# $\mathsf{Origin}^{\scriptscriptstyle\mathsf{TM}}$ Vault Owner's Guide

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# **About This Guide**

This guide describes how to set up and operate the Silicon Graphics® Origin™ Vault expansion option. This option has two formats: a standalone tower and an expansion enclosure that can be mounted in the Origin Rack or other Silicon Graphics rack.

Accommodating six single-ended Fast-20 (Ultra) SCSI 3.5-inch disk drives and one full-height or two half-height single-ended SCSI-2 5.25-inch drives, the Origin Vault expansion option provides additional I/O for the Origin200 $^{\text{\tiny M}}$  (with a SCSI option PCI card), Origin200 $^{\text{\tiny M}}$ , or Onyx2 $^{\text{\tiny M}}$  system.

Both the tower and rackmountable enclosure formats are available with single-ended or differential 3.5-inch drive interfaces; in the differential version, two external connectors are provided so that the option can be daisy-chained to another Origin Vault option, or connected to a second host, such as for a dual-hosted configuration. The 5.25-inch disk drive bay is single-ended in either version.

#### **Audience**

This guide is written for owners and users of the Origin Vault expansion option. It presumes general knowledge of SCSI devices and of the host system with which the Origin Vault option is to work.

#### Structure of This Guide

This guide contains the following chapters and appendix:

• Chapter 1, "Features of the Origin Vault Expansion Option," provides an overview of the Origin Vault option, explains versions, configurations, internal drive options, SCSI channels, and configurations, and gives operating guidelines.

- Chapter 2, "Setting Up an Origin Vault Expansion Option," describes how to set up an Origin Vault tower or mount an Origin Vault expansion chassis in an Origin Rack, how to install drives, how to cable the option, and how to power it on.
- Chapter 3, "Operating the Origin Vault Expansion Option," describes inserting and replacing disk drive modules and other removable media, adjusting the feet, and powering the Origin Vault tower off.
- Chapter 4, "Replacing Origin Vault Components," explains how to exchange the Origin Vault SCSI backplane, fan, converter board, system controller board, and power supply.
- Appendix A, "Technical Specifications," gives technical specifications for the option.

An index completes this guide.

**Note:** Besides this guide, have available the owner's guide for the host system to which the Origin Vault is to be cabled and for any peripherals to be installed in the Origin Vault. It is recommended that you also have access to the *Site Preparation for Origin Family, Onyx2, OCTANE, and O2* manual. For information on disks and filesystems under the  $IRIX^{TM}$  operating system, consult the latest edition of *IRIX Admin: Disks and Filesystems*.

If you don't have these printed guides handy, the information is also online in the following locations:

- IRIS InSight™ Library: from the Toolchest, choose Help > Online Books > SGI EndUser or SGI Admin, and select the applicable guide.
- Technical Publications Library: if you have access to the Internet, enter the following URL in your Web browser location window: http://techpubs.sgi.com/library/

# Features of the Origin Vault Expansion Option

The Origin Vault expansion option is a drive enclosure that holds up to six 3.5-inch drives and either one full-height 5.25-inch drive or two half-height 5.25-inch drives. It provides expansion capacity for Silicon Graphics Origin2000, Origin200, and Onyx2 deskside and rackmount servers and workstations.

#### This chapter discusses

- "Origin Vault Formats" on page 2
- "Internal Drives and SCSI Channels" on page 4
- "Operating Conditions" on page 11
- "Main Power Switch and Power Button" on page 13
- "Configurations and Cabling for the 3.5-Inch Drive Controller"

# **Origin Vault Formats**

The Origin Vault expansion option is available as a standalone tower or as a rackmountable enclosure. Figure 1-1 shows the standalone tower.



Figure 1-1 Origin Vault Standalone Tower, Front View

The Origin Vault drive enclosure version can be mounted in the Origin2000 Rack (Origin Rack) or other 19-inch Silicon Graphics rack, the Origin SCSI expansion rack (P-S-RACK, 21 inches wide), or in an industry-standard 19-inch rack. The rackmountable version has a front bezel (different from that for the tower), as well as mounting hardware. Figure 1-2 shows an example of a rackmounted Origin Vault drive enclosure.

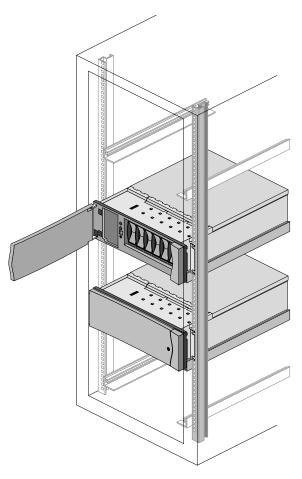


Figure 1-2 Example Rackmounted Origin Vault Enclosure

Both the tower and the rackmountable enclosure are available with a single-ended or a differential 3.5-inch drive controller; see "Internal Drives and SCSI Channels" on page 4 for an explanation and details of the connectors.

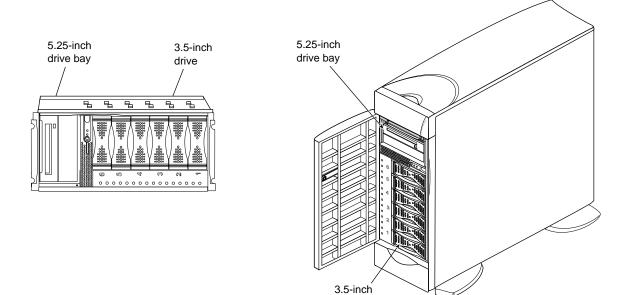
### **Internal Drives and SCSI Channels**

This section discusses

- "Drive Bay Locations" on page 4
- "Drive Controller Connectors" on page 6
- "Drives and Indicators" on page 8
- "Drive Termination" on page 11

# **Drive Bay Locations**

Figure 1-3 shows drive bay locations in each format of the expansion option.



drive

Figure 1-3 Drive Bay Locations

#### **Data Transfer Rates**

The 5.25-inch drives operate at 5 or 10 megatransfers per second (Fast-10 SCSI). The 3.5-inch drives can be 10 or 20 (Fast-20 SCSI) megatransfers per second. The data rate is double the transfer rate, because two bytes are transferred at a time.

# Single-Ended and Differential Versions (3.5-Inch Drive Controller)

Both formats (tower and rackmountable enclosure) are available with a single-ended or a differential 3.5-inch drive controller.

- The differential version allows daisy chaining to another Origin Vault option or connection to a second host in a dual-hosted configuration, such as for IRIS FailSafe™ or Oracle Parallel Server™. For the differential version, an additional SCSI connector is provided.
  - The connectors are explained in "Drive Controller Connectors," below; configurations are explained in "Configurations and Cabling for the 3.5-Inch Drive Controller" later in this chapter.
- The single-ended version of the 3.5-inch drive controller has only one connector; daisy chaining or dual hosting is not possible.

Both the single-ended and the differential versions of the 3.5-inch drive controller provide Fast-20 SCSI.

The drives themselves are single-ended regardless of the controller version.

For all Origin Vault versions, the 5.25-inch drive controller is single-ended only.

#### **Drive Controller Connectors**

The 3.5-inch drive controller and the 5.25-inch drive controller have separate connectors on the rear of the chassis. Figure 1-4 shows the SCSI connectors on the rackmountable enclosure.

