Macintosh Quadra 900/950/ AWS 95

Macintosh Quadra 900, Macintosh Quadra 950, Apple
Workgroup Server 95

Basics

Macintosh Quadra 900/950/AWS
95

◀■▶

Figure: Macintosh Quadra 900/950 and AWS 95

Overview

This manual includes complete repair procedures for the Quadra 900/950 and the Apple Workgroup Server 95, pictured at left.

Specifications

Macintosh Quadra 900/950/AWS 95

Processor

CPU

Motorola 68040 microprocessor
Built-in paged memory management unit (PMMU), floating-point
  unit (FPU), and 8K memory cache

Quadra 900:   25 MHz
Quadra 950 and AWS   33 MHz
95:

Addressing

32-bit registers
32-bit address bus
32-bit data bus

Memory

RAM

Quadra 900	4 MB standard, expandable to 256 MB (80 ns or faster SIMMs)
Quadra 950	8 MB standard, expandable to 256 MB (80 ns or faster SIMMs)
AWS 95	16 MB, 32 MB, or 48 MB parity RAM standard, expandable to 256 MB (80 ns or faster 9-bit SIMMs)

ROM   1 MB, using two 150 ns, 256K by 16-bit chips

PRAM   256 bytes of parameter memory

VRAM   1 MB, expandable to 2 MB (100 ns or faster VRAM SIMMs) by
                       installing four 256K or two 512K SIMMs

Clock/Calendar   ASIC clock chip with PRAM and DFAC support and seven-year
                       lithium battery

Disk Storage

Floppy Drive   Internal, 1.4 MB Apple SuperDrive

Hard Drive

    Quadra 900 and 950   230, 500, or 1000 MB hard drive (optional)
    AWS 95   230, 500, 1000, or 2000 MB hard drive; comes in either a two-drive or five-drive configuration

    Note: Refer to Take Apart for more information on the two-drive configuration and to Additional Procedures for more information on the five-drive configuration.

DDS-DC Drive   2 GB digital data storage-data compression drive for 4 mm tape backup; available as an upgrade on the Quadra 900 and 950; optional on the AWS 95

I/O Interfaces

SCSI	One external SCSI port; DB-25 connector
Quadra 900	One internal SCSI port with 50-pin IDC connector; Supports a maximum of eight devices (including the computer, which is always device 7)
AWS 95 and Quadra 900/950 (with PDS card upgrade)	Two internal SCSI ports with 50-pin IDC connectors; Two external SCSI ports with DB-25 connectors; Supports a theoretical limit of 20 devices (including the computer, which is always device 7) on four separate SCSI buses (two internal and two external); Macintosh Operating System supports only 7 devices
Apple Desktop Bus	One Apple Desktop Bus (ADB) port; low-speed, synchronous serial interface

NuBus

Five slots support standard and oversize cards, burst-mode transfers, a processor write buffer, and NuBus '90; 96-pin Euro-DIN connectors

Expansion

One 68040 processor-direct slot (PDS) with 140-pin connector

Serial

Two RS-232/RS-422 ports with mini DIN-8 connectors; 230.4 Kbits/sec. maximum; 0.920 Mbits/sec. if external clock source is provided (modem interface only)
Asynchronous, synchronous (modem only), and AppleTalk (printer only) protocols supported

Sound

8-bit stereo output; 8-bit monoaural input
Supports electret-type microphone

Video   Supports Apple monitors (8-bit), VGA monitors, and NTSC and
                     PAL video standards

Ethernet   One Ethernet port, AUI-15 connector

Sound and Video

Video Display   Built-in 8-bit video circuitry (upgradeable to 24-bit)
                       Supports Apple 8-bit monitors and many non-Apple monitor
                          types (NTSC, PAL, VGA)

Sound Generator   Four-voice, wavetable synthesis
                       Stereo sampling generator

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

Electrical

Line Voltage   100–240 VAC (RMS), self-configuring power supply

Line Frequency   50–60 Hz, single phase

Maximum Power   303 W (not including monitor)

Physical

Dimensions   Height: 16.8 in. (473 mm)
                        Width: 8.9 in. (224 mm)
                        Depth: 20.6 in. (523 mm)

Weight   36 lb., 12 oz. (16.7 kg) without hard drive

Environmental

Operating Temp   50–104° F (10–40° C)

Storage Temp   –40 to 116.6° F (–40 to 47° C)

Relative Humidity   20–80% noncondensing

Altitude   0–10,000 ft. (0–3048 m)

Troubleshooting

Macintosh Quadra 900/950/AWS 95

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.

Error Chords

One-part error
chord sounds during
startup sequence

1 Disconnect SCSI data cable from logic board and reboot
   system. If startup sequence is normal, initialize hard drive.
   If error chord still sounds, replace hard drive.
2 Disconnect floppy drive cable connector 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 SIMM verification. Refer to Memory manual.

System Problems

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 Problems (Continued)

System shuts down
intermittently

1 Make sure air vents on side and rear of computer 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 Problems (Continued)

System
intermittently
crashes or hangs

1 Verify that system software is correct version.
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. Refer to Memory manual.
6 Replace logic board. Retain customer's SIMMs.
7 Replace power supply.

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 a video interface card is installed, move it to a different
    slot.
5   Replace video interface card, if installed.
6   Clear parameter RAM. Hold down <Command> <Option> <P>
    <R> during startup but before "Welcome To Macintosh"
    appears.
7   Replace SIMMs. Refer to Memory manual.
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 a video interface card is installed move it to a different
   slot.
3 Replace video interface card, if installed.
4 Replace SIMMs. Refer to Memory manual.
5 Replace logic board. Retain customer's SIMMs.
6 Replace power supply.

Video **(Continued)**

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 a video interface card is installed, move it to a 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 Verify that keyswitch is not set to secure.
2 Replace disk with known-good disk.
3 Replace floppy drive cable.
4 Replace internal floppy drive.
5 Replace logic board. Retain customer's SIMMs.
6 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 internal floppy drive.
5 Replace logic board. Retain customer's SIMMs.

Floppy Drive (Continued)

Does not eject disk
1. Verify that keyswitch is not set to secure.
2. Switch off computer. Hold mouse button down while you switch computer on.
3. Replace internal floppy drive.
4. Replace floppy drive cable.
5. 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 system disk.
2   Replace floppy drive cable.
3   Replace internal 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 will not operate; drive doesn't spin

1   Replace hard drive data cable.
2   Replace hard drive power cable.
3   Replace hard drive.

No internal hard drives operate

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

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.

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 device.
3. Make sure internal hard drives are not terminated.
4. Refer to appropriate manual to troubleshoot defective external device.

Peripheral

Cursor does not move

1   Verify that keyswitch is not set to secure.
2   Check mouse connection.
3   Inspect inside of mouse for buildup of dirt or other contaminants. Clean mouse if necessary.
4   If mouse was connected to keyboard, connect it to a computer ADB port instead. If mouse works, replace keyboard.
5   If mouse does not work in any ADB port on computer, replace mouse.
6   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.

Peripheral (Continued)

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

1   Remove duplicate system files from hard drive.
2   Clear parameter RAM. Hold down <Command> <Option> <P> <R> during startup but before "Welcome To Macintosh" appears. Reset mouse controls.
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.

Peripheral (Continued)

No response to any
key on keyboard

1 Verify that keyswitch is not set to secure.
2 Check keyboard connection to ADB port.
3 Replace keyboard cable.
4 Replace keyboard.
5 Replace logic board. Retain customer's SIMMs.

Known-good serial
printer will not print

1 Verify that system software is 7.0.1 or later.
2 Make sure Chooser and Control Panel settings are correct.
3 Replace printer interface cable.
4 Replace logic board. Retain customer's SIMMs.

Known-good printer
on AppleTalk network
will not print

1 Verify that system software is 7.0.1 or later.
2 Make sure Chooser and Control Panel settings are correct.

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.

Take Apart

Macintosh Quadra 900/950/AWS 95

Cover

No preliminary steps are required before you begin this procedure.

1 Press the two latches, lift the cover, and remove it from the computer.

   Note: You must place the system on its side. Attempting to remove the cover with the system standing may cause damage to the cover.
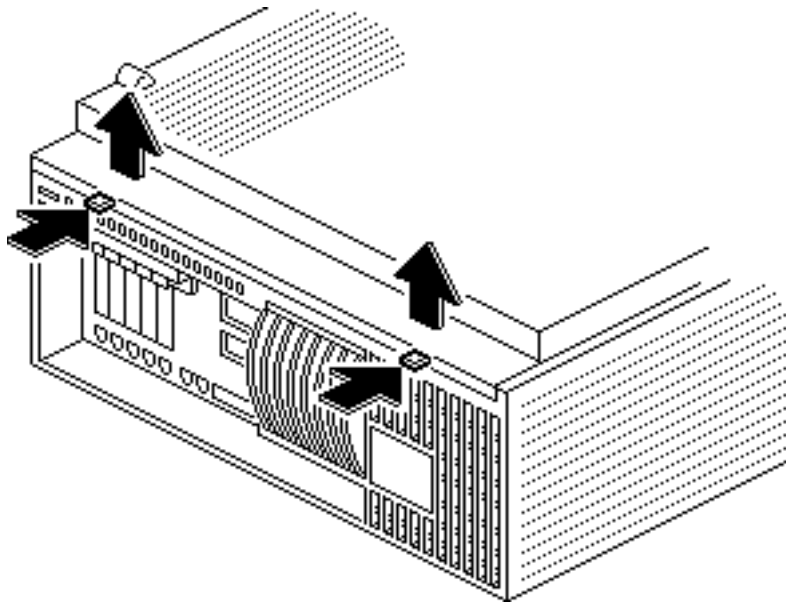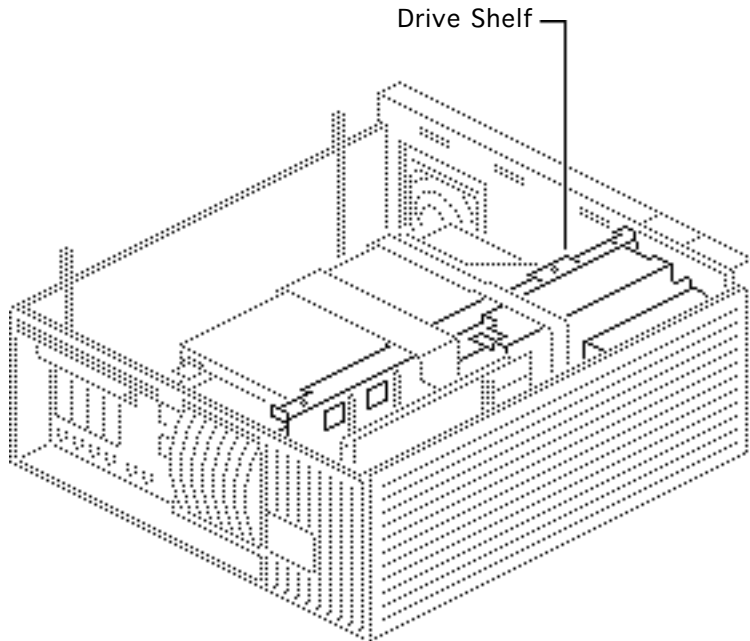
Drive Shelf

Drive Shelf

Before you begin, remove the cover.

Caution: Review the ESD precautions in Bulletins/Safety.

Note: For information on the Five-Drive configuration, refer to Additional Procedures.

SCSI Power Cable

Floppy Drive Cable
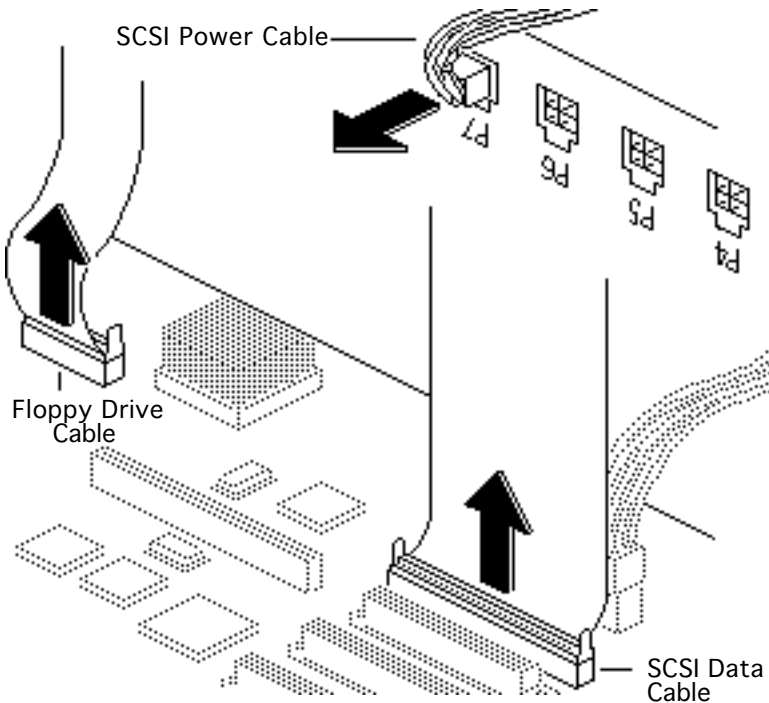
SCSI Data Cable

1 Disconnect the floppy drive cable and SCSI data cable from the logic board.

   Note: The SCSI data cable is connected to the PDS card in the Apple Workgroup Server 95.

2 Disconnect the SCSI power cable from the power supply.

Drive Shelf
Screws
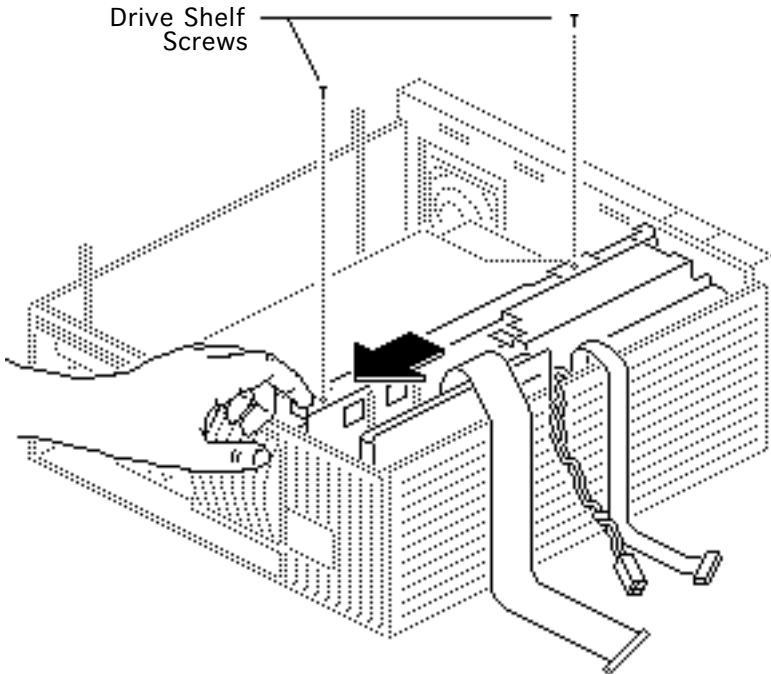
3 Remove the two drive shelf screws.

4 Slide the drive shelf toward the rear of the computer.
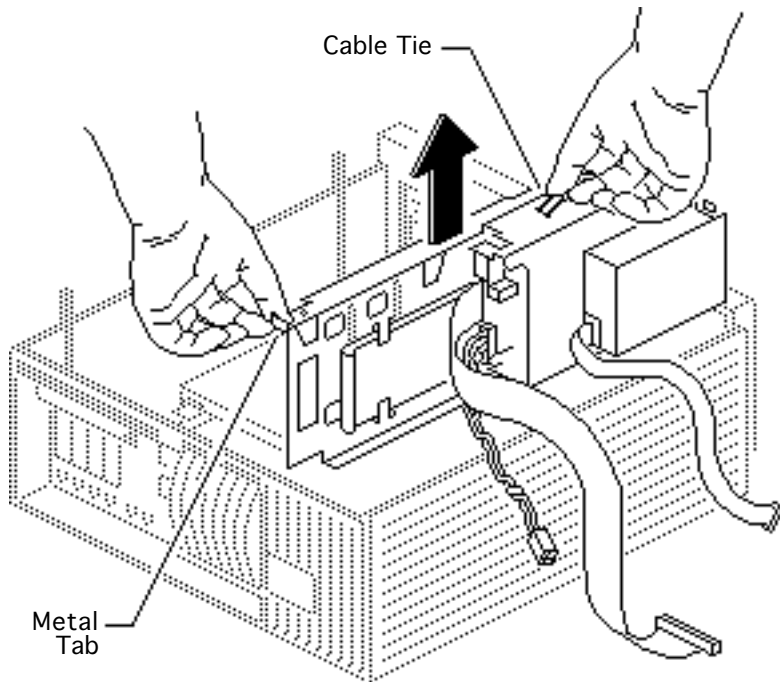
Cable Tie

Metal Tab

5 Grasp the cable tie and the metal tab and lift the drive shelf out of the computer, being careful that none of the cables catch on the case.

