



Macintosh Classic/
Classic II/Performa 200



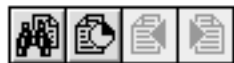
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Service Source Main Menu



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Basics

Macintosh Classic/Classic II/
Performa 200





Overview

This manual includes complete repair procedures for the Macintosh Classic, Classic II, and Performa 200.

Figure: Macintosh Classic/Classic II and Performa 200





Specifications

Macintosh Classic/Classic II/
Performa 200





Processor

Classic CPU

Motorola 68000 microprocessor
7.8336 MHz
32-bit internal data bus
256-byte instruction and data caches

Classic II/Per 200 CPU

Motorola 68030 microprocessor
16 MHz
32-bit internal data bus
256-byte instruction and data caches





Memory

RAM

Classic:	1 MB, expandable to 4 MB (120 ns or faster SIMMs)
Classic II/Per 200:	2 MB, expandable to 10 MB (120 ns or faster SIMMs)

ROM

512K

PRAM

256 bytes of parameter memory

Cache Connector

44-pin connector for optional memory expansion
256K by 4-bit DRAMs
Includes two SIMM connectors for additional RAM expansion





Disk Storage

Floppy Drive

Internal 1.4 MB floppy drive
Optional external 800K or 1.4 MB floppy drive

Hard Drive

Classic: Optional internal 40 MB hard drive; optional external SCSI drive
Classic II/Per 200: Internal 40 MB or 80 MB hard drive; optional external SCSI drive





I/O Interfaces

Floppy Drive

External drive port; DB-19 connector

SCSI

One SCSI parallel port; DB-25 connector

Apple Desktop Bus

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

Serial

Two RS-422 serial ports; mini DIN-8 connectors

Sound

Dual-channel headphone connector

Connected to the monophonic sound output

Macintosh Classic does not provide true two-channel output
(although stereo jack may be used)





I/O Devices

Keyboard

80 keys, with numeric keypad; ADB connector

Mouse

Mechanical tracking; ADB connector

Classic II/Per 200 Microphone

Electret, omnidirectional; output voltage is 4 mV, peak to peak, at normal volume





Sound and Video

Sound Generator

Classic: Four-voice sound with 8-bit digital/analog conversion, using 22-kHz sampling rate

Video Display

Classic II/Per 200: Monophonic, 8-bit digital/analog conversion using 22-kHz sampling rate; capable of driving stereo headphones or other stereo equipment through the sound jack
9-in. (diagonal) screen; high-resolution, 512 by 342 pixel, bit-mapped, monochrome display





Electrical

Line Voltage	100-120 V AC
Frequency	47-63 Hz, single phase
Maximum Power	100 W





Physical

Dimensions

Height: 13.2 in. (33.6 cm)

Width: 9.7 in. (24.6 cm)

Depth: 11.2 in. (28.5 cm)

Weight

16–17.1 lb. (7.3-7.8 kg) not including internal hard drive





Troubleshooting

Macintosh Classic/Classic II/
Performa 200





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

Video

Screen is dark; audio and drive operate

- 1 Readjust brightness (see Adjustments).
- 2 Readjust contrast (see Adjustments).
- 3 Check yoke cable connection.
- 4 Replace power/sweep board.
- 5 Replace logic board. Retain customer's SIMMs.
- 6 Replace CRT.

Screen is bright and audio is present, but no video information is visible

- 1 Replace power/sweep board.
- 2 Replace logic board. Retain customer's SIMMs.





Video (Continued)

Screen is dark; fan is not running	Replace power/sweep board.
Single vertical line is displayed	<ol style="list-style-type: none">1 Replace power/sweep board.2 Replace logic board. Retain customer's SIMMs.3 Replace CRT.
Single horizontal line is displayed	<ol style="list-style-type: none">1 Replace power/sweep board.2 Replace logic board. Retain customer's SIMMs.3 Replace CRT.
Vertical bars or stripes are displayed	<ol style="list-style-type: none">1 Replace power/sweep board.2 Replace logic board. Retain customer's SIMMs.





Video (Continued)

- | | |
|--|---|
| Horizontal bars or stripes are displayed | <ol style="list-style-type: none">1 Replace power/sweep board.2 Replace logic board. Retain customer's SIMMs. |
| White dot is displayed in center of screen | <ol style="list-style-type: none">1 Verify that yoke cable is connected.2 Replace power/sweep board.3 Replace CRT. |
| Screen jitters | <ol style="list-style-type: none">1 Move computer away from adjacent monitors or other electrical equipment that may cause interference.2 Replace power/sweep board. |





Video (Continued)

After replacement of failed hard drive, video distortion appears in upper and lower corners of screen

Check whether hard drive replacement was like-for-like. If not, install a like drive.





Floppy Drives

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

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

External floppy drive does not operate

- 1 Replace bad disk with known-good disk.
- 2 Be sure external floppy drive is placed on right side of computer.
- 3 Replace external floppy drive.
- 4 Replace logic board. Retain customer's SIMMs.

Disk ejects; display shows icon with blinking "X"

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





Floppy Drives (Continued)

Unable to insert disk
all the way

- 1 Insert opened paper clip into hole beside floppy drive.
- 2 Switch off system and hold mouse button down while switching system on (to complete eject cycle).
- 3 Replace floppy drive.

Does not eject disk

- 1 Insert opened paper clip into hole beside floppy drive.
- 2 Switch off system and hold mouse button down while switching system on (to complete eject cycle).
- 3 Replace floppy drive.

Internal floppy drive
runs continuously

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





Hard Drives

Internal or external hard drive does not operate

- 1 Verify that SCSI loopback card is not attached.
- 2 Check that internal SCSI terminator is positioned in connector properly.
- 3 Verify that internal hard drive has all three terminating resistor packs on circuit board.
- 4 Replace hard drive data cable.
- 5 Replace hard drive.
- 6 Replace logic board. Retain customer's SIMMs.

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

- 1 Verify that SCSI device ID switch setting on external device is higher than 0. Also verify that ID switch setting on external SCSI device does not duplicate ID switch settings on any other attached external SCSI devices.
- 2 Replace terminator on external SCSI device.
- 3 Verify that terminator is installed on internal SCSI drive.
- 4 Replace SCSI select cable.





Peripheral

Cursor does not move

- 1 Check mouse connection.
- 2 If mouse was connected to keyboard, connect it to rear ADB port instead. If mouse works, replace keyboard.
- 3 If mouse does not work in any ADB port, replace mouse.
- 4 Replace logic board. Retain customer's SIMMs.

Cursor moves, but clicking the mouse button has no effect

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





Peripheral (Continued)

Cannot double-click to open application, disk, or server

- 1 Remove extra system files on hard drive.
- 2 Clear parameter RAM. Hold down <Shift> <Option> <Command> keys and select Control Panel from Apple pull-down menu. Reset mouse controls.
- 3 If mouse was connected to keyboard, connect it to rear ADB port instead. If mouse works, replace keyboard.
- 4 If mouse does not work in any ADB port, 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.





Peripheral (Continued)

Known-good
ImageWriter or
ImageWriter II does
not print

- 1 Make sure that Chooser and Control Panel are set correctly.
- 2 Replace printer driver and system software with known-good.
- 3 Replace printer interface cable.
- 4 Replace logic board. Retain customer's SIMMs.

Known-good
LaserWriter does not
print.

- 1 Make sure that Chooser and Control Panel are set correctly.
- 2 Replace printer driver and system software with known-good.
- 3 Refer to Networks manual.





Miscellaneous

Clicking, chirping,
or thumping sound

- 1 Verify that logic board power cable is connected at J12 on logic board.
- 2 Replace power/sweep board.
- 3 Replace logic board. Retain customer's SIMMs.

Smoke/odor

Replace power/sweep board.

No video, no audio, and
no drive operation

- 1 Connect power cord.
- 2 Switch power on.
- 3 Replace power cord.
- 4 Replace power/sweep board.
- 5 Replace logic board. Retain customer's SIMMs.





Miscellaneous (Continued)

- “Sad Macintosh” icon
- 1 Replace bad disk with known-good disk.
 - 2 Verify that jumper on memory expansion board is configured correctly for “SIMMs” or “No SIMMs.” (See “Memory Upgrade” in Additional Procedures.)
 - 3 On 4 MB Macintosh Classic, confirm SIMMs used are eight-chip SIMMs. (See Memory manual.) Any 1 MB SIMMs with fewer than eight chips won’t work in the Macintosh Classic.
 - 4 On Macintosh Classic, replace optional memory expansion board; on Macintosh Classic II/Performa 200, replace optional SIMMs in two SIMMs slots on logic board.
 - 5 Replace logic board. Retain customer’s SIMMs.





Miscellaneous (Continued)

Screen shows “Sad Macintosh” icon and black vertical lines; screeching sound

- 1 Verify that jumper on memory expansion board is configured correctly for “SIMMs” or “No SIMMs.” (See “Memory Upgrade” in Upgrades.)
- 2 On 4 MB Macintosh Classic, confirm SIMMs used are eight-chip SIMMs. (See Memory manual.) Any 1 MB SIMMs with fewer than eight chips won’t work in the Macintosh Classic.
- 3 On Macintosh Classic, replace optional memory expansion board; on Macintosh Classic II/Performa 200, replace optional SIMMs in two SIMMs slots on logic board.
- 4 Replace logic board. Retain customer’s SIMMs.

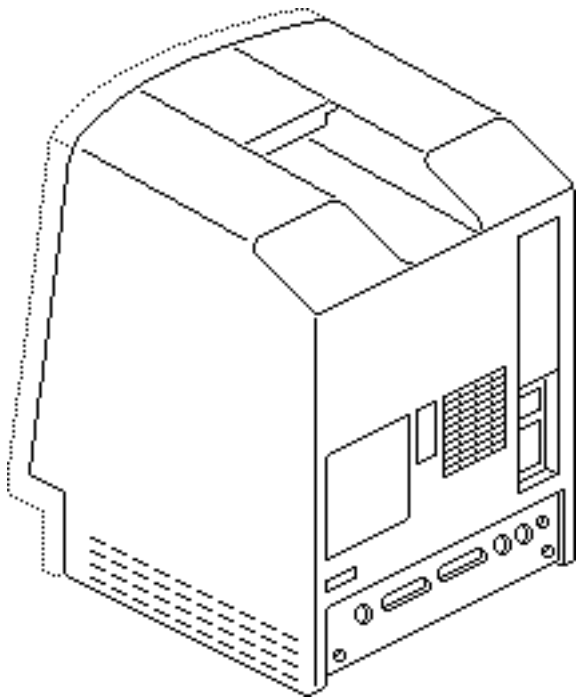




Take Apart

Macintosh Classic/Classic II/
Performa 200



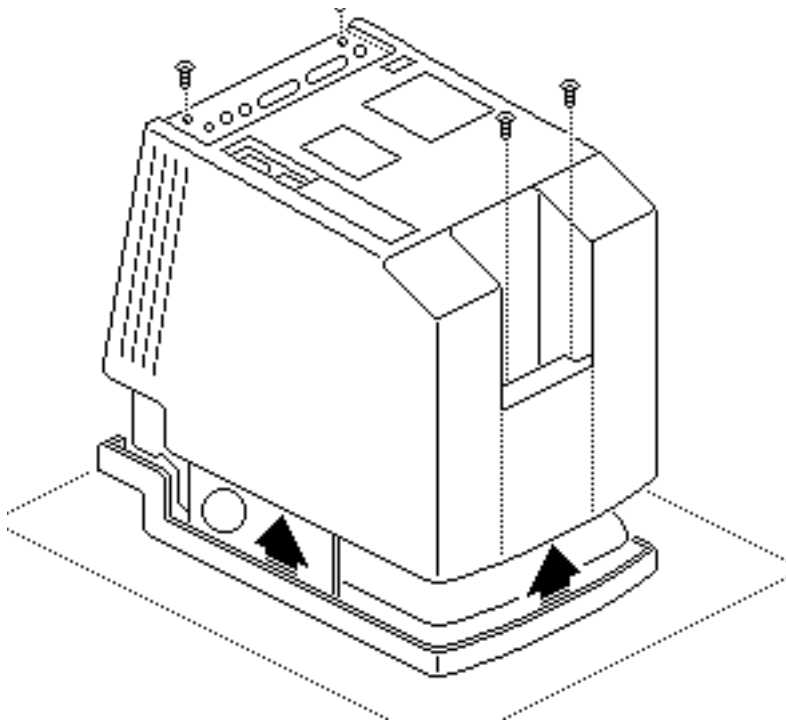


Cover

No preliminary steps are required before you begin this procedure.

⚠ Warning: This product contains high voltage and a high-vacuum picture tube. To prevent serious personal injury or equipment damage, review CRT safety and discharge instructions in Bulletins/Safety.





- 1 Using a Torx screwdriver, remove the four case screws. Using a case spreader or pull-apart tool, separate the cover from the chassis.
- 2 Carefully lift the cover and set it aside.

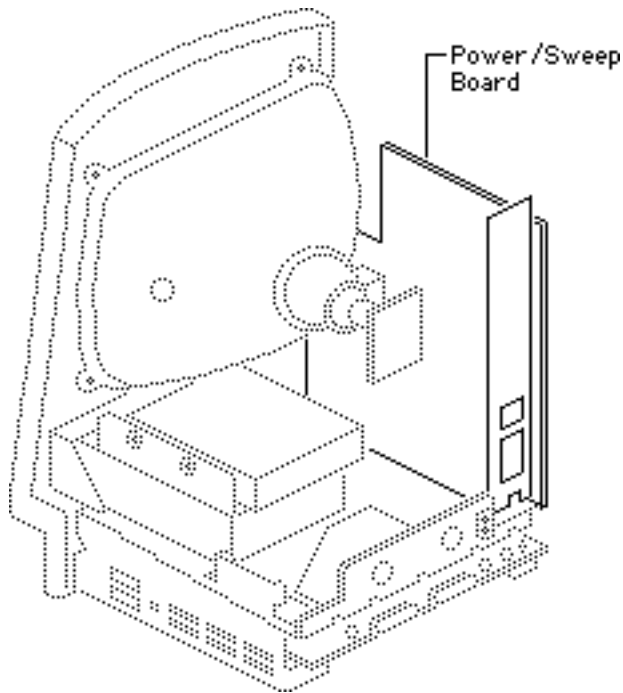
⚠ Warning: The edges of the metal chassis may be sharp. When moving the computer with the cover off, be sure to handle the chassis carefully.





Note: When replacing the cover, be sure to install the two black case screws in the bottom of the cover and the two silver-colored case screws in the top of the cover.





Power/Sweep Board

Before you begin:

- Remove the cover
- Discharge the CRT
- Remove the anode cap

⚠ Warning: This product contains high voltage and a high-vacuum picture tube. To prevent serious personal injury or equipment damage, review CRT safety and discharge instructions in Bulletins/Safety.

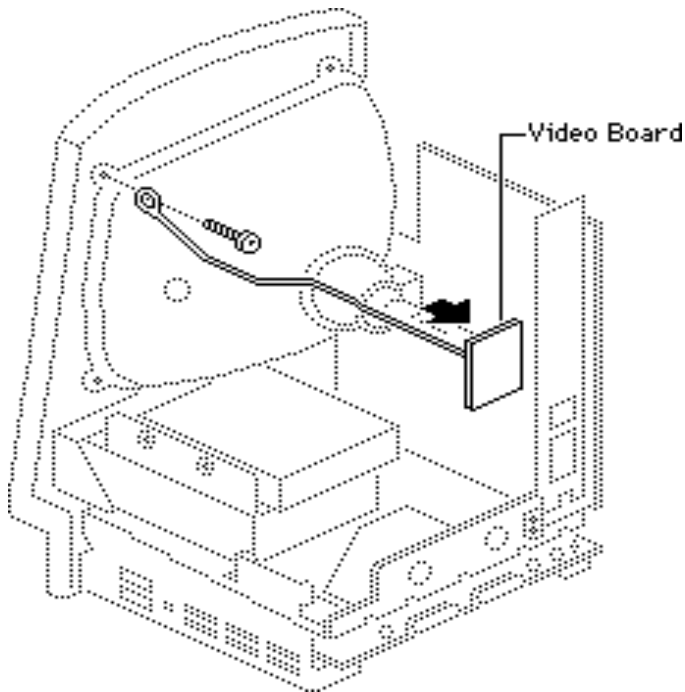
Caution: To prevent ESD





damage to components, wear a grounding wriststrap. Never use a grounding wriststrap until after discharging the CRT.