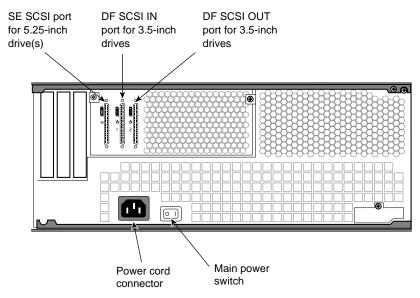


Figure 1-4 Origin Vault Rackmountable Enclosure Rear View (Differential)

In the differential version, the ports for the 3.5-inch drives are labeled for in and out connections, but they can be used interchangeably. If you use only one 3.5-inch drive connector in this version, you must terminate the unused one.

In the tower with the single-ended 3.5-inch drive controller, the third SCSI connector (which is the second 3.5-inch drive controller connector, SCSI OUT) is not present; see Figure 1-5.

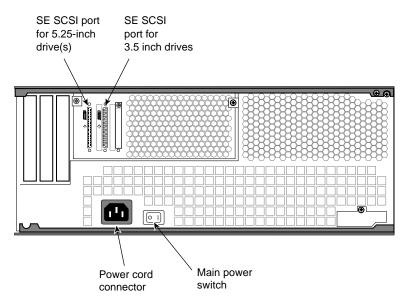


Figure 1-5 Origin Vault Rackmountable Enclosure Rear View (Single-Ended)

If the 3.5-inch drive controller is single-ended, this SCSI line terminates within the Origin Vault option.

**Note:** The SCSI line for the 5.25-inch drives always terminates within the Origin Vault option; daisy chaining is not possible for the 5.25-inch drive controller.

Figure 1-6 shows the SCSI connectors in a standalone tower with a differential 3.5-inch drive controller.

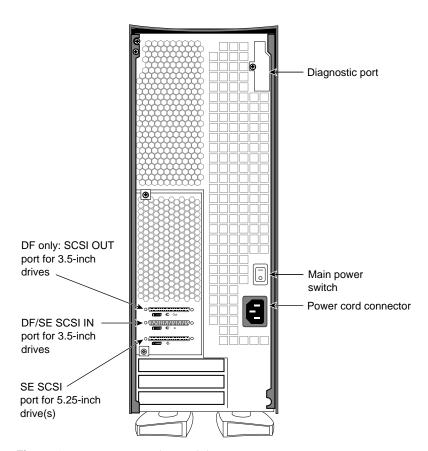


Figure 1-6 Origin Vault Standalone Tower Rear View

# **Drives and Indicators**

This section explains

- "3.5-Inch Disk Drives" on page 9
- "5.25-Inch Drives" on page 10
- "Drive LEDs" on page 10

#### 3.5-Inch Disk Drives

Each disk drive is mounted on a sled that interfaces to the SCSI backplane with a Fast-20 80-pin single-connector assembly (SCA2) connector. Figure 1-7 shows a drive, its sled, and drive bays.

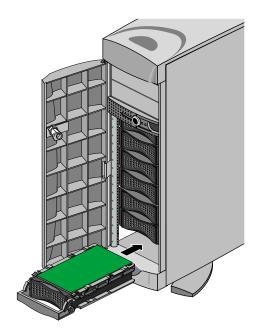


Figure 1-7 3.5-Inch Drive, Sled, and Bay

The connector on the backplane for each drive bay automatically sets the SCSI ID for the drive inserted into that bay. By default, drives are numbered 1 through 6, starting with the bay farthest from the power button. (Note the drive numbers at the left (standalone tower) or bottom (rackmountable enclosure) of the drive bays.)

Drive numbering from 9 through 14 is available by jumpering two pins on the 3.5-inch drive backplane; this procedure is explained in Chapter 2, "Setting Up an Origin Vault Expansion Option."

The Origin Vault expansion option is shipped either with six 3.5-inch disk drive modules or with no disk modules. Individual disk drive modules can be ordered; Table 1-1 summarizes the individual disk modules available.

**Table 1-1** Individual Disk Drive Modules

Disk Module	Marketing Code
4.5-GB SE Fast-20 SCSI	P-S-4
9.1-GB SE Fast-20 SCSI	P-S-9

The Origin Vault SCSI disk drives and their sleds are the same as those for the Origin2000 and Origin200 systems. The Origin Vault 3.5-inch disk drives support administrative warm swap, as described in Chapter 3, "Operating the Origin Vault Expansion Option."

For the differential version, the connectors for the 3.5-inch drives are labeled for in and out, but they can be used interchangeably.

#### 5.25-Inch Drives

The 5.25-inch two-drive bay's SCSI line provides a Fast-10 rate of transfer. This bay is used for one full-height drive, such as a DLT $^{\text{\tiny TM}}$  tape drive, or two half-height removable media drives, such as a CD-ROM drive and a DAT tape drive. The 5.25-inch drives are single-ended 8-bit (narrow) interfaces only.

Note that although the connector for the 5.25-inch drive on the rear of the Origin Vault has 68 pins, the cable inside to the 5.25-inch drive backplane has 50 lines.

See Appendix A, "Technical Specifications," for pinouts for the Origin Vault SCSI connectors.

#### **Drive LEDs**

The drives have LEDs that are made visible from the front of the tower or expansion chassis by the use of light pipes. The drive LEDs light to indicate disk activity. Drive fault is indicated by messages on the system console.

#### **Drive Termination**

Single-ended drive controllers (5.25-inch or 3.5-inch) are terminated within the Origin Vault option.

The differential version must be terminated externally. If you use only one of the two 3.5-inch drive connectors for this version, you must terminate the line by attaching the terminator supplied with the Origin Vault option.

# **Operating Conditions**

The Origin Vault expansion option is designed for operation in a typical office environment. Maintain the following operating conditions for best results:

- The standalone tower or the rack holding the drive enclosure should always be kept in a clean, dust-free environment.
- Protect the unit from harsh environments that produce excessive vibration, heat, or other extreme conditions.
- The available power should be rated and conditioned for computer operation.
- Use an uninterruptable power supply when possible.
- If the standalone tower is connected to an Origin200 system, both systems must be
  plugged into the same grounded power circuit; otherwise, loss of signal integrity or
  possible damage to components on the Origin200 main system board can result.
- The standalone tower should have air clearances of four inches (2.5 cm) on all sides. For more information, see *Site Preparation for Origin Family and Onyx*2.

Air flow through either version of the Origin Vault expansion option is from the front of the system to the rear, and is drawn by three DC fans located just behind the drive bays. Figure 1-8 shows air flow through the Origin Vault tower.

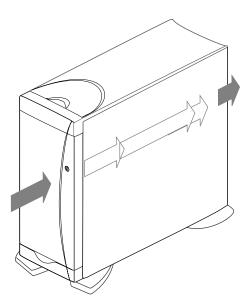


Figure 1-8 Air Flow Through the Origin Vault Tower

### **Main Power Switch and Power Button**

The Origin Vault expansion option has both a main (master) power switch at the rear and a power button in the front, as shown in Figure 1-9.

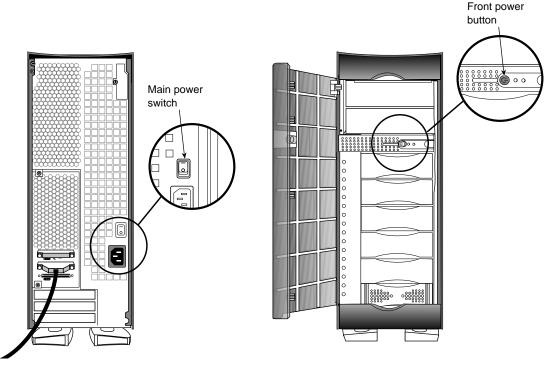


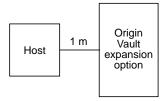
Figure 1-9 Main Power Switch (Circuit Breaker) and Power Button

Pressing the power button at the front is a soft power-off. Residual power is still supplied to the unit as long as the main power switch at the rear is on. The main power switch is a circuit breaker that cuts off all power to the Origin Vault system.