Floppy Drive

Floppy Drive

Before you begin, remove the following:

- Cover
- Drive shelf

Screw

Floppy Drive
Cable
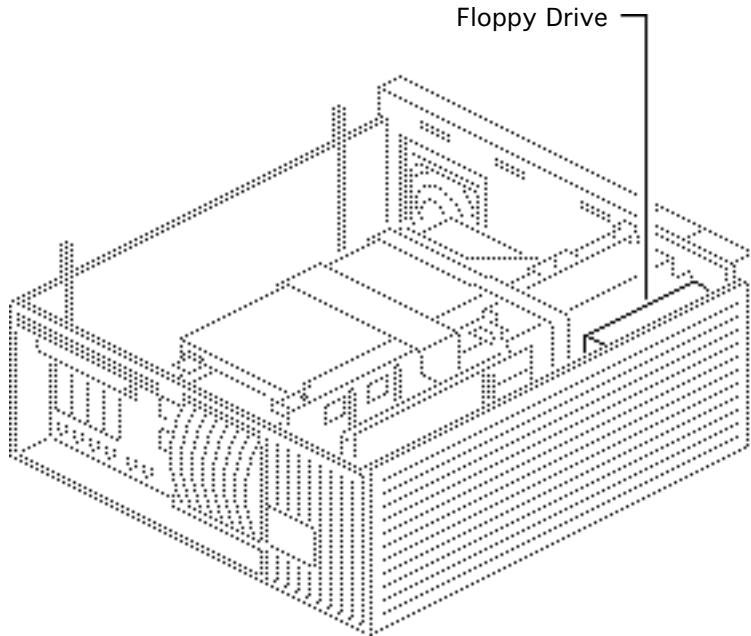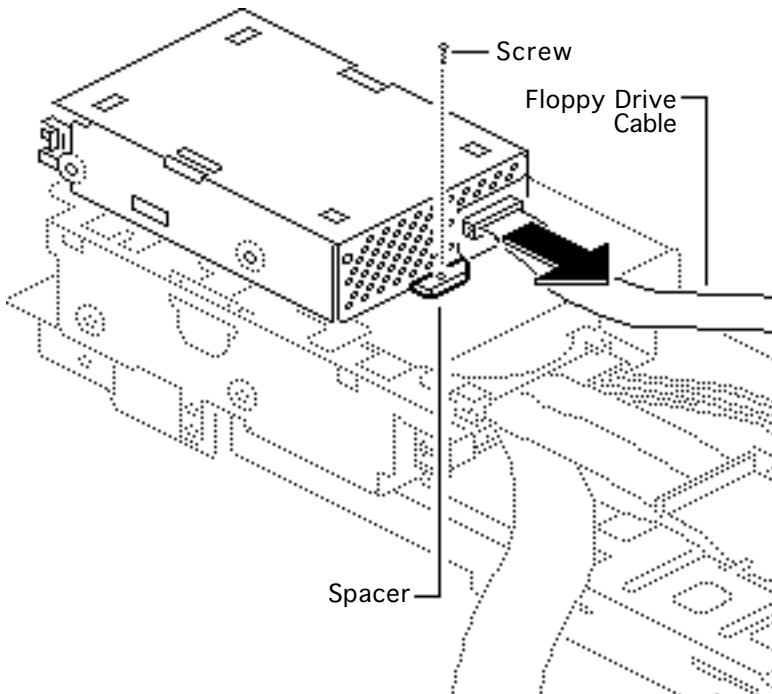
Spacer

1 Disconnect the floppy
   drive cable from the
   floppy drive.

2 Remove the floppy drive
   mounting screw and
   spacer.
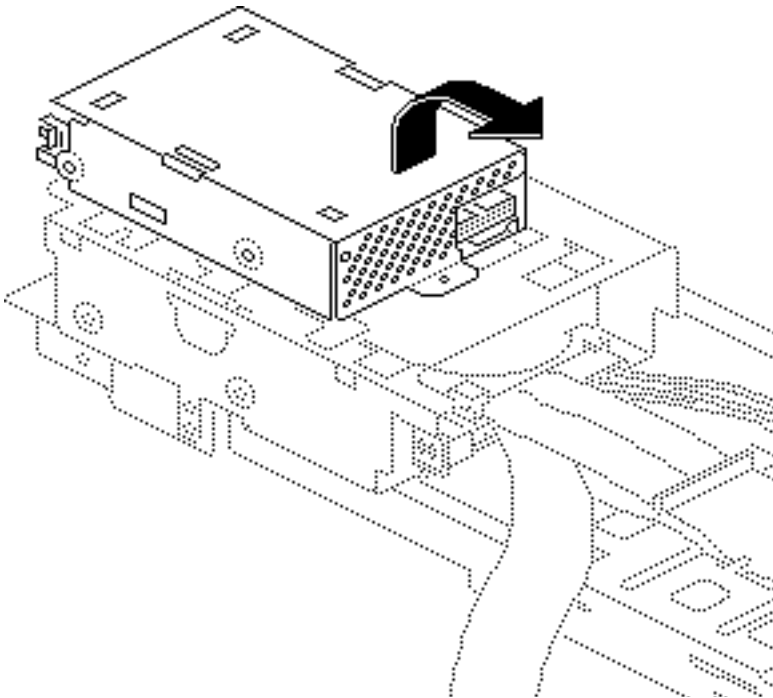
3 Lift the rear of the floppy drive and slide it off the drive shelf.

Replacement Note: Apple recommends using dust shields on 1.4 MB SuperDrives in Quadra 900 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.

Hard Drive ────

Hard Drive

Before you begin, remove the following:

- Cover
- Drive shelf
- Floppy drive

Drive Carrier

SCSI Power Cable

Carrier Mounting Screw
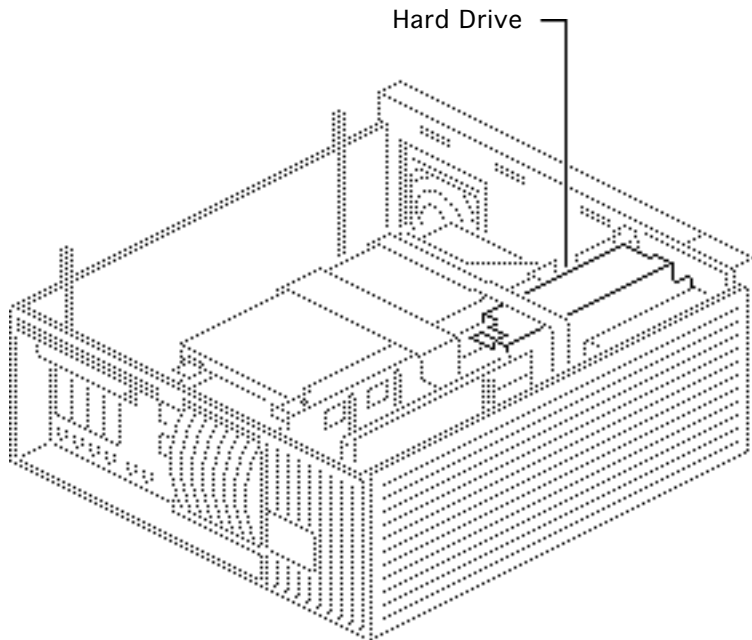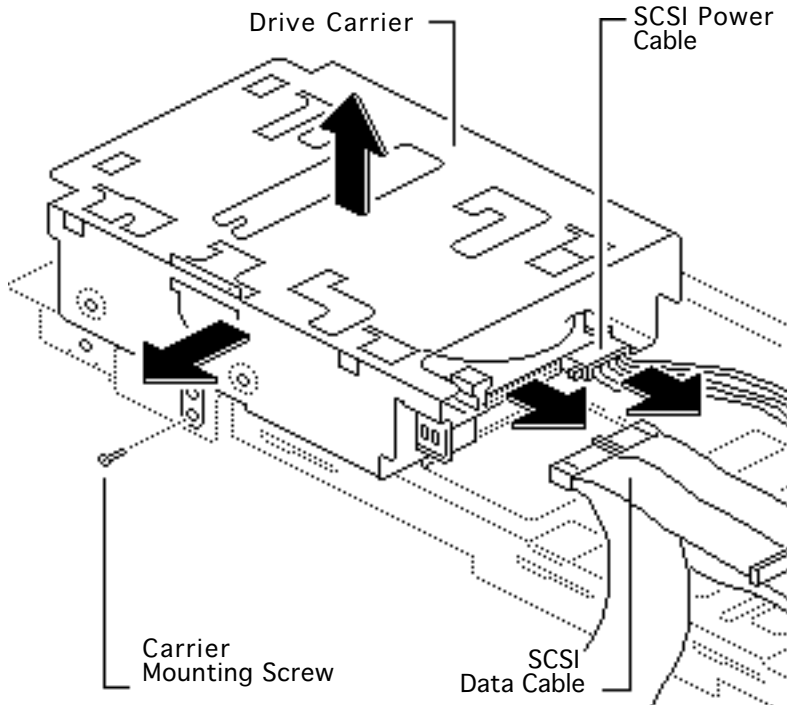
SCSI Data Cable

1 Disconnect the SCSI data cable and power cable from the hard drive.

2 Remove the hard drive mounting screw.

3 Lift the hard drive, along with its carrier, from the drive shelf.

Replacement Note: For information on removing the hard drive from the carrier and returning drives, cables, and carriers to Apple, refer to the Parts chapter in this manual.

DDS-DC Tape Drive ——
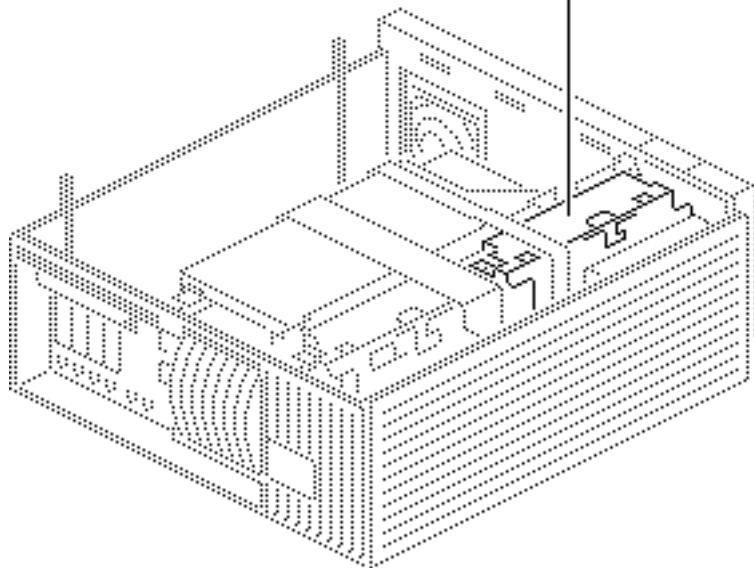
DDS-DC Tape Drive

Before you begin, remove the following:

- Cover
- Drive shelf
- Floppy drive

Drive Carrier

Power Cable

Carrier Mounting Screw
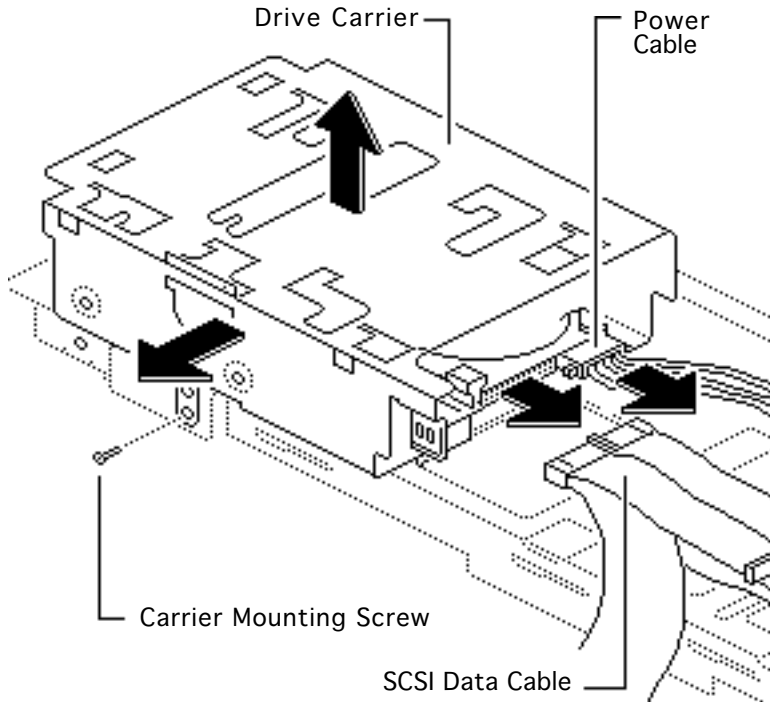
SCSI Data Cable

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

2 Remove the carrier mounting screw.

Drive Carrier

Power Cable

Carrier Mounting Screw

SCSI Data Cable
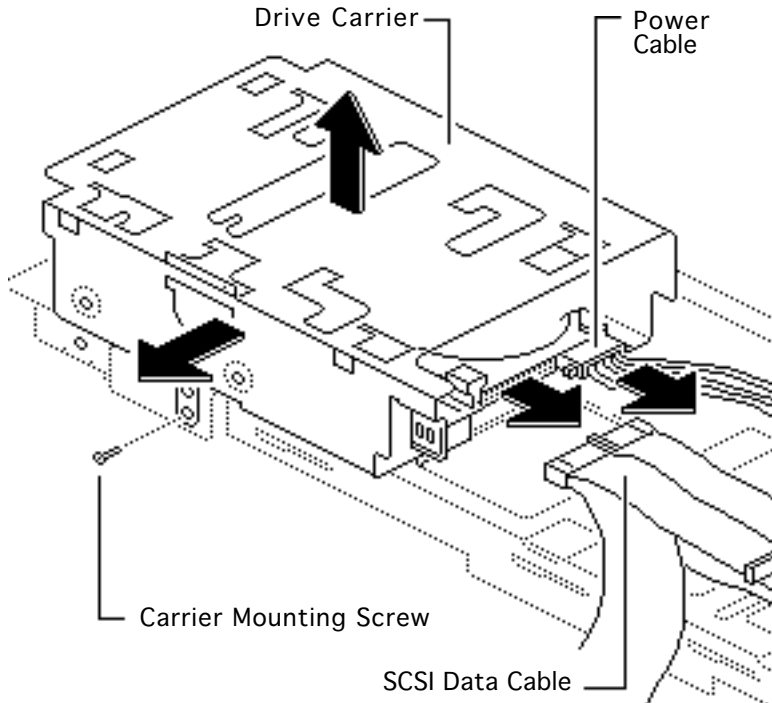
3 Lift the tape drive, along with its carrier, from the drive shelf.

Replacement Note: For information on removing the tape drive from the carrier and returning drives, cables, and carriers to Apple, refer to the Parts chapter in this manual.
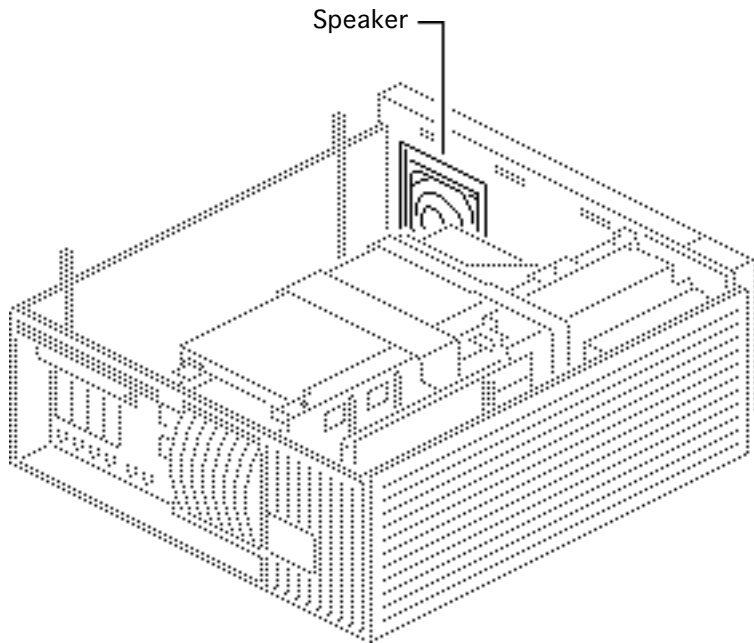
Speaker

Speaker Bezel and Speaker

Before you begin, remove the following:

- Cover
- Drive shelf

Speaker Cable — Speaker Bezel

Power
Supply
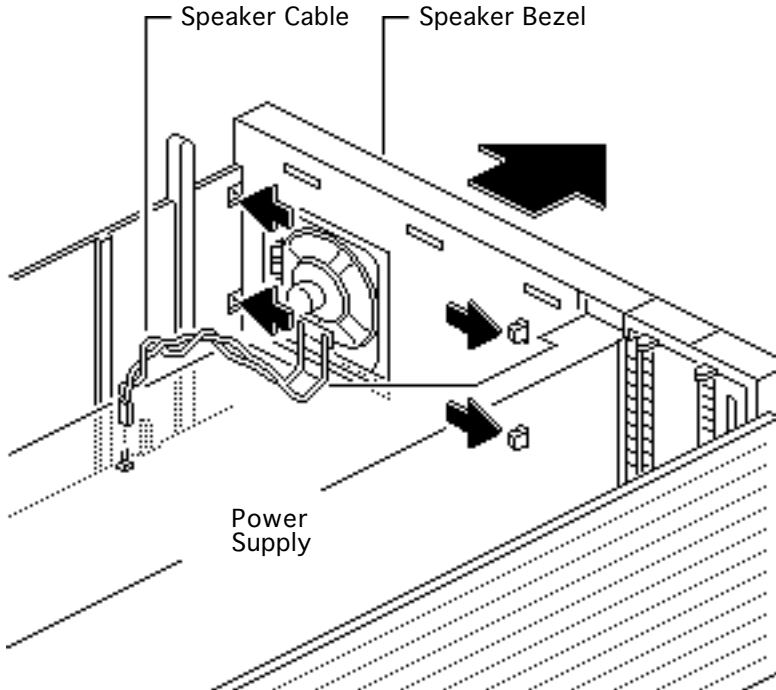
1. Disconnect the speaker cable from the logic board.