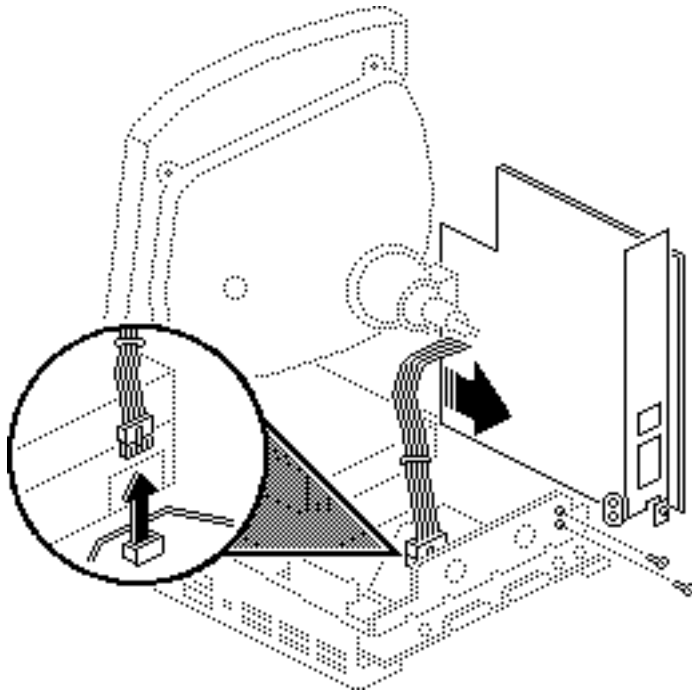




- 1 Using a Torx screwdriver, remove the screw that secures the ground wire to the upper corner of the CRT.
- 2 Carefully pull off the video board from the neck of the CRT.

Note: If sealant holds the board in place, cut the sealant with an art knife.

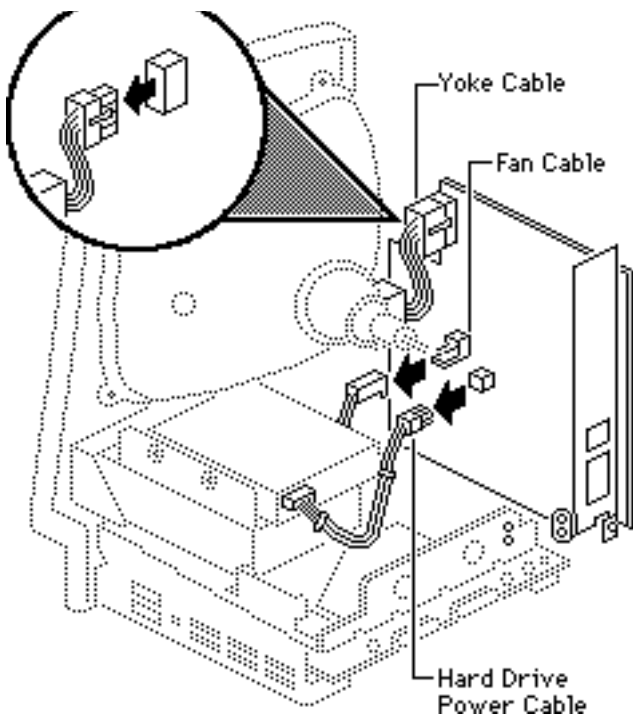




- 3 Remove the logic board power cable from the logic board. Remove the Phillips screws that secure the power/sweep bracket to the chassis and pull the board slightly away from the chassis.

Note: Most power/sweep brackets are secured by two screws; however, some are secured by three.



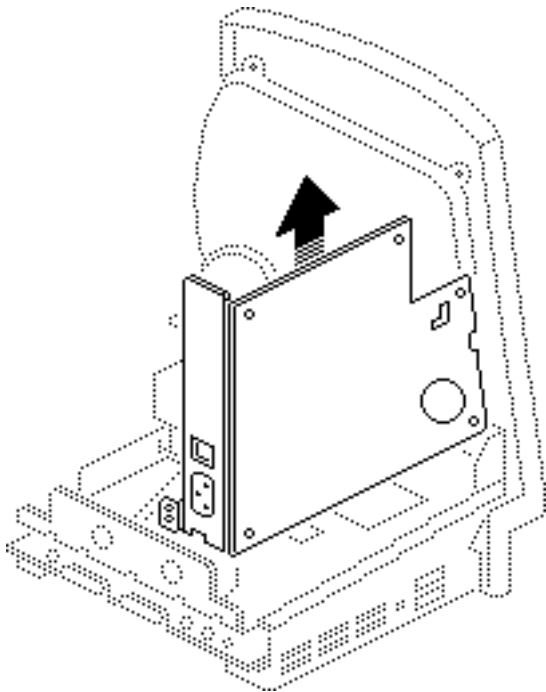


- 5 Remove the following cable connectors from the power/sweep board:
- Yoke cable
 - Fan cable
 - Hard drive power cable (if present)



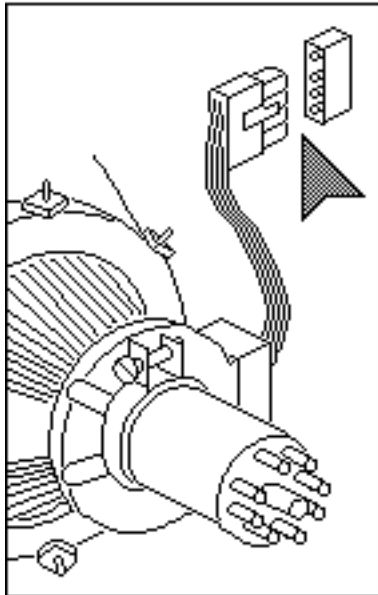


- 6 Lift the board free.

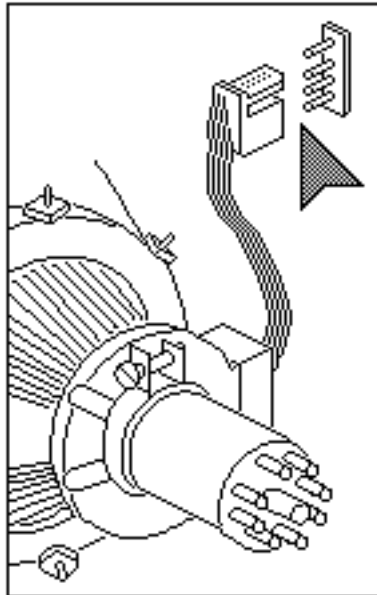




Revision A



Revision B



Note: The two versions of the power/sweep board, Rev A and Rev B, are functionally equivalent, but they are not interchangeable.

In addition, a Rev A power/sweep board must be used with a Rev A CRT yoke assembly and a Rev A or Rev B cover. A Rev B power/sweep board must be used with a Rev B CRT yoke assembly and a Rev B cover.





To identify compatible versions of the power/sweep board, CRT assembly, and cover, examine the CRT yoke connector. Power/sweep board Rev A has plastic sleeves surrounding the prongs; the prongs are exposed on power/sweep board Rev B.



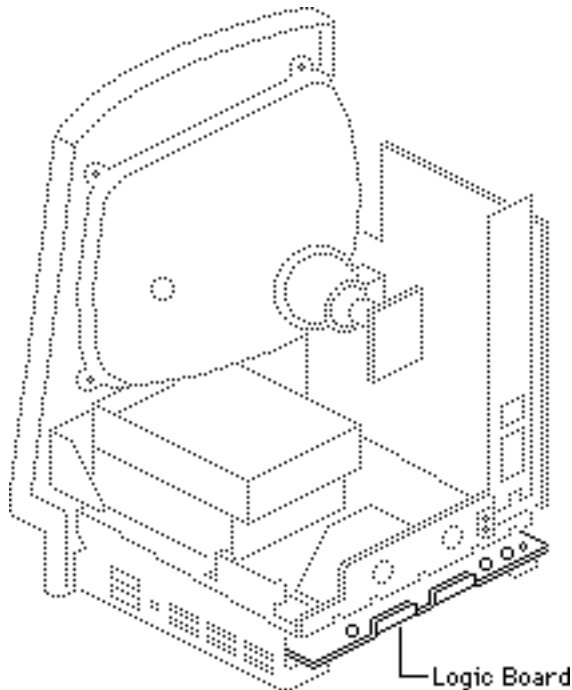


Logic Board

Before you begin:

- Remove the cover
- Discharge the CRT
- Remove the memory expansion board

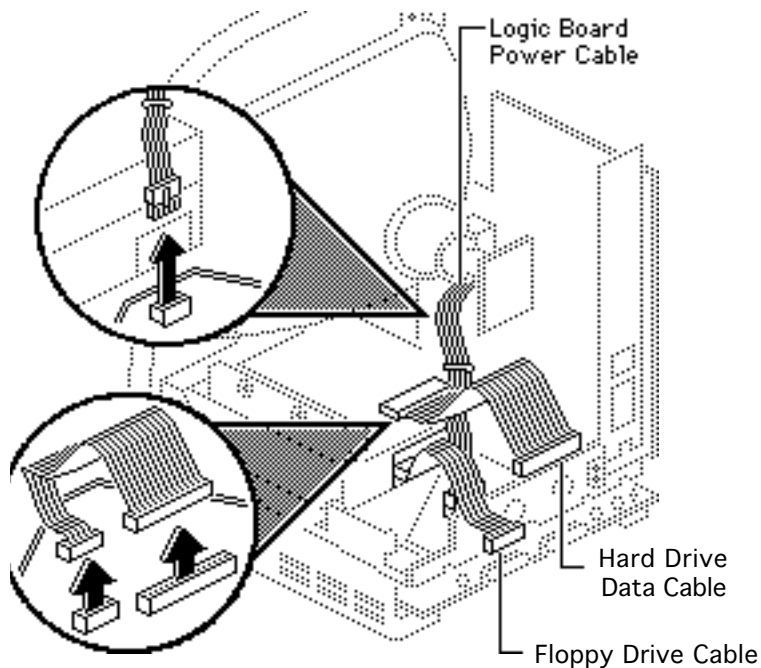
⚠ Warning: This product contains high voltage and a high-vacuum picture tube. To prevent serious personal injury or equipment damage, review CRT safety and discharge instructions in Bulletins/Safety.





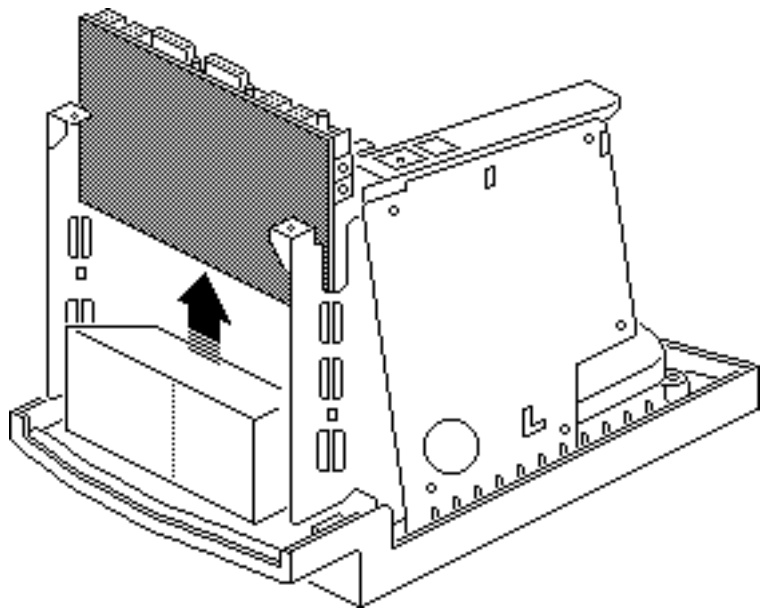
Caution: To prevent ESD damage to components, wear a grounding wriststrap. Never use a grounding wriststrap until after discharging the CRT.





- 1 Remove the following cable connectors from the logic board:
 - Logic board power cable
 - Floppy drive cable
 - Hard drive data cable (if present)





- 2 Grasp the logic board by the corners and slide it straight up and out of the chassis.

Replacement Note: Remove the SIMMs from the defective logic board and install them in the replacement logic board. (See Memory manual.)



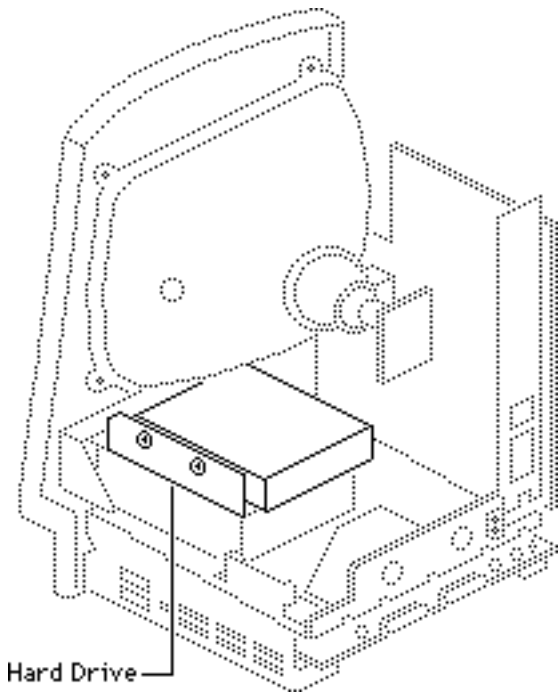


Hard Drive

Before you begin:

- Remove the cover
- Discharge the CRT

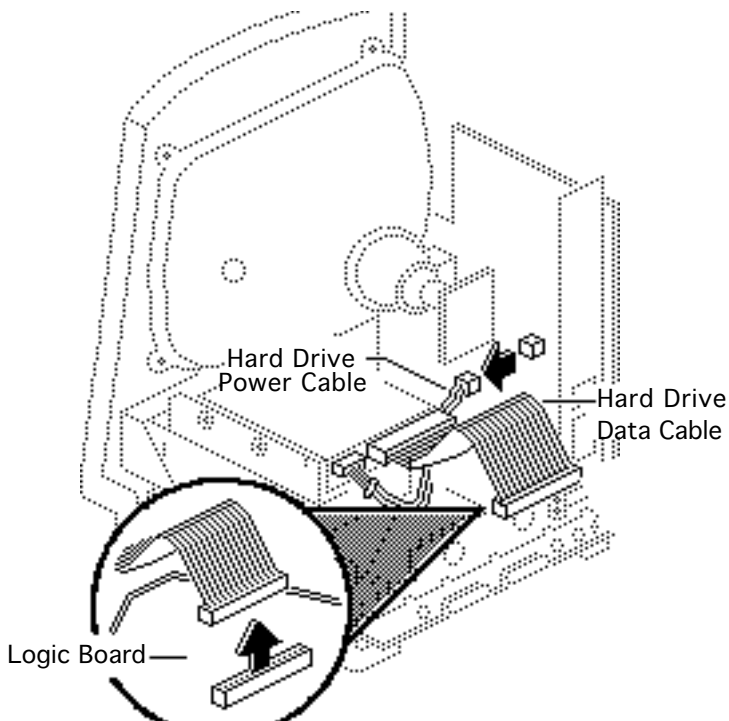
⚠ Warning: This product contains high voltage and a high-vacuum picture tube. To prevent serious personal injury or equipment damage, review CRT safety and discharge instructions in Bulletins/Safety.