Generally, to power off the Origin Vault expansion option, you press the power button at the front and then turn off the main switch at the rear. To turn the option back on, you reverse these steps. If you turn off the main switch and do not press the power button at the front, the Origin Vault system immediately powers back on when you turn the main switch back on. The system remembers the state of the front power switch independently of the main power switch so that when power is restored after a power failure, the system immediately powers back on.

# Configurations and Cabling for the 3.5-Inch Drive Controller

You can use the single-ended version of the Origin Vault expansion option only as diagrammed in Figure 1-10. Note that this configuration is terminated internally.



**Figure 1-10** Origin Vault Configuration (Single-Ended Only)

You can use the differential version of the Origin Vault expansion option in four configurations, summarized in Table 1-2.

 Table 1-2
 Origin Vault Differential Configurations

Hosts	Origin Vault Expansion Options	Description
1	1	Single-host single-option
1	2	Daisy-chained
2	1	Dual-host single-option (failover)
2	2	Dual-host dual-option (failover)

Figure 1-11 diagrams the differential configurations.

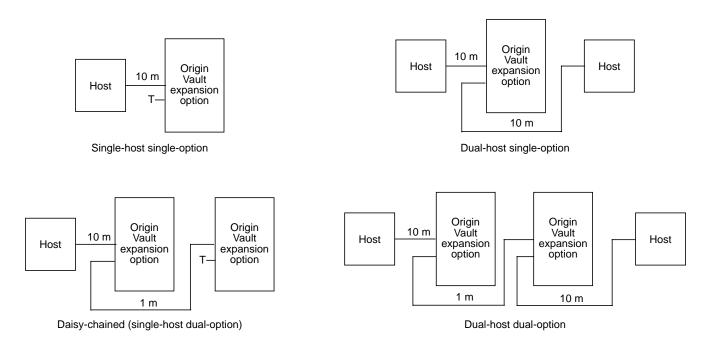


Figure 1-11 Origin Vault Configurations (Differential Only)

**Note:** In Figure 1-11, T represents an external passive differential SCSI terminator.

The Origin Vault expansion option includes these cables:

- single-ended versions
  - one 1-meter SCSI cable to connect 3.5-inch drives to the host
  - one 1-meter SCSI cable to connect 5.25-inch drives to the host
- differential versions
  - terminator
  - one 10-meter SCSI cable to connect 3.5-inch drives to the host
     For the configuration with two hosts and one option, you must order an additional 10-meter cable (marketing code X-S-DF-10M, part number 018-0546-501).
  - one 1-meter SCSI cable to connect 5.25-inch drives to the host or to daisy-chain the 3.5-inch drive controller to a second Origin Vault option

If you wish to do both, you must order an additional 1-meter cable (marketing code X-S-1M, part number 018-0546-301).

# Setting Up an Origin Vault Expansion Option

This chapter describes how to set up an Origin Vault standalone tower or rackmountable enclosure. Sections are

- "Safety Considerations" on page 18
- "Choosing a Location for the Origin Vault Tower" on page 18
- "Unpacking the Origin Vault" on page 19
- "Jumpering SCSI Device IDs" on page 20
- "Installing the Origin Vault Enclosure in a Rack" on page 24
- "Installing 3.5-Inch Drives" on page 43
- "Installing 5.25-Inch Options" on page 47
- "Cabling the Tower" on page 55
- "Adding a Second Origin Vault Expansion Option (One Host)" on page 59
- "Adding a Second Host to One Origin Vault Expansion Option" on page 61
- "Adding a Second Host and Second Origin Vault Expansion Option" on page 63
- "Turning On the Origin Vault Expansion Option" on page 66
- "Verifying Drive Installation" on page 67
- "Configuring Drives" on page 68



**Warning:** Removing the Origin Vault tower from its package or lifting an Origin Vault rackmountable enclosure into a rack requires two people.

# **Safety Considerations**

When setting up an Origin Vault tower, keep in mind the following.

- Removing the Origin Vault option from its package requires two people.
- When opening the chassis to install or remove peripherals, always observe proper electrostatic discharge (ESD) procedures. Make sure you are properly grounded with a wrist or heel strap before handling drive assemblies.

For further considerations for the Origin Vault tower, see the next section, "Choosing a Location for the Origin Vault Tower."

# **Choosing a Location for the Origin Vault Tower**

Follow these guidelines:

- If the standalone tower is connected to an Origin200 system, both systems must be plugged into the same grounded power circuit; otherwise, loss of signal integrity or possible damage to components on the Origin200 main system board can result.
- Any difference in ground potential greater than 500 millivolts (0.5 volts) between two chassis connected together with CrayLink<sup>™</sup> or XTown cables can cause severe equipment damage, and can create hazardous conditions.
- Be sure that there is a properly rated electrical outlet available near enough for the power cable to reach.
- Use an uninterruptable power supply when possible.
- Make sure that the surface on which you place the tower can support at least 60 lbs (27 kg) over an area of 9.25 inches (23.5 cm) by 26.5 inches (67.3 cm). These dimensions take into account the widest setting for the tower feet.
- Select a site that is clean and dust-free and that does not produce excessive vibration or other extreme conditions.
- Provide four inches (2.5 cm) clearance around all sides of a tower for proper air flow

For more information, consult the latest version of the *Site Preparation for Origin Family and Onyx*2.

# **Unpacking the Origin Vault**

Move the box(es) to the site you have selected (Origin Vault tower) or to the Origin Rack location (Origin Vault rackmountable chassis).

Remove the Origin Vault option from its packing.



**Warning:** Removing the Origin Vault option from its package requires two people.

For the standalone tower:

- If you are resetting the 3.5-inch drive device IDs from the default (1 through 6) to 9 through 14 (such as for installations in which one host accesses two Origin Vaults), proceed to the next section, "Jumpering SCSI Device IDs" on page 20.
- If you are not resetting 3.5-inch drive device IDs, swivel the feet out to the position you want and proceed to the section "Installing 3.5-Inch Drives" on page 43.

If you have a rackmountable chassis, set it flat on a work surface with the door facing out, as shown in Figure 2-1.

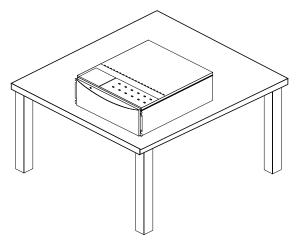


Figure 2-1 Rackmountable Origin Vault Enclosure

If you are resetting the 3.5-inch drive device IDs from the default (1 through 6) to 9 through 14, proceed to the section "Jumpering SCSI Device IDs" on page 20. Otherwise, proceed to the section "Installing the Origin Vault Enclosure in a Rack" on page 24.

# **Jumpering SCSI Device IDs**

The default SCSI device IDs for the drives are 1 through 6, starting at the drive farthest from the on/off button. For installations in which one host uses two Origin Vault options, you must reset the drives on one Origin Vault option to the higher number set, namely 9 through 14. Select the higher number set by placing a jumper (included inside the Origin Vault option) over certain pins. To do so, follow these steps:

- 1. Have ready a #2 Phillips screwdriver and a pair of needle-nosed pliers.
- 2. For an Origin Vault tower, remove the side panels, as shown in Figure 2-2.

