



Macintosh IIsx

---



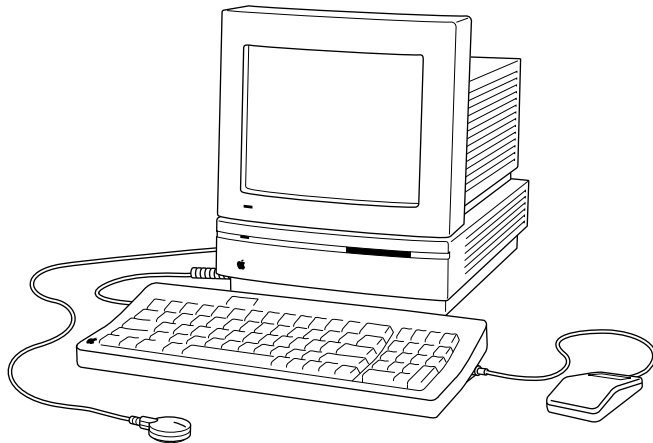


Basics

---

Macintosh IIsx





**Figure: Macintosh IIx**

## Overview

This manual contains complete repair procedures for the Macintosh IIx shown at left.





Specifications

---

Isi





## Processor

### CPU

Motorola 68030 microprocessor  
20 MHz  
32-bit internal data bus  
256-byte instruction and data caches  
Burst-mode RAM access  
Built-in memory management unit (MMU)

### Coprocessor

Motorola 68882 floating-point unit (FPU) included on the  
optional adapter card  
20 MHz





## Memory

<b>RAM</b>	2 MB, expandable to 17 MB
<b>ROM</b>	512K standard
<b>PRAM</b>	256 bytes of parameter memory





## Disk Storage

### **Floppy Drive**

Internal 1.4 MB floppy drive

### **Hard Drive**

Internal 40 MB hard drive  
Optional internal 80 MB hard drive





## I/O Interfaces

### **Expansion**

One slot for either a NuBus or 030 direct slot card

Power available (15 W maximum)

+ 5 V 2.0 A

+12 V 175 A

-12 V 150 A

### **SCSI**

One external SCSI port; DB-25 connector

### **Serial**

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







## I/O Devices

### **Keyboard**

Apple Keyboard, Apple Keyboard II, or Apple Extended Keyboard connected through Apple Desktop Bus (ADB) ports (mini DIN-4)

### **Mouse**

ADB mouse (mini DIN-4)





## Sound and Video

### **Sound Generator**

Output impedance of 8–600 ohms

Short-circuit protected

Disables internal speaker when in use

Four-voice, wavetable synthesis and stereo sampling generator





## Electrical

<b>Line Voltage</b>	100-240 VAC, automatically configured
<b>Frequency</b>	50-60 Hz, single phase
<b>Maximum Power</b>	100 W (not including monitor)





## Physical

### **Dimensions**

Height: 4.0 in. (10 cm)

Width: 12.4 in. (31 cm)

Depth: 14.9 in. (37.2 cm)

### **Weight**

10 lb. (4.5 kg)

Configuration of RAM, floppy drives, hard drives, and NuBus expansion cards will vary weight.





# Troubleshooting

---

Isi





## 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 at least one drive operate, fan is running, and LED is lit

- 1 Adjust brightness on monitor.
- 2 Verify monitor works with different Macintosh.
- 3 Replace monitor. Refer to appropriate monitor manual to troubleshoot defective monitor.
- 4 Replace video cable.
- 5 Replace video card.
- 6 Replace SIMMs. See Hardware/Memory.
- 7 Replace logic board. Retain customer's SIMMs.
- 8 Replace power supply.





## Video (Continued)

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

- 1 Verify monitor works with different Macintosh.
- 2 Replace video cable.
- 3 Replace monitor. Refer to appropriate monitor manual to troubleshoot defective monitor.
- 4 Remove NuBus cards.
- 5 Remove peripherals.
- 6 Replace SIMMs. See Hardware/Memory.
- 7 Replace logic board. Retain customer's SIMMs.
- 8 Replace power supply.

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

- 1 Verify monitor works with different Macintosh.
- 2 Replace monitor. Refer to appropriate monitor manual to troubleshoot defective monitor.
- 3 Replace video cable.
- 4 Replace logic board. Retain customer's SIMMs.







## Video (Continued)

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

- 1 Plug the monitor directly into a wall socket and verify that the monitor has power.
- 2 Remove NuBus card and switch on power again. (NuBus card draws more than 45 watts.)
- 3 Remove peripherals.
- 4 Replace power supply.
- 5 Replace logic board. Retain customer's SIMMs.





## Floppy Drive

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

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

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

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

Disk will not eject

- 1 Switch off computer. Hold mouse button down while switching computer on.
- 2 Eject disk manually.
- 3 Replace floppy drive.





## Floppy Drive (Continued)

Drive attempts to  
eject disk but doesn't

- 1 Push disk completely in.
- 2 Remove top cover and attempt to eject the disk.
- 3 Eject disk manually.
- 4 Replace floppy drive.





## Hard Drive

Internal hard drive runs continuously

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

Internal hard drive will not operate

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





## Peripheral

Works with internal hard drive or external SCSI device but not with both

- 1 Verify that SCSI select switch on external device shows a different priority from internal hard drive.
- 2 Replace terminator on the external device.
- 3 Verify that internal hard drive has a terminator.
- 4 Replace SCSI select cable.

Cursor does not move

- 1 Reboot computer.
- 2 Verify mouse connection.
- 3 If mouse was connected to keyboard, connect the mouse to a computer ADB port and disconnect the keyboard. If mouse works, replace keyboard.
- 4 If mouse does not work in any ADB port on computer, replace mouse.
- 5 Remove additional NuBus cards.
- 6 Replace logic board. Retain customer's SIMMs.





## Peripheral (Continued)

Cursor moves, but clicking the mouse button has no effect

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

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

- 1 Remove duplicate system files.
- 2 Clear parameter RAM. System 7: Hold down <Command> <Option> <P> <R> during startup but before "Welcome to Macintosh" appears. System 6 and earlier: Hold down <Command> <Option> <Shift> keys and select Control Panel from Apple menu.
- 3 If mouse was connected to keyboard, connect the mouse to a computer ADB port instead and disconnect the keyboard. 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.





## Peripheral (Continued)

No response to any key on the keyboard

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

Known-good ImageWriter® or ImageWriter II won't print

- 1 Verify that the System is version 6.0.7 (or later).
- 2 Verify that the Chooser and Control Panel settings are correct.
- 3 Check printer DIP switches.
- 4 Reset PRAM.
- 5 Replace printer interface cable.
- 6 Replace logic board. Retain customer's SIMMs.