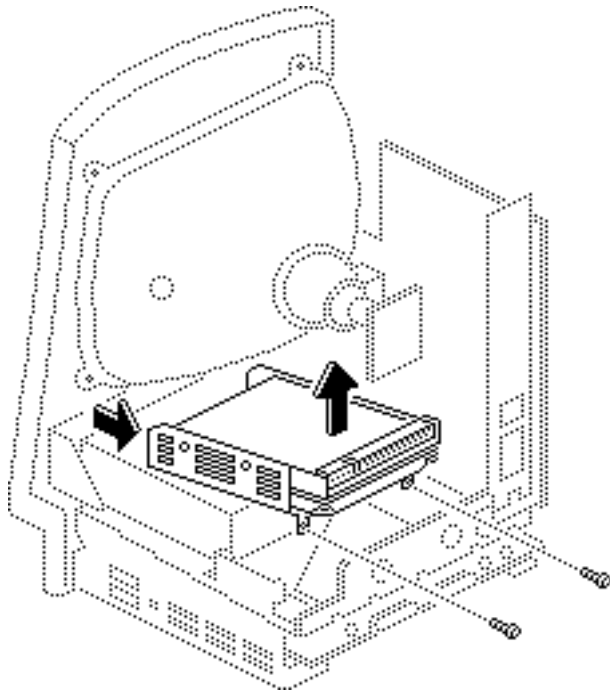
Caution: To prevent ESD damage to components, wear a grounding wriststrap. Never use a grounding wriststrap until after discharging the CRT.





- 1 Disconnect the hard drive data cable from the logic board.
- 2 Disconnect the hard drive power cable from the power/sweep board.





- 3 Remove the two Phillips screws that secure the hard drive housing to the floppy drive housing and lift out the hard drive assembly.

Replacement Note: If you are removing a hard drive from the system but not installing a new one, install a SCSI terminator on the logic board SCSI connector. To insert the terminator, line up the white key icon with the notch in the cable connector.





Replacement Note: For information on removing the hard drive from the carrier and returning drives, cables, and carriers to Apple, refer to Hardware/ Service Manuals/ SCSI Hard Drives Manual.





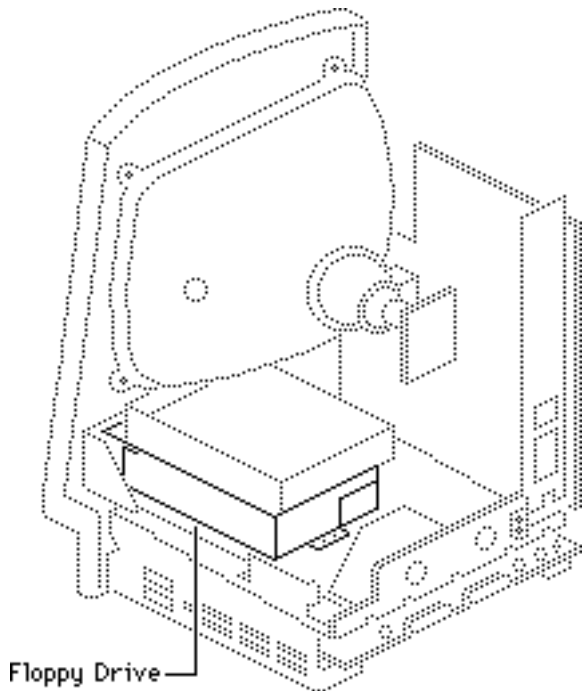
Floppy Drive

Before you begin:

- Remove the cover
- Discharge the CRT
- Remove the hard drive
- Remove the logic board

⚠ Warning: This product contains high voltage and a high-vacuum picture tube. To prevent serious personal injury or equipment damage, review CRT safety and discharge instructions in Bulletins/Safety.

Caution: To prevent ESD



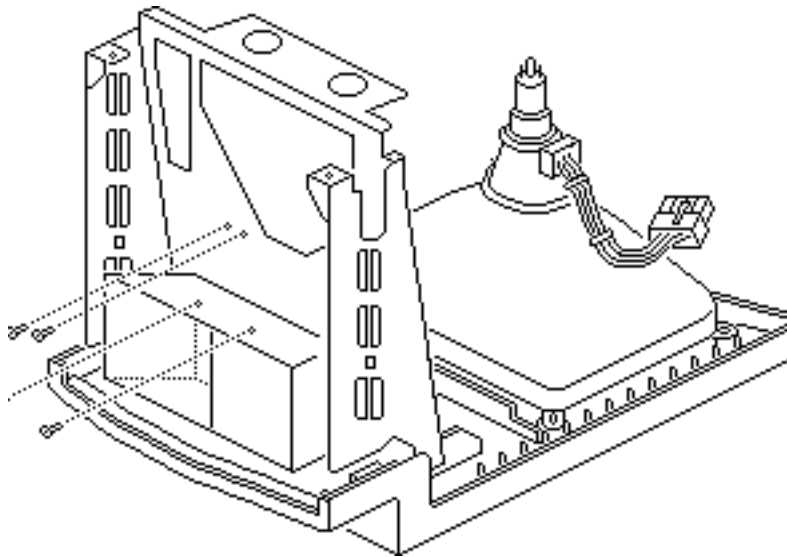


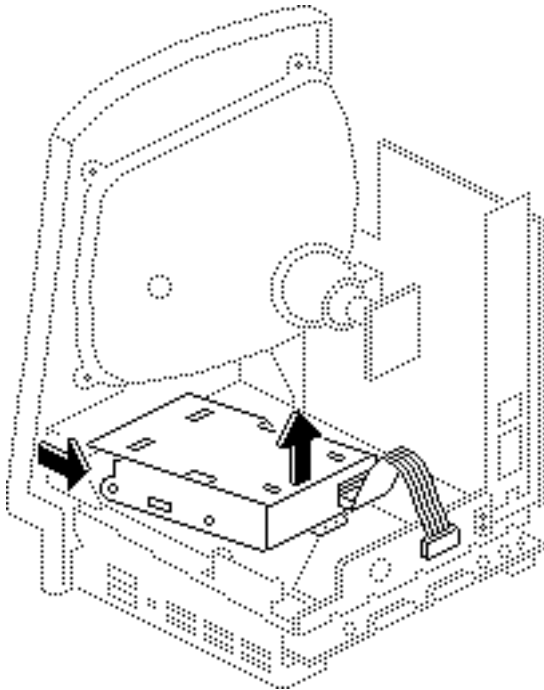
damage to components, wear a grounding wriststrap. Never use a grounding wriststrap until after discharging the CRT.





- 1 Remove the four Phillips screws that secure the floppy drive housing to the bottom of the chassis.

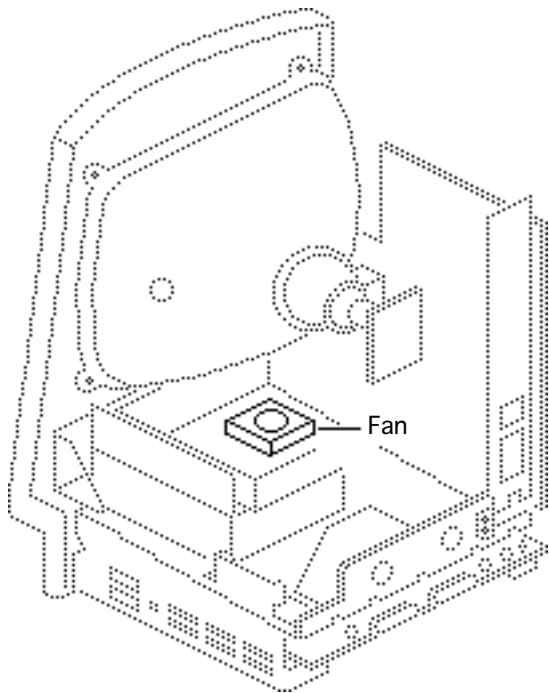




- 2 Lift out the floppy drive mechanism.

Replacement Note: Before you install a replacement 1.4 MB SuperDrive, you must remove the dust shield.





Fan

Before you begin:

- Remove the cover
- Discharge the CRT
- Remove the anode cap
- Remove the power/sweep board

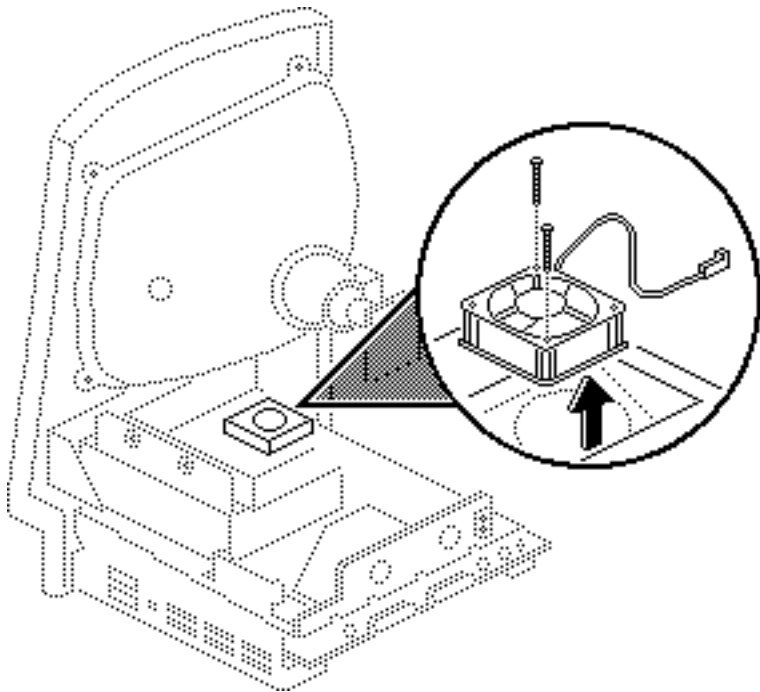
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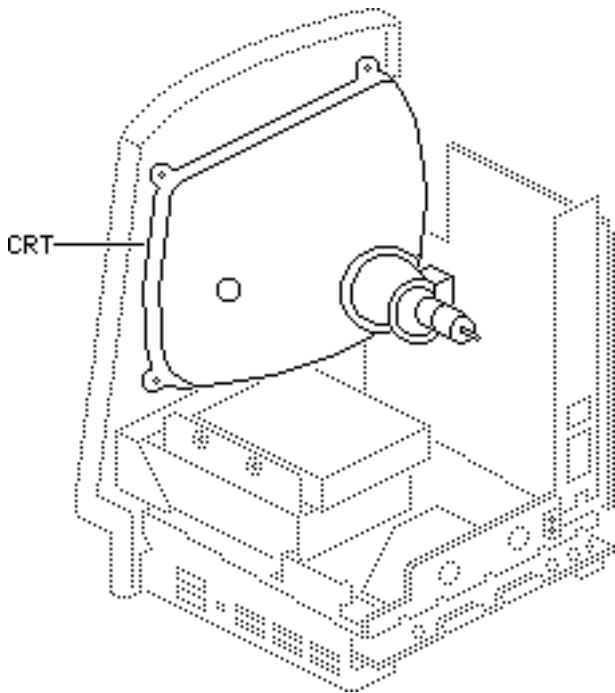
Caution: To prevent ESD damage to components, wear a grounding wriststrap. Never use a grounding wriststrap until after discharging the CRT.





- 1 Using a small, stump-handled Phillips screwdriver, remove the two screws that mount the fan to the chassis.
- 2 Lift out the fan.





CRT

Before you begin:

- Remove the cover
- Discharge the CRT
- Remove the anode cap
- Remove the power/sweep board

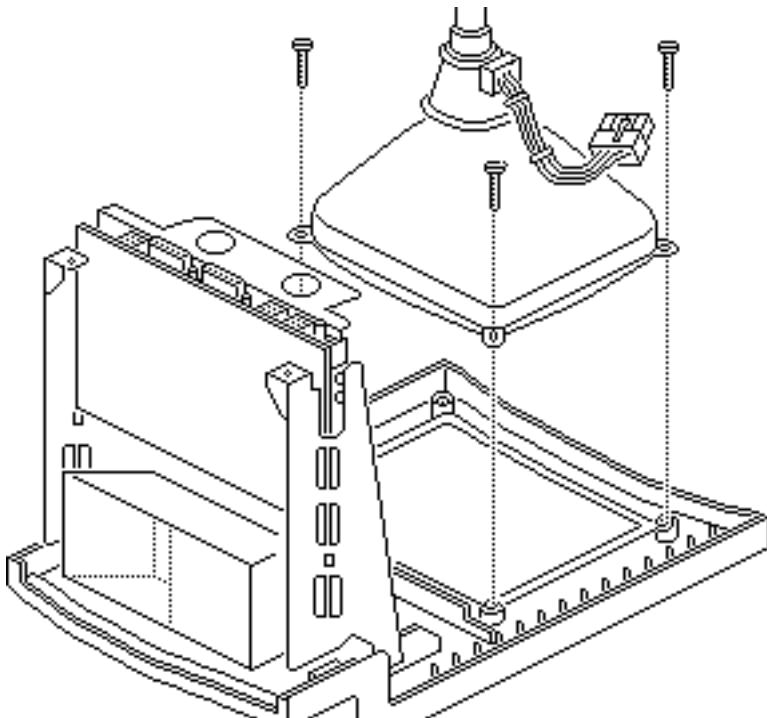
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Caution: To prevent ESD damage to components, wear a grounding wriststrap. Never use a grounding wriststrap until after discharging the CRT.





- 1 Remove the three Torx screws from the corners of the CRT.
- 2 Carefully lift the CRT free from the bezel.

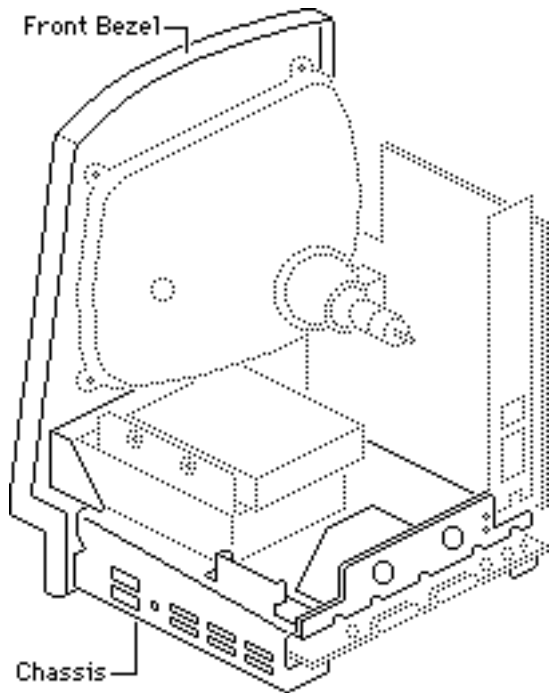
Note: The CRT yoke assembly must be compatible with the power/sweep assembly, which is available in two versions, Rev A and Rev B. CRT yoke assembly Rev A requires power/sweep board Rev A. CRT yoke assembly Rev B requires power/sweep board Rev B.





Refer to “Power/Sweep Board” in Take Apart to identify CRT and power/sweep revisions and to verify compatibility.