2. Release the four plastic latches on the inside of the speaker bezel.

3. Remove the speaker bezel and speaker from the computer.
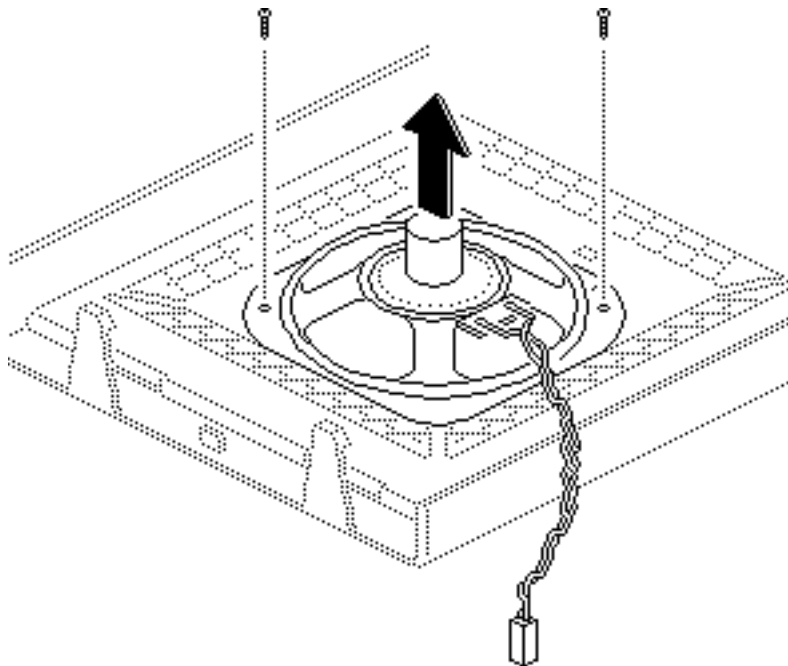
4 Remove the two screws and lift the speaker off the speaker bezel.

Power Supply

Power Supply

Before you begin, remove the following:

- Cover
- Drive shelf
- Speaker bezel

Power Supply Cable
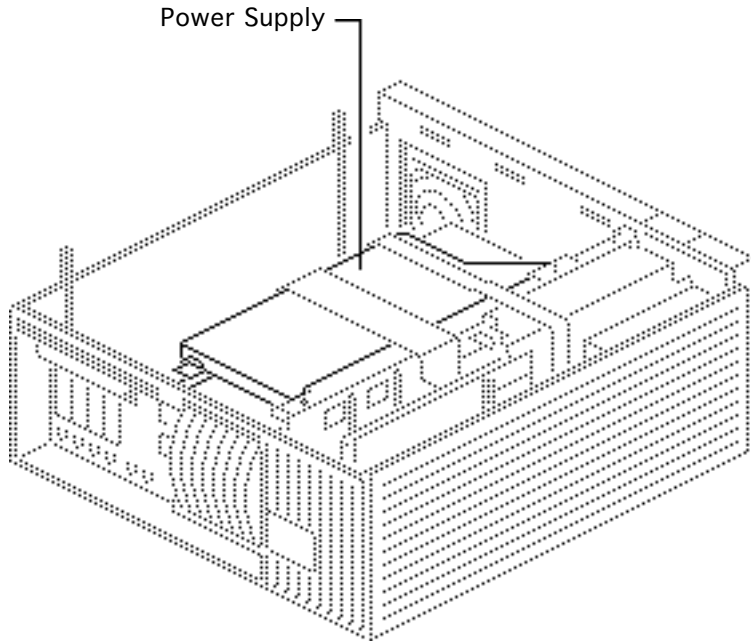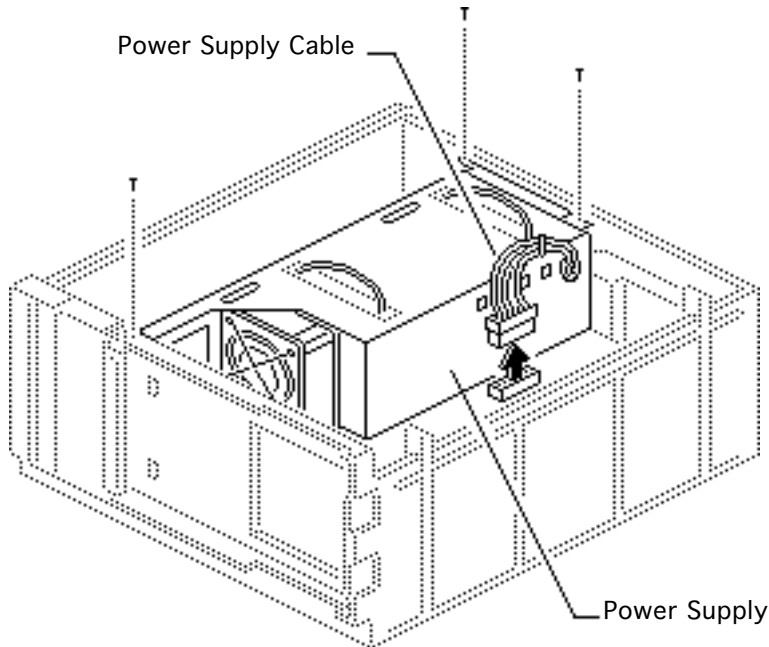
Power Supply

1 Disconnect the power supply cable from the logic board.

2 Remove the three power supply mounting screws.
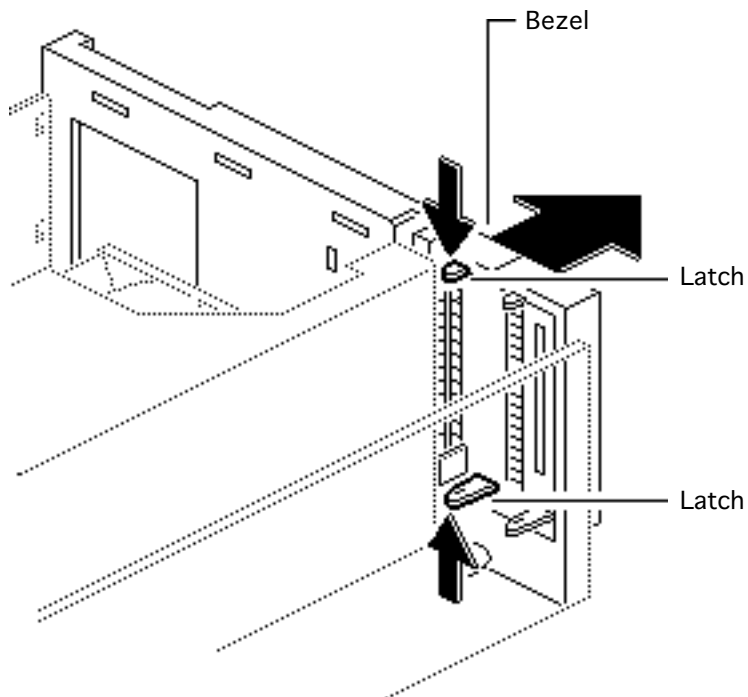
3 Release the two plastic latches on the inside of the blank bezel and remove the bezel.
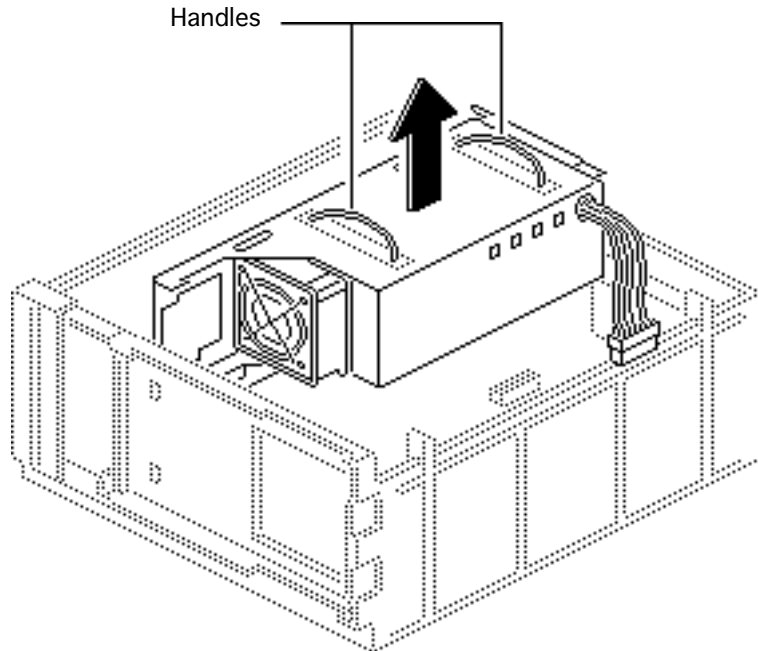
Handles

4 Grasp the two handles and, pulling evenly, lift the power supply straight up out of the computer.
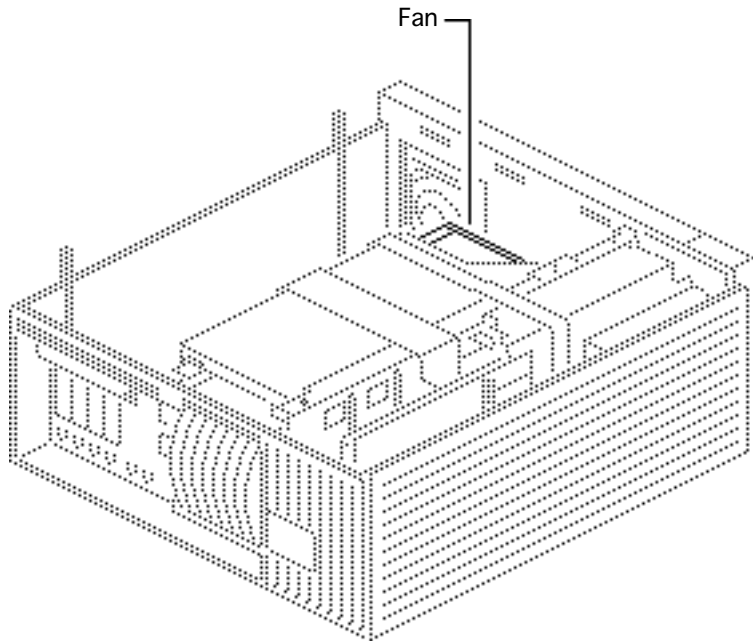
Fan ———

Fan

Before you begin, remove the following:

- Cover
- Drive shelf
- Speaker bezel
- Power supply

Fan Cable

Fan

Power Supply
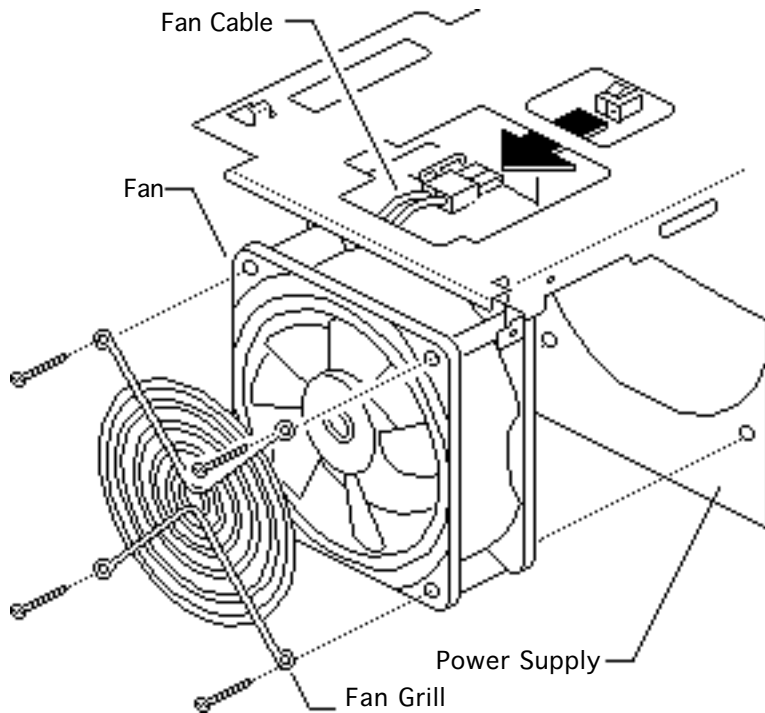
Fan Grill

1 Disconnect the fan cable from the power supply.

2 Remove the four fan mounting screws.

3 Remove the fan and fan grill from the power supply.

Workgroup Server
PDS Card

Workgroup Server PDS Card
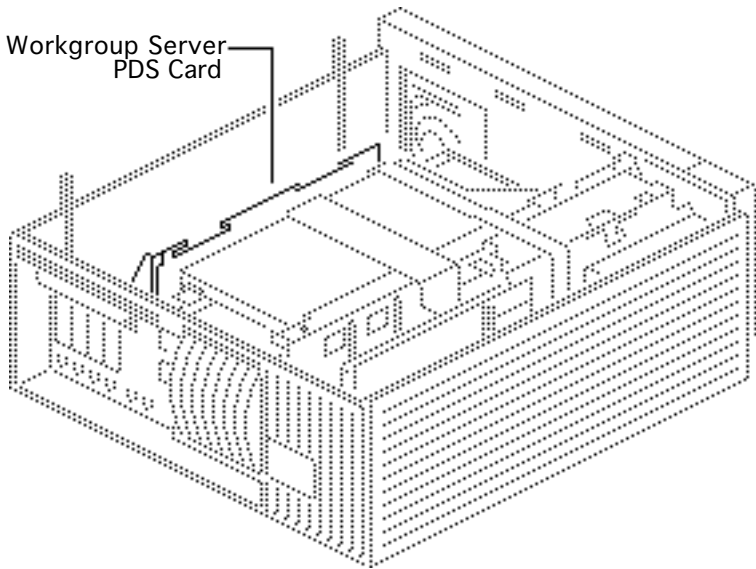
Before you begin, remove the cover

Caution: You must unplug the computer prior to removing or installing the Workgroup Server 95 PDS card. Failure to unplug the computer could cause damage to the logic board and/or card.
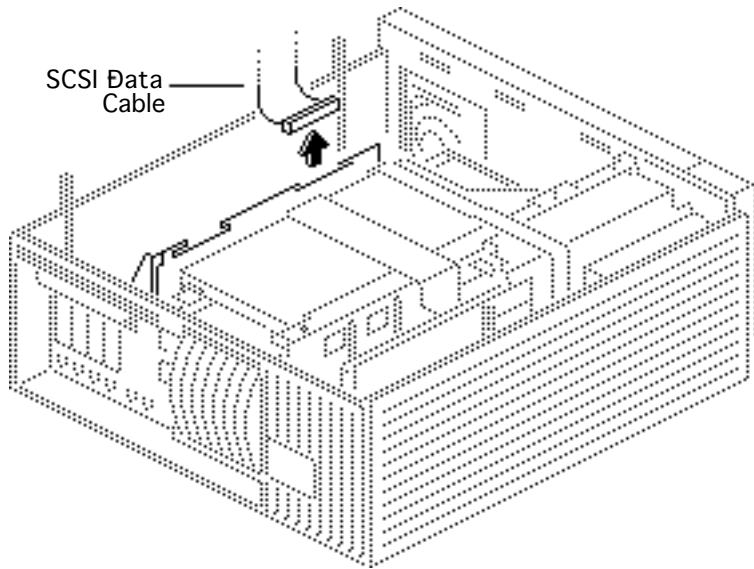
1 Disconnect the SCSI data cable from the Workgroup Server PDS card.

SCSI Data Cable
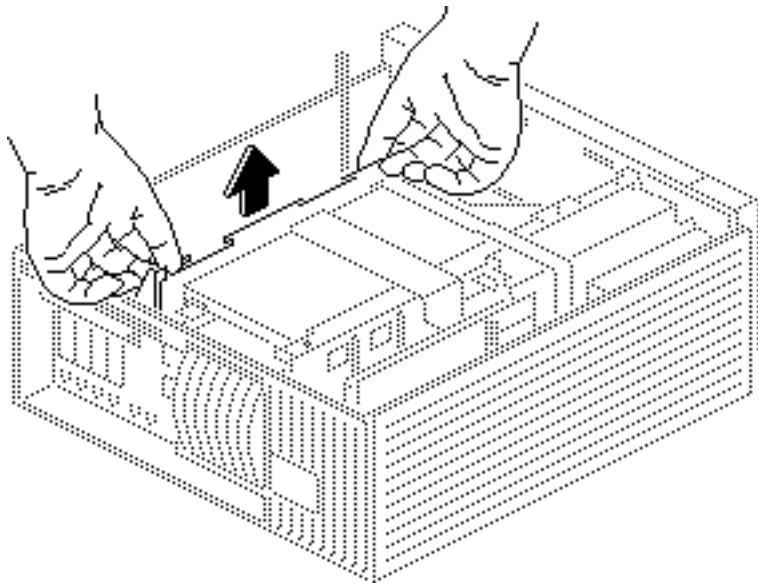
2 **Caution:** Pull up evenly on both sides of the card to avoid bending the connector pins and remove the card.