## Peripheral (Continued)

Known-good  
LaserWriter® won't  
print

- 1 Verify that the System is version 6.0.7 (or later).
- 2 Verify that the Chooser and Control Panel settings are correct.
- 3 Reset PRAM.
- 4 Refer to the Networking and Communications manual.







## Miscellaneous

Clicking, chirping,  
or thumping

- 1 Replace power supply.
- 2 Disconnect hard drive. If noise disappears, replace drive.
- 3 Replace logic board. Retain customer's SIMMs.

System shuts down  
intermittently

- 1 Check that air vents on the back and top of the case are unobstructed. (Thermal protection circuitry may shut down the system. After 30 to 40 minutes, the system should run.)
- 2 Replace power cord.
- 3 Replace power supply.
- 4 Replace logic board. Retain customer's SIMMs.





## Miscellaneous (Continued)

System  
intermittently  
crashes or locks up

- 1 Verify that the System is version 6.0.7 (or later).
- 2 Verify that software is known-good.
- 3 Remove additional RAM and NuBus cards.
- 4 Replace logic board. Retain customer's SIMMs.
- 5 Replace SIMMs. See Hardware/Memory.
- 6 Replace power supply.

No sound from  
speaker

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





## Miscellaneous (Continued)

- |  |   |
|--|---|
| Clock not running  | <ol style="list-style-type: none"><li>1 Replace battery. See “Battery Verification” in Additional Procedures.</li><li>2 Reset PRAM.</li><li>3 Replace logic board. Retain customer’s SIMMs.</li></ol>   |
| System seems to boot; then message “Finder is old version” appears | <ol style="list-style-type: none"><li>1 Clear parameter RAM. System 7: Hold down &lt;Command&gt; &lt;Option&gt; &lt;P&gt; &lt;R&gt; during startup but before “Welcome to Macintosh” appears. System 6 and earlier: Hold down &lt;Command&gt; &lt;Option&gt; &lt;Shift&gt; keys and select Control Panel from Apple menu.</li><li>2 Replace logic board. Retain customer’s SIMMs.</li></ol> |
| System restarts itself   | Set the locking power switch on the rear of the computer to the unlocked (horizontal) position.   |





## Error Chords

Error chord sounds during startup sequence

- 1 Perform SIMM verification on customer's logic board.
- 2 Replace logic board. Retain customer's SIMMs.





Take Apart

---

Ilisi

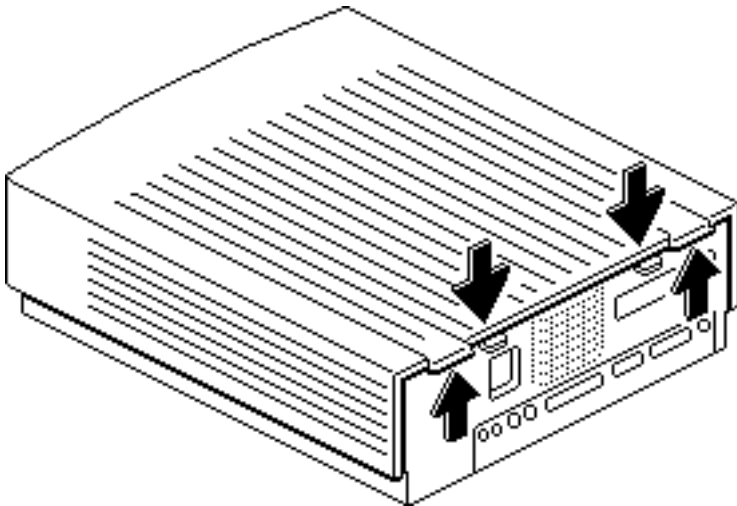




## Cover

No preliminary steps are required before you begin this procedure.

Push down on the small tabs with your thumbs and at the same time lift up on the large tabs with your forefingers. (The cover may make a loud snap.)



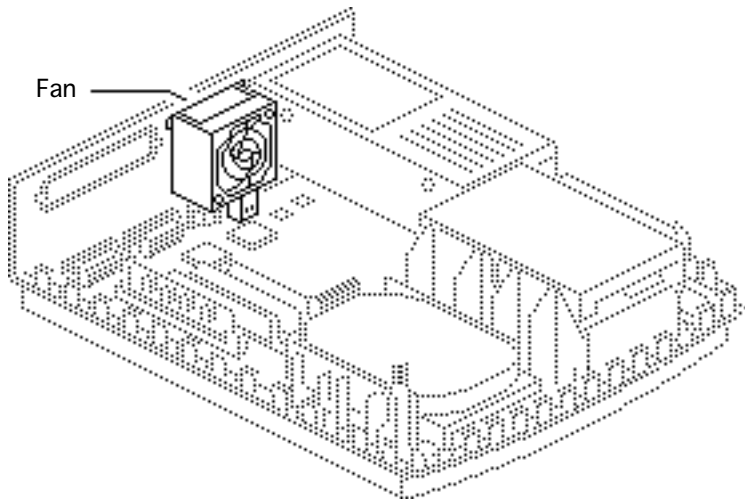


## Fan

Before you begin, remove the following:

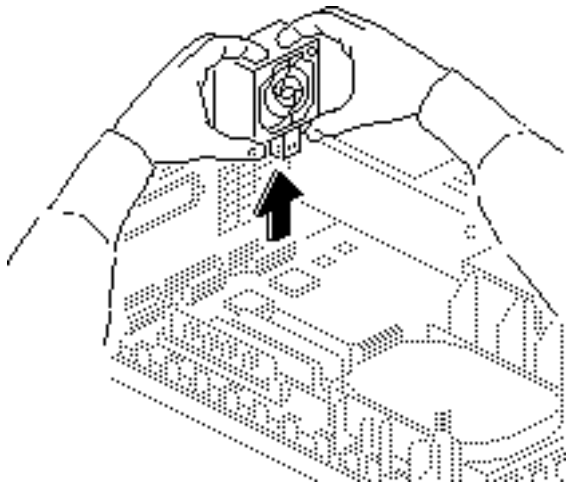
- Cover
- Expansion card

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





Place your thumbs under the fan and using some force pull up until the fan snaps free.