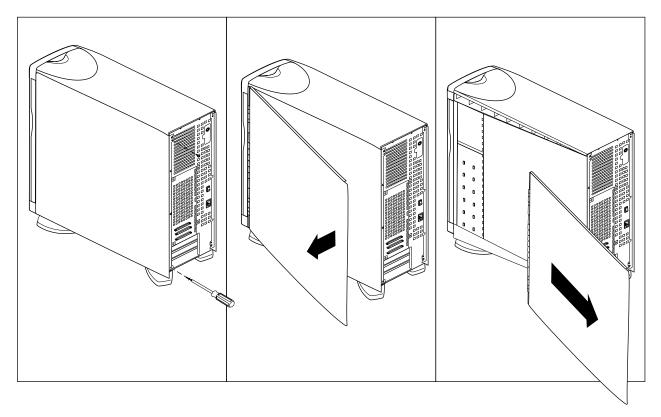


Figure 2-2 Removing Tower Side Panels

3. Lay the tower or rackmountable enclosure on a work surface with the top cover facing up, as shown in Figure 2-1.

4. Remove the two screws at the rear of the chassis that secure the top cover and remove the top cover. See Figure 2-3.

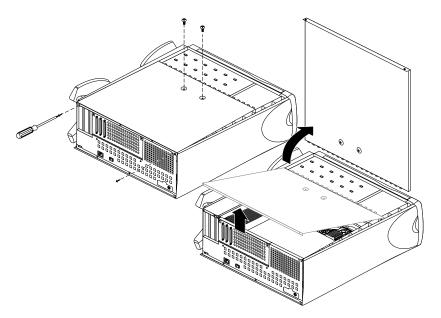


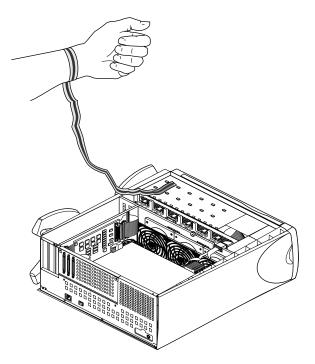
Figure 2-3 Removing the Origin Vault Cover

Be careful not to touch components within the chassis.



Warning: Do not attempt to open the power supply at any time.

5. Ground yourself with a wrist strap, as shown in Figure 2-4. The grounding strap is included in the Origin Vault shipment.



**Figure 2-4** Attaching the Grounding Strap

6. Locate the ID-setting pins near the outer edge of the 3.5-inch backplane; see Figure 2-5. Notice the jumper (shunt) that is inserted over one pin.

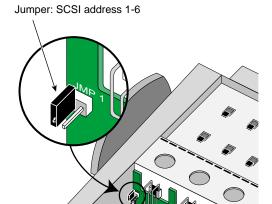
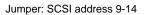
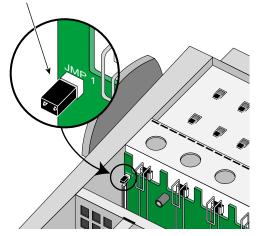


Figure 2-5 SCSI Device ID Jumper and Pins

7. Using the needle-nosed pliers, lift the jumper off the pin and slide it over both pins. See Figure 2-6.





**Figure 2-6** Setting 3.5-Inch Drive Device Numbering to 9 through 14

8. Remove the grounding strap and close the Origin Vault, reversing the procedures in step 4.

If you are setting up an Origin Vault tower, replace the side panels, set the tower upright, and, if desired, adjust the tower feet. Skip the next section and proceed to "Installing 3.5-Inch Drives" on page 43.

If you are setting up a rackmountable enclosure, proceed to "Installing the Origin Vault Enclosure in a Rack" on page 24.

# Installing the Origin Vault Enclosure in a Rack



**Warning:** Lifting the Origin Vault rackmountable enclosure into a rack requires two people.

You can install the Origin Vault enclosure in

- an Origin2000 Rack (also known as Origin Rack), which holds an Origin2000 rackmount chassis and includes an MMSC, power distribution unit, and other features
- an Origin SCSI expansion rack (P-S-RACK)
- an industry-standard third-party 19-inch rack

Different marketing codes have appropriate hardware for the various racks, as summarized in Table 2-1.

**Table 2-1** Rackmount Enclosure Hardware

Feature	For Origin2000 Rack or P-S-RACK	For Third-Party 19-Inch Rack or P-S-RACK
Door design	Side hinge	Bottom hinge
End caps	One (used only if door is removed)	Two pairs (two sizes)
Mounting hardware	Mounting ears (U-shaped in cross-section)	Rack brackets (L-shaped in cross-section)
Mounting shelf	Not included	Included
Faceplate/door preinstalled	No	Yes
Structured to	P-S-B6X4B-DF-R, P-S-B6X9B-DF-R, P-S-BOXB-DF-R	P-S-BOX2B-DF-R

Installing the Origin Vault enclosure in a rack is described in these sections:

- "Preparing the Enclosure for the Origin2000 Rack or P-S-RACK" on page 25
- "Preparing the Third-Party 19-Inch Rack for the Enclosure" on page 29
- "Securing the Enclosure in the Rack" on page 32
- "Removing the Enclosure Door (Optional)" on page 35
- "Cabling the Enclosure" on page 37

The last three sections pertain to all types of racks.

**Note:** These procedures require a #2 Phillips screwdriver.

## Preparing the Enclosure for the Origin2000 Rack or P-S-RACK

In an Origin2000 Rack or the P-S-RACK, the enclosure rests on rails, which are supplied in the rack.

The Origin Vault enclosure for the Origin2000 Rack includes mounting ears, with screws. These mounting ears are not weight-bearing, but serve to secure the enclosure in the rack and prevent it from sliding out.

The Origin Vault enclosure shipment for the Origin2000 Rack includes a faceplate with a door that is hinged at the left. The faceplate snaps into the mounting ears after it is installed in the rack. You can remove the door; an end cap is included to cover the mounting flange that is exposed, as explained in "Removing the Enclosure Door (Optional)" on page 35.

Preparing the rack and the enclosure consists of

- "Attaching Mounting Ears to the Enclosure" on page 26
- "Preparing the Origin2000 Rack" on page 27

#### **Attaching Mounting Ears to the Enclosure**

The U-shaped mounting ears are for the left (part number 040-1763-001) and right (part number 040-1764-001) sides of the Origin Vault enclosure; they are not interchangeable. See Figure 2-7.

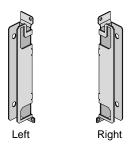


Figure 2-7 Mounting Ears

Using a #2 Phillips screwdriver and the screws provided with the Origin Vault enclosure, fasten the appropriate ear to each side of the enclosure behind the front flange, as shown in Figure 2-8. Use two screws for each mounting ear.

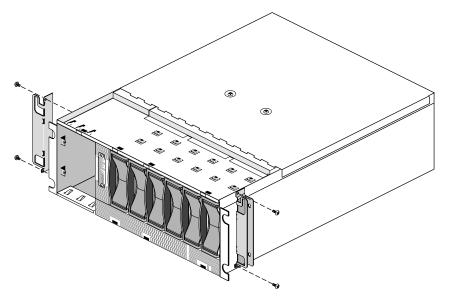


Figure 2-8 Attaching Mounting Ears

#### Preparing the Origin2000 Rack

The Origin2000 Rack provides front and rear access. In the Origin2000 Rack, the rear is where the main power switch is located, as well as all of the connectors.

