

NetApp® Filers F600 Series Field Service Guide

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- To reduce the risk of personal injury from hot surfaces, allow the internal components time to cool before touching or installing options.
- To reduce the risk of personal injury or damage to the equipment, ensure that the equipment is properly supported or braced when installing options.
- This equipment is designed for connection to a grounded outlet. The grounding type plug is an important safety feature. To avoid the risk of electrical shock or damage to the equipment, do not disable this feature.
- This equipment is furnished with one or more lithium batteries. There is a danger of explosion and risk of personal injury if the battery is incorrectly replaced or mistreated. Do not attempt to recharge the battery, disassemble it, or dispose of it in a fire.

Many of the electronic components used in the filer are susceptible to damage from static electricity. Except when servicing the power supply, leave the filer plugged in and connect a wrist strap from your wrist to the frame of the filer whenever you are working inside the enclosure.

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Preface

About this guide

This guide describes the field service procedures for replacing, upgrading, and maintaining hardware units in all models of the Network Appliance NetApp™ F600 series. Use this guide after you have familiarized yourself with the system hardware by reading the *Hardware Guide for the NetApp F600 Series*.

This guide is organized as follows:

Chapters	Provide information on ...
1	Filer features.
2 – 7	Hardware component replacement.

Use this guide in conjunction with the *System Administrator’s Guide*, which describes how to operate and manage your filer, and the *Hardware Guide for the NetApp F600 Series*, which describes initial system installation and how to open the filer chassis.

This guide does not provide information about disk shelves. For disk shelf information, refer to the hardware guide for the disk shelf that is part of your system.

Audience

This guide is for field service engineers, service providers, and customers who purchased the service kit from Network Appliance. The procedures in this guide describe replacement, upgrade, and maintenance tasks for personnel with the following skills and experience:

- working familiarity with small computer system hardware and operation
- basic understanding of common networking concepts and practices
- working familiarity with accepted tools and procedures for installing and operating sensitive electronic equipment

Terminology

When the term “filer” is used by this guide, the information applies to all Network Appliance filer models in the NetApp F600 series.

This guide uses the term “FDDI card” when the cable supported is a twisted-pair or fiber-optic cable. To distinguish between FDDI card with different media types, this guide uses the terms “FDDI-TP” and “FDDI-fiber.”

Command conventions

You can enter filer commands on the system console or from any client that can obtain access to the filer using `telnet`. In examples of commands run on a UNIX workstation, this guide uses the command syntax and output of SunOS 4.1x. (The command syntax and output may be different depending on your version of UNIX.)

Formatting conventions

In this guide, the following kinds of formatting in the text identify special information.

Formatting convention	Type of information
<i>Italic type</i>	Words or characters that require special attention. File names. Placeholders for information you must supply. For example, if the guide says to enter the <code>arp -d <i>hostname</i></code> command, you enter the characters “arp -d” followed by the actual name of the host. Man page names. Book titles in cross-references.
Monospaced font	Command and daemon names. Information displayed on the system console or other computer monitors. The contents of files.
Bold monospaced font	Words or characters you type.

Keyboard conventions

This guide uses capitalization and some abbreviations to refer to the keys on the keyboard. (The keys on your keyboard may not be labeled exactly as they are in this guide.)

When describing key combinations, this guide uses the hyphen (-) to separate individual keys. For example, Ctrl-D means holding down the Ctrl key while pressing the D key. In addition, this guide uses the term Enter to refer to the key that generates a carriage return, although the key is named Return on some keyboards.

This guide uses the term “type” to mean pressing one or more keys on the keyboard. It uses the term “enter” to mean pressing one or more keys and then Enter.

Special messages

This guide contains special messages that are denoted by icons in the margin. They are described as follows:



NOTE: A note contains important information that helps you install or operate the system efficiently.



CAUTION: A caution contains instructions that you must follow to avoid damage to the equipment, a system crash, or loss of data.



WARNING: A warning contains instructions that you must follow to avoid personal injury.

Chapter 1: Introduction

This chapter identifies and describes the units that are field replaceable in the filer models of the NetApp F600 series.

This chapter includes the following information:

- the units that can be replaced in the NetApp F600 series
- tools and equipment required for servicing the filer



CAUTION: Do not operate the filer for an extended time with the front sliding door opened, because the proper cooling of the system depends on the door being closed.

Field replaceable units

This section identifies and describes the replaceable units in the filer. The filers in the NetApp F600 series are designed for easy access so that units can be removed and installed in the field. The units are accessible from the front or back panel. With the exception of system memory modules and disks drives, you must purchase all field replaceable units from Network Appliance.

The following units are field replaceable in the NetApp F600 series:

- expansion cards
 - environmental card
 - NVRAM card (with removable SIMMs and lithium batteries)
 - SCSI cards for disks and tape drives
 - network cards
- system card assembly (with removable DIMMs, lithium battery, and CPU fan)
- backplane
- 3.5-in. diskette drive
- power supply
- fans
 - chassis fan assembly
 - expansion card fan
- LCD control panel

Units accessible from the front

The filer front panel consists of an aluminum bezel and front door. Figure 1-1 shows the location of the front bezel and door. You can remove the bezel to get access to the fan assembly and LCD control panel. Figure 1-2 shows the location of the fan assembly and the LCD control panel. To remove the bezel, hold the upper and lower edges of the bezel and pull it straight off the front panel of the filer. To replace the bezel, align the pins on the bezel with the holes on the front panel of the filer, and then push the bezel straight onto the front panel.

The front door can be opened to gain access to the diskette drive. Figure 1-3 shows the location of the diskette drive. To open the door, grip the right edge of the door and slide it to the left.

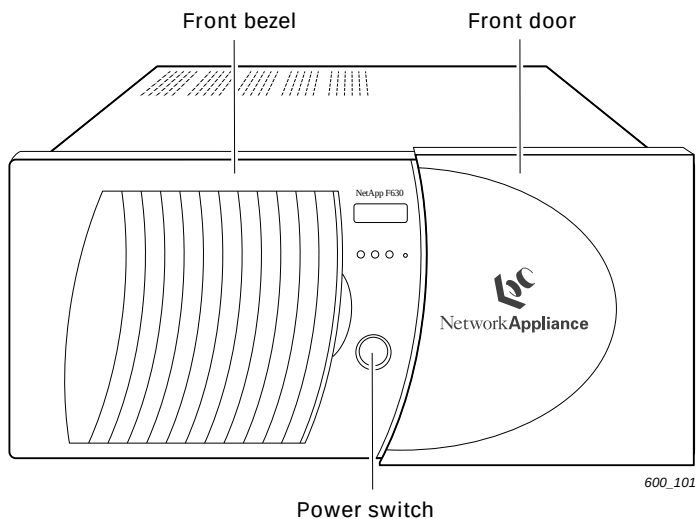
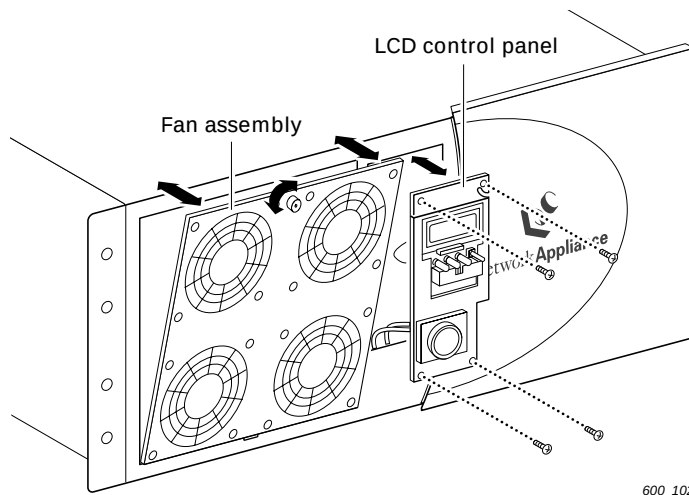
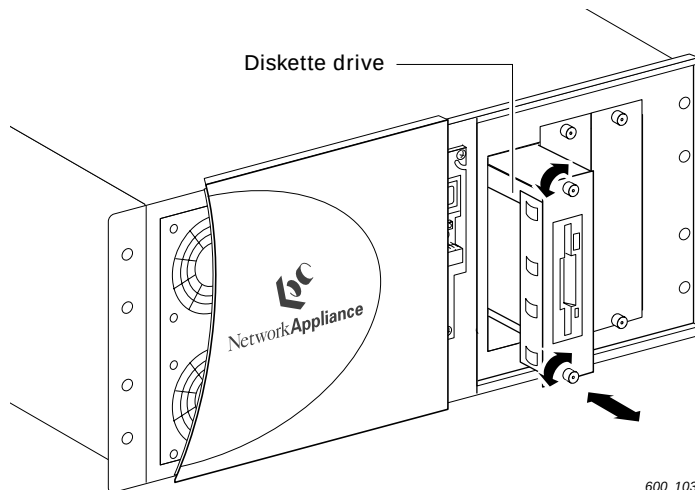


Figure 1-1. Front bezel and door of a NetApp F600 series filer



600_102

Figure 1-2. Replaceable units accessible from the bezel side



600_103

Figure 1-3. Replaceable unit accessible from the door side

Units accessible from the back

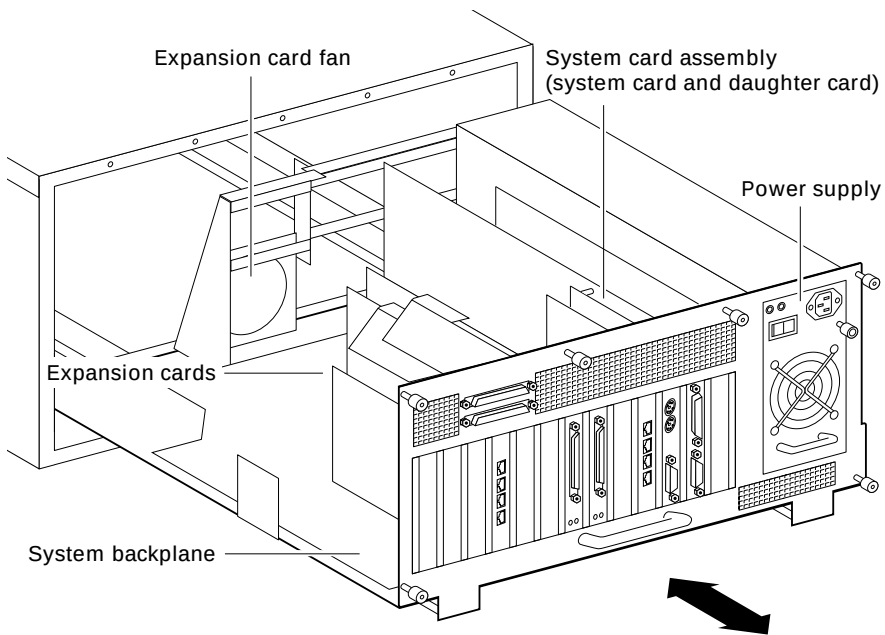
The filer power supply is accessible from the back of the filer. The system backplane carrier, also accessible from the back of the filer, is a slide-mounted tray that serves as the mounting base for the system backplane. The system backplane provides the expansion slots for the system card assembly and the expansion cards.

The system backplane carrier can be pulled out of the chassis for access to the system card assembly and the expansion cards.



CAUTION: Shut down the system properly before opening the system backplane carrier. Opening the system backplane carrier without first shutting down the system causes the system to shut down improperly. This is because all power connections, as well as connections to the LCD control panel and the diskette drive, are through internal blind-mating connectors between the system chassis and the system backplane carrier. When the system backplane carrier is pulled out, the connections are broken. The system cannot be powered on again until the system backplane carrier is completely closed. For information on shutting down the system properly, refer to the *System Administrator's Guide*.

Figure 1-4 shows the units accessible from the back panel with the system backplane carrier open.



600_104

Figure 1-4. Units accessible from the back of the filer

Tools and equipment

Have the following items ready before you begin replacing units:

- Phillips screwdrivers (#0, #1, and #2)
- wire cutters (for cable ties)
- antistatic wrist strap and grounding leash



CAUTION: The filer uses electronic components that are sensitive to static electricity. Static discharge from your clothing or other fixtures around you can damage these components. Wear an antistatic wrist strap and grounding leash to free yourself of static electricity before touching any electronic components.

If you are adding expansion cards to the filer, check for information about expansion card slot assignments at the “NetApp on the Web” (NOW) Web page at <http://now.netapp.com>.

Chapter 2: Expansion cards

This chapter describes the procedures for installing and replacing the expansion cards. This chapter includes the following information:

- description of expansion slots
- description of expansion cards
- procedures for preparing expansion cards
- procedures for installing and replacing expansion cards



NOTE: To ensure compatibility, performance, and reliability, you must obtain filer expansion cards from Network Appliance or an authorized reseller.



CAUTION: The filer uses electronic components that are sensitive to static electricity. Static discharge from your clothing or other fixtures around you can damage these components. Wear an antistatic wrist strap and grounding leash to free yourself of static electricity before touching any electronic components.

Expansion slots

The system backplane has eight 32-bit PCI (Peripheral Component Interconnect) slots, two 64-bit PCI slots, one PICMG (PCI Industrial Computer Manufacturers Group) slot of two connectors for the system card assembly, and three ISA (Industry Standard Architecture) slots. Figure 2-1 shows the location of the expansion slots on the system backplane.

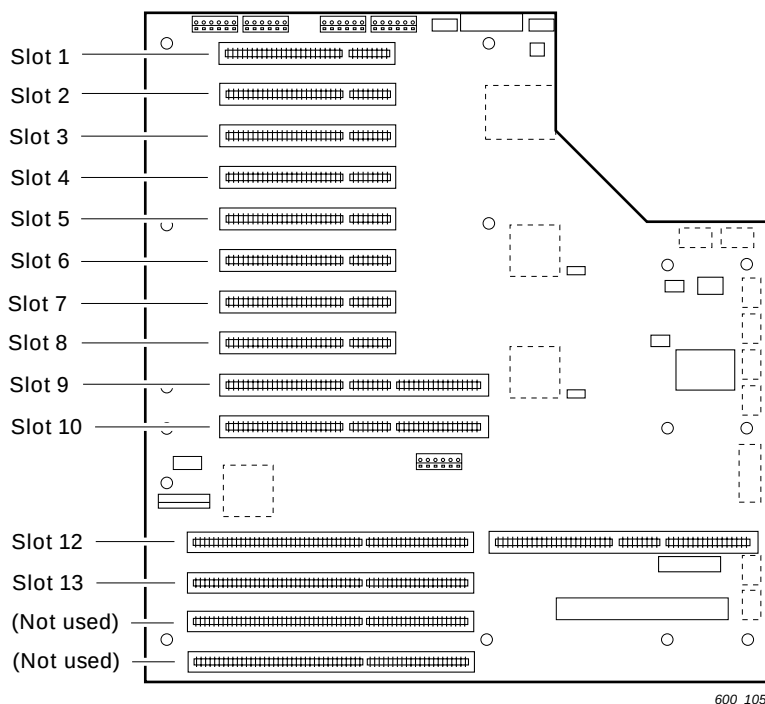


Figure 2-1. Expansion slots

Slots 1 through 8 are 32-bit PCI slots. Slots 9 and 10 are 64-bit PCI slots. There is no expansion card connector in slot 11 because this space is occupied by the daughter card attached to the system card in slot 12. Slot 12 is a PICMG slot. Slots 13 through 15 are ISA slots. ISA slots 14 and 15 are not used.



NOTE: If you are adding expansion cards to the filer, check for information about expansion slot assignments at the “NetApp on the Web” (NOW) Web page at <http://now.netapp.com>.

Expansion cards

The following expansion cards are used in NetApp F600 series filers:

- SCSI cards
- network cards
- NVRAM card
- environmental card

Preparing expansion cards

You must prepare some of the expansion cards before installing them in the filer. For example, you may need to verify that jumpers are set correctly, add memory, or replace batteries on a card before installing it in the filer. This section provides the preparation procedures for the following expansion cards:

- differential wide SCSI card for external tape devices
- NVRAM card

The environmental, network, and other SCSI cards do not require preparation before they are installed in the filer.

Differential wide SCSI card for external tape devices

The differential wide SCSI card connects the filer to a differential wide SCSI external tape device. The differential wide SCSI card is shipped from the factory with terminators (plug-in resistors) installed in the RM1 through RM8 sockets on the card. Figure 2-2 shows the location of the terminators.

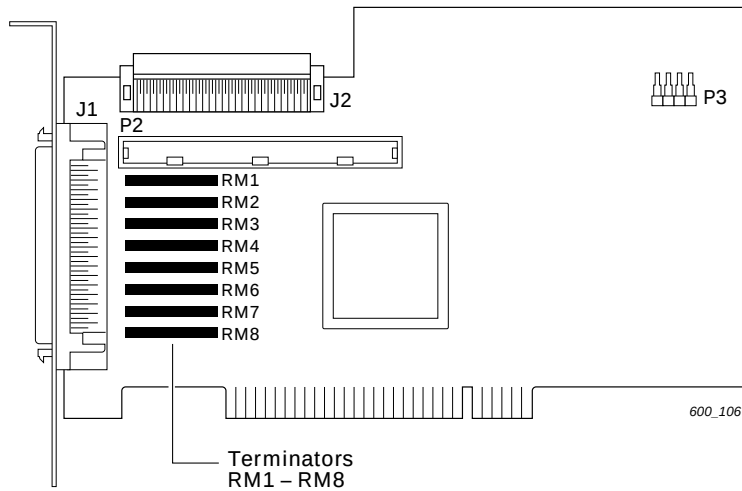


Figure 2-2. Differential wide SCSI card terminators

The terminators terminate the internal SCSI connector (J2) so that the external SCSI connector (J1) can be used to connect an external tape device to the filer. Before you install the card in a filer, make sure that the RM1 through RM8 terminators are in place.

NVRAM card

You can upgrade memory or replace the batteries on an NVRAM card before installing it in the filer. This section provides the following procedures:

- adding or replacing NVRAM SIMMs
- removing lithium battery insulators
- changing the lithium batteries



NOTE: The NVRAM card II in the NetApp F600 series is different than the NVRAM card in other models of NetApp filers. The NVRAM card II is not interchangeable with NVRAM cards from other models of NetApp filers.



CAUTION: Always use the halt command to perform a clean shutdown before upgrading or replacing the NVRAM card.

Adding or replacing NVRAM SIMMs

The NVRAM card in the NetApp F600 series supports 8 MB, 16 MB, or 32 MB of memory. The card comes with two 4-MB NVRAM SIMMs (8 MB) installed in Bank 0. Figure 2-3 shows the location of the NVRAM SIMM slots.

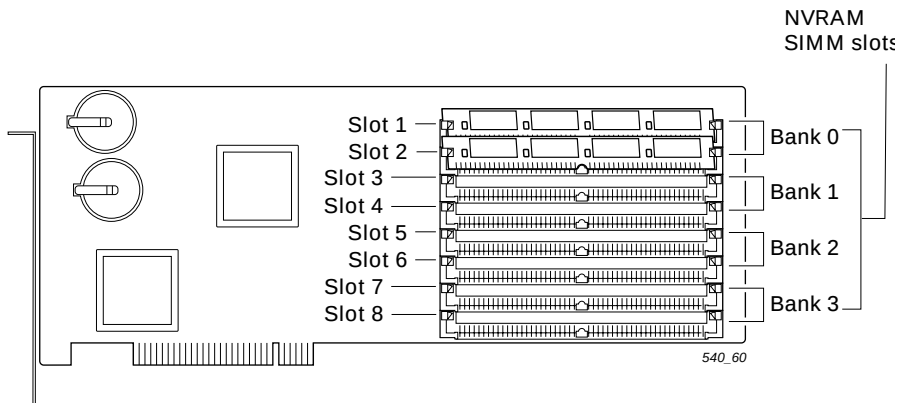


Figure 2-3. NVRAM card SIMM slot locations

You can expand the NVRAM capacity to 16 MB or 32 MB by installing additional pairs of 4-MB NVRAM SIMMs. Figure 2-4 illustrates a typical NVRAM SIMM. The SIMMs must be added in the following order: Bank 1 (to expand the capacity to 16 MB), Bank 2 and Bank 3 (to expand the capacity to 32 MB).

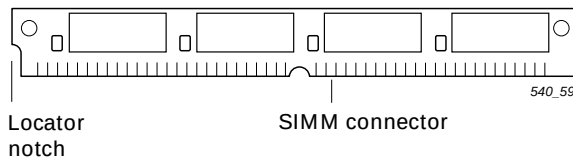


Figure 2-4. NVRAM SIMM for the NVRAM card

Removing the NVRAM SIMMs

Follow these steps to remove the NVRAM SIMMs:

1. Shut down the filer.
2. Loosen the six thumbscrews on the back panel and pull out the backplane carrier.
3. Remove the NVRAM card from the expansion slot, and set the card aside on an antistatic surface.
4. Starting with the first occupied SIMM slot closest to the bottom edge of the card, press outward on the mounting tabs while lifting the SIMM. Figure 2-5 illustrates how to remove a SIMM.

