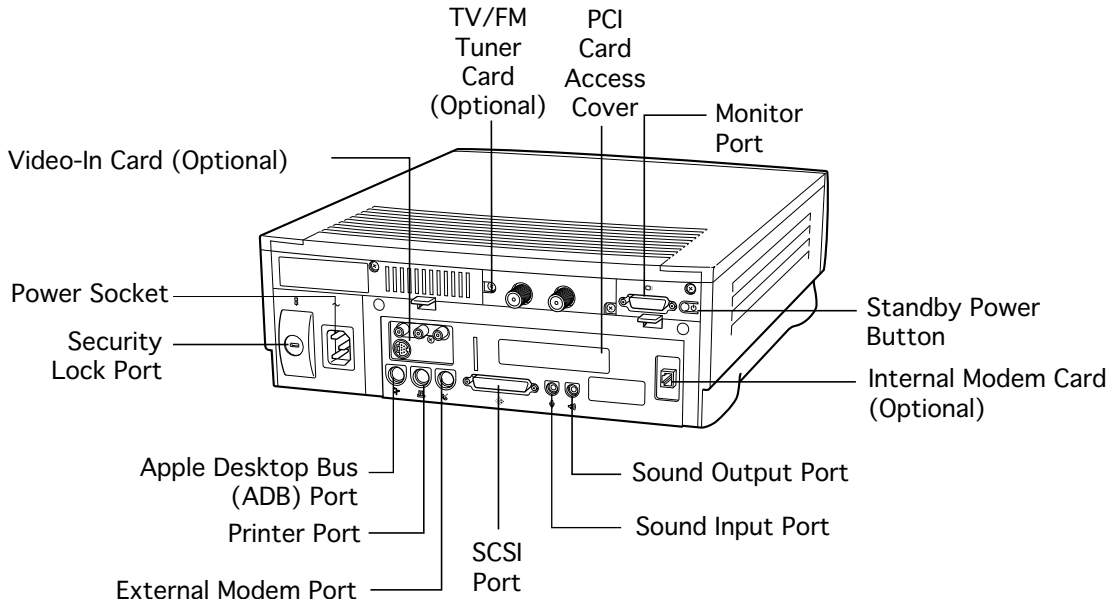


Front View



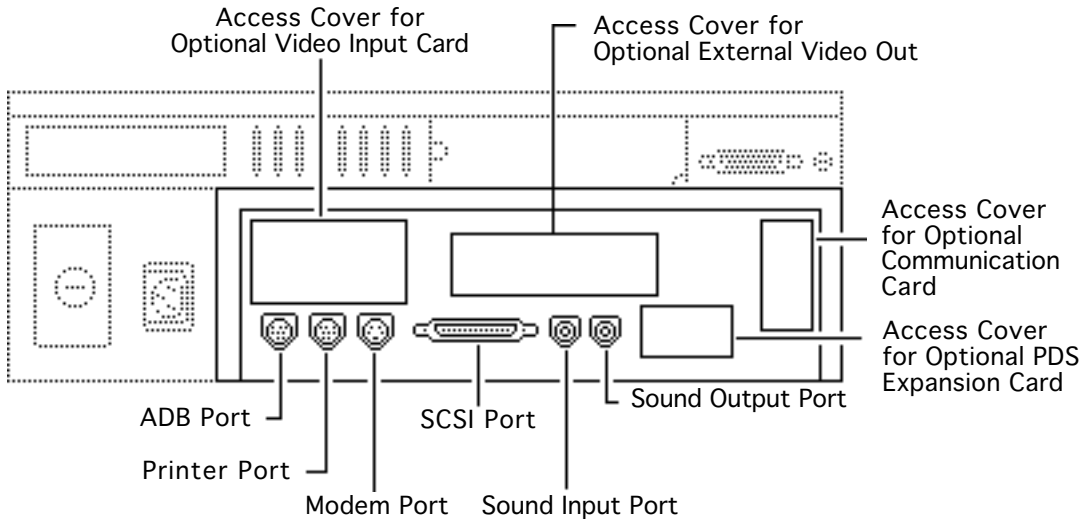


Performa 6360 Rear View





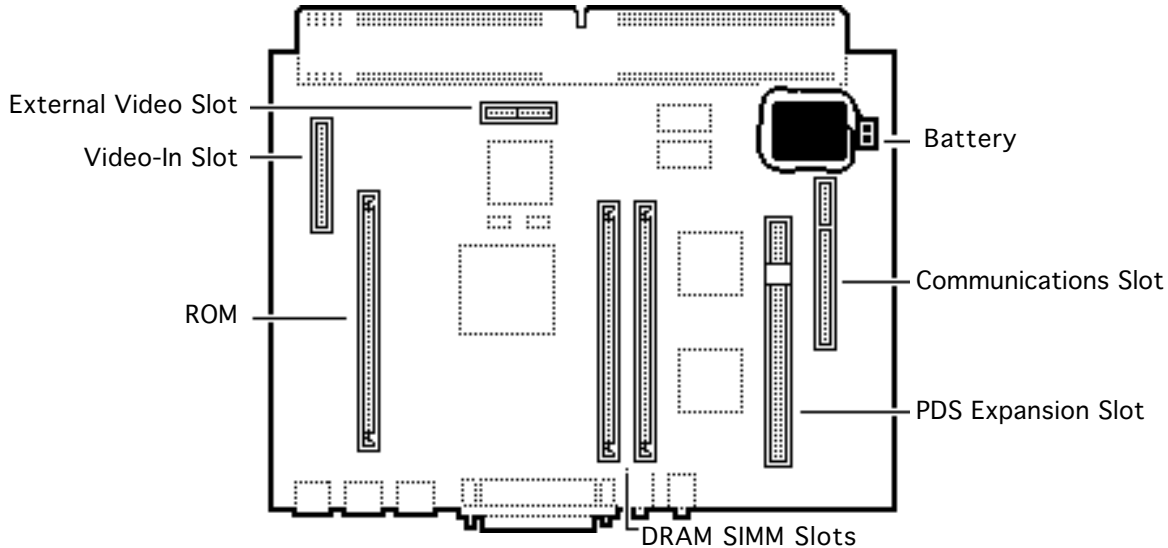
I/O Door Diagram

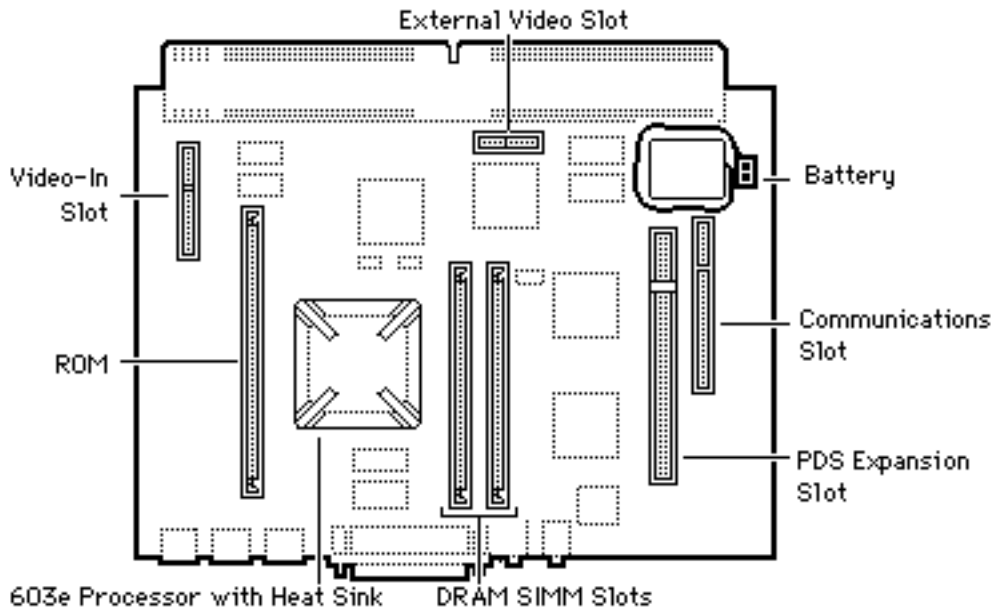




Logic Board Diagrams

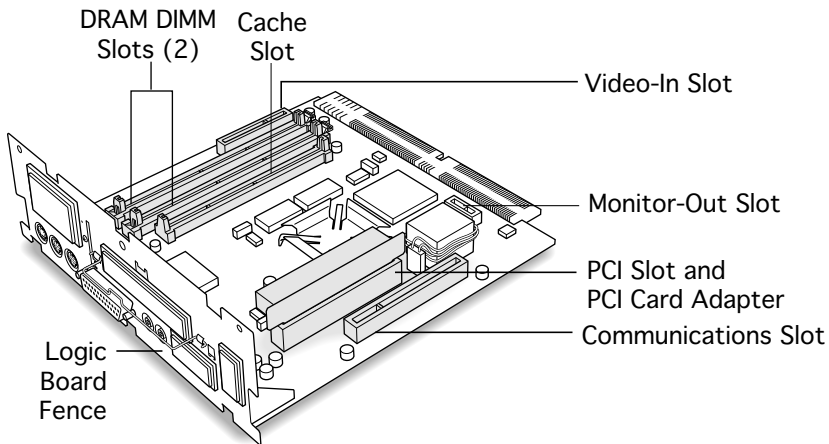
Performa 6200 Series



**Performa 6300 (except 6360)**

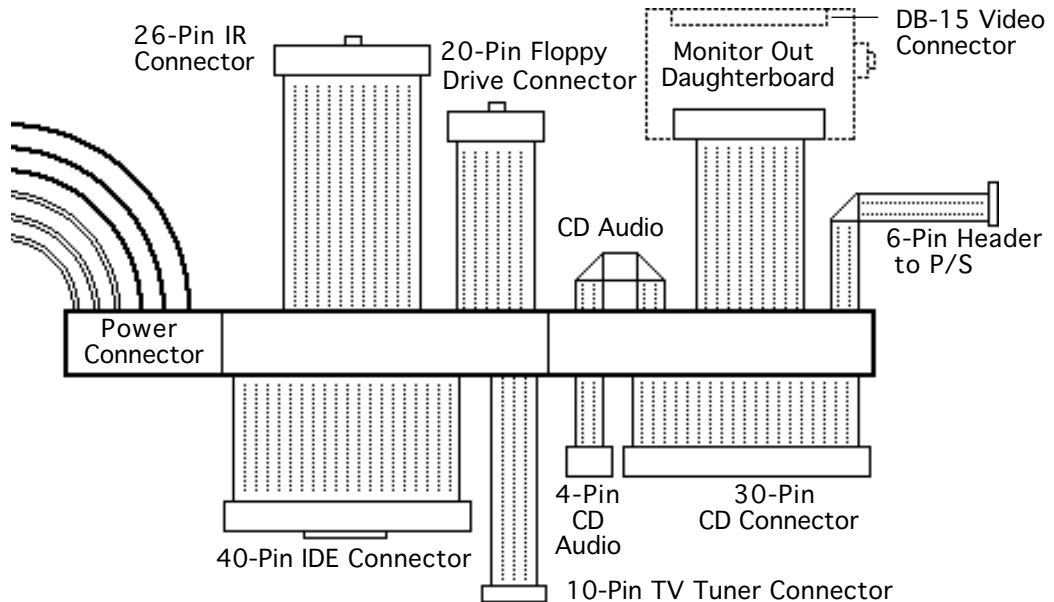


Performa 6360





Shield/Wiring Harness





Specifications

Performa 6200/6300 Series





Processor

Performa 6200

PowerPC 603 processor
75 MHz

**Performa 6290 and
6300**

PowerPC 603e processor
100 MHz

Performa 6320CD

PowerPC 603e processor
120 MHz

Performa 6360

PowerPC 603e processor
160 MHz

Addressing

64-bit PowerPC bus





Memory

DRAM

Performa 6200 Series

8 MB DRAM, minimum, in one SIMM slot
Expandable to 64 MB in two SIMM slots (72-pin, 80 ns or faster SIMMs)

Performa 6300 Series (except 6360)

16 MB DRAM
Expandable to 64 MB in two SIMM slots (72-pin, 80 ns or faster SIMMs)

Performa 6360

16 MB DRAM
Expandable to 136 MB in two sockets (168-pin, 70 ns or faster DIMMs)





DRAM Frame Buffer 1 MB DRAM on board, for video support

ROM 4 MB

Cache Memory 256K Level 2





Disk Storage

Floppy Drive

1.4 MB Apple SuperDrive manual insert drive

CD-ROM Drive

Optional Apple 600i Plus CD-ROM drive

Performa 6360/160

8X CD-ROM

Hard Drive

1 GB IDE

Performa 6360/160

1.2 GB IDE





I/O Interfaces

Serial

**6200 and 6300 Series
(except 6360)** Two RS-232/422 serial ports; mini DIN-8 connectors

Performa 6360 Two RS-232/RS-422 serial GeoPort-compatible ports

SCSI One external SCSI port; DB-25 connector
Supports up to seven SCSI devices

Apple Desktop Bus One Apple Desktop Bus (ADB) port; mini DIN-4 connector





Sound Input

6200 and 6300 Series

Sound-input port for microphone or line input

Note: The port accepts stereophonic input, but sound is combined into monophonic sound for play-through or recording.

Performa 6360

One sound input port for stereo sound input





Sound Output

6200 and 6300 Series (except 6360)

Two stereophonic sound-output ports, level nominally 0.5 V RMS into 39 ohms (one front headphone jack, one rear stereo mini phone jack)
Internal stereo speakers

Performa 6360

One front headphone jack
One rear sound output port for line-level devices
One built-in speaker

External Video Connector

One DB-15 mirror video-out connector using optional video connector kit; this feature provides “mirroring” (or display of the system monitor screen on a presentation screen)

Note: The external video display is presentation only. It cannot be manipulated directly by mouse or other input signals.





Video-in Slot	One 60-pin video-in slot for optional expansion card providing real-time video display, capture, and overlay
TV Tuner	One 10-pin port for optional TV tuner card
Processor-Direct Slot (PDS) not on 6360	One 96/114-pin internal expansion slot for LC-compatible processor-direct card
Peripheral Component Interconnect (PCI) on Performa 6360	One internal expansion slot supporting 6.88-inch PCI expansion cards
Communications Slot	One 112-pin internal expansion slot for modem or Ethernet card Performa 6205CD is bundled with the 28.8 baud modem





Controls

Soft power-on control from keyboard

Front panel pushbutton control for sound volume

Infrared remote control





I/O Devices

Keyboard

AppleDesign, Apple Extended Keyboard II (other ADB keyboards supported)

Mouse

ADB Mouse II
Mechanical tracking, optical shaft, or contact encoding

Microphone

Integrated microphone for monophonic sound input

Speaker

Integrated stereo speakers capable of delivering 16-bit stereo sound





Sound and Video

Sound

6200 and 6300 Series (except 6360)

Records at 11 kHz or 22 kHz sample rate

Plays back at 22 kHz sample rate

Two speakers with enhanced stereo sound

Allows playback and recording of ordinary audio compact discs

16-bit monophonic sound input

16-bit stereophonic sound output (16-bit CD stereophonic playback), level nominally 0.5 V RMS into 39 ohms

Sound-input port for microphone or line input; accepts stereophonic input, but sound is combined into monophonic sound for play-through or recording

Two stereophonic sound output ports, level nominally 0.5 V RMS into 39 ohms

Internal speaker muted when a plug is inserted into an output jack





Sound

Performa 6360

Sample rates of 11.025, 22.05, and 44.1 kHz

16-bit stereophonic input

16-bit stereophonic output featuring SRS 3D Surround Sound technology

Sound-input connector line level 2 Vpp maximum, into 10 kilohms impedance

Sound-output connector line level 2 Vpp maximum, into 32 ohms impedance

Video Screen (not on Performa 6360/160)

15-inch 0.28 mm dot-pitch cathode-ray tube (CRT)





Video Resolution

6200 and 6300 Series (except 6360)

640 x 480 resolution with 16-bit color at 67 Hz or 60 Hz (VGA)
800 x 600 resolution with 8-bit color at 60 Hz or 72 Hz (VGA)
832 x 624 resolution with 8-bit color at 75 Hz (does not support video input)

Performa 6360

640 x 480 resolution with 16-bit color at 60 Hz or 67 Hz
800 x 600 resolution with 16-bit color at 60 Hz (supports video input at 8-bit or less color depth)
800 x 600 resolution with 8-bit color at 72 Hz (does not support video input)
832 x 624 resolution with 8-bit color at 75 Hz
1024 x 768 resolution with 8-bit color at 60 Hz or 70 Hz (does not support video input)





Video Mirroring

With the external video connector kit, the Macintosh Performa 6200CD series supports video mirroring on these monitors:

- 640 x 480 resolution: Macintosh 12" Color Display, Apple Color Plus 14" Display, Apple Performa Plus Display, Apple Multiple Scan 15 Display, Apple Multiple Scan 17 Display, and Apple Multiple Scan 20 Display
- 800 x 600 resolution: Apple Multiple Scan 15 Display, Apple Multiple Scan 17 Display, Apple Multiple Scan 20 Display, and SVGA monitors





Electrical

Line Voltage

**6200 and 6300 Series
(except 6360)** 100–240 VAC

Performa 6360 90–270 VAC

Frequency

**6200 and 6300 Series
(except 6360)** 47–63 Hz

Performa 6360 43–67 Hz





Power

**6200 and 6300 Series
(except 6360)**

125 watts

Surge Voltage: 300 V RMS for 100 ms

Peak Inrush Current: 40 A pk

Current: 2.5 A maximum for all line and load conditions

Power: 220 W maximum for all line and load conditions

Performa 6360

150 watts





Physical

Dimensions

Height: 4.3" (10.95 cm)

Width: 16.5" (41.95 cm)

Depth: 12.6" (32 cm)

Weight

Without CD-ROM: 17 lb. (7.7 kg)

With CD-ROM: 19 lb. (8.6 kg)

Weight varies with options





Environmental

Temperature

Operating: 50°–104° F (10°– 40° C)

Transit (72 hours): -40° F to 149° F (-40° C to 65° C)

Storage (6 months): -40° F to 116° F (-40° C to 47° C)

Humidity

6200 and 6300 Series
(except 6360)

Noncondensing, 20–95%

Performa 6360

Noncondensing, 5–95%

Altitude

0–10,000 ft. (0–3,000 m)





Troubleshooting

Performa 6200/6300 Series





General

The Symptom Charts included in this chapter 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 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 the Symptom Charts do not resolve the problem, or if you would like additional information on troubleshooting procedures and practices, refer to the general troubleshooting documents in the Troubleshooting tab.

For additional assistance, contact Apple Technical Support.





Symptom Charts

Error Chords

Eight-tone error chord sounds during startup

- 1 Reseat SIMMs or DIMMs.
- 2 Replace SIMMs or DIMMs.
- 3 Replace logic board. Retain customer's SIMMs or DIMMs.
- 4 Perform SIMM or DIMM verification on replacement logic board.

Four-tone error chord sounds during startup

- 1 Disconnect hard disk drive power cable and restart system. If startup sequence is normal, run "Macintosh Hard Disk Test" and replace hard drive, if necessary.
- 2 Disconnect floppy drive cable and restart system. If startup sequence is normal, replace floppy drive.
- 3 Replace logic board. Retain customer's SIMMs or DIMMs.



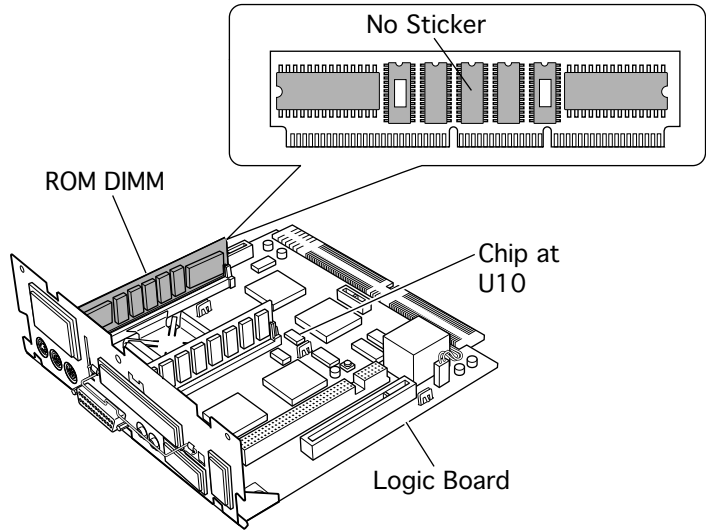


System

System
intermittently
crashes or hangs

- 1 Verify that system software is version 7.5 or later.
- 2 Verify that software is compatible with system.
- 3 If clock chip at U10 is not p/n 343S1191 or 343S1121, replace logic board. (Ignore any letters following part number.)
- 4 If ROM DIMM is laid out **exactly** as shown on next page, and doesn't have a sticker on center chip, replace DIMM.
- 5 If Ethernet card is installed, verify that it is fully seated.
- 6 Check that system has enough memory installed for application.







System

System does not power up

- 1 Reset logic board. Refer to Additional Procedures.
- 2 Replace power supply.
- 3 Replace logic board.

Flashing “?” appears at startup in system with vacant PDS and communications slots

- 1 Diagnose hard drive with Disk First Aid included on Power Macintosh CD ROM.
- 2 Perform repairs and then go to step 4.
- 3 If repairs are impossible, back up drive, reformat with Drive Setup 1.0.3, and then go to step 4.
- 4 Update driver using Drive Setup 1.0.3.
- 5 Perform clean installation of system software.

Menu bar constantly flashes or system constantly beeps.

- 1 Verify that front panel control buttons are not jammed.
- 2 Reseat drive bezel and front control panel board.





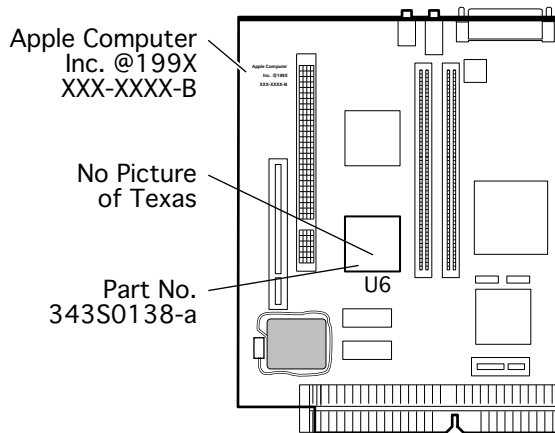
System

Flashing “?”
appears at startup in
system with version
B logic board and card
in PDS or
communications slot

Note: Version “B” logic boards display a “B” at the end of the serial number printed on the board near the communications slot port. (See figure on the next page.)

- 1 Verify that system software is version 7.5 or later.
- 2 If chip at logic board location U6 does not include picture of Texas and is p/n 343S0138-a, and there is no wire at U27 on underside of board, replace logic board.







Flashing ? appears at startup in system with 1.2 GB hard drive, and is corrected with a restart.

- 1 Use the 1.2 GB Firmware Utility 1.1 to check the firmware version of your drive. Refer to the [Tech Info Library, article 22102](#) for additional information on this utility.
- 2 Remove the 1.2 GB hard drive and look at the serial number. The serial number is on a white label under the bar code, and follows this line of print: 1.2GB, LAPZA, 655-0397
- 3 If the serial number does **not** end with a "C" replace the 1.2 GB hard drive under the Apple Limited Warranty.

Flashing ? appears at startup in 6360 with 1.6 GB ATA hard drive (p/n 661-1107), and may be corrected with restart.

- 1 Be sure system software is not corrupted. See the Software Troubleshooting document in the HW-SW Procedures topic under the Troubleshooting tab on the Service Source CD startup screen.
- 2 Remove the 1.6 GB ATA hard drive and look at the serial number on the bar code label.
- 3 If serial number is within range XXX**6 0 9 9** XXXXX to XXX**6 1 3 1** XXXXX, replace hard drive.





Audio

Crackling noise is present when you play sounds other than system beeps and you are not in “play through” mode

- 1 If static noise varies when adjusting volume by the Sound control panel, use Audio Volume Extension 1.1 or later. Note: Audio Volume Extension is available from standard Apple software update sites.
- 2 Replace logic board.

Sound distortion with MPEG board installed

Replace MPEG board with modified MPEG board. A modified board should have a jumper present from U5 Pin 2 to D1 Pin 1.





Video

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

- 1 Confirm that video connections are secure.
- 2 Confirm that monitor-out daughterboard connection on the fan bracket is secure.
- 3 Reseat logic board.
- 4 Perform monitor adjustments.
- 5 Replace monitor.
- 6 Replace logic board. Retain customer's SIMMs or DIMMs.
- 7 Replace power supply.

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

- 1 Reseat logic board.
- 2 Remove expansion card, if present.
- 3 Remove peripherals.
- 4 Replace SIMMs.
- 5 Replace logic board. Retain customer's SIMMs or DIMMs.
- 6 Replace power supply.





Video

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

- 1 Reseat logic board.
- 2 Replace fan/video card bracket.
- 3 Replace monitor.
- 4 Replace logic board. Retain customer's SIMMs or DIMMs.





Video

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

- 1 Check all external power connections.
- 2 Computer powers on exclusively through softpower on keyboard. Verify that power-on connections of keyboard are functioning by testing with known-good keyboard.
- 3 Reseat logic board.
- 4 Unplug 4.5 V battery, wait 20 seconds, plug in battery, and restart computer.
- 5 Verify that monitor has power.
- 6 Remove expansion card, if present.
- 7 Remove peripherals.
- 8 Replace power supply.
- 9 Replace logic board. Retain customer's SIMMs or DIMMs.





Video

Vertical lines, horizontal lines, or snow appears on screen, or screen is completely dark; startup tone is normal

- 1 Perform monitor adjustments.
- 2 Replace monitor.
- 3 Replace logic board. Retain customer's SIMMs or DIMMs.
- 4 Replace power supply.