To prepare the Origin2000 Rack, follow these steps:

1. Open the front and rear of the rack. Plan where in the rack to install the enclosure. Figure 2-9 shows locations; an Origin2000 Rack containing one module can accommodate as many as four Origin Vault enclosures.

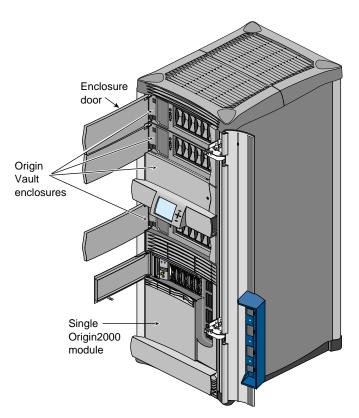


Figure 2-9 Example Origin Vault Enclosures in Origin2000 Rack

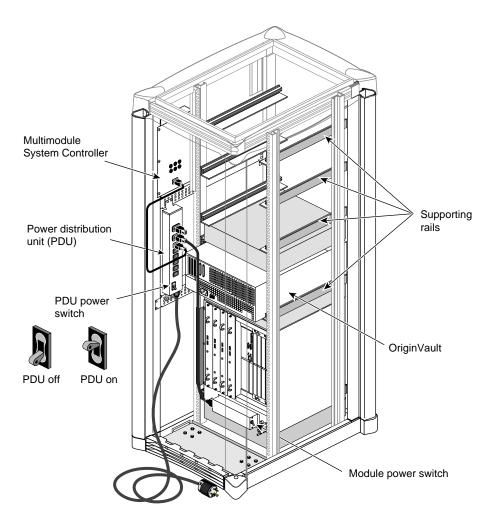


Figure 2-10 shows rail placement in an Origin2000 Rack, with other features.

Figure 2-10 Rail Placement for Origin Vault Enclosure in an Origin2000 Rack

- 2. Power off the Origin 2000 Rack, following procedures outlined in its manual.
- 3. If necessary, remove the filler panel for the bay you have selected for the Origin Vault enclosure.
- 4. Proceed to "Securing the Enclosure in the Rack" on page 32.

# Preparing the Third-Party 19-Inch Rack for the Enclosure

In an industry-standard third-party 19-inch rack, the Origin Vault enclosure rests on a shelf included with the Origin Vault enclosure. This mounting shelf takes up 4 U (7 inches, or 17.8 cm) of space and works in most 19-inch racks.

This Origin Vault enclosure shipment includes brackets (with screws) for securing the enclosure to the shelf.

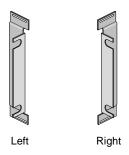
The Origin Vault enclosure shipment for the third-party 19-inch rack also includes end caps for covering the ends of the front bezel if you want the enclosure door removed. Two pairs are included to accommodate the different widths of racks. Placing these end caps is explained in "Securing the Enclosure in the Rack" on page 32.

Preparing the rack and the enclosure consists of

- "Attaching Rack Brackets to the Enclosure" on page 30
- "Installing the Mounting Shelf" on page 31

#### **Attaching Rack Brackets to the Enclosure**

The L-shaped mounting ears) are stamped "L" (part number 040-2007-001) and "R" (part number 040-2006-001) for left and right; they are not interchangeable. See Figure 2-11.



**Figure 2-11** Rack Brackets (Mounting Ears)

Using a #2 Phillips screwdriver and the screws provided with the Origin Vault enclosure, fasten the appropriate bracket to each side of the enclosure behind the front flange, as shown in Figure 2-12. Use two screws for each bracket.

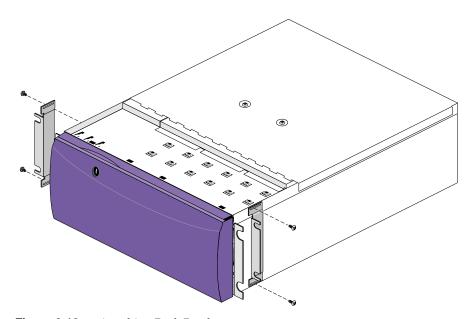
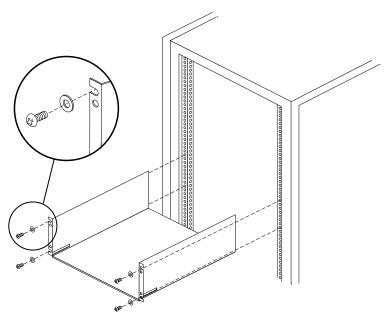


Figure 2-12 Attaching Rack Brackets

#### **Installing the Mounting Shelf**

Follow these steps to install the mounting shelf in the 19-inch rack:

- 1. Determine where in the rack you want to install the Origin Vault enclosure.
  - **Note:** The Origin Vault enclosure shipped for the 19-inch rack has a door that is hinged at the bottom. You can remove this door if desired.
- 2. Locate four  $10-32 \times 1/2$ -inch screws and the four #10 washers included with the mounting shelf.
- 3. Place a washer between each screw head and the mounting shelf, as shown in Figure 2-13. Screw in the screws to install the mounting shelf.



**Figure 2-13** Installing the Rackmounting Shelf in a P-S-RACK or 19-Inch Industry-Standard Rack

# **Securing the Enclosure in the Rack**

For any type of rack, follow these steps to install and secure the Origin Vault enclosure:

1. If the front door of the Origin Vault rackmountable enclosure is not locked, use the key to lock it so that the door cannot be pulled open accidentally when the enclosure is being installed.



# **Warning:** Lifting the Origin Vault rackmountable enclosure into a rack requires two people.

If the enclosure contains peripherals, you can remove them to lighten the enclosure before you install it. Follow procedures in "Removing and Adding a 5.25-Inch Drive Option" and "Replacing and Adding a Disk Drive Module" in Chapter 3.

2. With a person on each side of the enclosure, lift it into the front of the rack, as shown in Figure 2-14. Place it on top of the side rails or shelf and slide it back into the rack.



Figure 2-14 Lifting the Origin Vault Enclosure Into a Rack

3. Attach the enclosure to the rack, using the screw and fastener combination appropriate for the rack.

4. If the Origin Vault option has a bottom-hinged door, attach plastic end caps to conceal the mounting flanges, as shown in Figure 2-15. For the Origin SCSI expansion rack (P-S-RACK), use the larger pair of end caps; for a 19-inch third-party rack, use the smaller pair.

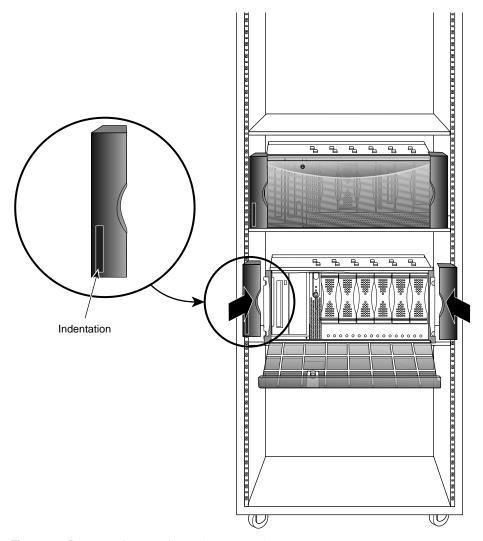


Figure 2-15 Attaching End Caps (P-S-RACK)

Attach the label to the indentation in the left end cap shown in Figure 2-15.