One easy way to remove a SIMM is to press and hold down the mounting tabs with your thumbs while raising the SIMM with your index fingers.

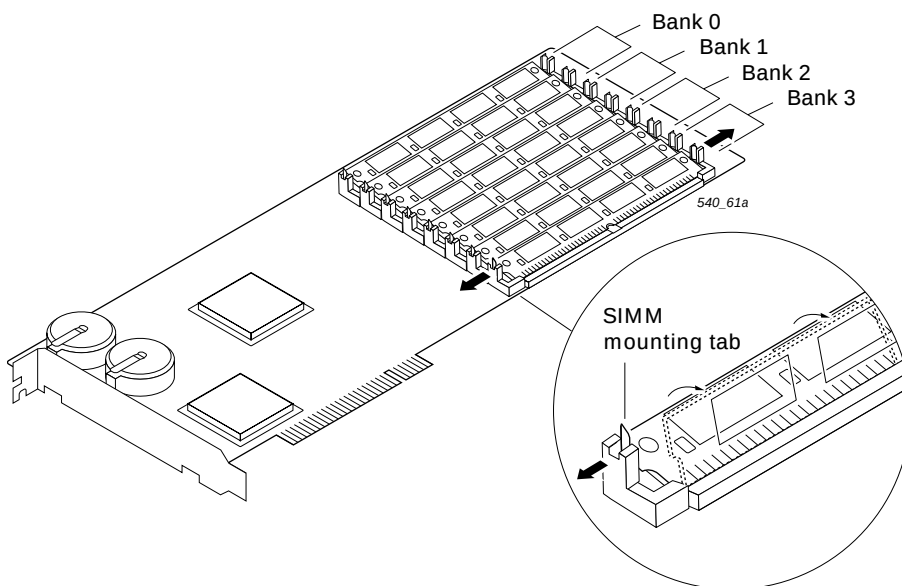


Figure 2-5. Releasing the NVRAM SIMM

5. Set the SIMMs you've removed aside in an antistatic bag.

Installing the NVRAM SIMMs

Follow these steps to install the NVRAM SIMMs:

1. Turn the SIMM so that its locator notch is towards the lithium batteries.

Hold the SIMM at the top corners to avoid damaging the components or the edge connector.

2. Starting with the first unoccupied slot closest to the top edge of the NVRAM card, align the SIMM over the slot and then tilt the top edge of the SIMM at a slight angle towards the top edge of the NVRAM card. Figure 2-6 illustrates how to align a SIMM to insert it in a slot.

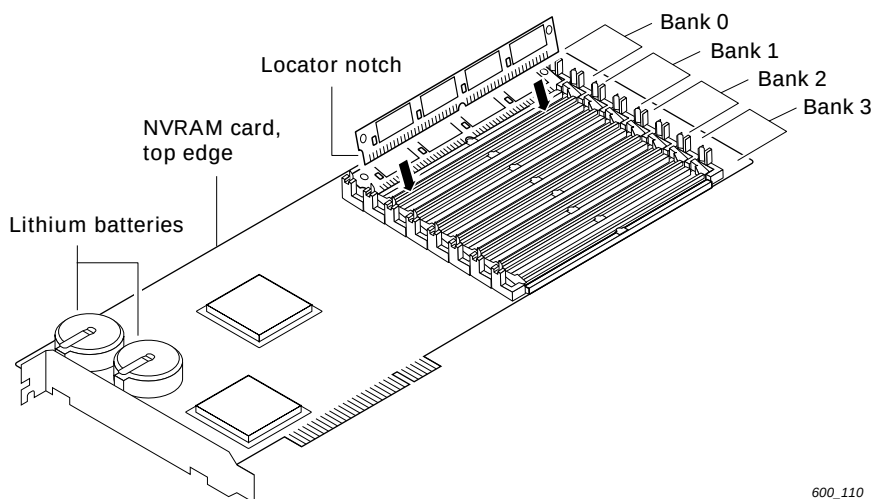


Figure 2-6. Aligning the NVRAM SIMM with its slot

3. Insert the SIMM at an angle into the slot.

The SIMM should go into the slot easily. If not, realign the SIMM with the slot and try again. The SIMM should slide into the slot easily if you wiggle the SIMM into position.

4. Push downward on the top edge of the SIMM until the mounting tabs close over the SIMM to lock it in place. Figure 2-7 illustrates how to lock an NVRAM SIMM in place in its slot.



CAUTION: Visually inspect the SIMM to verify that it is evenly aligned and fully inserted into the slot; otherwise, the SIMM could bend or break when pushed to the locked position.

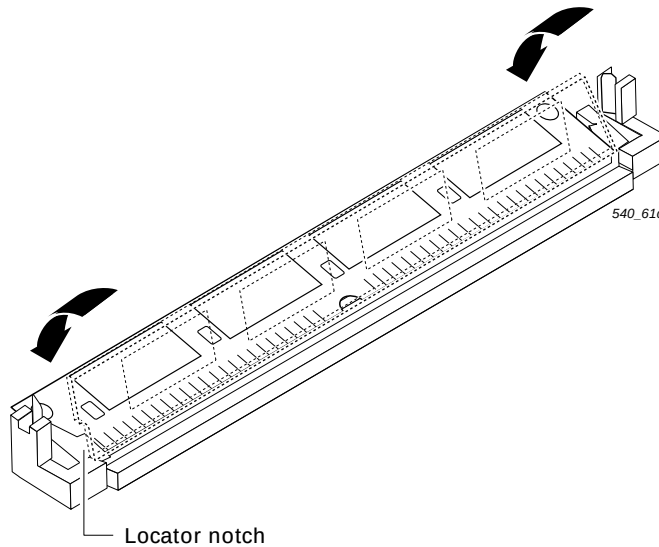


Figure 2-7. Locking the NVRAM SIMM into place

5. Reinstall the NVRAM card into its original slot.
6. Push in the backplane carrier and tighten the six thumbscrews on the back panel.
7. Power on the filer.

To verify that the added NVRAM has been detected, use the `sysconfig -v` command to display the configuration information and check the NVRAM section, which should display information similar to the following:

```
Slot 9: NVRAM (NetApp NVRAM II)
      Revision:      A0
      Serial Number: 6007
      Memory Size:   32 MB
      Battery 1 Status: 100% (3.30v)
      Battery 2 Status: 100% (3.29v)
```

Removing lithium battery insulators

NVRAM cards are shipped from the factory with a plastic sheet inserted between the positive (+) side of the batteries and the positive terminals on the battery holders. This insulator prevents the batteries from draining while the card is stored. The insulator must be removed before installing the NVRAM card in a filer.

To remove the battery insulator, grip the insulator and pull it out from between the battery and the positive terminal on the battery holder.

Changing the NVRAM lithium batteries

The NVRAM card has two lithium batteries. Figure 2-8 shows the battery locations.

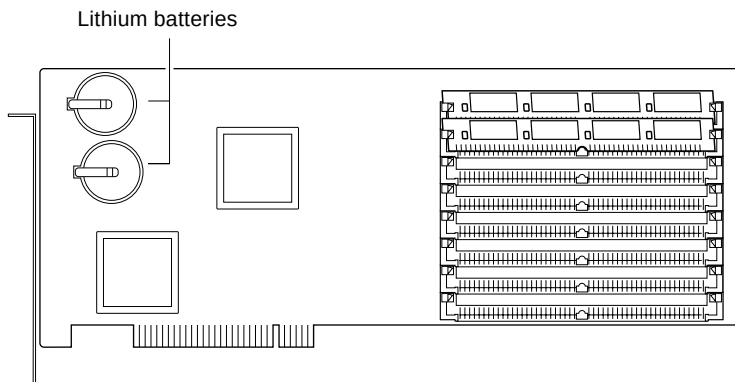


Figure 2-8. NVRAM lithium battery locations

To protect data integrity during a power failure, replace both lithium batteries when the filer indicates that the batteries are low.



NOTE: The lithium batteries on the NVRAM card differ from the lithium battery used on the system card. The batteries for the NVRAM card and the system card cannot be interchanged.

Removing the NVRAM lithium batteries

Follow these steps to remove the NVRAM lithium batteries:

1. Shut down the filer.



CAUTION: You must shut down the filer; otherwise, the NVRAM data will be lost.

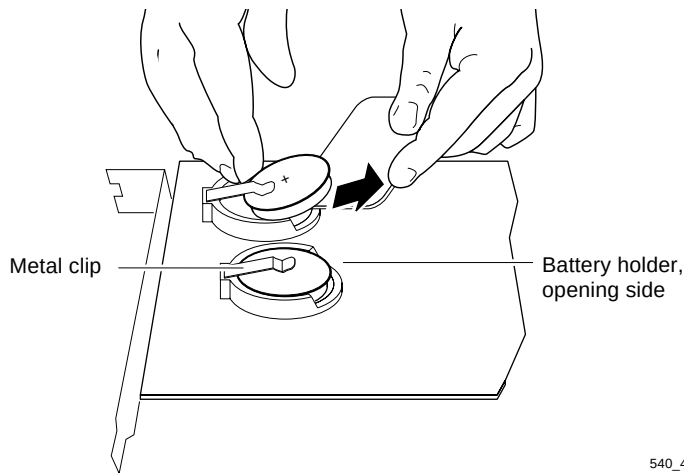
2. Loosen the six thumbscrews on the back panel and pull out the backplane carrier.
3. Remove the NVRAM card from the expansion slot and set the card aside on an antistatic surface.

4. Lift up the lithium battery while pushing the battery towards the open side of the battery holder. Figure 2-9 illustrates how to remove a battery from a battery holder.

You can insert a nonconducting tool such as a credit card to help lift the battery.



CAUTION: Do not bend the metal clip because this will damage the connection between the battery and the NVRAM card.



540_48

Figure 2-9. Removing the NVRAM lithium battery

5. Dispose of the old batteries according to the manufacturer's instructions that come with the replacement batteries.

Installing the NVRAM lithium batteries

Follow these steps to install the NVRAM lithium batteries:



WARNING: There is danger of explosion if a battery is replaced incorrectly. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

1. Turn the battery so that the positive side is up (marked with a “+”).
2. Push the battery under the metal clip through the open side of the battery holder so that the battery sits flush inside the battery holder.
3. Reinstall the NVRAM card into its original slot.
4. Push in the backplane carrier and tighten the six thumbscrews on the back panel.
5. Power on the filer.

Installing or replacing expansion cards

This section describes the general steps involved in replacing an expansion card or installing a new expansion card.



NOTE: Before replacing a differential SCSI card for tape devices or an NVRAM card, make sure the card has been prepared according to “Differential wide SCSI card for external tape devices” on page 2-3.

Replacing or removing an existing expansion card

To replace or remove existing expansion cards, follow these steps:



NOTE: Because of its special handling requirements and cable connections, the system card is covered separately in Chapter 3, “System card and backplane.”

1. Shut down the filer and disk shelves.
2. Note which cables (if any) are connected to the connectors on the faceplate of the expansion card, and then disconnect the cables.



CAUTION: Do not disconnect SCSI cables from, or connect SCSI cable to filer SCSI connectors while the filer is powered up. You may cause permanent damage to the SCSI cards in the filer.

3. Unscrew the six captive thumbscrews that secure the system backplane carrier in the cabinet.
4. If you are replacing the environmental card, disconnect the cables from the internal connectors on the top edge of the card.

Figure 2-10 shows the location of the internal cables connected to the environmental card:

- P2 fan assembly cable connector
- P100 LCD control panel cable connector
- P1 input/output cable connector
- P6 input cable

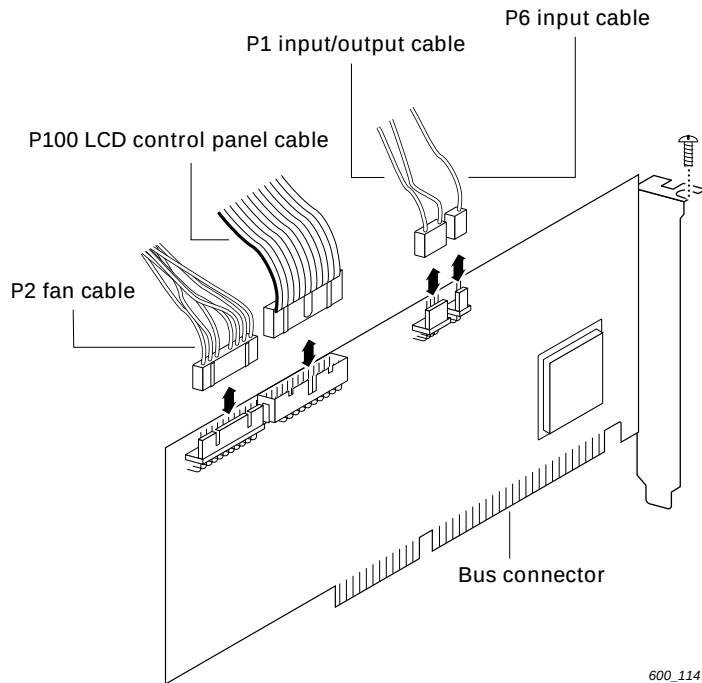


Figure 2-10. Environmental card connections

5. If you are replacing or removing the differential wide SCSI card for disk shelves, disconnect the internal SCSI ribbon cable from the internal connector on the top edge of the differential wide SCSI card.

Figure 2-11 shows the location of the internal connector on the top edge of the card.

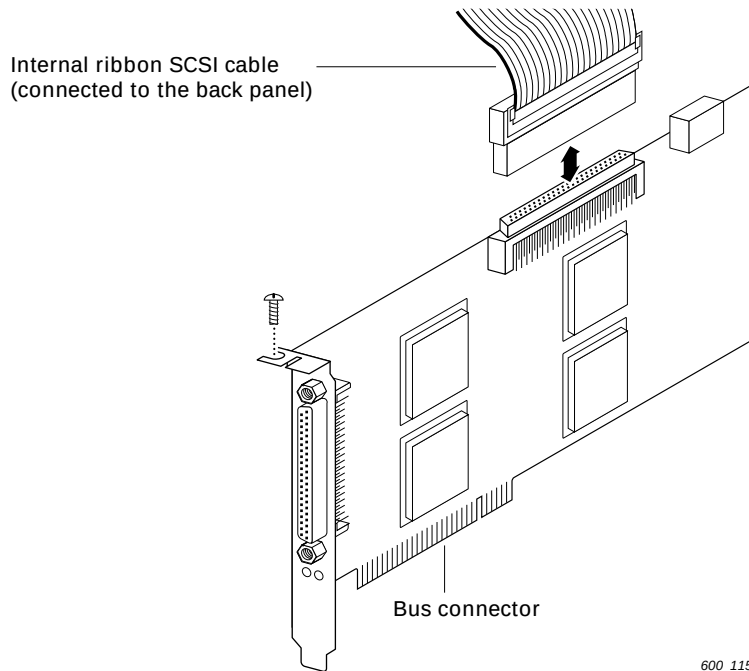
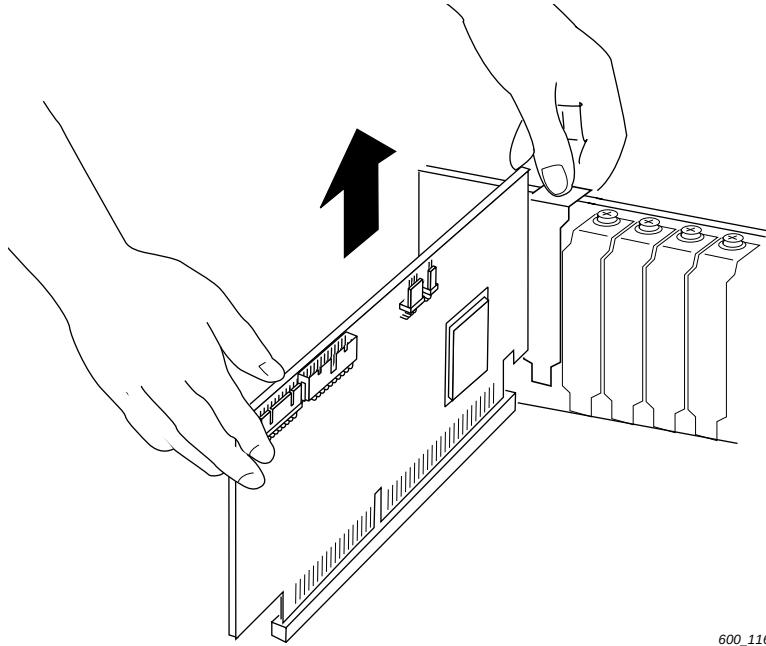


Figure 2-11. Dual-channel differential wide SCSI card internal cable connection

6. Remove the screw holding the expansion card faceplate to the back panel bracket.

Save the screw for reinstalling the card.

7. Pull upward on the top edge of the expansion card and lift it out of the chassis (see Figure 2-12).



600_116

Figure 2-12. Removing an expansion card

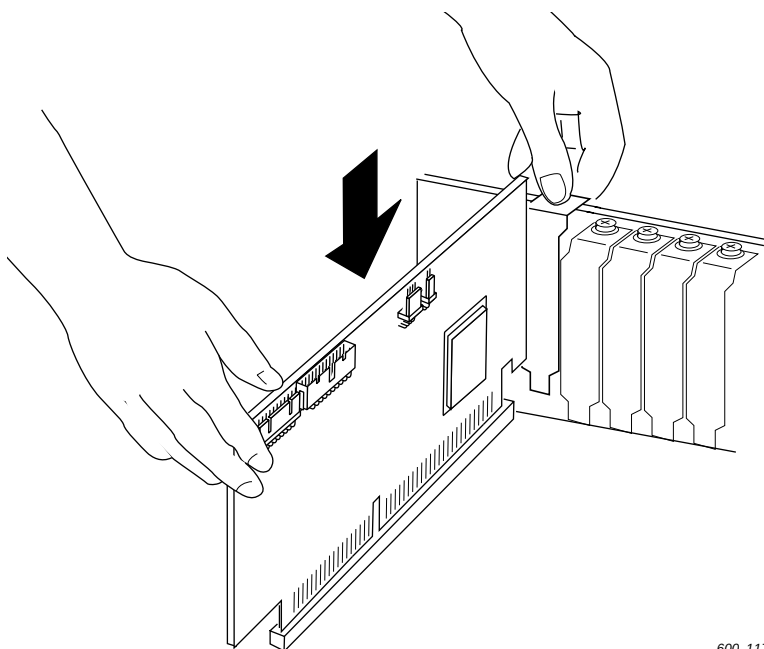
8. If you are not installing a replacement card, install a slot cover using the screw you saved in step 6, and then skip to step 14.
9. If you are installing a replacement card, pull the replacement card out of its antistatic bag and put the card you are replacing into the same antistatic bag.

10. Install the replacement expansion card:

- a. Hold the card by its top edge, with the faceplate near your left hand.
- b. Lower the card into the slot until its connector edge meets the grooves in the system backplane expansion slot (see Figure 2-13).

The faceplate of the card should be in position against the back panel, and should cover the endplate slot on the back panel.

- c. Press carefully on the top edge of the card until the edge connector is seated in the system backplane expansion slot.
- d. Replace the faceplate screw to secure the card to the back panel bracket of the system backplane carrier.



600_117

Figure 2-13. Installing an expansion card

11. If you are installing an environmental card, reconnect the cables to the internal connectors on the top edge of the card (see Figure 2-10 on page 2-14).
12. If you are installing a differential wide SCSI card for disk shelves, reconnect the SCSI cable to the internal connector on the top of the card (see Figure 2-11 on page 2-15).
13. Reconnect the cables to the external connectors on the replacement expansion card.
14. Push in the system backplane carrier and tighten the six thumbscrews on the back panel.
15. Turn on power to the filer and disk shelves.

Installing a new expansion card

This section describes the procedure for adding a new expansion card to the filer. Depending on the type of card you are installing, you may need to prepare the card for installation (refer to “Preparing expansion cards” on page 2-3).

Follow these steps to add an expansion card to a filer:

1. Shut down the filer.
2. Turn off power to the filer and disk shelves.
3. Loosen the six thumbscrews on the back panel and pull out the system backplane carrier.
4. Identify the backplane expansion slot where the new expansion card will be installed.

For information about expansion slot assignments, refer to the “NetApp on the Web” (NOW) Web page at <http://now.netapp.com>.

5. Remove the screw holding the slot cover to the back panel of the backplane carrier.

Save the screw for installing the new expansion card.

6. Hold the card by its top edge, with the faceplate near your left hand.
7. Lower the card into the slot until its edge connector meets the grooves in the backplane expansion slot.

The faceplate of the card should be in position against the back panel and should cover the endplate slot on the back panel.

8. Press carefully on the top edge of the card until the edge connector is seated in the backplane expansion slot.
9. Insert and tighten the faceplate screw to secure the card to the back panel of the backplane carrier.

