



# Macintosh Quadra 800/WS 80

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Macintosh Quadra 800  
Workgroup Server 80





## Specifications

Quadra 800/WS 80





## Processor

### **CPU**

Motorola 68040 microprocessor

33 MHz

Built-in paged memory management unit (PMMU), floating-point unit (FPU), and 8K memory cache

### **Addressing**

32-bit registers

32-bit address/data bus





## Memory

<b>DRAM</b>	8 MB (soldered DRAM) or 24 MB (8 MB soldered DRAM plus four 4 MB SIMMs) standard; expandable to 136 MB 72-pin SIMMs 60 ns access time
<b>ROM</b>	1 MB soldered on logic board
<b>PRAM</b>	256 bytes of parameter memory



**VRAM**

512K or 1 MB standard, expandable to 1 MB (80 ns or faster  
VRAM SIMMs)

Maximum pixel depths for 512K / 1 MB VRAM:

12-inch color (512 x 384) - 16 / 16 bits per pixel

12-inch monochrome (640 x 480) - 8 / 8 bits per pixel

13-inch color (640 x 480) - 8 / 16 bits per pixel

15-inch portrait (640 x 870) - 4 / 8 bits per pixel

16-inch color (832 x 624) - 8 / 16 bits per pixel

19-inch color (1024 x 768) - 4 / 8 bits per pixel

21-inch monochrome (1152 x 870) - 4 / 8 bits per pixel

21-inch color (1152 x 870) - 4 / 8 bits per pixel

VGA (640 x 480) - 8 / 16 bits per pixel

SVGA (800 x 600) - 8 / 16 bits per pixel

**Clock/Calendar**

CMOS custom chip with long-life lithium battery





## Disk Storage

### **Floppy Drive**

Internal, 1.4 MB Apple SuperDrive

### **Hard Drive**

Internal, 3.5 in. hard drive (230, 500, 1000 MB) optional

### **CD-ROM Drive**

Internal, CD-300 mechanism optional





## I/O Interfaces

### **Serial**

Two RS-232/RS-422 ports; mini DIN-8 connectors

230.4K baud maximum

0.920 Mbit/sec. if external clock source is provided (modem interface only)

Asynchronous, synchronous (modem only), and AppleTalk (printer only) protocols supported

### **Video**

One video port; DB-15 connector

Supports Apple monitors (up to 16 bits), VGA monitors, and NTSC and PAL video standards

### **Ethernet**

One Ethernet port; AUI-15 connector





<b>SCSI</b>	One SCSI port; DB-25 connector Supports a maximum of eight devices (including the computer, which is always device 7)
<b>NuBus</b>	Three slots support standard size cards, burst-mode transfers, a processor write buffer, and NuBus '90; 96-pin Euro-DIN connectors
<b>Expansion</b>	One 68040 processor-direct slot (PDS); 140-pin connector
<b>Audio</b>	One 8-bit stereo output port; one 8-bit monaural input port; mini phone jack connectors
<b>Apple Desktop Bus</b>	Two Apple Desktop Bus (ADB) ports for keyboard, mouse, and low-speed input devices; mini DIN-4 connectors







## I/O Devices

### **Keyboard**

Apple Keyboard, Apple Extended Keyboard, Apple Keyboard II, or Apple Extended Keyboard II (optional); mini DIN-4 connector

### **Mouse**

Apple Desktop Mouse or Apple Desktop Mouse II; mini DIN-4 connector

### **Microphone**

Electret, omnidirectional; output voltage is 4 mV, peak to peak, at normal value; mini phone plug connector





## Sound and Video

### **Video Display**

Built-in VRAM video support for all Apple monitors; two VRAM expansion slots (one bank)

Supports Apple 16-bit monitors and many non-Apple monitor types (NTSC, PAL, VGA)

Multiple external color and monochrome monitors through NuBus expansion slots

### **Sound Generator**

Enhanced Apple sound chip (EASC), including four-voice wave-table synthesis and stereo sampling generator capable of driving stereo mini-phone-jack headphones or stereo equipment





## Electrical

<b>Line Voltage</b>	100-240 VAC
<b>Frequency</b>	50-60 Hz, single phase
<b>Maximum Power</b>	200 W continuous





## Physical

### **Dimensions**

Height: 14.25 in. (360 mm)

Width: 7.75 in. (196 mm)

Depth: 16 in. (396 mm)

### **Weight**

24 lb. (11.3 kg)





## Environmental

**Operating  
Temperature**

50-104° F (10° to 40° C)

**Storage  
Temperature**

-40 to 116.6° F (-40 to 47° C)

**Relative Humidity**

5-90% non condensing

**Altitude**

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





## Troubleshooting

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Macintosh Quadra 800/WS 80





## General

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

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

For additional assistance, contact Apple Technical Support.





# Symptom Charts

## Error Chords

One-part error chord sounds during startup sequence

- 1 Disconnect SCSI data cable from hard drive and reboot system. If startup sequence is normal, initialize hard drive. If error chord still sounds, replace hard drive.
- 2 Disconnect floppy drive cable from floppy drive and reboot system. If startup sequence is normal, replace floppy drive.
- 3 Replace logic board. Retain customer's SIMMs.

Two-part error chord sounds during startup sequence

Perform SIMMs verification.







## System

Does not power on;  
screen is black, fan is  
not running, and LED  
is not lit

- 1 Check power cables.
- 2 Plug monitor directly into wall socket, and verify that monitor has power.
- 3 Replace power cord.
- 4 Replace power supply.
- 5 Replace logic board. Retain customer's SIMMs.

Clicking, chirping,  
or thumping

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





## System (Continued)

System shuts down  
intermittently

- 1 Make sure air vents are clear. Thermal protection circuitry may shut down system. After 30 to 40 minutes, system should be OK.
- 2 Replace power cord.
- 3 Check battery. Refer to “Battery Verification” in Additional Procedures.
- 4 Replace power supply.
- 5 Replace logic board. Retain customer’s SIMMs.





## System (Continued)

System  
intermittently  
crashes or hangs

- 1 Verify that system software is version 7.1 or later.
- 2 Verify that software is known-good.
- 3 Verify that software is System 7 compatible.
- 4 Clear parameter RAM. Hold down <Command> <Option> <P> <R> during startup but before “Welcome To Macintosh” appears.
- 5 Replace SIMMs.
- 6 Replace logic board. Retain customer’s SIMMs.
- 7 Replace power supply.

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

- 1 Verify that startup disk is good.
- 2 Attach LED cable to logic board.
- 3 Replace LED cable.
- 4 Replace logic board. Retain customer’s SIMMs.





## Video

Screen is black, audio and drive operate, fan is running, and LED is lit

- 1 Adjust brightness on monitor.
- 2 Replace monitor. Refer to appropriate monitor manual to troubleshoot defective monitor.
- 3 Replace video cable.
- 4 If video interface card is installed, move it to different slot.
- 5 Replace video card, if installed.
- 6 Clear parameter RAM. Hold down <Command> <Option> <P> <R> during startup but before “Welcome To Macintosh” appears.
- 7 Replace SIMMs.
- 8 Replace logic board. Retain customer’s SIMMs.
- 9 Replace power supply.





## Video (Continued)

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

- 1 Replace video cable.
- 2 If video interface card is installed, move it to different slot.
- 3 Replace video interface card, if installed.
- 4 Replace SIMMs.
- 5 Replace logic board. Retain customer's SIMMs.
- 6 Replace power supply.

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

- 1 Replace monitor. Refer to appropriate monitor manual to troubleshoot defective monitor.
- 2 Replace video cable.
- 3 If video interface card is installed, move it to different slot.
- 4 Replace video interface card, if installed.
- 5 Clear parameter RAM. Hold down <Command> <Option> <P> <R> during startup but before "Welcome To Macintosh" appears.
- 6 Replace logic board. Retain customer's SIMMs.





## Floppy Drive

Internal floppy drive does not operate

- 1 Replace disk with known-good floppy disk.
- 2 Replace floppy drive cable.
- 3 Replace floppy drive.
- 4 Replace logic board. Retain customer's SIMMs.
- 5 Replace power supply.

During system startup, disk ejects; display shows icon with blinking "X"

- 1 Replace disk with known-good system disk.
- 2 Clear parameter RAM. Hold down <Command> <Option> <P> <R> during startup but before "Welcome To Macintosh" appears.
- 3 Replace floppy drive cable.
- 4 Replace floppy drive.
- 5 Replace logic board. Retain customer's SIMMs.





## Floppy Drive (Continued)

Does not eject disk

- 1 Switch off computer. Hold mouse button down while you switch computer on.
- 2 Replace floppy drive cable.
- 3 Replace floppy drive.
- 4 Replace logic board. Retain customer's SIMMs.

Attempts to eject disk, but doesn't

- 1 Push disk completely in.
- 2 Reseat floppy drive bezel and drive so bezel slot aligns correctly with drive.
- 3 Eject disk manually.
- 4 Replace floppy drive.





## Floppy Drive (Continued)

Internal floppy drive runs continuously

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

MS-DOS drive does not recognize a disk formatted on a 1.4 MB drive

To read and write files with either MS-DOS or 1.4 MB drive, format all disks with MS-DOS drive first.







## Hard Drive

Single internal hard drive does not operate; drive doesn't spin

- 1 Replace hard drive power cable.
- 2 Replace hard drive.
- 3 Replace power supply.

No internal SCSI drives operate

- 1 Verify there are no duplicate SCSI device addresses.
- 2 Replace SCSI data cable.
- 3 Replace power supply.
- 4 Replace logic board. Retain customer's SIMMs.

Works with internal or external SCSI devices but not with both

- 1 Verify there are no duplicate SCSI device addresses.
- 2 Replace terminator on external SCSI device.
- 3 Verify that SCSI device at end of internal SCSI data cable is only device terminated.
- 4 Refer to appropriate manual to troubleshoot defective external device.





## Hard Drive (Continued)

Drive does not appear on the desktop

- 1 Verify there are no duplicate SCSI device addresses.
- 2 Update the SCSI device driver using Apple HD SC Setup. Run Disk First Aid to verify the condition of the drive's directory structure.
- 3 Replace the SCSI hard drive cable.
- 4 If drive is not initialized, use HD SC Setup to initialize.
- 5 Replace with known-good hard drive. If the hard drive still doesn't work, switch back to the original hard drive and replace the logic board.





## Peripherals

Cursor does not move

- 1 Check mouse connection.
- 2 Inspect inside of mouse for buildup of dirt or other contaminants. Clean mouse if necessary.
- 3 If mouse was connected to keyboard, connect mouse to computer ADB port instead. If mouse works, replace keyboard.
- 4 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 mouse button has no effect

- 1 Replace mouse.
- 2 Replace logic board. Retain customer's SIMMs.