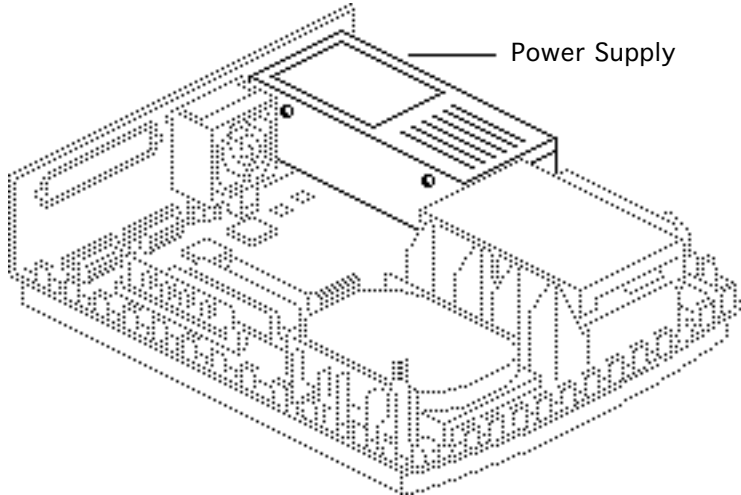


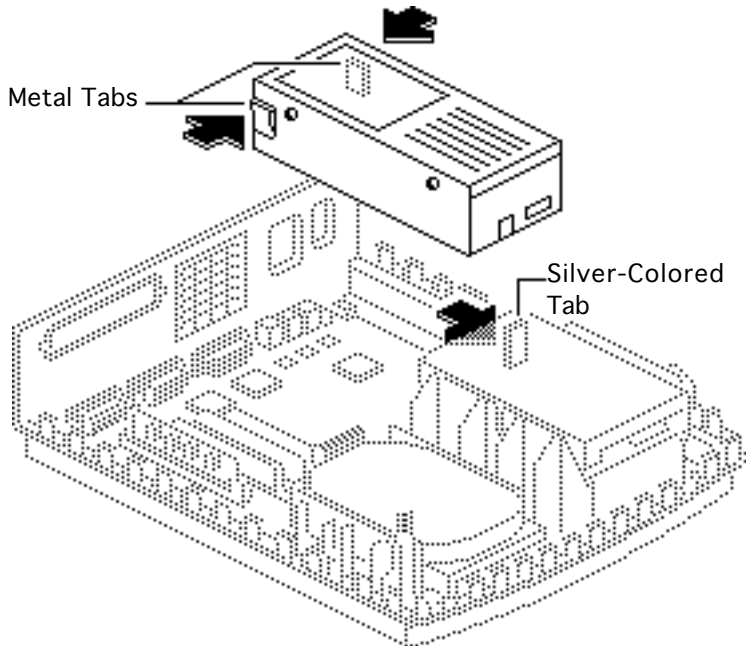
## Power Supply

Before you begin, remove the following:

- Cover
- Expansion card
- Fan

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





- 1 Press the two metal tabs near the rear of the power supply and lift the power supply about 1/2 inch.
- 2 Pull the silver-colored tab toward the floppy drive and at the same time lift the power supply out of the case.

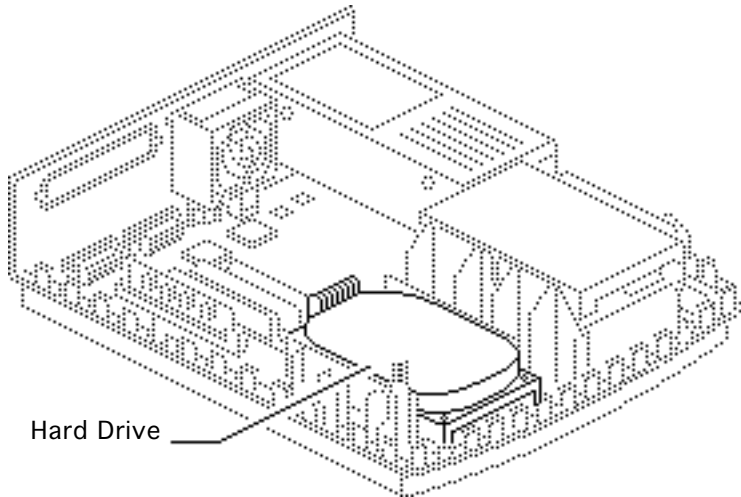




## Hard Drive

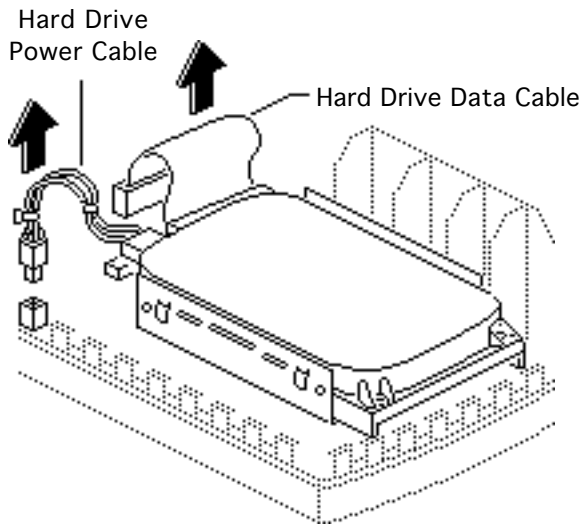
Before you begin, remove the cover.

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



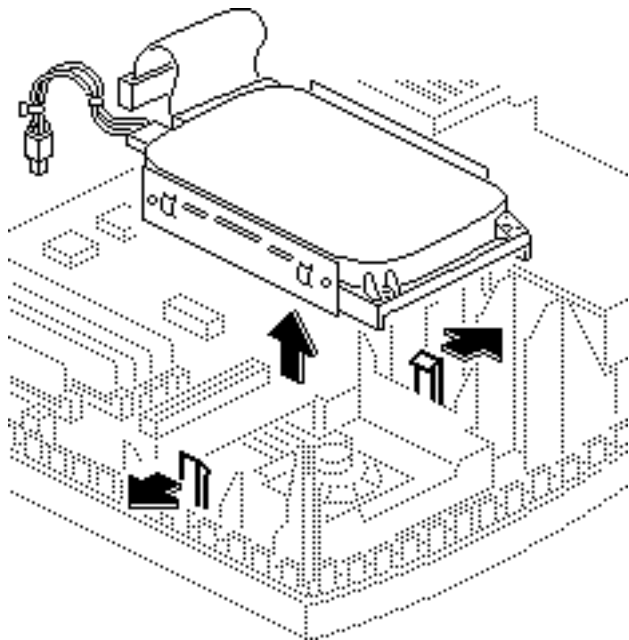
Hard Drive





- 1 Disconnect the hard drive power cable and hard drive data cable from the logic board.