10. If you are installing an additional differential wide SCSI card into expansion slot 7:
 - a. Disconnect the internal SCSI cable from the internal connector on the top edge of the SCSI card in expansion slot 8 and fold the cable over the top of the backplane carrier back panel.

This step makes it easier to see what you are doing when you install the new SCSI card and its internal cable.

- b. Remove the port 7b metal knock-out plate on the back panel by inserting a screwdriver (from the inside of the backplane carrier) into the center hole and pushing out the knock-out plate.

Figure 2-14 shows the location of port 7b on the backplane carrier back panel.

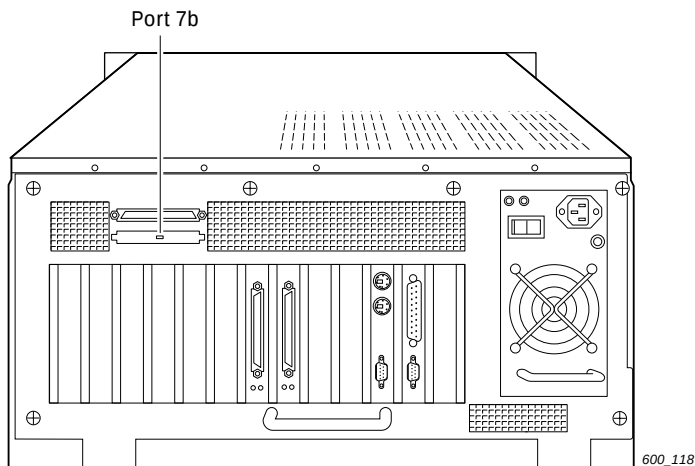


Figure 2-14. Dual-channel SCSI card port 7b location

- c. Discard the knock-out plate.
 - d. Locate the SCSI ribbon cable (included with the new SCSI card).

This ribbon cable has a shielded external SCSI-2 connector on one end, and an unshielded internal SCSI-2 connector on the other end.

- e. Insert the shielded external SCSI-2 connector on the SCSI ribbon cable into the port 7b opening from the inside of the backplane carrier.

Figure 2-15 shows the installation of the internal SCSI cable.

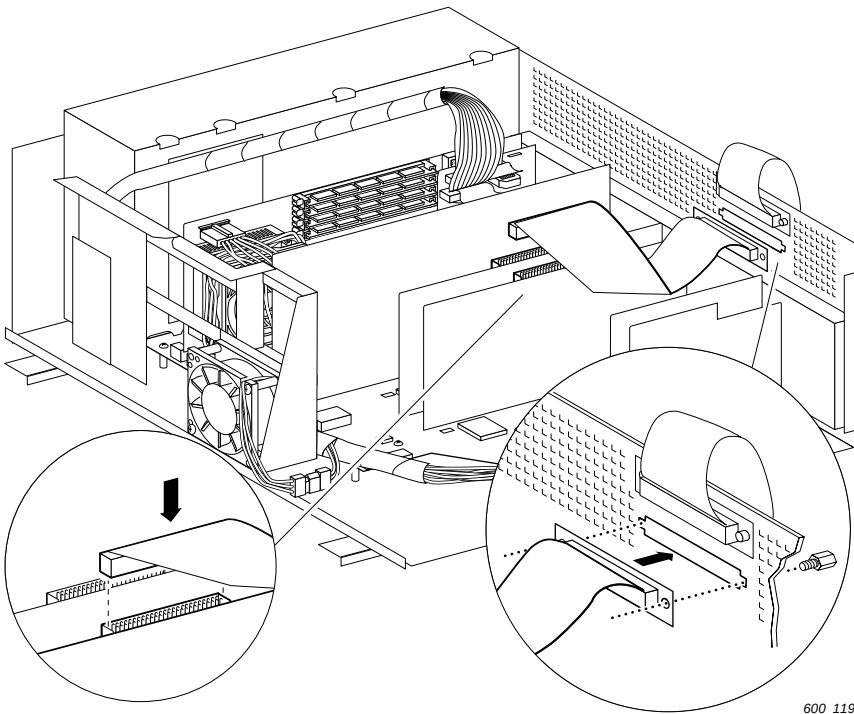


Figure 2-15. Differential wide SCSI card internal cable connection

- f. Insert the two screw locks from the outside of the carrier back panel and tighten them to secure the cable connector in the port 7b opening.



CAUTION: To avoid cross-threading the screw locks, start the screw locks by hand and then tighten them carefully using a 1/4-inch wrench or nut driver.

- g. Press the unshielded internal SCSI connector of the ribbon cable onto the internal SCSI connector on the top edge of the SCSI card in expansion slot 7 (see Figure 2-15 on page 2-21).
 - h. Reconnect the 8b internal SCSI cable to the internal SCSI connector on the top edge of the SCSI card in expansion slot 8.
11. Connect the external cable (if any) to the connector on the faceplate of the expansion card.
 12. Push in the backplane carrier and tighten the six thumbscrews on the back panel.
 13. Power on the filer and disk shelves.

Chapter 3: System card and backplane

This chapter describes the procedures for removing and installing the NetApp F600 system card assembly and the system backplane. It also describes the procedures for replacing or upgrading the following units on the system card:

- DRAM DIMMs (dual in-line memory modules) for the system memory
- CPU fan
- lithium battery



CAUTION: The filer uses electronic components that are sensitive to static electricity. Static discharge from your clothing or other fixtures around you can damage these components. Wear an antistatic wrist strap and grounding leash to free yourself of static electricity before touching any electronic components.

NetApp F600 system card

The NetApp F600 system card is actually an assembly consisting of two cards: the system card, which provides all the core computational logic, and the daughter card, which provides the system I/O functions.

Figure 3-1 illustrates the layout of the main components on the system card assembly. Figure 3-2 shows an exploded view of the system card and the daughter card, including the I/O cables that link the daughter card to connectors on the faceplate of the system card. Figure 3-3 shows the layout of the system card. Table 3-1 further describes the main components of the system card. Figure 3-4 shows the layout of the daughter card. Table 3-2 further describes the connectors on the daughter card.

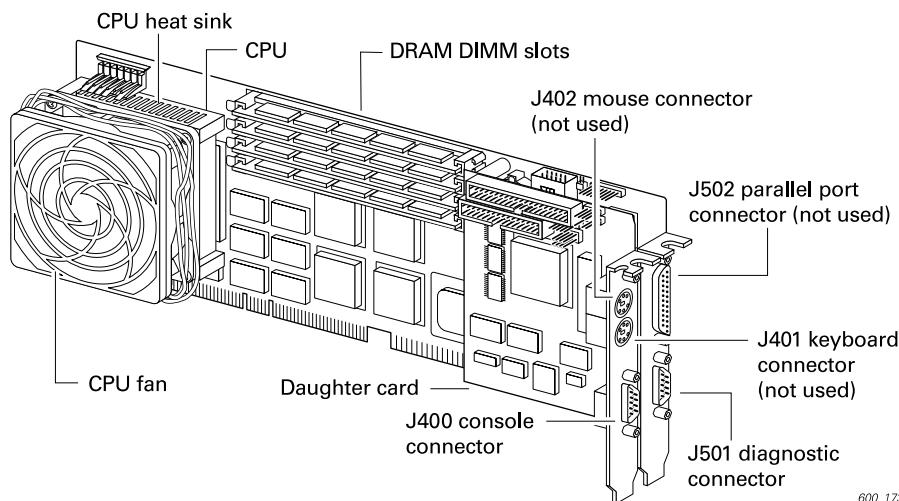


Figure 3-1. Main components of the system card assembly

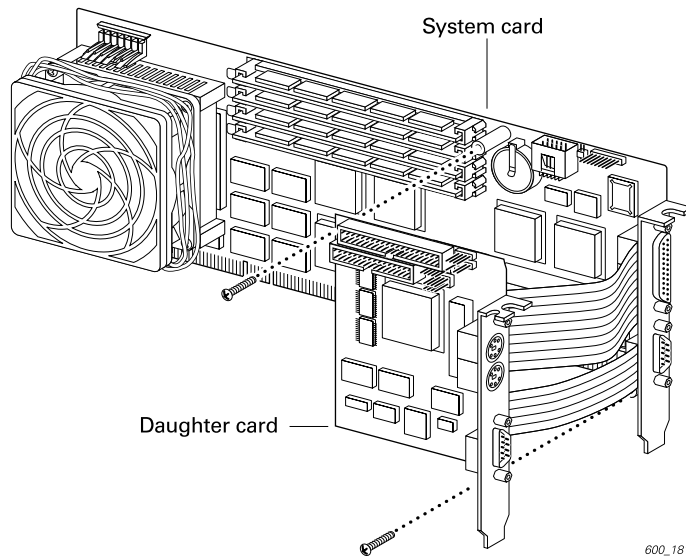


Figure 3-2. System card and daughter card, exploded view

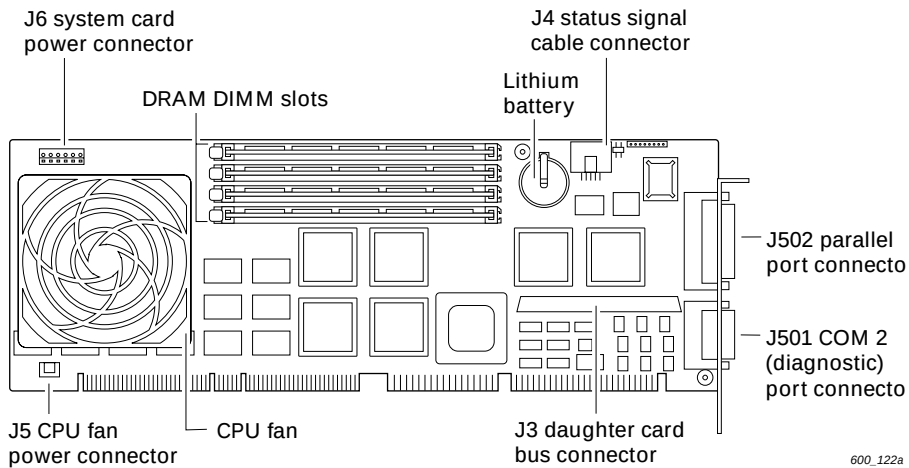
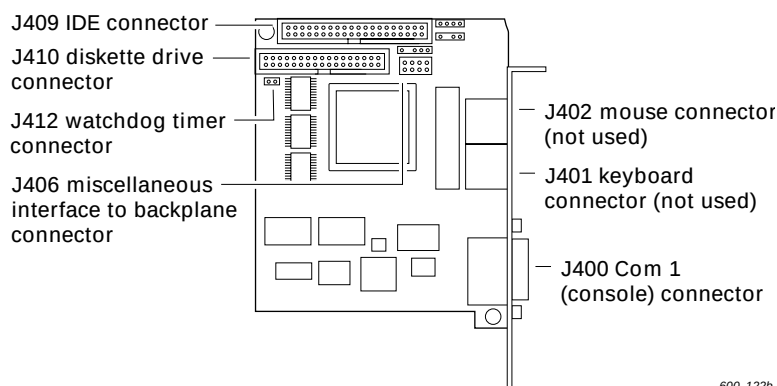


Figure 3-3. Main components of the system card

Table 3-1. Main components of the system card

Component	Description
CPU	The CPU is not a field replaceable unit.
CPU fan	A CPU fan is mounted on the CPU heat sink. This fan must be operating any time the filer is powered on. Refer to “Replacing the CPU fan” on page 3-31 for replacement instructions.
DRAM DIMMs	The system card uses 168-pin, 64-MB or 128-MB DRAM DIMMs that are installed into four DIMM slots (J100, J101, J102, and J103) for memory configurations expandable from 128 MB to 512 MB.
J502	25-pin parallel port connector on the faceplate, but not used; cabled to J502 on the underside of the daughter card.
J501	9-pin serial port connector on the faceplate. The serial port is labeled COM 2 on the filer back panel, and is the diagnostic port for the filer. This connector is cabled internally to J501 on the underside of the daughter card.
J4	Connector for status signal cable from backplane
J5	Connector for CPU fan power cable
J6	Connector for system card power cable
Lithium battery	The system card uses one 3.3-volt lithium battery to provide backup power to the real-time clock and system card firmware configuration NVRAM. The lithium battery on the system card differs from the batteries on the NVRAM card. The batteries for the system card and the NVRAM card cannot be interchanged.



600_122b

Figure 3-4. Daughter card connectors

Table 3-2. Daughter card connectors

Connector	Description
J400	9-pin serial port connector on the faceplate. This serial port is labeled COM 1 on the filer back panel, and is the console port for the filer.
J401	Keyboard connector (not used)
J402	Mouse connector (not used)
J403	Fan status cable
J406	Miscellaneous interface cable from the backplane
J409	Integrated Drive Electronics (IDE) interface with Direct Memory Access (DMA) support
J410	Diskette drive interface
J412	Watchdog timer monitor

Replacing the system card assembly

This section describes the procedures for removing and installing the system card assembly.

Removing the system card assembly

Follow these steps to remove the system card assembly:

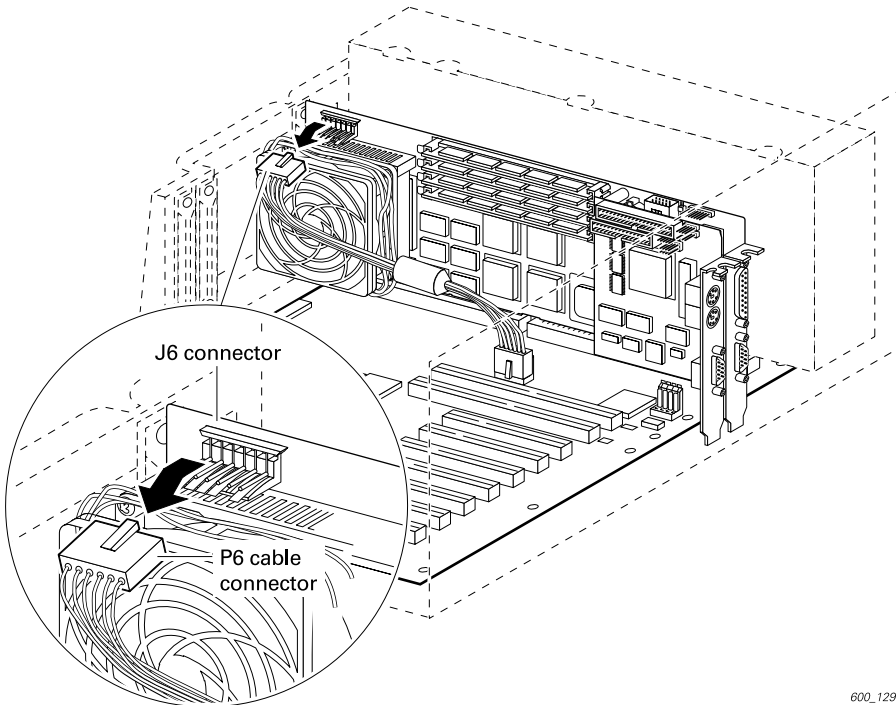
1. Shut down the filer.
2. Disconnect any cables connected to the COM 1 (console) or COM 2 (diagnostic) faceplate connectors of the system card and daughter card on the back panel of the filer.
3. Loosen the six thumbscrews on the back panel and pull out the backplane carrier.



NOTE: To gain access to the cable connectors attached to the system card assembly, you may need to remove one or more expansion cards for working space (refer to “Replacing or removing an existing expansion card” on page 2-13).

4. Unplug the P6 power cable connector from the J6 connector on the system card.

Figure 3-5 shows the power cable in relation to the J6 connector on the system card.

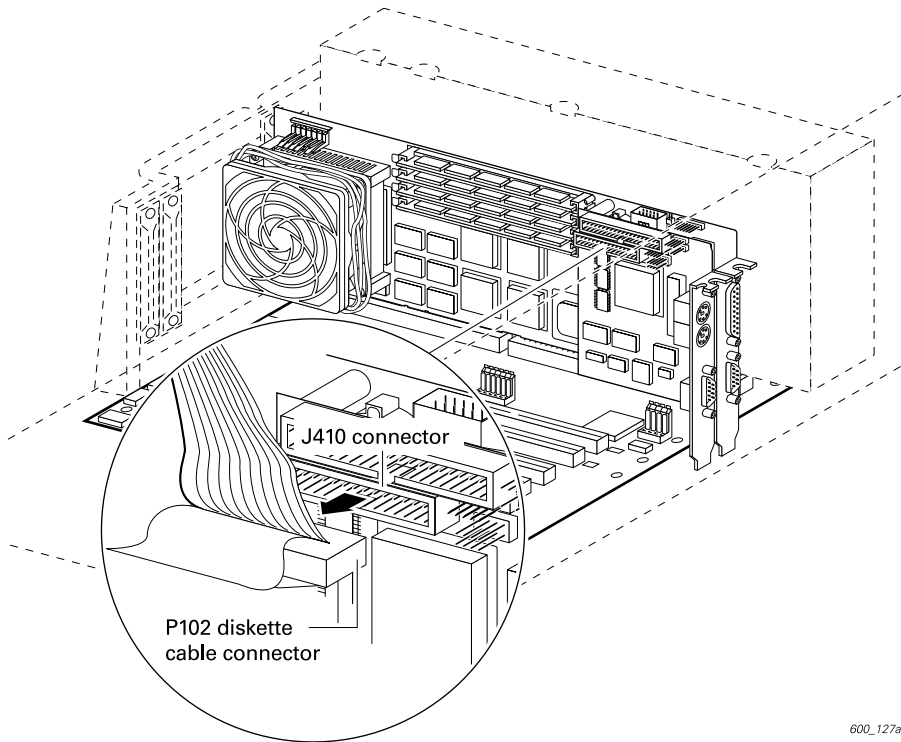


600_129a

Figure 3-5. Disconnecting the system card P6 power cable

5. Unplug the P102 diskette drive ribbon cable connector from the J410 connector on the daughter card.

Figure 3-6 shows the P102 diskette drive cable connector in relation to the J410 connector on the daughter card.

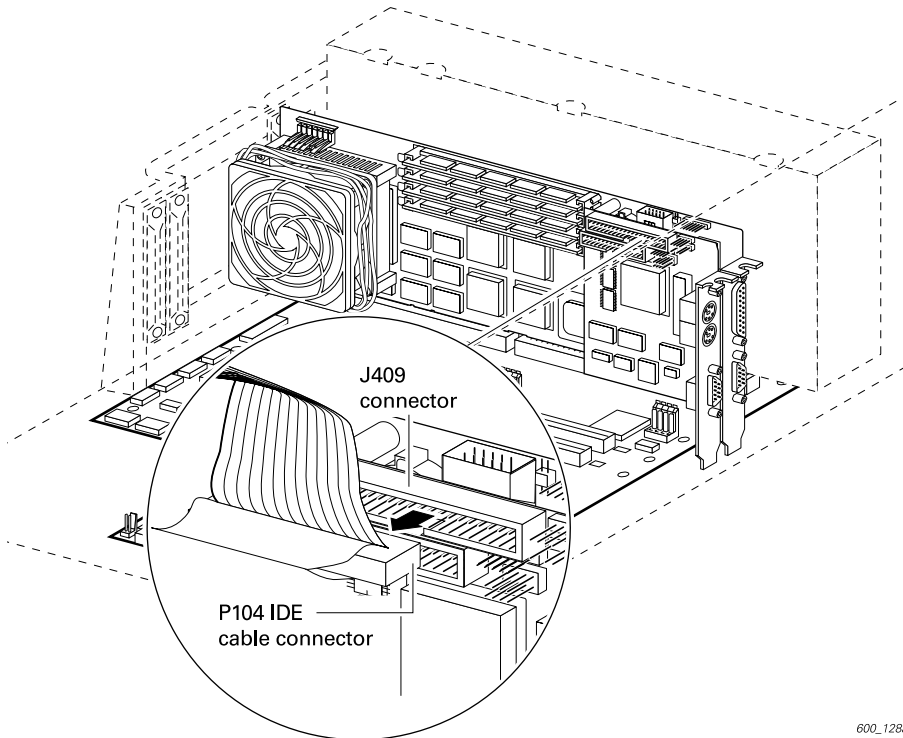


600_127a

Figure 3-6. **Disconnecting the daughter card P102 diskette drive cable**

6. Unplug the P104 IDE ribbon cable connector from the J409 connector on the daughter card.

Figure 3-7 shows the P104 IDE cable connector in relation to the J409 connector on the daughter card.



600_128a

Figure 3-7. Disconnecting the daughter card P104 IDE cable

7. Unplug the P5 watchdog timer cable connector from the J412 connector on the daughter card.

Figure 3-8 shows the P5 watchdog timer cable connector in relation to the J412 connector on the daughter card.