## Peripherals (Continued)

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

- 1 Remove duplicate system folders.
- 2 Clear parameter RAM. Hold down <Command> <Option> <P> <R> during startup but before "Welcome To Macintosh" appears.
- 3 If mouse was connected to keyboard, connect mouse to computer ADB port instead. If mouse works, replace keyboard.
- 4 If mouse does not work in any ADB port on computer, replace mouse.
- 5 Replace logic board. Retain customer's SIMMs.

No response to any key on keyboard

- 1 Check keyboard connection to ADB port.
- 2 Replace keyboard cable.
- 3 Replace keyboard.
- 4 Replace logic board. Retain customer's SIMMs.





## Peripherals (Continued)

Known-good serial  
printer does not work

- 1 Verify that system software is version 7.1 or later.
- 2 Verify that Chooser is set correctly.
- 3 Replace printer interface cable.
- 4 Replace logic board. Retain customer's SIMMs.

Known-good network  
printer does not print

- 1 Verify that system software is version 7.1 or later.
- 2 Verify that Chooser is set correctly.
- 3 Replace logic board. Retain customer's SIMMs.





## Miscellaneous

No sound from  
speaker

- 1 Verify that volume setting in Control Panel is 1 or above.
- 2 Replace speaker.
- 3 Replace logic board. Retain customer's SIMMs.





## CD-ROM Drive

CD-ROM drive does not accept compact disc

- 1 Exchange disc.
- 2 Replace CD-ROM drive mechanism.

Macintosh does not display CD-ROM drive icon

- 1 Verify that CD-ROM software is installed.
- 2 Replace CD-ROM drive mechanism.
- 3 Replace SCSI data cable.
- 4 Replace power supply.





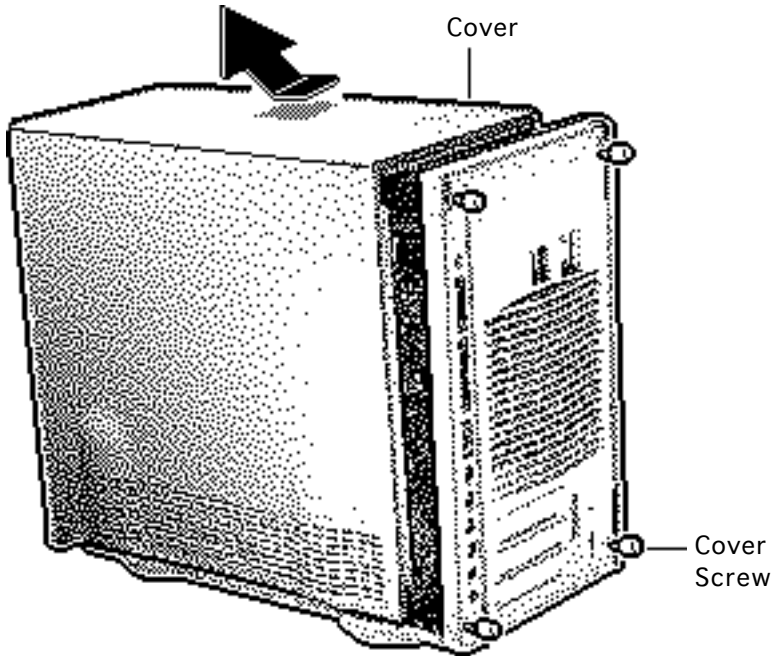
Take Apart

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Macintosh Quadra 800/WS 80







## Cover

No preliminary steps are required before you begin this procedure.

- 1 Loosen the four captive cover screws.
- 2 Slide the cover forward about 1/2 inch and lift the cover from the computer.

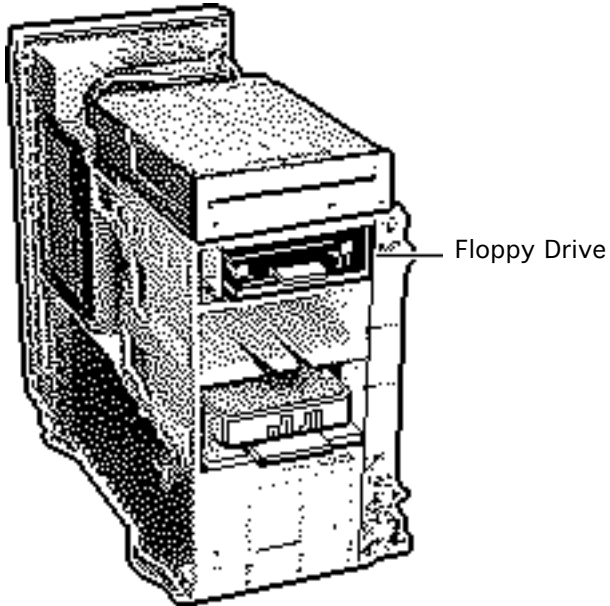


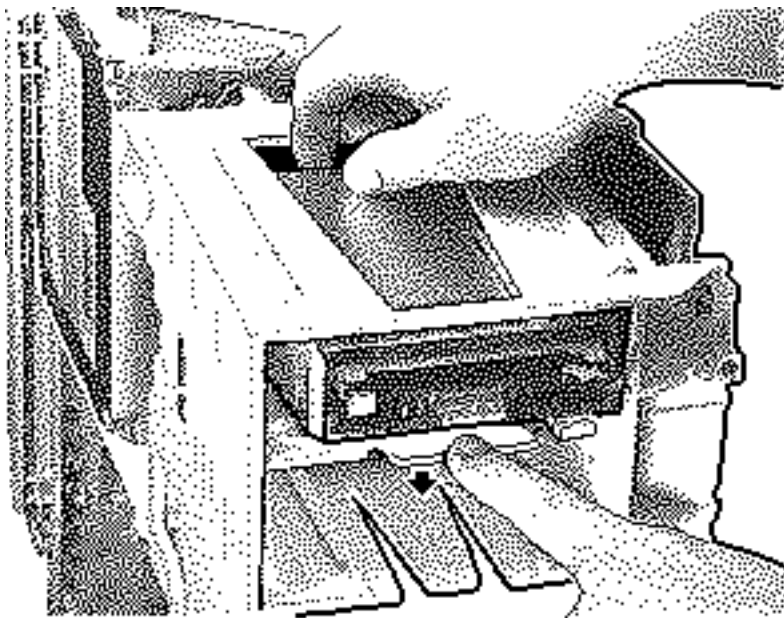


## Floppy Drive

Before you begin, remove the cover.

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





- 1 Press down the retaining clip and slide the floppy drive forward about 2 inches.
- 2 Disconnect the floppy drive cable from the floppy drive.
- 3 Remove the floppy drive from the chassis.

**Replacement Note:** Apple recommends dust shields on 1.4 MB SuperDrives in the Macintosh Quadra 800. All 1.4 MB replacement drives ship with dust shields installed.

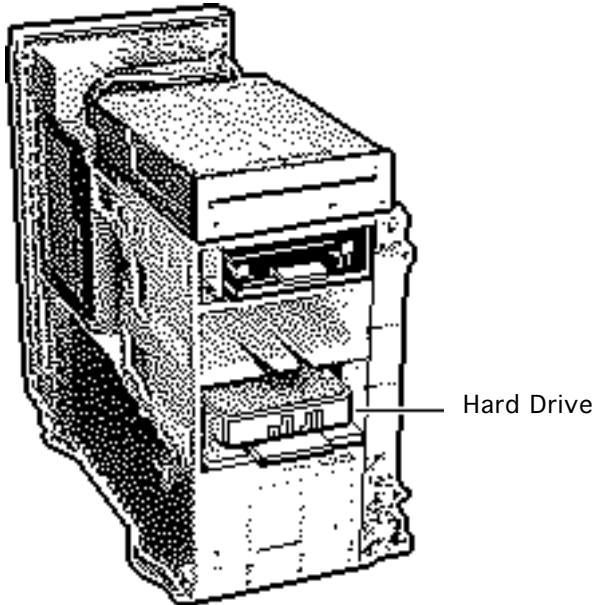


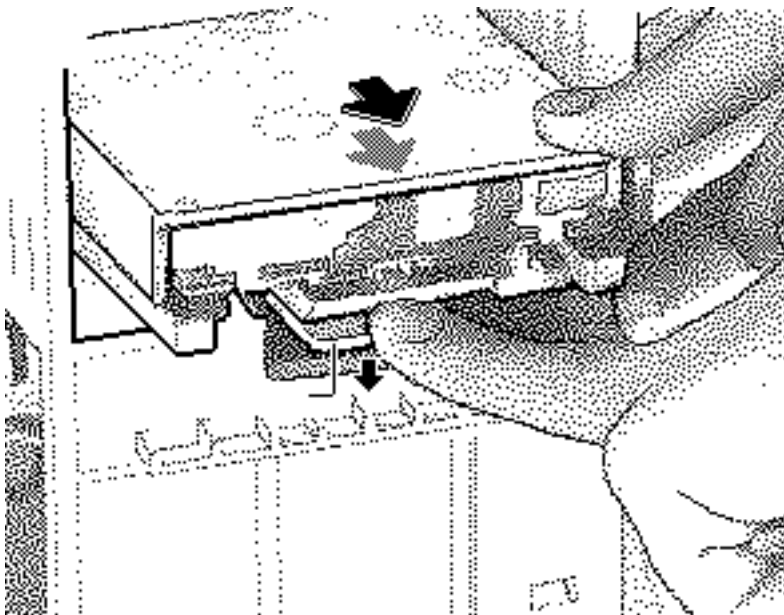


## Hard Drive

Before you begin, remove the cover.

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





- 1 Disconnect the SCSI data cable and hard drive power cable from the hard drive.
- 2 Press down the retaining clip securing the hard drive and slide the hard drive out.

**Replacement Note:** For information on removing the hard drive from the carrier and returning drives, cables, and carriers to Apple, refer to Additional Procedures in the Hard Drives manual.