   Note: Grasp the rear 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.

Logic Board

Before you begin, remove the following:

- Cover
- Drive shelf
- Speaker bezel
- Power supply
- Expansion cards

Note: The Quadra 900 contains a 25 MHz logic board; the Quadra 950 and AWS 95 contain a 33 MHz board. Be sure to install the correct board.

Logic Board

Reset Switch
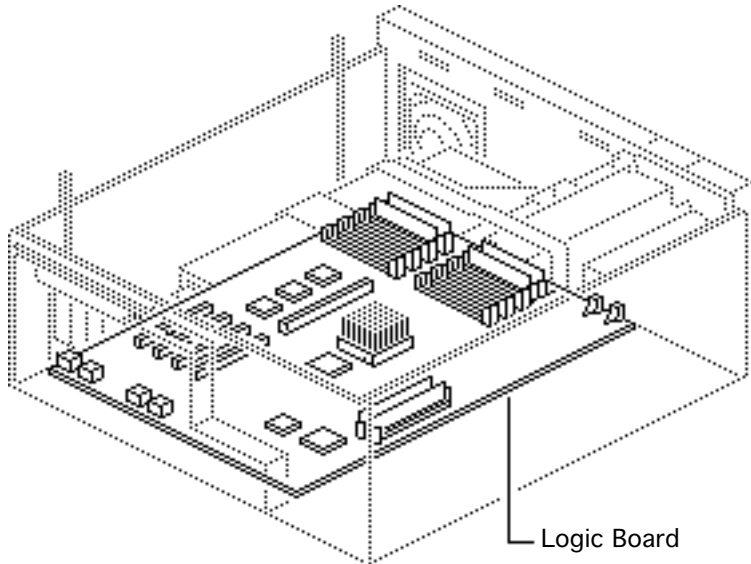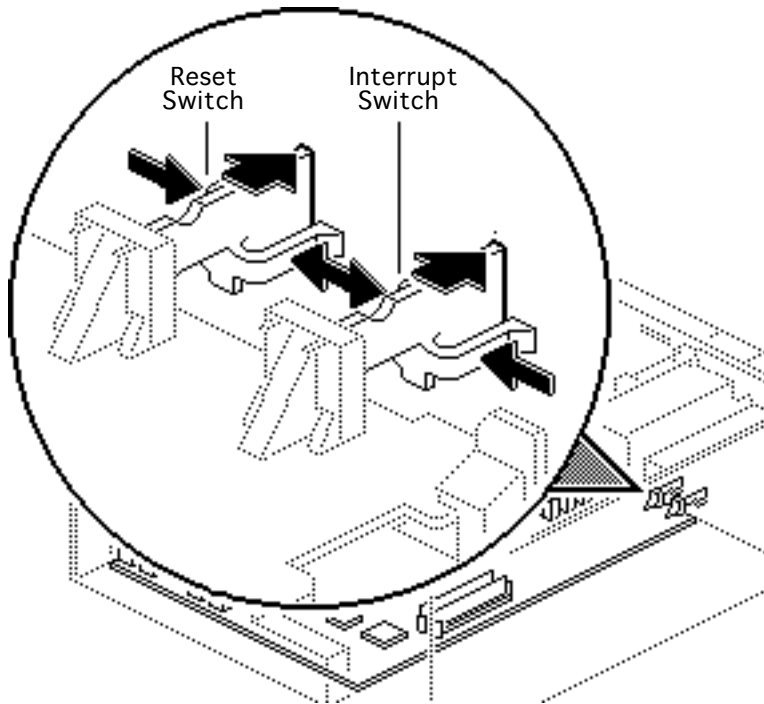
Interrupt Switch

Caution: You must unplug the computer prior to removing expansion cards. Failure to unplug the computer could cause damage to the logic board and/or cards.

1　Press in on the sides of the interrupt and reset switches and push them out of the case.

Latch

Logic Board
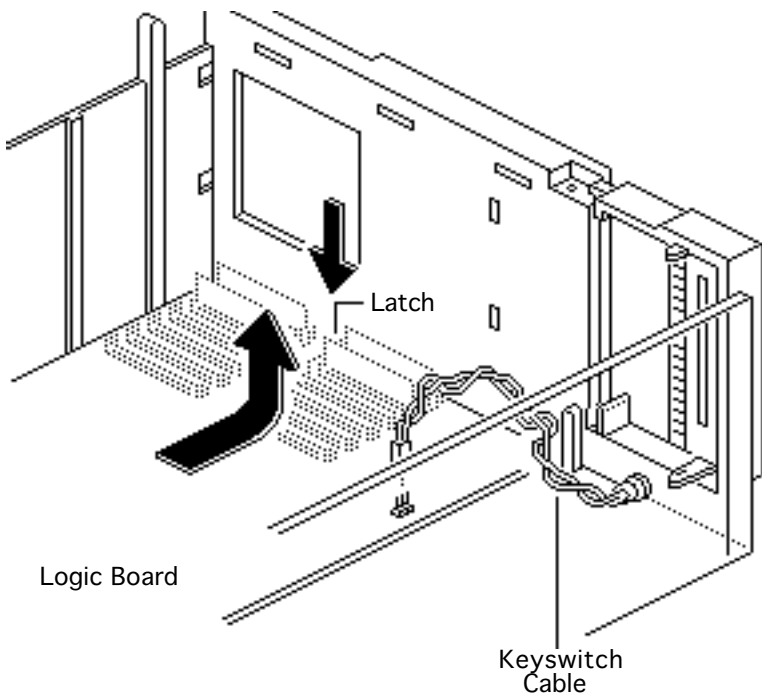
Keyswitch
Cable

2 Disconnect the
keyswitch cable from the
logic board.

3 Press down on the latch
and slide the logic board
toward the front of the
computer.

4 Lift the logic board,
front first, from the
computer.

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

Upgrades

Macintosh Quadra 900/950/AWS 95

Expansion Cards

Before you begin, remove the cover.

Caution: You must unplug the computer prior to removing or installing expansion cards. Failure to unplug the computer could cause damage to the logic board and/or cards.
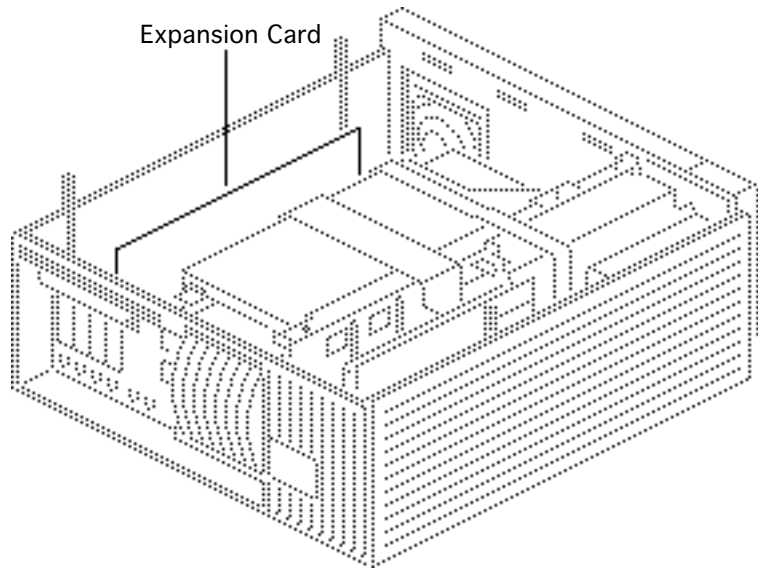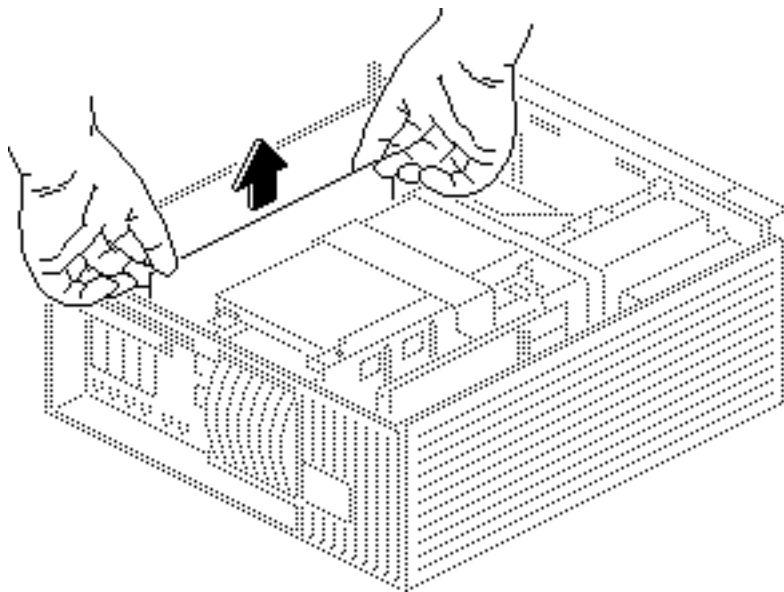
Expansion Card

1 **Caution:** Pull up evenly on both sides of the card to avoid bending the connector pins and remove the card.

   Note: Grasp the rear 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.
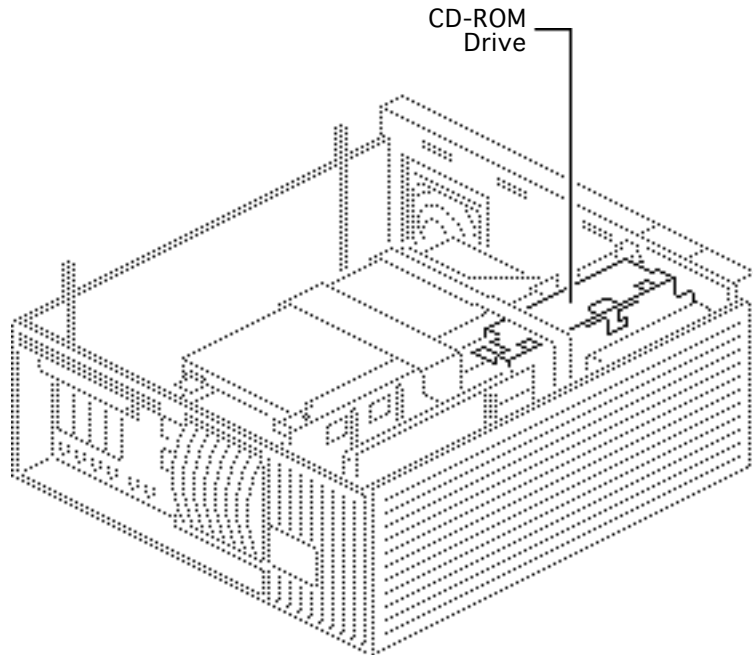
CD-ROM
Drive

CD-ROM Upgrade

Before you begin, remove
the following:

- Cover
- Drive shelf
- Floppy drive
- Speaker bezel

Note: Before installing the
CD-ROM drive, be sure to
remove any SCSI device
installed beneath the floppy
drive.
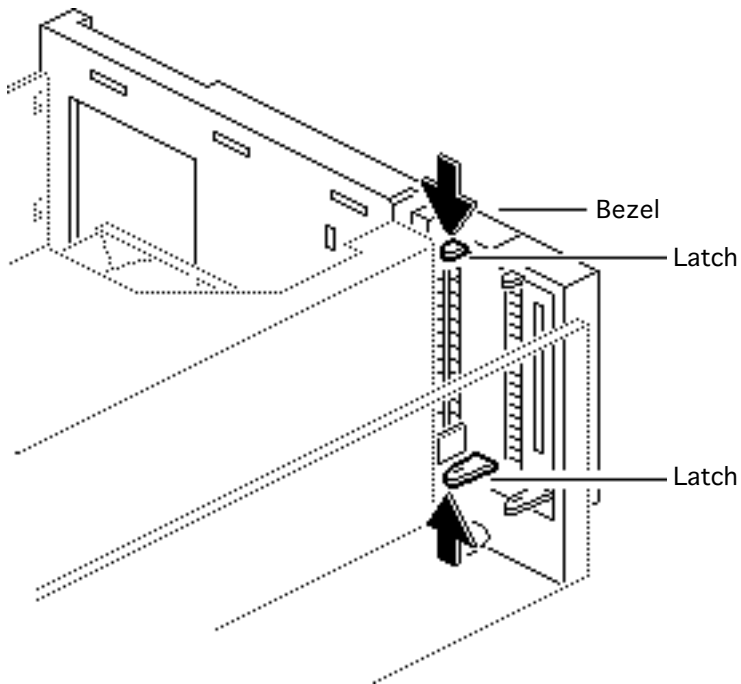
1 Remove the blank bezel.

2 Install the slotted CD-ROM drive bezel.

3 Reinstall the speaker bezel.

Bezel

Latch

Latch

Audio Cable
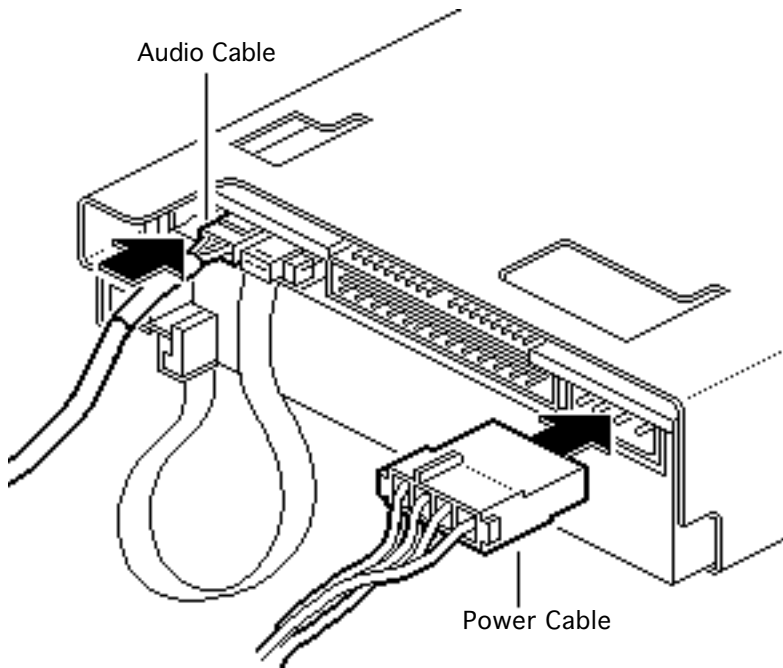
Power Cable

4   Connect the audio and CD-ROM drive power cables to the CD-ROM drive.

Floppy Drive

SCSI ID Select Switch

CD-ROM Drive
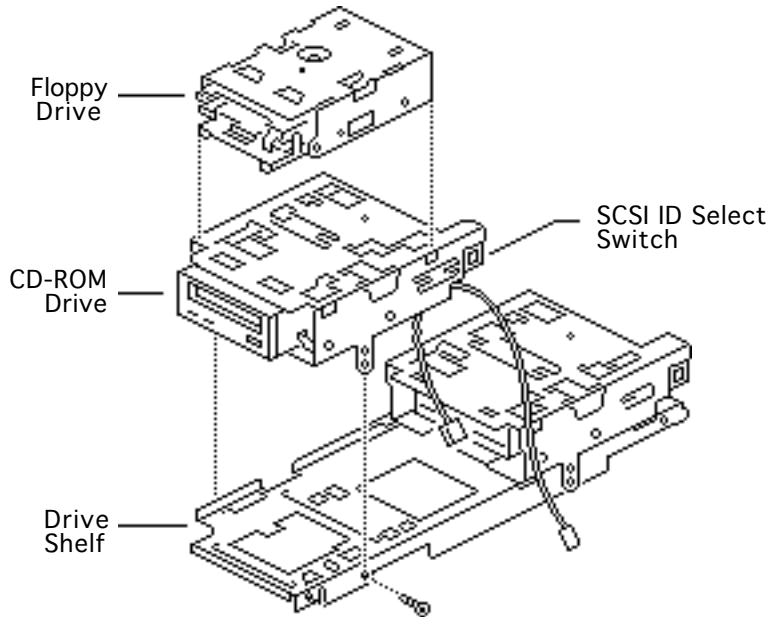
Drive Shelf

5 Install the CD-ROM drive on the drive shelf in the front position.

Note: Set the SCSI ID number on the CD-ROM drive. Make sure the ID number is unique from any other internal SCSI device. Apple recommends SCSI ID number 5.