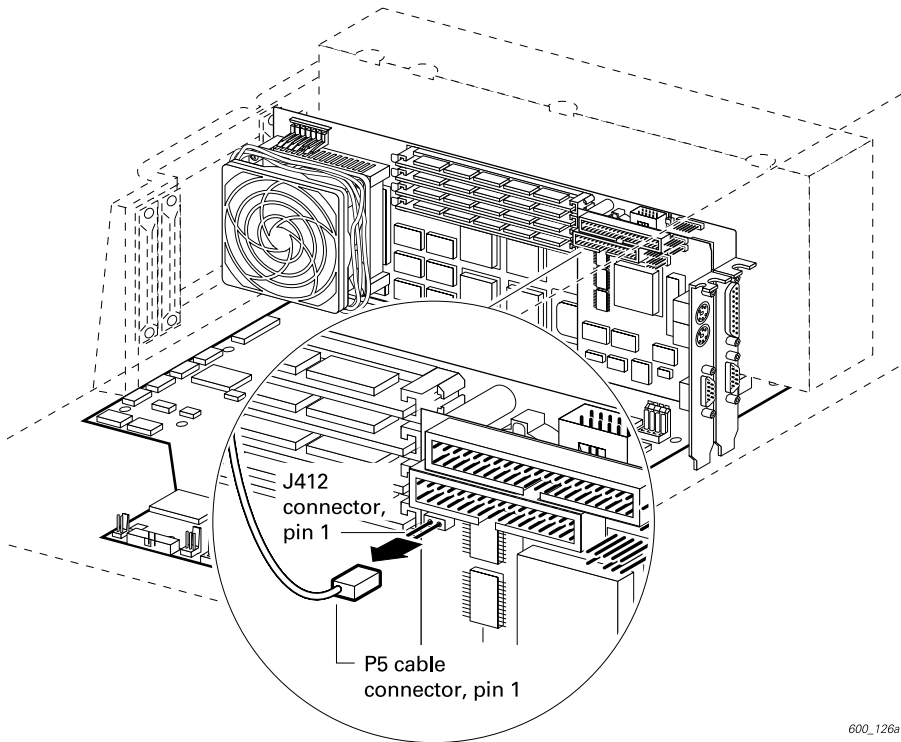


Figure 3-8. Disconnecting the daughter card P5 watchdog timer cable

8. Unplug the P403 fan status cable connector from the J403 connector on the daughter card.

Figure 3-9 shows the P403 fan status cable connector in relation to the J403 connector on the daughter card.

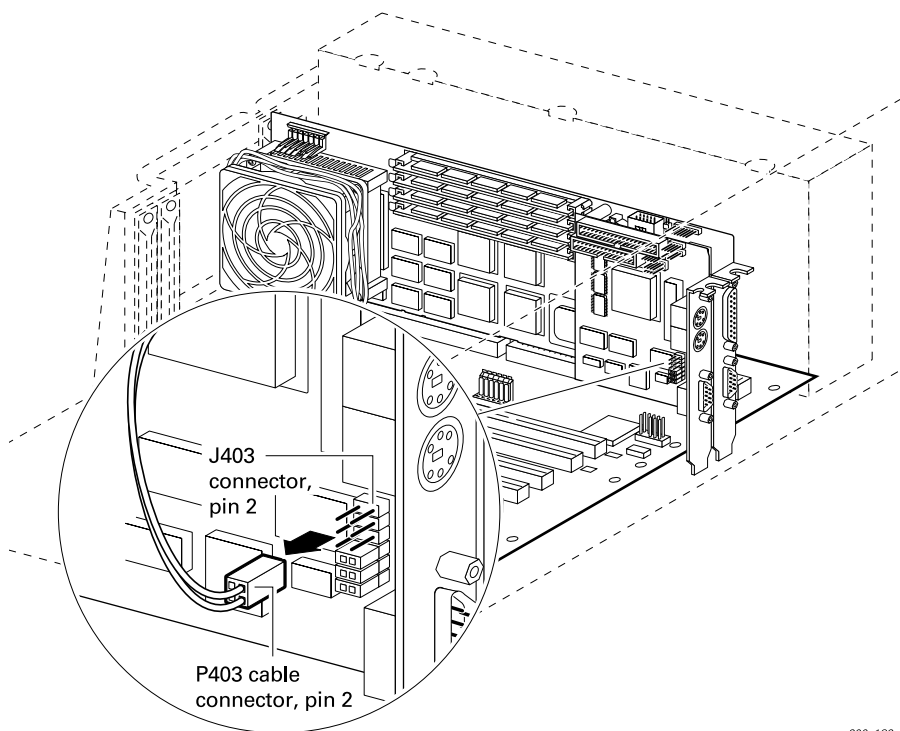
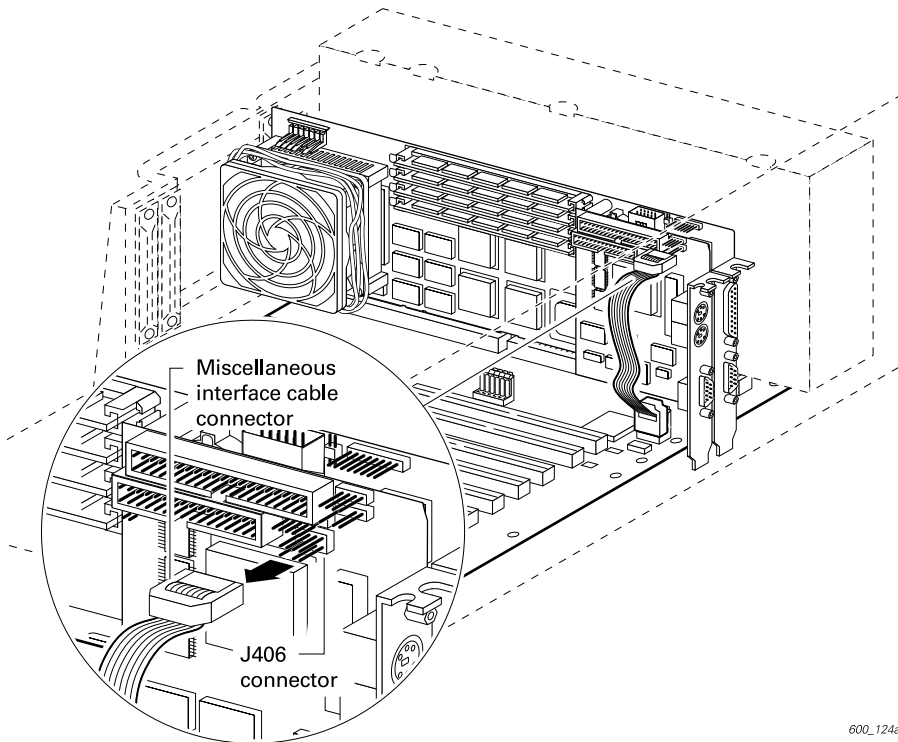


Figure 3-9. Disconnecting the daughter card P403 fan status cable

9. Unplug the miscellaneous interface ribbon cable connector from the J406 connector on the daughter card.

Figure 3-10 shows the miscellaneous interface cable connector in relation to the J406 connector on the daughter card. The other end of this cable connects to the J39 connector on the system backplane.



600_124a

Figure 3-10. Disconnecting the daughter card miscellaneous interface cable

10. Unplug the status signal cable from the J4 connector on the top edge of the system card.

Figure 3-11 shows the status signal cable connector in relation to the J4 connector on the system card.

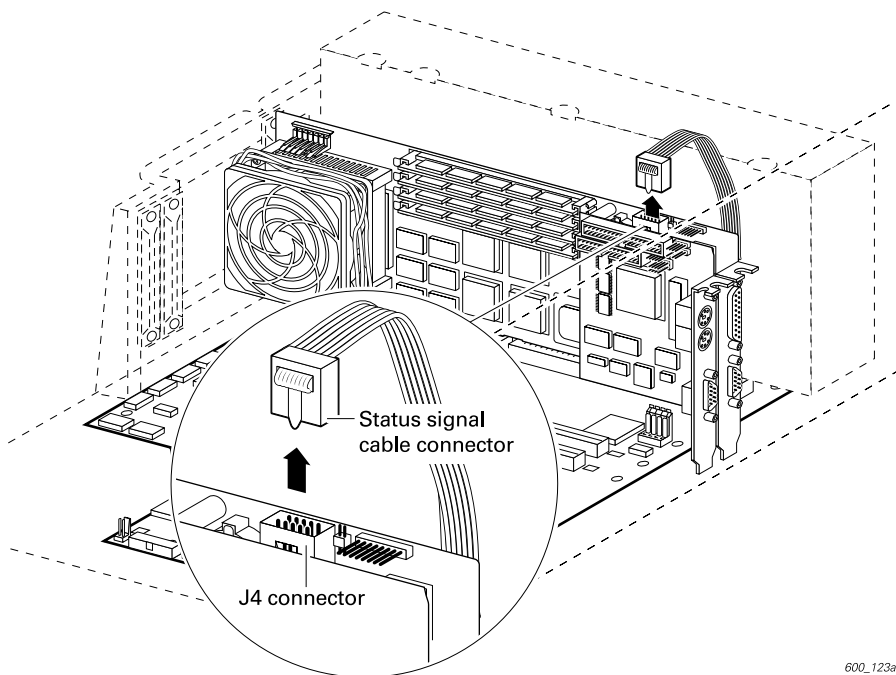


Figure 3-11. Disconnecting the system card status signal cable

11. Remove the two screws that fasten the faceplates of the system card and daughter card to the back panel.
12. Pull upward on the top edge of the system card assembly and lift it out of the chassis.

13. Remove the DRAM DIMMs from the system card and place them in antistatic bags. Refer to “Adding or changing DRAM DIMMs” on page 3-24 for instructions on removing DRAM DIMMs.

The DRAM DIMMs will be installed on the replacement system card.

14. Place the system card assembly in an antistatic bag and set it aside.

Installing the system card assembly

Follow these steps to install the system card:

1. Install the DRAM DIMMs into the slots on the new system card as described in “Adding or changing DRAM DIMMs,” on page 3-24.
2. Insert the new system card assembly into its assigned slot in the backplane.
3. Insert and tighten the two screws to secure the faceplates of the system card and daughter card to the back panel of the backplane carrier.

4. Plug the P6 power cable connector into the J6 connector on the system card.

Figure 3-12 shows the power cable in relation to the J6 connector on the system card

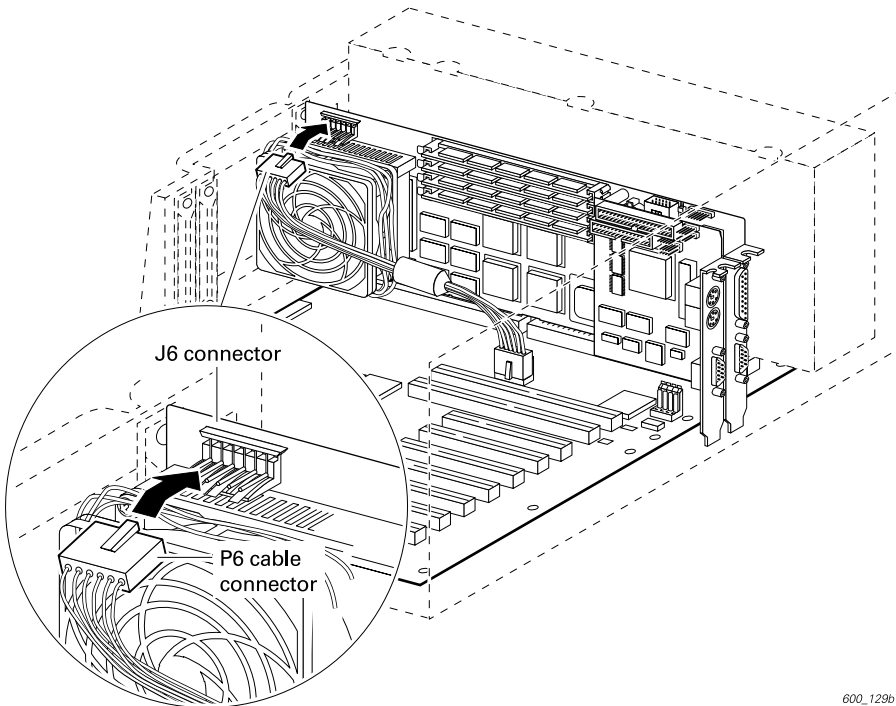
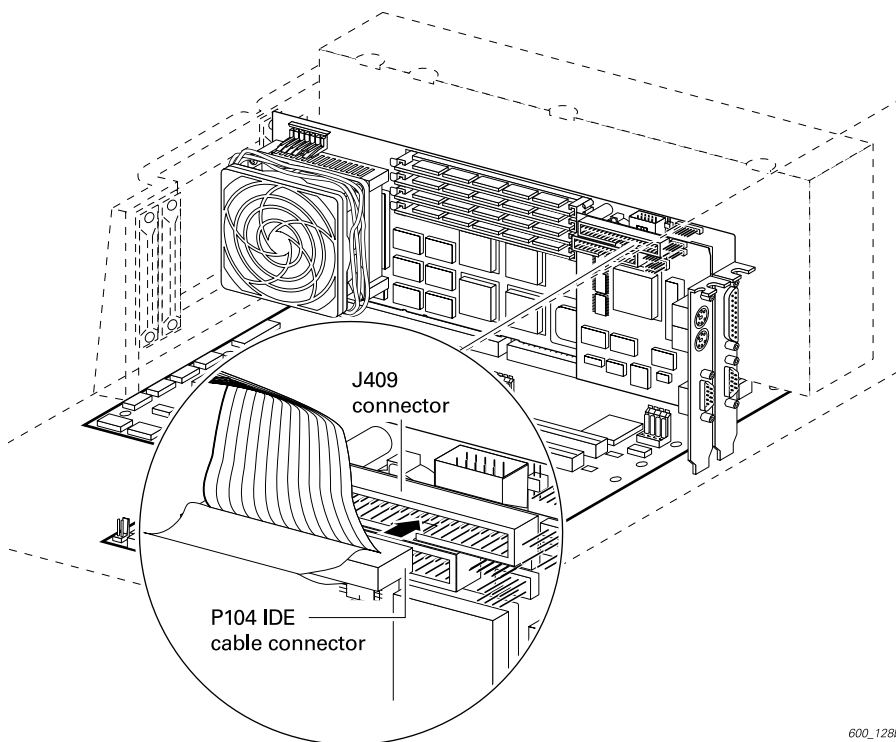


Figure 3-12. Connecting the system card P6 power cable

5. Plug the P104 IDE ribbon cable connector into the J409 connector on the daughter card.

Figure 3-13 shows the P104 IDE cable connector in relation to the J409 connector on the daughter card.



600_128b

Figure 3-13. Connecting the daughter card P104 IDE cable

6. Plug the P102 diskette drive ribbon cable connector into the J410 connector on the daughter card.

Figure 3-14 shows the P102 diskette drive cable connector in relation to the J410 connector on the daughter card.

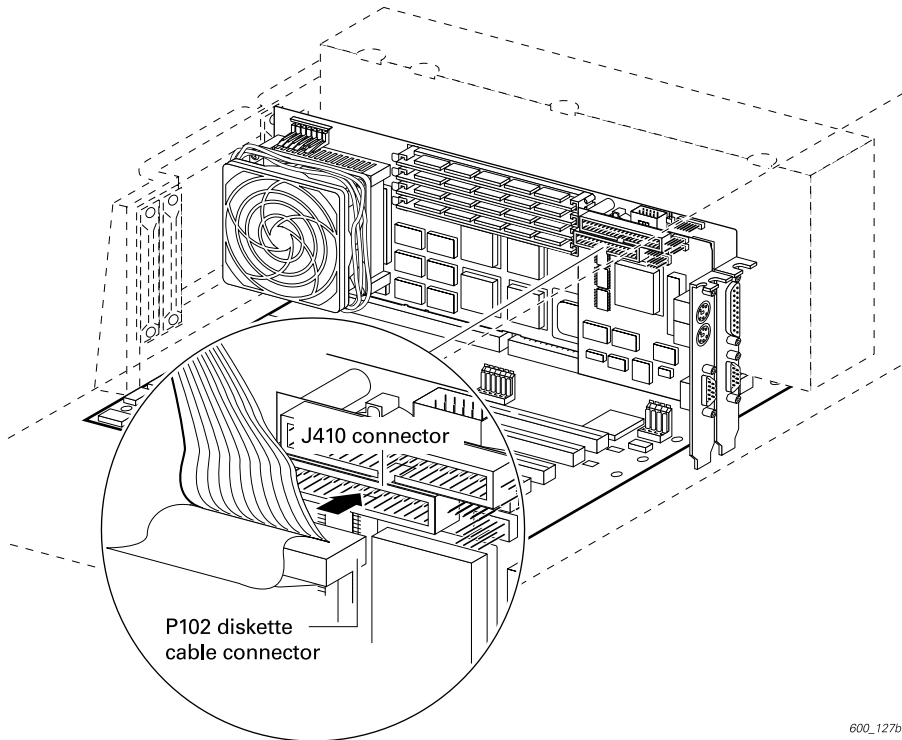


Figure 3-14. Connecting the daughter card P102 diskette drive cable

7. Plug the P5 watchdog timer cable connector into the J412 connector on the daughter card.

Figure 3-15 shows the P5 watchdog timer cable connector in relation to the J412 connector on the daughter card.



NOTE: The P5 connector must be plugged into the J412 connector so that the wire is on pin 1 of the J412 connector.

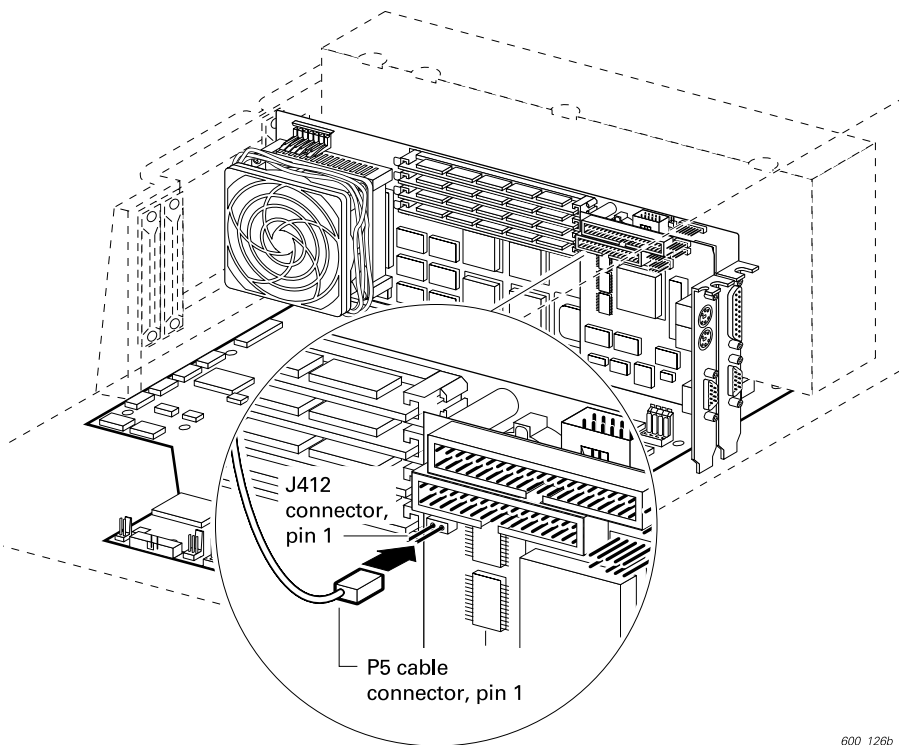


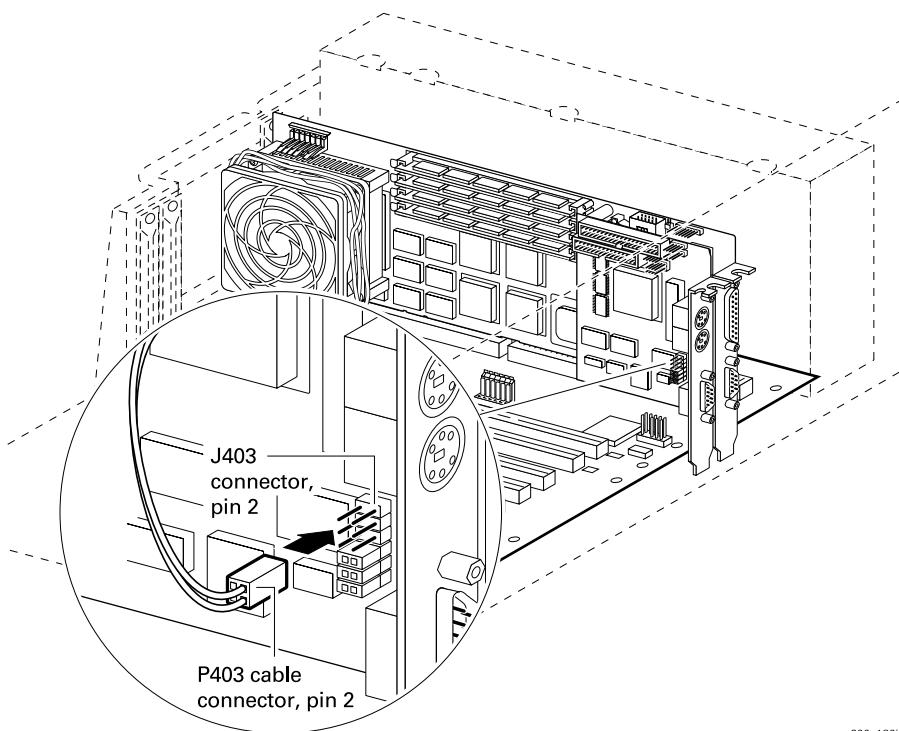
Figure 3-15. Connecting the daughter card P5 watchdog timer cable

8. Plug the P403 fan status cable connector into the J403 connector on the daughter card.

Figure 3-16 shows the P403 fan status cable connector in relation to the J403 connector on the daughter card.