- 2 Release the two tabs and lift the drive (along with its carrier) out of the computer.

**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.

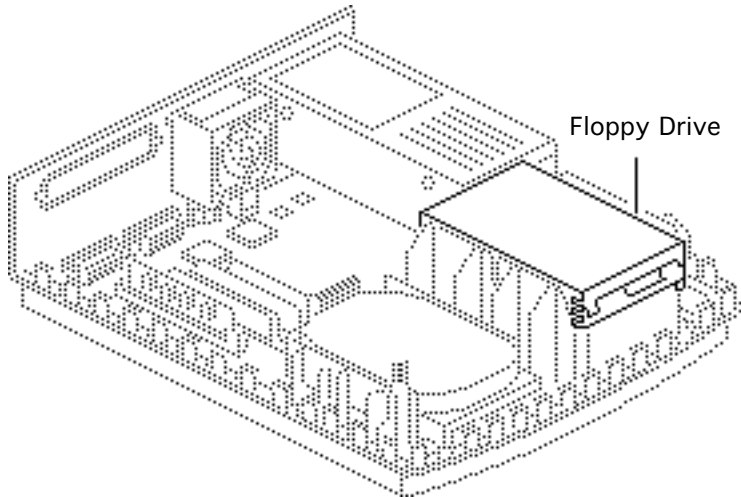


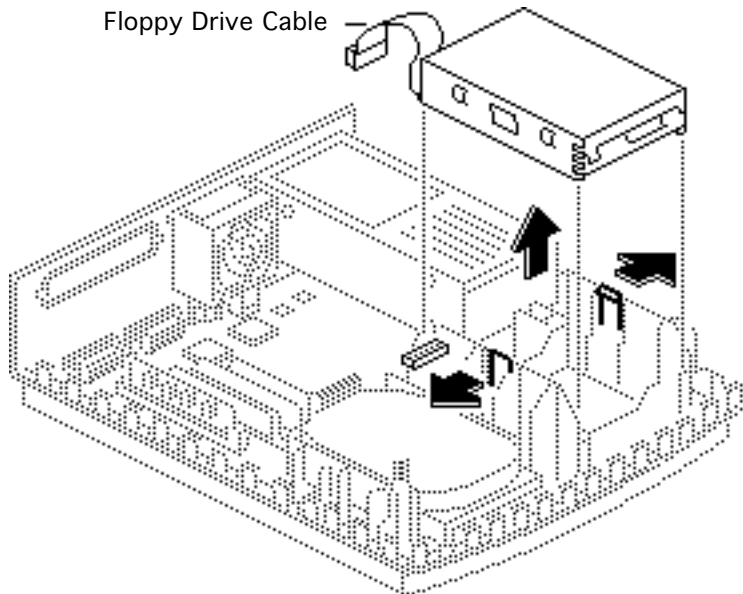


## Floppy Drive

Before you begin, remove the cover.

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





- 1 Disconnect the floppy drive cable from the logic board.
- 2 Release the two tabs and lift the floppy drive out of the computer.

**Replacement Note:**

Apple recommends using dust shields on 1.4 MB SuperDrives in Macintosh IIsi computers. All 1.4 MB replacement drives ship with the dust shield already installed.





If you plan to install a dust shield on the current drive, you must first clean the drive.





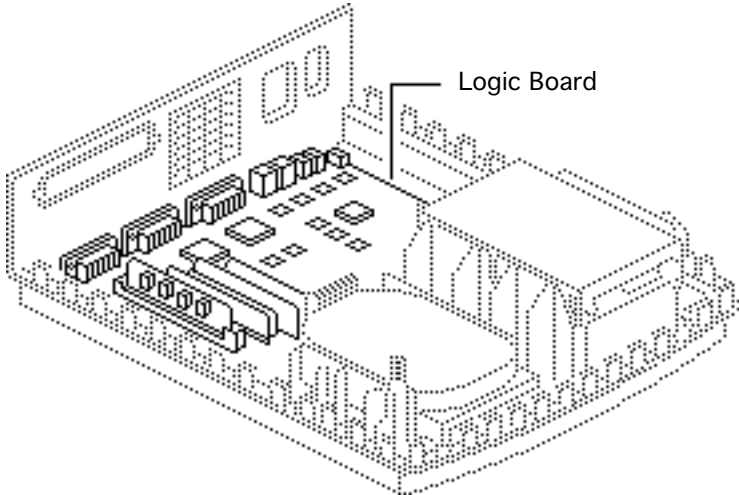


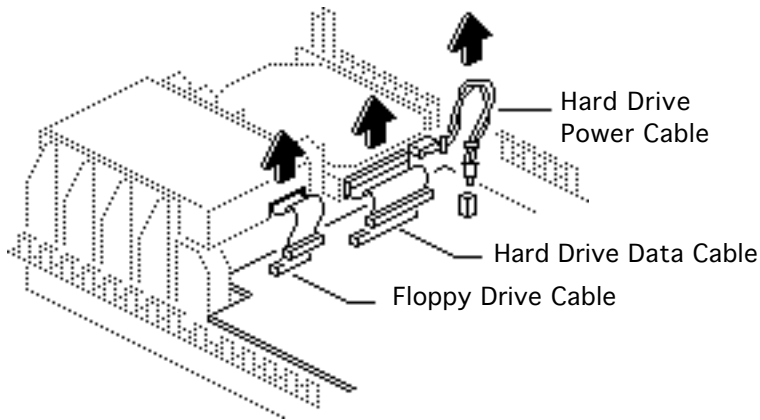
## Logic Board

Before you begin, remove the following:

- Cover
- Adapter card
- Fan
- Power supply

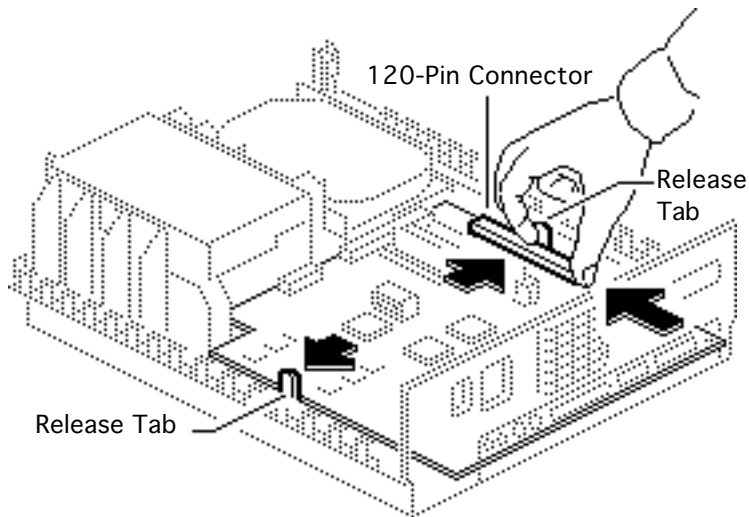
**Caution:** Review the ESD precautions in Bulletins/Safety.