6 Reinstall the floppy drive on the CD-ROM drive carrier.

7 Reinstall the drive shelf and drives into the computer.
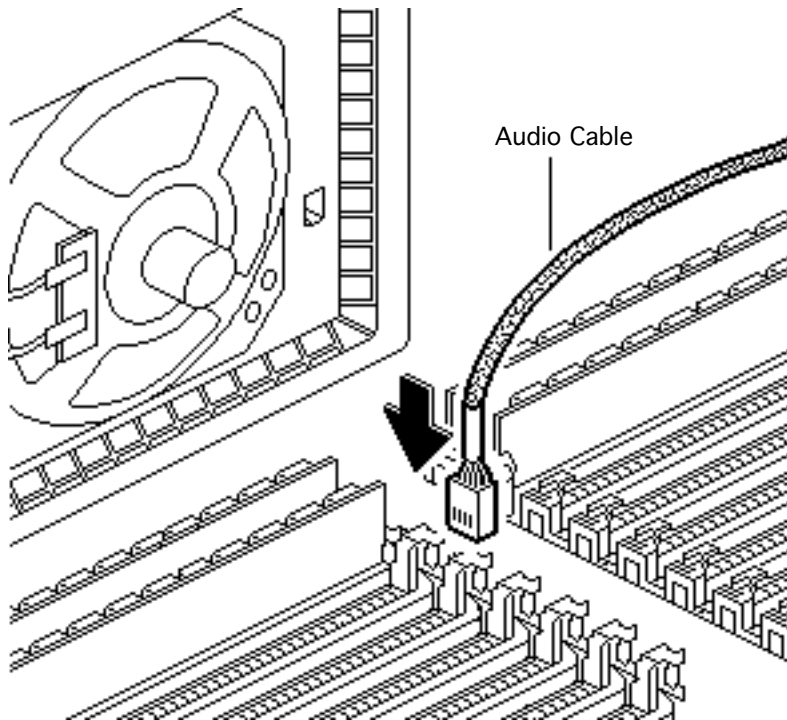
Audio Cable

8 Remove the jumper at connector J16 and connect the audio cable to the logic board at that location.

9 Reconnect the SCSI data cable to all SCSI devices

10 Reconnect the SCSI power cables to the power supply.

Quadra 950 Upgrade

Before you begin, remove the following:

- Cover
- Drive shelf
- Speaker bezel
- Power supply
- Expansion cards
- Logic board
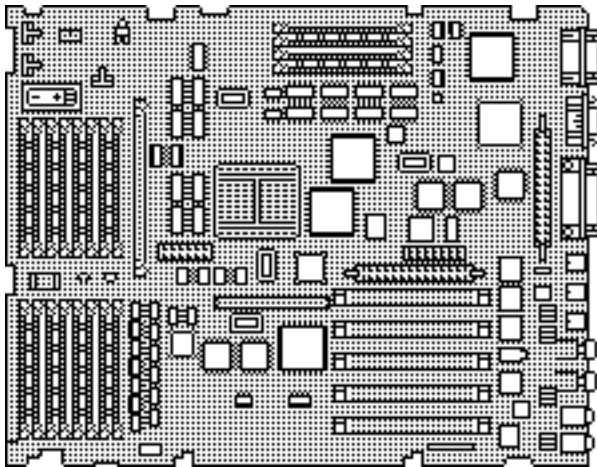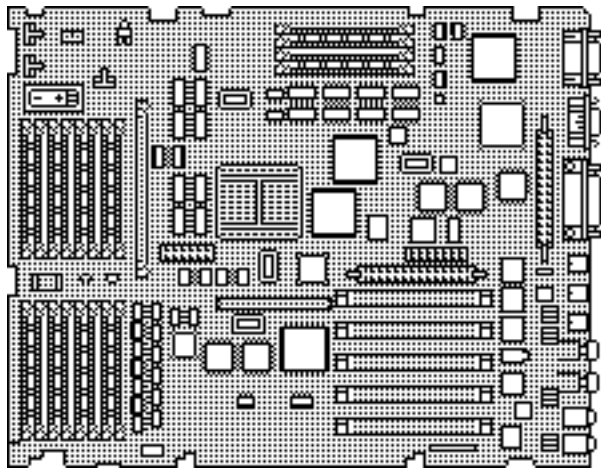
Note: A Macintosh Quadra 950 upgrade kit upgrades a Macintosh Quadra 900 to a Macintosh Quadra 950. The upgrade kit includes a Macintosh Quadra 950 logic board and product labels.

Note: After you perform a Quadra 950 upgrade, the system information displayed by About This Macintosh under the Apple menu will still indicate a Macintosh Quadra 900. You must reinstall system software to display the correct system information.

1 Install the Macintosh
   Quadra 950 logic board.

2 Replace all modules.

Logic Board
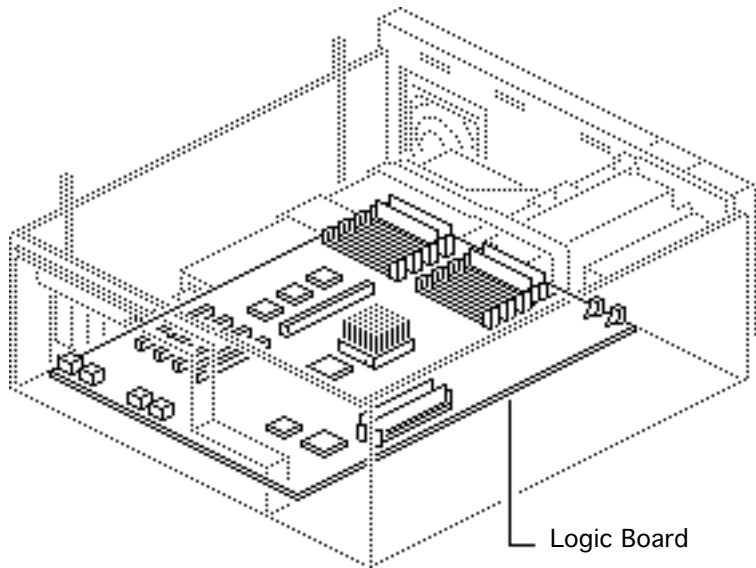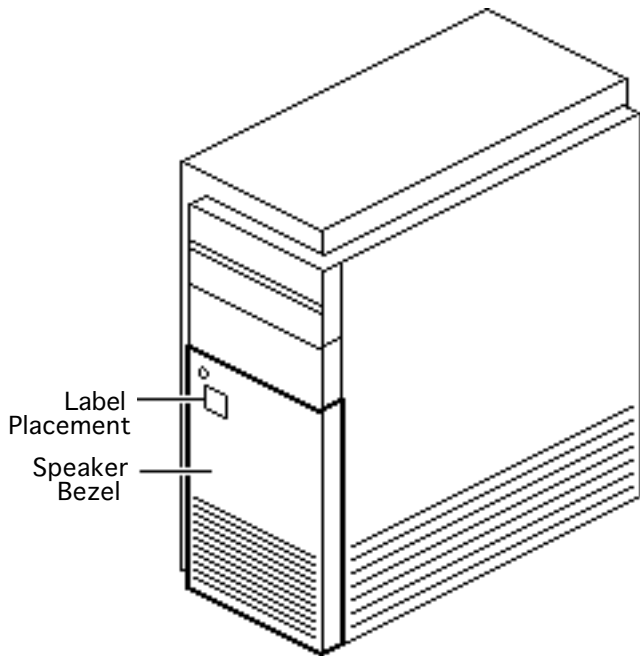
3   Peel off the backing from the product label and place the label on the speaker bezel.

Label
Placement

Speaker
Bezel

4 Peel off the backing from the product label and place the label on the rear bezel.

Label Placement

Workgroup
Server 95
PDS Card
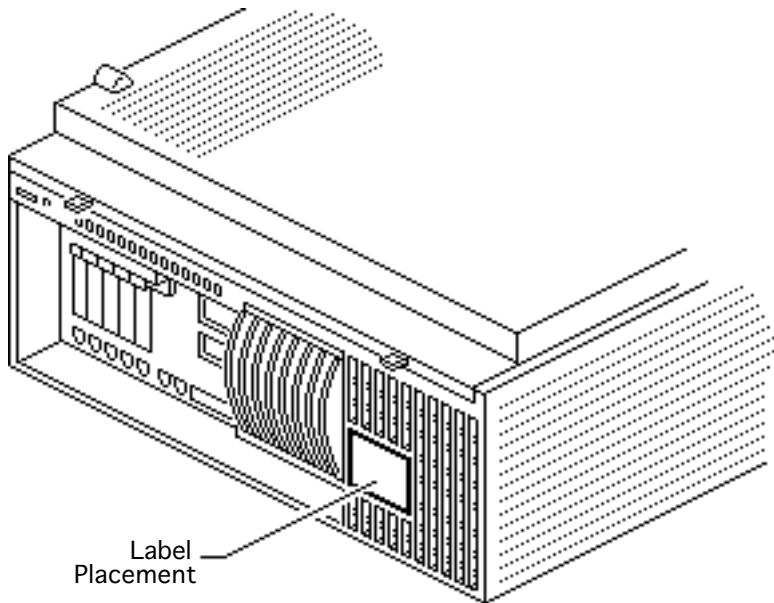
AWS 95 Upgrade

Before you begin, remove the cover.

Note: A Workgroup Server 95 upgrade kit upgrades a Macintosh Quadra 900 or 950 to a Workgroup Server 95. The upgrade kit includes a processor-direct slot (PDS) card and A/UX 3.0.1 and Retrospect backup software on CD-ROM.

Caution: You must unplug the computer prior to

Plastic
Cover
Plate
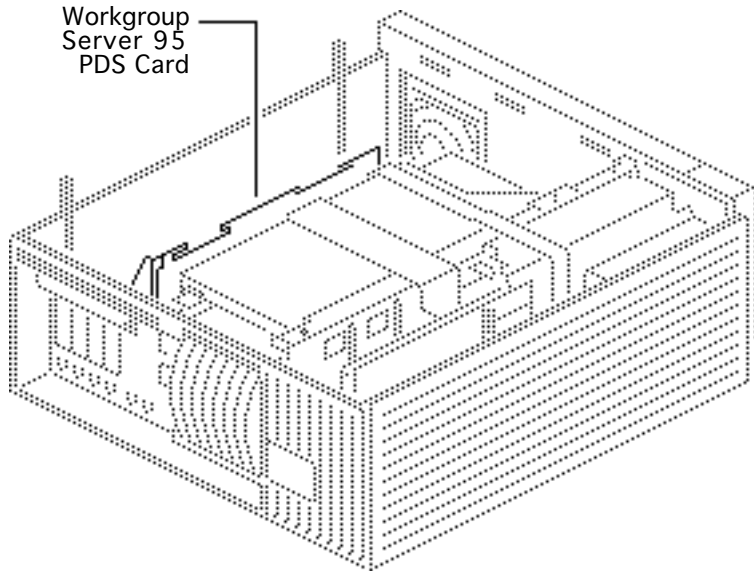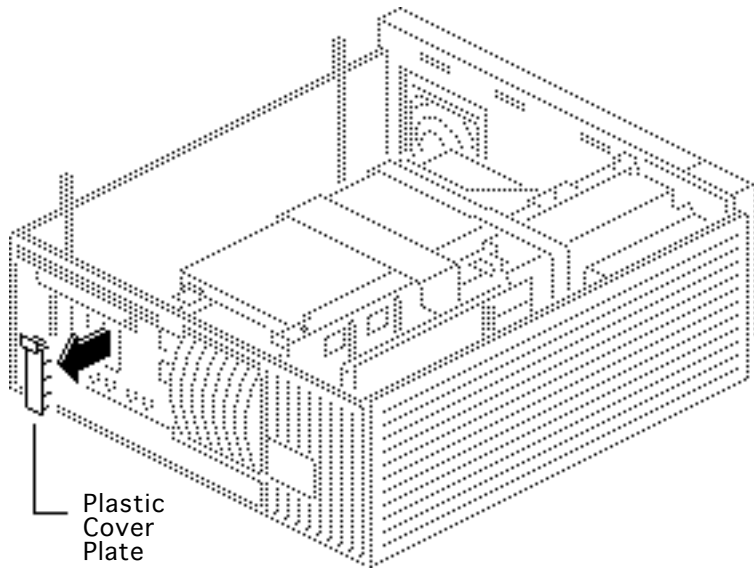
installing or removing the Workgroup Server 95 PDS card. Failure to unplug the computer could cause damage to the logic board and/or card.

1 Remove the plastic cover plate behind the processor-direct slot.

2 Disconnect the SCSI data cable from the logic board.

SCSI Data Cable

Workgroup Server 95
PDS Card
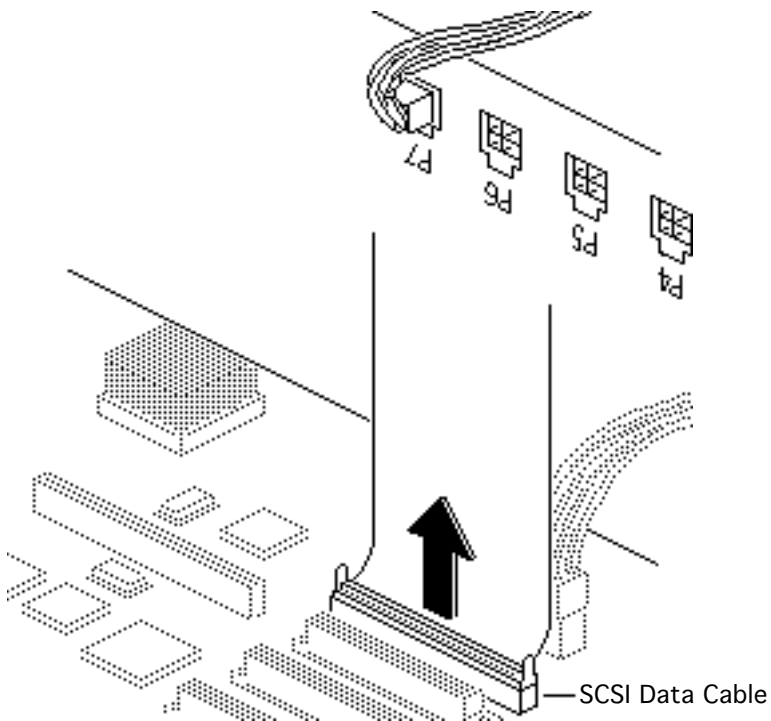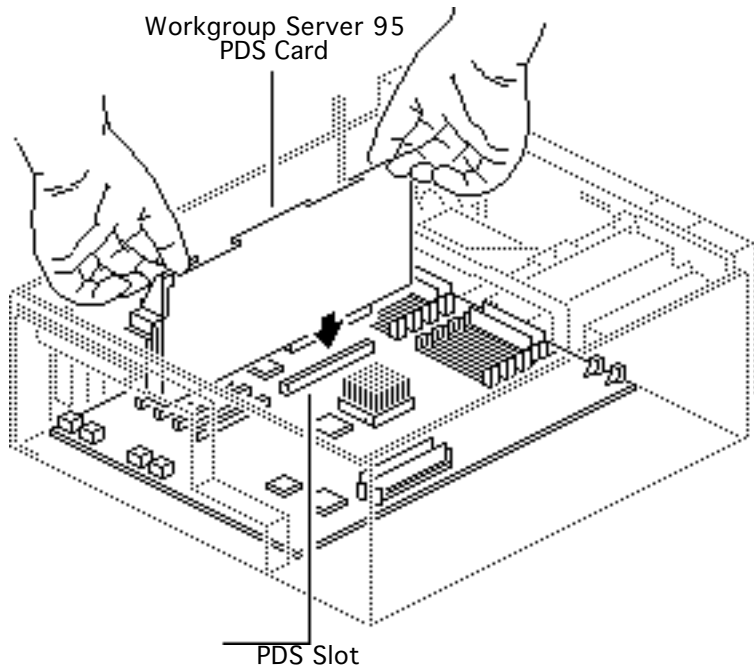
PDS Slot

3   Install the Workgroup
    Server 95 PDS card in
    the PDS slot.

    Replacement Caution:
    When installing the
    card, do not force it into
    the PDS slot. If the card
    does not seat properly,
    remove it and try again.
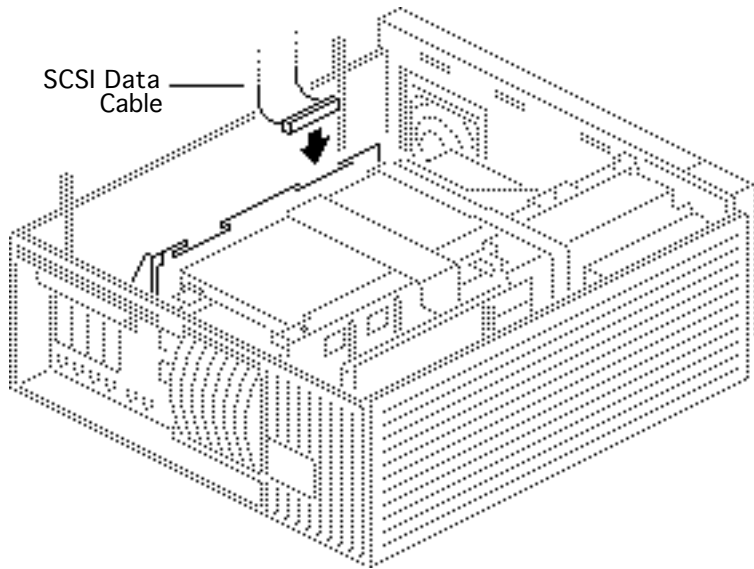
SCSI Data Cable

4 Connect the SCSI data cable to the 50-pin connector at the top of the Workgroup Server 95 PDS card.

5 Install the A/UX 3.01 and Retrospect software.

Workgroup
Server 95
PDS Card

AWS Cache Upgrade

Before you begin, remove the following:

- Cover
- WGS 95 PDS card

Note: A Workgroup Server PDS card cache upgrade increases the amount of RAM cache from 128K to 256K or 512K.
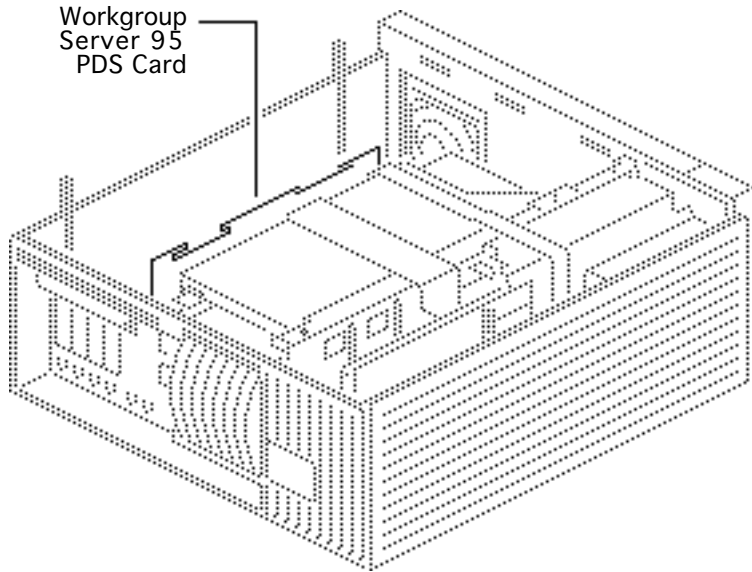
Workgroup
Server 95
PDS Card
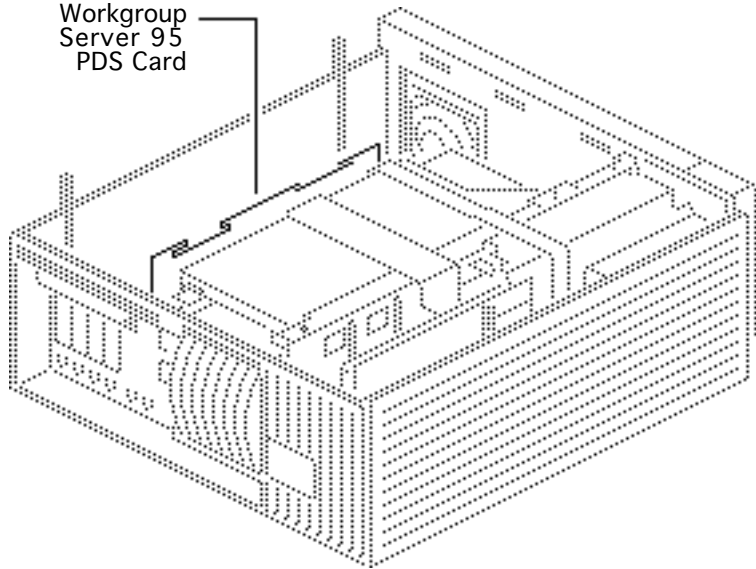
Caution: You must unplug the computer prior to removing or installing the Workgroup Server 95 PDS card. Failure to unplug the computer could cause damage to the logic board and/or card.

Install SIMMs as indicated.
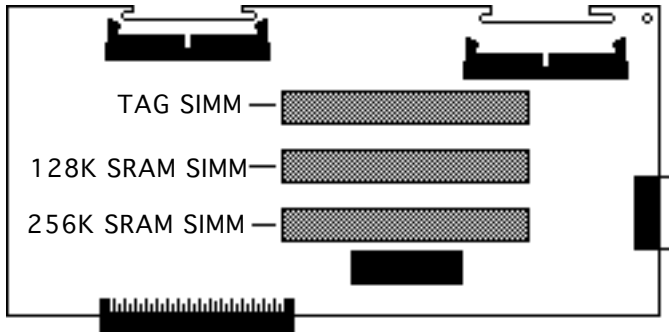
- Upgrade from 128K to 256K:
  - One 128K SRAM SIMM
  - One TAG SIMM
- Upgrade from 128K to 512K:
  - One 128K SRAM SIMM
  - One 256K SRAM SIMM
  - One TAG SIMM

TAG SIMM —

128K SRAM SIMM—

256K SRAM SIMM —

DDS-DC
Tape Drive

Tape Drive Upgrade

Before you begin, remove the following:

- Cover
- Drive shelf
- Floppy drive
- Speaker bezel
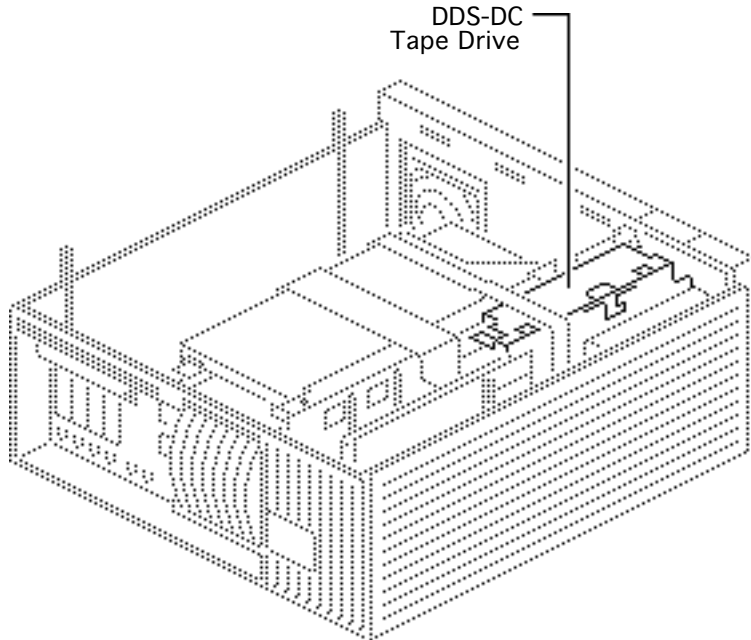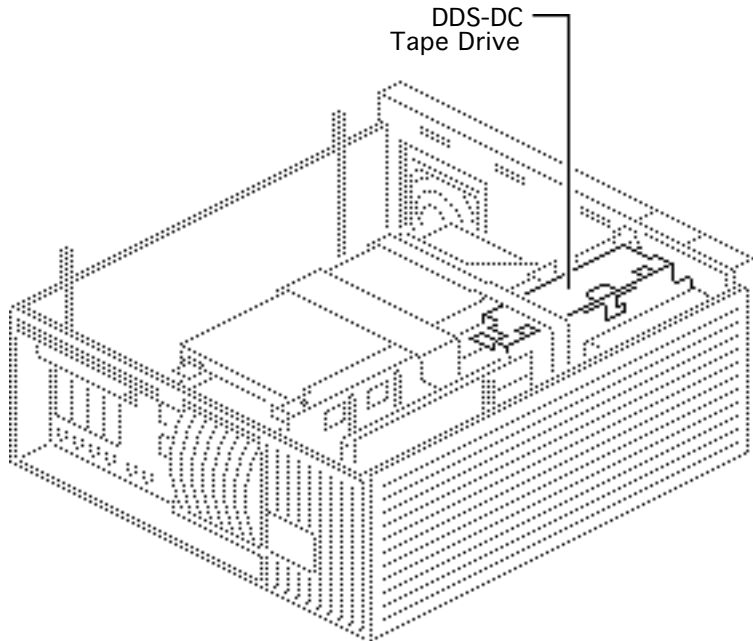
DDS-DC
Tape Drive

Note: A DDS-DC drive upgrade kit adds a digital data storage–data compression drive to a Workgroup Server 95 or to a Quadra 900 or Quadra 950 with the Workgroup Server PDS card.

Note: Before installing the DDS-DC drive, be sure to remove any SCSI device installed beneath the floppy drive.

DDS-DC Tape Drive

SCSI ID Switch
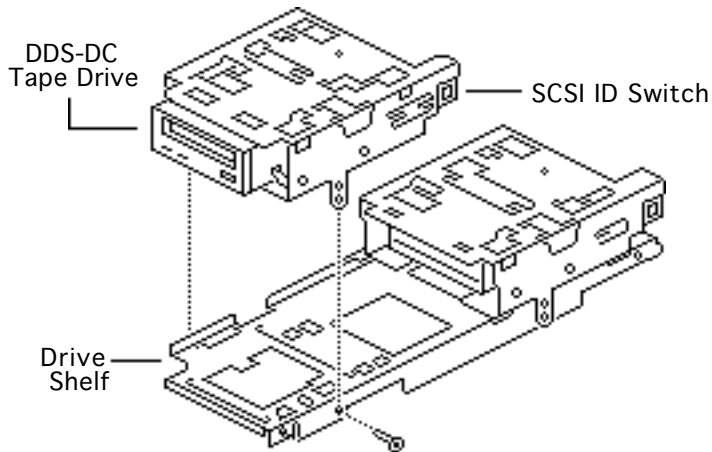
Drive Shelf

1 Install the DDS-DC tape drive on the drive shelf in the front position.

Note: Set the SCSI ID number on the DDS-DC drive. Make sure the ID number is unique from any other internal SCSI device. Apple recommends SCSI ID number 5.

Floppy Drive

DDS-DC Drive
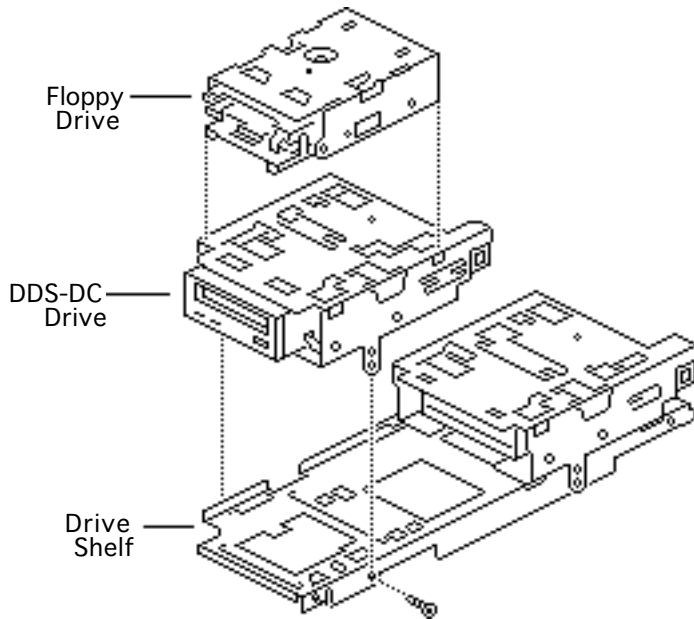
Drive Shelf

2 Attach the floppy drive on the carrier for the DDS-DC tape drive.
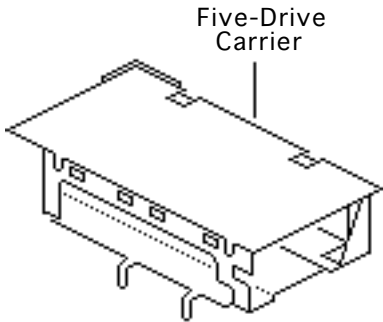
3 Reinstall the drive shelf and drives into the computer.

Blank Bezel
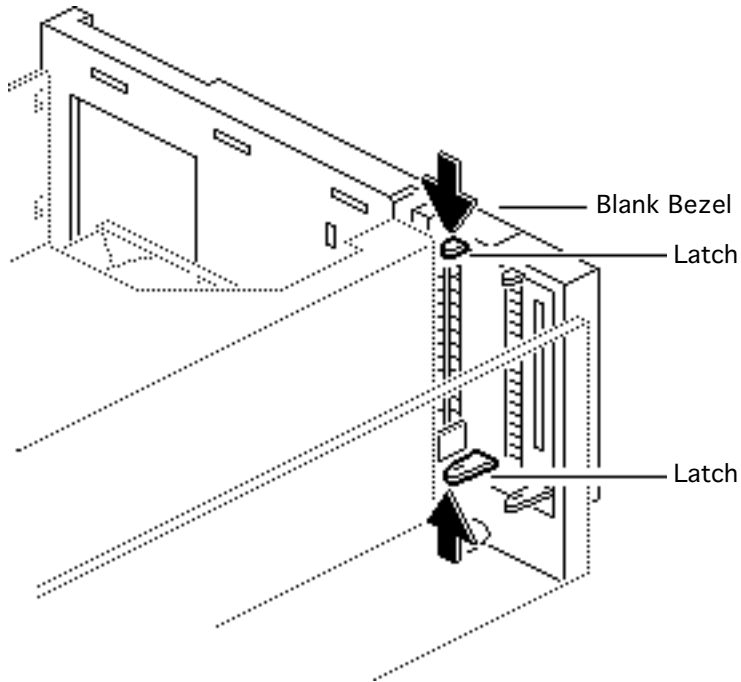
Latch

Latch

4 Squeeze the two plastic latches on the inside of the blank bezel.

5 Remove the blank bezel from the front of the computer.

6 Install the DDS-DC drive bezel.

7 Replace the speaker bezel and cover.
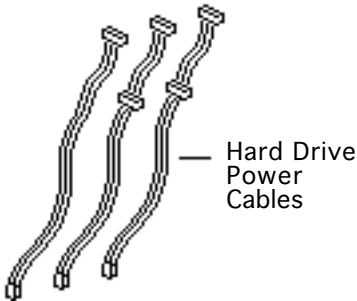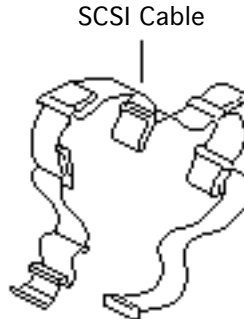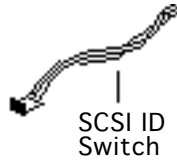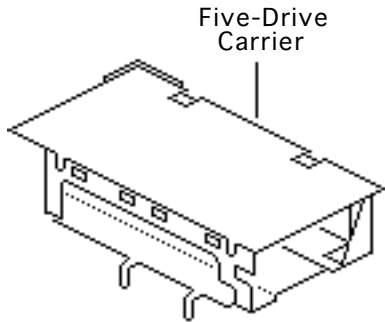
Five-Drive
Carrier

SCSI ID
Switch

SCSI Cable

Hard Drive
Power
Cables

Five-Drive Upgrade

Before you begin, remove the existing drive shelf.

Five-Drive
Carrier

SCSI ID
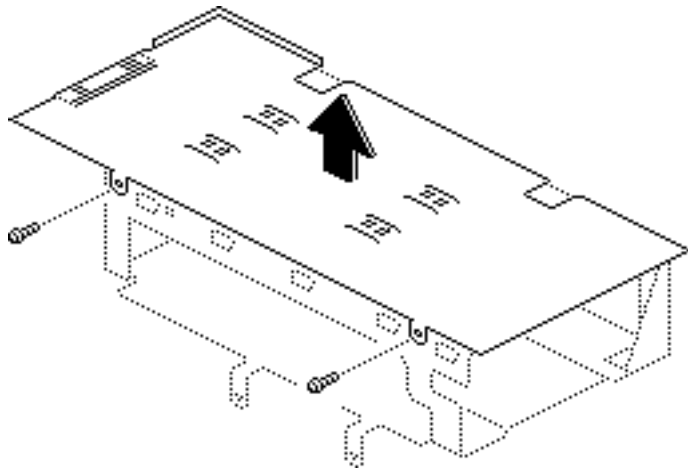Switch

SCSI Cable

Hard Drive
Power
Cables
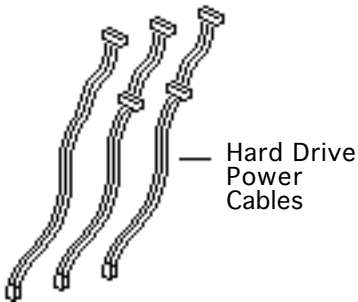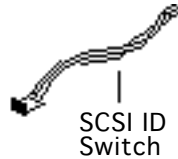
You will need the following
to ready the AWS 95 to hold
five drives:

- Five-drive carrier kit
- Five SCSI ID select
  switches (part number
  depends on drive type)
- Five-drive SCSI cable
  with terminator
- Two hard drive power
  cables with two drive
  connectors each (each
  cable connects up to two
  hard drives)
- One hard drive power
  cable with one drive
  connector (already in
  existing unit)

1 Remove the two screws that secure the top of the new drive carrier to the bottom piece.

2 Remove the top piece of the drive carrier.

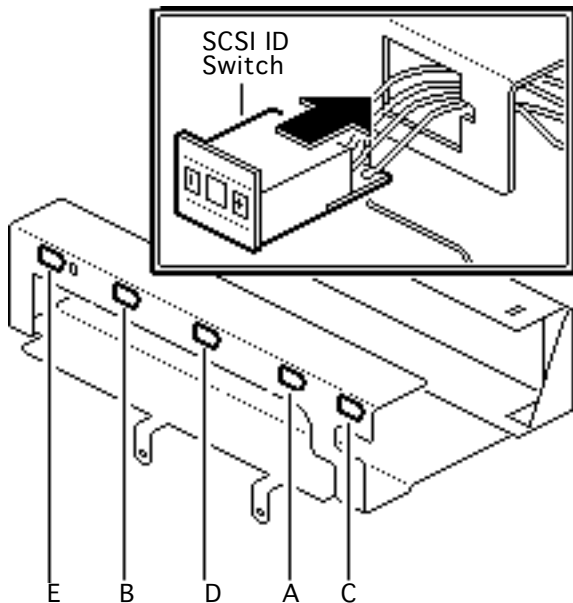SCSI ID
Switch

E B D A C
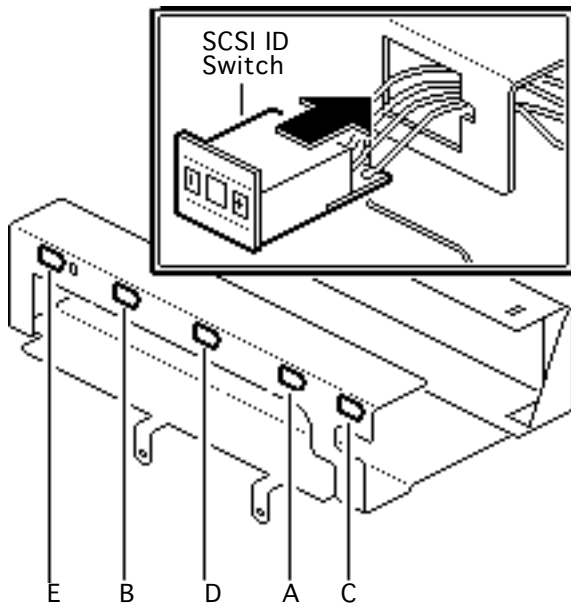
There are five openings in the bottom panel of the drive carrier for the SCSI ID switches. The openings are labeled A-E.