Video will not play or system hangs when you attempt to run video in units with MPEG card

- 1 If chip at location U12 on MPEG card displays number 341SO205, check all connections.
- 2 If chip at location U12 on MPEG card does not display number 341SO205, replace MPEG card





Floppy Drive

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

- 1 Reseat logic board.
- 2 Replace floppy drive.
- 3 Replace shield/wiring harness.
- 4 Replace logic board. Retain customer's SIMMs or DIMMs.

Disk ejects; display shows Macintosh icon with blinking "X"

- 1 Replace disk with known-good system disk.
- 2 Replace floppy drive cable.
- 3 Replace floppy drive.
- 4 Replace logic board. Retain customer's SIMMs or DIMMs.

Disk does not eject

- 1 Switch off system and hold down mouse button while switching on system again.
- 2 Eject disk manually by pushing opened paper clip into hole on right side of drive slot.
- 3 Replace floppy drive cable.
- 4 Replace floppy drive.





Floppy Drive

Drive attempts to eject disk, but doesn't

- 1 Switch off system and hold down mouse button while switching on system again.
- 2 Eject disk manually by pushing opened paper clip into hole on right side of drive slot.
- 3 Replace floppy drive cable.
- 4 Replace floppy drive.





Hard Drive

Internal hard drive runs continuously

- 1 Make sure System is version 7.1.2 or later.
- 2 Replace hard drive cable.
- 3 Replace internal hard drive.
- 4 Replace logic board. Retain customer's SIMMs or DIMMs.

Internal hard drive does not operate

- 1 Confirm that all hard drive connections are secure.
- 2 Reseat logic board.
- 3 Replace internal IDE hard drive.
- 4 Replace shield/wiring harness chassis.
- 5 Replace logic board. Retain customer's SIMMs or DIMMs.

Hard drive not found when booted from CD-ROM drive.

Use Drive Setup 1.0.3.





CD-ROM drive

CD-ROM drive does not accept disc

- 1 Replace disc if dirty or damaged.
- 2 Reseat CD-ROM drive.
- 3 Replace CD-ROM drive.

Volume control does not operate correctly

- 1 Check Control Panel Sound setting.
- 2 Check front panel controls.
- 3 Reseat front panel control board.
- 4 Replace shield/wiring harness chassis.

Macintosh cannot mount CD-ROM drive

- 1 Reseat CD-ROM drive.
- 2 Check SCSI ID setting. Internal CD-ROM drive was originally set at "3" at the factory.
- 3 Replace CD-ROM drive.





CD-ROM drive

CD Plus (CD+) format CD-ROM disc causes stuttering sound, and may not mount.

Replace CD-ROM drive.





Peripheral

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

- 1 Verify that SCSI select switch on external device is set to different priority from internal CD-ROM drive.
- 2 Verify that both ends of external SCSI device are terminated.
- 3 Replace terminator on external device.
- 4 Verify that terminator is installed on internal SCSI drive.
- 5 Replace SCSI select cable (on external SCSI device).

Doesn't recognize SCSI device

- 1 Check for proper SCSI termination.
- 2 Check that the SCSI cable is good and firmly connected.
- 3 Check the SCSI device manual for required software.
- 4 If repairing a Power Macintosh 6360, use the 6360/64xx/54xx Update disk to correct a possible SCSI timing problem.





Peripheral

Cursor does not move

- 1 Restart system.
- 2 Check mouse connection.
- 3 If mouse was connected to keyboard, connect mouse to rear ADB port and disconnect keyboard. If mouse works, replace keyboard.
- 4 If mouse does not work in ADB port, replace mouse.
- 5 Reseat logic board.
- 6 Replace logic board. Retain customer's SIMMs or DIMMs.

Cursor moves, but clicking mouse button has no effect

- 1 Replace mouse.
- 2 Reseat logic board.
- 3 Replace logic board. Retain customer's SIMMs or DIMMs.





Peripheral

Double-click doesn't open application, disk, or server

- 1 Remove extra system files on hard drive.
- 2 Check mouse speed on Mouse control panel.
- 3 Unplug 4.5 V battery, wait 20 seconds, plug in battery, and restart computer.
- 4 If mouse was connected to keyboard, connect mouse to rear ADB port and disconnect keyboard. If mouse works, replace keyboard.
- 5 If mouse does not work in ADB port, replace mouse.
- 6 Replace logic board. Retain customer's SIMMs or DIMMs.

No response to any key on keyboard

- 1 Make sure System is version 7.1.2 or later.
- 2 Check keyboard connection to ADB port.
- 3 Replace keyboard.
- 4 Reseat logic board.
- 5 Replace logic board. Retain customer's SIMMs or DIMMs.





Peripheral

Known-good
ImageWriter or
ImageWriter II does
not print

- 1 Make sure that Chooser and Control Panel settings are correct.
- 2 Make sure System is version 7.1.2 or later.
- 3 Check printer DIP switches.
- 4 Replace printer-interface cable.
- 5 Replace logic board. Retain customer's SIMMs or DIMMs.

Known-good
LaserWriter does not
print

- 1 Make sure that Chooser and Control Panel settings are correct.
- 2 Make sure System is version 7.1.2 or later.





Miscellaneous

Rattling sound at startup in system with Apple External Video Connector

Press or fold the Apple External Video cable to prevent it from contacting the fan blades.

Headphone jack does not operate correctly

- 1 Verify that headphone jack is seated properly.
- 2 Replace front panel control board.
- 3 Replace chassis/wiring harness.

System with internal modem unable to recognize graphics or Ethernet card in communications slot

- 1 Replace internal modem
- 2 Replace graphics or Ethernet card.





Take Apart

Performa 6200/6300 Series

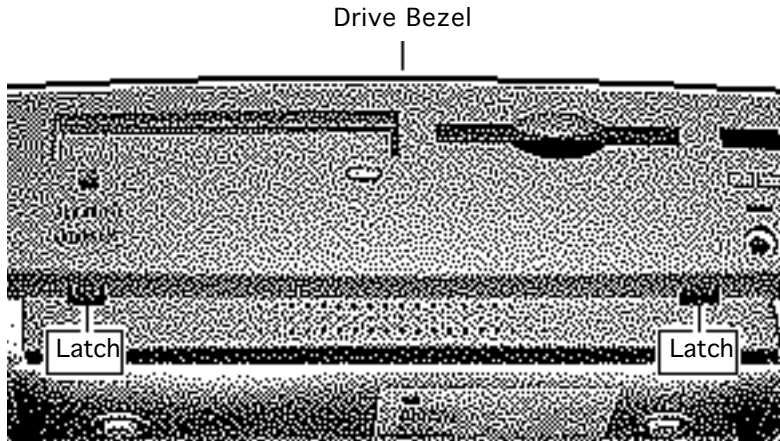


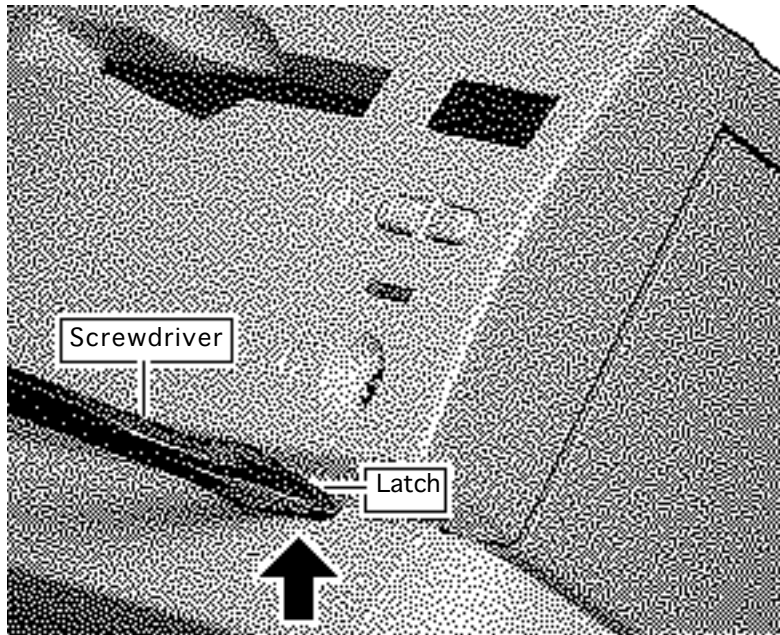


Drive Bezel

No preliminary steps are required before you begin this procedure.

- 1 Locate the two latches below the ridge on the drive bezel.





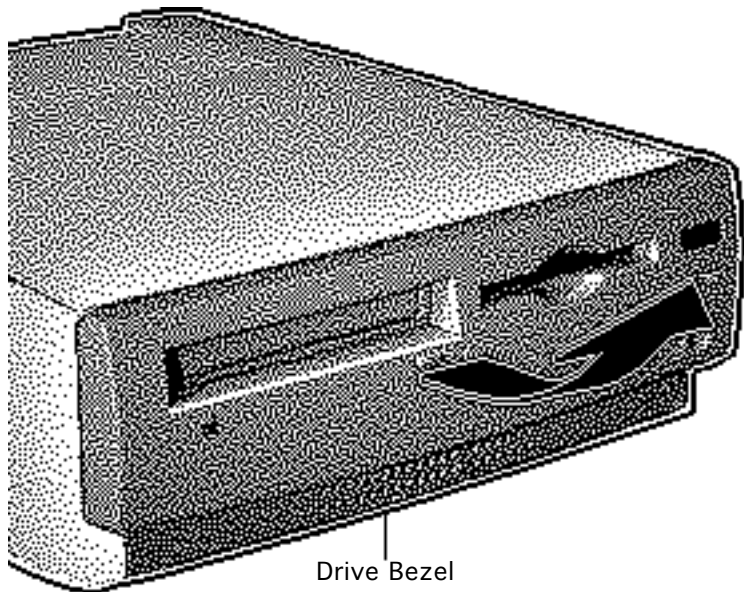
- 2 **Caution:** When using a screwdriver to release a latch, press up carefully. Do not scratch or gouge the plastic.

Insert a flat-blade screwdriver and pry up to release each latch.





- 3 Swing up the drive bezel and pull it away from the metal chassis.



Drive Bezel

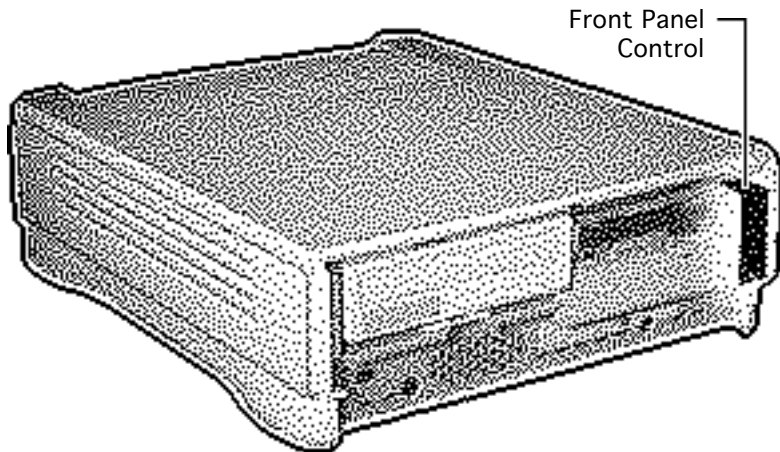


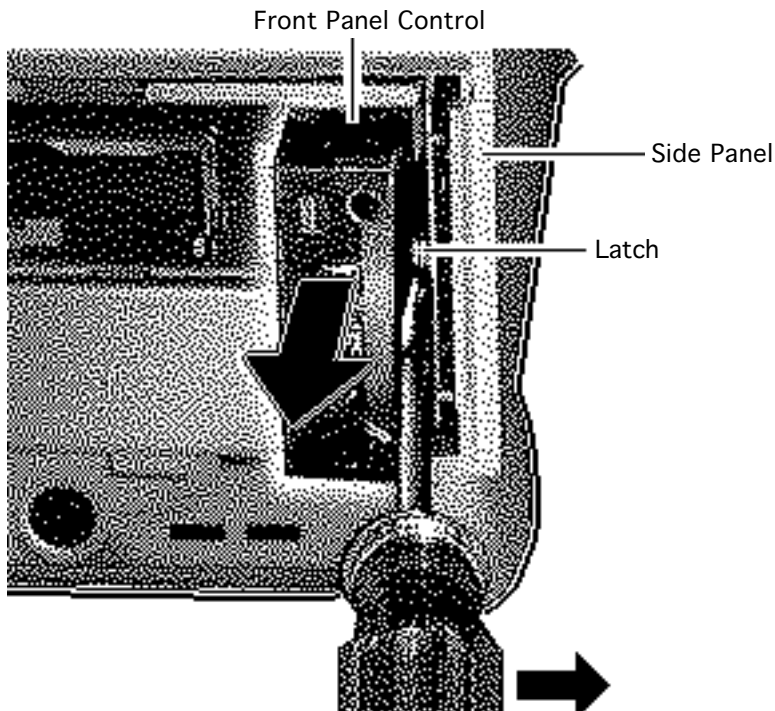


Front Panel Control

Before you begin, remove the drive bezel.

Caution: Review the ESD precautions in Bulletins/ Safety.





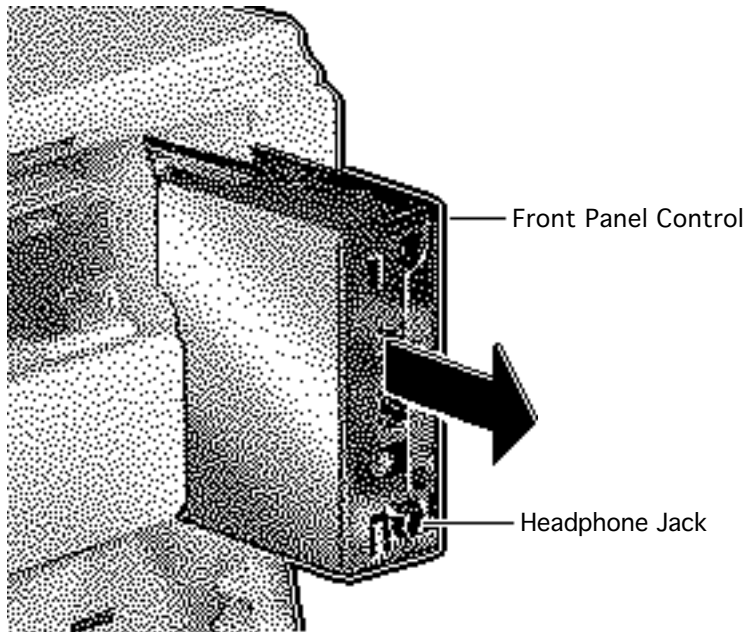
- 1 **Caution:** When using a screwdriver to release a latch, be careful not to scratch or gouge the plastic.

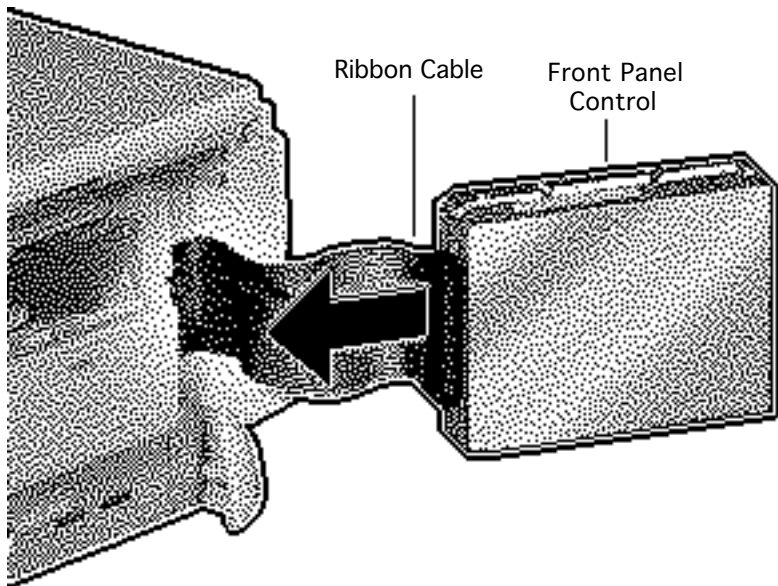
Insert a flat-blade screwdriver about an inch between the side panel and the front panel control. Pry open the latch to release the front panel control.





- 2 Pull out the front panel control just far enough to reach the ribbon cable connector.





- 3 Disconnect the front panel control from the ribbon cable.

Replacement Note:
When you replace the front panel control assembly, make sure that the headphone jack is at the bottom of the assembly.

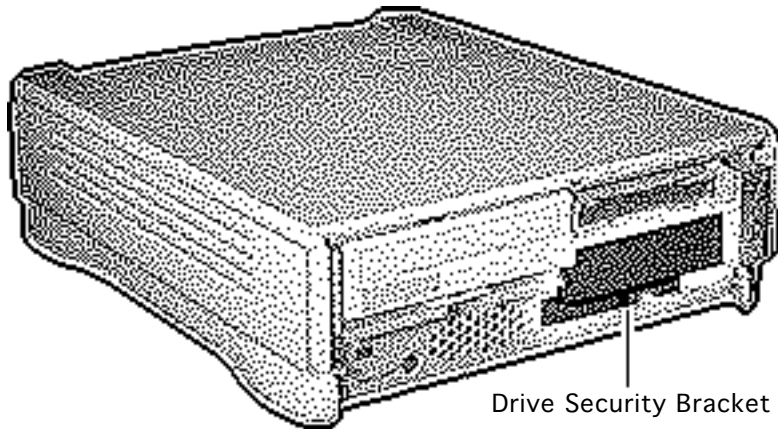




Drive Security Bracket

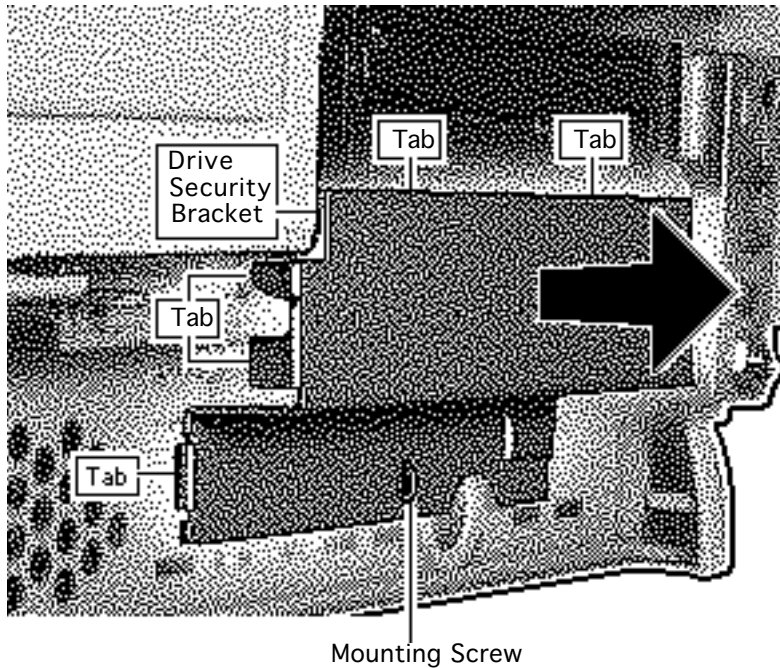
Before you begin, remove the drive bezel.

Caution: Review the ESD precautions in Bulletins/ Safety.



Drive Security Bracket





- 1 Remove the mounting screw and pull off the drive security bracket.

Replacement Note: Be sure to correctly position the four tabs of the drive security bracket.



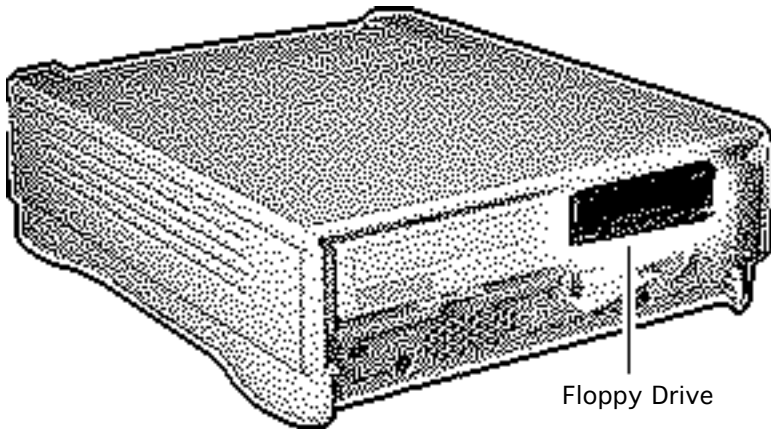


Floppy Drive

Before you begin, remove the following:

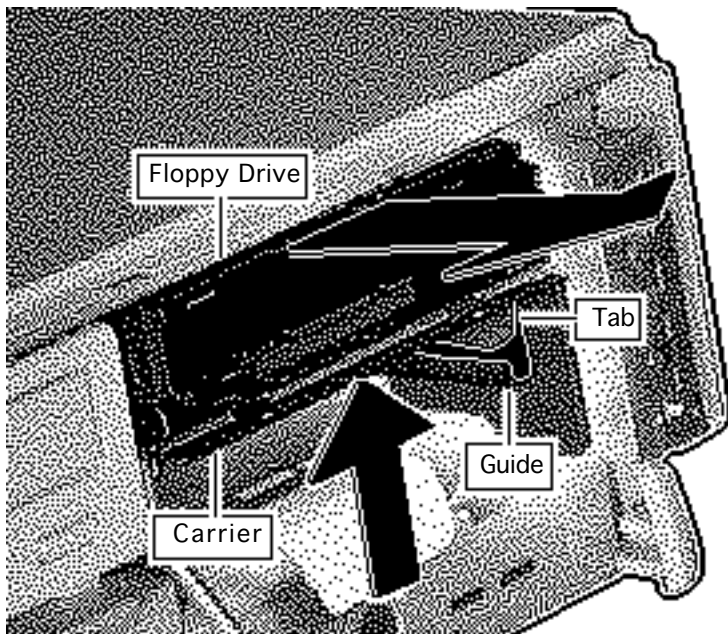
- Drive bezel
- Drive security bracket

Caution: Review the ESD precautions in Bulletins/ Safety.



Floppy Drive





- 1 Lift the front of the floppy drive and carrier.
- 2 Pull out the floppy drive just far enough to reach the ribbon cable connector.

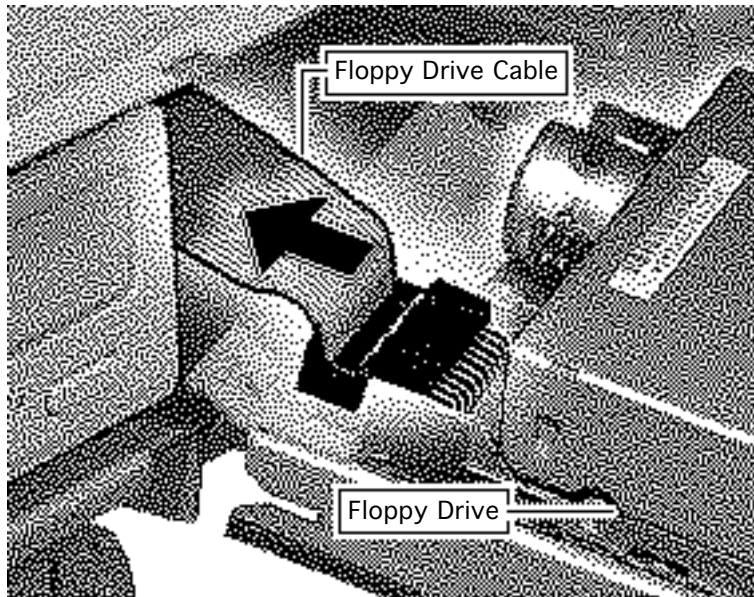
Replacement Note:

When you replace the floppy drive, make sure that the tab of the floppy carrier is seated properly in the floppy drive guide.





- 3 Disconnect the floppy drive from the floppy drive cable.



Replacement Note: If you are replacing a defective floppy drive, invert the drive and carrier, and then remove the four carrier mounting screws. Separate the drive from the carrier.



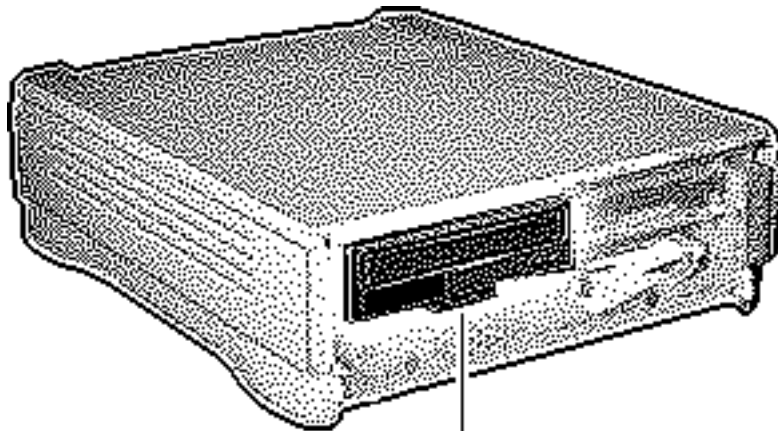


CD-ROM Drive

Before you begin, remove the following:

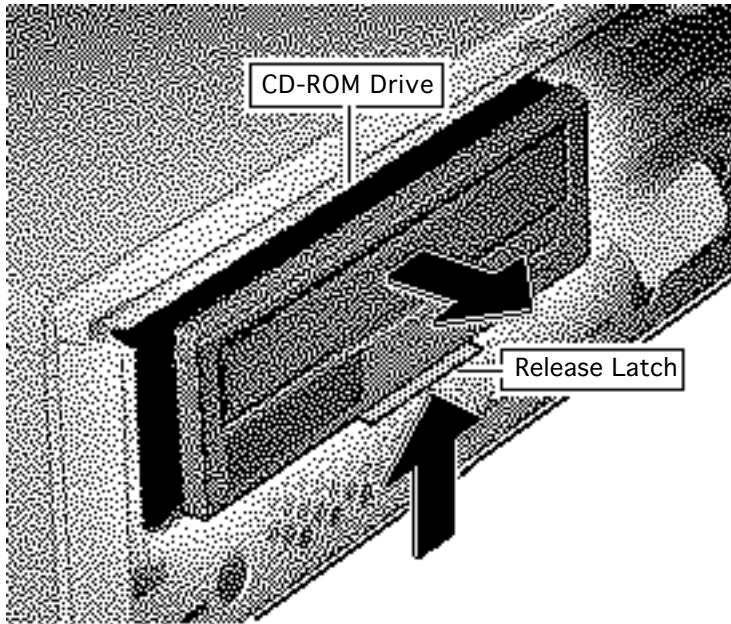
- Drive bezel
- Drive security bracket

Caution: Review the ESD precautions in Bulletins/Safety.