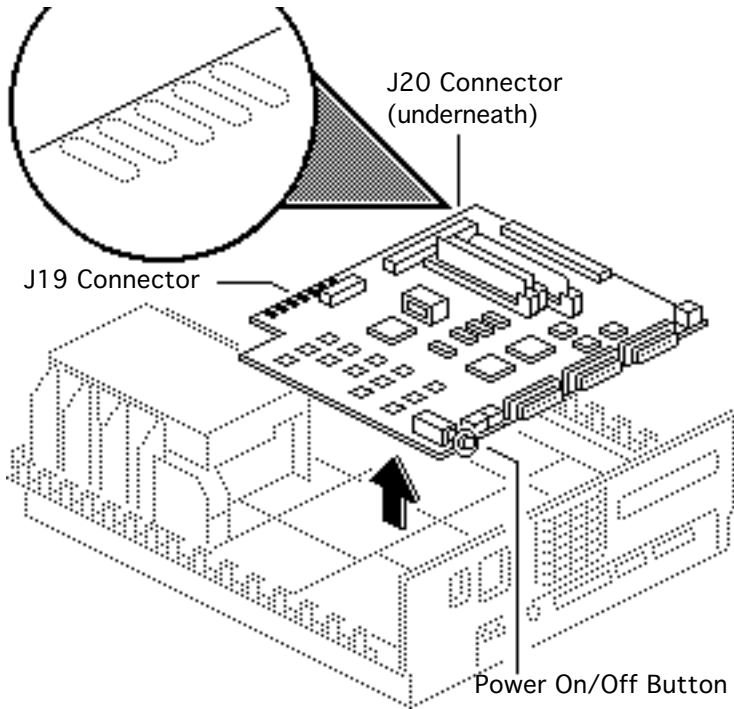
- 1 Disconnect these cable connectors from the logic board:
  - Hard drive power cable
  - Hard drive data cable
  - Floppy drive cable





- 2 With the rear of the case facing you, release the two tabs with your forefingers and at the same time push on the 120-pin connector with your right thumb.
- 3 Slide the logic board toward the front of the case until the board stops.





- 4 **Caution:** Be sure the power on/off button clears the rear panel before you lift the logic board out of the case. While lifting the board, do not touch connector J19 or J20. (The oil from your skin harms the connectors.)

Gently lift the board out of the case.





**Replacement Note:** Remove the SIMMs from the defective logic board and install them on the replacement logic board.

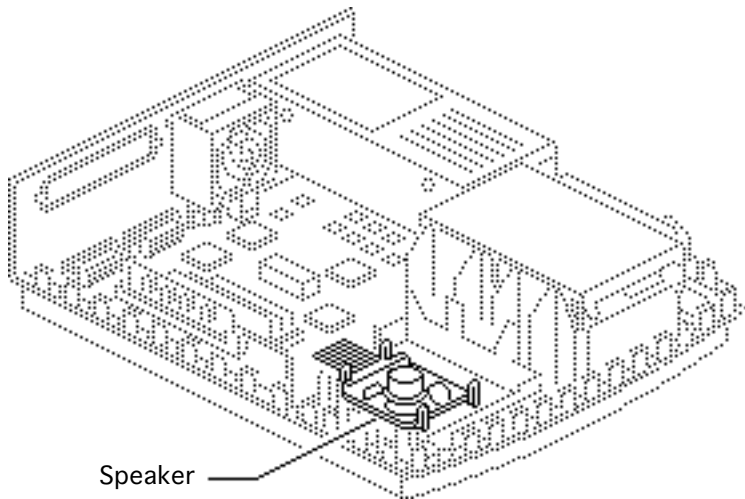




## Speaker

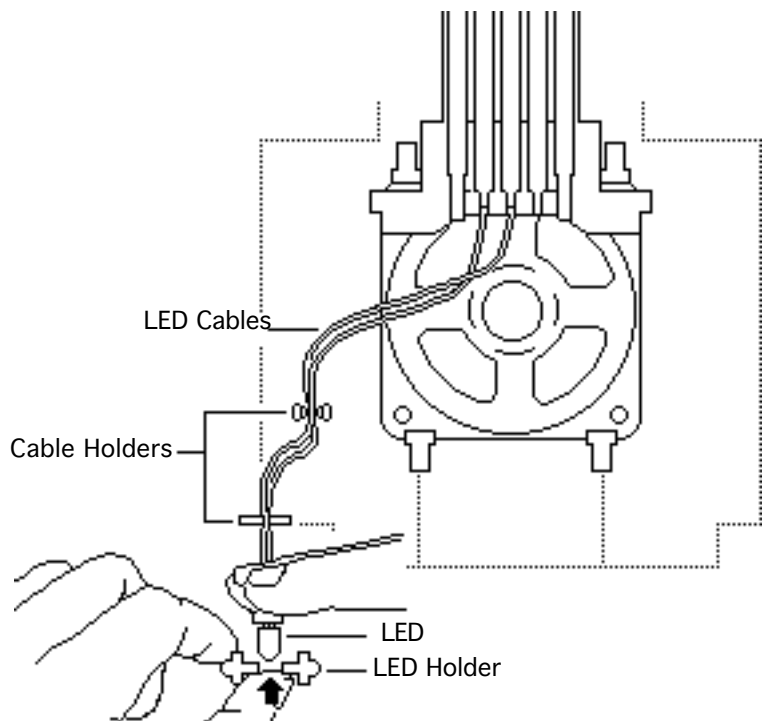
Before you begin, remove the following:

- Cover
- Adapter card
- Fan
- Power supply
- Hard drive
- Logic board



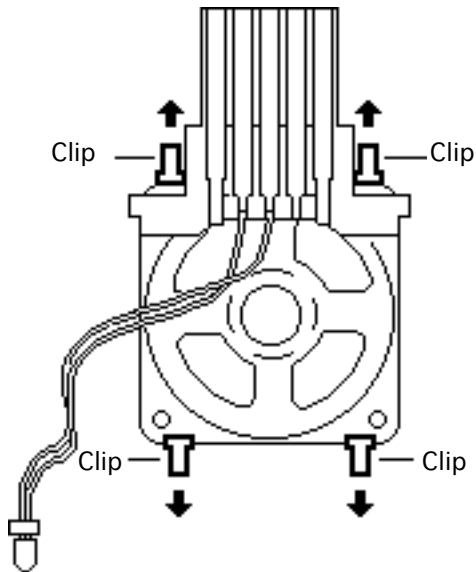
Speaker





- 1 Push the LED out of the holder.
- 2 Carefully remove the LED cables from the two cable holders.