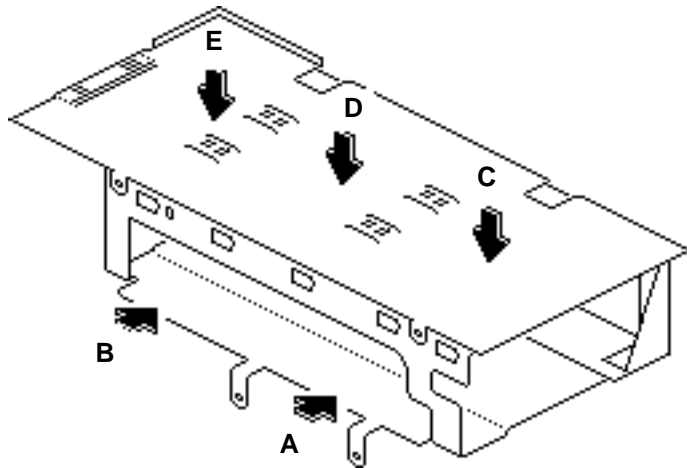**Note**: The type of SCSI ID switch you install will depend on the drive type.

3 To install the SCSI ID switch for the first drive, feed the connector end of the SCSI ID cable through the opening labeled A on the drive carrier.

SCSI ID
Switch

E   B   D   A   C

4 Push in on the SCSI ID
   switch until it clicks
   into place.

5 Repeat this procedure to
   install the remaining
   SCSI ID switches.

6 Connect the free end of
   the first SCSI ID switch
   cable to the first hard
   drive, which you will be
   installing in drive slot A.

   Note: When setting the
   SCSI ID switches, make
   sure no two peripherals,
   including the DAT
   player, are using the
   same SCSI ID. Also, do
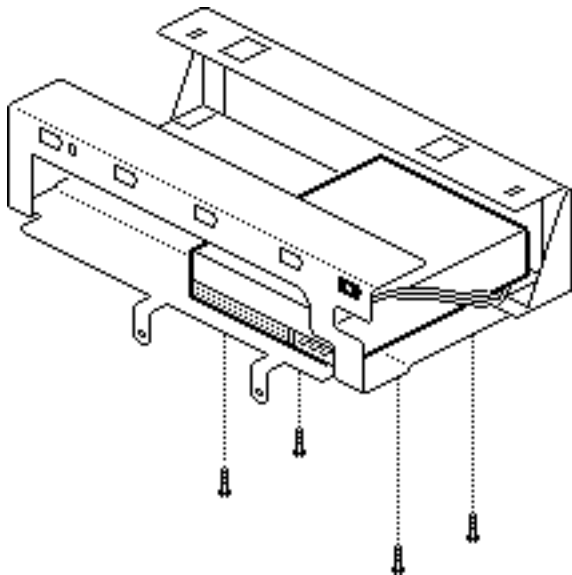   not set any of the SCSI ID
   switches to 7.

   Hard drives must be
   installed in the five-
   drive carrier in the
   order shown (A–E).
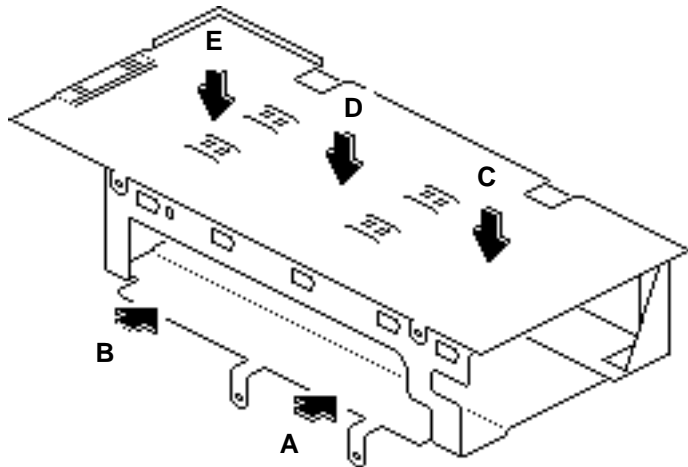
Note: If you install fewer than five drives, you must still install the drives in the order shown.
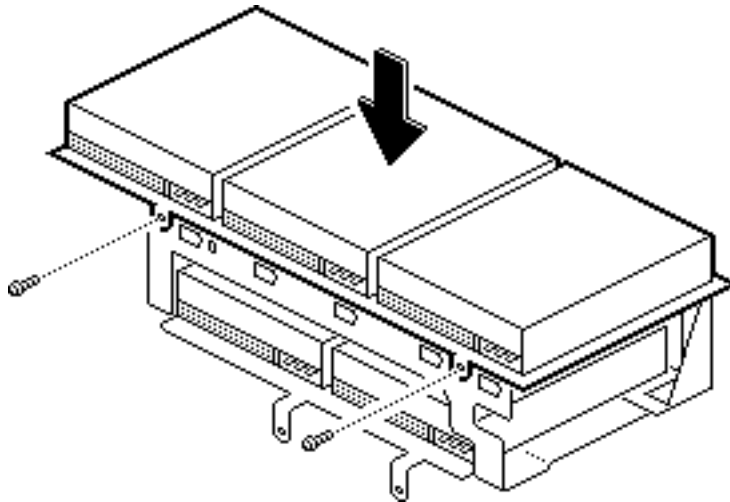
7 Remove the hard drives'
   terminating resistors
   before installation.

8 Install the first hard
   drive in slot A (the
   lower right slot) of the
   drive carrier.

9 Insert the four screws
   that secure the hard
   drive to the drive
   carrier. Tighten the
   screws.

Follow this procedure to
install up to four additional
hard drives in the order
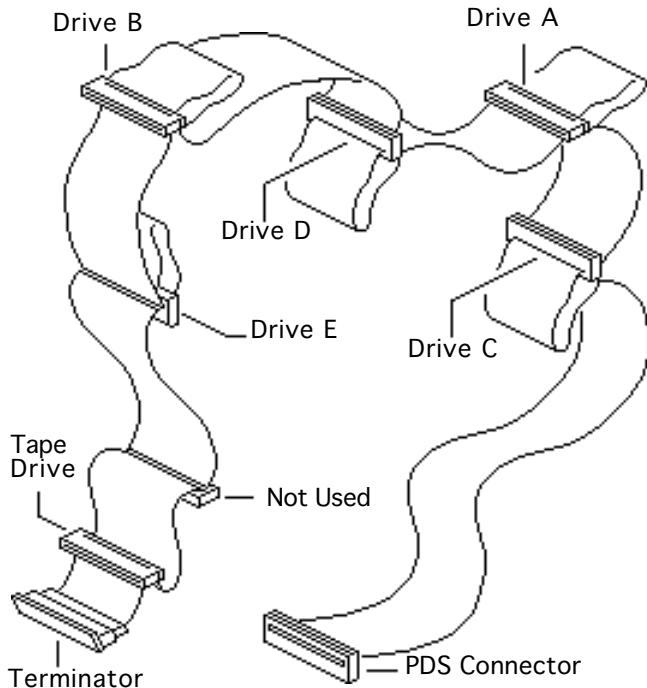shown on the previous page.

10 Once you have installed all the hard drives, replace the top of the drive carrier.

11 Replace the two screws that secure the top of the drive carrier to the bottom of the drive carrier.

   Caution: Be careful not to pinch the cables that run from the SCSI ID select switches.

Drive B

Drive A

Drive D

Drive E

Drive C

Tape
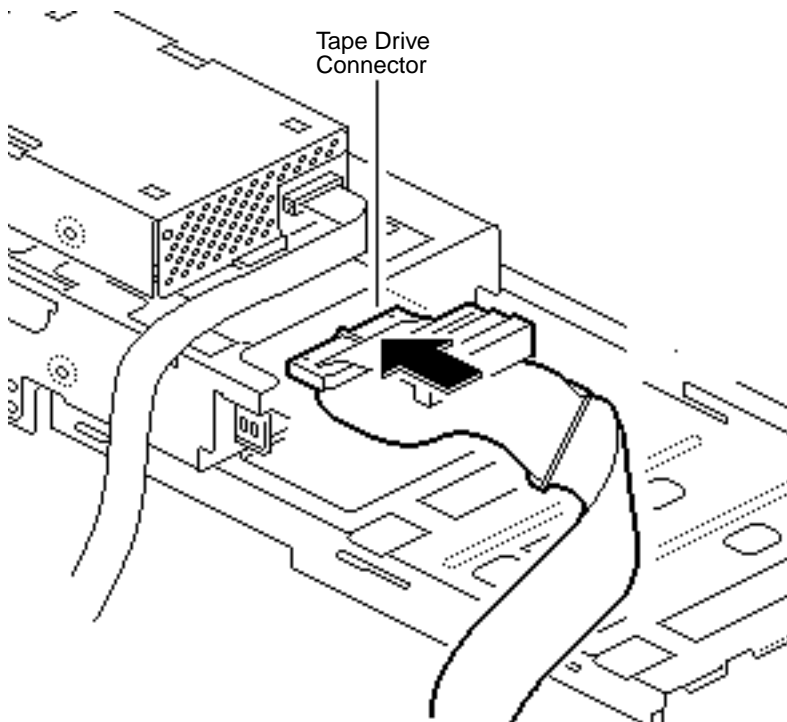Drive

Not Used

Terminator

PDS Connector

The SCSI cable connects up to five hard drives and one tape drive. The illustration on this page indicates which connectors attach to which peripherals. The pull tabs on the cable are marked as illustrated.

**Note**: Connect the tape drive first. (See next page.)

Note: If fewer than six peripherals are present, leave the connectors for the missing peripherals disconnected.

Tape Drive
Connector
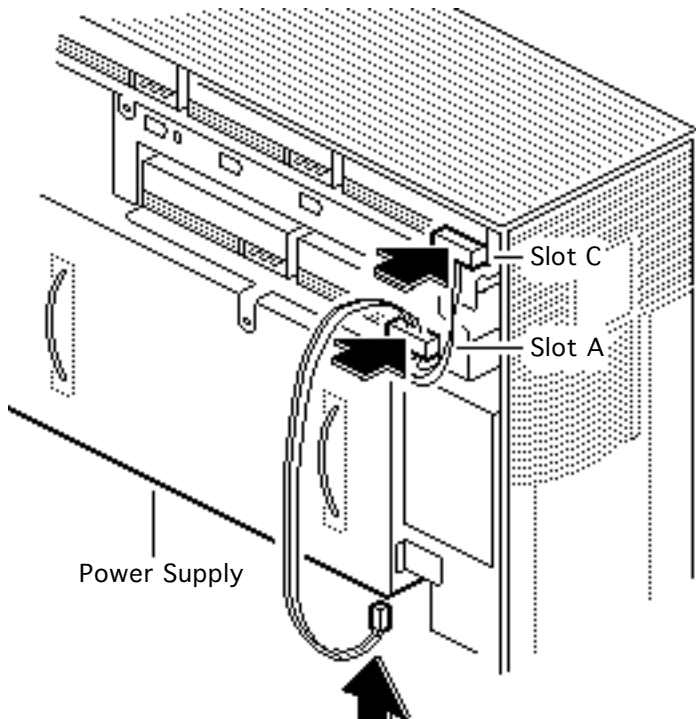
12 Attach the end of the SCSI cable to the connector on the tape drive (if present).

13 Pull through the cable that connects the floppy drive (if present) to the logic board so that the cable will not obstruct the insertion of the drive carrier.
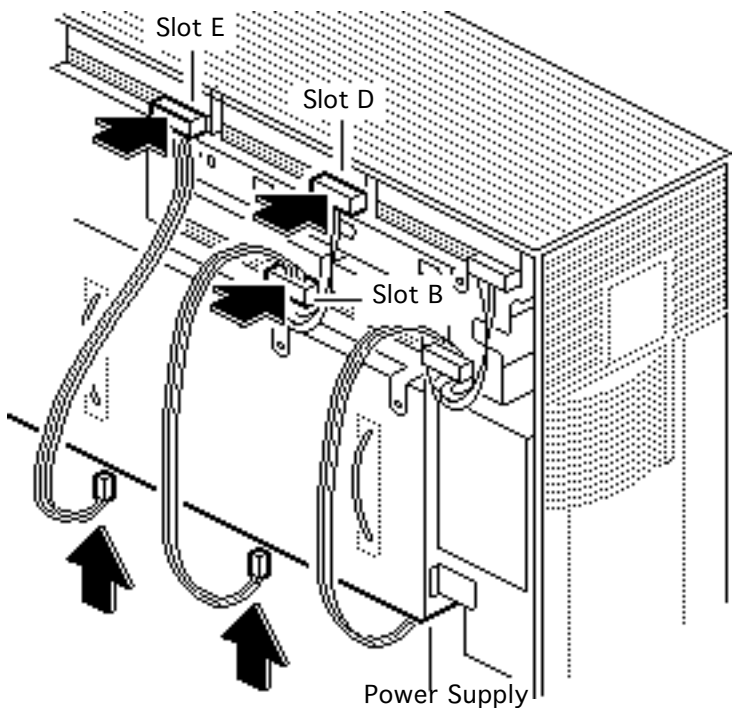
SCSI Cable
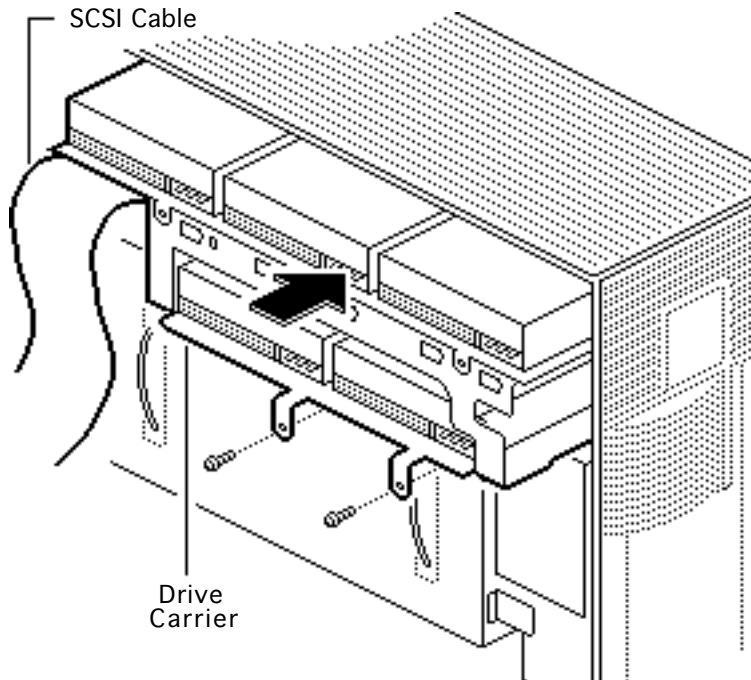
Drive
Carrier

14 Hold up the five-drive
   SCSI cable so that it does
   not obstruct the
   insertion of the drive
   carrier.

15 Insert the drive carrier
   in the upper right area
   of the tower (above the
   power supply).

16 Insert the two screws
   that secure the drive
   carrier to the metal
   frame. Tighten the
   screws.

Slot C

Slot A

Power Supply

17 Attach the second connector on one of the hard drive power cables to the drive in slot A.

18 Attach the first connector on the same hard drive power cable to the drive in slot C.

19 Connect the free end of the same power cable to the first connector (the far right connector) on the underside of the power supply.