NOTE: The P403 connector must be plugged into the J403 connector so that the two wires are on pin 2 and pin 4 of the J403 connector.

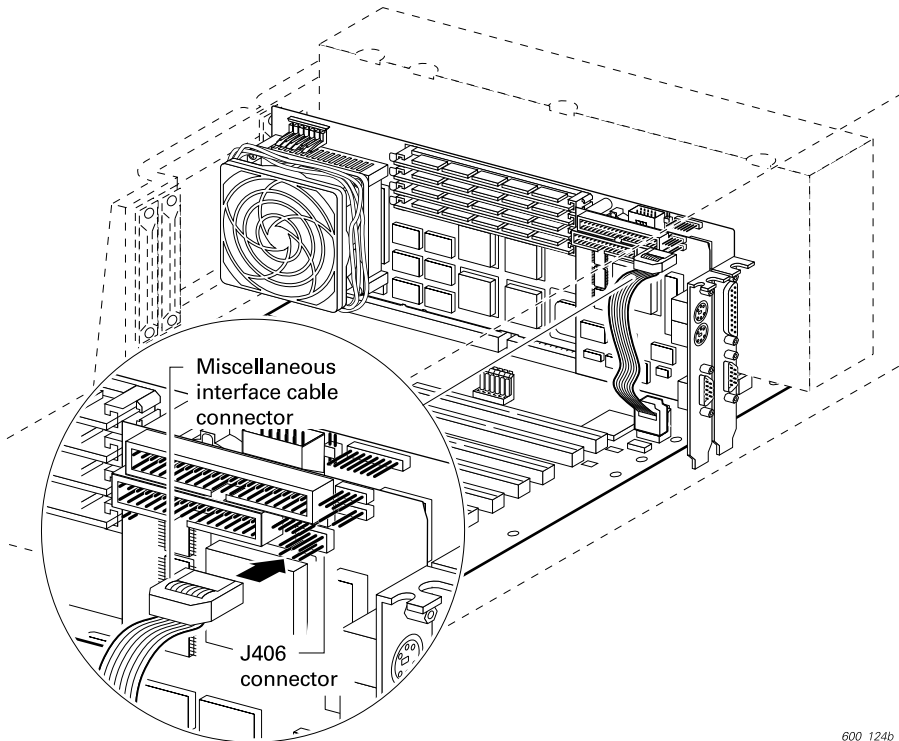


600_182b

Figure 3-16. Connecting the daughter card P403 fan status cable

9. Plug the miscellaneous interface ribbon cable connector into the J406 connector on the daughter card.

Figure 3-17 shows the miscellaneous interface cable connector in relation to the J406 connector on the daughter card. The other end of this cable connects to the J39 connector on the system backplane.

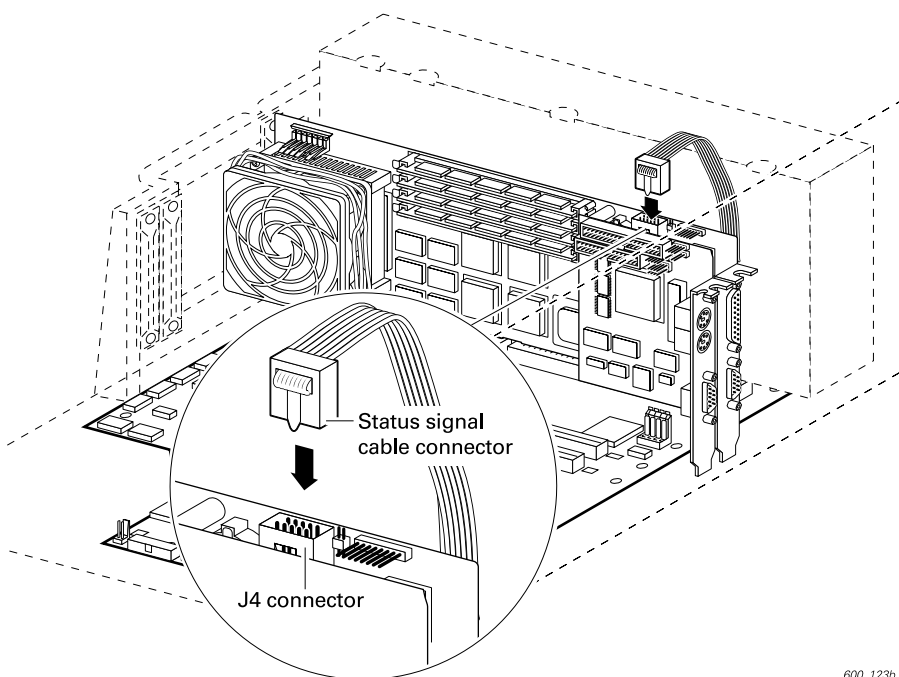


600_124b

Figure 3-17. Connecting the daughter card miscellaneous interface cable

10. Plug the status signal cable into the J4 connector on the system card.

Figure 3-18 shows the status signal cable in relation to the J4 connector on the system card.



600_123b

Figure 3-18. Connecting the system card status signal cable

11. Make sure that all the cables described in this procedure are securely attached to their connectors on the system card and daughter card.
12. Push in the backplane carrier and tighten the six thumbscrews on the back panel.
13. Reconnect cables (if any) to the COM 1 (console) or COM 2 (diagnostic) faceplate connectors of the system card and daughter card on the back panel of the filer.
14. Power on the filer.

Changing units on the system card assembly

This section provides the following information:

- verifying jumper settings on the system card
- adding or changing DRAM DIMMs for the system memory
- replacing the lithium battery
- replacing the CPU fan

Verifying jumper settings on the system card assembly

When you replace the system card assembly, you must check jumper positions on the two cards that make up the assembly (system card and daughter card) to verify that jumpers are set correctly.

System card

Figure 3-19 shows the locations and settings for the following jumper positions on the system card:

- J2
- J7, J8, and J9

Verify that these jumpers are set as shown in Figure 3-19.

Daughter card

Figure 3-20 shows the locations and settings for the following jumper positions on the daughter card:

- J403
- J411

Verify that these jumpers are set as shown in Figure 3-20.

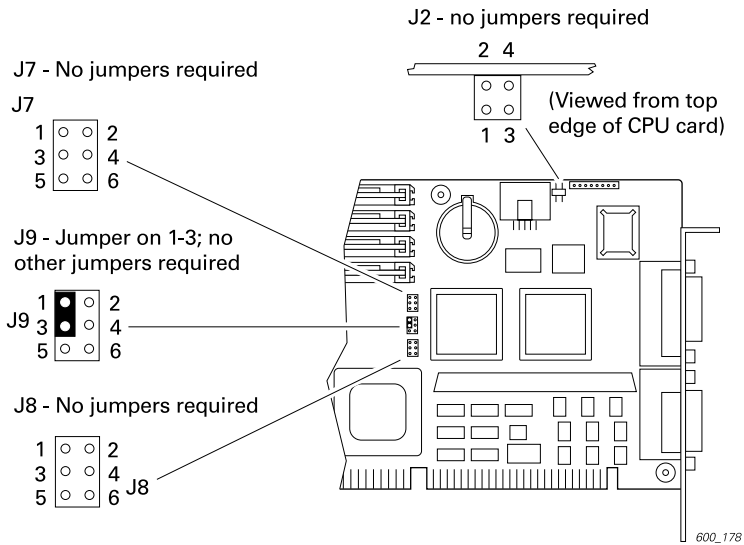


Figure 3-19. Jumper settings on the system card

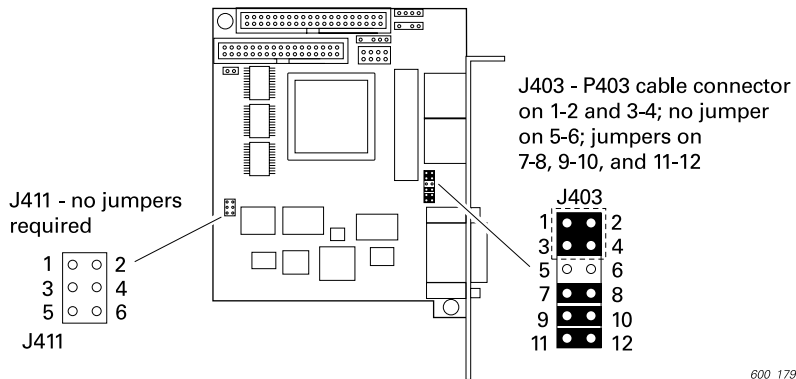


Figure 3-20. Jumper settings on the daughter card

Adding or changing DRAM DIMMs

This section provides the procedures for adding or replacing the DRAM DIMMs on the system card assembly. Figure 3-21 shows the location of the DRAM DIMM slots.

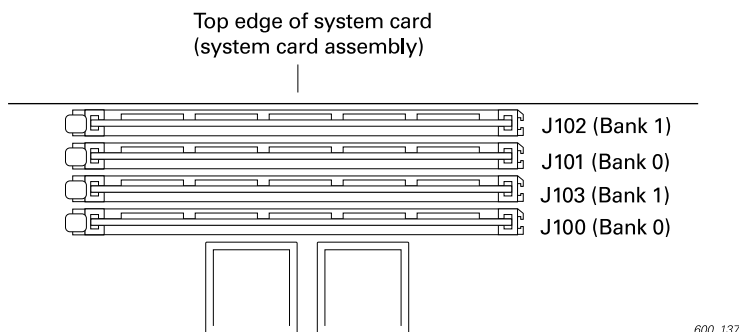


Figure 3-21. System card DRAM DIMM slots

The DRAM DIMMs must meet the following requirements:

- 3.3-volt, 72-bit, fast page mode ECC DIMMs. All DIMMs must be listed on the Network Appliance Approved Parts List. Contact Network Appliance Sales to obtain this list. Do not use unapproved DIMMs.
- All DIMMs must be the same size.
- Install the DIMMs in pairs (one bank). Install Bank 0 first (J100, then J101); install Bank 1 second (J102, then J103).

Figure 3-22 illustrates a typical DRAM DIMM.

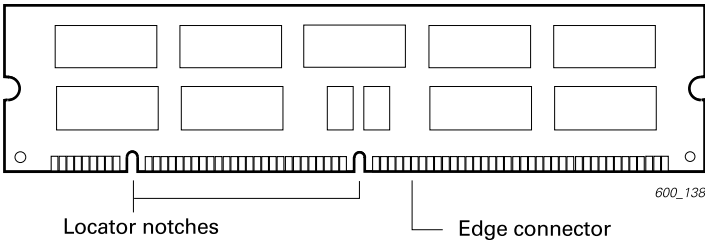


Figure 3-22. DRAM DIMM

Configuring the system memory

The possible configurations of the system memory are 128 MB, 256 MB, and 512 MB. You must add DRAM DIMMs one bank at a time starting with Bank 0. The possible DRAM DIMM configurations are listed in Table 3-3.

Table 3-3. DRAM DIMM configurations

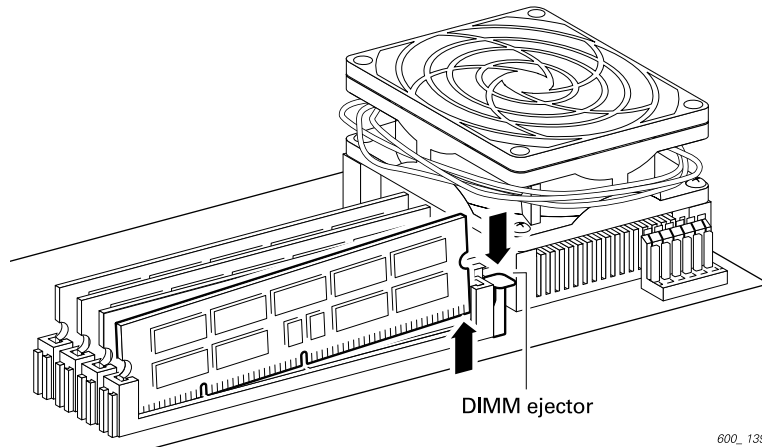
Memory	Bank 0 (slots J100 and J101)	Bank 1 (slots J102 and J103)
128 MB	two 64-MB DIMMs	none
256 MB	two 64-MB DIMMs	two 64-MB DIMMs
256 MB	two 128-MB DIMMs	none
512 MB	two 128-MB DIMMs	two 128-MB DIMMs

Removing a DRAM DIMM

Follow these steps to remove a DRAM DIMM:

1. Shut down the filer.
2. Loosen the six thumbscrews on the back panel and pull out the backplane carrier.

3. Use Figure 3-21 on page 3-24 to locate the DRAM DIMM that you want to remove.
4. Press the DIMM ejector to push the DIMM part way out of its slot (see Figure 3-23).



600_139

Figure 3-23. Ejecting the DIMM

5. Pull the DIMM out of the slot.
6. Set the DIMM aside in an antistatic bag.

Installing a DRAM DIMM

Follow these steps to install a DRAM DIMM:

1. Locate the DIMM slots for the DIMMs you are installing (see Figure 3-21 on page 3-24).
2. Turn the DIMM so that the locator notches on the edge connector (see Figure 3-22 on page 3-25) are near the daughter-card end of the slot (away from the ejector tab on the side of the slot).

Hold the DIMM by its top corners to avoid damaging the components or the edge connector.

3. Insert the DIMM straight into the slot, starting with the lowest available slot number first.

The DIMM fits tightly in the slot, but should go in easily. If not, realign the DIMM with the slot and try again.



CAUTION: Visually inspect the DIMM to verify that it is evenly aligned and fully inserted into the slot; otherwise, the edge connector on the DIMM will not make complete contact with the slot.

4. Push carefully, but firmly on the top edge of the DIMM until you hear an audible “click” and the DIMM snaps into place.
5. Push in the backplane carrier and tighten the six thumbscrews on the back panel.
6. Power on the filer.

Replacing the battery on the system card assembly

The system card assembly uses one 3.3-volt lithium battery to provide backup power to the real-time clock and system card firmware configuration NVRAM. Figure 3-24 shows the battery location.



NOTE: The lithium battery on the system card differs from those on the NVRAM card. The batteries for the system card and the NVRAM card cannot be interchanged.

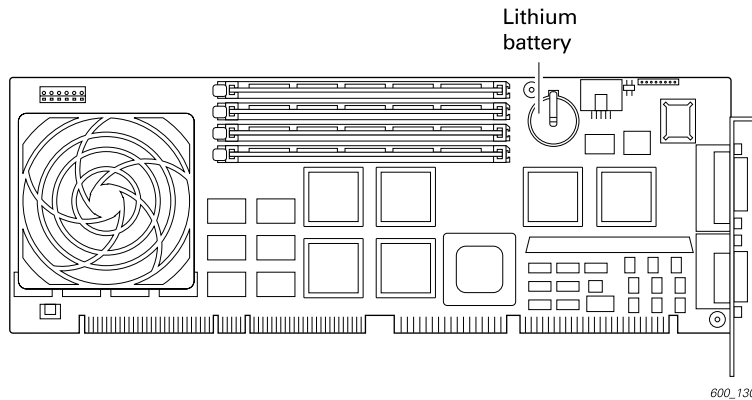


Figure 3-24. System card lithium battery location (daughter card removed)

Removing the system card battery

Follow these steps to remove the system card lithium battery:

1. Shut down the filer and switch off the power supply.
2. Loosen the six thumbscrews on the back panel and pull out the backplane carrier.
3. Remove the system card assembly as described in “Removing the system card assembly” on page 3-6 and place it on an antistatic mat.
4. Use a Phillips screwdriver to remove the two screws that fasten the daughter card to the stand-offs on the system card.
5. Hold the system card in place and carefully lift the daughter card off the system card.

There are three connections between the daughter card and the system card:

- a direct interface connection
- a ribbon cable connecting the daughter card J502 parallel port to the parallel port connector on the system card faceplate

- a ribbon cable connecting the daughter card J501 serial port to the serial port connector (COM 2) on the system card faceplate

The direct connection is broken when you separate the daughter card from the system card. There is no need to disconnect the parallel and serial port ribbon cables.

6. Swing the daughter card out of the way to gain access to the system card battery holder.
7. Lift up the battery while pushing the battery towards the open side of the battery holder (see Figure 3-25).

You can insert a nonconducting tool such as a credit card to help lift the battery.



CAUTION: Do not bend the metal clip that holds the battery. Bending the metal clip damages the electrical connection between the battery and the battery holder.

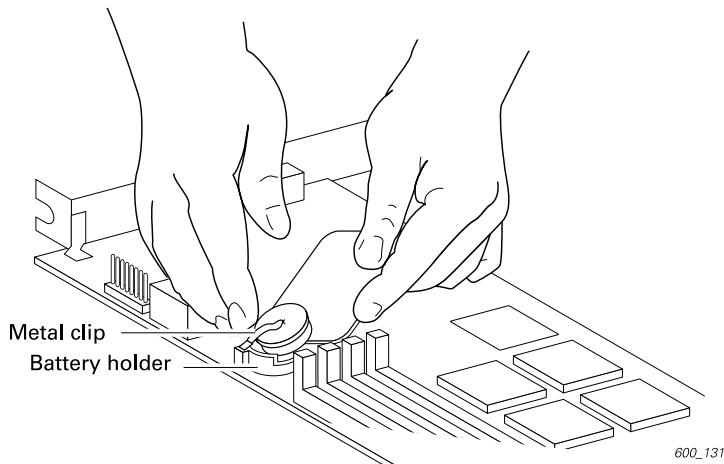


Figure 3-25. Removing the system card lithium battery

8. Dispose of the old battery according to the manufacturer's instructions that come with the replacement battery.

Installing the system card battery

Follow these steps to install the system card lithium battery:



WARNING: There is danger of explosion if the battery is replaced incorrectly. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

1. Turn the battery so that the positive side is up (marked with a "+").
2. Push the battery under the metal clip through the open side of the battery holder so that the battery sits flush inside the battery holder.



CAUTION: Do not bend the metal clip that holds the battery. Bending the metal clip damages the electrical connection between the battery and the battery holder.

3. Swing the daughter card over the system card and align the daughter card J500 connector with the J3 connector on the system card.
4. Press down on the daughter card to seat the daughter card connector in the system card connector.
5. Use a Phillips screwdriver to replace the two screws that fasten the daughter card to the system card.
6. Reinstall the system card assembly in its assigned slot as described in "Installing the system card assembly" on page 3-14.
7. Push in the backplane carrier and tighten the six thumbscrews on the back panel.
8. Power on the filer.

Replacing the CPU fan

This section provides the procedures for replacing the CPU fan on the system card. Figure 3-26 shows the location of the CPU fan on the system card.

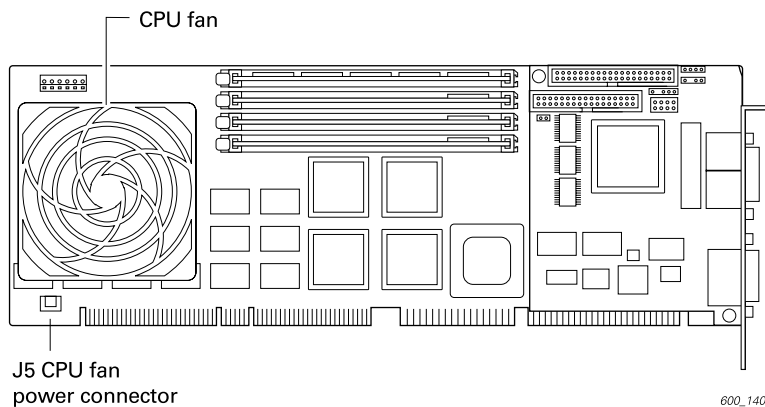


Figure 3-26. Locating the system card CPU fan

Removing the CPU fan

Follow these steps to remove the CPU fan:

1. Shut down the filer and switch off the power supply.
2. Loosen the six thumbscrews on the back panel and pull out the backplane carrier.
3. Remove the system card assembly as described in “Removing the system card assembly” on page 3-6 and set it on an antistatic mat.