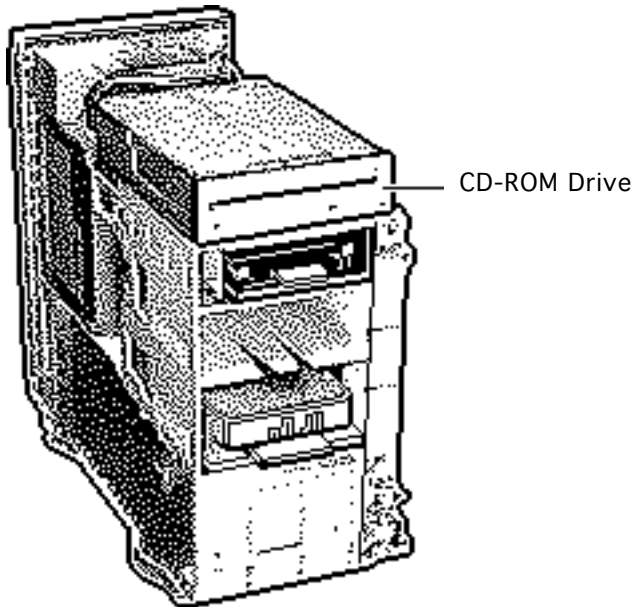


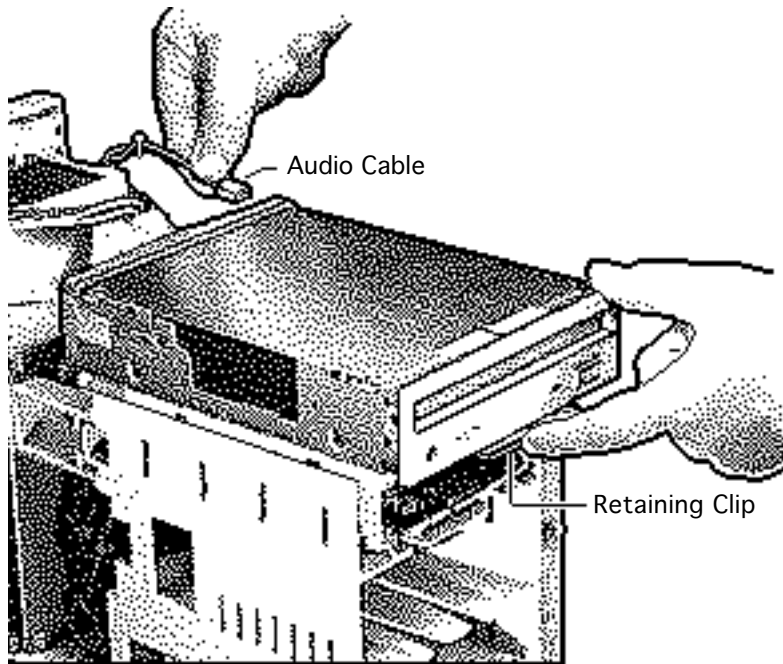


## CD-ROM Drive

Before you begin, remove the cover.

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





- 1 Disconnect the SCSI data cable, audio cable, and CD-ROM drive power cable from the CD-ROM drive.
- 2 Pull up on the retaining clip securing the CD-ROM drive and slide the CD-ROM drive out.

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

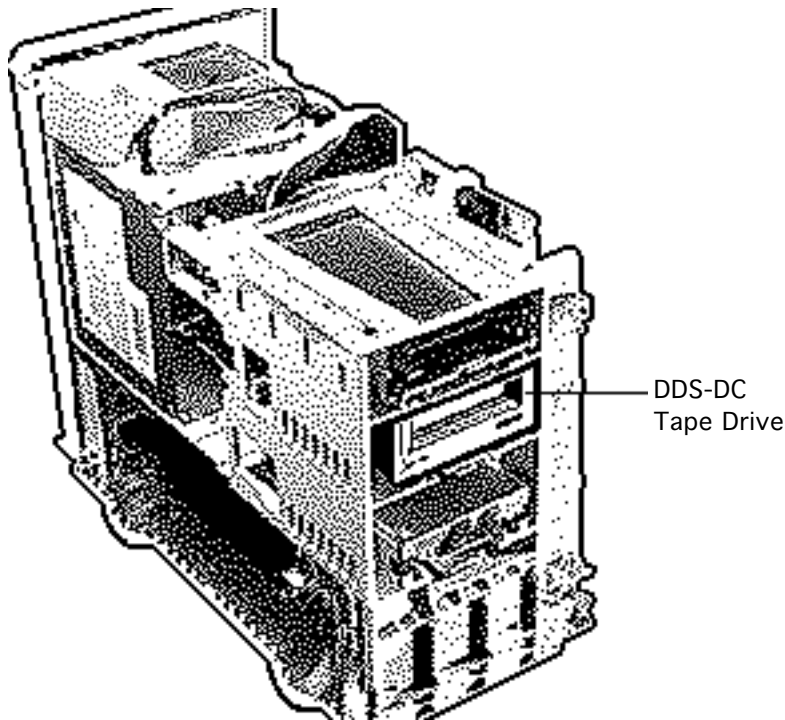




## DDS-DC Tape Drive

Before you begin, remove the cover.

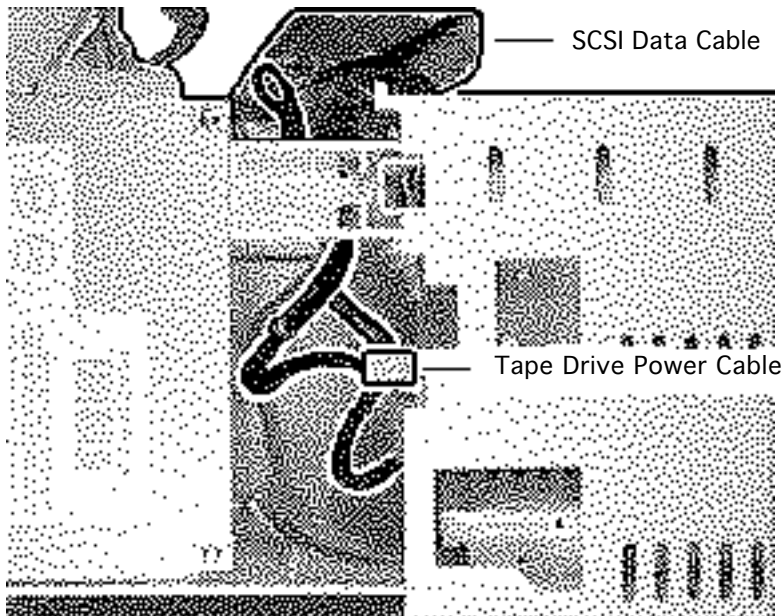
**Caution:** Review the ESD precautions in Bulletins/Safety.

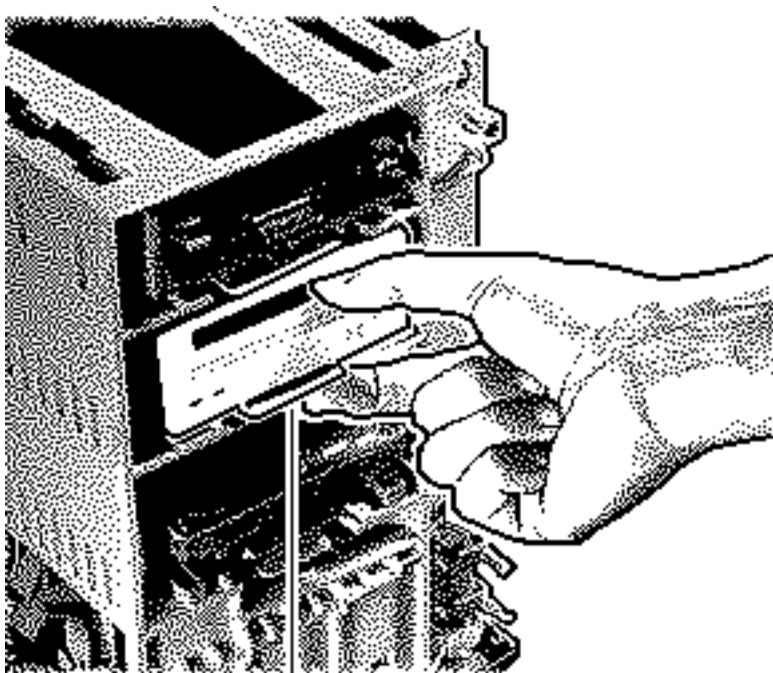






- 1 Disconnect the SCSI data cable and tape drive power cable from the tape drive.





Tape Drive

- 2 Press down the retaining clip securing the tape drive and slide the tape drive out.

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

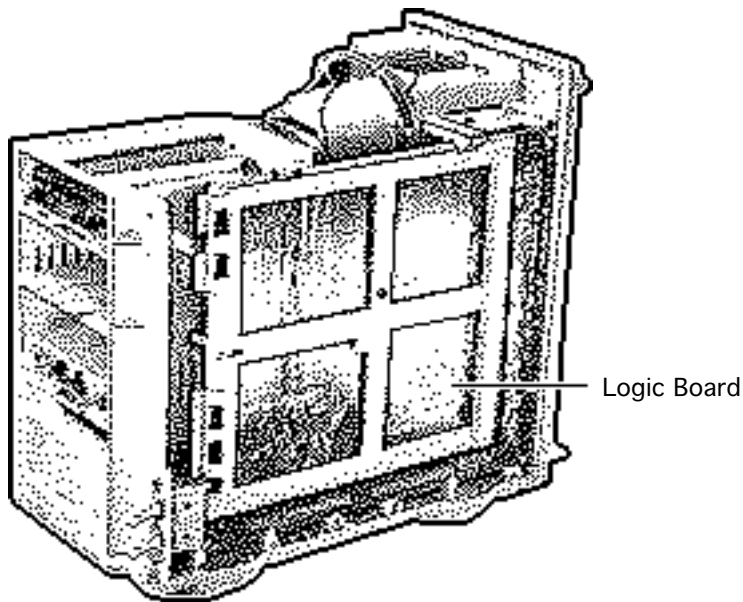


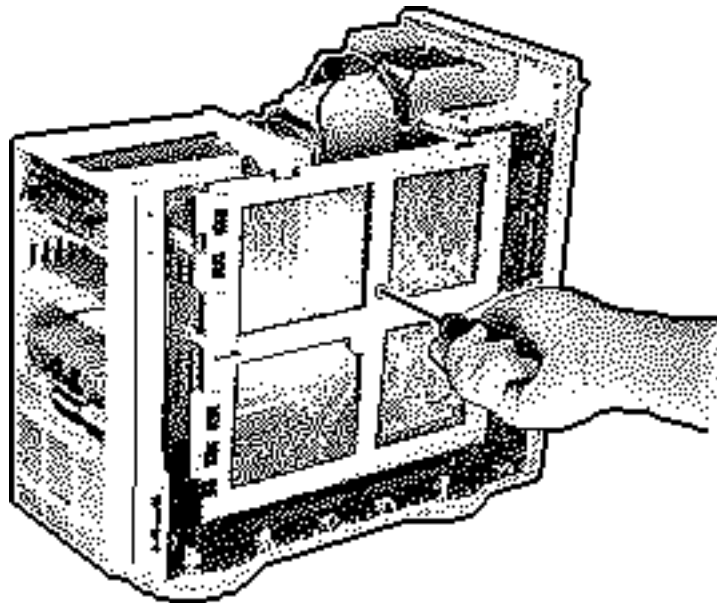


## Logic Board

Before you begin, remove the cover.