5. If the Origin Vault option has a side-hinged door, attach it by plugging it into the holes in the U-shaped mounting ears, as shown in Figure 2-16.

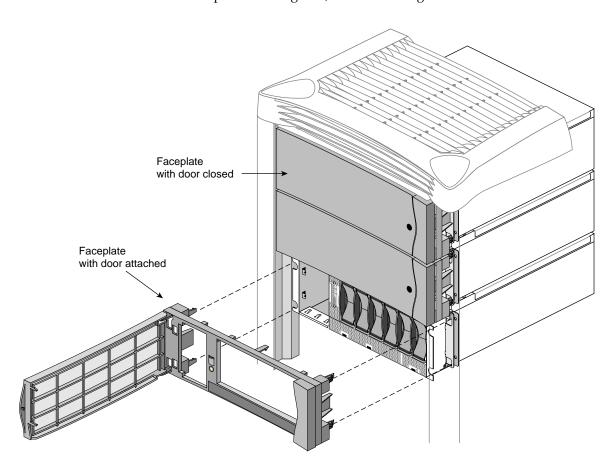


Figure 2-16 Installing Faceplate and Door: Origin2000 Rack

# **Removing the Enclosure Door (Optional)**

You may wish the enclosure door removed for easier access to the media. You can pull either type of door off its faceplate.

Figure 2-17 shows this operation in an Origin2000 Rack.

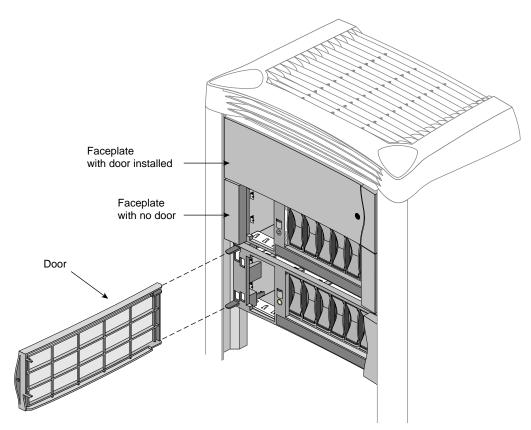


Figure 2-17 Removing Faceplate and Door: Origin2000 Rack

Use the single end cap provided to cover the end of the faceplate that is exposed when the door is removed.

Figure 2-18 shows this operation in a third-party rack. Move the retention clip out of the way, continue pulling the door down, and it comes off.

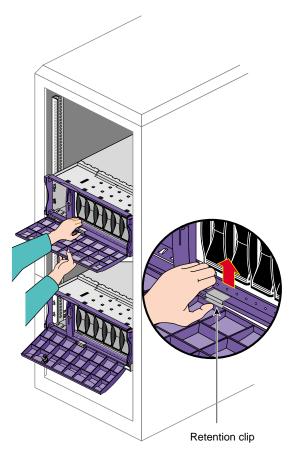


Figure 2-18 Removing Faceplate and Door: Third-Party 19-Inch Rack

## **Cabling the Enclosure**

Before you cable the Origin Vault enclosure, note the following:

- The Origin Vault enclosure package includes two SCSI cables: two 1-meter cables for the single-ended version, a 1-meter and a 10-meter cable for the differential version. Use only these cables.
- Make sure the SCSI channel you are using on the host system matches the type of expansion option you ordered.

**Caution:** If you connect a differential SCSI cable to a single-ended expansion option, the entire differential bus shuts down. If you connect a single-ended SCSI cable to a differential expansion option, none of the drives in the Origin Vault will work.

By default, the Origin2000 host system SCSI connector on the BaseIO panel is single-ended. Ultra SCSI XIO board output channels 0, 1, 2, and 3 are differential; channel 0 is autosensing to work with either differential or single-ended SCSI devices. However, channel 0 is not suitable for use with the Origin Vault's single-ended or differential 3.5-inch drives.

Figure 2-19 shows the SCSI connectors on the back of the enclosure.

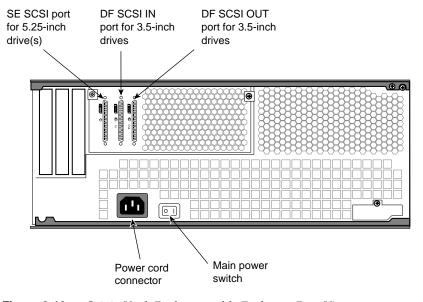


Figure 2-19 Origin Vault Rackmountable Enclosure Rear View

#### This section explains

- "Connecting to the Power Distribution Unit" on page 38
- "Cabling the Single-Ended 3.5-Inch Drive Controller" on page 39
- "Cabling the Differential 3.5-Inch Drive Controller" on page 40
- "Cabling the 5.25-Inch Drive Controller" on page 43

#### **Connecting to the Power Distribution Unit**

Connect the Origin Vault power cord to the Origin Rack power distribution unit, as shown in Figure 2-20.

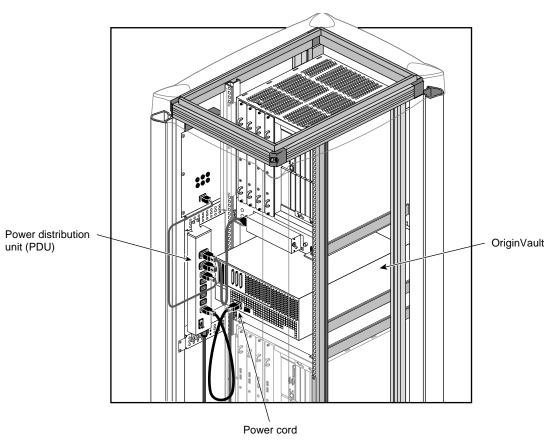


Figure 2-20 Connecting the Rackmount Power Cable

#### Cabling the Single-Ended 3.5-Inch Drive Controller

If the host is in the same rack, use the 1-meter SCSI cable to connect the single-ended 3.5-inch drives to these ports:

- the SCSI port on an Origin2000 IO6 board
- the port on the single-ended version of the PCI SCSI board; see Figure 2-21



Figure 2-21 PCI SCSI Option Board Icons

**Note:** Do not use channel 0 on the optional Ultra SCSI XIO board for the 3.5-inch drives.

Figure 2-22 shows cabling to the IO6 board in an Origin2000 server.

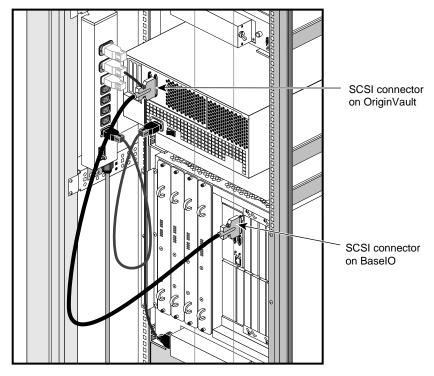


Figure 2-22 Connecting the Rackmount SCSI Cable to an Origin2000 Host: Single-Ended Only

#### Cabling the Differential 3.5-Inch Drive Controller

To cable the differential 3.5-inch drive controller, plug the 10-meter SCSI cable into the IN SCSI connector (the middle port) on the Origin Vault option. Connect the other end to

- Ultra SCSI XIO board channel 1, 2, or 3 (not 0)
- the port on the differential version of the PCI board; see Figure 2-21

**Note:** Do not use channel 0 on the optional Ultra SCSI XIO board for the 3.5-inch drives. Also, do not use the SCSI connector on the host BaseIO panel, which is single-ended.