4. Unplug the P5 fan power connector from the J5 connector on the system card (see Figure 3-27).

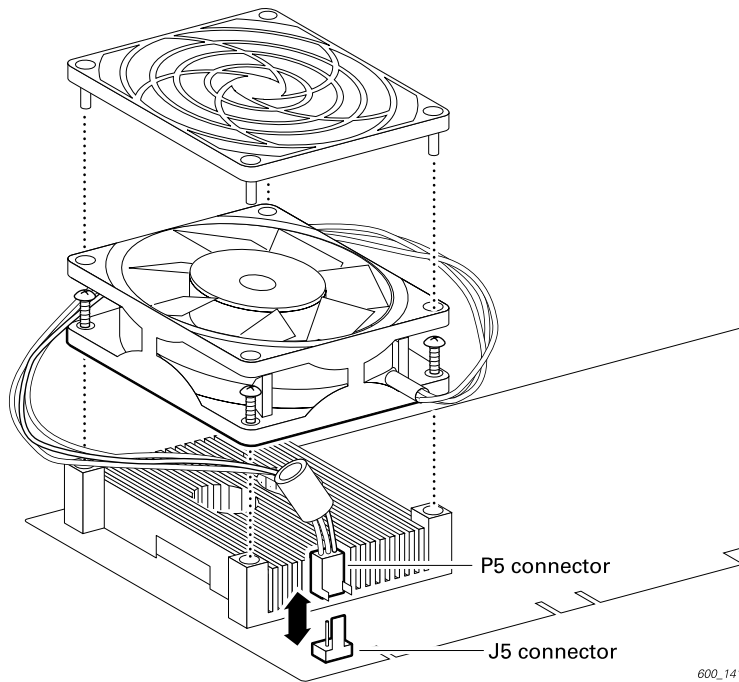


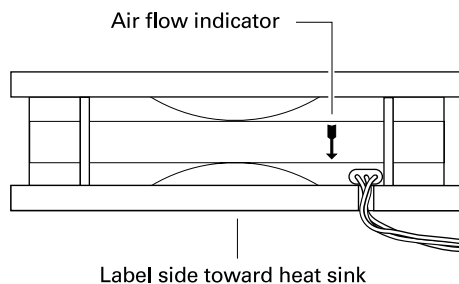
Figure 3-27. Removing the CPU fan

5. Remove the four screws that fasten the fan to the CPU heat sink.
6. Lift the CPU fan from the CPU heat sink.
7. Set the CPU fan aside.

Installing the CPU fan

Follow these steps to install the CPU fan:

1. Examine the edges of the fan for an arrow indicating the direction of air flow through the fan (see Figure 3-28).



600_142

Figure 3-28. Air flow indicator on the CPU fan

2. Orient the new fan so that air flows through the fan onto the heat sink.
3. Replace the four screws to secure the CPU fan to the heat sink.



CAUTION: Do not overtighten the fan screws; otherwise, you may damage the heat sink and its bond to the CPU.

4. Plug the P5 CPU fan cable connector into the J5 connector on the system card (see Figure 3-27 on page 3-32).

The connectors are keyed so that they can fit together only one way.

5. Reinstall the system card in its assigned slot as described in “Installing the system card assembly “ on page 3-14.
6. Push in the backplane carrier and tighten the six thumbscrews on the back panel.
7. Power on the filer.

Replacing the system backplane

This section describes the procedures for completing the following tasks:

- removing the system backplane
- verifying jumper settings on the system backplane
- installing the system backplane

To replace the system backplane, you must remove the NetApp F600 system card assembly and all expansion cards, and then reinstall them on the new backplane.

Removing the backplane

Follow these steps to remove the system backplane:

1. Shut down the filer.
2. Power down the filer and its disk shelves.
3. Note which cables are connected to the connectors on the back panel of the filer, and then disconnect the cables.
4. Loosen the six thumbscrews on the back panel and pull out the backplane carrier.
5. Remove the system backplane carrier from the chassis:
 - a. On the underside of the system backplane carrier, press in on the carrier tabs to release the system backplane carrier from the slides in the chassis.

System backplane carrier, back panel

Carrier tab

600_175

- b.** Support the system backplane carrier with both hands and pull it off the slides in the chassis.

- Refer to Chapter 2, “Expansion cards,” for instructions.

- Refer to “Removing the system card assembly” on page 3-6 for instructions.

8. Unplug the P20A, P20B, P19A, and P19B backplane power cable connectors from the J20A, J20B, J19A, and J19B connectors on the backplane.

Figure 3-30 shows the power cable connectors in relation to the power connectors on the backplane.

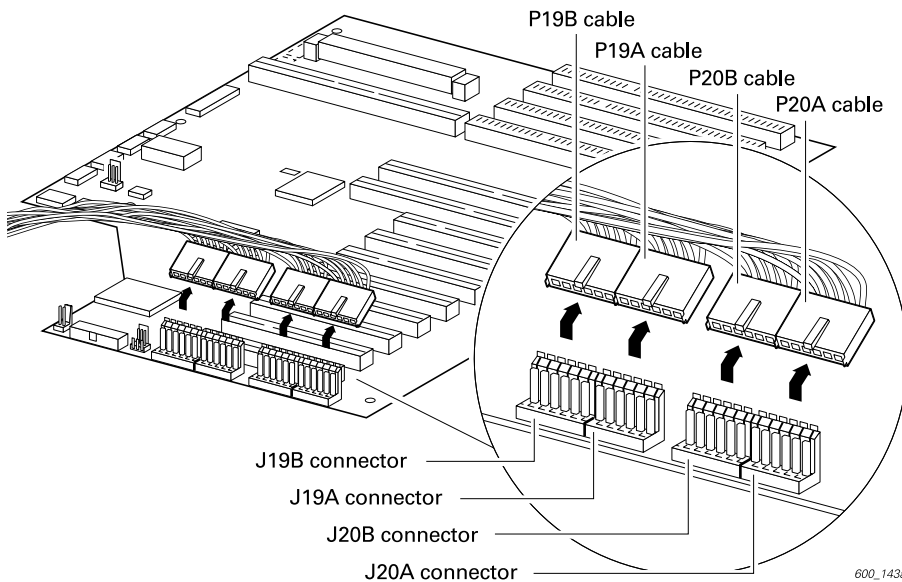


Figure 3-30. Disconnecting the backplane P20 and P19 power cables

- a. Wiggle the cable connector gently while pulling it straight up to expose the backplane connector pins.
- b. Tilt the cable connector at a 45° angle to the center of the backplane and pull the cable connector off the backplane connector.

9. Unplug the P18 cable connector from the J18 backplane connector.

Figure 3-31 shows the P18 cable connector in relation to the J18 connector on the backplane.

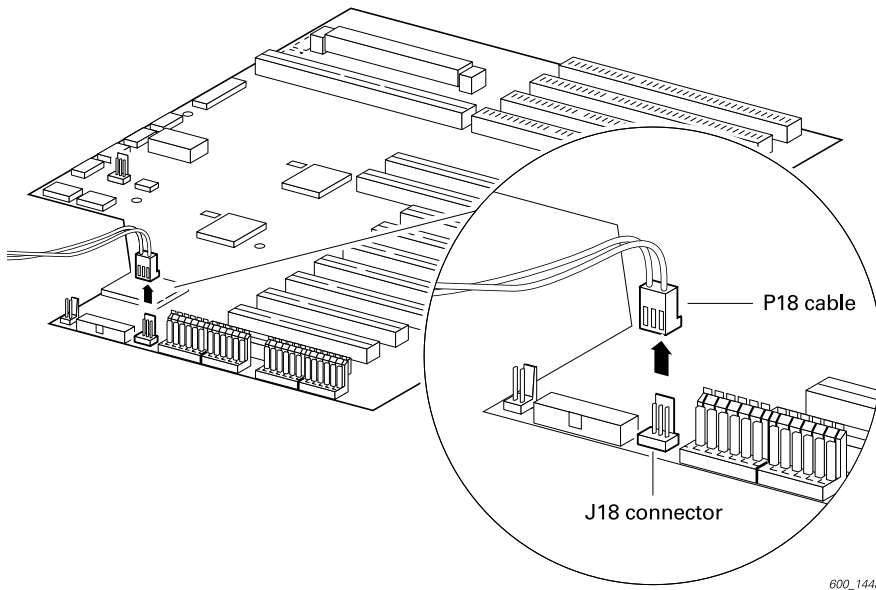


Figure 3-31. Disconnecting the backplane P18 cable

10. Unplug the P43 cable connector from the J43 connector on the backplane.

Figure 3-32 shows the P43 cable connector in relation to the J43 connector on the backplane.

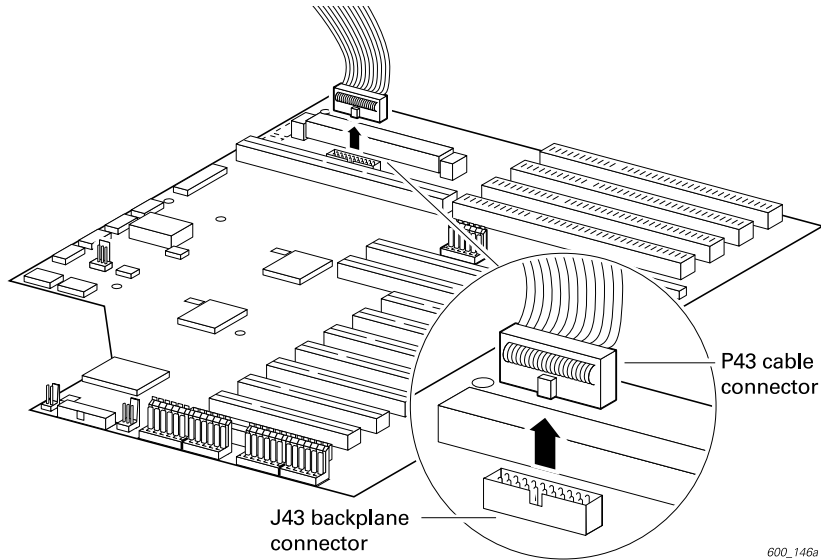


Figure 3-32. Disconnecting the backplane P43 cable

11. Unplug the P38 cable connector from the J38 connector on the backplane.

Figure 3-33 shows the P38 cable connector in relation to the J38 connector on the backplane.

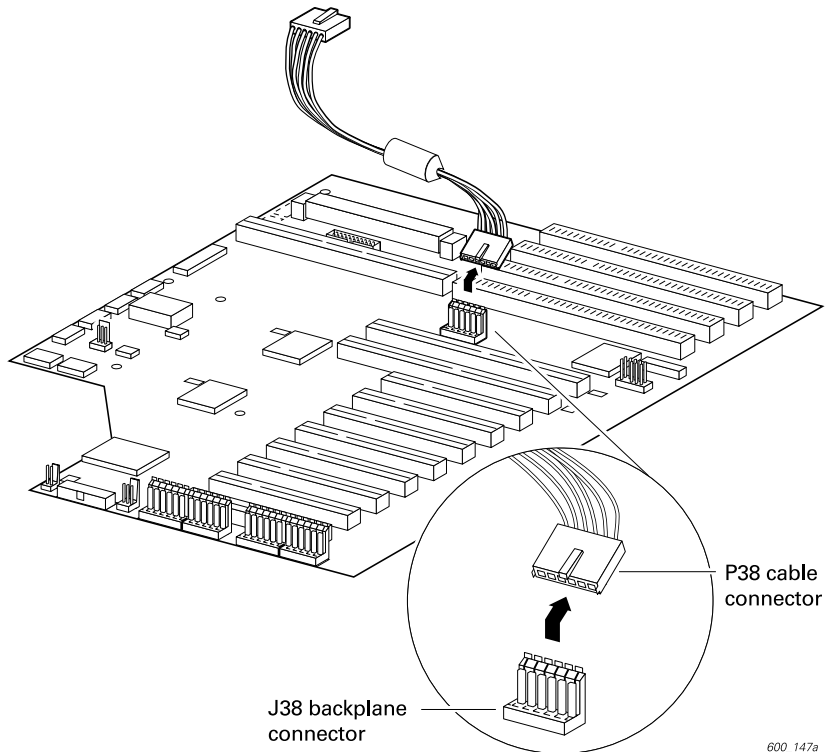


Figure 3-33. Disconnecting the backplane P38 cable

12. Unplug the P39 cable connector from the J39 connector on the backplane.

Figure 3-34 shows the P39 cable connector in relation to the J39 connector on the backplane.

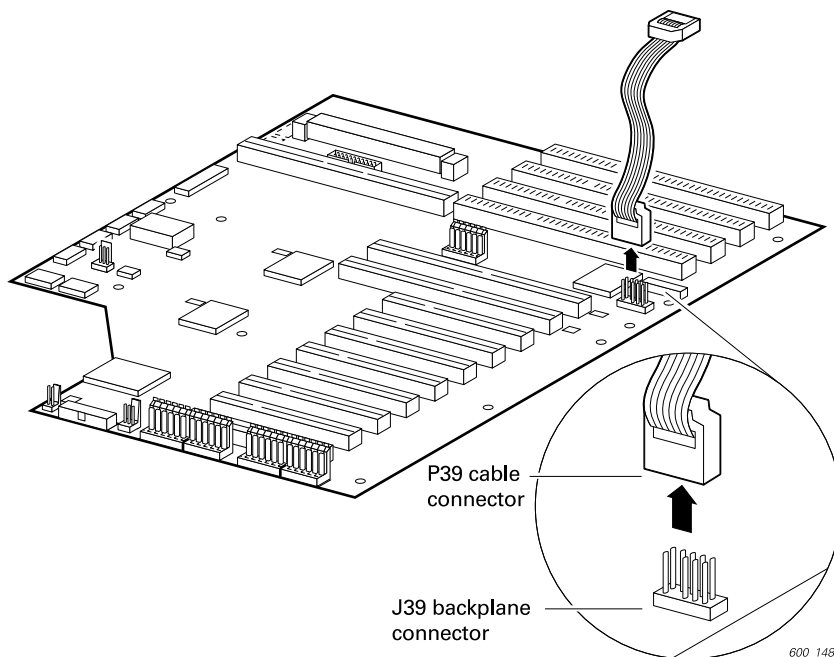


Figure 3-34. Disconnecting the backplane P39 cable

13. Turn the thumbscrew on the power supply counterclockwise until it stops and then remove the power supply to gain access to the four backplane mounting screws located under the power supply bay.

For more information about removing the power supply, refer to “Removing the power supply” on page 5-3.

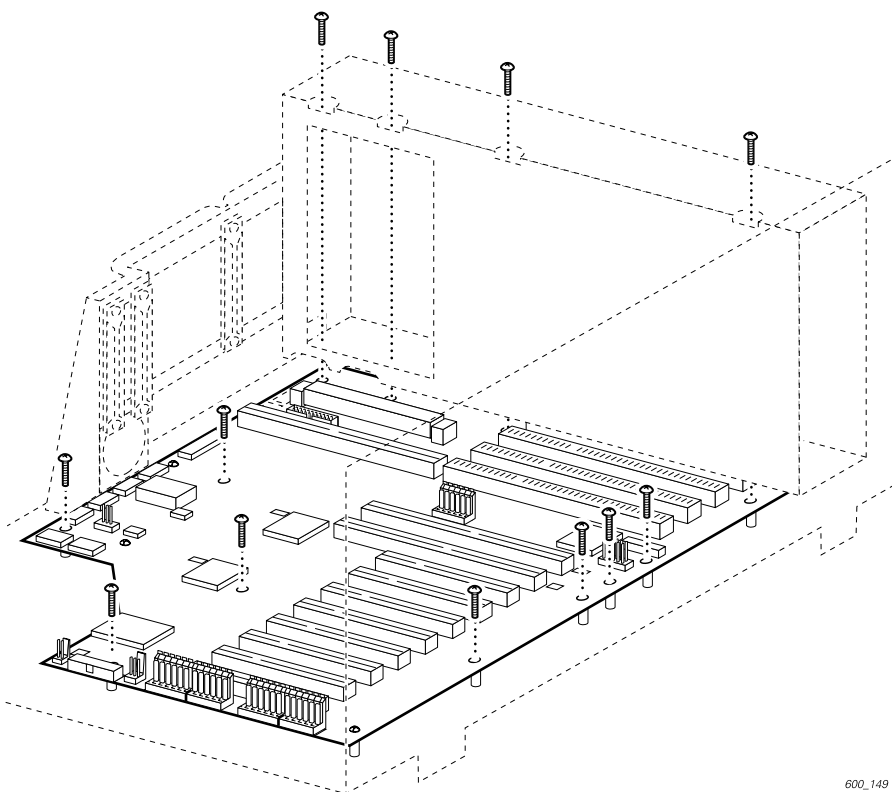
14. Use a #1 Phillips screwdriver with at least an 8-inch shaft to remove the four screws located along the edge of the backplane that is under the power supply bay.

Figure 3-35 shows the locations of the screws under the power supply bay.



NOTE: A screwdriver with a magnetic tip makes an easier job of removing the screws.

Set the screws aside for installing the replacement backplane.

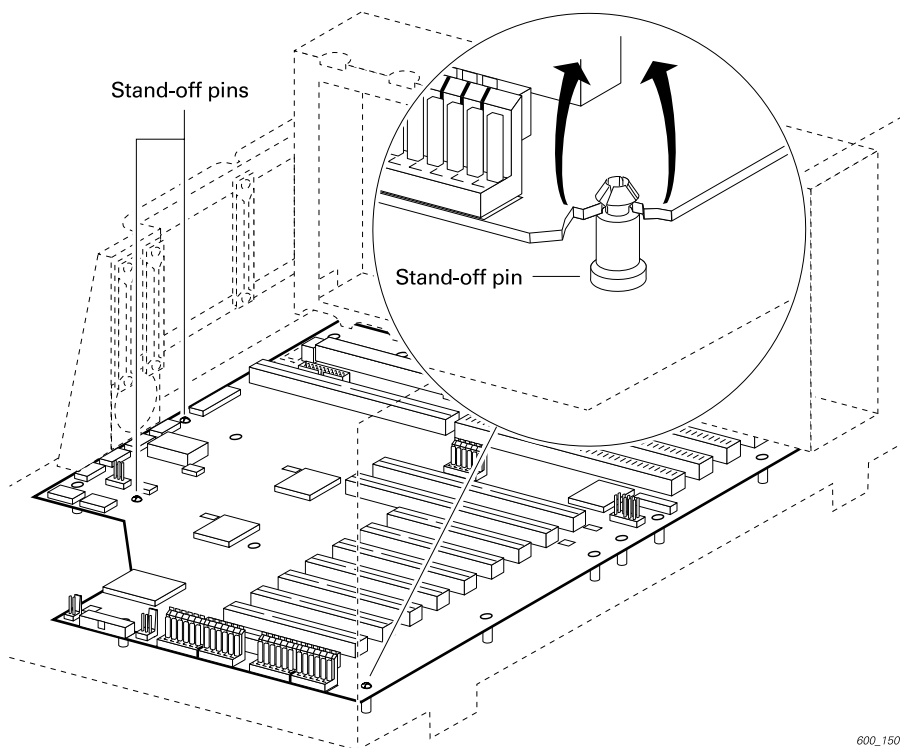


600_149

Figure 3-35. Removing the backplane mounting screws

15. Remove the eight remaining screws that secure the backplane to the carrier (see Figure 3-35 on page 3-41) and set them aside for installing the replacement backplane.
16. For each of the three press-fit stand-off pin positions, carefully lift upward on the backplane to pull it off the stand-off pins.

Figure 3-36 shows the locations of the three stand-off pins.

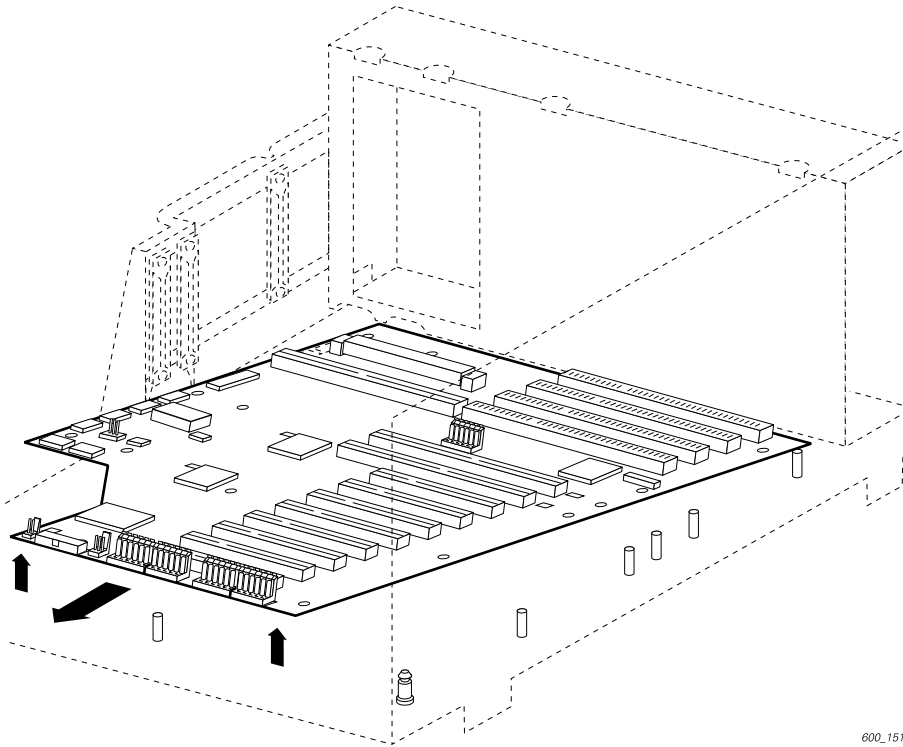


600_150

Figure 3-36. Removing the backplane from the stand-off pins

17. Remove the backplane from the carrier.

Figure 3-37 shows how to remove the backplane from the carrier.