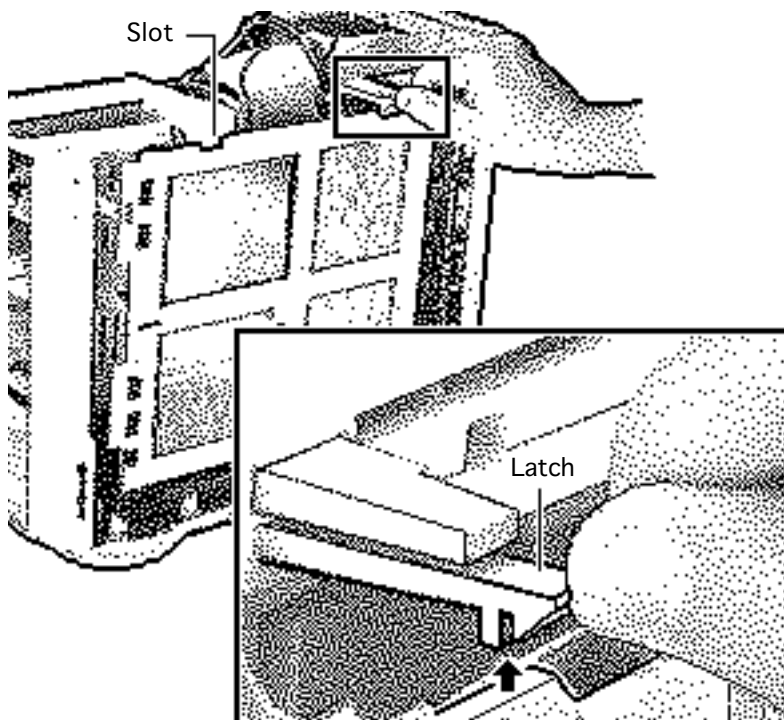
**Caution:** Review the ESD precautions in Bulletins/Safety.





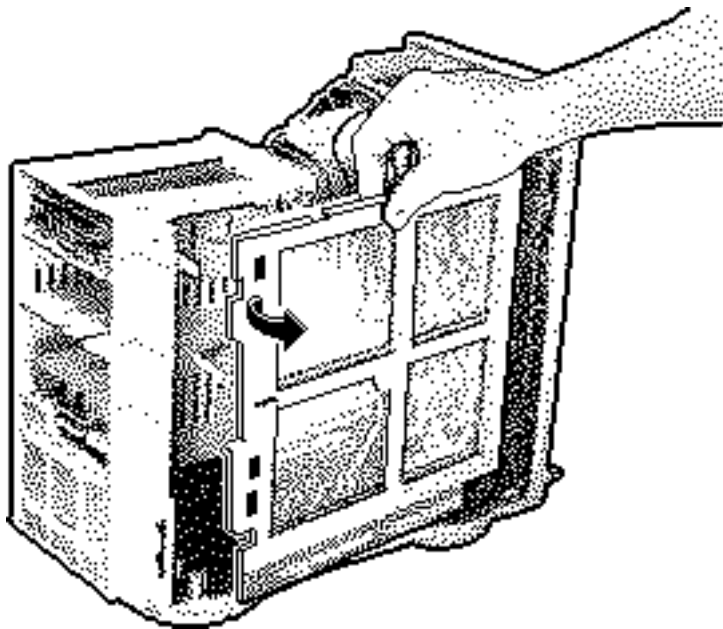
- 1 Remove the reset/  
interrupt actuator.
- 2 Remove the screw  
securing the logic board.





- 3 Slide the logic board forward until the slot indicated lines up with the tab.
- 4 Lift the latch at the rear of the logic board and release the logic board.





- 5 Pivot the front of the logic board out of the chassis.
- 6 Disconnect these cables from the logic board:
  - Logic board power
  - Speaker cable
  - LED cable
  - SCSI data cable
  - Floppy drive cable
  - CD-ROM audio cable (if present)

**Replacement Note:** Be sure to reconnect the LED cable to the logic board to ensure proper system operation.

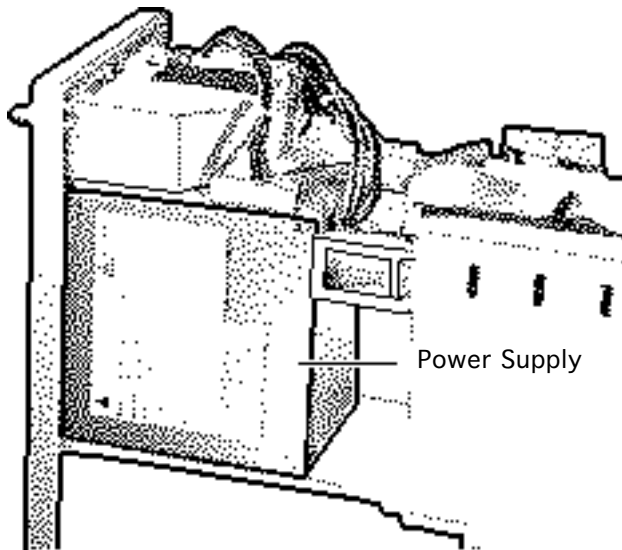




## Power Supply

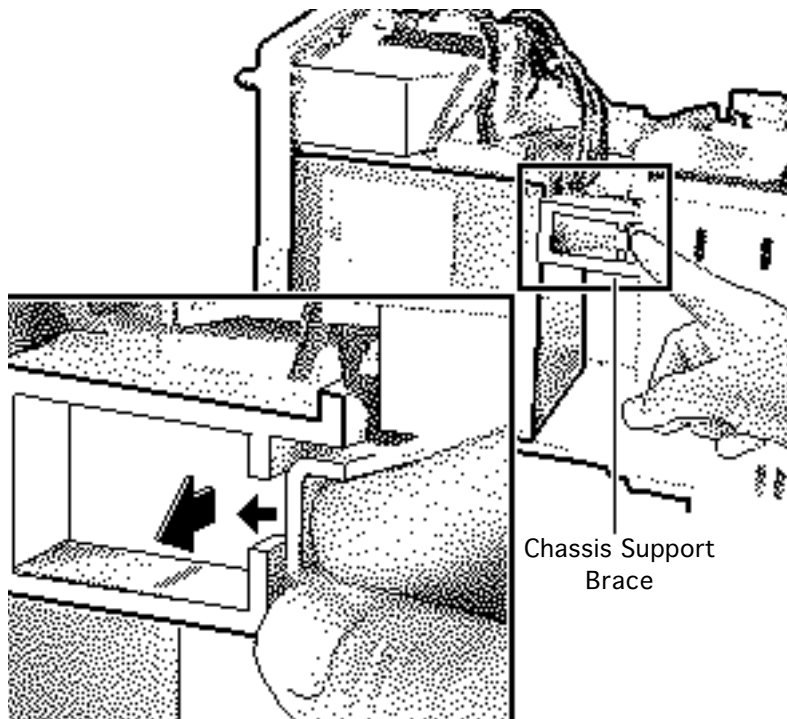
Before you begin, remove the cover.

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





- 1 Remove the chassis support brace.



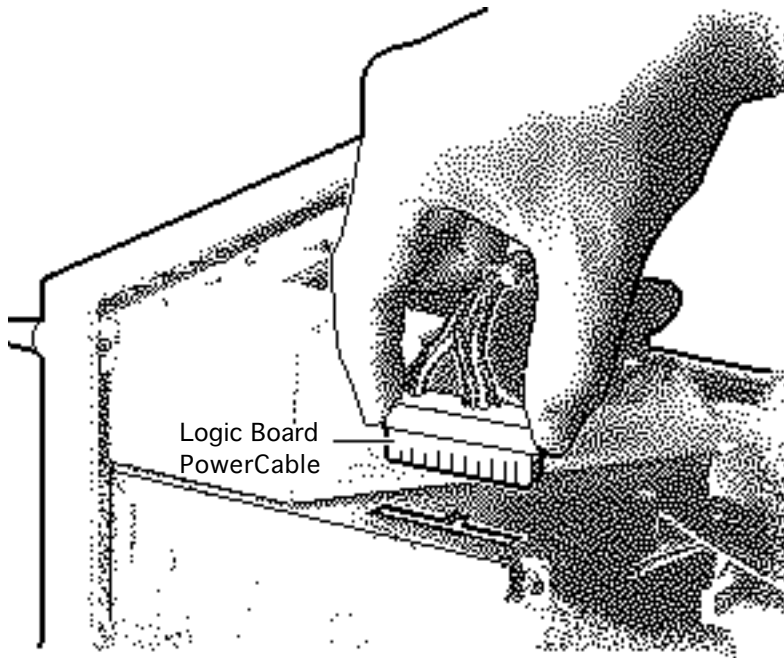
Chassis Support  
Brace

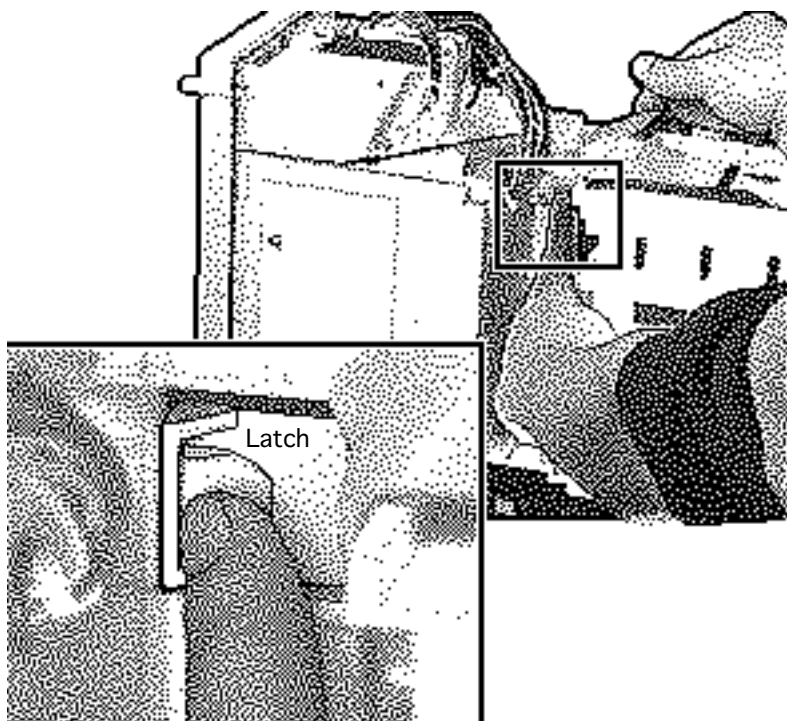






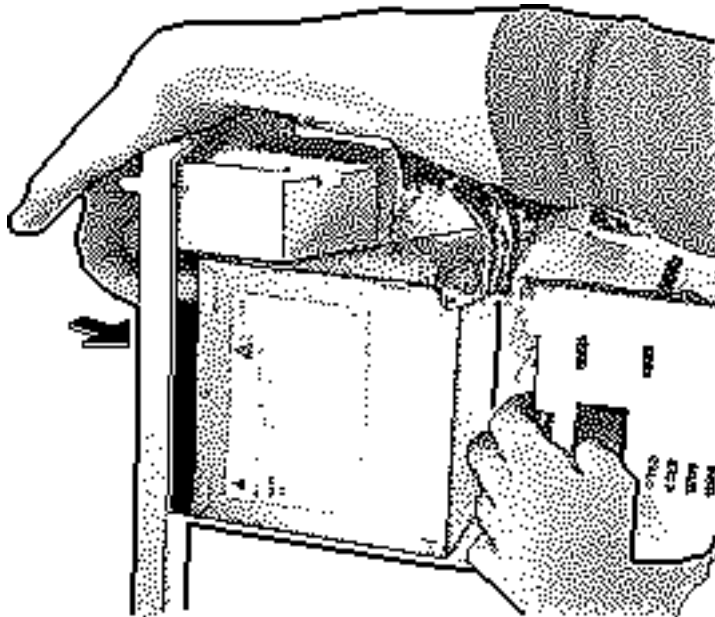
- 2 Disconnect the logic board power cable.