Chassis & Front Bezel

Before you begin:

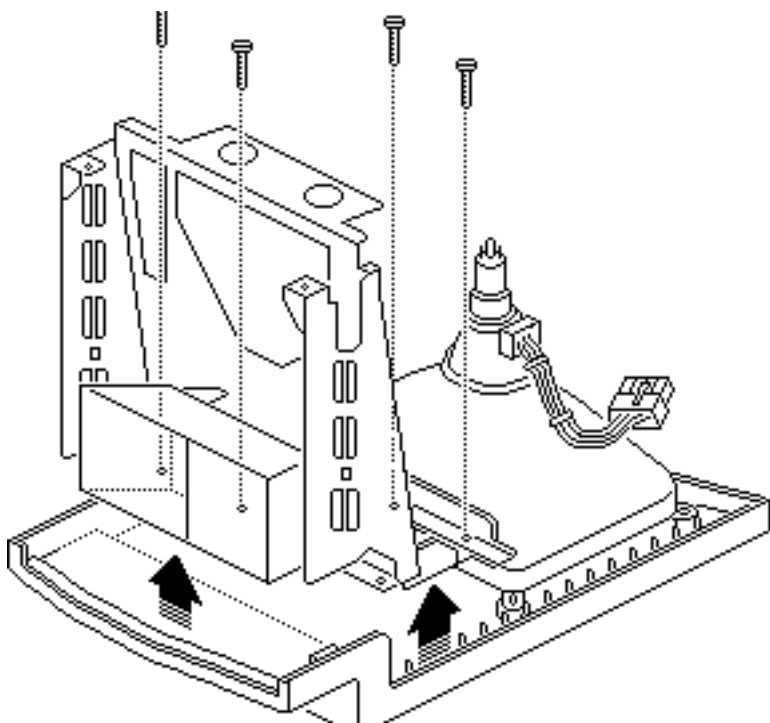
- Remove the cover
- Discharge the CRT
- Remove the anode cap
- Remove the power/sweep board
- Remove the memory expansion board
- Remove the logic board
- Remove the hard drive
- Remove the floppy drive
- Remove the fan





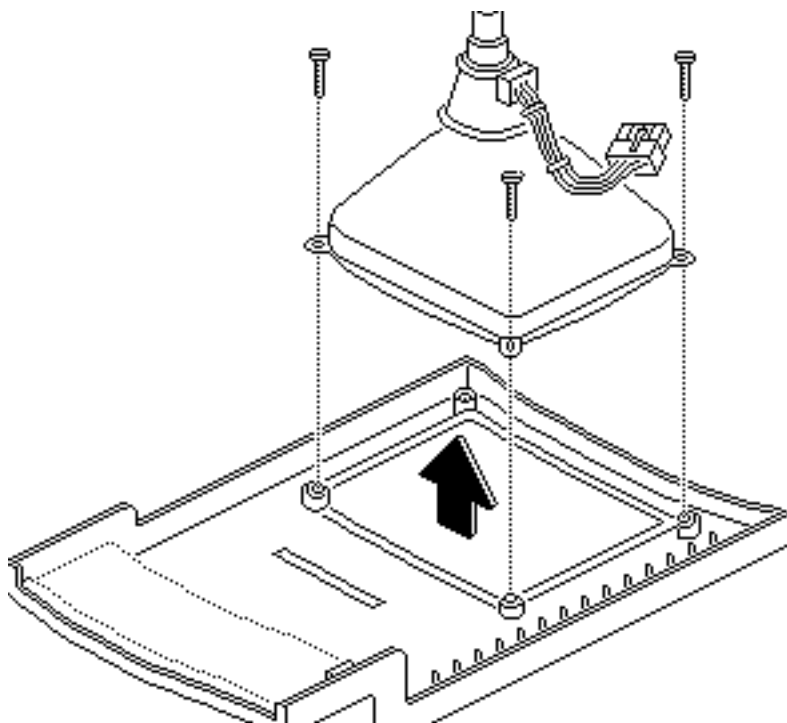
⚠ Warning: This product contains high voltage and a high-vacuum picture tube. To prevent serious personal injury or equipment damage, review CRT safety and discharge instructions in Bulletins/Safety.





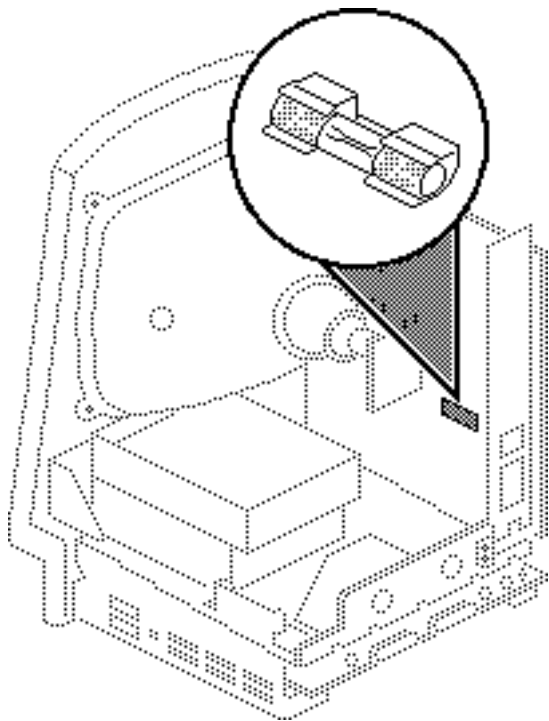
- 1 Remove the four Torx screws from the front bezel.
- 2 Lift out the metal chassis.





- 3 Remove the three Torx screws from the corner of the CRT, and remove the CRT.





Fuse

Before you begin:

- Remove the cover
- Discharge the CRT

⚠ Warning: This product contains high voltage and a high-vacuum picture tube. To prevent serious personal injury or equipment damage, review CRT safety and discharge instructions in Bulletins/Safety.





Caution: To prevent ESD damage to components, wear a grounding wriststrap. Never use a grounding wriststrap until after discharging the CRT.

Using a fuse puller or small flat-blade screwdriver, carefully remove the fuse from its holder.

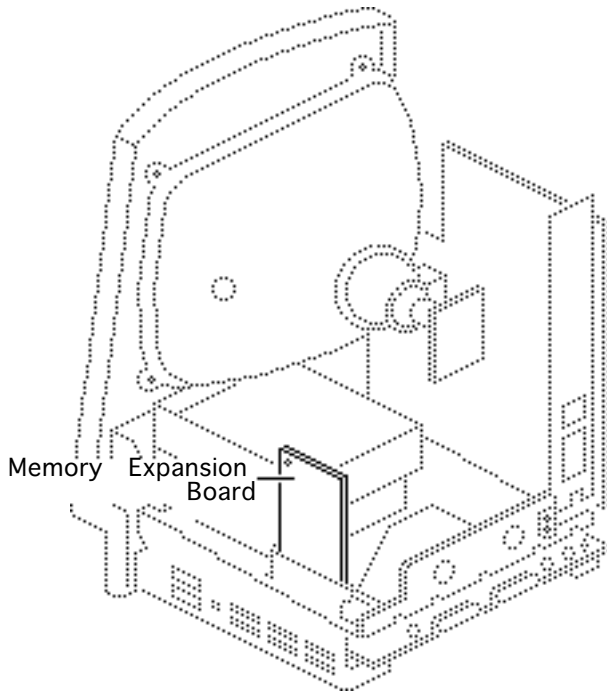




Upgrades

Macintosh Classic/Classic II/
Performa 200





Memory Exp. Bd.

Before you begin:

- Remove the cover
- Discharge the CRT

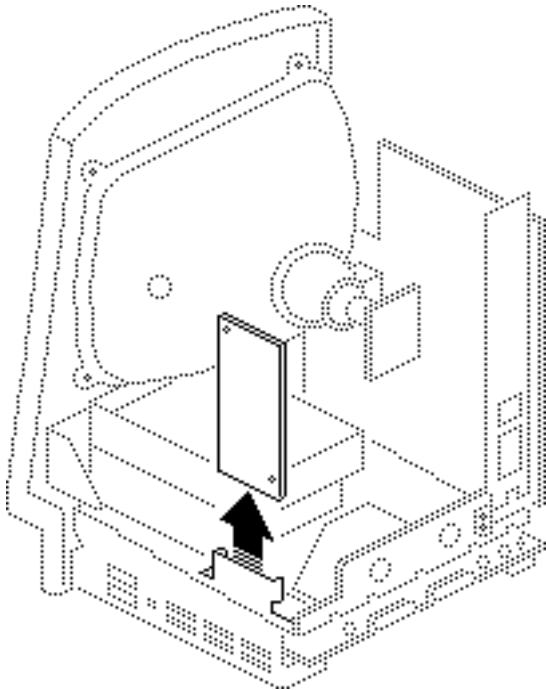
⚠ Warning: This product contains high voltage and a high-vacuum picture tube. To prevent serious personal injury or equipment damage, review CRT safety and discharge instructions in Bulletins/Safety.





Caution: To prevent ESD damage to components, wear a grounding wriststrap. Never use a grounding wriststrap until after discharging the CRT.





Note: The memory expansion board is an option for the Macintosh Classic only. It contains 1 MB of soldered RAM plus one pair of SIMM connectors.

Carefully slide the memory expansion board up to free it from the logic board and the chassis.



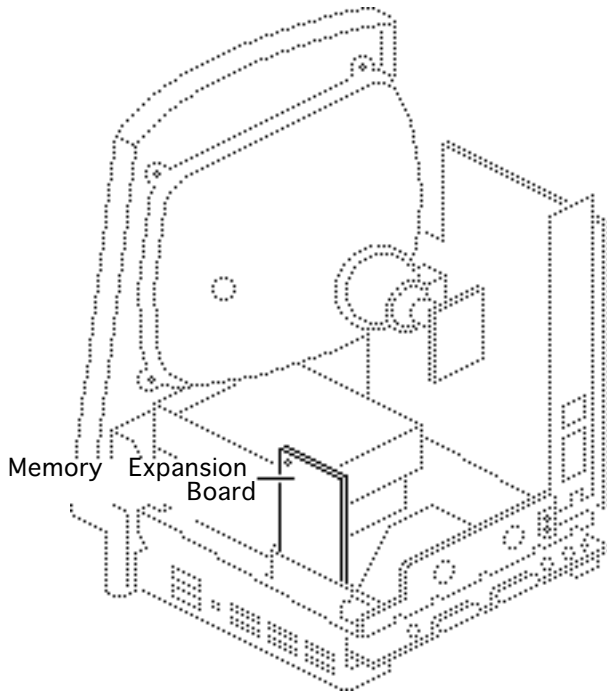


Memory Upgrade

Before you begin:

- Remove the cover
- Discharge the CRT
- Remove the memory expansion board

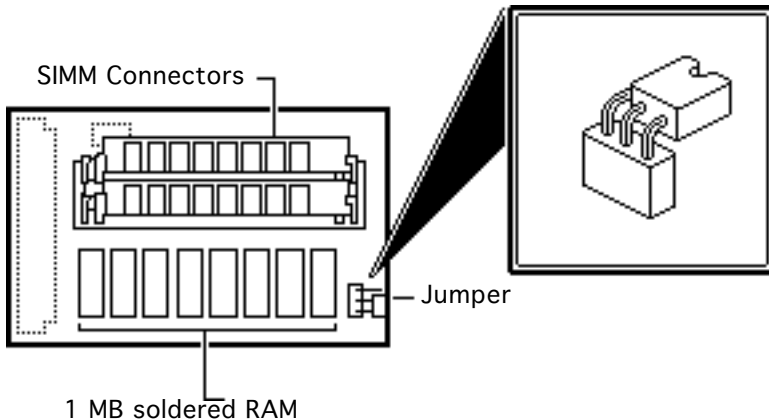
⚠ Warning: This product contains high voltage and a high-vacuum picture tube. To prevent serious personal injury or equipment damage, review CRT safety and discharge instructions in Bulletins/Safety.





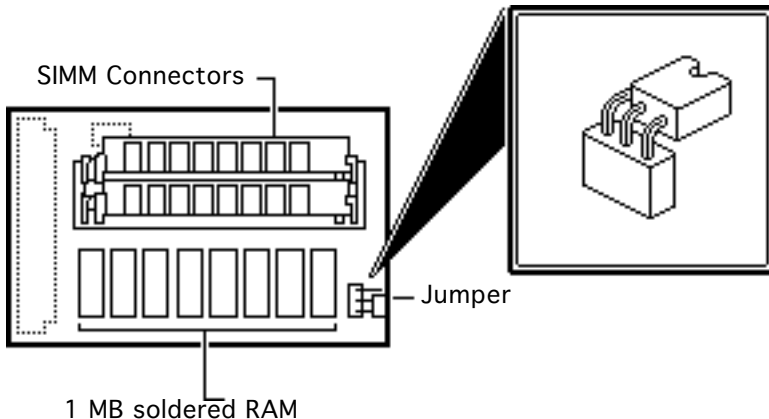
Caution: To prevent ESD damage to components, wear a grounding wriststrap. Never use a grounding wriststrap until after discharging the CRT.





Note: The memory expansion board is an option for the Macintosh Classic only. It contains 1 MB of soldered RAM plus one pair of SIMM connectors. You can upgrade the system further by adding two 256K or two 1 MB SIMMs to the memory expansion board and moving the jumper. You must use 120-ns (or faster) SIMMs.





Note: Install the memory board without additional SIMMs for a 1 MB RAM upgrade. Install two 256K SIMMs onto the memory expansion board for a 2.5 MB RAM upgrade or two 1 MB SIMMs for a 4 MB RAM upgrade.

- 1 Install the SIMMs in the SIMM slots on the memory expansion board.
- 2 Position the jumper as shown.





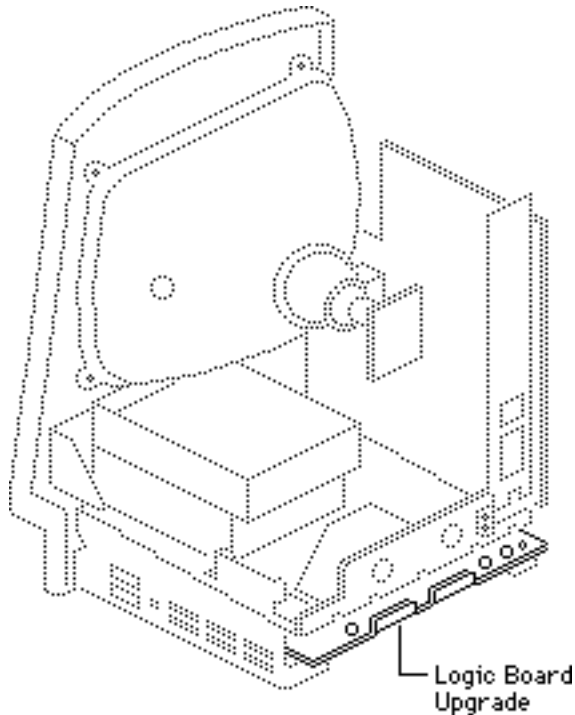
Classic II Upgrade

Before you begin:

- Remove the cover
- Discharge the CRT
- Remove the logic board

⚠ Warning: This product contains high voltage and a high-vacuum picture tube. To prevent serious personal injury or equipment damage, review CRT safety and discharge instructions in Bulletins/Safety.

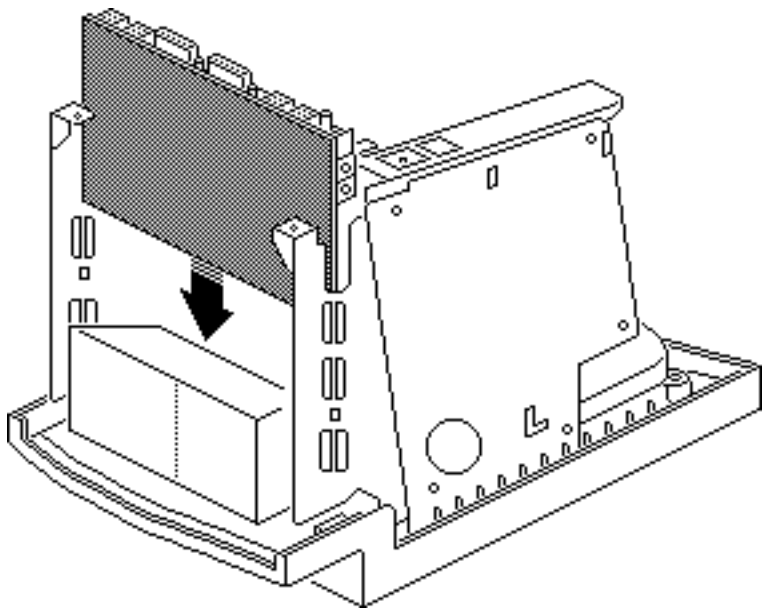
Caution: To prevent ESD damage to components, wear





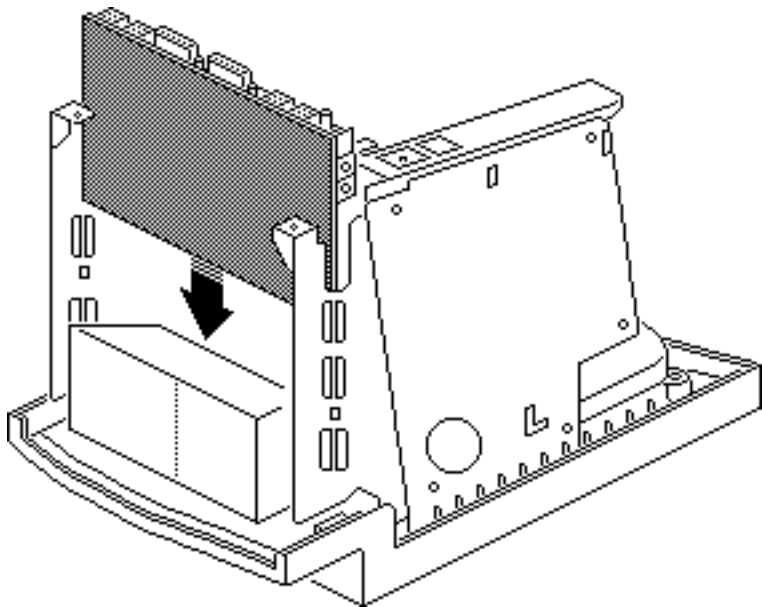
a grounding wriststrap.
Never use a grounding
wriststrap until after
discharging the CRT.