CD-ROM Drive



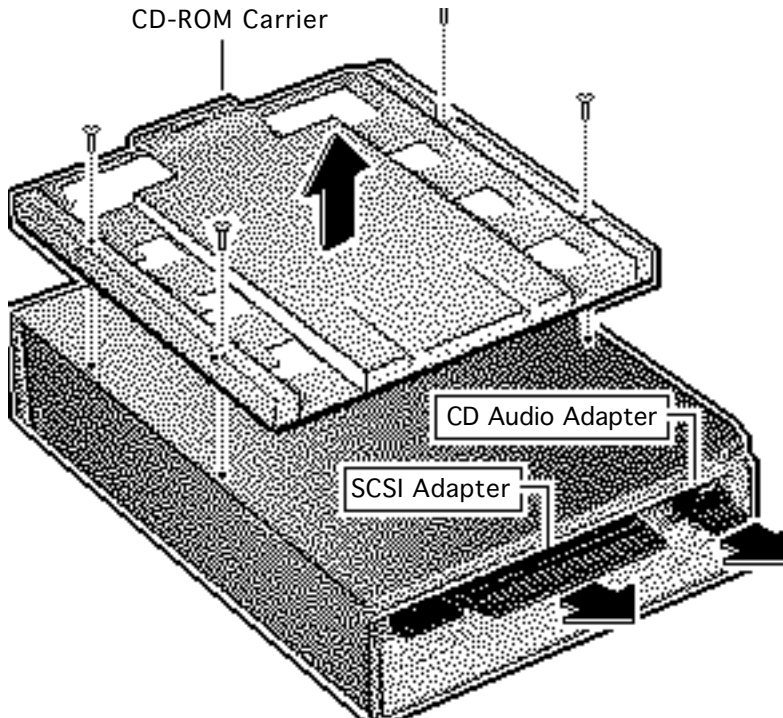


Note: To perform the next procedure, you may want to insert a flat-blade screwdriver in the slot of the release latch to help you pull out the CD-ROM drive.

- 1 Push up the release latch and pull out the CD-ROM drive from the chassis.

Note: You may need to use some initial force to disconnect the CD-ROM from the internal wiring harness.





Note: Perform the following steps only if you are replacing a defective CD-ROM drive.

- 2 Disconnect the CD-ROM audio adapter.
- 3 Disconnect the SCSI adapter.
- 4 Remove the four mounting screws and carrier from the drive.

Replacement Caution: Before reinstalling the SCSI adapter, be sure that the SCSI drive connector pins are not bent.



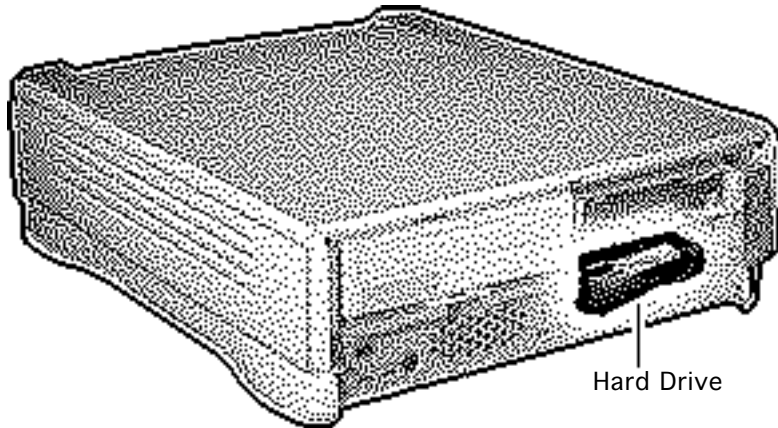


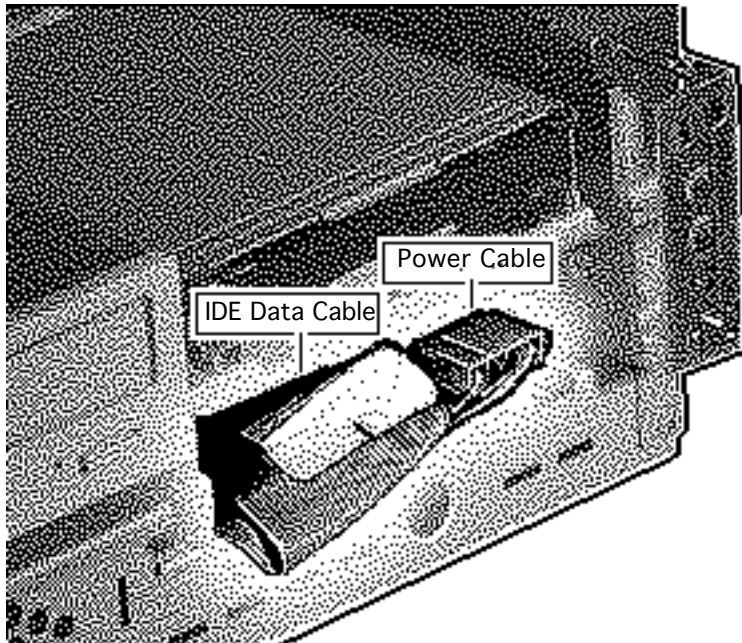
Hard Drive

Before you begin, remove the following:

- Drive bezel
- Drive security bracket

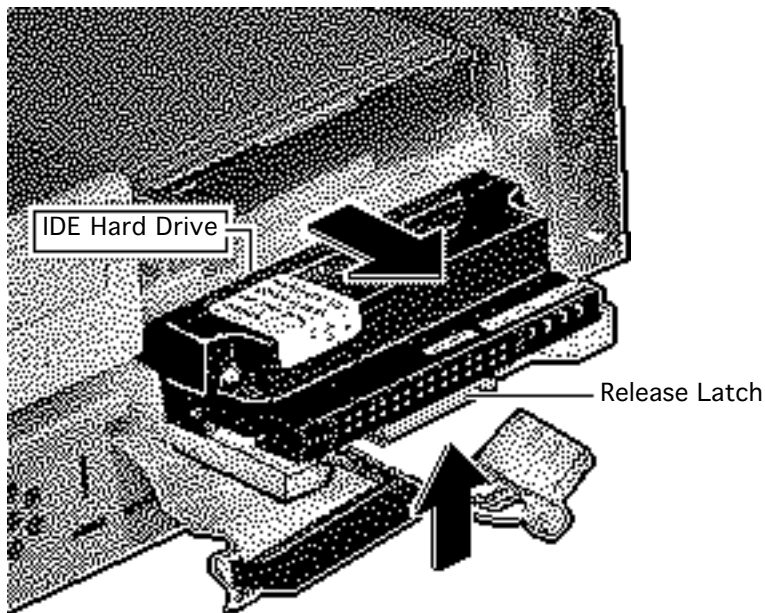
Caution: Review the ESD precautions in Bulletins/Safety.





- 1 Using the pull tabs, disconnect the IDE data cable from the hard drive connector.
- 2 Disconnect the power cable.





- 3 **Caution:** When using a screwdriver to release a latch, be careful not to scratch or gouge the plastic.

Using a flat-blade screwdriver, push up the release latch and pull out the IDE hard drive from the chassis.

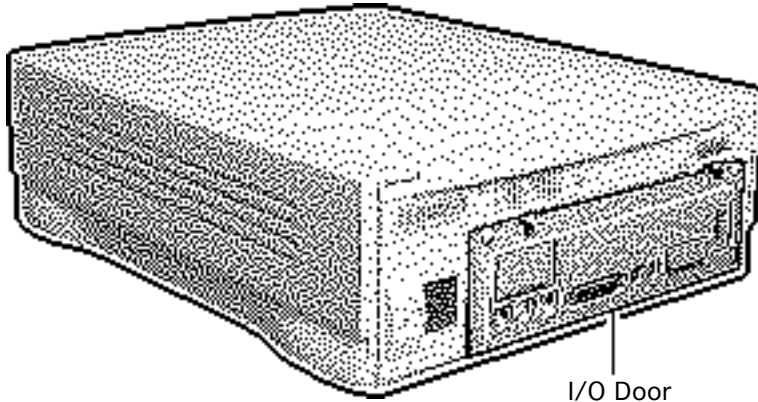




I/O Door

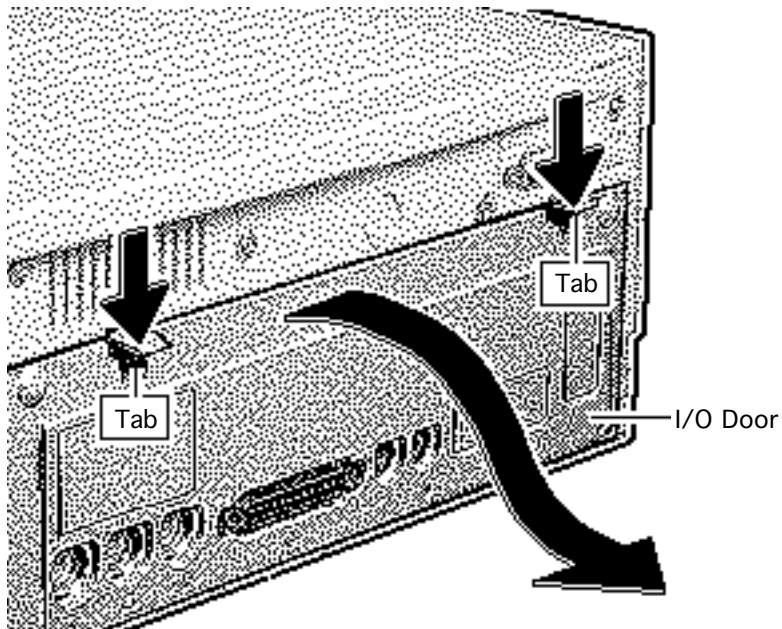
No preliminary steps are required before you begin this procedure.

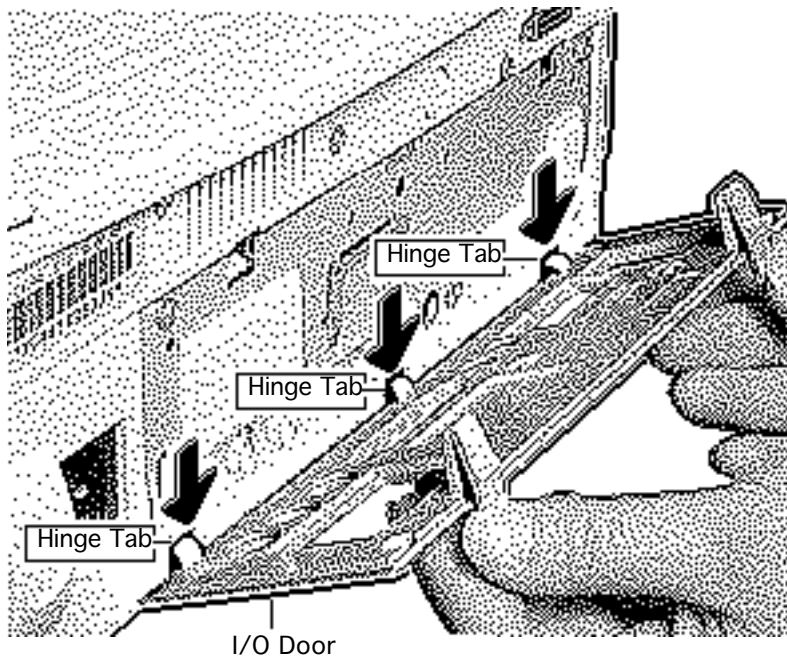
Caution: Review the ESD precautions in Bulletins/ Safety.





- 1 Push down the two locking tabs and swing down the door.





Replacement Note:

Carefully align the three hinge tabs before swinging up the I/O door.

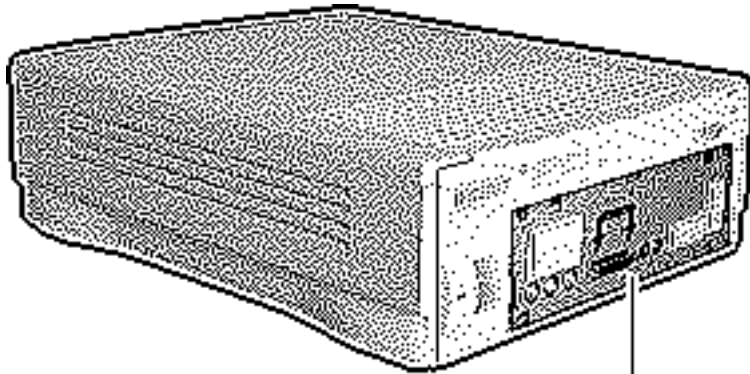




Logic Board

Before you begin, remove the I/O door.

Caution: Review the ESD precautions in Bulletins/Safety.

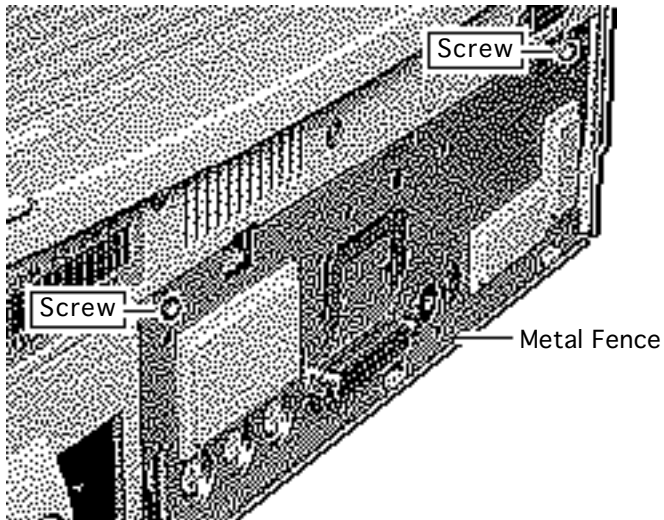


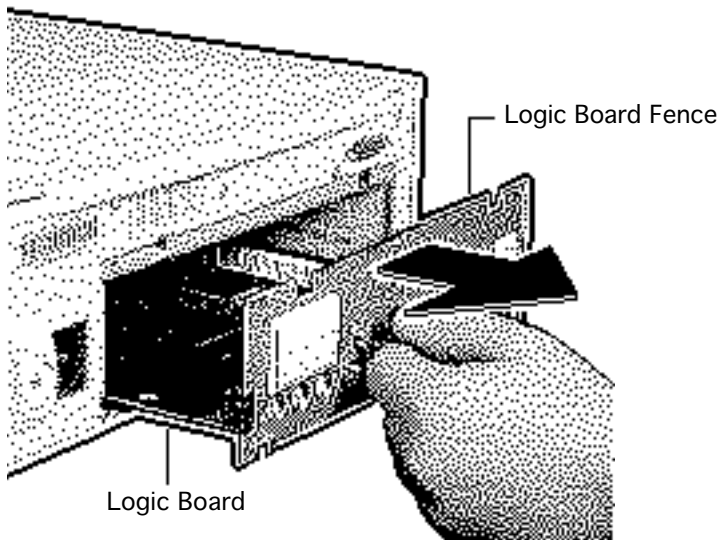
Logic Board with Fence





- 1 Remove the two screws from the metal fence.

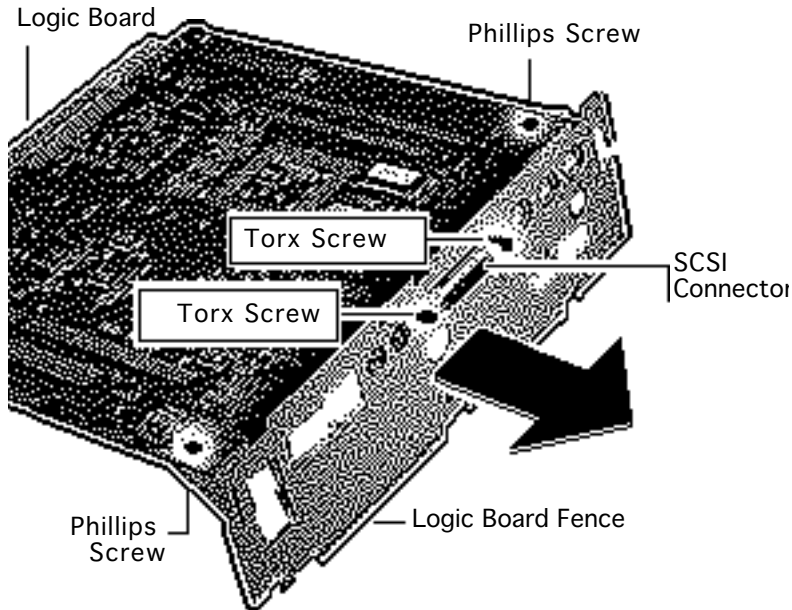




- Note:** The logic-board-and-fence assembly may need a firm initial tug to loosen it from the shield/wiring harness.

Slide out the logic-board-and-fence assembly.





Note: Perform the following steps only if you are replacing a defective logic board.

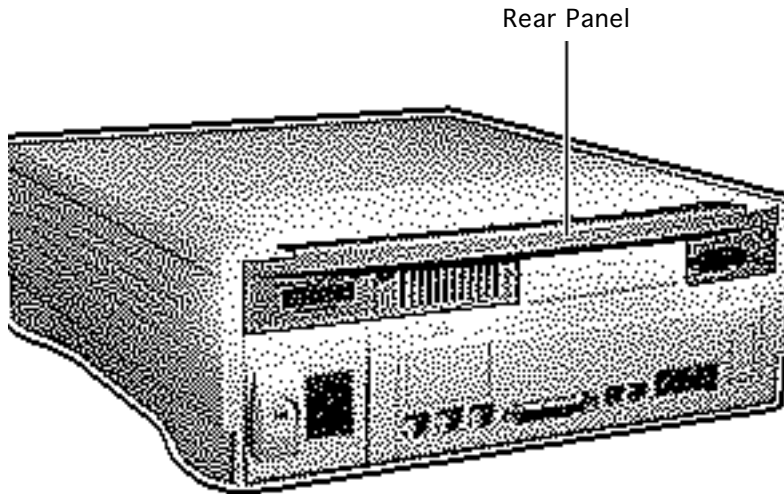
- 3 Remove the two Phillips screws that secure the fence to the solder side of the logic board.
- 4 Using a T9 torx driver, remove the two torx screws that secure the logic board fence to the SCSI connector.
- 5 Separate the logic board fence from the logic board.





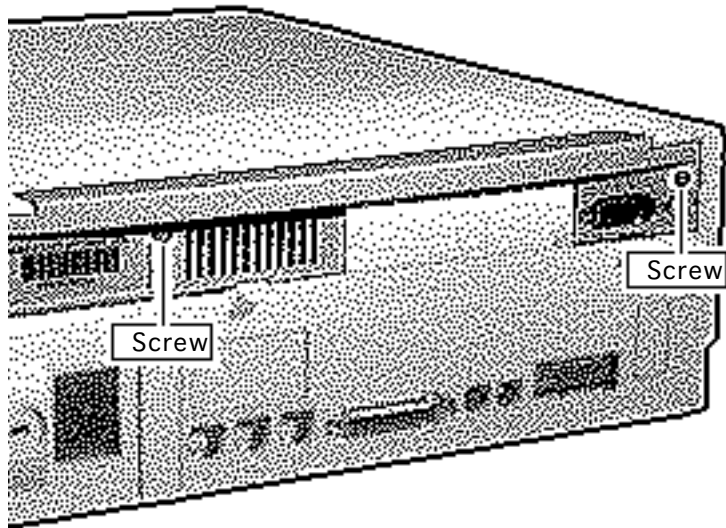
Rear Panel

No preliminary steps are required before you begin this procedure.





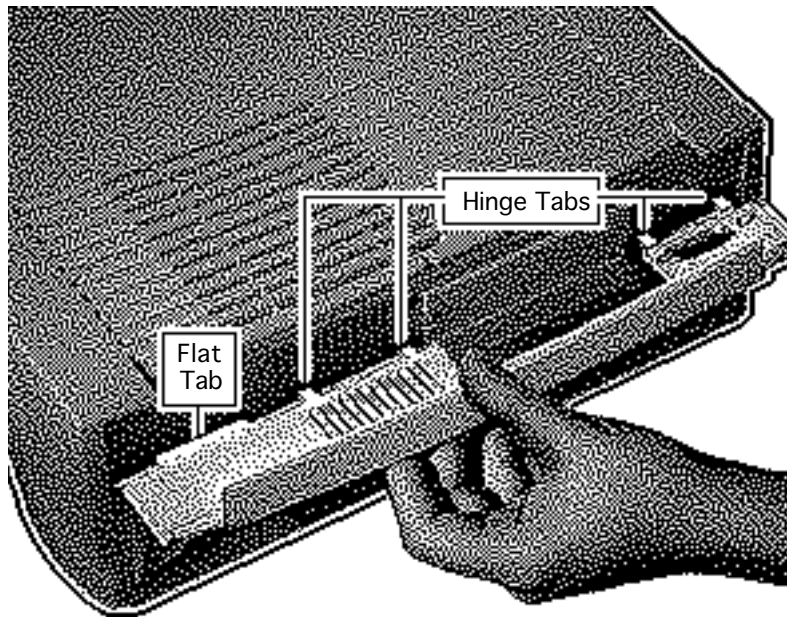
- 1 Remove the two Phillips screws.
- 2 Lift off the rear panel.





Replacement Note:

Carefully align the flat tab and the four hinge tabs.





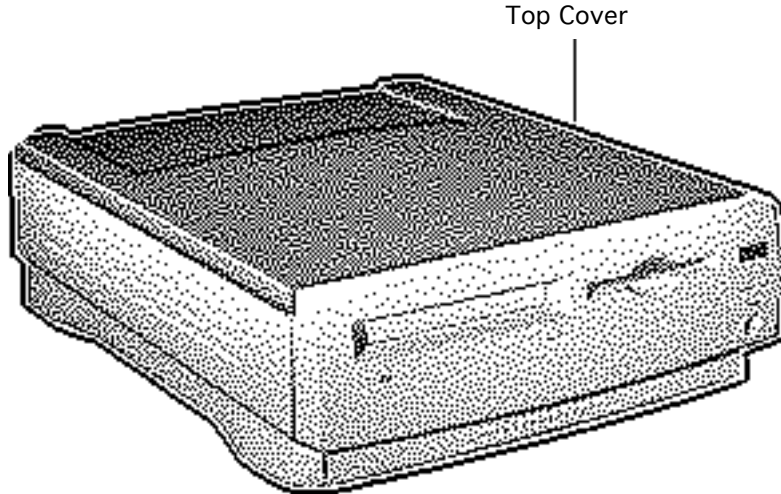
Top Cover

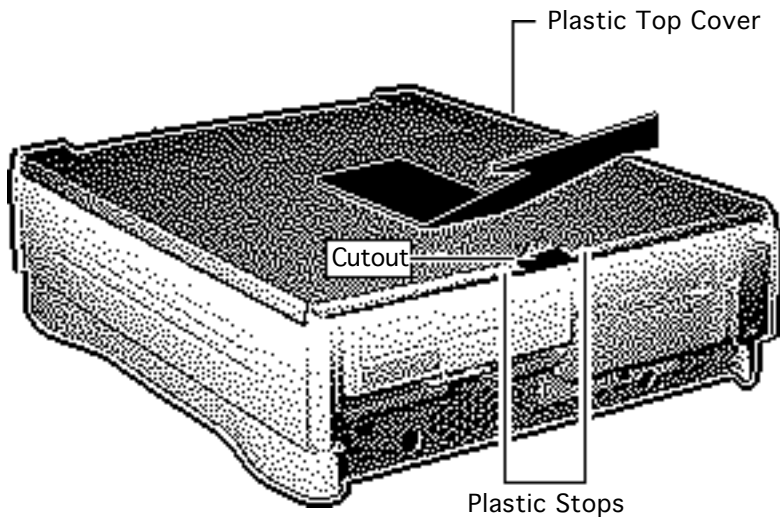
Before you begin, remove the following:

- Drive bezel
- Rear panel

Caution: Review the ESD precautions in Bulletins/ Safety.

Note: The top cover consists of two parts that must be removed separately—a plastic cover on top of a metal shield.



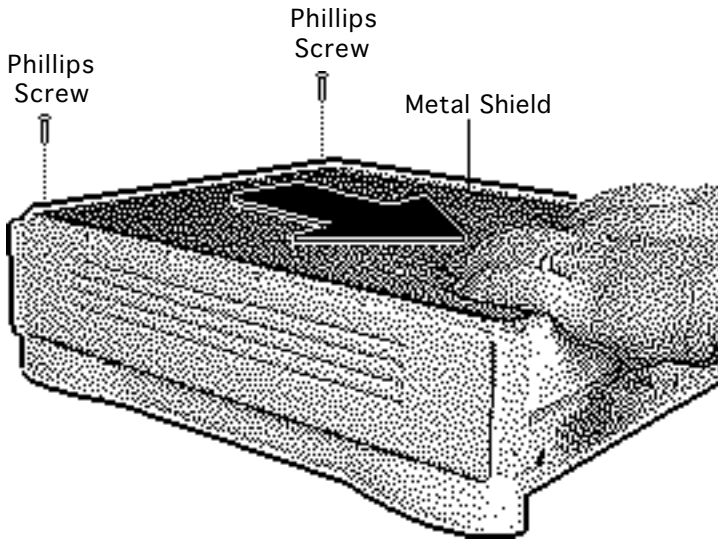


- 1 **Caution:** When using a screwdriver to release a latch, be careful not to scratch or gouge the plastic.