If the Origin Vault enclosure is interfacing with the Ultra SCSI option board, cable the Origin Vault SCSI to a SCSI connector of one of the Y cables supplied with the Ultra SCSI board option, not directly to the board, as shown in Figure 2-23.

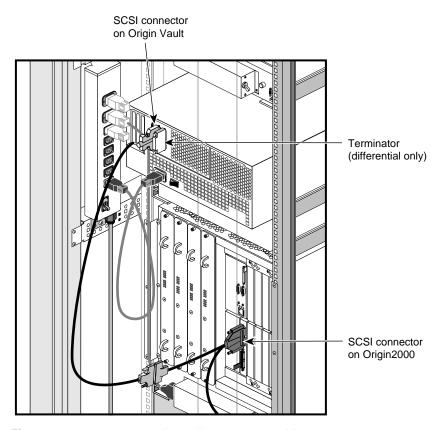


Figure 2-23 Connecting the Rackmount SCSI Cable to an Origin2000 Host: Differential Only

For a differential Origin Vault, if the host is not in the same rack, use the 10-meter SCSI cable supplied with the enclosure to connect the 3.5-inch drive controller's IN SCSI connector (the middle port) to a differential SCSI connector in the host. Figure 2-24 shows cabling to a differential PCI option board in an Origin200 tower.

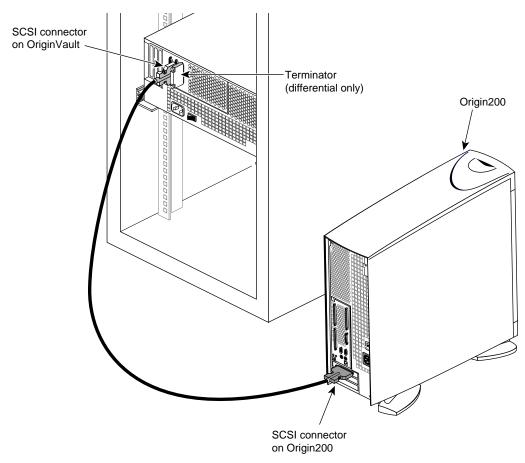


Figure 2-24 Connecting the Rackmount SCSI Cable to a Host (Not in Same Rack)

Attach a terminator (part number 9660006; included in the differential Origin Vault shipment) to the OUT SCSI connector if it does not already have one, unless you are adding a second host or Origin Vault option, as explained in "Adding a Second Origin Vault Expansion Option (One Host)" on page 59, "Adding a Second Host to One Origin Vault Expansion Option" on page 61, or "Adding a Second Host and Second Origin Vault Expansion Option" on page 63.

#### Cabling the 5.25-Inch Drive Controller

If peripherals are present in the 5.25-inch drive bay, connect this controller port to a single-ended SCSI port in the host with the second 1-meter cable included with the option. For the 5.25-inch drives, you can use either

- channel 0 on the optional Ultra SCSI XIO board
- the SCSI connector on the host BaseIO panel
- the port on the single-ended version of the PCI SCSI board; see Figure 2-21

  If the Origin Vault enclosure is interfacing with the Ultra SCSI option board, you cable the Origin Vault SCSI to a SCSI connector of one of the Y cables supplied with the Ultra SCSI board option, not directly to the board.

# **Installing 3.5-Inch Drives**

The SCSI device IDs of the 3.5-inch bays in the Origin Vault are numbered 1 through 6 (or 9 through 14), starting farthest from the power button. The SCSI backplane automatically sets the SCSI ID of the disk drive in each bay.

Disk drives ordered from Silicon Graphics are preconfigured; you can install them in the bays with no additional configuration. If you are installing third-party peripherals, or wish to change the configuration of a Silicon Graphics supplied drive, follow these guidelines:

- Set the SCSI device numbers from 1 to 6 or from 9 to 14.
   Setting the drives to device numbers 9 through 14 is explained in "Jumpering SCSI Device IDs" on page 20.
- Do not use
  - SCSI ID 0, which is reserved for the controller
  - SCSI ID 7, which is reserved for the second host adapter in dual-host configurations

Note that the 5.25-inch drive bay and the 3.5-inch drives are on separate SCSI buses in the Origin Vault.

Set the drive (motor) start jumper to start on command from the host. Do not
configure the drive to start as soon as power is applied, because this setting might
draw too much current when the system is first turned on. Options from Silicon
Graphics have this jumper set correctly.

**Note:** If you are replacing a 3.5-inch drive, see "Replacing and Adding a Disk Drive Module" on page 74 or "Warm Swapping Drives (Administrative Warm Swap)" on page 75 in Chapter 3, "Operating the Origin Vault Expansion Option."

To install a 3.5-inch drive, follow these steps:

1. At the back of the tower or chassis, make sure that the main power switch is turned off, as shown in Figure 2-25.

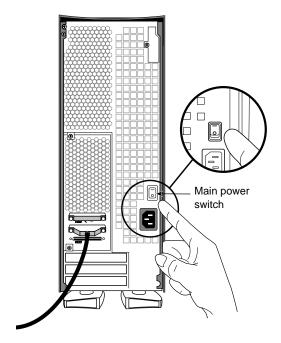
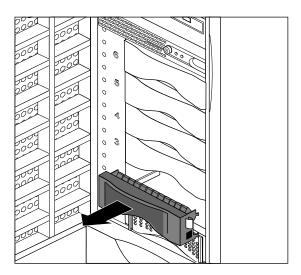


Figure 2-25 Turning Off the Main Power Switch

- 2. Unlock and open the Origin Vault front door using the key included with the option.
- 3. Attach the grounding strap to ground yourself to a metal part of the Origin Vault.

4. For each drive you are installing, remove a blanking panel from a drive bay, starting with the bay farthest from the on/off button. See Figure 2-26.

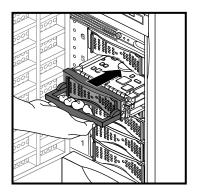


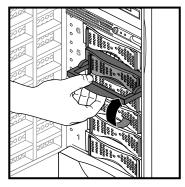
**Figure 2-26** Removing a Blanking Panel for a 3.5-Inch Drive

**Note:** Save the blanking panel(s) you remove. If you need to remove a drive and do not replace it with another one, you must reinstall the blanking panel to ensure proper cooling and electromagnetic interference (EMI) shielding in the Origin Vault chassis.

5. Insert each drive sled into a bay until it is almost flush with the edge of the drive bay, as shown in Figure 2-27 and Figure 2-28.

Latch the drive: For a tower, pull the handle up to latch the drive; for an enclosure in a rack, pull the handle to the left.





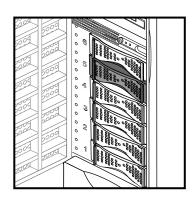
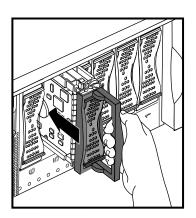
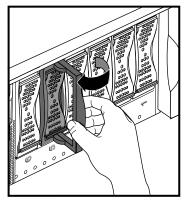


Figure 2-27 Inserting a 3.5-inch Drive, Standalone Tower





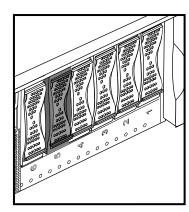


Figure 2-28 Inserting a 3.5-inch Drive, Rackmountable Enclosure

- 6. To avoid drives becoming mixed up if they are removed later from their bays, label each drive SCSI 1, SCSI 2, and so on through SCSI 6 (or 9 through 14, if you have jumpered the pins on the 3.5-inch drive backplane to give the drives the higher number set, as explained in "Jumpering SCSI Device IDs" on page 20).
- 7. Remove the grounding strap.