Note: A Macintosh Classic II upgrade kit upgrades a Macintosh Classic to a Macintosh Classic II. The upgrade kit includes a Classic II logic board, a Classic II cover, a microphone, and an accessory kit.

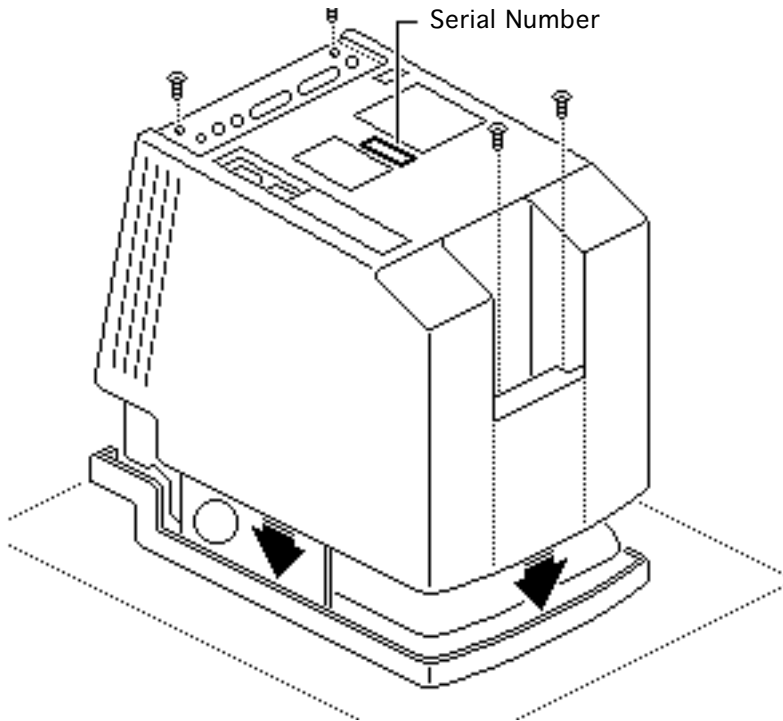




Caution: Take care that the connections to the sound output and sound input ports are correct. Inserting the wrong equipment into the wrong port could damage the Macintosh Classic II or external equipment.

- 1 Install the Macintosh Classic II logic board.





- 2 Install the Classic II cover.
- 3 Read the customer's original serial number from the label on the back of the old rear housing and record the number with indelible ink or engrave it onto the new rear housing.

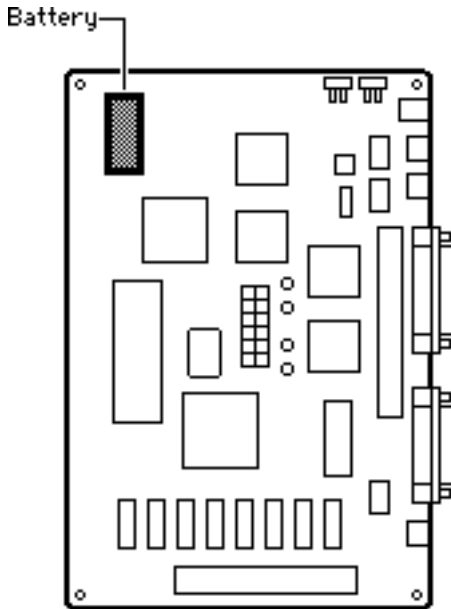




Additional Procedures

Macintosh Classic/Classic II/
Performa 200





Battery Verification

Before you begin:

- Remove the cover
- Discharge the CRT
- Remove the logic board

⚠ Warning: This product contains high voltage and a high-vacuum picture tube. To prevent serious personal injury or equipment damage, review CRT safety and discharge instructions in Bulletins/Safety.

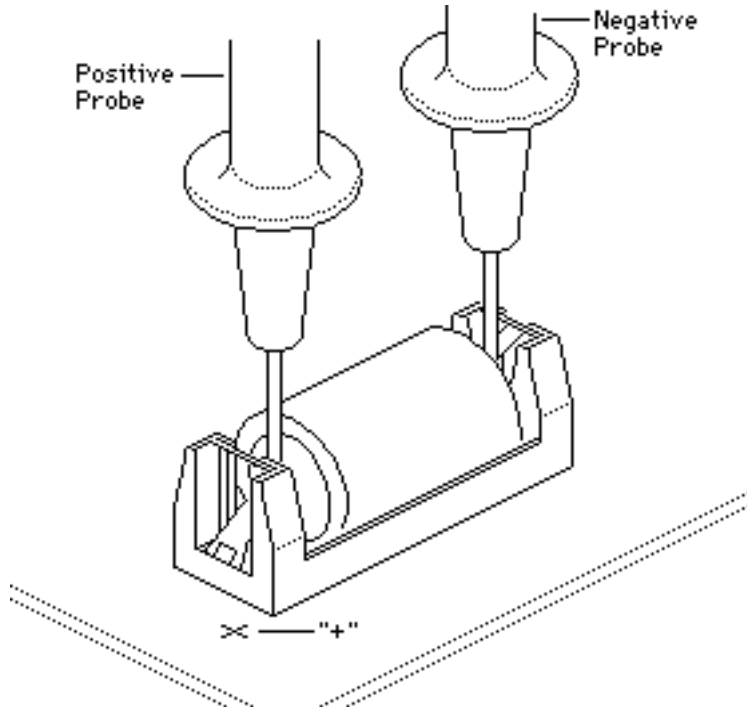
Caution: To prevent ESD





damage to components, wear a grounding wriststrap. Never use a grounding wriststrap until after discharging the CRT.





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

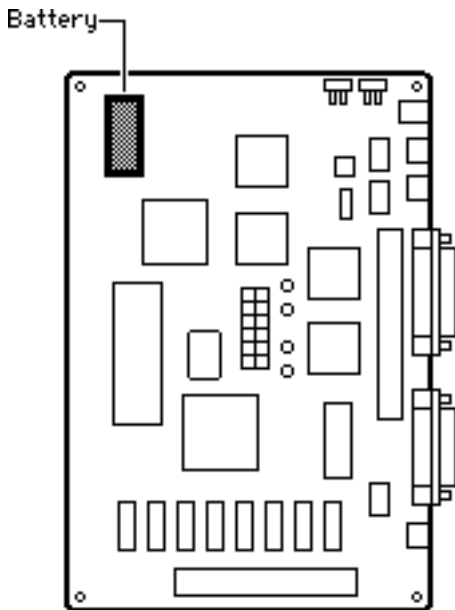
- 1 Set the voltmeter range to the 10 volts DC scale.
- 2 Hold the positive probe of the voltmeter to the positive "+" side of the battery. Hold the ground probe of the voltmeter to the negative (-) side of the battery.





- 3 If the battery voltage is below 3.0 volts, replace the battery. See “Battery Replacement” in this chapter.





Battery Replacement

Before you begin:

- Remove the cover
- Discharge the CRT
- Remove the logic board

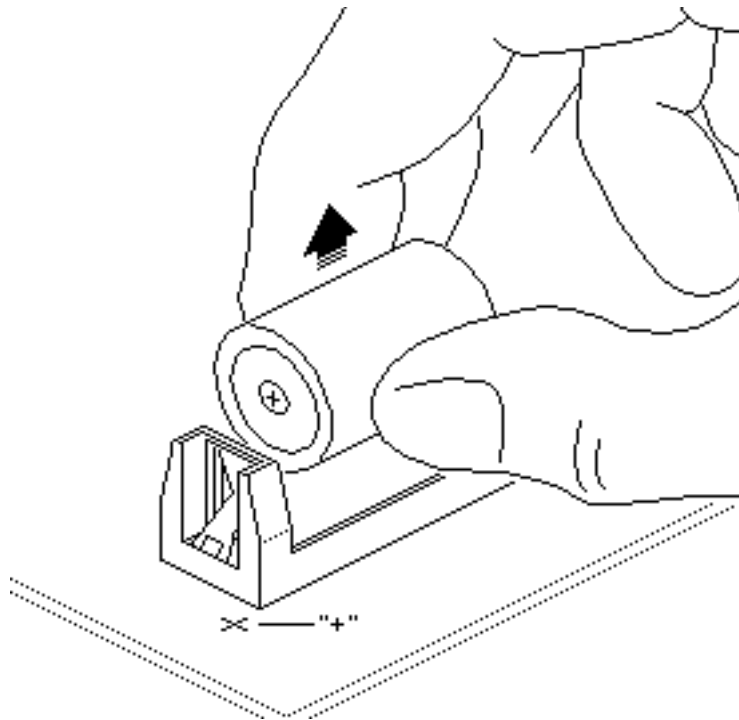
⚠ Warning: This product contains high voltage and a high-vacuum picture tube. To prevent serious personal injury or equipment damage, review CRT safety and discharge instructions in Bulletins/Safety.





Caution: To prevent ESD damage to components, wear a grounding wriststrap. Never use a grounding wriststrap until after discharging the CRT.





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

- 1 Pull the old battery out of the battery holder.
- 2 Replacement Note: Orient the new battery so that the end marked “+” matches the “+” on the logic board, and insert the battery into the battery holder.





Note: For information about properly disposing of the old battery, refer to battery disposal instructions in Bulletins/Safety.

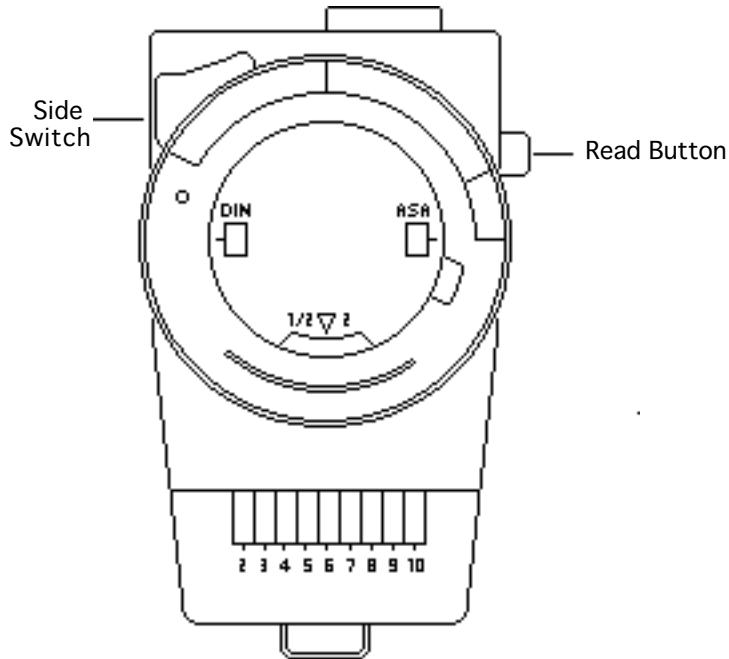




Adjustments

Macintosh Classic/Classic II/
Performa 200





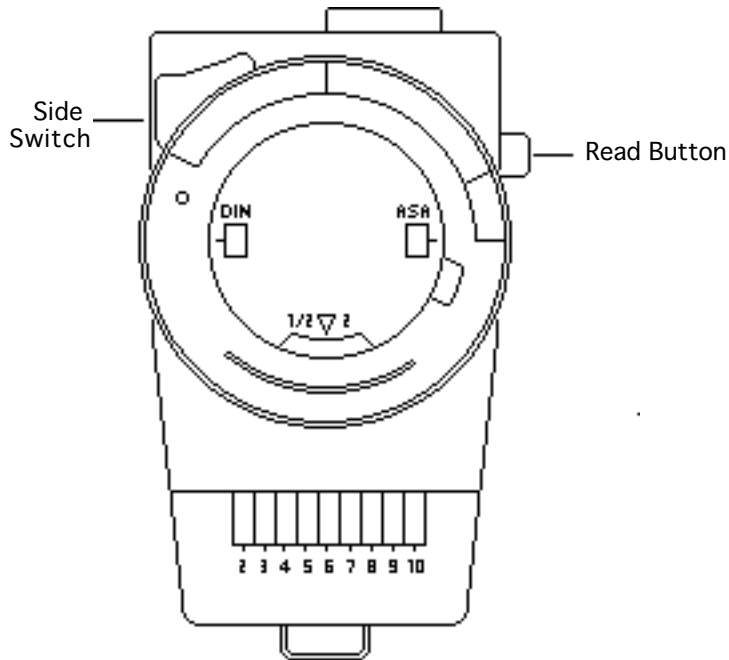
Light Meter Setup

Note: This topic covers setup for two light meters: Models L-248 and 246.

Model L-248

- 1 Press the red button on the back of the light meter. If the reading is out of the red bar, replace the battery.
- 2 Luminance tests will instruct you to move the side switch either to the low position (2-10) or





- the high position (10-18) to get a reading.
- 3 Uncover the lens of the meter.
- 4 Place the lens against the middle of the screen and press the Read button.

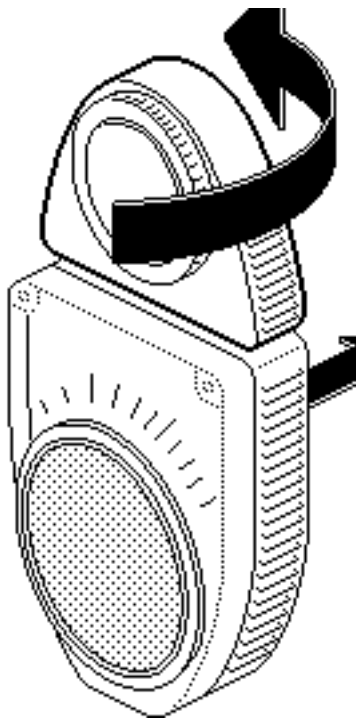
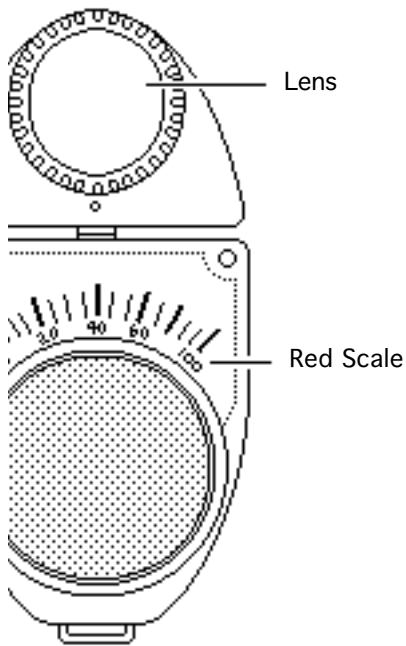




Model 246

Note: Remove the metal slide, if installed, from the top of the light meter. Install the white lens with the red dot.

- 1 Rotate the lens for the meter so the lens faces the monitor and the scale faces you.
- 2 Use your hand to shield the lens from ambient light.
- 3 Place the lens against the middle of an all-white screen.





- 4 Read the red scale while you perform the Brightness and Contrast adjustments in the Video topic.