Insert a small flat-blade screwdriver into the cutout and lift the front edge to clear the plastic stops.

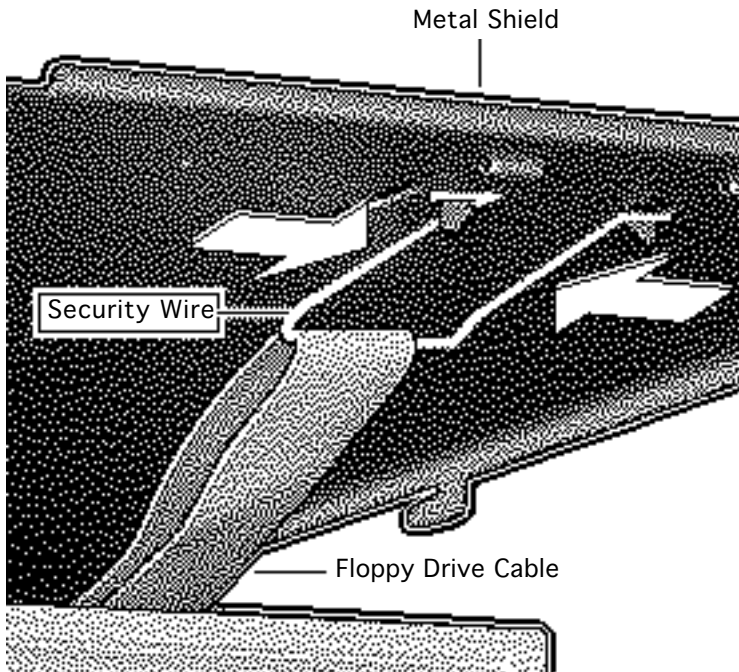
- 2 With your other hand, slide the plastic cover forward about one-half inch.
- 3 Lift the plastic cover off the metal shield.





- 4 Remove the two Phillips screws.
- 5 Slide the metal shield toward the front of the unit about one-half inch.





- 6 Lift the front edge of the metal shield about an inch.
- 7 Under the metal shield, squeeze together the ends of the floppy drive cable security wire and unhook it from the metal shield.
- 8 Remove the security wire from the floppy drive cable.
- 9 Lift off the metal shield.

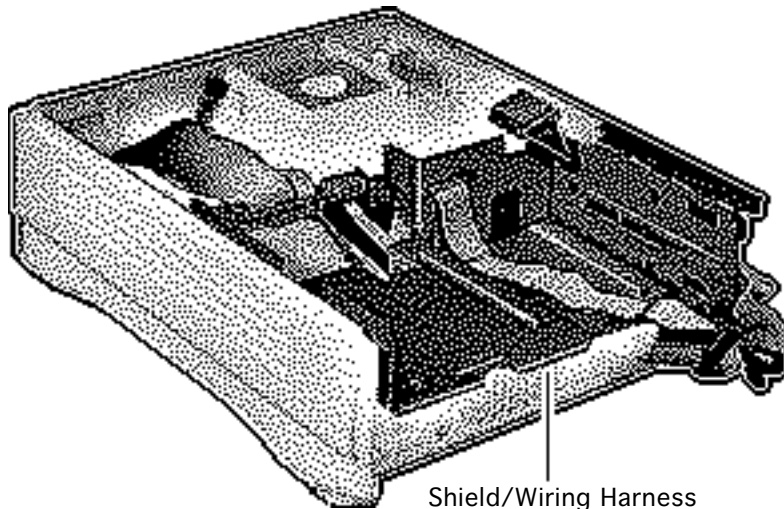




Shield/Wiring Harness

Before you begin, remove:

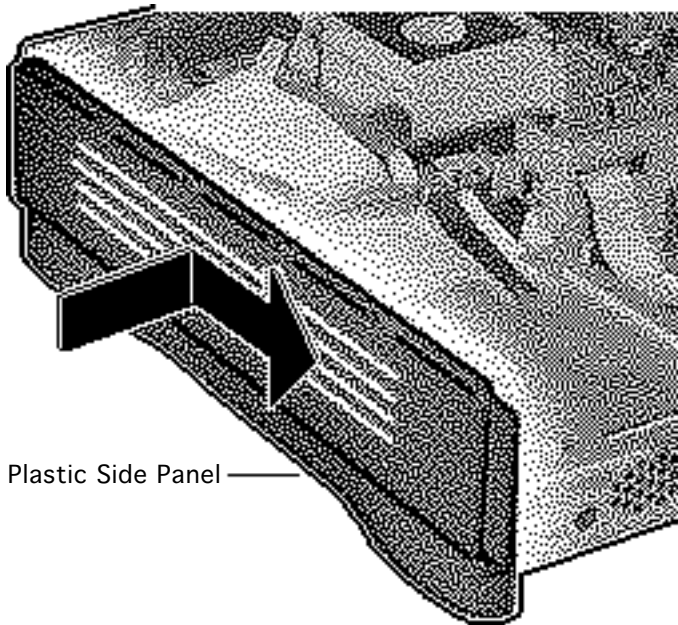
- Drive bezel
- Drive security bracket
- Front panel control
- Floppy drive
- CD-ROM drive
- Hard drive
- I/O door
- Logic board
- Rear panel
- Top cover and shield



Shield/Wiring Harness

Caution: Review the ESD precautions in Bulletins/ Safety.

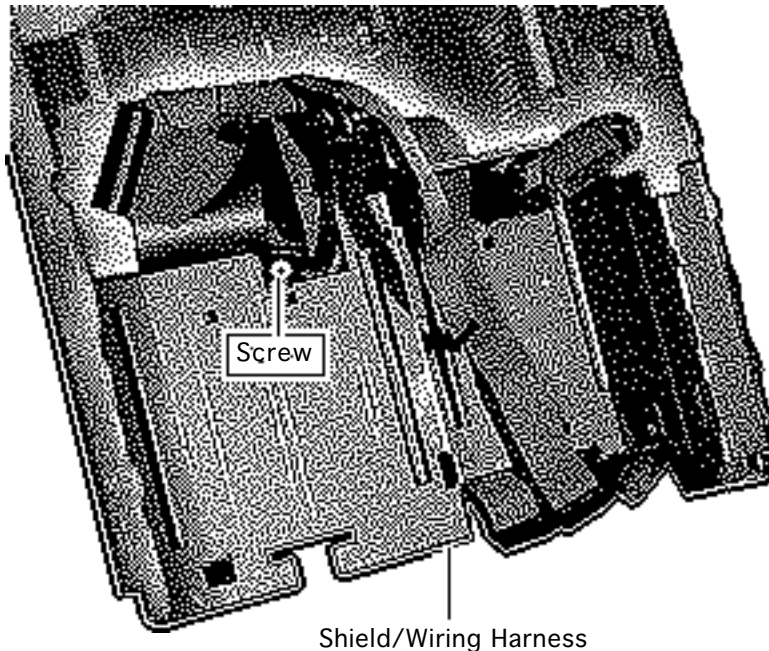




Plastic Side Panel

- 1 Push in and slide the plastic side panels toward the front of the computer about one-half inch.
- 2 Remove the plastic side panels.





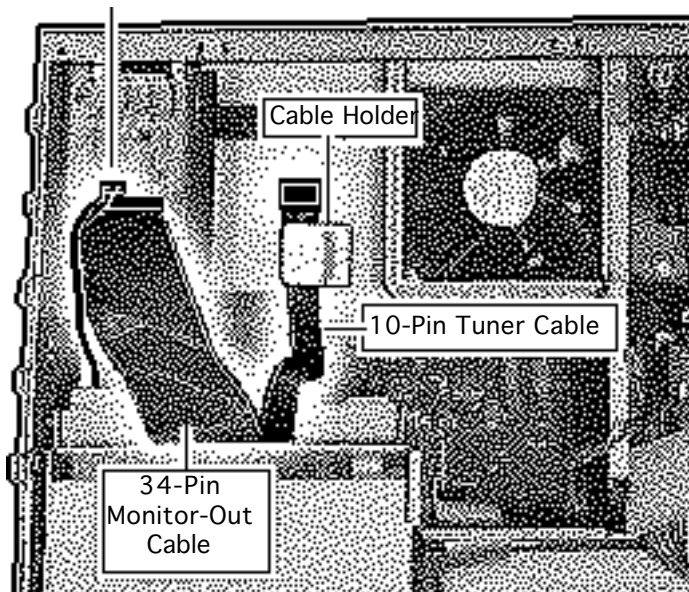
- 3 **Note:** This graphic shows the bottom case tipped to provide a better view of the screw. Perform this procedure with the bottom case seated on a firm, flat surface.

Remove the screw that secures the shield/wiring harness to the bottom case.



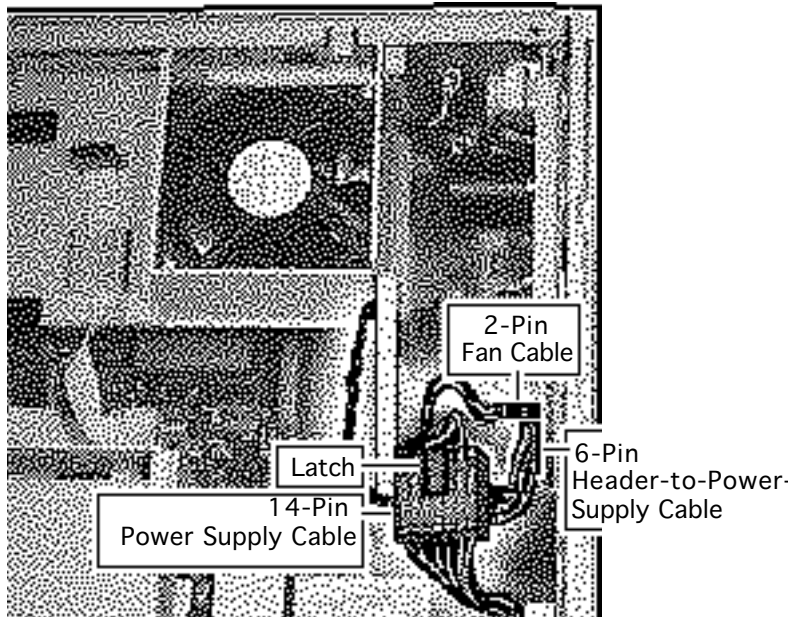


2-Pin Speaker Cable



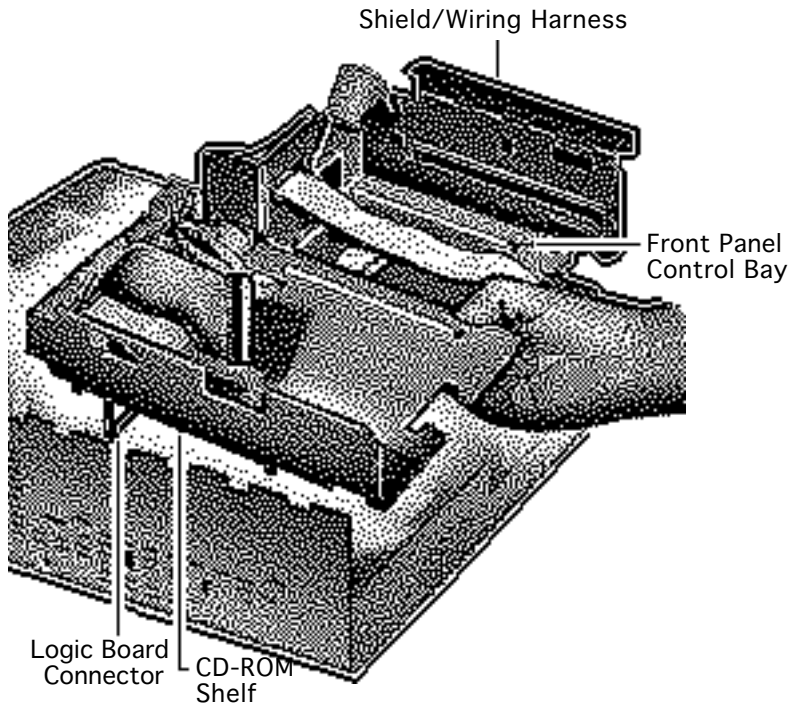
- 4 Disconnect the following:
 - 2-pin speaker cable
 - 34-pin monitor-out cable
 - 10-pin tuner cable, if connected
- 5 Slide the tuner cable from the cable holder.





- 6 Release the latch on the 14-pin power supply cable and disconnect the cable.
- 7 Disconnect the 2-pin fan cable.
- 8 Disconnect the 6-pin header-to-power-supply cable and remove the cable from the routing notch in the power supply case.





- 9 Lift up one side of the shield/wiring harness a few inches, then lift up the other side about an inch.
- 10 **Note:** Guide the speaker cable through the shield/wiring harness as you remove the harness.

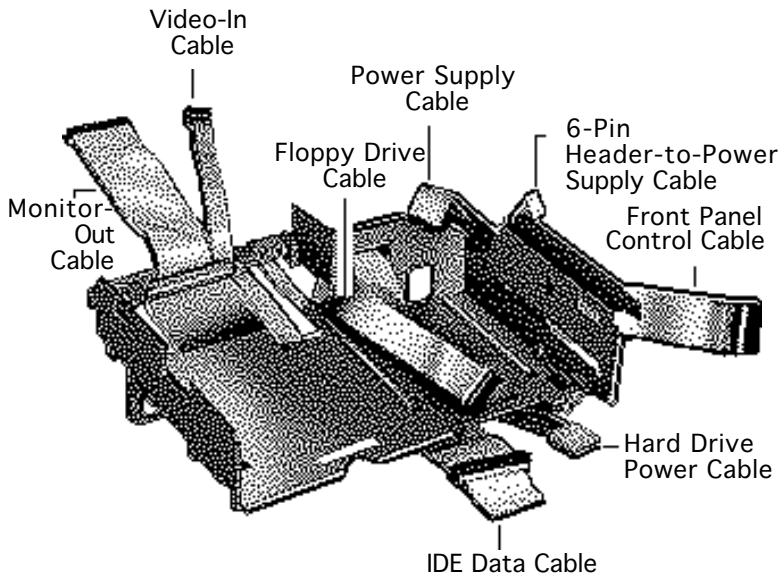
Remove the shield/wiring harness.





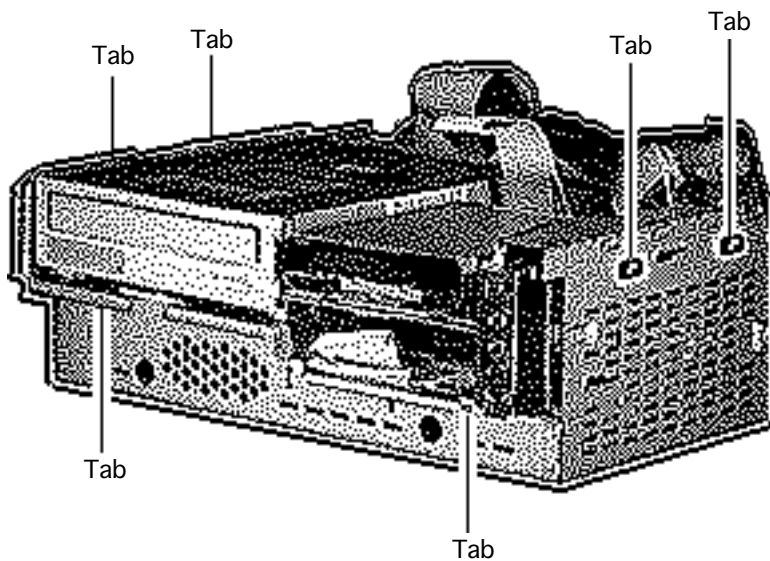
Replacement Note: In rerouting the cables, do not crimp cables between the harness and the floor of the bottom case, or between the harness and the sides of the bottom case. Route the speaker cable between the logic board connector and the CD-ROM shelf. Route the fan cable, power supply cable, and header cables to the side of the front panel control bay.





Replacement Note: Arrange the cables as shown before replacing the shield/wiring harness. When dressing the cables, do not crimp them between the harness and the floor of the bottom case, or between the harness and the sides of the bottom case. Route the speaker cable between the logic board connector and the CD-ROM shelf. Route front panel control, power supply, and header cables to the side of the front panel control bay.





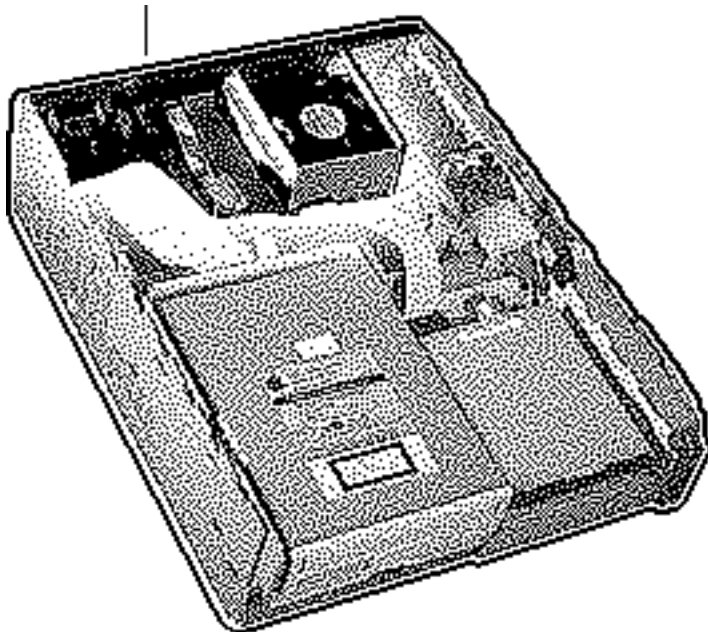
Replacement Note:

Carefully position all six tabs of the shield/wiring harness.





Fan/Video Card Bracket



Fan/Video Card Bracket

Before you begin, remove the following:

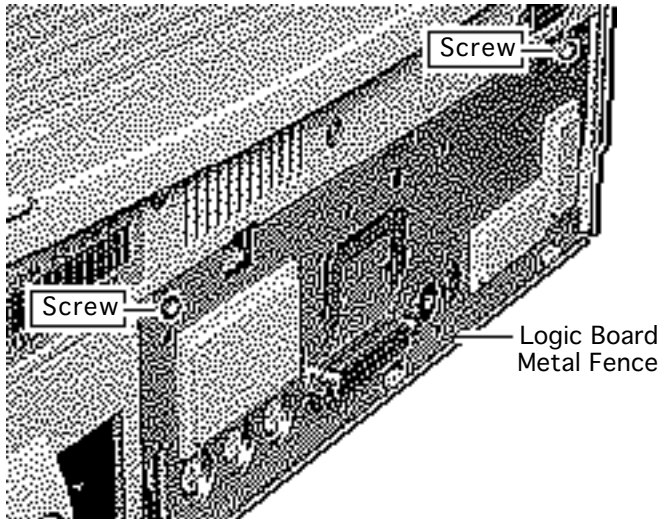
- I/O door
- Drive bezel
- Top cover and shield

Caution: Review the ESD precautions in Bulletins/Safety.



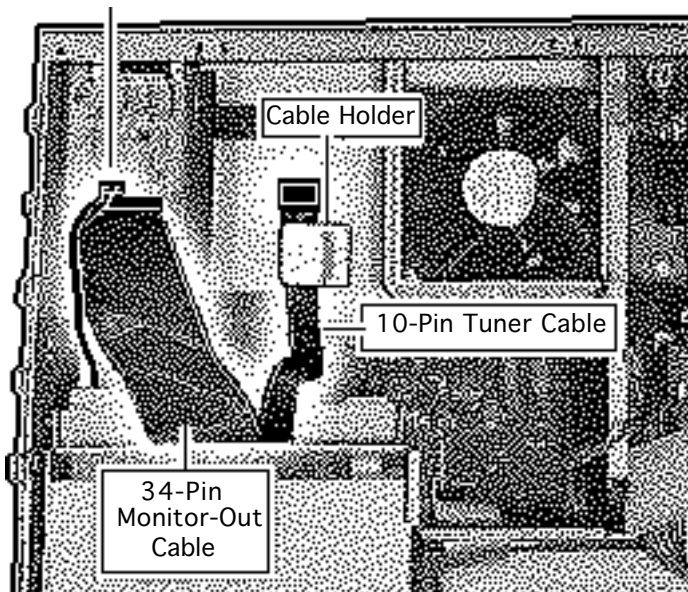


- 1 Remove the two screws from the logic board metal fence.





2-Pin Speaker Cable

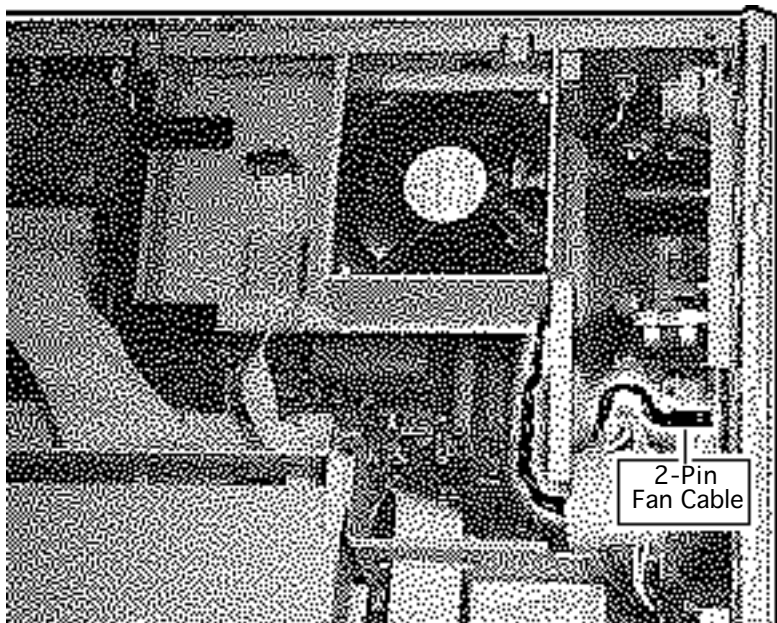


- 2 Disconnect the following:
 - 2-pin speaker cable
 - 34-pin monitor-out cable
 - 10-pin tuner cable, if connected
- 3 Slide the tuner cable from the cable holder.



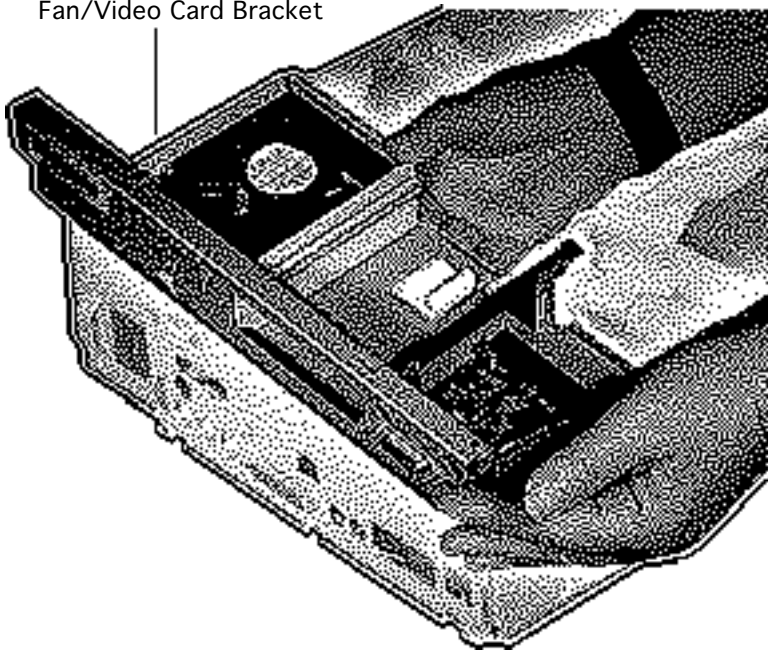


- 4 Disconnect the 2-pin fan cable.





Fan/Video Card Bracket



- 5 Lift up one side of the fan/video card bracket, then lift up the other side.
- 6 Remove the fan/video card bracket.