- 3 Release the four clips and lift the speaker out of the case.

**Replacement Note:**

When you replace the speaker and logic board, make sure the metal connector fingers of the speaker contact the metal fingers on the underside of the logic board.



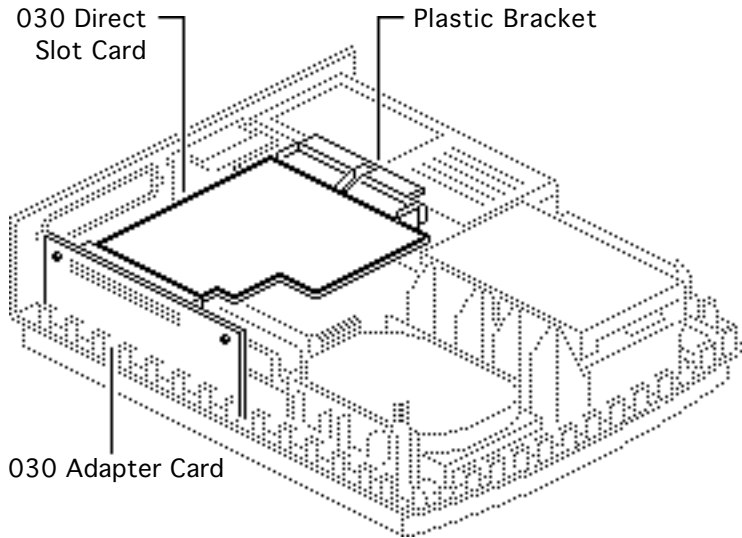




Upgrades

Isi





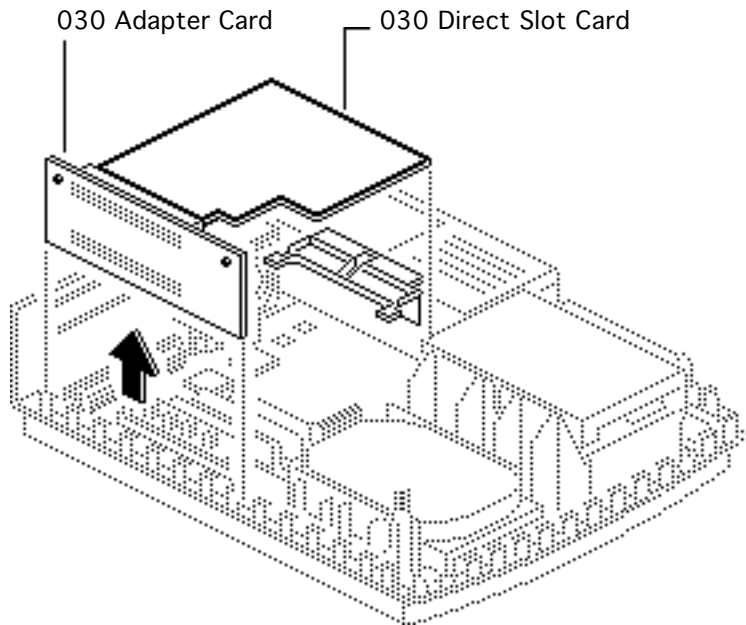
## Adapter/030 Direct Slot Card

Before you begin, remove the cover.

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

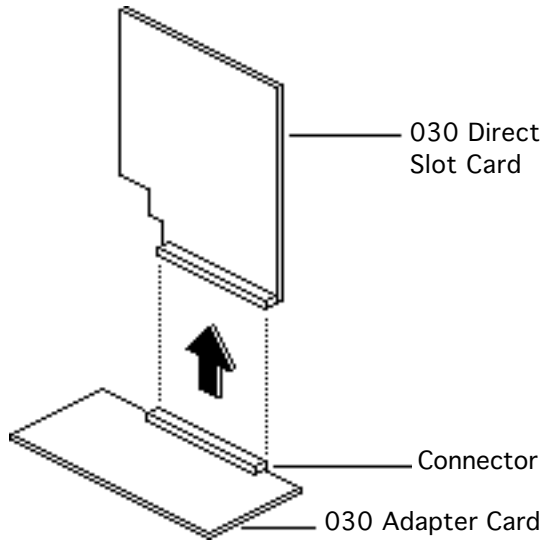
**Note:** The following procedure explains how to remove the 030 adapter card, 030 direct slot card, and plastic bracket.





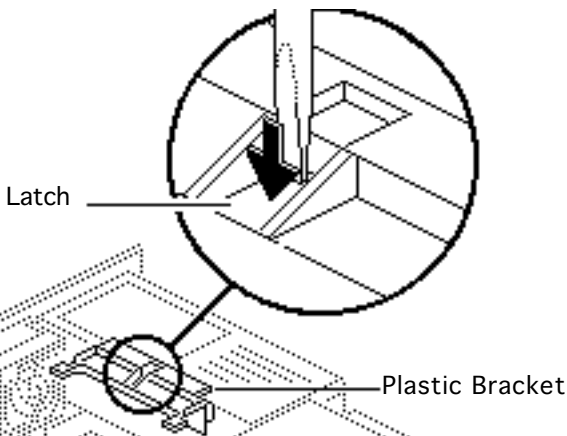
- 1 Pull straight up on the adapter card and carefully remove it and the direct slot card from the logic board.





- 2 If you are replacing the direct slot card, place the adapter card on a flat surface, and carefully pull the direct slot card from the adapter card connector.





- 3 To remove the plastic bracket, press on the latch with a screwdriver and lift the bracket from the power supply.

**Replacement Note:** If you are replacing the direct slot card, retain the plastic bracket and use it with the replacement card.