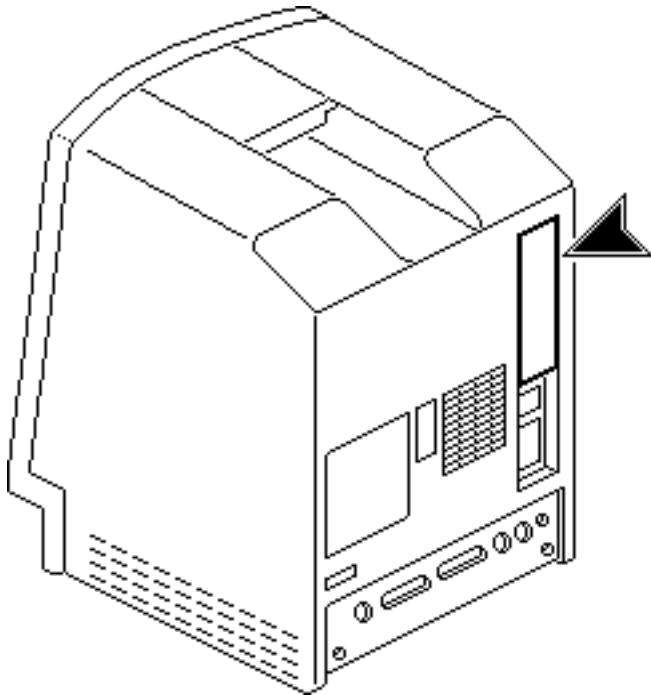




Video

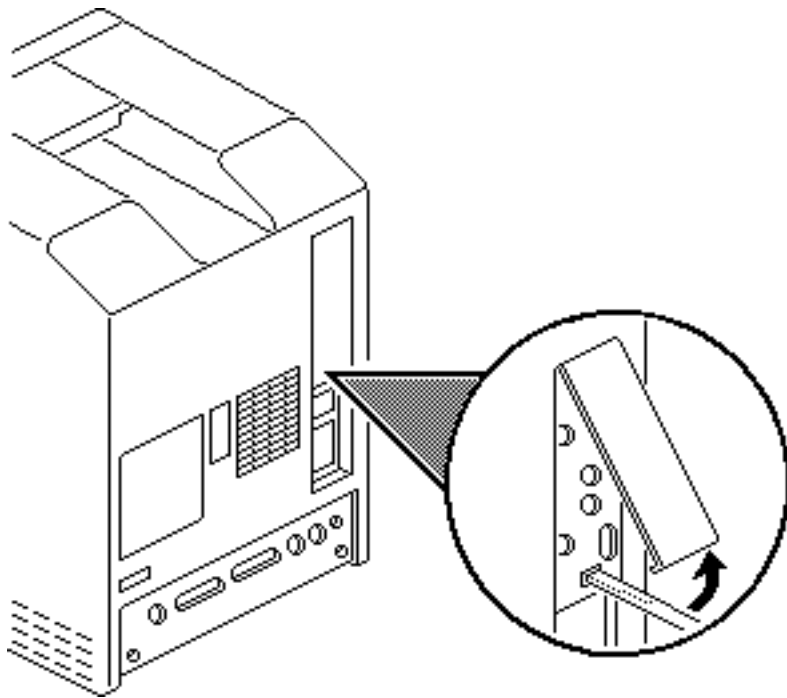
Note: After you replace the CRT or power/sweep board, you may need to perform video adjustments.

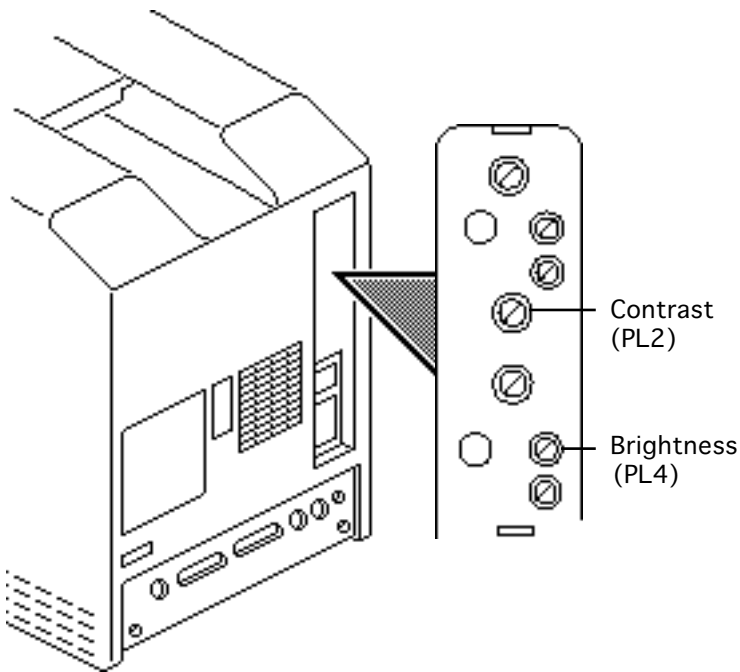
- 1 **Caution:** Because you must make adjustments from the rear of the computer, position a mirror to view the computer screen.





- 2 Using a small flat-blade screwdriver, depress the center tab and lift out the service door.





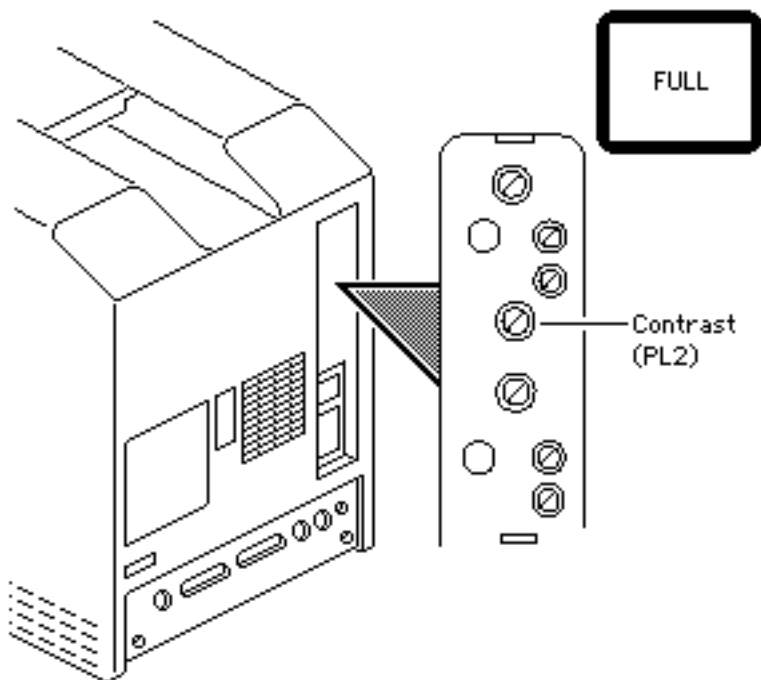
Brightness & Contrast

Important: Readings from light meters may differ between models. Please note the type of meter you are using (Model L-248 or 246) before making an adjustment. (See “Light Meter Setup.”)

Note: Be sure the computer has been on for at least 30 minutes.

- 1 Run the Display Service Utility from the Utilities folder on the MacTest Pro CD.





- 2 From the pattern selections screen, select the Full brightness screen.
- 3 Hold the light meter lens against the center of the screen.
- 4 Using an insulated flat-blade screwdriver, adjust the contrast control until you measure luminance at 40 foot lamberts (± 3 foot lamberts), which on the light meter is
 - Model L-248: 10 to 11 on the 10-18 scale



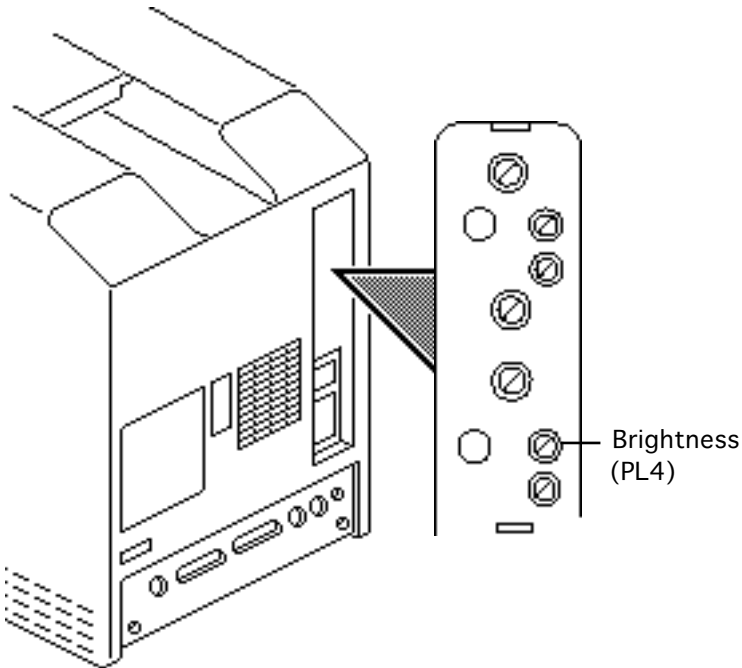


- Model 246: 29 on the red scale

Important: Over time, light meter tolerance can vary. If you doubt your meter's accuracy, verify the readings with a known-good light meter or photometer.

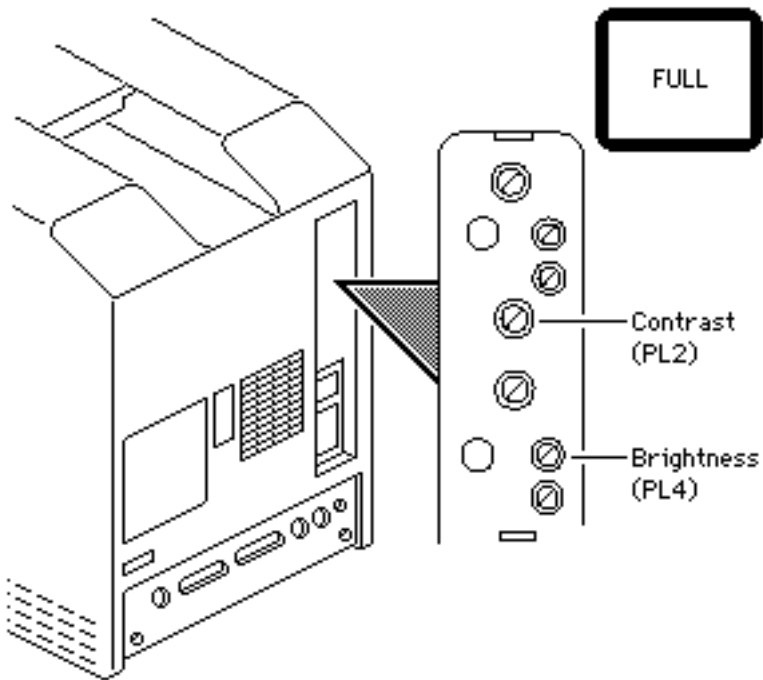
- 5 Press a key to return to the pattern selections screen. Select the Half brightness screen.





- 6 Using a plastic hex alignment tool, adjust the brightness control until the luminance at the center of the screen measures 5 foot lamberts (± 1 foot lambert), which on the light meter is
- Model L-248: high end of 7 on the 2-10 scale
 - Model 246: 5 on the red scale

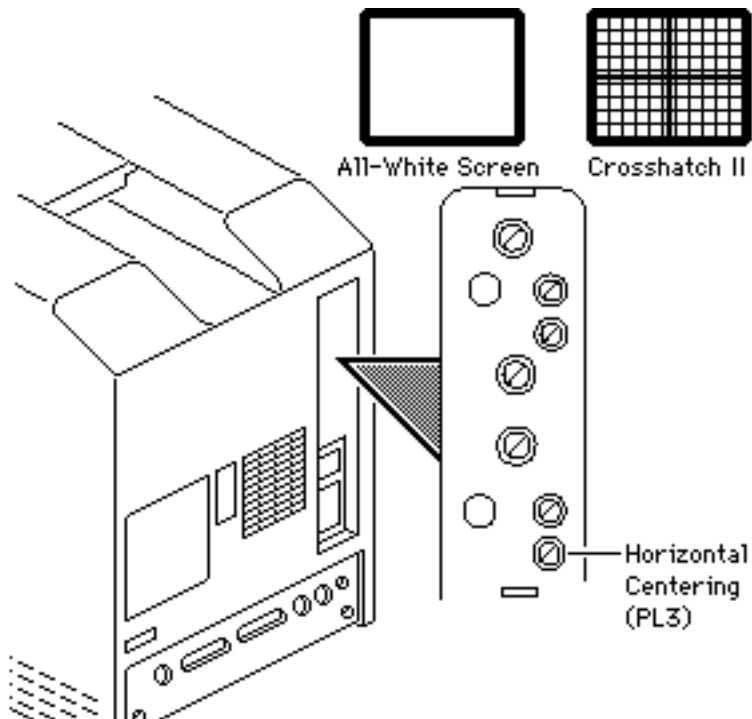




- 7 Press a key to return to the pattern selections screen. Select the Full brightness screen.
- 8 Recheck the luminance at the center of the screen:
 - Model L-248: 10 to 11 on the 10-18 scale
 - Model: 246: 29 on the red scale

If the light meter reading does not match the luminance measurement shown, repeat the brightness & contrast procedure.

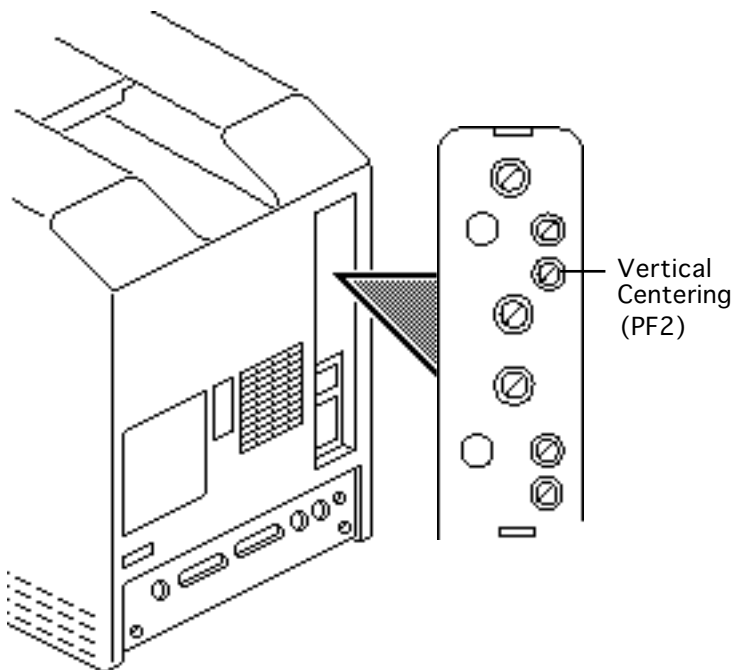




Centering

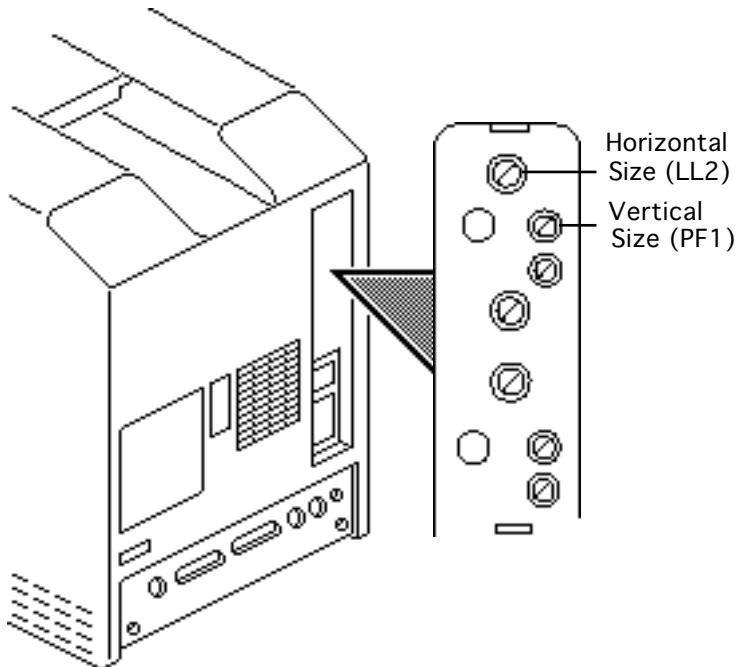
- 1 Run the Display Service Utility.
- 2 Select the Crosshatch pattern or the All-White pattern.
- 3 Using the plastic hex alignment tool, adjust the horizontal centering control to center the display image horizontally within the bezel.