- 3 Press the latch to release the power supply.





- 4 Slide the power supply forward.
- 5 Pull the power supply out of the computer.



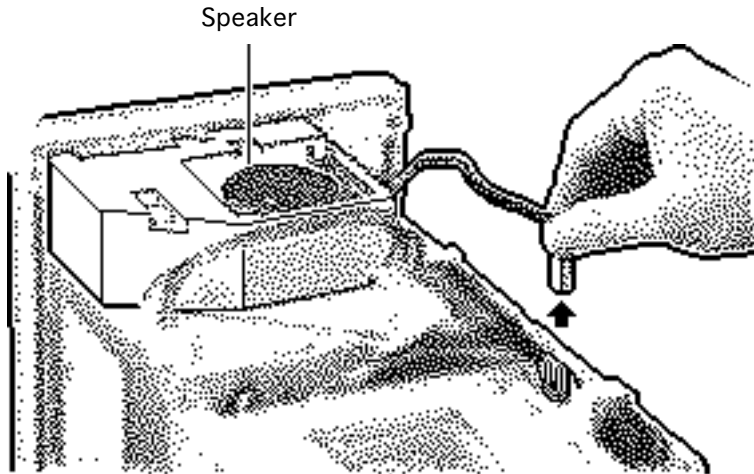


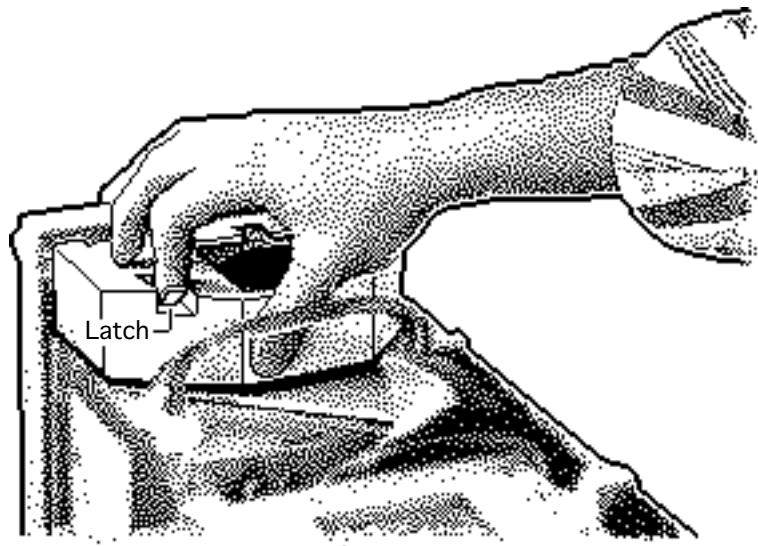
## Speaker

Before you begin, remove the cover.

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

- 1 Disconnect the speaker cable from the logic board.





- 2 Press the latch holding the speaker housing to the chassis and lift the front of the speaker housing.
- 3 Pull the speaker housing from the clips at the rear of the chassis.



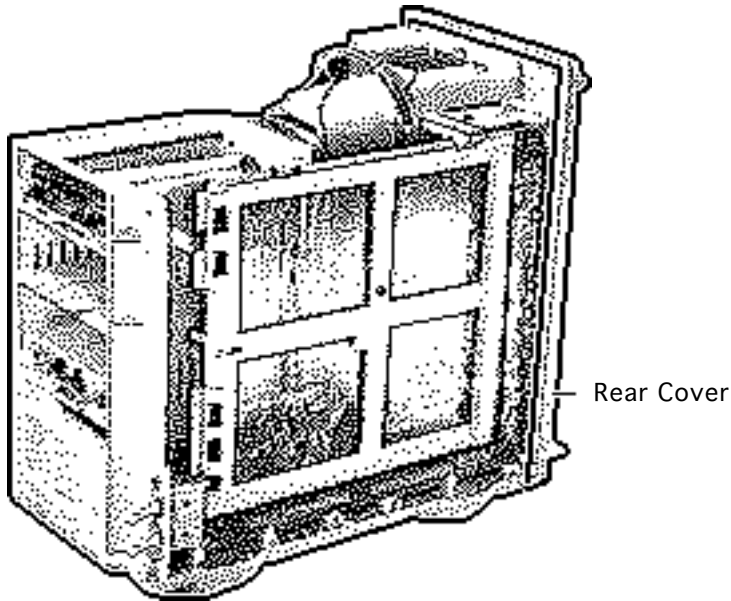


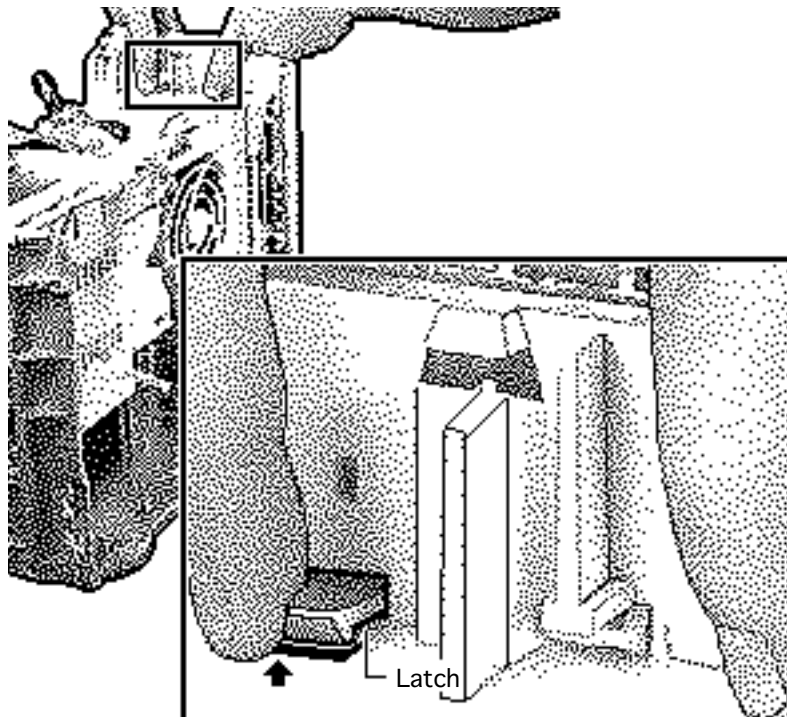
## Rear Cover

Before you begin, remove the following:

- Cover
- Speaker

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



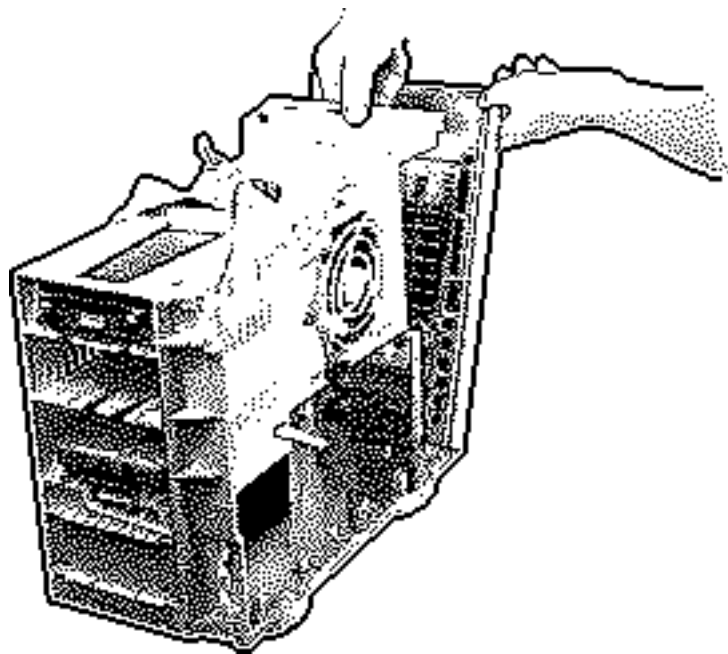


- 1 Lift the two latches and pull the rear cover loose.





- 2 Remove the rear cover from the computer.