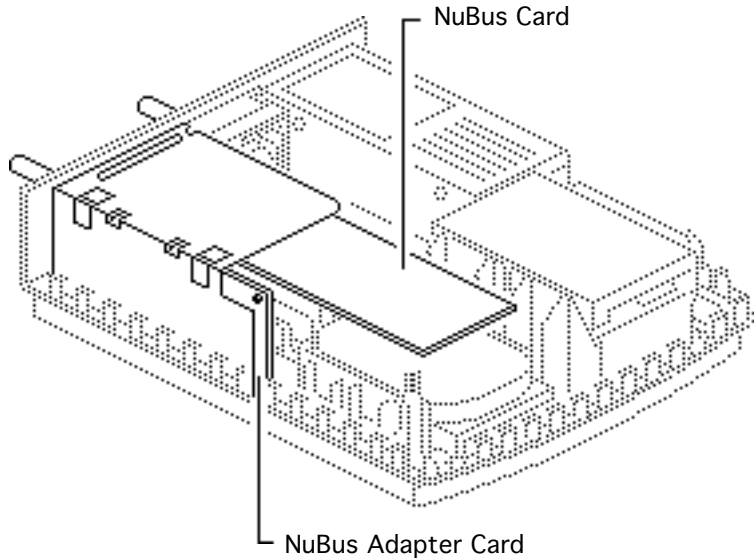


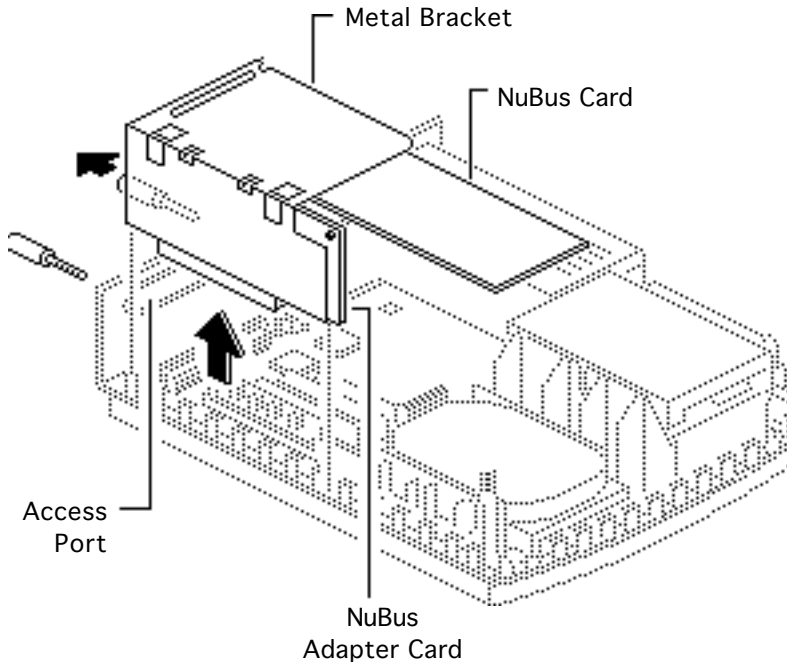


## Adapter/NuBus Card

Before you begin, remove the cover.

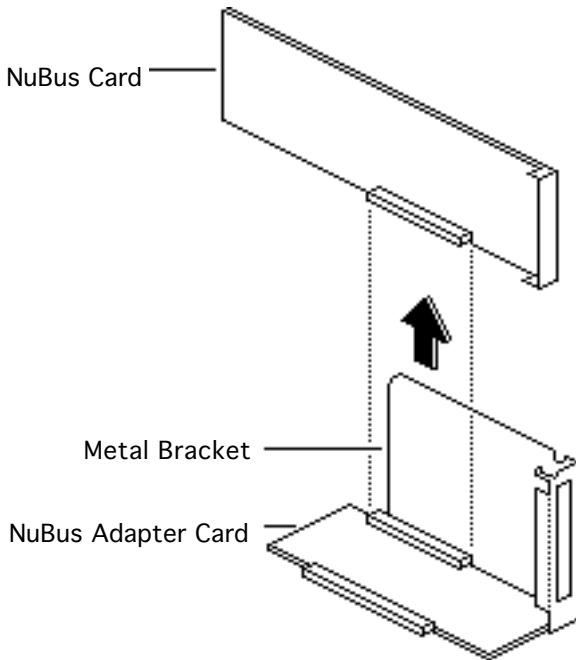
**Caution:** Review the ESD precautions in Bulletins/Safety.





- 1 Remove the screws that secure the NuBus adapter card to the access port.
- 2 Pull straight up on the metal bracket and remove the bracket, NuBus card, and adapter card from the computer.





- 3 If you are replacing the NuBus card, place the adapter card on a flat surface, and carefully pull the NuBus card from the adapter card connector.







## Additional Procedures

---

IIsi



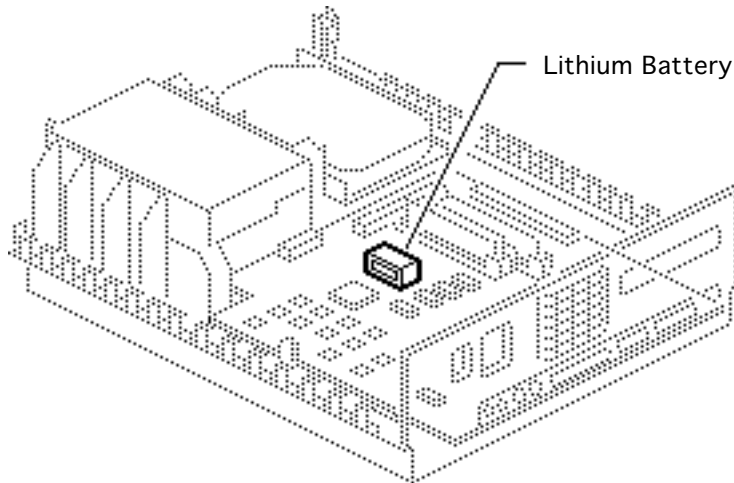


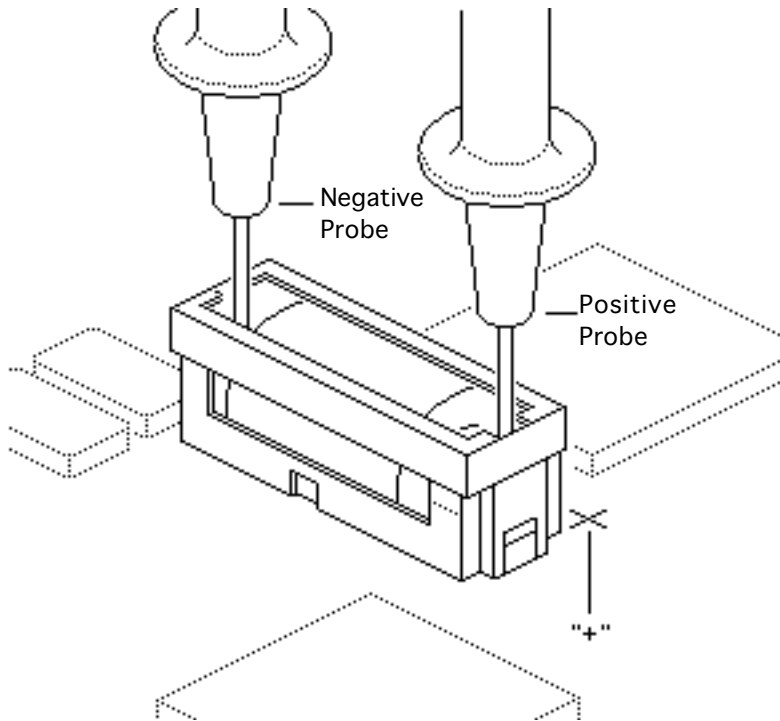
## Battery Verification

Before you begin, remove the cover.