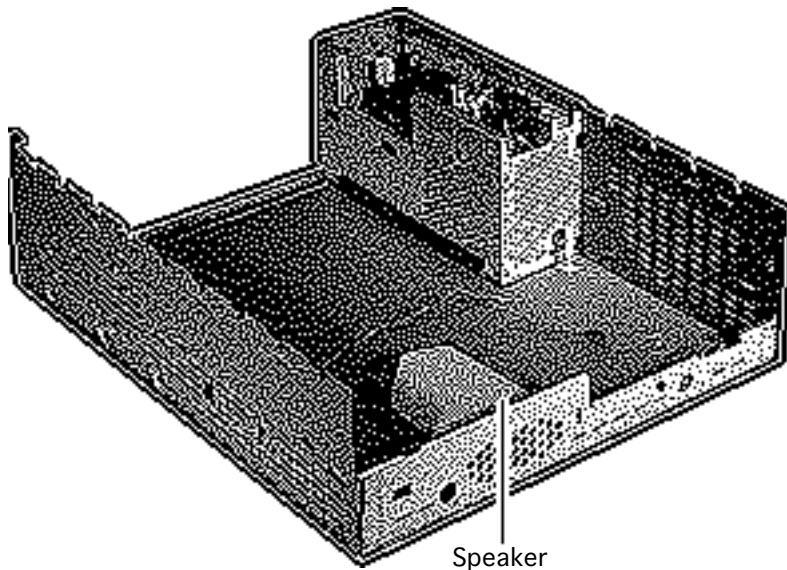


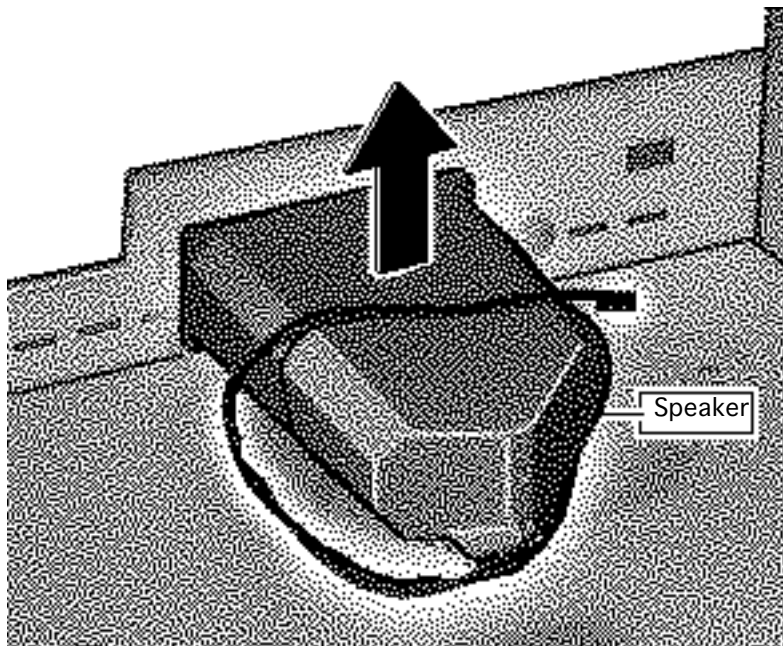


Speaker

Before you begin, remove the following:

- Drive bezel
- Drive security bracket
- Front panel control
- Floppy drive
- CD-ROM drive
- Hard drive
- I/O door
- Logic board
- Top cover and shield
- Shield/Wiring harness
- Fan/Video card bracket





Pull up on the speaker to disengage it from its hook-and-loop connection.

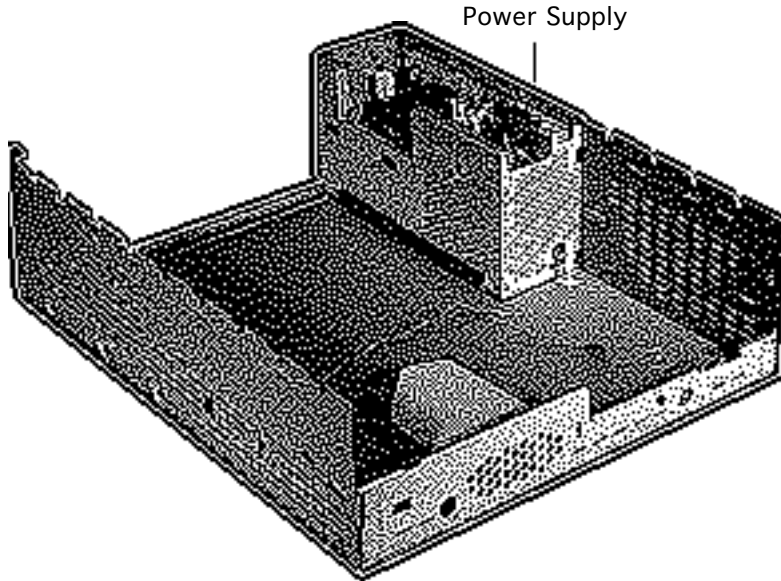




Power Supply

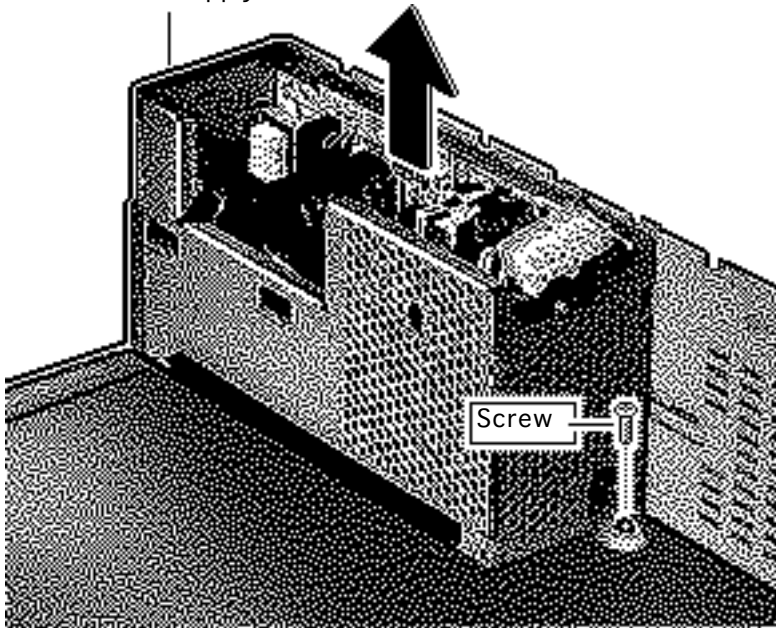
Before you begin, remove the following:

- Drive bezel
- Drive security bracket
- Front panel control
- Floppy drive
- CD-ROM drive
- Hard drive
- I/O door
- Logic board
- Top cover and shield
- Shield/Wiring harness
- Fan/Video card bracket





Power Supply



Remove the screw from the power supply and lift the power supply from the bottom case.

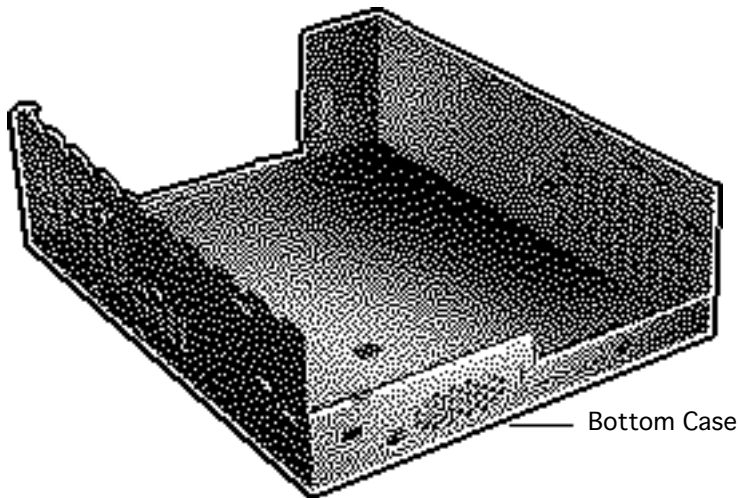




Bottom Case

Before you begin, remove the following:

- Drive bezel
- Drive security bracket
- Front panel control
- Floppy drive
- CD-ROM drive
- Hard drive
- I/O door
- Logic board
- Top cover and shield
- Shield/Wiring harness
- Fan/Video card bracket
- Speaker
- Power supply





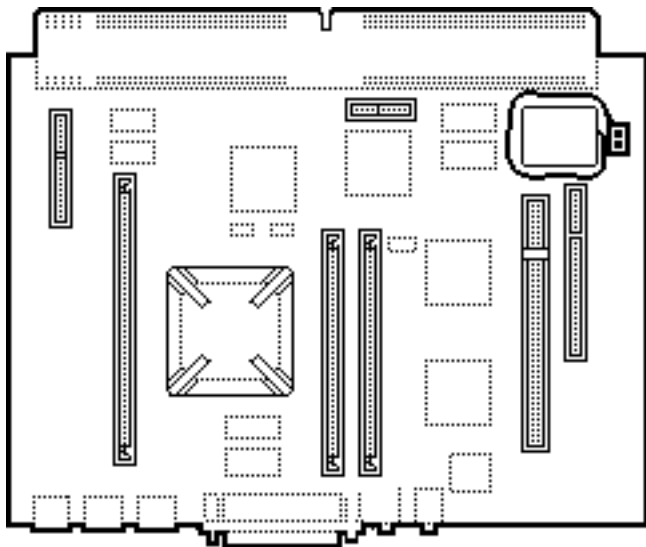
Upgrades

Performa 6200/6300 Series





Logic Board



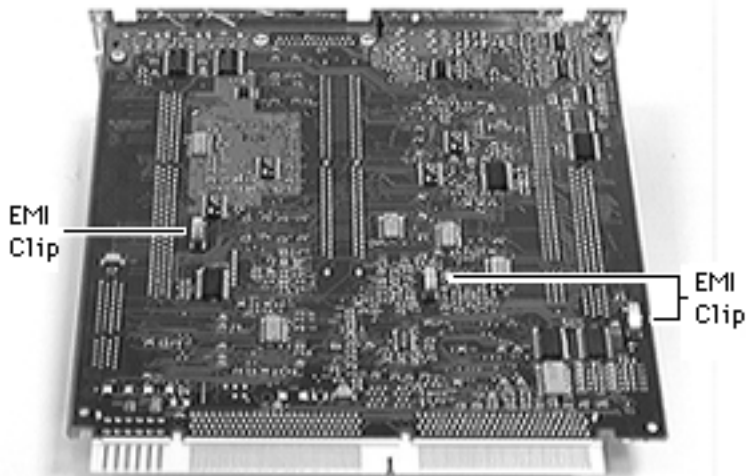
Power Macintosh 6300 Logic Board Upgrade

Before you begin, remove the following:

- I/O door
- Logic board
- Card in PDS slot (if any)

Caution: Review the ESD precautions in Bulletins/Safety.





Caution: Avoid compressing the EMI clips on the bottom of the logic board. If possible, support the underside of the board to avoid compressing the three silver-colored EMI clips.





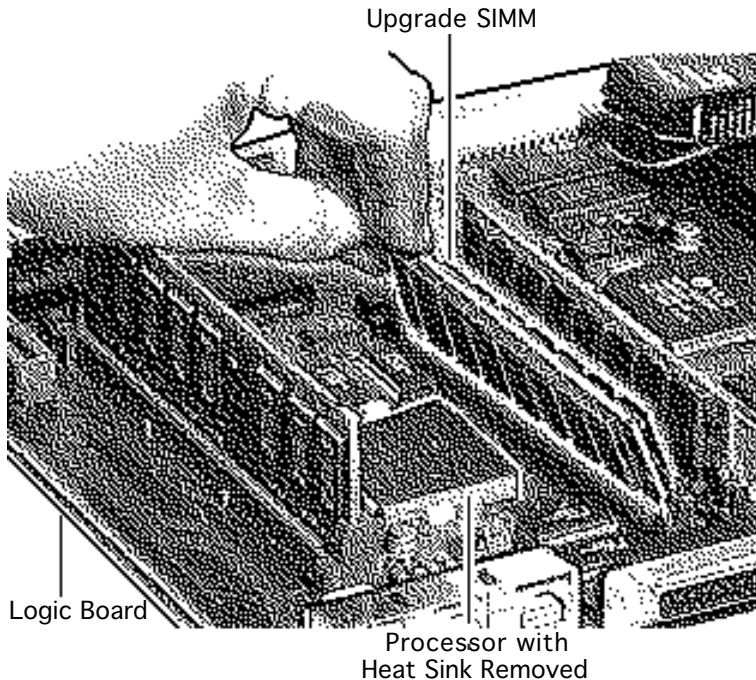
The Power Macintosh 5300/6300 Logic Board Upgrade is a finished goods product. The upgrade kit includes the 603e, 100 MHz logic board and logic board fence. See Take Apart chapter, “Logic Board” topic for installation procedures.

Service Provider’s Checklist

- Install the upgrade board
- Run Safe Install
- Install System 7.5
- Turn on the upgrade board
- Turn on Modern Memory Manager
- Restart the computer to verify the board works properly

Replacement Note: You may need to remove the 603e processor on the 6300 Series logic board to install or service SIMMs. See “6300 SIMM Upgrade.”





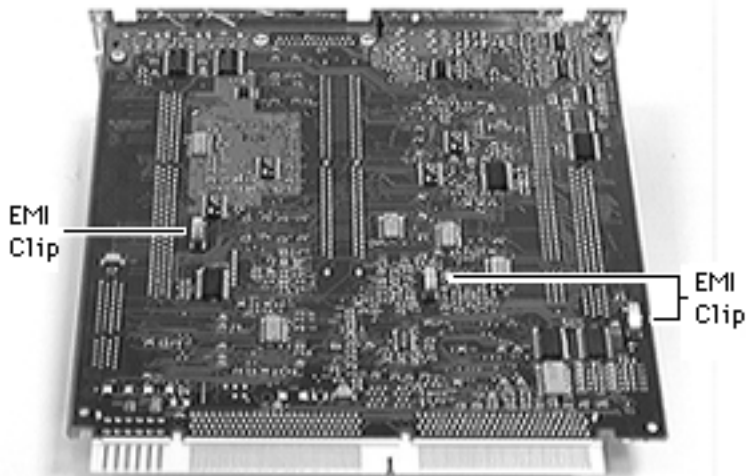
6300 SIMM Upgrade

Before you begin, remove the following:

- I/O door
- Logic board

Caution: Review the ESD precautions in Bulletins/Safety.



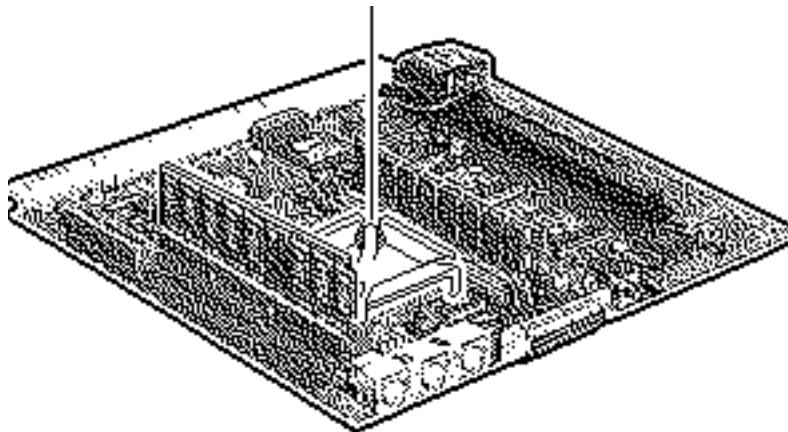


Caution: Take care to avoid compressing the EMI clips on the bottom of the logic board. If possible, support the underside of the board to avoid compressing the three silver-colored EMI clips.



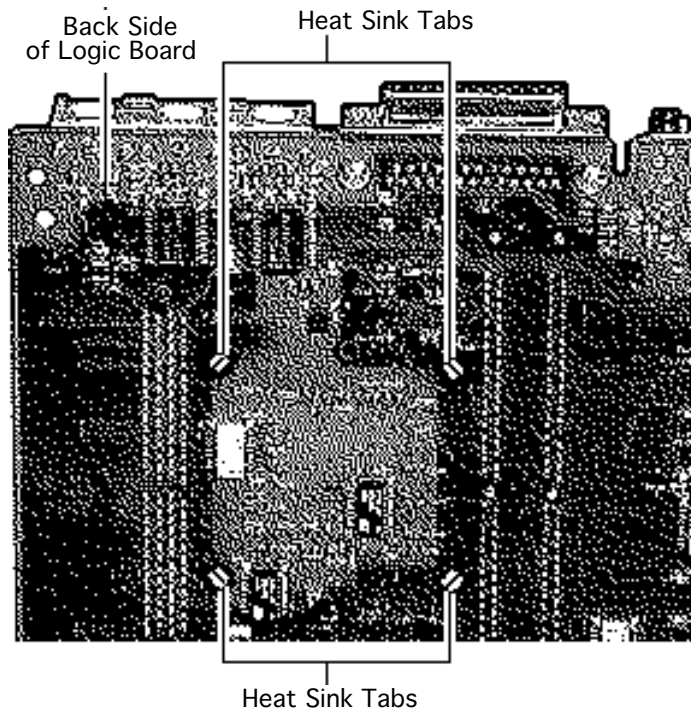


Processor Heat Sink



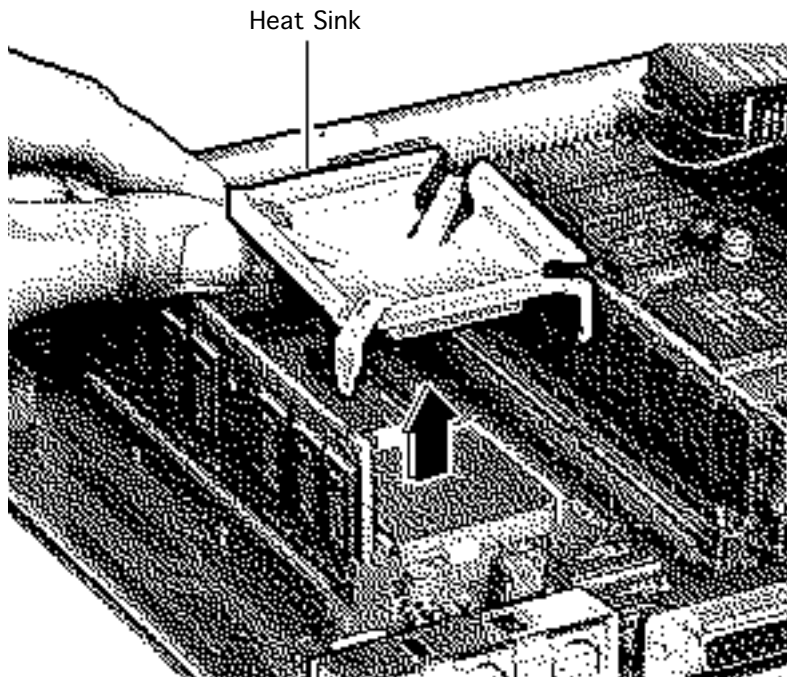
Replacement Note: You must remove the heat sink of the 6300 Series logic board to install or replace a SIMM in the slot next to the processor.





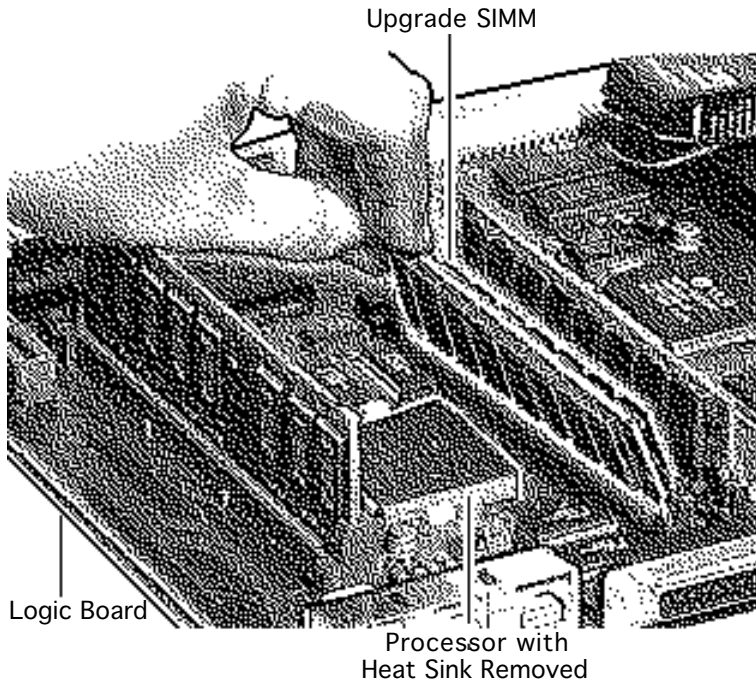
- 1 On the back (tracing side) of the logic board, pry off the four corner tabs of the heat sink.





- 2 Remove the heat sink from the component side of the logic board.





- 3 Install the SIMM in the slot next to the processor.

Replacement Note: Be sure to remove the customer's SIMMs if you must return a defective logic board.





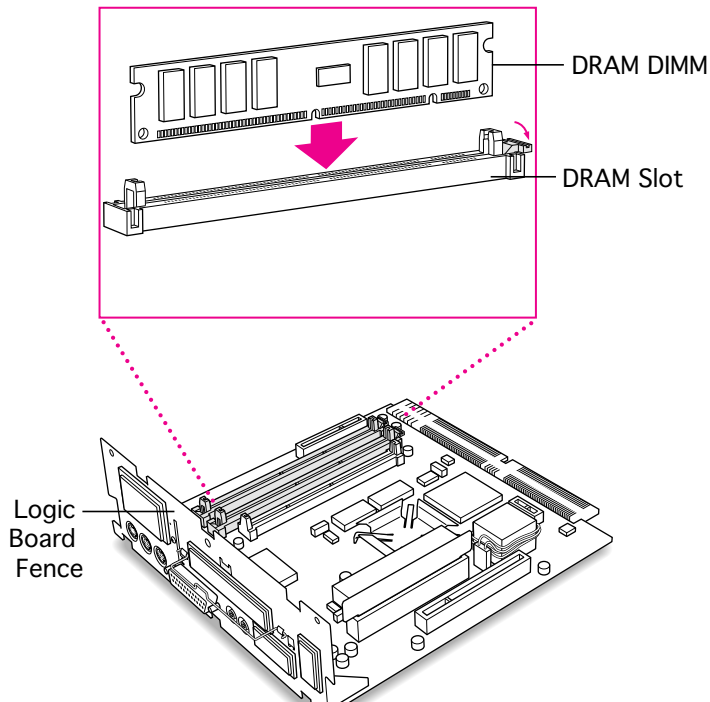
6360 DIMM Upgrade

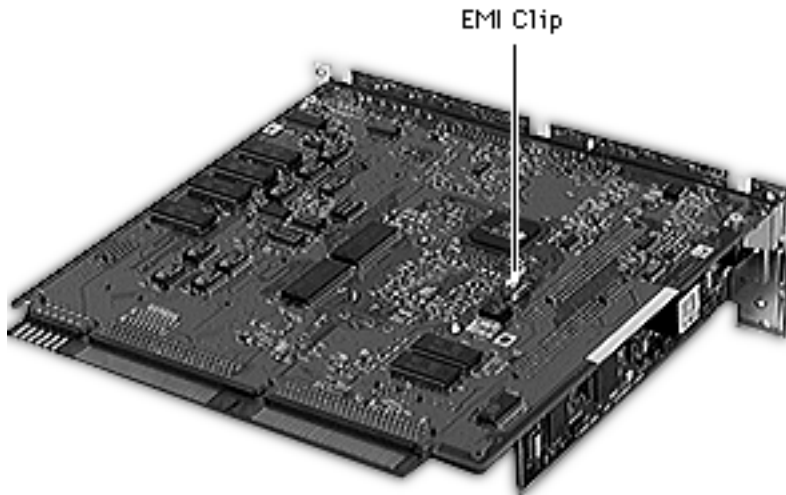
Before you begin, remove the following:

- I/O door
- Logic board

Caution: Review the ESD precautions in Bulletins/ Safety.

Note: Read the “EDO-Compatible Logic Board Identification” topic at the end of this section.



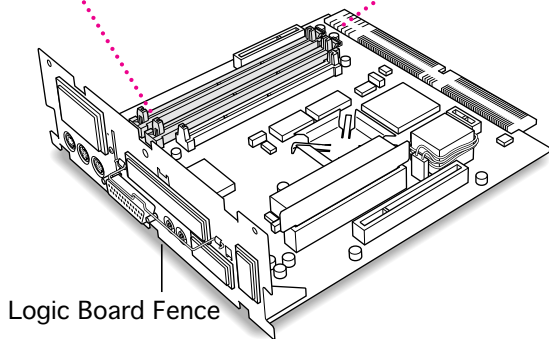
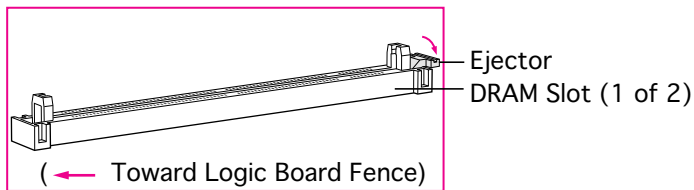


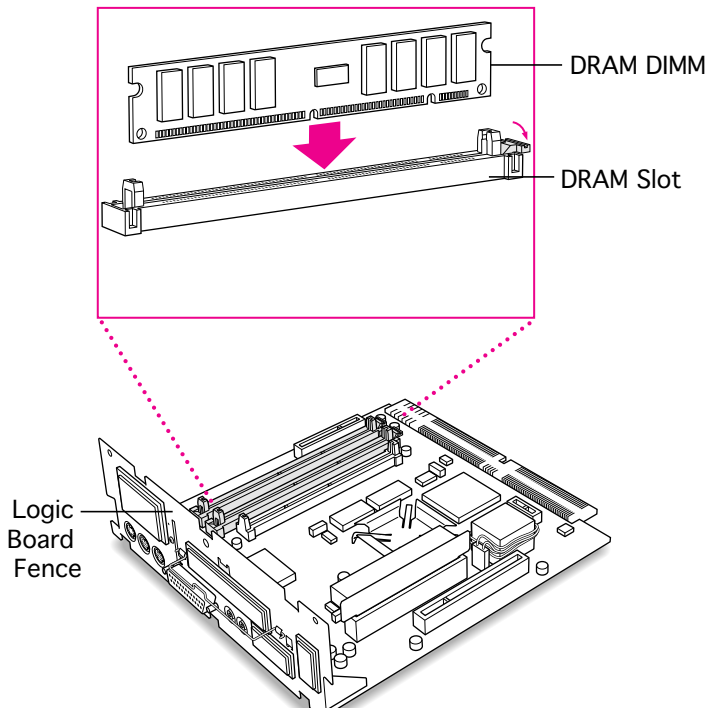
Caution: Take care to avoid compressing the EMI clip on the bottom of the logic board. If possible, support the underside of the board to avoid compressing the EMI clip.





- 1 Push the ejector on the DRAM slot outward and down to open it.





- 2 **Caution:** Do not touch the DIMM's connectors. Handle the DIMM only by the edges.

With the ejector open, align the DRAM DIMM in the DRAM slots.
- 3 Push down on the DIMM until it snaps into place.