600_151

Figure 3-37. Removing the backplane from the carrier

18. Set the backplane aside on an antistatic surface.

Verifying backplane jumper settings

Figure 3-38 shows the locations and setting for the following jumper positions on the backplane:

- J21
- J28 and J31
- J34 and J36

Verify that these jumpers are set as shown in Figure 3-38.

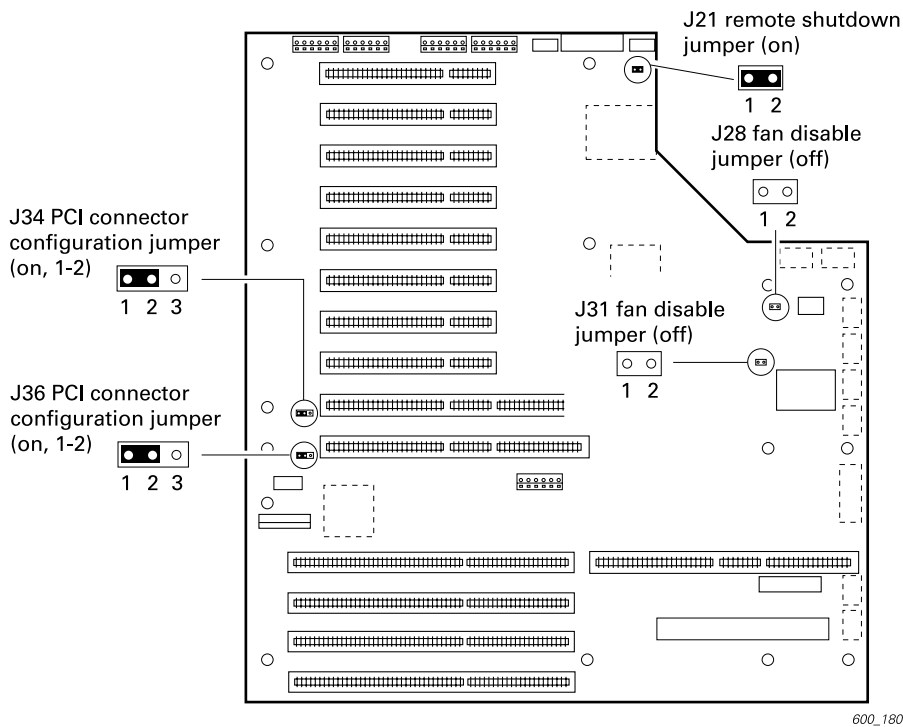


Figure 3-38. Backplane jumper locations and settings

J21 is a two-pin connector that must have a shorting jumper installed for correct system operation.

J28 and J31 are two-pin connectors that control fan sensing logic. J28 and J31 should both be open (no shorting jumper) for correct system operation.

J34 and J36 are three-pin connectors that control the configuration of signal lines in the 64-bit PCI expansion slots. J34 is associated with PCI slot J7; J36 is associated with PCI slot J6. To ensure compliance with the PICMG specification, both J34 and J36 must have a two-pin shorting jumper installed between pins 1 and 2.

Installing the backplane

Follow these steps to install the system backplane:

1. Verify that the system backplane jumpers are set as described in “Verifying backplane jumper settings” on page 3-44.
2. Turn the backplane so that the expansion slots are up and adjacent to the carrier back panel.
3. Set the backplane onto the carrier stand-off pins.
4. Align the three locator holes on the backplane with the three stand-off pins on the carrier.

Figure 3-36 on page 3-42 shows the locations of the three stand-off pins.

5. Press down carefully, but firmly on the backplane at each stand-off pin until the backplane snaps into place on the stand-off pin.

6. Use a #1 Phillips screwdriver with at least an 8-in. shaft to insert and fasten the four screws located along the edge of the backplane that is under the power supply bay.

Figure 3-39 shows the locations of the access holes used to insert and fasten the four screws under the power supply bay.

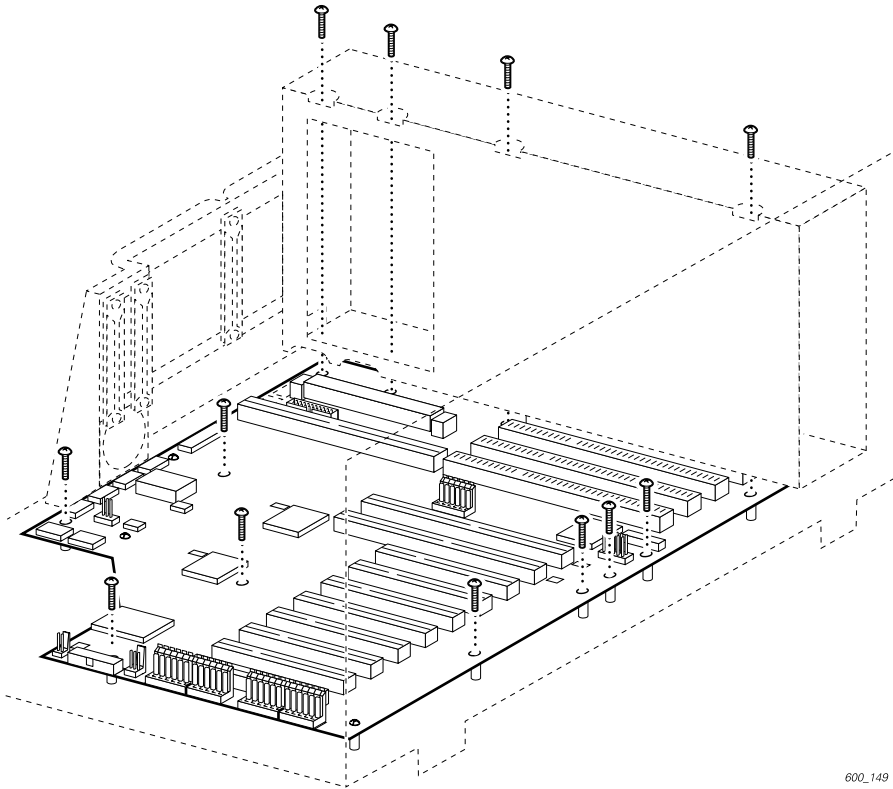


Figure 3-39. Replacing the backplane mounting screws



NOTE: A screwdriver with a magnetic tip makes an easier job of replacing the screws.

7. Replace the remaining eight screws to secure the backplane to the carrier (see Figure 3-39 on page 3-46).
8. Plug the P20A, P20B, P19A, and P19B backplane power cable connectors into the J20A, J20B, J19A, and J19B connectors on the backplane.

Figure 3-40 shows the power cable connectors in relation to the power connectors on the backplane.

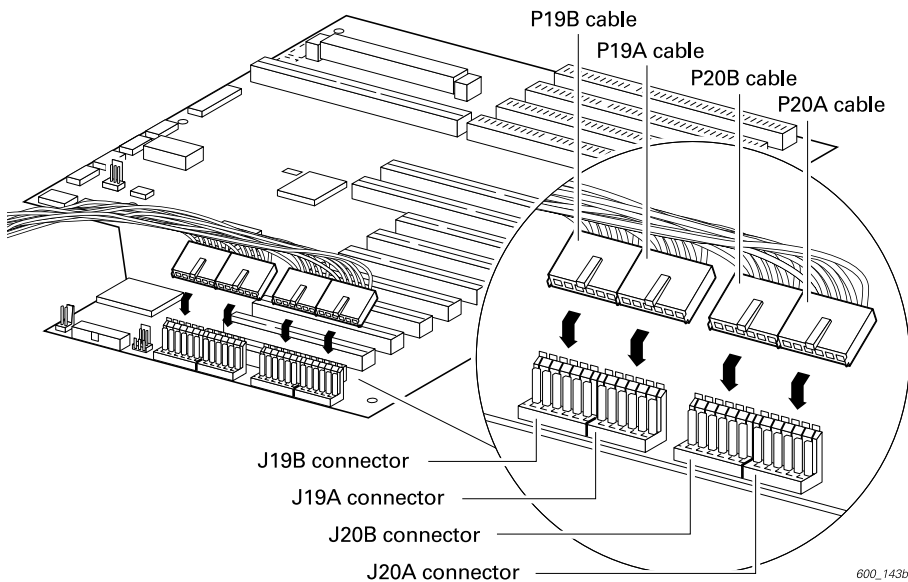


Figure 3-40. Connecting the backplane P20 and P19 power cables

- a. Tilt the cable connector at a 45° angle to the center of the backplane and push the cable connector onto the backplane connector.
- b. Wiggle the cable connector gently while pushing it straight down onto the backplane connector pins.

9. Plug the P18 cable connector into the J18 backplane connector.

Figure 3-41 shows the P18 cable connector in relation to the J18 connector on the backplane.

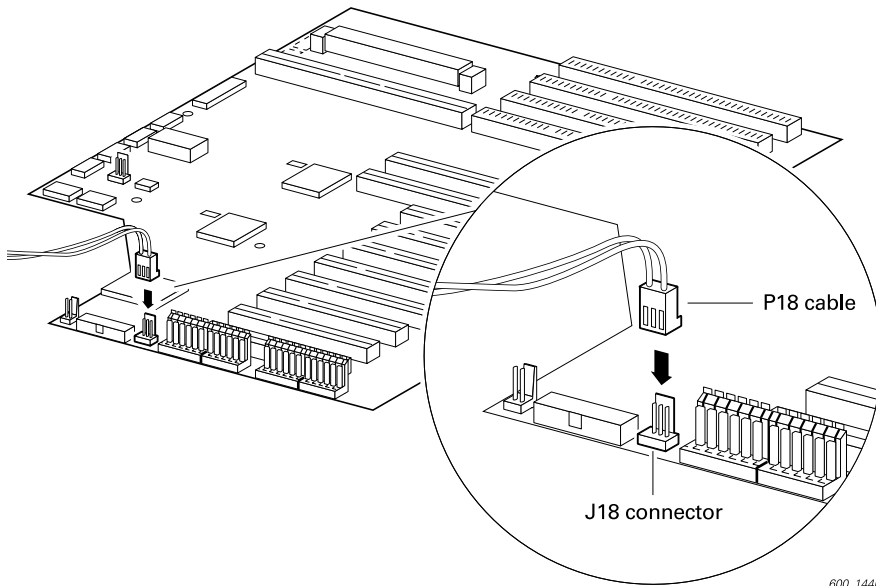


Figure 3-41. Connecting the backplane P18 cable

10. Plug the P43 cable connector into the J43 connector on the backplane.

Figure 3-42 shows the P43 cable connector in relation to the J43 connector on the backplane.

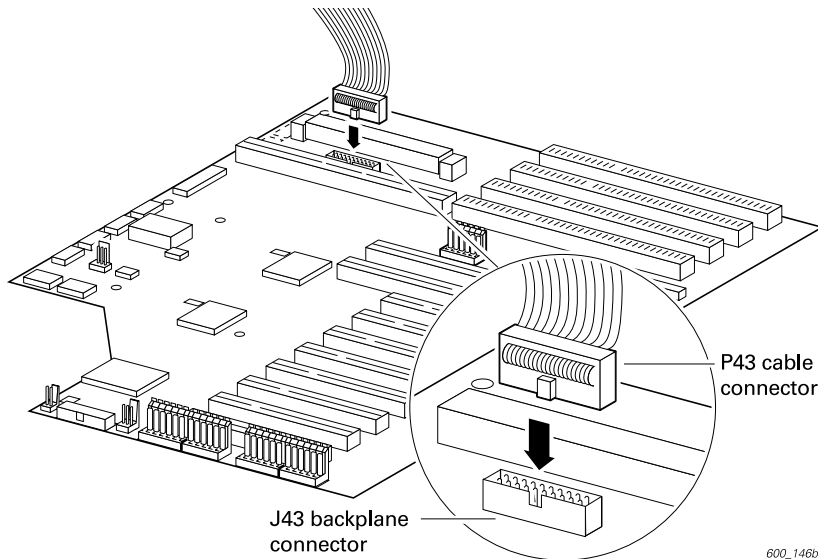


Figure 3-42. Connecting the backplane P43 cable

11. Plug the P38 cable connector into the J38 connector on the backplane.

Figure 3-43 shows the P38 cable connector in relation to the J38 connector on the backplane.

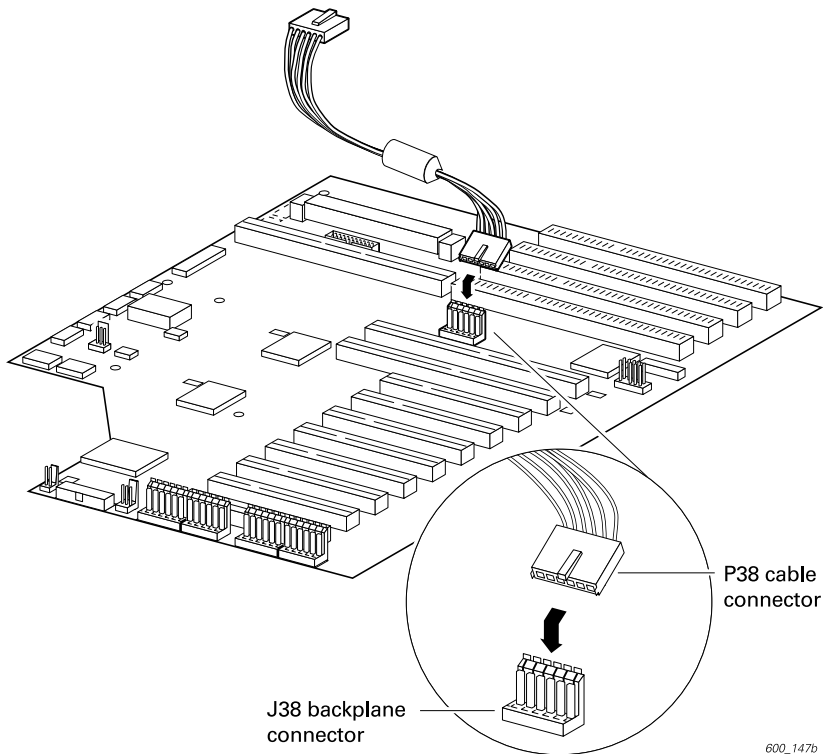


Figure 3-43. Connecting the backplane P38 cable

12. Plug the P39 cable connector into the J39 connector on the backplane.

Figure 3-44 shows the P39 cable connector in relation to the J39 connector on the backplane.

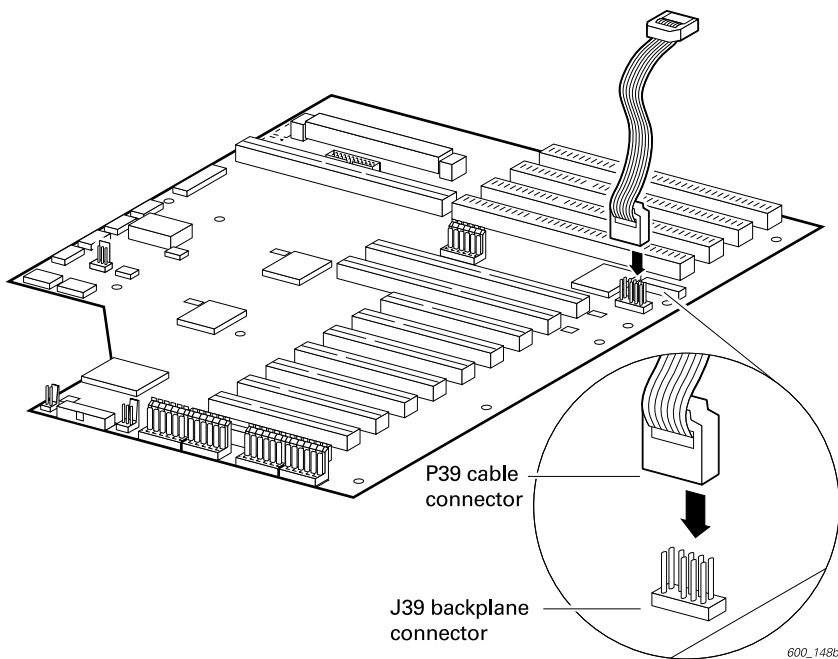


Figure 3-44. Connecting the backplane P39 cable

13. Make sure all the cable connections described in this section are securely attached to their connectors on the backplane.
14. Reinstall the system card assembly as described in “Installing the system card assembly” on page 3-14.
15. Reinstall all of the expansion cards as described in Chapter 2, “Expansion cards.”

16. Push in the backplane carrier and tighten the six thumbscrews on the back panel.
17. Reconnect the cables to the faceplate connectors on the back panel.
18. Reinstall the power supply.
19. Power on the disk shelves and then the filer.

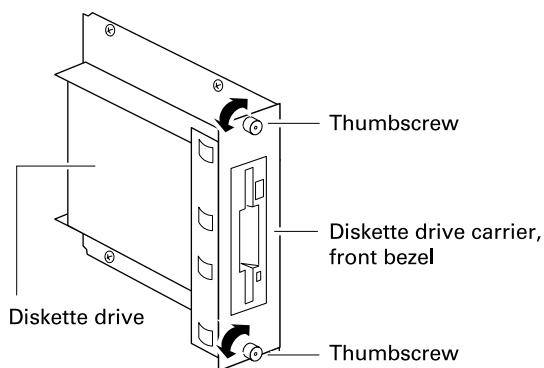
Chapter 4: **Diskette drive**

This chapter describes the procedures for removing and installing the diskette drive.

This chapter also describes how to use the diskette drive carrier if the replacement drive you obtained does not come installed in a drive carrier.

Removing the diskette drive

Figure 4-1 shows the diskette drive in its carrier.



600_160

Figure 4-1. Diskette drive

Follow these steps to remove the diskette drive:

1. Shut down the filer and turn off power to the filer.
2. Slide the filer front panel door to the left.
3. Loosen the two thumbscrews on the diskette drive carrier front bezel.
4. Pull the diskette drive carrier out of the drive bay.

5. Unplug the following cables from the connectors on the back of the diskette drive (see Figure 4-2)

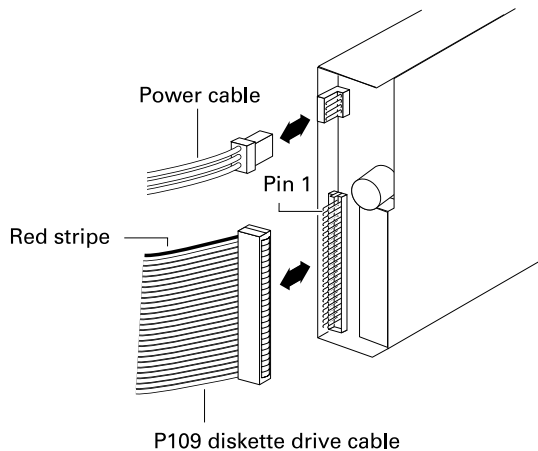
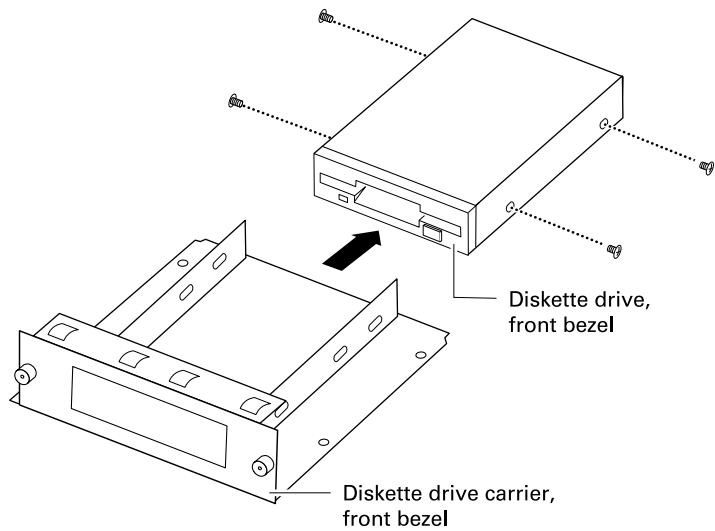


Figure 4-2. Diskette drive cable connections

- a. Unplug the ribbon cable connector (P109) from the data connector on the back of the diskette drive.
 - b. Unplug the power cable connector (P10) from the power connector on the back of the diskette drive.
6. If you need to remove the diskette drive from its drive carrier, follow these steps:
 - a. Remove the four carrier screws on the diskette drive carrier (two on each side of the diskette drive; see Figure 4-3).