- 4 Using the plastic hex alignment tool, adjust the vertical centering control to center the image vertically within the bezel.

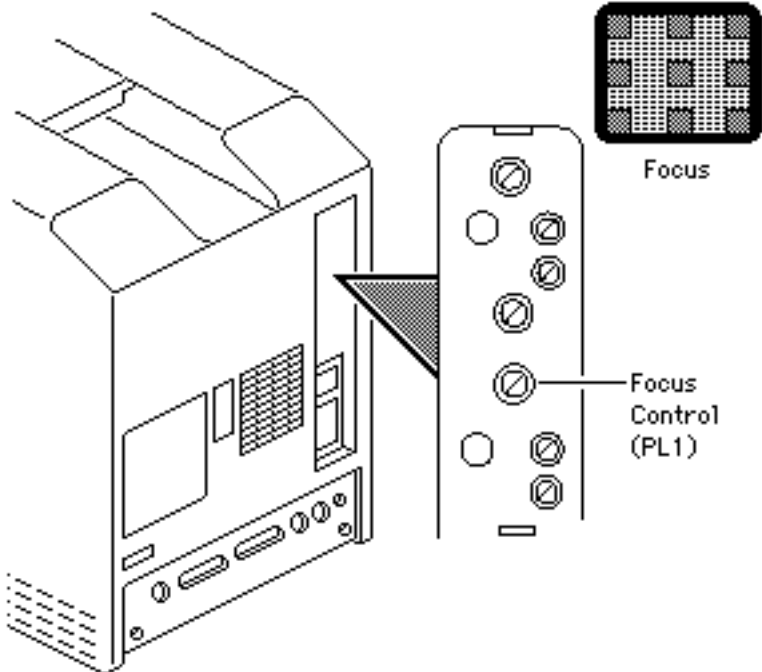




Size Adjustments

- 1 Using the plastic hex alignment tool and a ruler, adjust the horizontal size control until the display image is 7 inches (177.8 mm) wide.
- 2 Using the plastic hex alignment tool, adjust the vertical size control until the display image is 4.7 inches (119.38 mm) high.

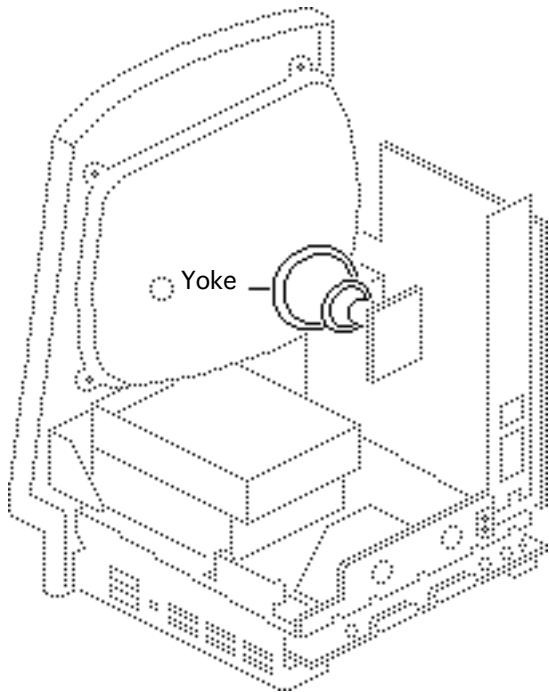




Focus Adjustments

- 1 Display the Focus test pattern using Display Service Utility.
- 2 Using an insulated flat-blade screwdriver, adjust the focus control for the best overall focus.





Yoke

Before you begin:

- Remove the cover
- Discharge the CRT

⚠ Warning: This product contains high voltage and a high-vacuum picture tube. To prevent serious personal injury or equipment damage, review CRT safety and discharge instructions in Bulletins/Safety.

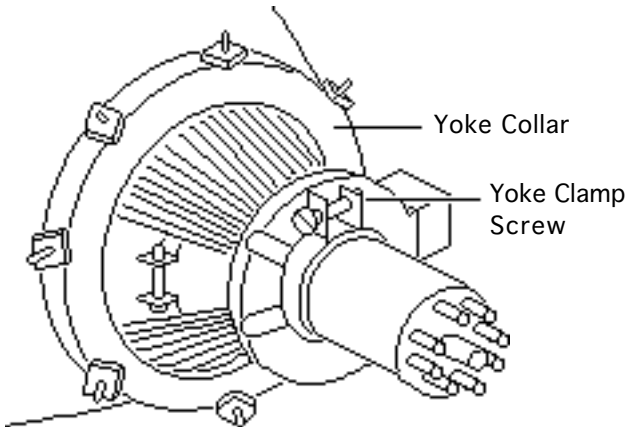




Caution: Because you must make adjustment from the rear of the computer, position a mirror to view the computer screen. Do not reach around the computer to adjust collars and rings.

Note: After you replace the CRT, you may need to adjust the yoke.

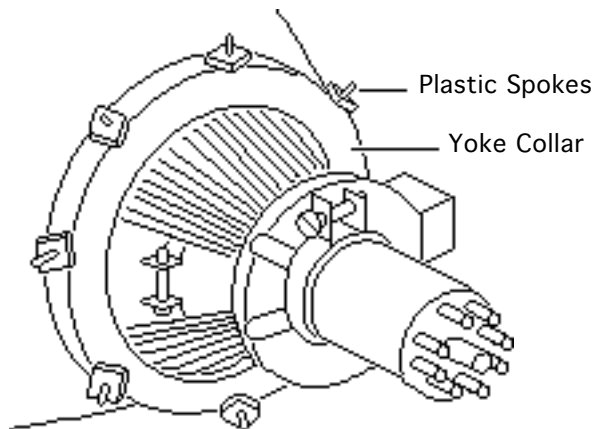




- 1 **Note:** If glue holds the yoke collar in place, use an art knife to cut through the glue.

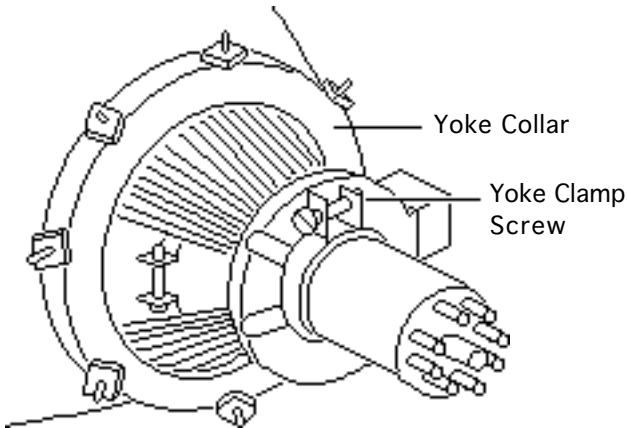
Loosen the yoke clamp screw two or three turns.
- 2 Switch on the computer.





- 3 With one hand, grasp the plastic spokes of the yoke collar and rotate the yoke collar until the top and bottom edges of the picture are parallel with the top and bottom of the bezel.





- 4 Switch off and unplug the computer.
- 5 Discharge the CRT.
- 6 **Caution:** Do not overtighten the yoke clamp screw.

Hold the plastic collar in position and carefully tighten the yoke clamp screw so that the collar cannot slip.



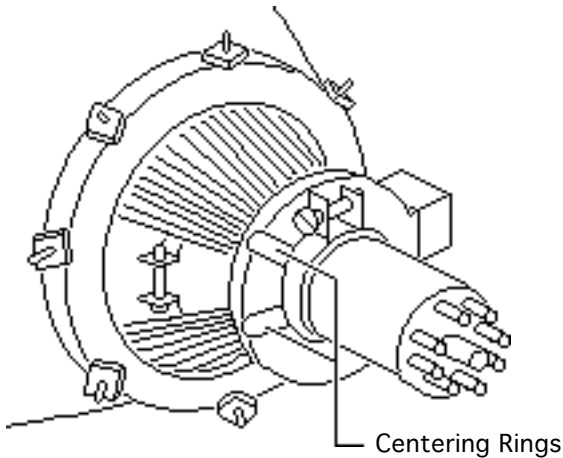


- 7 Replace the cover and switch on the computer. Make sure the top and bottom edges of the picture are parallel with the top and bottom of the bezel.





Centering Ring Adjustment



- 1 **Note:** If glue holds the yoke collar in place, use an art knife to cut through the glue.

Switch on the computer.

- 2 To center the picture within the bezel: Hold the front centering ring steady and move the rear ring; then hold the rear centering ring steady and move the front ring.





Parts

Classic/Classic II/Performa 200





Battery, Lithium, without Leads

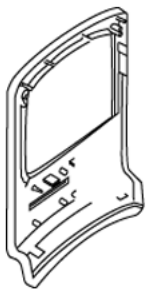
742-0011





Bezel, Monitor, Mac Classic II

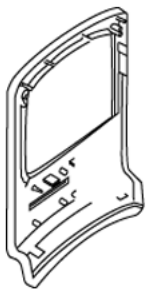
630-6046





Bezel, Monitor, Mac Classic

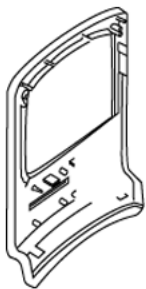
630-5825





Bezel, Monitor, Performa 200

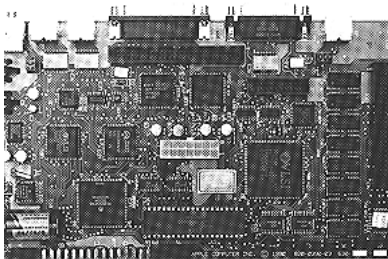
922-0832

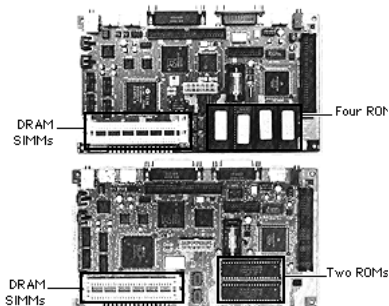




Board, Logic, 1MB, Macintosh Classic

661-0596



**Board, Logic, 2MB, Classic II & Performa 200****661-0672**

Macintosh Classic II logic boards come with either two or four ROM chips installed. The boards are interchangeable and provide the same amount of ROM memory.

Remove the RAM SIMMs before returning the Macintosh Classic II logic board to Apple.

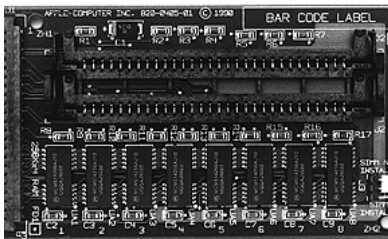


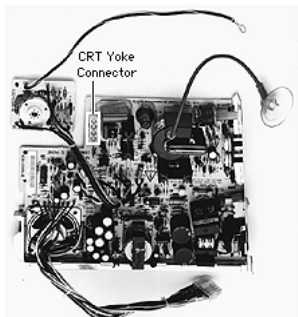


Board, Memory Expansion, with 1MB, Macintosh Classic

661-0598

Remove the RAM SIMMs before returning the Macintosh Classic memory expansion board to Apple.



**Board, Power Sweep, 110V, Mac Classic, Rev. A****661-0597**

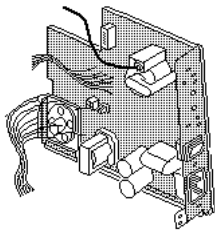
The two versions of the power/sweep board, Rev. A and Rev. B are functionally equivalent, but not interchangeable. The CRT yoke connector on power/sweep board Rev. A has plastic sleeves surrounding the prongs. See also module P/N 661-0651.

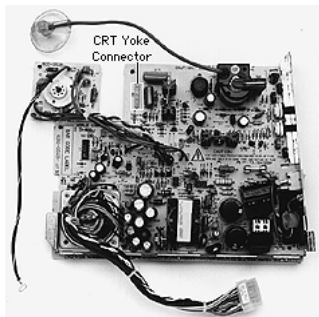




Board, Power Sweep, 220V, Mac Classic, Rev. A

661-0599



**Board, Power Sweep, 110V, Rev. B~Classic/Classic II & Performa 200****661-0651**

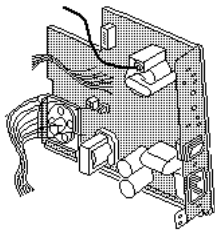
The two versions of the power/sweep board, Rev. A and Rev. B are functionally equivalent, but not interchangeable. The CRT yoke connector on power/sweep board Rev. B is a series of four exposed prongs. See also module P/N 661-0597.





Board, Power Sweep, 220V, Rev. B, Classic/Classic II

661-0652





Cable, ADB Keyboard (1 meter) (Replaced by 590-0616)

590-0361





Cable, ADB Keyboard (1 meter)

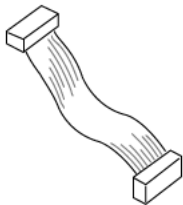
590-0616





Cable, Floppy Drive (Red Stripe)

590-0167





Cable, Hard Drive, Power

590-0521





Cable, Hard Drive, SCSI

590-0211





Cable, Power, 110 V, Smoke

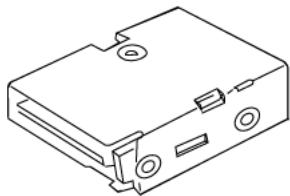
590-0380





Carrier, 800K/SuperDrive

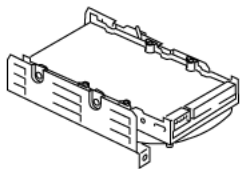
805-5050





Carrier, Hard Drive, SCSI, 3.5"

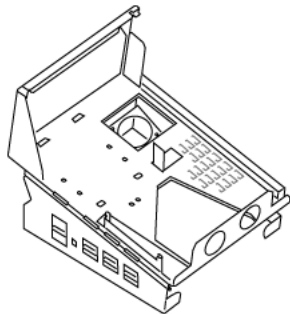
805-0950





Chassis with Plenum

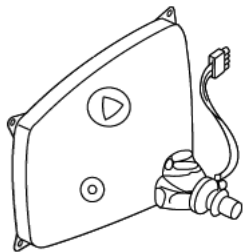
630-5818





CRT and Yoke Assembly, Rev. A

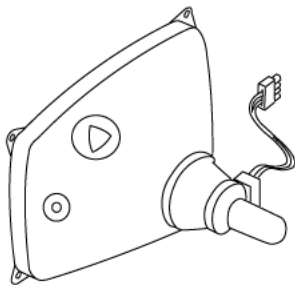
076-0103





CRT and Yoke Assembly, Rev. B, Classic/Classic II

076-0546





CRT/Video Adjustment

011-7026





Door, Rear Housing Access

815-1195





Facilitation Warranty Reimbursement, Per Repair

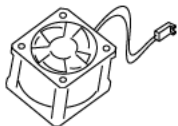
011-0083





Fan

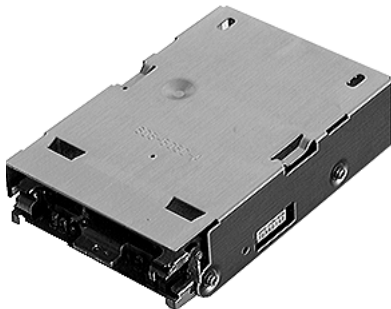
982-0055





Floppy Drive, Apple SuperDrive 1.4 MB

661-0474



You can identify the 1.4 MB drive mechanism by the 2 MB designation on the blue model number label, on the right side of the module.

When returning the defective drive to Apple, assemble the shipping fixture and remove the drive cable. Special Packaging Is Required:

Pkg: #602-0210

Surcharge: \$50.00

Failure to comply with these requirements may result in a packaging noncompliance surcharge. Please refer to Service Prices for ordering and pricing information.