Slot E
Slot D
Slot B
Power Supply

20 Repeat the procedure on the previous page to connect the drives in slots D and B.

21 Use the last hard drive power cable to connect the single drive in slot E.

Drive E
Connector
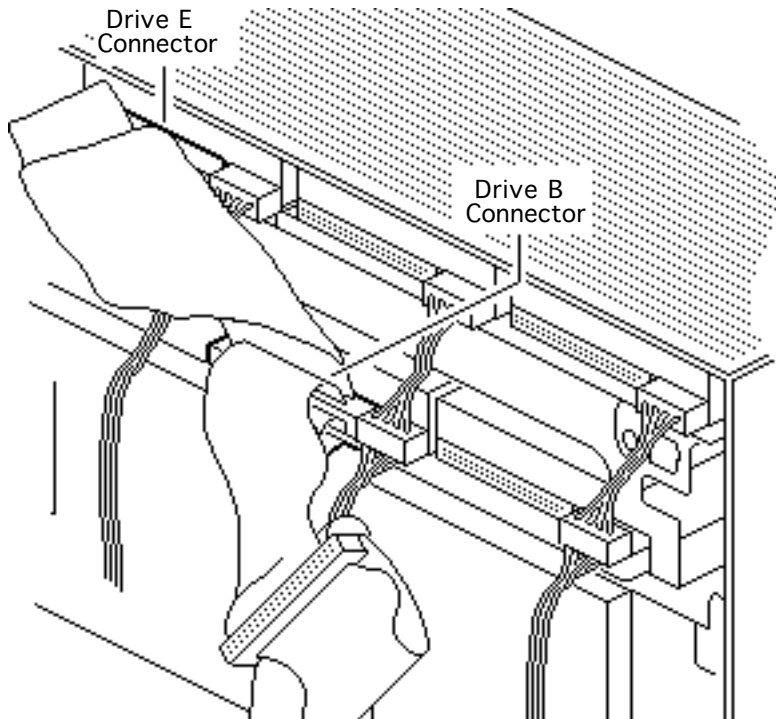
Drive B
Connector

22 Attach the drive E
   connector on the five-
   drive SCSI cable to the
   hard drive in slot E.

23 Fold over the cable and
   attach the drive B
   connector to the drive in
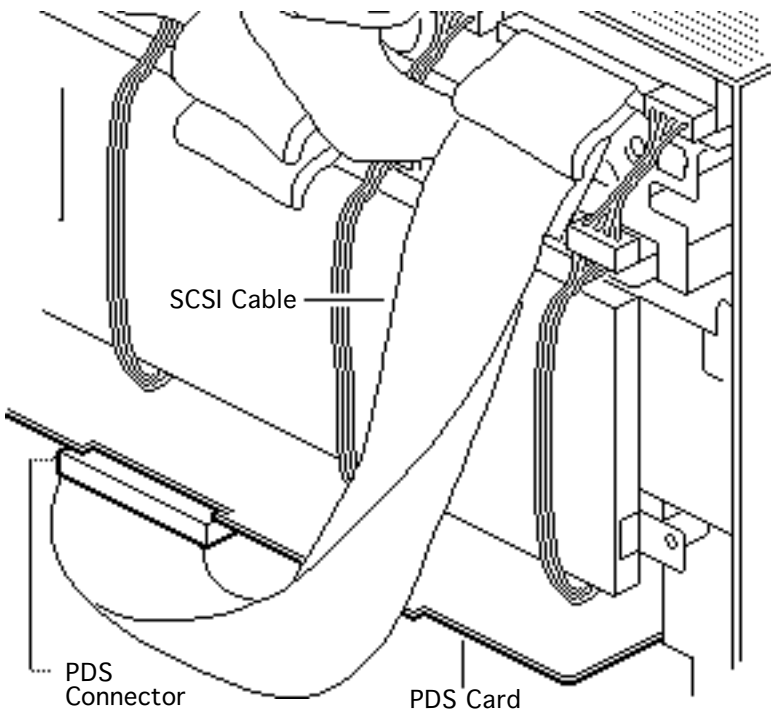   slot B.

Drive D
Connector
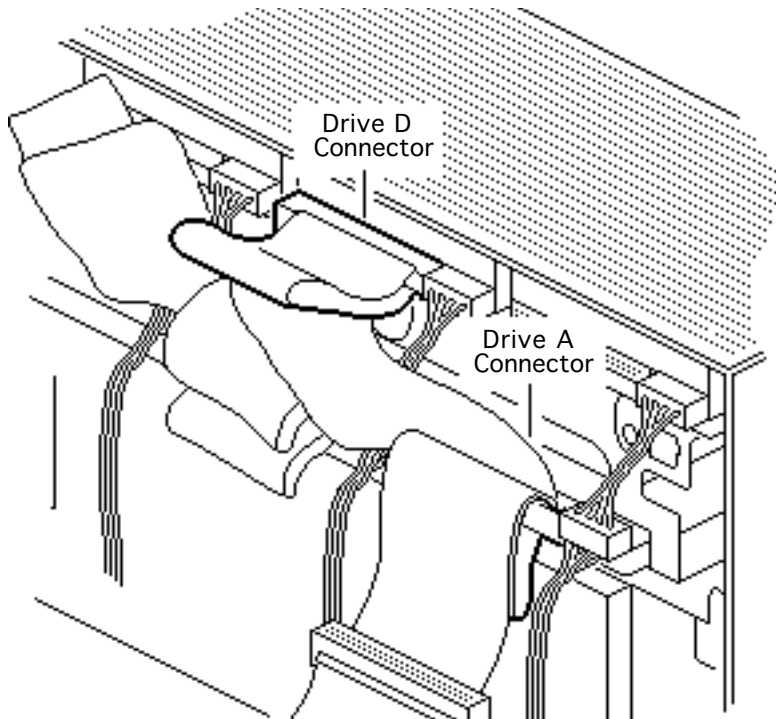
Drive A
Connector

24 Attach the drive D
connector on the five-
drive SCSI cable to the
hard drive in slot D.

25 Fold over the cable and
attach the drive A
connector to the drive in
slot A.
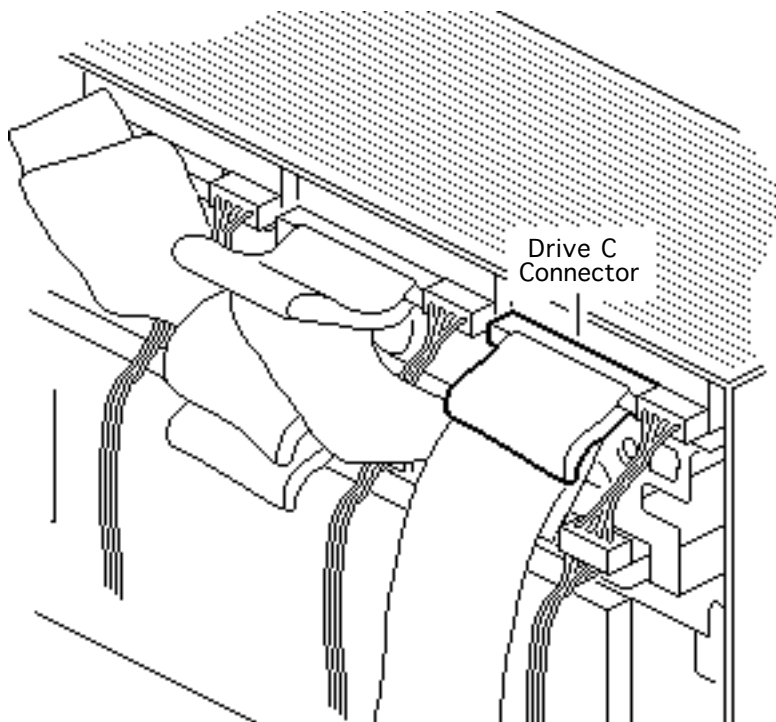
Drive C
Connector

26 Fold over the cable and
attach the drive C
connector to the drive in
slot C.

27 Attach the end of the five-drive SCSI cable to the hard drive connector on the PDS card.
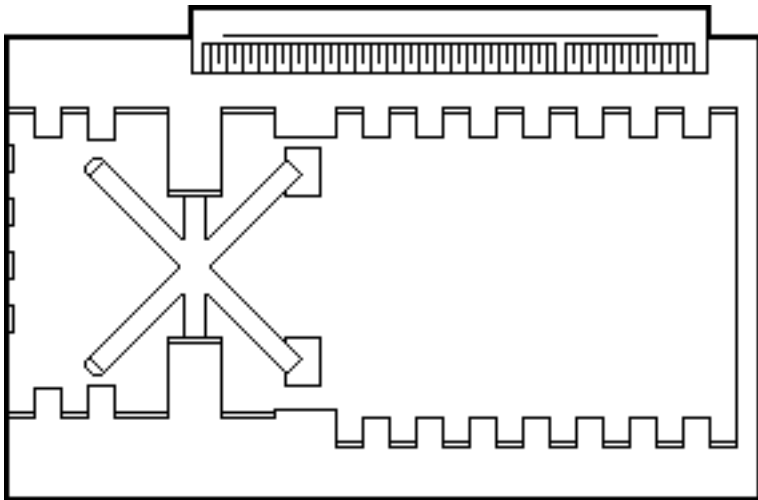
SCSI Cable

PDS
Connector

PDS Card

Power Macintosh Upgrade Card

Before you begin, remove the cover.

By installing this card in the computer's PDS slot, you can upgrade to a PowerPC microprocessor. For more information, including installation instructions, refer to the Basics chapter in the Power Macintosh Upgrade Card manual.
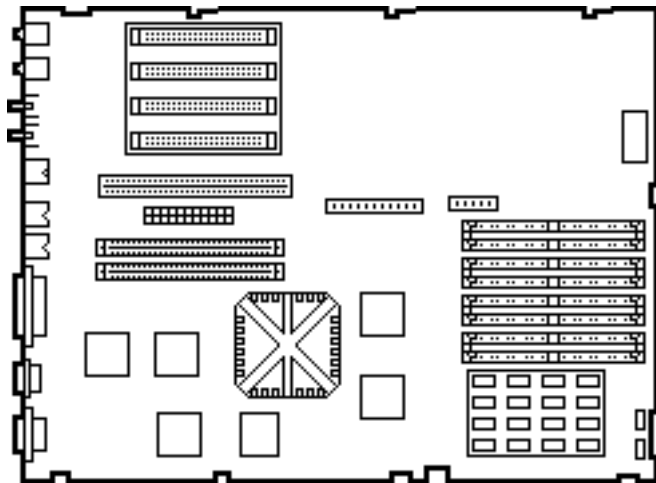
WS 9150 Upgrade

You can upgrade a Quadra 900 or Quadra 950 to a Workgroup Server 9150 with a Workgroup Server 9150 logic board upgrade kit.

For instructions on how to install the upgraded logic board, refer to Take Apart in the WS 9150 manual.

Additional Procedures
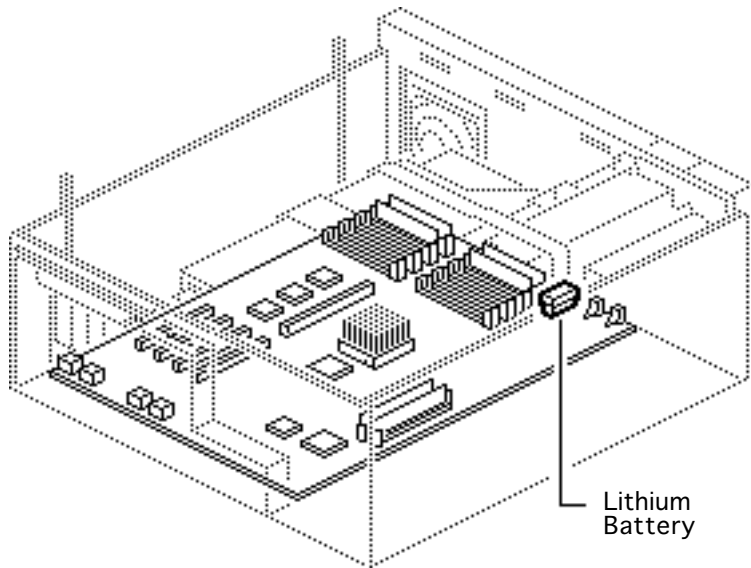
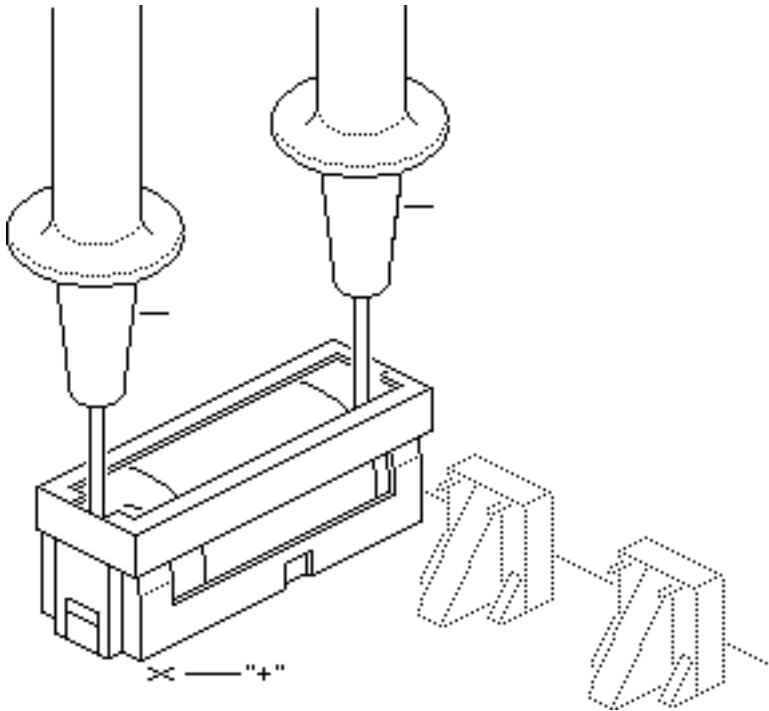Macintosh Quadra 900/950/AWS
95

Lithium
Battery

Battery Verification

Before you begin, remove the cover.

Warning: If handled or discarded improperly, the lithium battery in the computer could explode. Review battery 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.
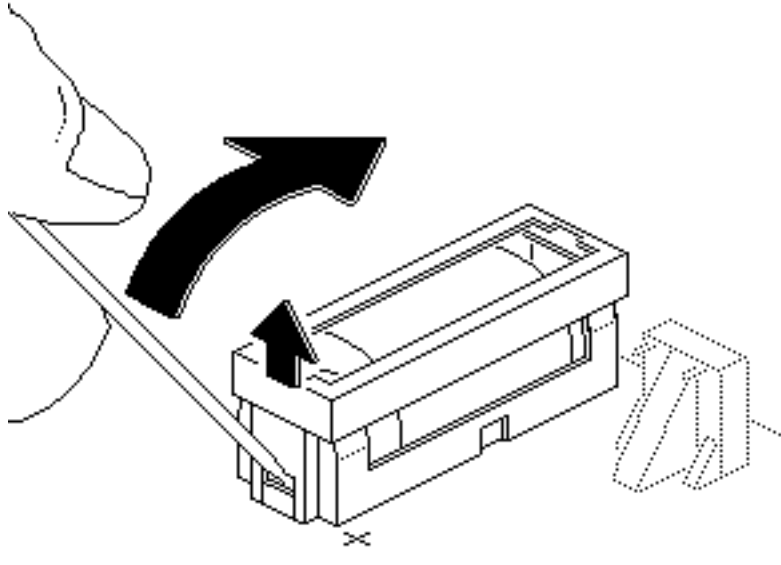
Battery Replacement

Before you begin, remove the following:

- Cover
- Drive shelf
- Power supply

Warning: If handled or discarded improperly, the lithium battery in the computer could explode. Review battery handling and disposal instructions in Bulletins/Safety.
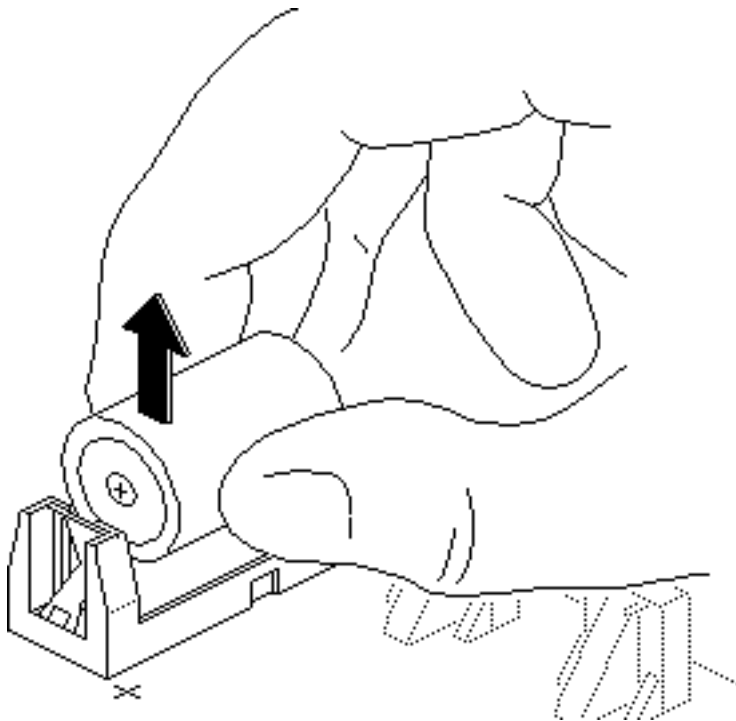
1   Using a small flat-blade

screwdriver, pry open
the latch at the end of the
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

Macintosh Quadra 900/950/AWS 95

Exploded View
Macintosh Quadra 900/950 and WS 95

Keyswitch

Interrupt Actuator

Reset Actuator

Floppy Drive Bezel

Blank Bezel

Speaker Bezel Assembly

Speaker Assembly

SCSI Power Cable

Floppy Drive Cable

Floppy Drive

Spacer

Drive Carrier

SCSI Device Select Cable

Drive Shelf Assembly

Power Supply

Fan

Main Housing Assembly

Logic Board

Hard Drive

SCSI Data Cable

SCSI Select Switch

Side Cover Latches

Side Cover Assembly

AC Power Cable

ADB Cable

Microphone