Save the screws for reinstalling the diskette drive.
 - b. Slide the diskette drive out of the drive carrier.



600_162

Figure 4-3. Removing the diskette drive from its carrier

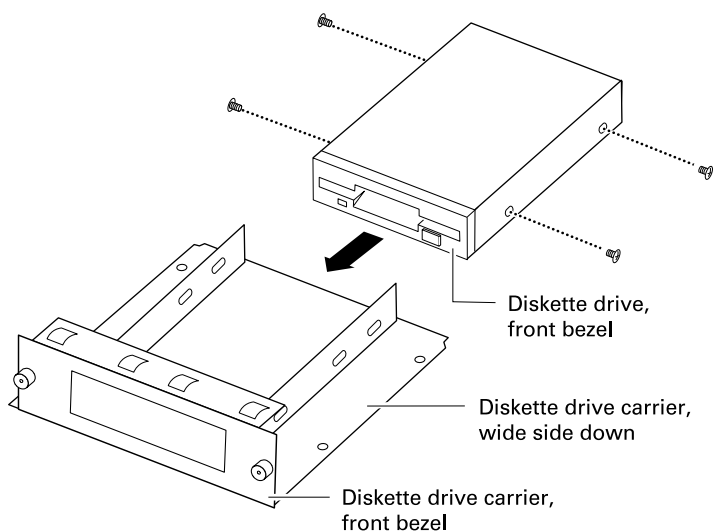
7. Set the diskette drive aside.

Installing the diskette drive

Follow these steps to install the diskette drive:

1. If you need to install the diskette drive in a drive carrier, follow these steps:
 - a. Turn the diskette drive so that its front bezel faces the diskette drive opening in the front bezel of the diskette drive carrier (see Figure 4-4).
 - b. Slide the diskette drive into the drive carrier and align the screw holes in the side of the diskette drive with the slots in the drive carrier.

The front bezel of the diskette drive should be flush with the front bezel of the drive carrier.



600_163

Figure 4-4. Installing the diskette drive in the drive carrier

2. Plug the diskette drive ribbon cable connector (P109) into the data connector on the back of the diskette drive (see Figure 4-2 on page 4-3).

The red stripe on the ribbon cable aligns with pin 1 on the connector.

3. Plug the power cable connector (P10) into the power connector on the back of the diskette drive (see Figure 4-2 on page 4-3).

The power cable connector is keyed so that it can fit in the diskette drive power connector only one way.

4. Turn the diskette drive carrier so that its rails align with the grooves in the drive bay.

The diskette drive carrier is keyed so that it will fit in the drive bay in only one way.

5. Slide the diskette drive carrier into the drive bay.
6. Tighten the two thumbscrews to secure the diskette drive carrier to the chassis.
7. Slide the front panel door to the right.
8. Power on the filer.

Chapter 5: Power supply

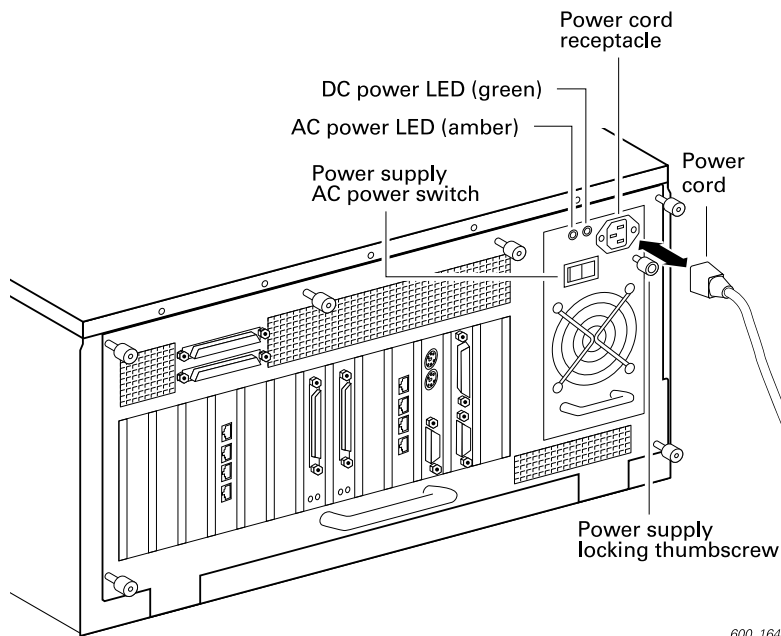
This chapter describes the procedures for removing and installing the power supply in the NetApp F600 series.



NOTE: To maintain UL, CSA, and TUV safety certifications, you must obtain replacement power supply units from Network Appliance.

Replacing the power supply

Figure 5-1 shows the location of the power supply in the NetApp F600 series. Figure 5-2 shows how to remove the power supply from the filer.



600_164

Figure 5-1. Power supply for the NetApp F600 series

Removing the power supply

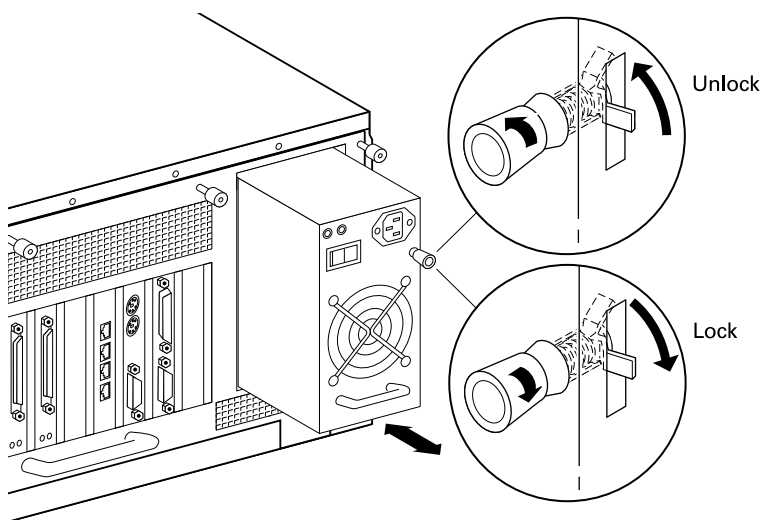
Follow these steps to remove the NetApp F600 series power supply:

1. Shut down the filer, switch it off, and switch off the power supply.
2. Unplug the AC power cord from the AC power cord receptacle on the filer power supply.



WARNING: Disconnect the AC power cord before removing the power supply. When the power cord is connected, some of the pins in the blind-mating connector on the power supply are live even after the power supply has been switched off. If the power cord is connected, touching the pins may cause personal injury.

3. Turn the power supply thumbscrew counterclockwise until it stops (see Figure 5-2).



600_165

Figure 5-2. Removing the power supply from the filer



NOTE: The thumbscrew drives a pawl latch that rotates out of the power supply to secure the power supply in its bay in the system backplane carrier. Turning the thumbscrew counterclockwise retracts the latch into the power supply; turning the thumbscrew clockwise rotates the latch out of the power supply and locks the power supply in its bay.

4. Use the handle to pull the power supply out of the power supply bay in the filer.



CAUTION: The power supply is heavy. Support the bottom of the unit while removing the unit from its bay.

5. Set the power supply aside.

Installing the power supply

Follow these steps to install the NetApp F600 series power supply:

1. Turn the power supply so that its passive interlock power connector faces into the power supply bay on the filer.

The power supply for the NetApp F600 series is keyed so that it can be inserted in the filer power supply bay in only one way.

2. Verify that the thumbscrew pawl latch is fully retracted into the power supply.



CAUTION: If the thumbscrew pawl latch is not fully retracted, you cannot insert the power supply completely. Attempting to insert the power supply with the pawl latch open may damage the pawl latch.

3. Push the power supply, slowly and firmly, into the bay until the power supply is firmly seated in the bay.



CAUTION: Do not force the power supply into the bay; you may damage the connectors on the equipment.

4. Turn the thumbscrew clockwise until it stops to secure the power supply in its bay.

5. Plug the AC power cord into the AC power cord receptacle on the power supply.
6. Plug the other end of the AC power cord into the power outlet.
7. Power on the filer.

Chapter 6: Fans

This chapter describes the procedures for removing and installing the following types of fans:

- chassis fan assembly
- expansion card fan



NOTE: To maintain UL, CSA, and TUV safety certifications, you must obtain replacement fan assemblies from Network Appliance. Using unapproved replacement fans voids the safety certifications.

Replacing the chassis fan assembly

The filer uses four small muffin fans to circulate air through the chassis. The fans are mounted on a perforated fan tray that is secured to the front panel of the chassis. Figure 6-1 shows the chassis fan assembly location in the front of the filer.

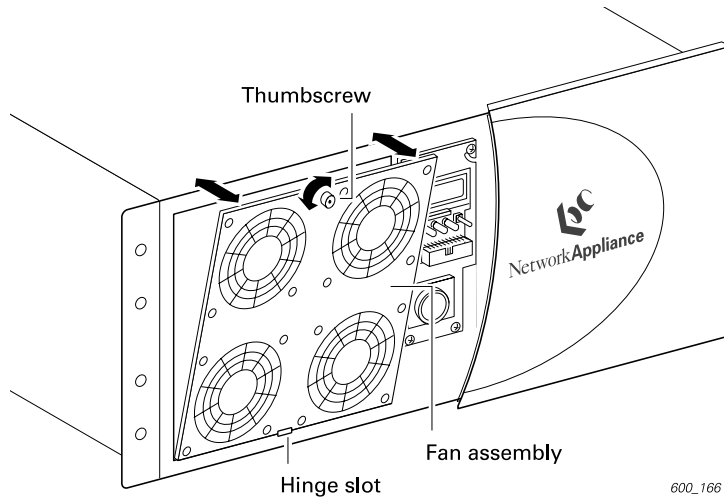


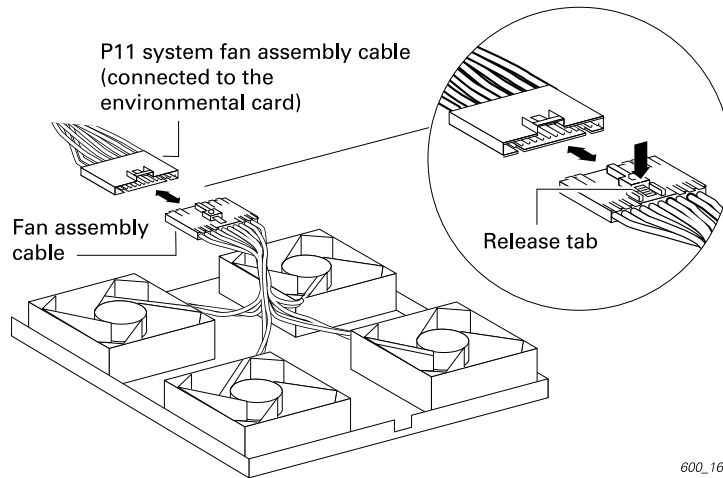
Figure 6-1. Filer fan assembly

Removing the fan assembly

Follow these steps to remove the fan assembly:

1. Shut down the filer and switch off the power supply.
2. Remove the front panel bezel of the filer.
3. Loosen the thumbscrew on the fan assembly.
4. Tilt the fan assembly out of the filer chassis.
5. Unhook the fan assembly from the hinge slot.

6. Unplug the fan assembly cable from the P11 system fan assembly cable by pressing inward on the release tab located on the cable end (see Figure 6-2).



600_167

Figure 6-2. Fan assembly cable connection

7. Set the fan assembly aside

Installing the fan assembly

Follow these steps to install the fan assembly:

1. Plug the fan assembly cable connector into the P11 system fan assembly cable connector until the release tab clicks in place (see Figure 6-2).

The cable connectors are keyed so that they can fit together in only one way.

2. Hook the fan assembly into the hinge slot.
3. Raise the fan assembly toward the cabinet.
4. Tighten the thumbscrew to secure the fan assembly to the chassis.

5. Snap on the front panel bezel of the filer.
6. Power on the filer.
7. Verify that the fans are operating.

Expansion card fan

The filer uses a small muffin fan to direct air through the expansion cards. The fan is mounted on the card guide bulkhead that is attached to the system backplane carrier. Figure 6-3 shows the fan location.

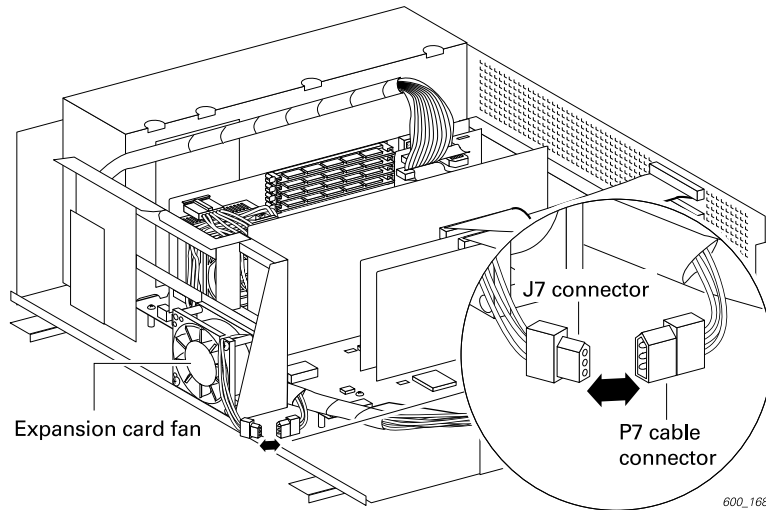


Figure 6-3. Expansion card fan location

Removing the expansion card fan

Follow these steps to remove the expansion card fan:

1. Shut down the filer and switch off the power supply.
2. Loosen the six thumbscrews on the back panel and pull out the backplane carrier.
3. Unplug the P7 fan power cable connector from the J7 cable connector on the fan cable.

Figure 6-3 shows the location of the cable connectors.

4. Loosen the two screws that secure the fan to the card guide bulkhead.

Figure 6-4 shows the locations of the two screws. Save the two screws to install the replacement fan.

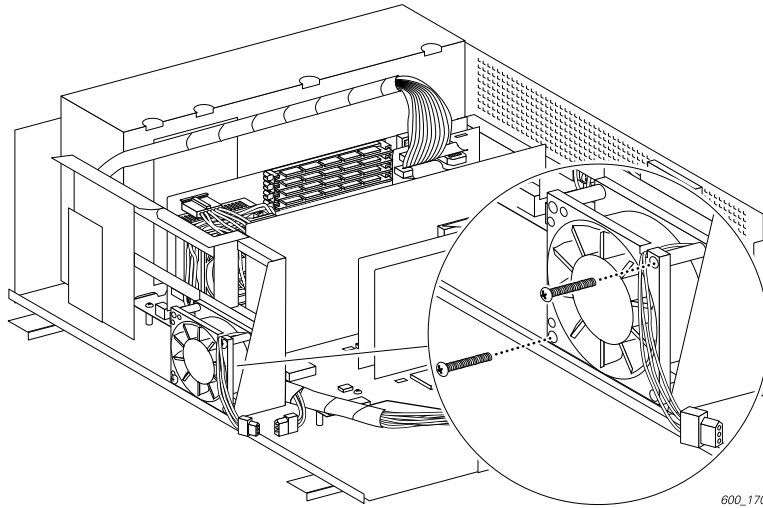


Figure 6-4. Removing the fan mounting screws

Installing the expansion card fan

Follow these steps to install the expansion card fan:

1. Examine the edges of the fan for an arrow that indicates the direction of air flow through the fan.

Figure 6-5 shows the location of the air flow indicator on the edge of the fan.

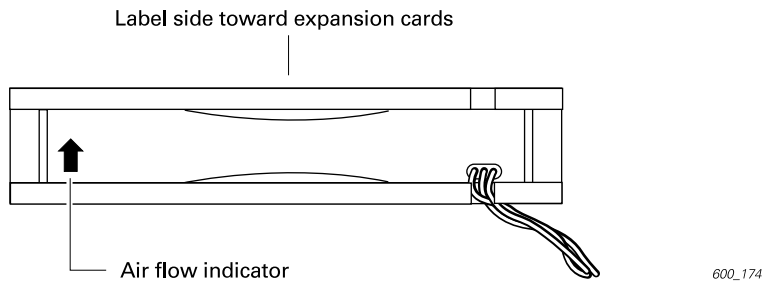


Figure 6-5. Air flow indicator on the expansion card fan

2. Orient the new fan on the card guide bulkhead so that the air from the fan flows into the expansion cards.
3. Secure the fan on the card guide bulkhead using the two screws (see Figure 6-4 on page 6-6).
4. Plug the P7 fan power cable connector onto the J7 connector on the fan cable (see Figure 6-3 on page 6-5).
5. Push in the backplane carrier and tighten the six thumbscrews on the back panel.
6. Power on the filer.

Chapter 7: LCD control panel

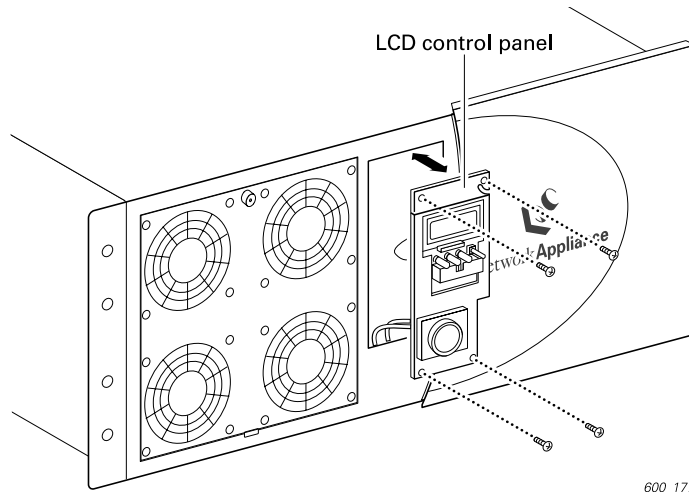
This chapter describes the procedures for removing and installing the LCD control panel.



CAUTION: To avoid damaging the filer, you should shut down the filer and unplug the filer AC power cord from the AC power outlet before you begin removing or installing the LCD control panel.

Removing the LCD control panel

Figure 7-1 shows the LCD control panel location. Figure 7-2 shows the connections to the LCD control panel.



600_177

Figure 7-1. LCD control panel

Follow these steps to remove the LCD control panel:

1. Shut down the filer and switch off the power supply.
2. Unplug the AC power cord from the power outlet.
3. Remove the front panel bezel from the filer.
4. Remove the four panhead screws that fasten the LCD control panel to the front panel of the chassis.

Save the screws for reinstalling the unit.

5. Carefully pull the LCD control panel and its attached cables from its hole in the chassis front panel.

6. Unplug the P107 LCD control panel ribbon cable from its connector on the LCD control panel (see Figure 7-2).
7. Unplug the power cables from the black-wire connector and red-wire connector on the back of the power switch (see Figure 7-2).

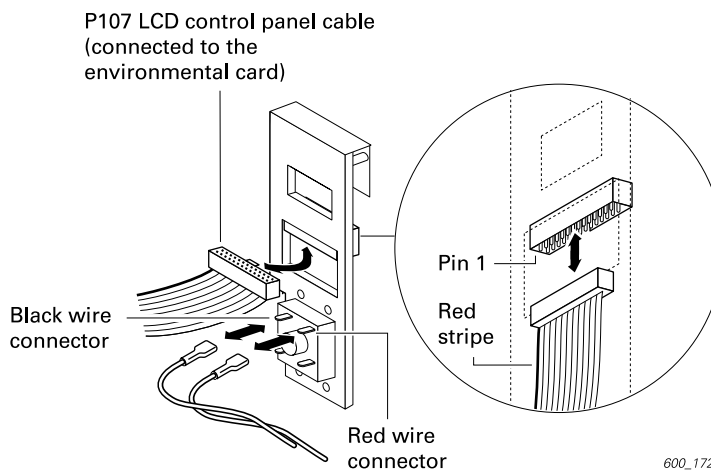


Figure 7-2. LCD control panel connections

8. Set the LCD control panel aside.

Installing the LCD control panel

Follow these steps to install the LCD control panel:

1. Use Figure 7-2 on page 7-3 to locate the black-wire and red-wire connectors on the back of the power switch.
2. Plug the black wire onto the black-wire connector; plug the red wire onto the red-wire connector.

Verify that the black and red wires are attached to the correct terminal.

3. Plug the P107 LCD panel ribbon cable connector into the connector on the bottom edge of the LCD panel (see Figure 7-2 on page 7-3).

The red stripe on the ribbon cable aligns with pin 1 on the cable connector.

4. Feed the cables back through their holes in the filer front panel as you push the LCD control panel against the filer front panel.
5. Insert and tighten the four panhead screws to secure the LCD control panel to the chassis front panel (see Figure 7-1 on page 7-2).
6. Snap on the filer front bezel.
7. Plug the power cord into the power outlet.
8. Power on the filer.

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