## Upgrades

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Macintosh Quadra 800/WS 80



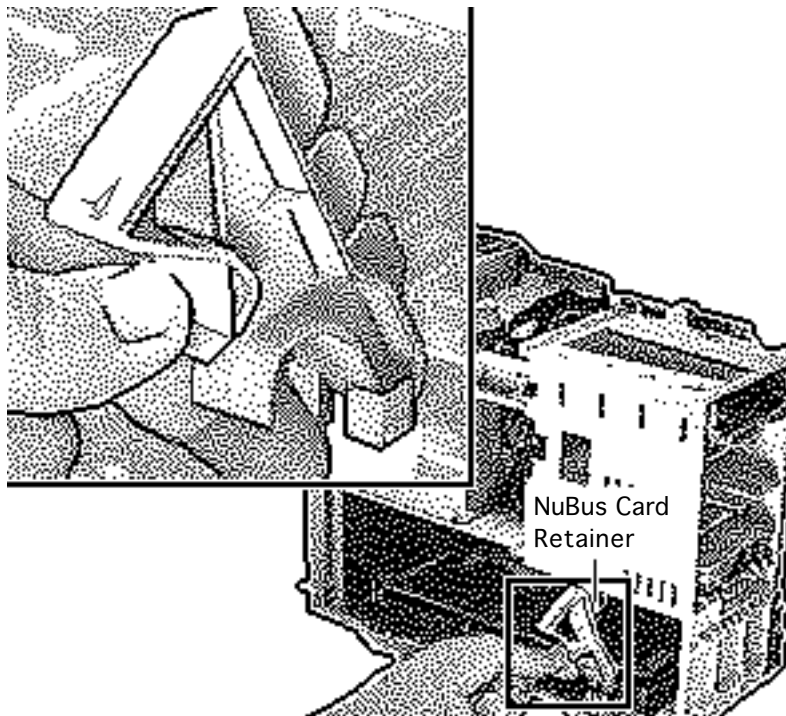


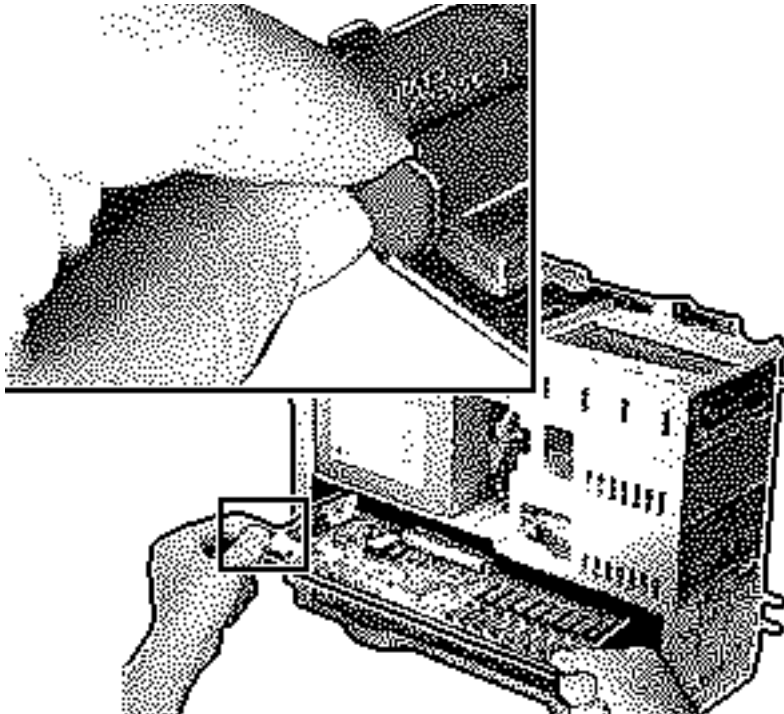
## Expansion Cards

Before you begin, remove the cover.

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

- 1 Pinch the two handles and remove the NuBus card retainer.





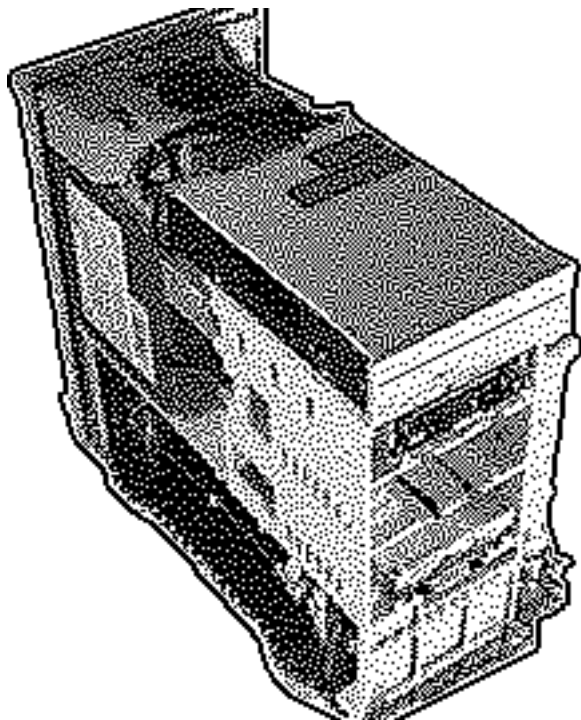
- 2 **Caution:** Pull up evenly on both sides of the card to avoid bending the connector pins.

Carefully grasp each end of the card and pull straight out to remove it.

**Note:** Grab the left side of the card by the metal bracket.

**Replacement Caution:** When replacing the card, do not force it into the expansion slot. If the card does not seat properly, remove it and try again.





## CD-ROM Upgrade

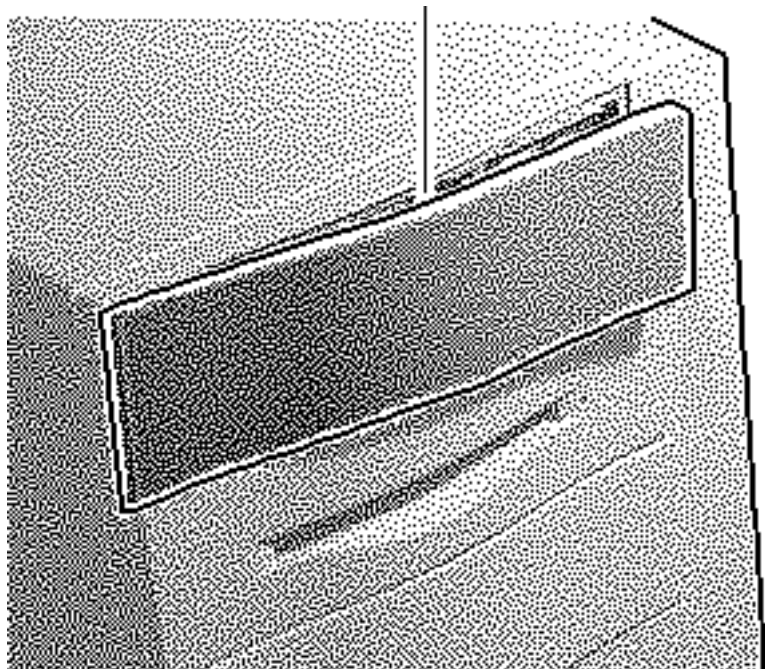
Before you begin, remove the cover.

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





Upper Blank Bezel

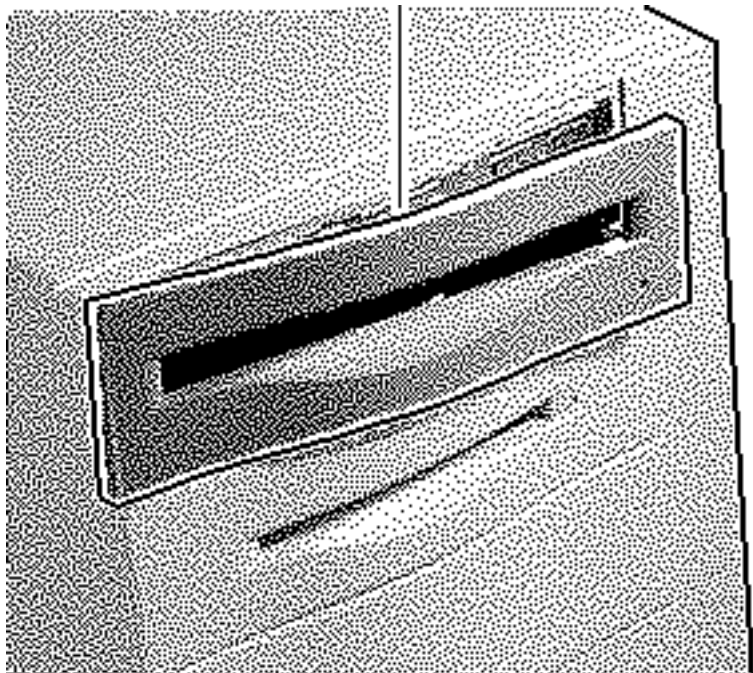


- 1 Remove the upper blank bezel from the top cover.



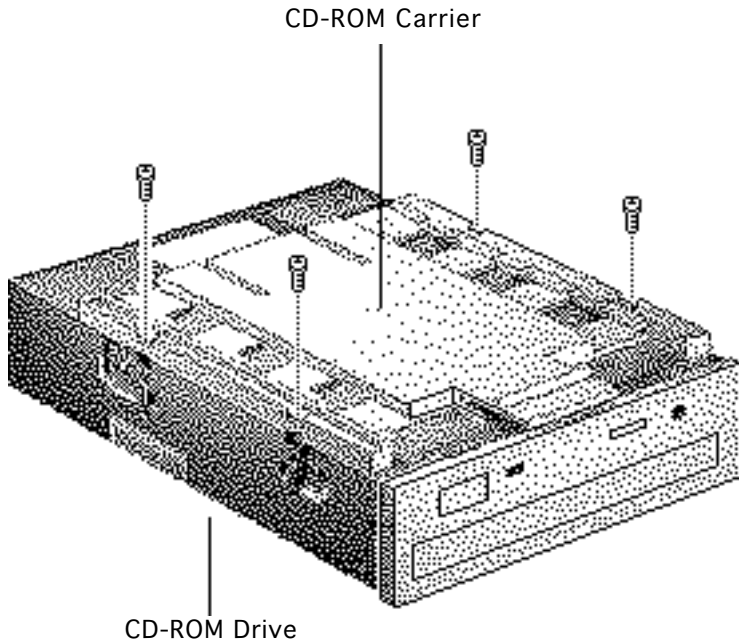


CD-ROM Drive Bezel



- 2 Install the slotted CD-ROM drive bezel in the top cover.



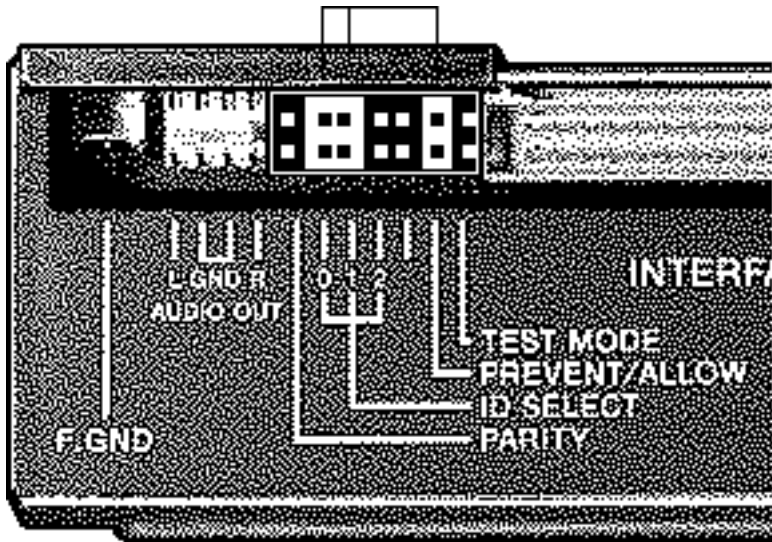


- 3 Attach the CD-ROM carrier to the CD-ROM drive with four Phillips screws.