EDO-Compatible Logic Board Identification

Before you install extended data out (EDO) memory in a Performa 6360 computer, you must verify that the logic board is EDO-compatible.

There are four ways to verify that a logic board from a Performa 6360 computer is compatible with EDO memory:

- The logic board has soldered-on EDO DRAM
- The logic board has a resistor present at chip U34
- The logic board has **no** resistor present at location R77

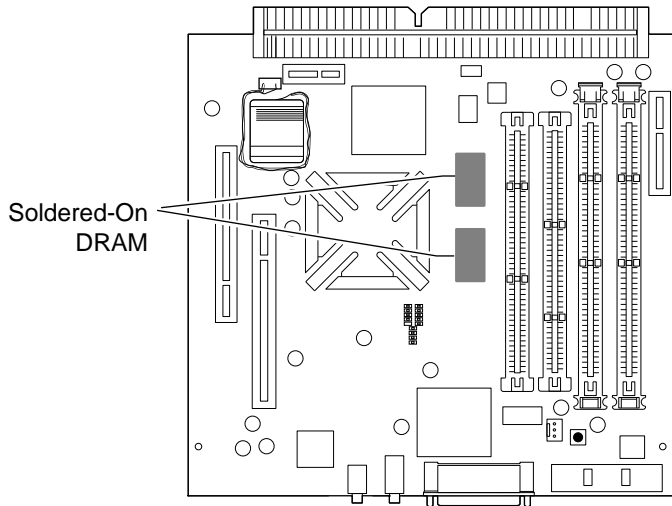
The details for identifying an EDO-compatible logic board by these methods are presented in the following sections.





Soldered-On DRAM is EDO

- 1 Locate the two soldered-on DRAM chips.
- 2 Compare the markings on these chips to the examples in the EDO Chip Identification table on the next page. If the soldered-on DRAM chip markings meet the criteria of an example here, the logic board supports EDO memory.



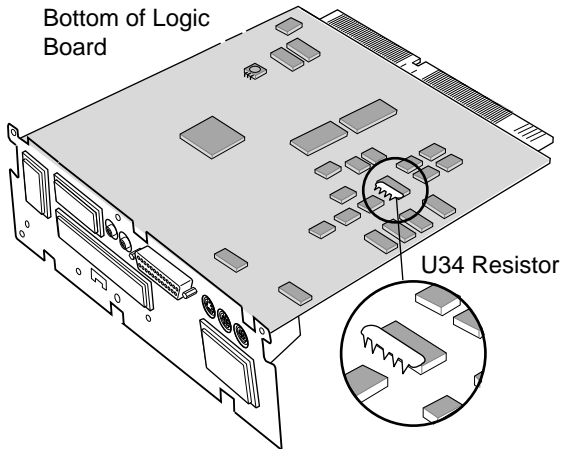


Important: Apple may use vendors not listed on this table. If the DRAM markings don't match the table criteria, use another identification method.

EDO Chip Identification

Vendor	Marking Example
SEC	The third character from the right is a non-zero number (for example, KM44C400 4 -60)
SEC	The fourth character from the right is a non-zero number (for example, KM416C120 4 BJ-6)
Hyundai	The second character from the right is a non-zero number (for example, HY51181 64 B)
Micron	A space and a capital X are present at the end of the marking (for example, MT8D264G-xx X)

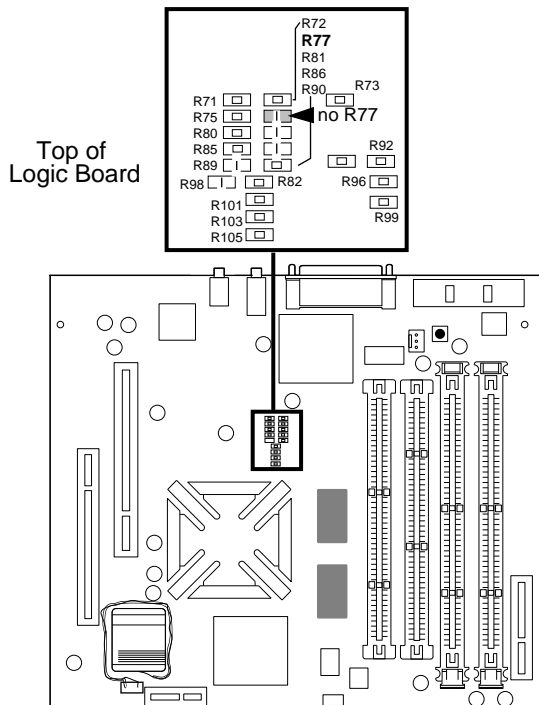




Resistor Present at U34

- 1 Turn the logic board over so that you are looking at the soldered-side of the board.
- 2 Locate chip U34 as pictured in the graphic. If a resistor package (SIP network) is on top of the U34 chip, as seen in this picture, the logic board supports EDO memory.

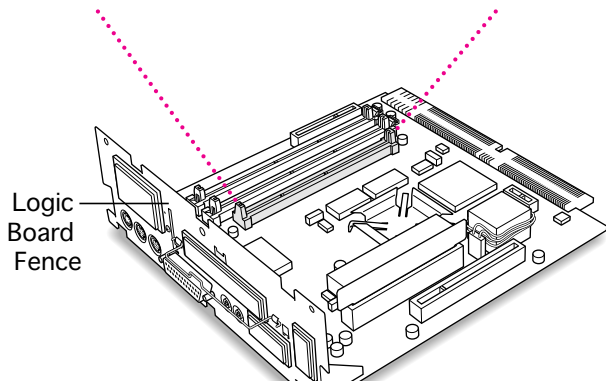
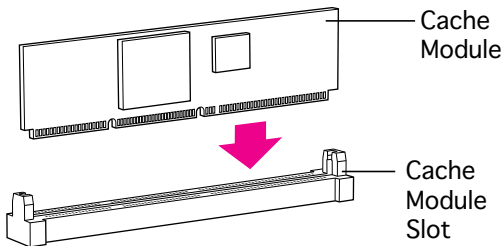




No Resistor at R77

- 1 Use the graphic here to locate the R77 resistor space near the SCSI port on the logic board.
- 2 If a resistor does not occupy the R77 location, as seen in the picture, the logic board supports EDO memory.





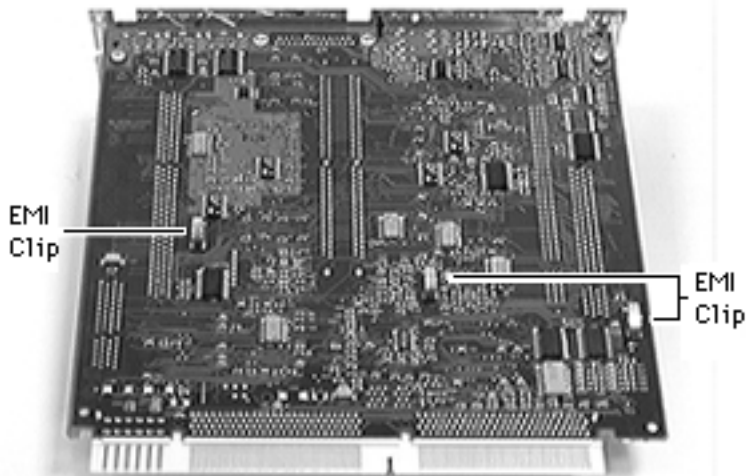
Cache (High Performance Module) Upgrade

Before you begin, remove the following:

- I/O door
- Logic board

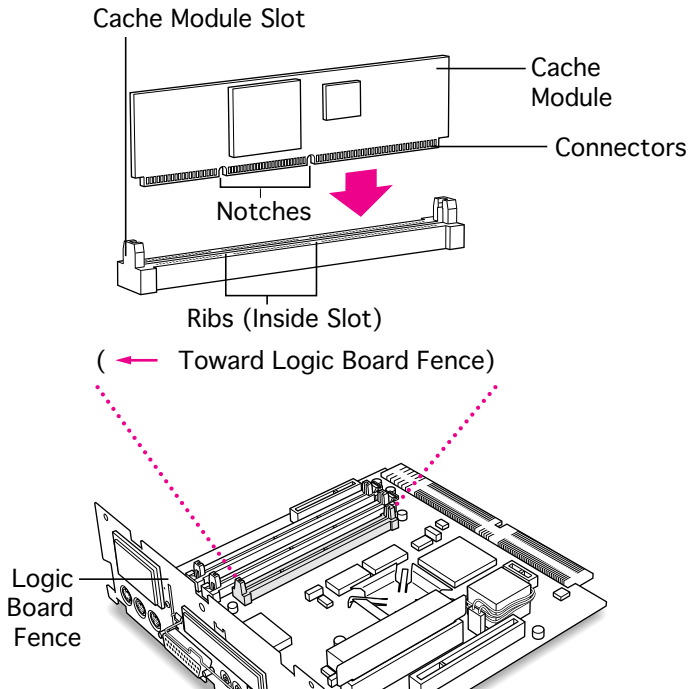
Caution: Review the ESD precautions in Bulletins/ Safety.





Caution: Take care to avoid compressing the EMI clips on the bottom of the logic board. If possible, support the underside of the board to avoid compressing the three silver-colored EMI clips. (The Performa 6360/160 has only one EMI clip.)





- 1 **Caution:** Do **not** touch the module's connectors. Handle the module only by the edges.

Align the notches in the module with the small ribs inside the cache module slot.

- 2 Push the cache module into place.

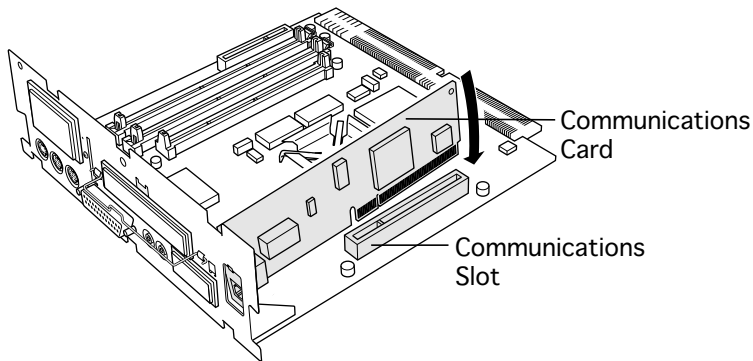




Communications Card Installation

Before you begin, remove the following:

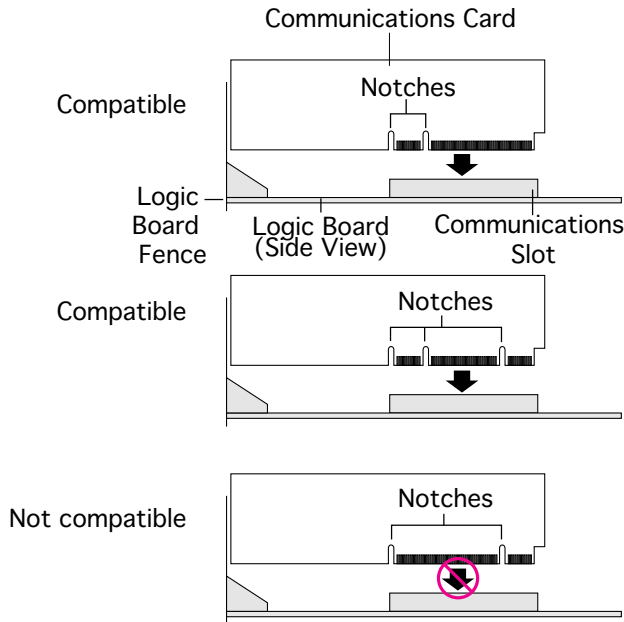
- I/O door
- Logic board



Caution: Review the ESD precautions in Bulletins/ Safety.

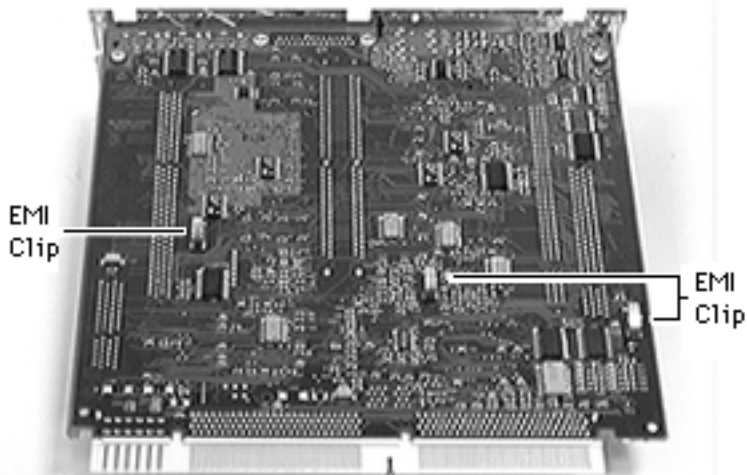
Note: This procedure shows installing an Ethernet or internal modem card.





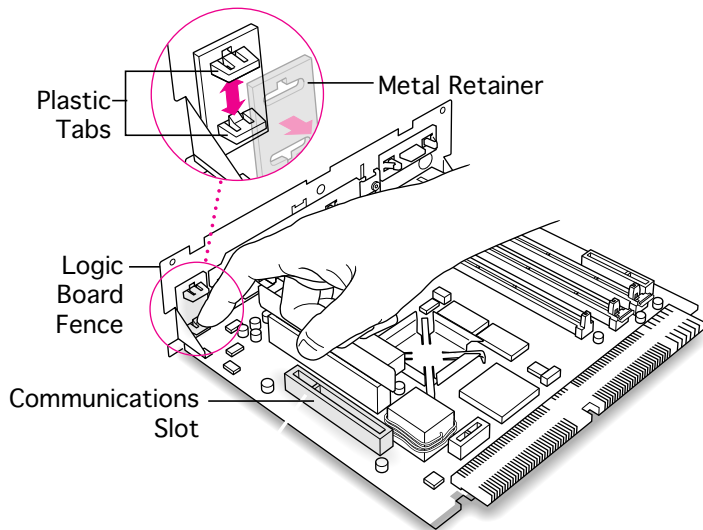
Note: Some communications cards are not compatible with this computer. Examine the placement of the notches on the card. Use these illustrations as a guide to identify the correct type of card for the slot.





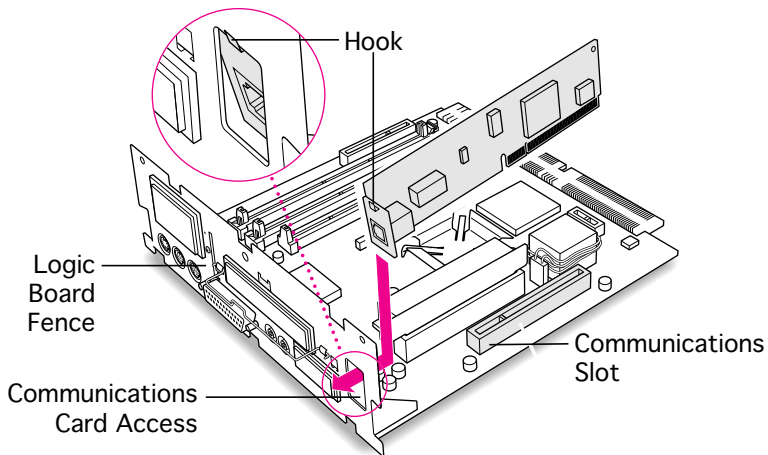
Caution: Take care to avoid compressing the EMI clips on the bottom of the logic board. If possible, support the underside of the board to avoid compressing the three silver-colored EMI clips. (The Performa 6360/160 has only one EMI clip.)





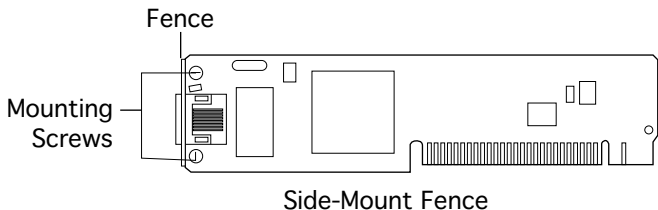
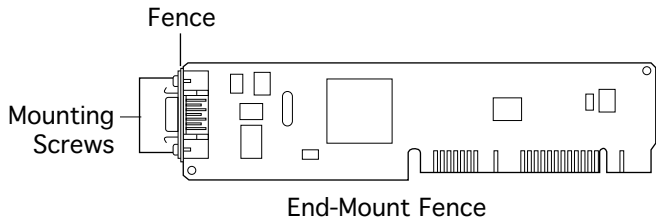
- 1 Remove the communications card access cover by pushing the two plastic tabs apart and removing the metal retainer.





- 2 Angle the hook-end of the card down and bring the hook under and up through the communications card access port. The hook should rest against the outside of the logic board fence.



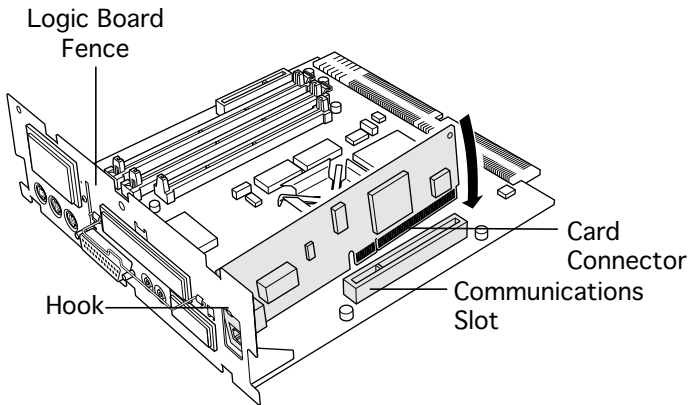


Replacement Note: If you are installing an Ethernet card and its fence does not include a hook, replace the fence.

- 3 Remove the card.
- 4 Remove the two card fence screws.
- 5 Remove the old fence.
- 6 Install the replacement fence on the card.

Note: If the Ethernet card fence does not include a hook and is riveted onto the card, replace the card.





- 7 Insert the card connector into the communications slot.

Note: Be sure the hook remains against the outside of the logic board fence.

- 8 Reset the logic board following the procedure in “Reset Logic Board” in the Additional Procedures chapter.



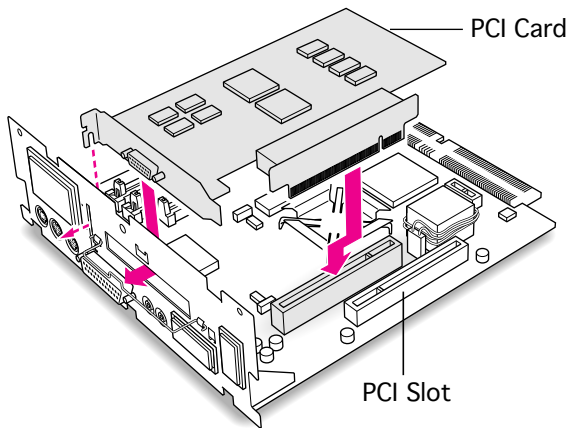


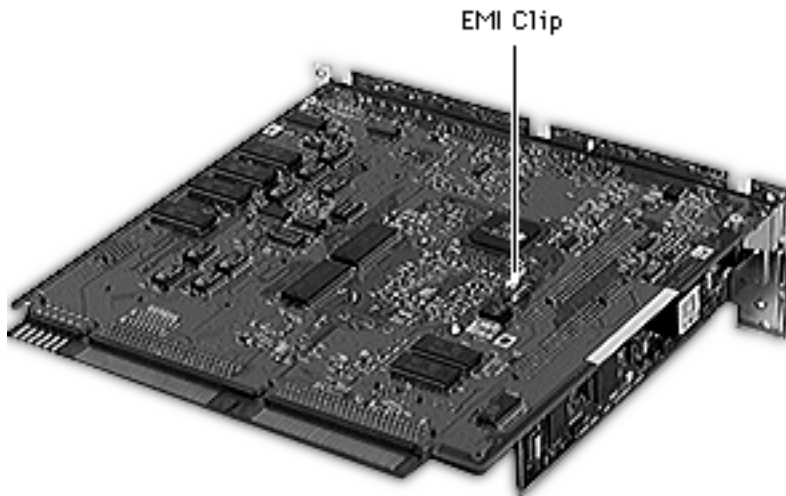
6360 PCI Card Installation

Before you begin, remove the following:

- I/O door
- Logic board

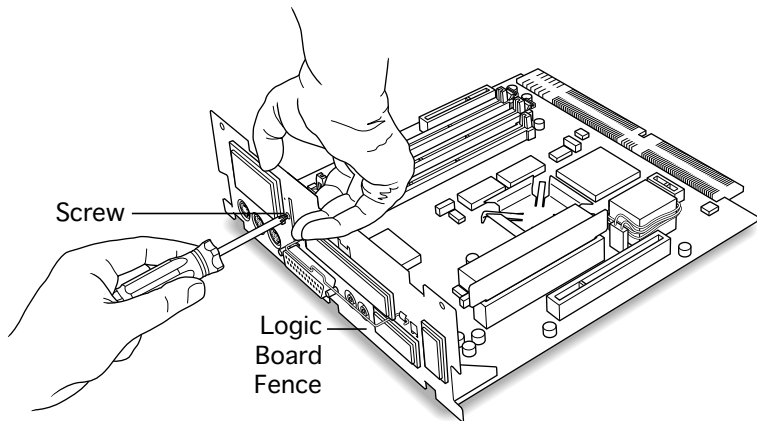
Caution: Review the ESD precautions in Bulletins/Safety.





Caution: Take care to avoid compressing the EMI clip on the bottom of the logic board. If possible, support the underside of the board to avoid compressing the silver-colored EMI clip.





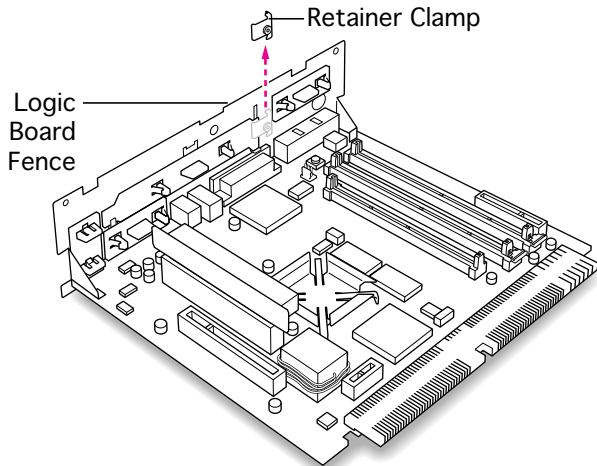
- 1 **Caution:** Avoid letting the retainer clamp fall onto the logic board.

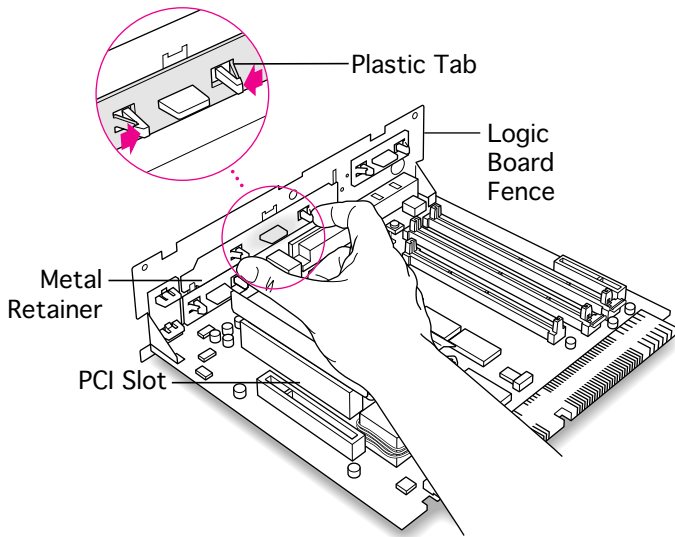
While holding the retainer clamp in place, remove the screw that secures the clamp to the logic board fence.





- 2 Remove the retainer clamp.



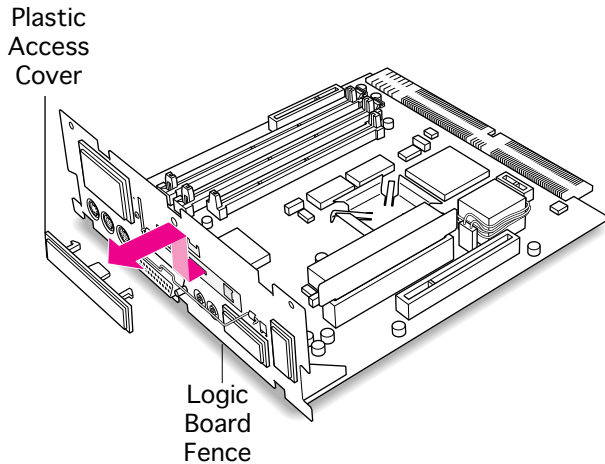


- 3 If the PCI card has ports for connecting equipment, remove the plastic access cover from the logic board fence. On the inside of the logic board fence, squeeze together the two plastic tabs of the plastic access cover.



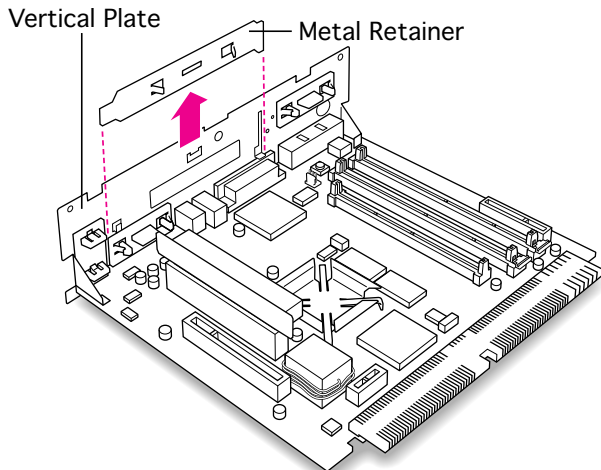


- 4 Remove the plastic access cover from the logic board fence.