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

**Warning:** If handled or discarded improperly, the lithium battery in the Macintosh IIsi could explode. Review battery-handling and disposal instructions 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 and the negative probe to the negative end of the battery.
- 3 If the battery voltage is below 3.0 volts, replace the battery. Refer to "Battery Replacement" in this chapter.



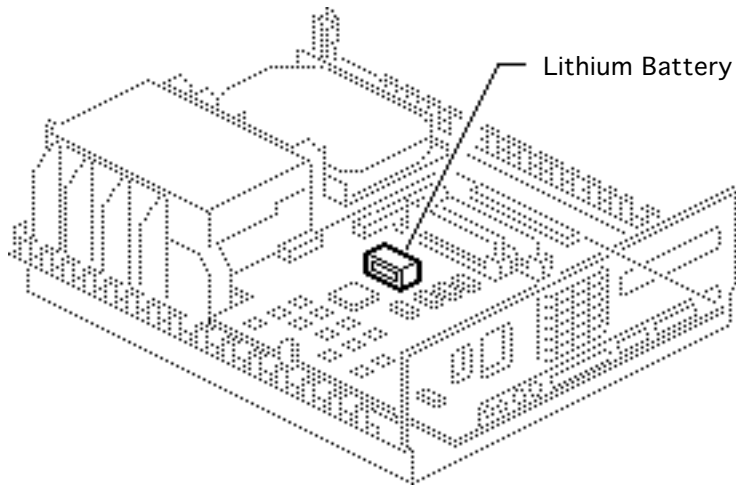


## Battery Replacement

Before you begin, remove the following:

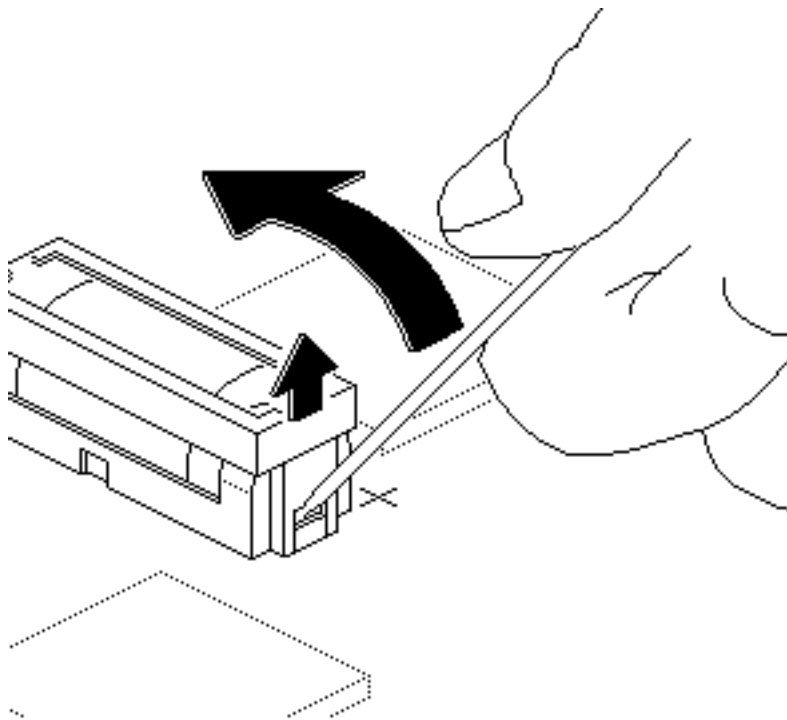
- Cover
- Expansion cards

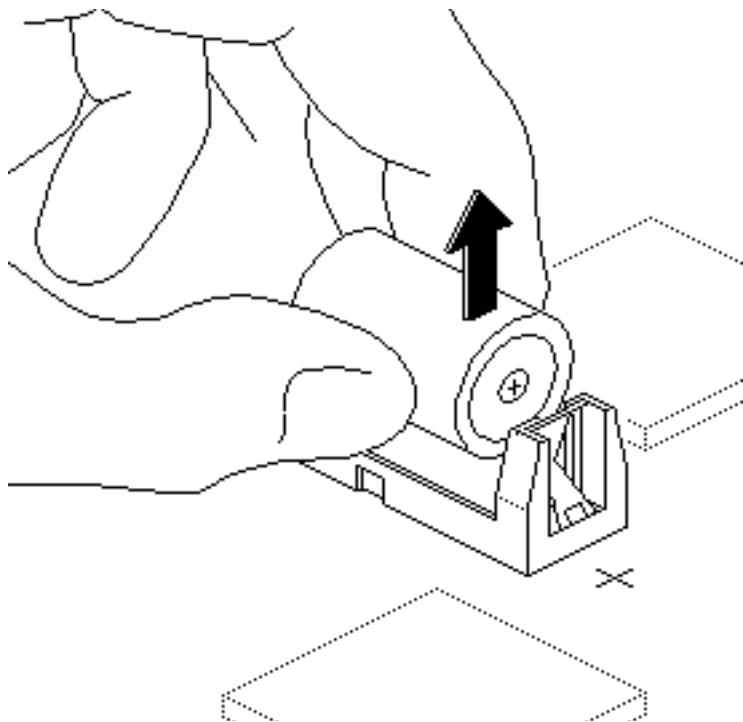
**⚠ Warning:** If handled or discarded improperly, the lithium battery in the Macintosh IIsx could explode. Review battery-handling and disposal instructions in Bulletins/Safety.





- 1 Using a small flat-blade screwdriver, pry open the latch at the end of the 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 the safety information in Bulletins/Safety.

**Replacement Caution:**  
Match the battery end marked “+” to the “+” on the battery holder.





Exploded View

---

Macintosh IIx





# Exploded View