Jumper Connectors

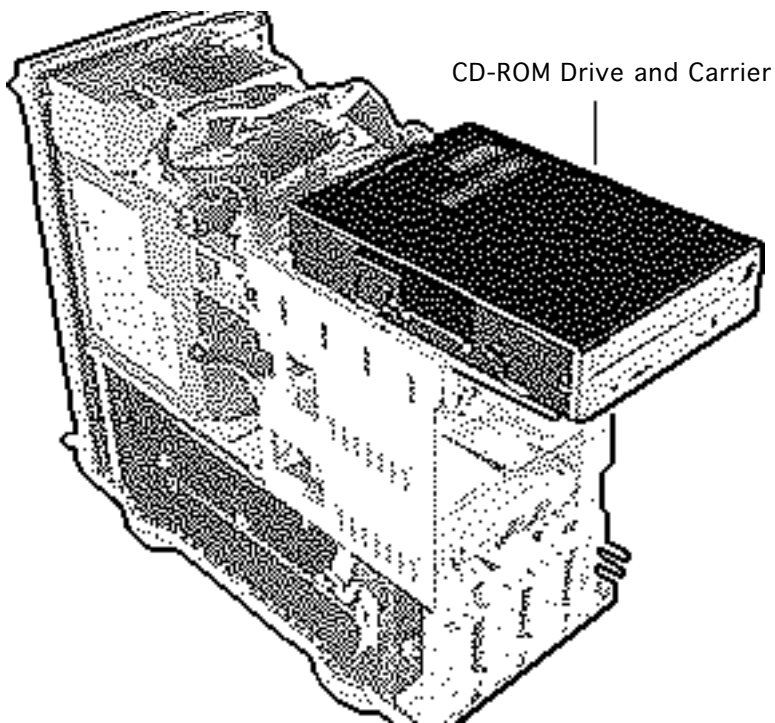


- 4 Verify the three jumper connectors are installed as shown.

**Important:** These jumpers configure the SCSI device address of the CD-ROM drive. The CD-ROM drive will have a SCSI device ID of 3. Verify that no other SCSI device installed in the computer already has that address. If another device does have an ID of 3, change the ID prior to installing the CD-ROM drive.

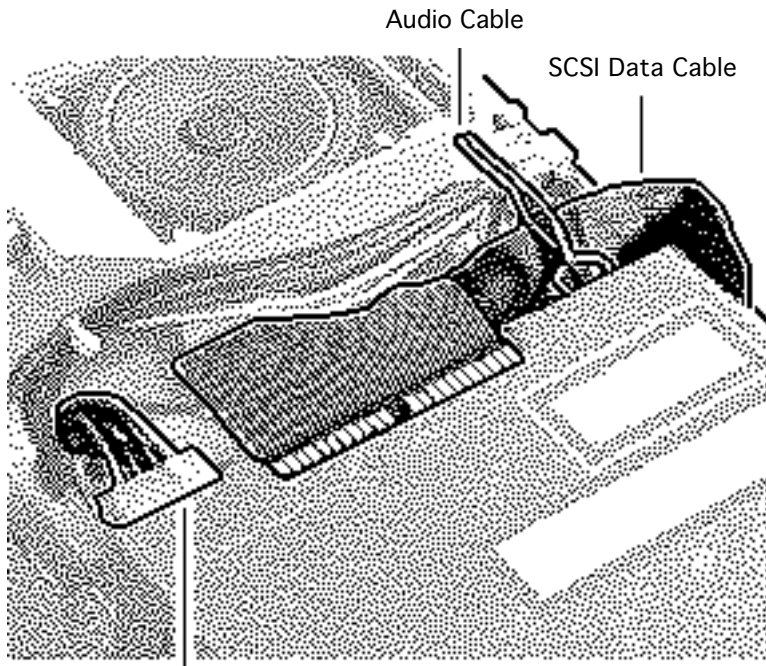






- 5 Slide in the CD-ROM drive and carrier.





Audio Cable

SCSI Data Cable

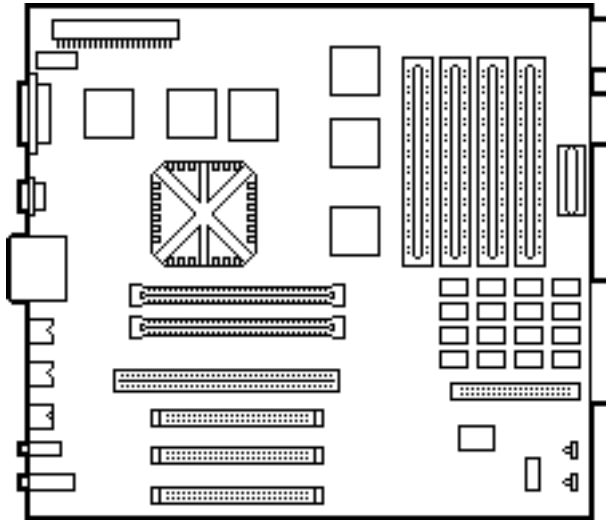
CD-ROM Drive Power Cable

- 6 Connect these cables to the CD-ROM drive:
- Audio cable
  - SCSI data cable
  - CD-ROM drive power cable





## Power Macintosh Upgrade



The Macintosh Quadra 800 can be upgraded to a Power Macintosh 8100/80 or Power Macintosh 8100/80AV. The AWS 80 can be upgraded to a Workgroup Server 8150.

For upgrade instructions, refer to Upgrades in the Power Macintosh 8100/WS 8150 manual.



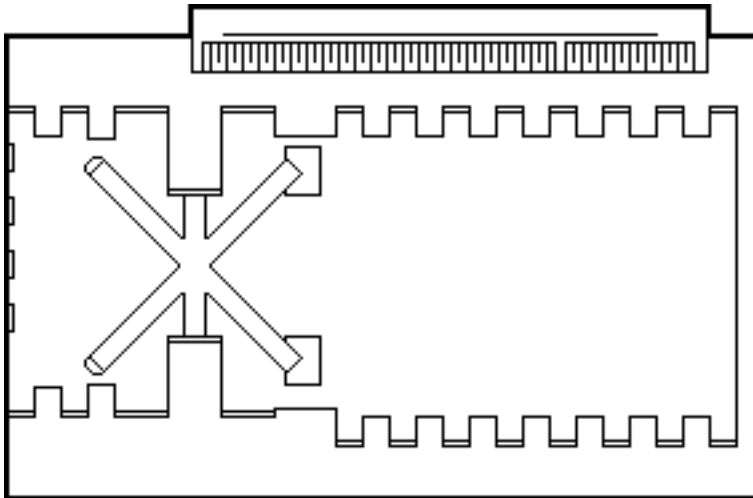


## Power Macintosh Card

Before you begin, remove the cover and review the ESD precautions in Bulletins/Safety.

Installing this card in the Processor-Direct Slot (PDS) upgrades this 68040 computer to a PowerPC microprocessor.

For installation instructions, refer to the Basics chapter in the Power Macintosh Card manual.





## Power Macintosh 8500 Upgrade

The Power Macintosh 8500 Upgrade Kit can be used to upgrade a Quadra 800, Quadra 840, or a Power Macintosh 8100. The kit includes everything except:

- The peripherals (such as the hard drive, floppy drive, and CD-ROM drive), which must be transferred from the original unit you are upgrading
- A processor card, which must be purchased separately.

Refer to the appropriate Take Apart chapter (that is, the Take Apart chapter in the Quadra 800, Quadra 840AV, or Power Macintosh 8100 manual) for instructions on how to remove the drives from the original unit.

Refer to the Take Apart chapter in the Power Macintosh 8500/WS 8550 manual to see where the peripherals should be installed in the upgraded unit and for instructions on how





to install the processor card.

Once you have installed all the drives in the upgraded unit and replaced the top housing, copy the serial number from the original unit to the blank serial label on the upgraded unit.





## WorkGroup Server 8550/132 Upgrade

The WorkGroup Server 8550/132 Upgrade Kit can be used to upgrade a WorkGroup Server 80, 8150/80, or 8150/110. The kit includes everything except:

- The peripherals (such as the hard drive, floppy drive, and CD-ROM drive), which must be transferred from the original unit you are upgrading
- Drive carriers
- Drive bezels
- Drive shields
- Speaker
- CD-ROM audio cable
- Floppy drive cable
- Power supply to logic board cable
- Chassis support bracket
- DRAM DIMMs





All of the part listed above, except for the DRAM DIMMs, need to be removed from the original unit and installed in the upgraded unit. Refer to the Take Apart chapter for the product from which you are upgrading for instructions on how to remove these parts. Refer to the Take Apart chapter in the Power Macintosh 8500/WS 8550 manual to see where the peripherals should be installed in the upgraded unit.

**Note:** The WS 8550 logic board in the upgrade kit does not contain any DRAM. You must install 64 bit-wide, 168-pin DRAM DIMMs. The DIMMs should be fast-paged mode, 70 ns or faster. You can use 8, 16, 32, or 64 MB DIMMs, which can be installed in any configuration. For the best performance, however, the DIMMs should be installed in pairs of the same size into paired slots. The slower 80 ns SIMMs and DIMMs used in older Macintosh computers will not work reliably in the WS 8550.







Once you have installed all the necessary parts in the upgraded unit and replaced the top housing, copy the serial number from the original unit to the blank serial label on the upgraded unit.

**Note:** The WorkGroup Server 8550/132 Upgrade Kit does not include a hard drive bracket.



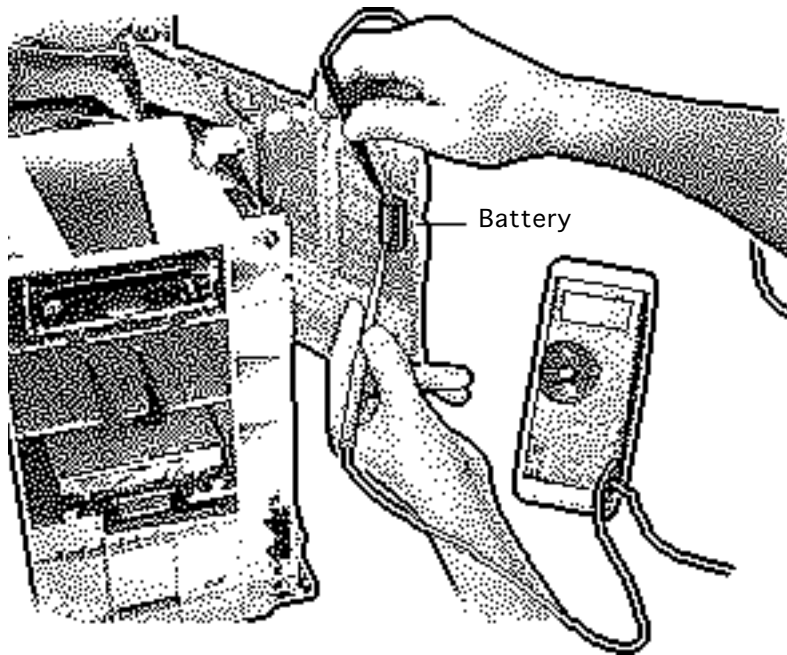


## Additional Procedures

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Macintosh Quadra 800/WS 80





## Battery Verification

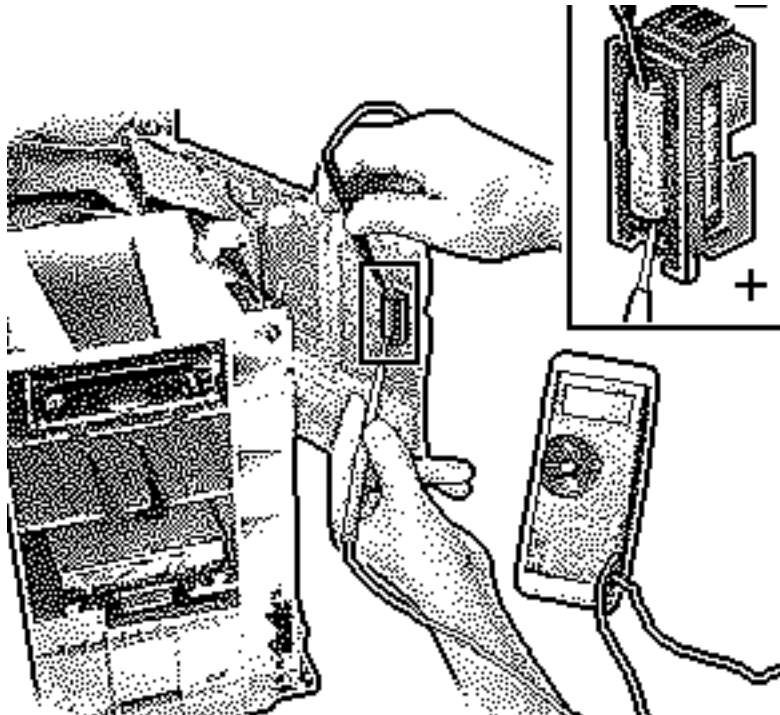
Before you begin, remove the following:

- Cover
- Logic board

**⚠ Warning:** If handled or discarded improperly, the lithium battery could explode. Review handling and disposal instructions in Bulletins/Safety.

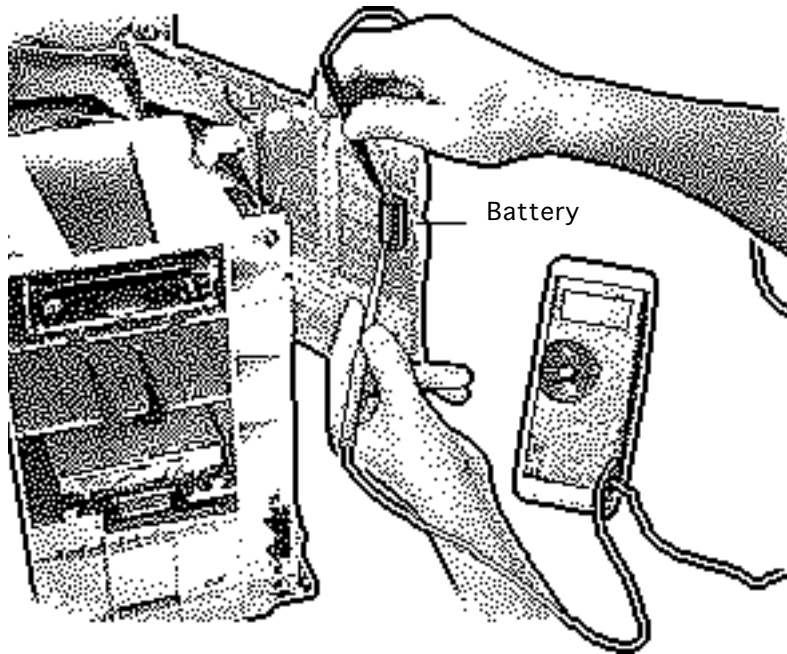
**Caution:** Review the ESD precautions in Bulletins/Safety.





- 1 Set the voltmeter to the 10 volts DC scale.
- 2 Hold the positive probe of the voltmeter to the positive end of the battery (marked “+” on the logic board) and the negative probe to the negative end of the battery.
- 3 If the battery voltage is below 3.2 volts, replace the battery. Refer to “Battery Replacement” in this chapter.





## Battery Replacement

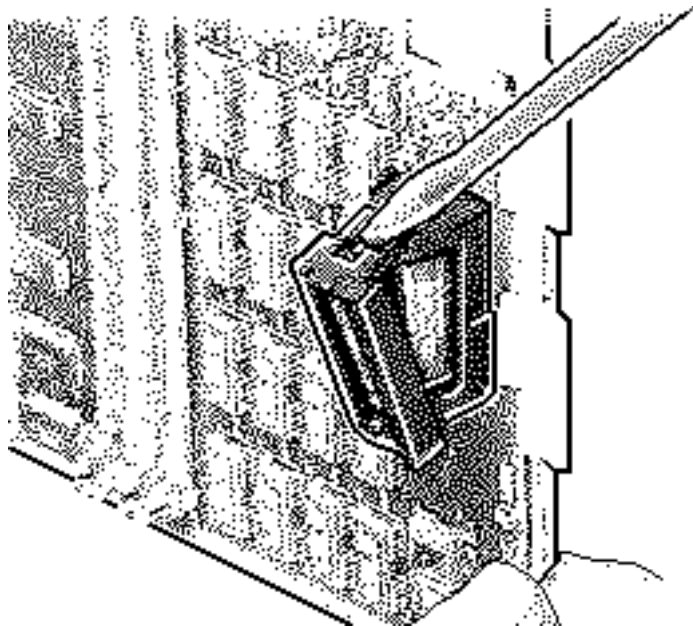
Before you begin, remove the following:

- Cover
- Logic board

**⚠ Warning:** If handled or discarded improperly, the lithium battery could explode. Review handling and disposal instructions in Bulletins/Safety.

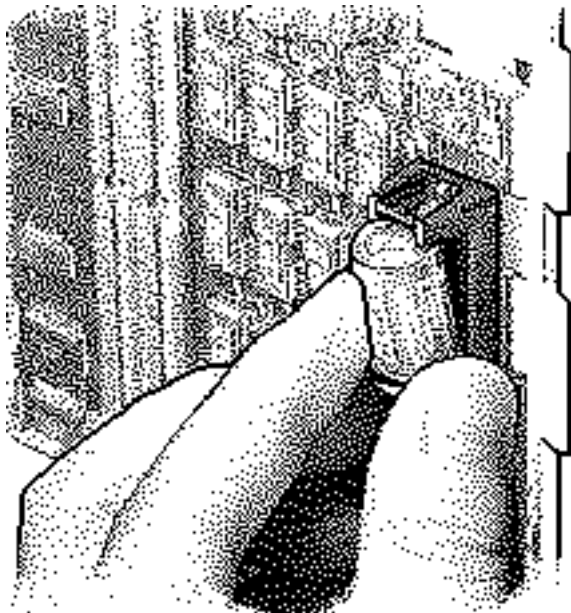
**Caution:** Review the ESD precautions in Bulletins/Safety.





- 1 Using a small flat-blade screwdriver, pry open the latch at the end of the battery holder and lift off the cover.





- 2 Grasp the battery and remove it from the holder.
- 3 Return the battery to Apple for proper disposal. For battery packaging and labeling instructions, refer to Bulletins/Safety.





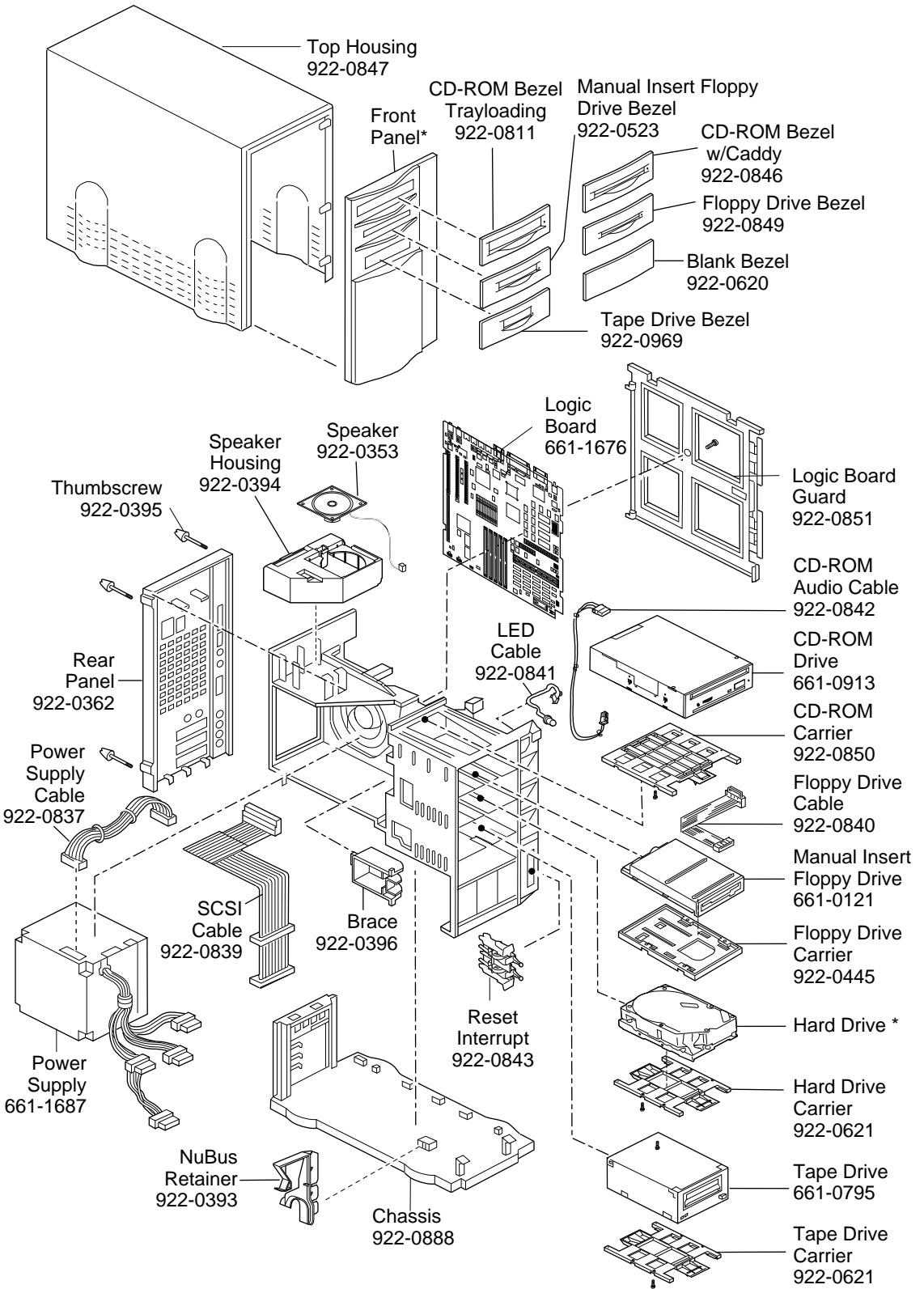
Exploded View

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Macintosh Quadra 800/WS 80







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

**Quadra 800/AWS80**