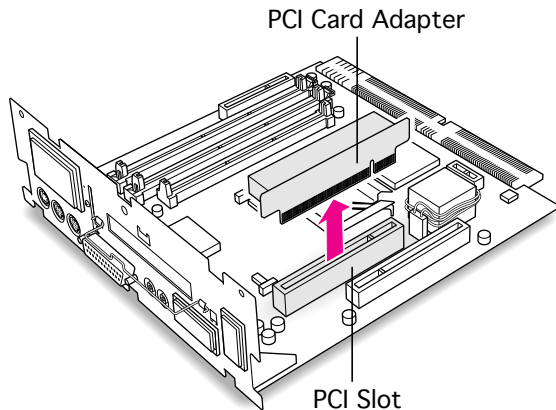


- 5 Remove the metal retainer from inside the logic board fence.



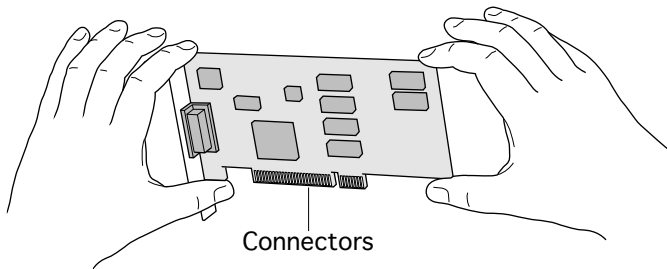


- 6 Pull up on the PCI card adapter to remove it from the PCI slot.



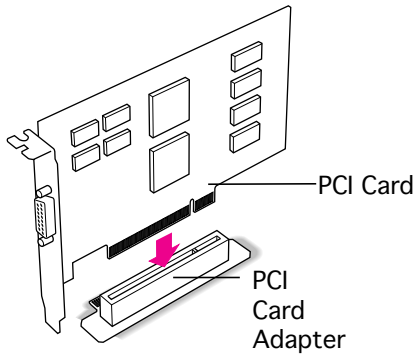


- 7 Hold the card by the edges to avoid touching any connectors.



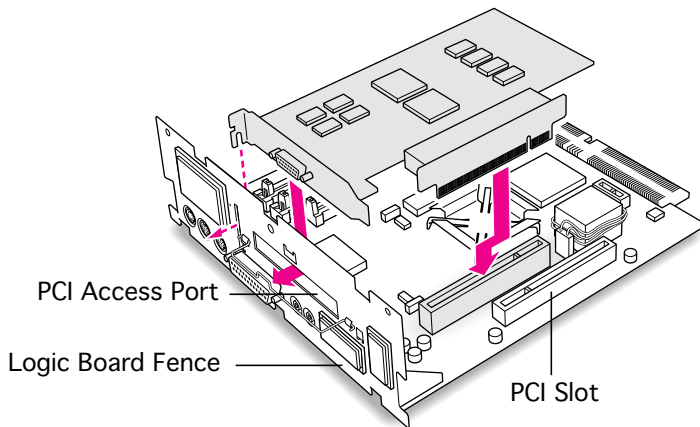


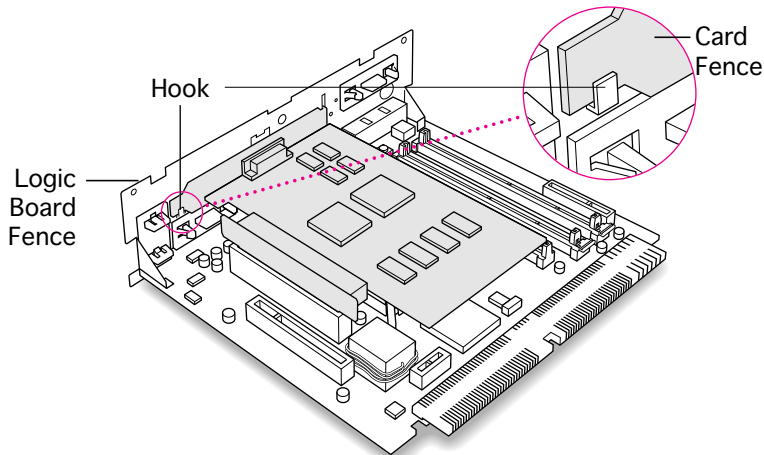
- 8 Press the PCI card connector into the PCI card adapter.





- 9 Press the PCI card adapter contact points into the PCI slot on the logic board.





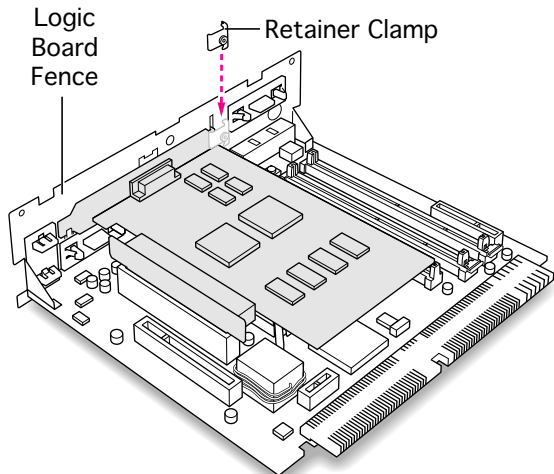
10 Be sure the PCI connector is in the access port and accessible outside the logic board fence.

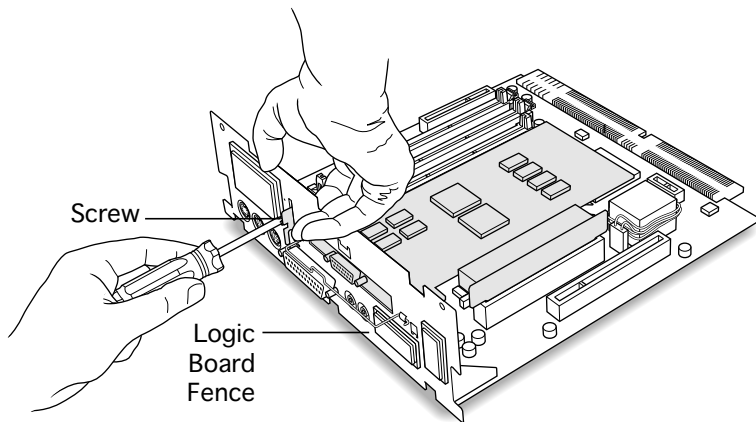
Make sure the metal fence on the PCI card engages the hook on the logic board fence.





- 11 Replace the retainer clamp inside the logic board fence.





- 12 Secure the clamp with a screw on the outside of the logic board fence.
- 13 Reset the logic board following the procedure in “Reset Logic Board” in the Additional Procedures chapter.





Additional Procedures

Macintosh Performa 6200/6300
Series



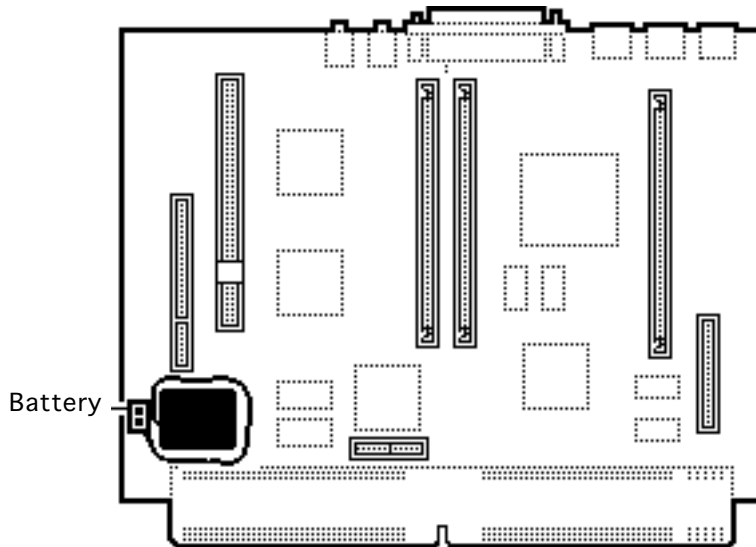


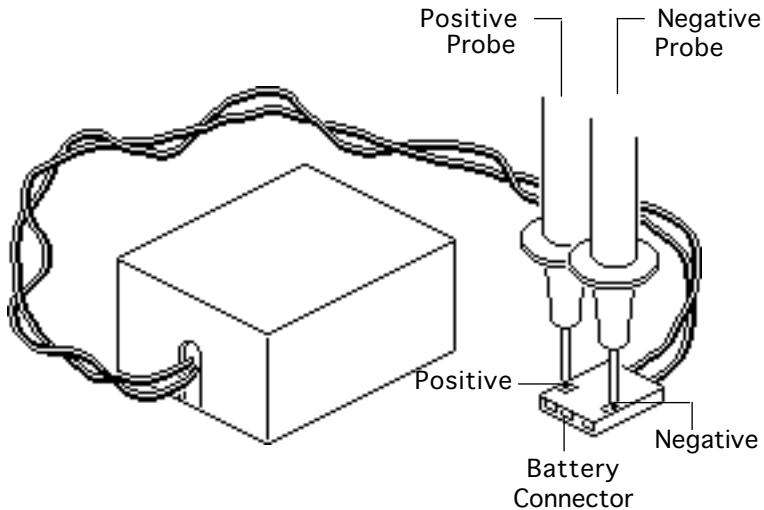
Battery Verification

Before you begin, remove the following:

- I/O door
- Logic board
- Battery

Caution: Review the ESD precautions in Bulletins/Safety.





Set the voltmeter to the 10 VDC scale.

Hold the positive probe of the voltmeter to the positive end of the battery. Hold the negative probe to the negative end of the battery.

If the battery voltage is below 3.0 V, replace the battery. Refer to “Battery Replacement.”



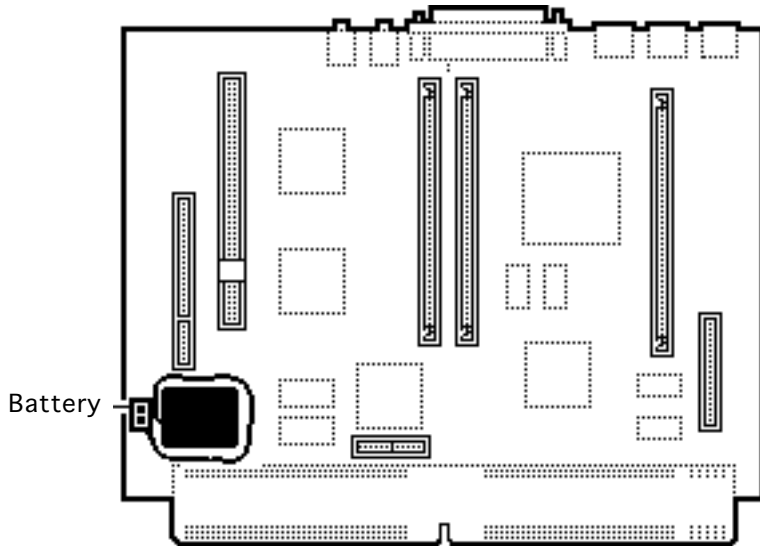


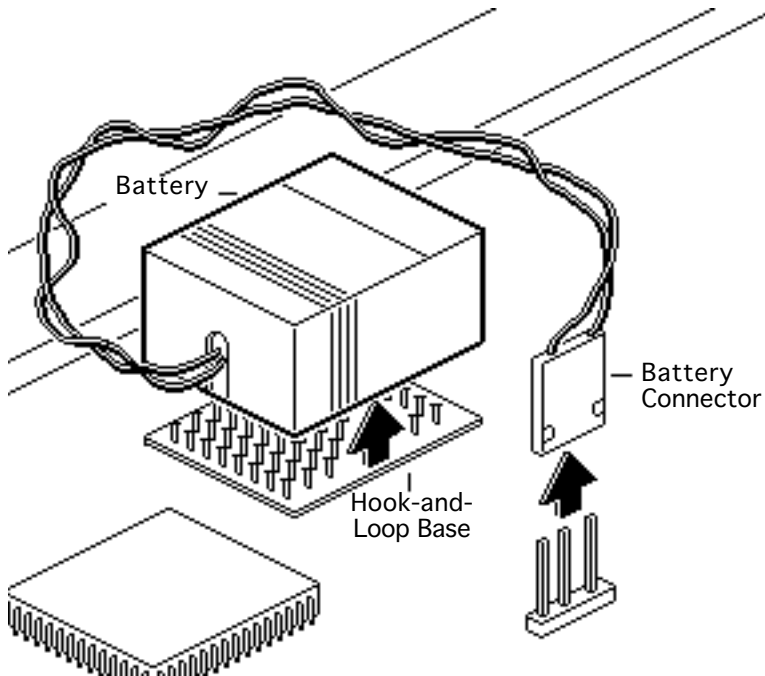
Battery Replacement

Before you begin, remove the following:

- I/O door
- Logic board

Caution: Review the ESD precautions in Bulletins/Safety.



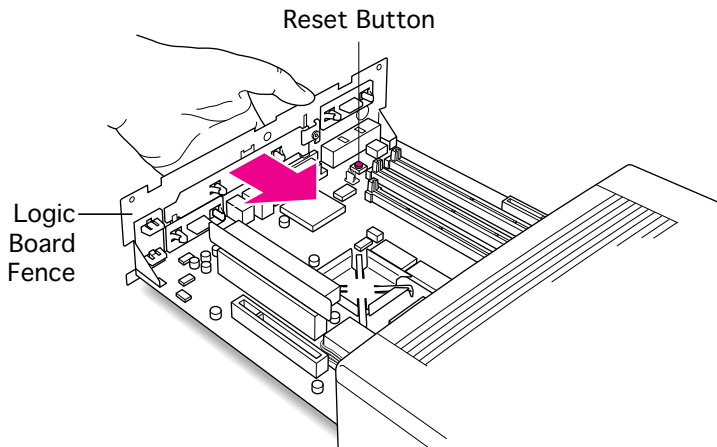


- 1 Pull up and disconnect the connector.
- 2 Pull up and remove the battery from its hook-and-loop base.





6360 Logic Board



Reset Button (6320, 6360)

Before you begin, remove the following:

- Power cord
- I/O door
- Logic board

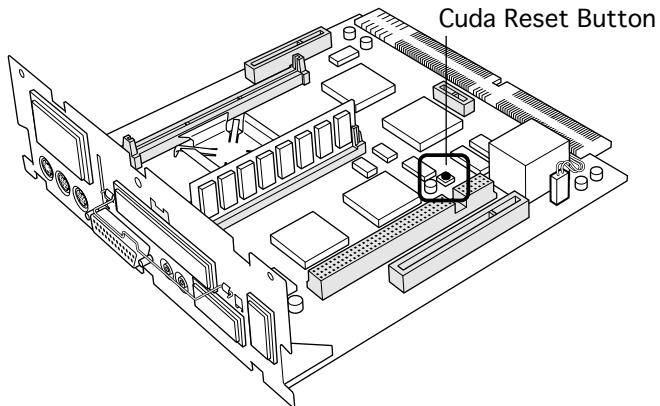
Caution: Review the ESD precautions in Bulletins/Safety.

Press the reset button on the logic board using a flat plastic tool.





6320 Logic Board



Note: The reset button is located in a different place on the 6320 and 6360 logic boards. See the diagrams on this page and the previous page.



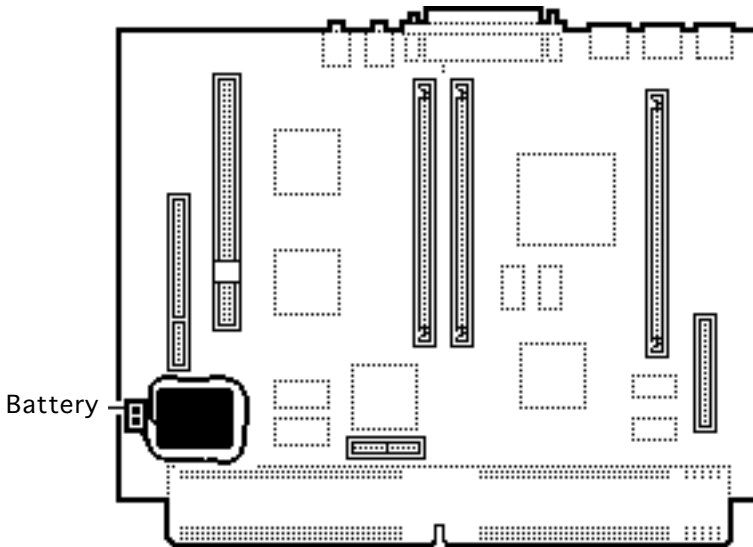


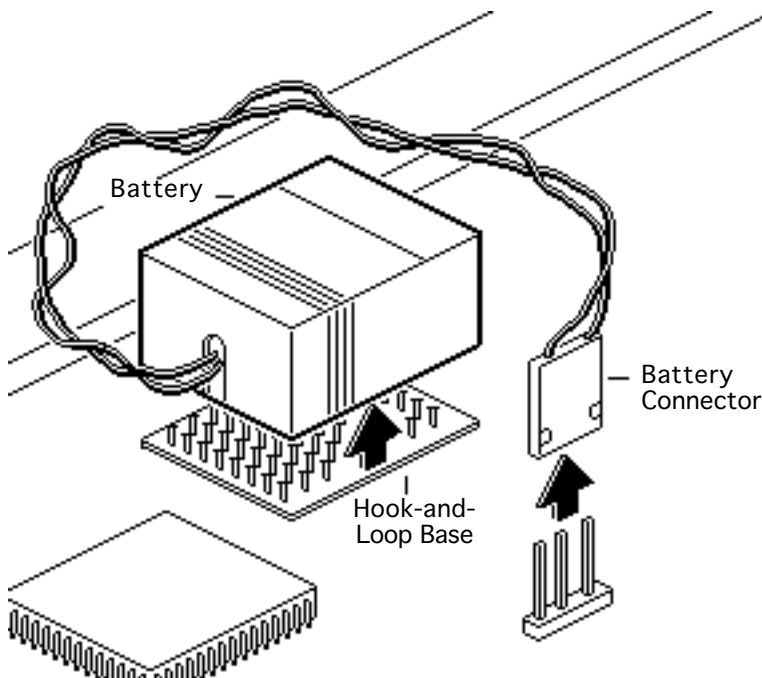
Reset Logic Board

Before you begin, remove the following:

- Power cord
- I/O door
- Logic board

Caution: Review the ESD precautions in Bulletins/ Safety.





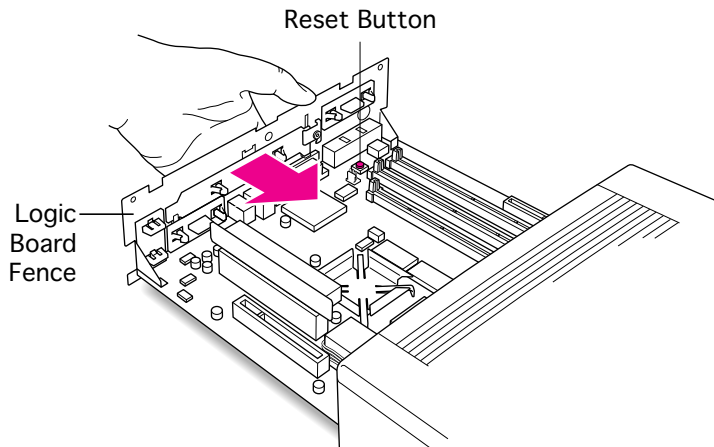
Note: Try resetting the logic board by clearing parameter RAM with key commands. To clear parameter RAM, hold down Command-Option-P-R during startup but before the “Welcome to Macintosh” message appears.

- 1 Pull up and disconnect the connector.
- 2 Pull up and remove the battery from its hook-and-loop base.
- 3 Wait 5 to 10 minutes, and then replace the battery.





6360 Logic Board



- Note:** The reset button is located in a different place on the 6320 and 6360 logic boards. See the diagrams on this page and the next page.

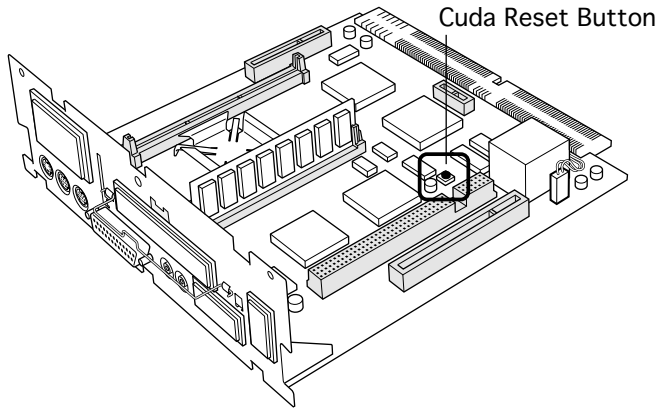
For a 6360 or 6320, press the reset button on the logic board using a flat plastic tool.

- Align the logic board at an upward angle to clear EMI clips.
- Fully seat the logic board in the enclosure.





6320 Logic Board



Note: After resetting PRAM, check the computer's time/date and other system parameter settings.

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.





REA Procedures

Macintosh Performa 62xx/63xx





Repair Overview for Freezing and Video Color Hue Issues

These procedures describe repairs for system freezes and sudden changes in video color hue on the Performa 62xx, 63xx computers (except the Performa 6320 and 6360).





Performa 62xx, 63xx

Perform these steps for Performa 62xx, 63xx computers exhibiting system freezes:

- Note the unit's external cable hookups.
- Remove the I/O door.
- Remove the logic board.
- If the clock chip at U10 is not p/n 343S1191 or 343S1121, replace the logic board. (Ignore any letters following the part number.)
- If the Cache/ROM DIMM is laid out **exactly** as illustrated and has **no** sticker on the middle vertical IC, replace the DIMM.
- If an Ethernet card is installed and the card fence doesn't hook onto the logic board fence, replace the card fence.
- If you are not replacing the logic board, replace the EMI clips.
- Upgrade RAM for U.S. and Canadian Education customers.





Note: Following all repairs, test, reassemble, and label the unit.

Why Replace the Logic Board/ROM DIMM?

Replacing the logic board or Cache/ROM DIMM addresses known component issues that can cause system freezes (the system clock stops and moving the mouse does not move the cursor).

Note: Freezes due to Type 11 errors should be addressed through a clean install of system software or by updating third-party software.





Why Replace the EMI Clips?

Replacing the EMI clips prevents possible damage to the logic board during the installation of expansion boards.

Why Replace the Ethernet Card Fence?

Installing a hooked fence on the Ethernet card provides a way to hold the card more securely in the communications slot. Without the hooked fence, the card could rock out of the slot and cause intermittent network connection.





System Tester

The diagnostic application 5XXX/6XXX Tester, which is included in the Utilities folder on the Macintosh 5xxx, 6xxx System 7.5 v 2.0 Update Service CD, tests for known component issues causing system freezes in Power Macintosh/Performa 5xxx/6xxx computers. The application does not test for video color hue issues.

When the application finds a problem with a unit, it displays one of the following two messages:

The logic board has been checked and a potential issue has been found. Please contact Apple Customer Support or an Apple Authorized Service Provider to have the logic board replaced as part of the repair extension program.





A potential issue with the Cache has been found. Please contact Apple Customer Support or an Apple Authorized Service Provider to have the Cache replaced as part of the repair extension program.

If the application finds no problem with a unit, it displays this message:

The logic board has been checked and none of the specific, known hardware issues that are covered under this program were found. If you are experiencing problems, we recommend that you verify that any software applications you are using are compatible with your computer. You can do this by contacting the developer of the software. You should also follow the procedures described in the troubleshooting section of the User's Guide to reduce any freezing issues you are experiencing.





You or a customer may run 5XXX/6XXX Tester on units before you make onsite repair calls, so you can better estimate the number of logic boards and Cache/ROM DIMM cards to stock and transport.





Part Numbers

Use the following part numbers when ordering replacement parts included in these procedures:

Logic Board, 603/75 MHz, 16-Bit Sound	661-1008
Logic Board, 603E/100 MHz	661-1041
Cache/ROM DIMM	661-1278
EMI Clips (Pkg. of 25)	922-2320
Fence for Ethernet 10 Base-T Card (Pkg. of 2)	922-2329
Fence for Ethernet Thin Coax Card (Pkg. of 2)	922-2330
Fence for Ethernet AAUI Card (Pkg. of 2)	922-2441
Ethernet 10 Base-T Card	661-0888
Ethernet Thin Coax Card	661-0036
Ethernet AAUI Card	661-0889
SIMM, DRAM, 4 MB, 80 ns, 72-Pin, EDU	922-2397
System 5xxx, 6xxx Update CD	600-4454
REA Label (Logic Board Repair, Pkg. of 100)	922-2396





Before You Begin

Before you begin the repair procedures,

- Note the unit's external cable hookups (onsite).
- Turn off the power.
- Disconnect the external and power cables (onsite).
- Put on a grounding wriststrap.





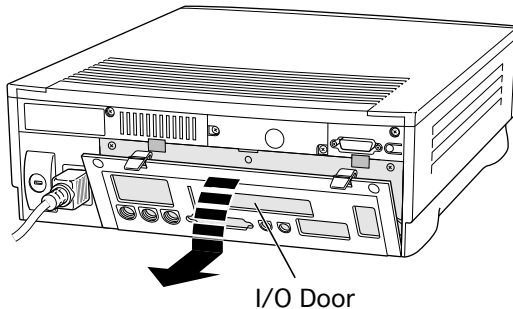
Repair Procedures

Remove the I/O Door

- 1 Release the two latches.
- 2 **Caution:** Be careful not to damage the bottom tabs when removing the door.

Swing the door down and release the three bottom tabs.

- 3 Remove the door from the unit.