Note: Service is removing dust shields from standard packaging. Drives will be shipped with either carriers 805-5050 or 805-0961.

Use this drive in the Macintosh LC and LCII.





Foot, Platinum

865-0051



**Hard Drive, 120 MB, SCSI, 3.5" (Discontinued)****661-0021**

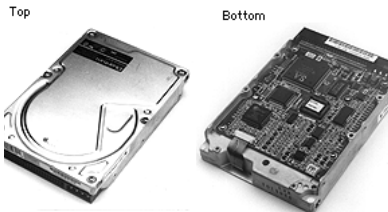
This part has been discontinued. For replacement of parts covered under warranty or AppleCare®, order 661-1750. For replacement of out-of-warranty parts, refer to the parts list in the Service Source manual for the product you are repairing.



**Hard Drive, 160 MB, SCSI, 3.5" (Discontinued)****661-0214**

This part has been discontinued. For replacement of parts covered under warranty or AppleCare®, order 661-1750. For replacement of out-of-warranty parts, refer to the parts list in the Service Source manual for the product you are repairing.



**Hard Drive, 160 MB, SCSI, 3.5", HD Adapter Support (Discontinued)****661-1649**

This part has been discontinued. For replacement of parts covered under warranty or AppleCare®, order 661-1750. For replacement of out-of-warranty parts, refer to the parts list in the Service Source manual for the product you are repairing.



**Hard Drive, 230 MB, SCSI, 3.5" (Discontinued)****661-1637**

This part has been discontinued. For replacement of parts covered under warranty or AppleCare®, order 661-1750. For replacement of out-of-warranty parts, refer to the parts list in the Service Source manual for the product you are repairing.



**Hard Drive, 40 MB, SCSI, 3.5"****661-0216**

Upon failure all 20 MB drives will be upgraded to 40 MB drives. If you send in a 20 MB drive, you will receive a 40 MB replacement drive.

Note: All replacement drives will be shipped without carriers.

Compatibility

This drive can be used in the following:

- Macintosh SE, SE/30
- Macintosh II, IIcx, IIci, IIx, IIfx
- Macintosh IIsi
- Classic, Classic II
- Color Classic, Color Classic II
- LC, LC II, LC III
- Performa 400





Cable Return Requirements

Return the defective drive without cables.

Carrier Return Requirements

Return the drive without a carrier.

Special Packaging Requirements

Pkg: #602-0282

Surcharge: \$150.00

Failure to comply with these requirements may result in a packaging noncompliance surcharge. Please refer to Service Prices for ordering and pricing information.



**Hard Drive, 80 MB, SCSI, 3.5" (Discontinued)****661-0111**

This part has been discontinued. For replacement of parts covered under warranty or AppleCare®, order 661-1750. For replacement of out-of-warranty parts, refer to the parts list in the Service Source manual for the product you are repairing.



**Hard Drive, 80 MB, SCSI, 3.5" (Discontinued)****661-0212**

This part has been discontinued. For replacement of parts covered under warranty or AppleCare®, order 661-1750. For replacement of out-of-warranty parts, refer to the parts list in the Service Source manual for the product you are repairing.



**Hard Drive, 500 MB, SCSI, 3.5", In-Warranty Exchange Only****661-1750**

Only order this part number when exchanging a failed hard drive that meets both of the following conditions: 1) the failed hard drive is covered under warranty or AppleCare®, and 2) the like-for-like replacement hard drive has been discontinued.

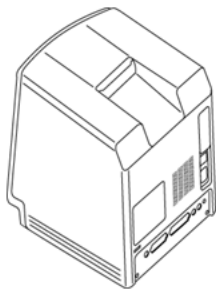
Apple has made every effort to maintain LED support in its exchange program; however, some drives no longer support an LED. We regret any inconvenience this may cause.





Housing, Rear Assembly with Door and Feet (replaced by 630-6045)

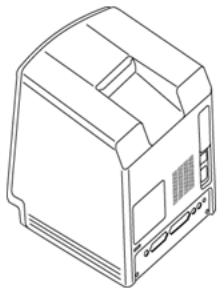
630-5812





Housing, Rear Assembly with Feet

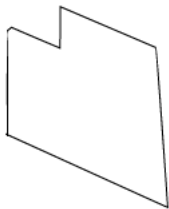
630-6045





Insulator, Power/Sweep Board

815-1216





Internal SCSI Terminator

630-0408





Keyboard, Apple Adjustable

661-0731



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

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





Keyboard, AppleDesign

922-2832





Keyboard, AppleDesign, British

B661-0310





Keyboard, AppleDesign, French Canadian

C661-0310





Keyboard, AppleDesign, French

F661-0310





Keyboard, AppleDesign, German

D661-0310





Keyboard, AppleDesign, Italian

T661-0310





Keyboard, AppleDesign, Spanish

E661-0310



**Keyboard, Apple Desktop Bus (replaced by 661-0603)****661-0337**

Internationally localized versions of this module may be ordered by utilizing P/Ns 661-0337B/D/F/T.
Keyboard is to be returned to Apple without the cable.





Keyboard, Apple Extended (Replaced by 661-0543)

661-0384

§





Keyboard II, Apple Extended

661-0543





Keyboard II, Apple

661-0603





Keypad, Apple Adjustable, Int'l, w/Decimal Point (.)

661-0817





Keypad, Apple Adjustable, Int'l, w/Decimal Point (,)

661-0816





Keypad, Apple Adjustable

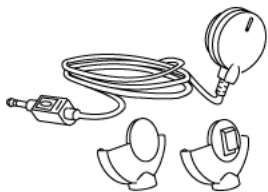
661-0762

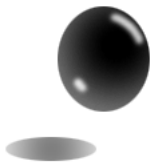




Microphone Assembly

699-5103



**Mouse Ball (21.9 mm Diameter), Black****699-8038**

Order this mouse ball to replace a black mouse ball in ADB mouse II version A (P/N 661-0763), ADB mouse II version B (P/N 661-0104), ADB mouse (P/N 661-0479), and ADB mouse (P/N 661-0585). The product label on the bottom of the mouse begins with “L.”



**Mouse Ball (25.4 mm Diameter), Gray****699-8001**

Used in ADB Mouse P/N 661-0338 and P/N 661-0479.
However, these mice have been replaced by ADB Mouse II, P/
N 661-0104.





Mouse II, Apple Desktop Bus, Version A

661-0763



This module is replaced by part number 661-0104.



**Mouse II, Apple Desktop Bus, Version B****661-0104**

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



**Mouse, Apple DeskTop Bus (Replaced by 661-0763)****661-0338**

Note: This module is replaced by Apple P/N 661-0104.





Mouse, Apple Desktop Bus (replaced by 661-0763)

661-0479



Note: This module is replaced by Apple P/N 661-0104.

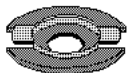




Plug, Microphone Port (Bag of 10)

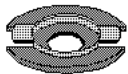
922-0522



**Retainer, ADB Mouse (for 21.9 mm Black Mouse Ball)****815-0816**

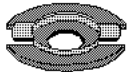
Used in Low Power Mouse P/N 661-0585 (for the Macintosh Portable) and in ADB Mouse P/N 661-0479. However, P/N 661-0479 has been replaced by ADB Mouse II, P/N 661-0104.



**Retainer, Snap-On, ADB Mouse~(for 25.4 mm Gray Mouse Ball)****815-1136**

Used in ADB Mouse P/N 661-0479. However, that mouse has been replaced by ADB Mouse II, P/N 661-0104.



**Retainer, Twist-On, ADB Mouse~(for 25.4 mm Gray Mouse Ball)****076-0231**

Used in ADB Mouse P/N 661-0338. However, that mouse has been replaced by ADB Mouse II, P/N 661-0104.





Rivet, Nylon Snap-In, Black

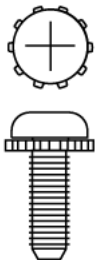
830-0270





Screw (Power/Sweep to Chassis; Hard Drive to Apple SuperDrive)

490-0001





Screw, 6-32x.250

444-6104





Screw, M 3.5 x 6 x .8 PNCR Rec

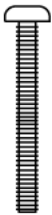
462-4100





Screw, M3x.5x30mm (Fan to Plenum)

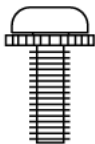
416-1330





Screw, M3X0.5X6MM

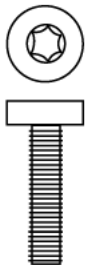
460-3400





Screw, Tap 8.32 x .625 Fill, Torx, Zinc Oxide (Case Bottom)

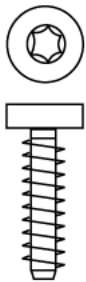
435-5002





Screw, Tap, M4.22 x 1.41 x 13, Torx, Zinc (CRT & Chassis)

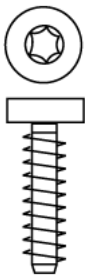
426-1001





Screw, Tap, M4.22 x 1.41 x 16, Torx, Zinc (Case Top)

426-1007





Service Packaging, 800K/FDHD Apple SuperDrive

602-0210





Service Pkg., HDA 3.5", 1" High Drives w/o Carriers~(Also for 19mm High Floppy)

602-0308



**SIMM, 1 MB, 80 ns (Classic II, Perf 200 Only)****661-0719**

The RAM speed is usually indicated by the -XX after the manufacturer's part number (e.g., -8 indicates 80 ns, -6 indicates 60 ns, etc.). This number is located on the surface of the chip or on the back of the SIMM board. For return, Apple accepts only 80 ns or faster RAM SIMMs of this 1 MB variety.

Compatibility:

These SIMMs can be used in the following computers and printers:

- Macintosh SE/30
- Macintosh Classic II/Performa 200
- Macintosh IIcx
- Macintosh IIci
- Macintosh IIsi
- Macintosh IIvi/IIvx





- Macintosh Quadra 700
- Macintosh Quadra 900, 950, and Apple Workgroup Server 95
- Macintosh LC
- Macintosh LC II/Performa 400
- LaserWriter IIx and IIg
- Personal LaserWriter NT
- LaserWriter Select 300

Note: This SIMM is not compatible with the Macintosh Classic.



**SIMM, 1 MB, 80ns****661-0520**

fig. Part Number

Compatibility:

These SIMMs can be used in the following computers and printers:

- Macintosh Plus
- Macintosh SE and SE/30
- Macintosh Classic and Classic II/Performa 200
- Macintosh II and IIx
- Macintosh IIcx
- Macintosh IIfx
- Macintosh IIsi
- Macintosh Quadra 700
- Macintosh Quadra 900, 950, and Apple Workgroup Server 95
- Macintosh LC
- Macintosh LC II/Performa 400
- LaserWriter IIf and IIg





- Personal LaserWriter NT
- LaserWriter Select 300



**SIMM, 256K, 120ns****661-0402**

fg. Part Number

The RAM speed is usually indicated by the -XX after the manufacturer's part number (e.g. -10 indicates 100 ns, -12 indicates 120 ns, etc.). This number is located either on the surface of the chip or on the back of the SIMM board. Although 150 ns RAM SIMMs are acceptable for return to Apple, Apple will ship 120 ns (or faster) RAM SIMM exchange modules.

Compatibility:

Service Exchange SIMMs:

These SIMMs can be used in the following computers and printers:

- Macintosh Plus
- Macintosh Classic
- Macintosh SE, SE/30
- Macintosh II, IIx

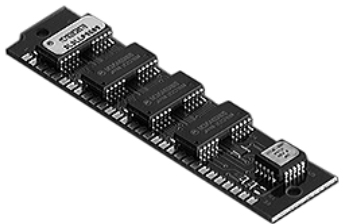




- Macintosh IIcx
- LaserWriter IIx, IIg
- Personal LaserWriter NT and SC

Apple substitutes a compatible service exchange module for finished-goods SIMMs. You will not receive a finished-goods SIMM as a service exchange module.



**SIMM, 2MB, 80ns****661-0643**

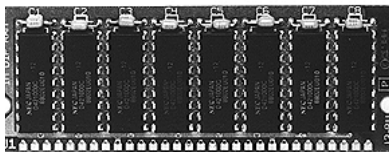
The RAM speed is usually indicated by the -XX after the manufacturer's part number (e.g., -8 indicates 80 ns, -6 indicates 60 ns, etc.). This number is located on the surface of the chip or on the back of the SIMM board. For return, Apple accepts only 80 ns or faster RAM SIMMs of this 2 MB variety.

Compatibility:

These SIMMs can be used in the following computers:

- Macintosh Classic II/Performa 200
- Macintosh IIci
- Macintosh IIsi
- Macintosh IIvi, IIvx, and Performa 600
- Macintosh LC
- Macintosh LC II/Performa 400



**SIMM, DIP, 1MB, 120ns****661-0410**

These DIPs (Dual In-line Packages) can be identified by the eight (8) ICs soldered through the PCB.

The RAM speed is usually indicated by the -XX after the manufacturer's part number (e.g., -10 indicates 100 ns, -12 indicates 120 ns, etc.). This number is located either on the surface of the chip or on the back of the SIMM board. Only 120 ns or faster RAM SIMMs of this 1 MB variety will be accepted by Apple for return.

Compatibility:

These SIMMs can be used in the following computers and printers:

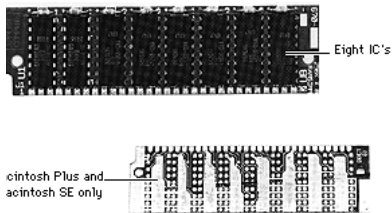
- Macintosh SE (fits positions 3 and 4 only)
- Macintosh SE/30 (fits memory bank A only)
- Macintosh Classic





- Macintosh II and IIx
- Macintosh IIcx
- Personal LaserWriter NT



**SIMM, DIP, 256K, 120ns****661-0494**

These DIPs (Dual In-Line Packages) can be identified by the eight (8) ICs soldered through the PCB.

The RAM speed is usually indicated by the -XX after the manufacturer's part number (e.g. -10 indicates 100 ns, -12 indicates 120 ns, etc.). This number is located either on the surface of the chip or on the back of the SIMM board. Although 150 ns RAM SIMMs are acceptable for return to Apple, Apple will ship 120 ns (or faster) RAM SIMM exchange modules.

Please note that this SIMM is for the Macintosh Plus and Macintosh SE only. The back side of this SIMM is marked "For use only in Mac Plus SIMM positions (1,2,3,4) and Mac SE SIMM positions (3,4)".



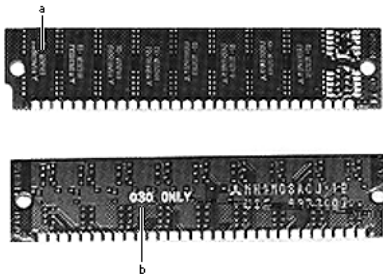


Compatibility:

These SIMMs can be used in the following computers and printers:

- Macintosh Plus
- Macintosh SE (fits in positions 3 and 4 only)
- Macintosh SE/30 (fits in memory bank A only)
- Macintosh Classic
- Macintosh II and IIx
- Macintosh IIcx
- Personal LaserWriter SC



**SIMM,1MB, 120ns****661-0403**

The RAM speed is usually indicated by the -XX after the manufacturer's part number (e.g. -10 indicates 100 ns, -12 indicates 120 ns, etc.). This number is located either on the surface of the chip or on the back of the SIMM board. Only 120 ns or faster RAM SIMMs of this 1 MB variety will be accepted by Apple for return.

Please note that this SIMM is for Macintosh units with the 68030 central processing unit only. The back side of the SIMM is marked "030 only."

Compatibility:

Service Exchange SIMMs:

These SIMMs can be used in the following computers:

- Macintosh Plus
- Macintosh Classic





- Macintosh SE, SE/30
- Macintosh II, IIx
- Macintosh IIcx

Finished Goods SIMMs (1 MB, SOJ, 120 ns):

These SIMMs can be used in the following computers:

- Macintosh SE/30
- Macintosh IIx

Apple substitutes a compatible service exchange module for finished-goods SIMMs. You will not receive a finished-goods SIMM as a service exchange module.





Exploded View

Macintosh Classic/Classic II/
Performa 200





Exploded View Classic/Classic II/Performa 200