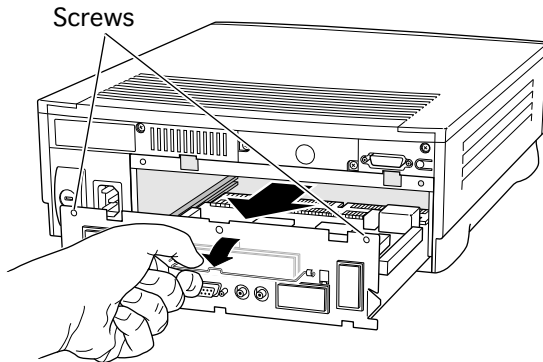
Replacement Note: Align the bottom tabs before swinging the door up.

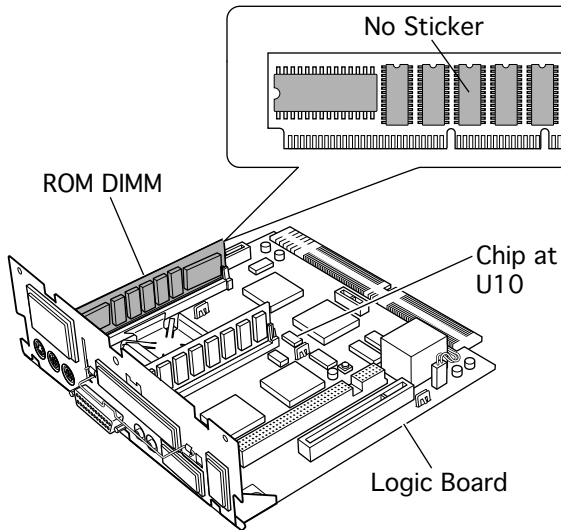




Inspect the Logic Board

- 4 Remove the two logic board mounting screws.
- 5 Grasp the logic board handle and pull out the logic board.





- 6 Inspect the clock chip at location U10. If it is **not** printed with part number 343S1191 or 343S1121 (ignore any letters following the part number), replace the logic board. **Go to step 14.**

Note: The 5XXX/6XXX Tester will report that an issue has been found with the logic board.

- 7 Inspect the Cache/ROM DIMM. If it is laid out **exactly** as shown in the illustration on this page,

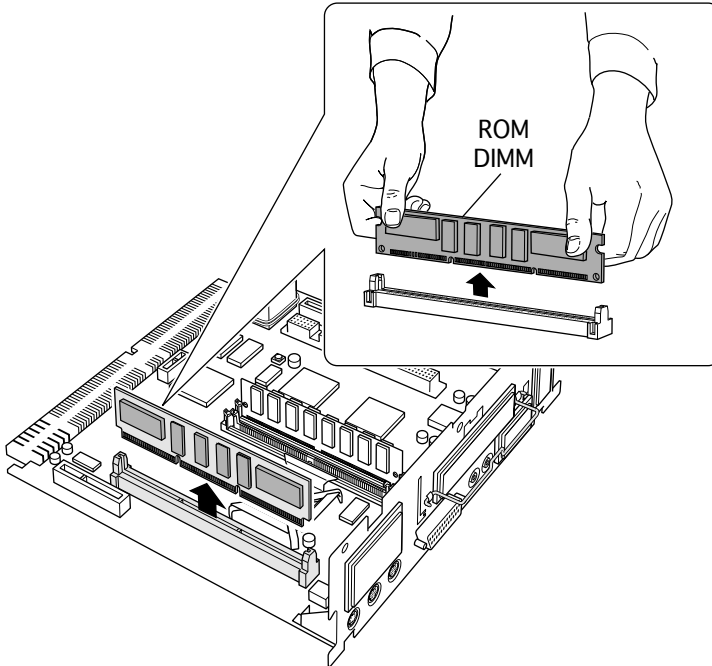




and does not include a sticker on the center chip, replace the DIMM. Otherwise, **go to step 24.**

Note: The 5XXX/6XXX Tester will report that an issue has been found with the Cache/ROM DIMM.





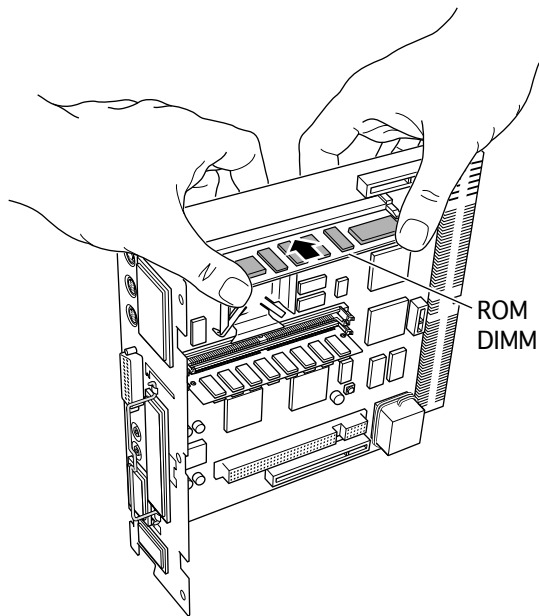
Replace the Cache/ ROM DIMM

- 8 Hold each end of the Cache/ROM DIMM between the thumb and forefinger of each hand.

Note: You may hold the DIMM by the chips.

- 9 Using some force, pull the DIMM straight up out of its slot.





10 Hold the logic board vertically with the communications slot end of the board resting on your workspace.

11 Insert the replacement Cache/ROM DIMM into the DIMM slot.

Caution: Make sure the notches in the DIMM line up with the pegs in the DIMM slot.

12 Bracing the underside of the logic board with your fingertips, use both thumbs to press down on the top edge of the DIMM





until you hear it snap
into place.

13 Go to step 24.



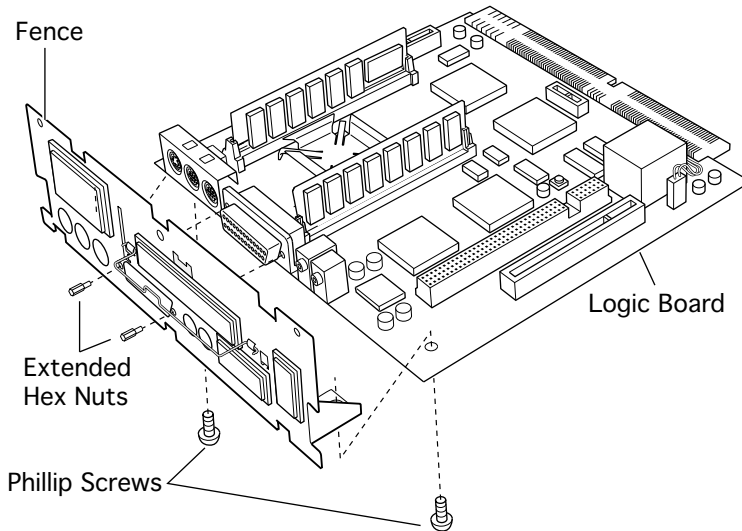


Replace the Logic Board

Perform steps 14-17 only if you are replacing the logic board.

Note: Replacement logic boards come without a fence. When replacing a logic board, remove the fence from the old board and reinstall it on the replacement board.





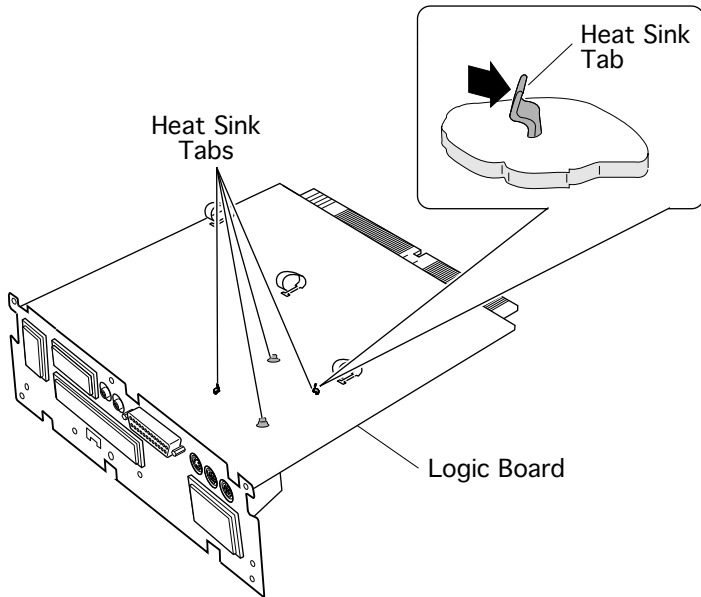
- 14 Remove the two Phillips screws that secure the fence to the solder side of the logic board.
- 15 Remove the two hex nuts that secure the logic board fence to the SCSI connector.
- 16 Remove the logic board fence from the old logic board and reinstall it on the replacement board.
- 17 Plug in the logic board battery.





Note: Be sure to transfer any SIMMs or expansion cards from the old board to the replacement board. (See “Transfer the Double-Sided DRAM SIMM,” steps 18-23, “Upgrade RAM for Education Customers,” step 24, and “Replace the Ethernet Card Fence,” steps 25-29.) Do not transfer the Cache/ROM DIMM to the replacement board; return the old board with its Cache/ROM DIMM installed.





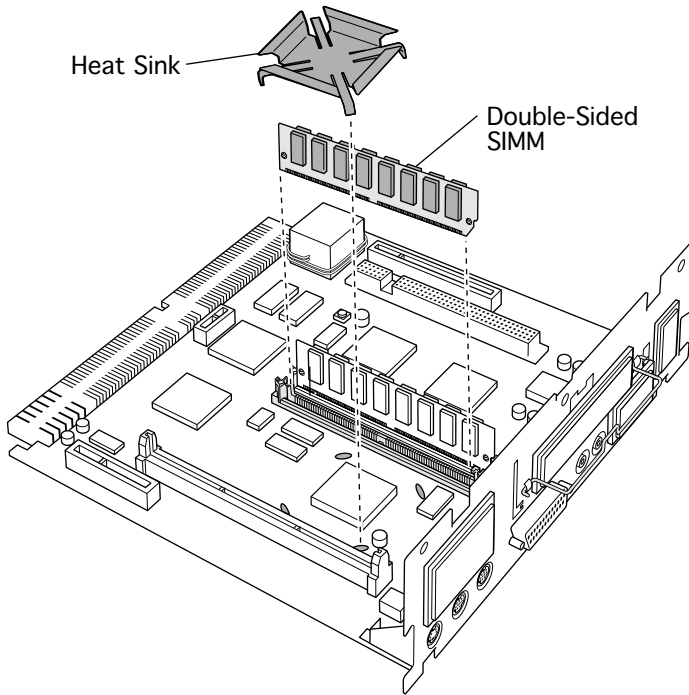
Transfer the Double-Sided DRAM SIMM

Perform steps 18-23 if you are replacing the logic board and a double-sided DRAM SIMM is installed next to a processor heat sink. (Some logic boards do not include a processor heat sink.)

Caution: Be careful not to disturb the layer of thermal grease on the bottom of the heat sink and the top of the processor chip.

18 Release the four heat sink tabs from the





underside of the old logic board.

- 19 Remove the heat sink.
- 20 Remove the double-sided SIMM next to the processor.
- 21 Remove the heat sink from the replacement logic board.
- 22 Install the SIMM next to the processor on the replacement board.
- 23 Reinstall the heat sinks on both boards.





Upgrade RAM for Education Customers

Perform step 24 if you are installing System 7.5.3 on a U.S. or Canadian Education customer's unit and the unit has 8 MB RAM installed. (See "Before You Begin.")

24 Install a 4 MB DRAM SIMM (part number 922-2397) in the empty DRAM SIMM slot.

Note: The Desktop Repair Extension Program is intended to address specific hardware issues. Due to the unique needs of public and private nonprofit educational institutions, Apple is performing some additional services above and beyond the repair extension program. Specifically, to meet the requirements of certain solutions bundles sold to public and private nonprofit educational institutions, Apple is installing System 7.5.3 and additional RAM.

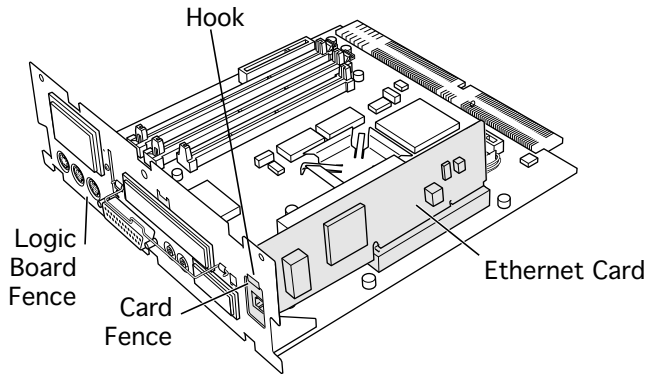


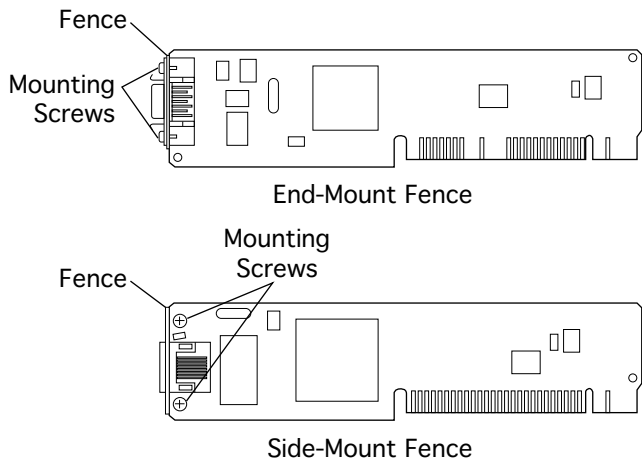


Replace the Ethernet Card Fence

Perform steps 25-29 if an Apple Ethernet card is installed on the logic board (whether or not you are replacing the logic board).

Note on ordering and claims procedures: Do not enter the part number for the card fence on the SRO.





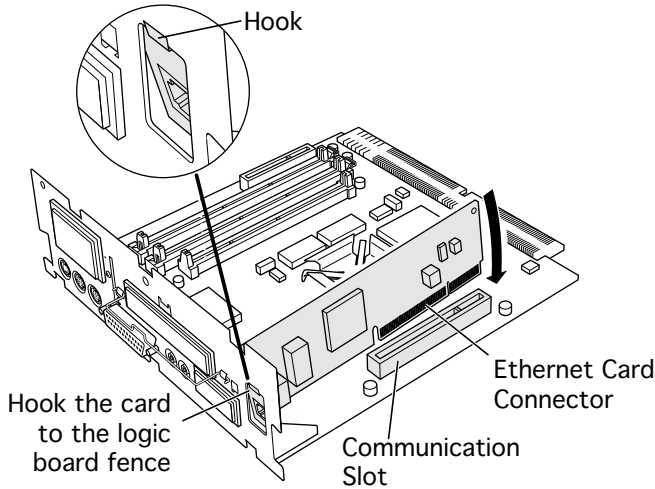
- 25 Inspect the metal fence on the Ethernet card.
- 26 If the card fence hooks onto the logic board fence, **go to step 30**.
- 27 If the card fence does not hook onto the board fence and the card fence is riveted onto the card, replace the card.
- 28 If the card fence does not have a hook and is screwed onto the card:
 - Remove the card.
 - Remove the two card fence screws.
 - Remove the old fence.





- Install the replacement fence on the card.

29 Hook the Ethernet card fence onto the logic board fence and insert the card into the communication slot.





Replace the EMI Clips

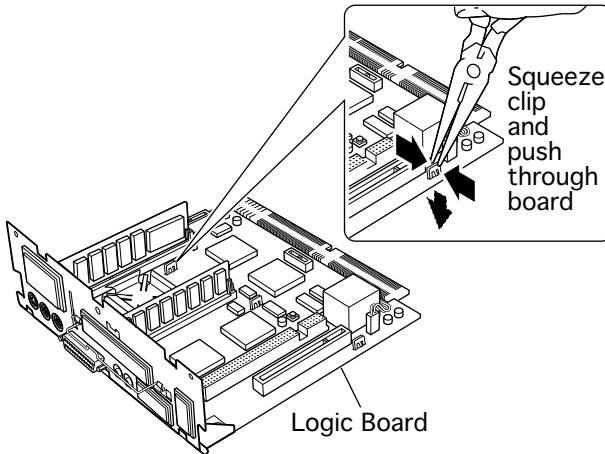
If you are retaining the original logic board, you must replace the board's three EMI clips (ground clips). Perform steps 30-33 only if you are not replacing the board.

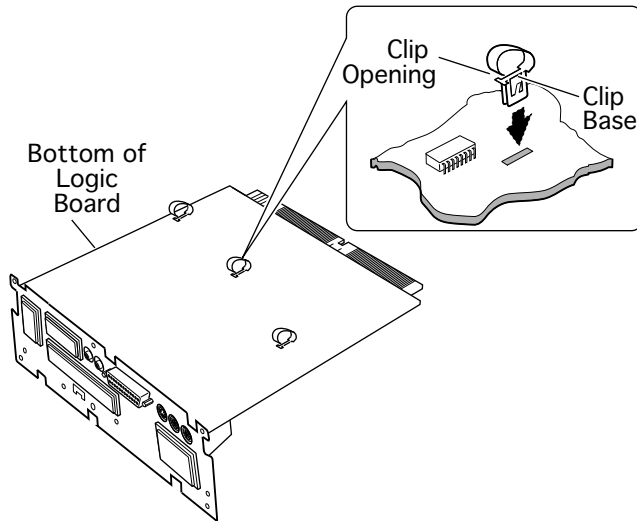
Note on ordering and claims procedures: Please claim part number 011-0156 when you replace the EMI clips but do not replace the logic board. Do not enter the part number for the clips on the SRO.





- 30 With the logic board facing right side up, squeeze together the top of each EMI clip and push it out through the slot.





- 31 Turn the logic board underside facing up. Orient the first clip with its open end facing the logic board fence.
- 32 Insert the clip into the slot and press firmly on the clip base until you hear it snap into place. Repeat the procedure for the other two clips.
- 33 You are now finished with the necessary hardware repairs. Continue with the following steps.





Test, Reassemble, and Label the Unit

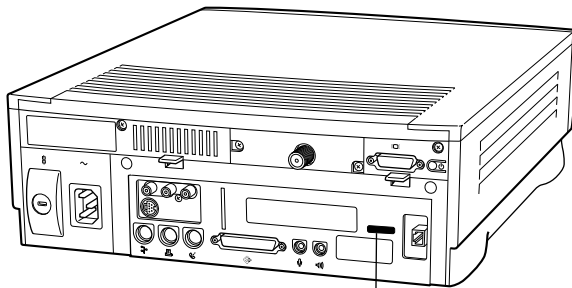
- 34 Reassemble the unit.
- 35 If you are repairing the unit onsite, reconnect the external cables.
- 36 Verify that the unit starts up correctly.





37 Apply the REA label (part number 922-2396) to the left of the communication port on the back of the unit.

Note: If the labels are not available, write the letters "REA" in the designated area on the back of the unit.



Label
Location





Install System 7.5.3

Give the Macintosh 5xxx, 6xxx System 7.5 v 2.0 Update Service CD to Performa customers so they can perform their own installation.





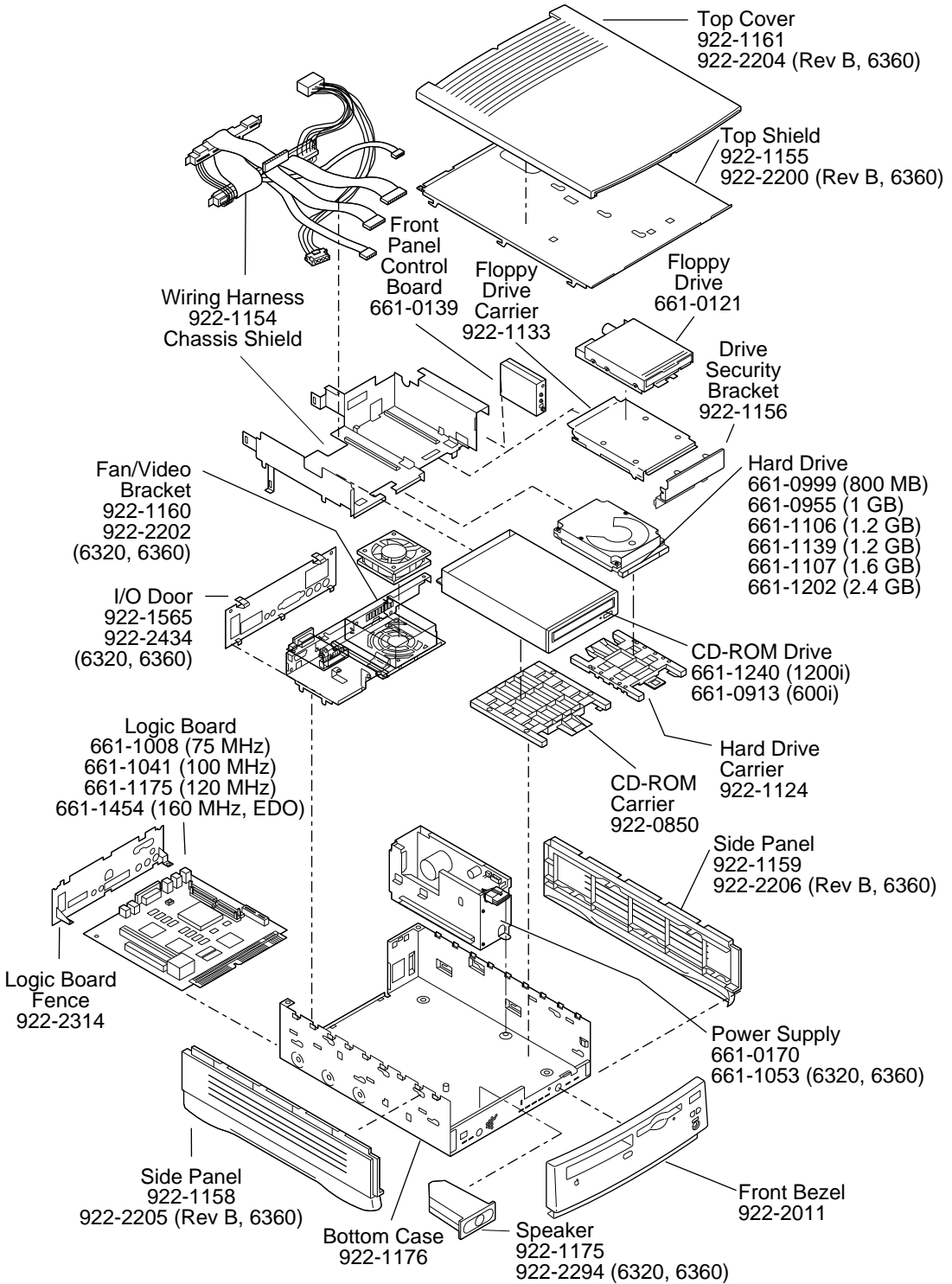
Exploded View

Performa 6200/6300





Exploded View



Product family configurations may vary.



TIL article #22102

TOPIC

This article is the 1.2 GB Firmware Utility v1.1 Read Me file.

DISCUSSION

Requires:

A 1.2 GB drive on a Power Macintosh or Performa with firmware version 1.37 and below. This utility can be used on international versions of Mac OS as well as US Mac OS.

Description:

This bootable disk image contains a utility to fix a problem with a limited number of 1.2 GB ATA hard drives in some Power Macintosh and Performa configurations that can cause a flashing question mark at startup. 1.2 GB Firmware Utility 1.1 will upgrade the firmware on the affected drives and is only needed for 1.2 GB ATA drives with firmware versions 1.37 and below.

This software consists of a Disk Copy NDIF (New Disk Image Format) compressed image, which requires Disk Copy 6.1 or later to use. Download this software to your hard drive and then double-click it to use it. Disk Copy is available in the Utilities folder.

Disk Copy 6.1 (or later) is the recommended application to access this disk image.

Overview

Due to an anomaly with some of the 1.2 GB ATA hard drives, a limited number of configurations of the Power Macintosh and Performa models may experience an intermittent flashing question mark from a cold boot or a restart. Restarting the computer may allow the hard drive to boot up properly, but the flashing question mark may return upon the next cold boot.

In order to update the firmware on a hard drive, you must boot the computer from a diskette made from this image. To make a floppy, hold down the option key when opening this disk image in Disk Copy.

Note: Do not lock this diskette, since the utilities need unlocked media to run properly.

Identifying Suspect Units

You can use 1.2 GB Firmware Utility 1.1 or Apple System Profiler to check the firmware version of your drive. To use Apple System Profiler, launch it and go to the Select menu

and choose Device Information. The firmware version will be displayed as the Revision Number. The 1.2 GB Firmware Utility 1.1 is not needed unless the firmware version is 1.37 or below. The 1.2 GB Firmware Utility 1.1 also checks the firmware, and will only update the firmware of the appropriate drives.

Note: If you do not have access to Apple System Profiler, you can download it from Apple Software Updates:
<http://www.info.apple.com/swupdates>

If troubleshooting procedures have been performed and there still is an intermittent flashing question mark, use the following hard drive identifying procedure to determine whether the hard drive should be updated or replaced:

1. If the machine is running, shut down.
2. Power off and disconnect all external SCSI devices (if any).
3. Insert the Utility floppy disk and start the Power Macintosh.
4. Double click the ATA_Serial_Num application. If the internal drive is a candidate to be updated, ATA_Serial_Num automatically downloads the firmware. A window will be displayed with the drive information, including the new firmware version. If the drive is not one of the affected drives, the window will display the drive information and a message stating that the drive does not need to be updated.
5. Choose Quit from the File menu. You can choose to save the drive information window as a text file.
6. Reconnect external SCSI devices.
7. Restart. The Macintosh is now ready for normal operation.

Update Note

For this issue, the firmware version 1.37 and below are the affected drives. If you find a drive with the firmware version 1.37 or below, then use the firmware update utility. The utility will check the drive firmware version before update. If the drive firmware version does not qualify for the update, the utility will leave the drive untouched.

Replacement Note

If the drive is updated and it is still exhibiting problems, it may be necessary to replace the drive. See an Apple Authorized Service Provider. To locate a Service Provider in your area see: <http://www.info.apple.com/>