# **Installing 5.25-Inch Options**

Optional 5.25-inch drives are housed in a peripheral carrier, which accommodates one full-height drive (such as a DLT tape drive) or two half-height drives (such as a CD-ROM drive and a DAT tape drive).

Peripherals ordered from Silicon Graphics are preconfigured; you can install them in the 5.25-inch peripheral carrier with no additional configuration. If you are installing third-party peripherals, or wish to change the configuration of a Silicon Graphics supplied drive, follow these guidelines:

- Set the SCSI device ID between 1 and 15. Do not use SCSI ID 0, which is reserved for the controller. Note that the 5.25-inch drive bay and the 3.5-inch drives are on separate SCSI buses in the Origin Vault.
- Set the drive (motor) start jumper to start on command from the host. Do not
  configure the drive to start as soon as power is applied, because this setting may
  draw too much current when the system is first turned on. Options from Silicon
  Graphics have this jumper set correctly.

The installation process consists of these steps:

- "Preparing the Peripheral Carrier" on page 47
- "Installing the Drive(s) and the Peripheral Carrier" on page 50

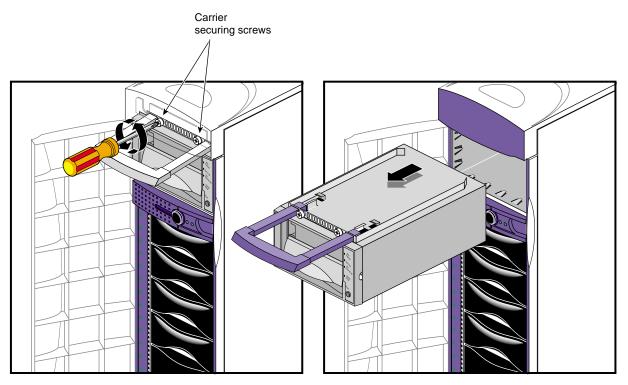
These procedures require a #2 Phillips screwdriver.

#### **Preparing the Peripheral Carrier**

To prepare the peripheral carrier for the peripheral(s), follow these steps:

1. To remove the peripheral carrier, use a #2 Phillips screwdriver to unscrew the two screws that secure the peripheral carrier to the Origin Vault chassis, as shown in Figure 2-29. Reserve the screws.

2. Grasp the handle of the peripheral carrier; the handle slides out about an inch. Pull the carrier out of the bay, supporting it with your other hand. See Figure 2-29.



**Figure 2-29** Unscrewing the Peripheral Carrier

- 3. Place the peripheral carrier on a work surface. Remove the EMI shielding plate from the rear of the peripheral carrier:
  - Unscrew the screw at the bottom of the EMI shielding plate on either side of the carrier, as shown in Figure 2-30.

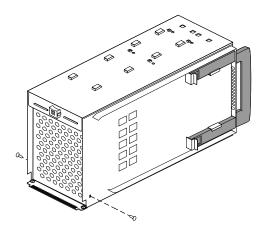


Figure 2-30 Removing Peripheral Carrier EMI Shielding Plate

■ Pull the shielding plate out from the bottom and then down. This plate has tabs that hook into slots at the top of the carrier.

- 4. At the front of the peripheral carrier, use a fingernail to pull out one or both blanking plates:
  - For a full-height drive or two half-height drives, remove both.
  - For one half-height drive, remove either the upper or lower blanking plate.

For ease of access during this installation process, you may wish to remove both plates, even if you are installing only one drive; you can reinstall the blanking plate for the empty side at the end of the process.

The blanking plates snap into and out of place with tabs at the top and bottom. See Figure 2-31.

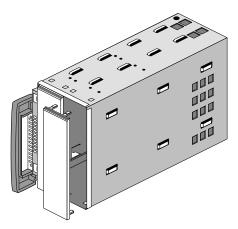


Figure 2-31 Removing a Peripheral Carrier Blanking Plate

**Note:** Save the blanking plate(s) you remove. If you remove a peripheral and do not replace it with another one, you should reinstall the blanking plate(s) to ensure proper cooling in the Origin Vault chassis.

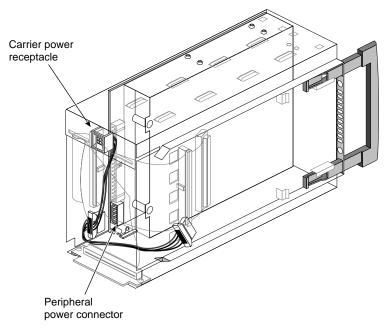
# Installing the Drive(s) and the Peripheral Carrier

To install drives in the peripheral carrier and insert the carrier into the Origin Vault, follow these steps:

- 1. If you are installing two half-height peripherals, check the orientation of their SCSI connectors. Note the configuration of the SCSI cable in the peripheral carrier.
- 2. Slide the peripheral(s) into the carrier from the front.

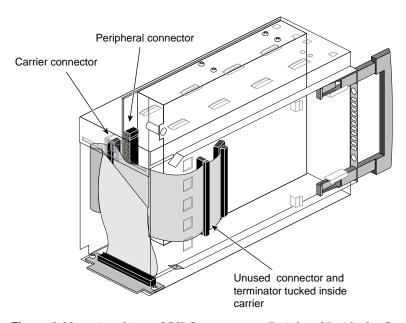
If you are installing one half-height peripheral only, align it flush with one side or the other of the carrier. At least two screw holes on the top of the carrier and two on the bottom must align with screw holes on the peripheral so that it can be secured in the carrier.

3. Attach a connector of the power cable to each peripheral; Figure 2-32 shows an example.



**Figure 2-32** Attaching a Power Cable Connector to a Peripheral Inside the Carrier (Example)

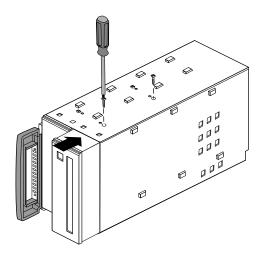
4. Attach one of the SCSI connectors on the carrier's internal SCSI cable to each peripheral; Figure 2-33 shows an example. If you are inserting only one peripheral, use either connector. Fold the excess cable lengths as appropriate.



**Figure 2-33** Attaching a SCSI Connector to a Peripheral Inside the Carrier (Example)

If you are installing a DLT tape drive, use the SCSI connector in the middle of the cable, rather than the one near the end.

5. Push the peripheral all the way into the carrier so that the front is flush with the front of the carrier. Secure the peripheral(s) in the carrier with two screws on the top and two screws on the bottom of the carrier, as shown in Figure 2-34.

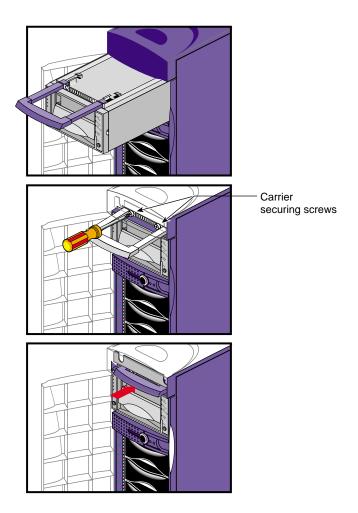


**Figure 2-34** Securing a Peripheral in the Carrier

If all four screw holes align with holes in the peripheral, insert screws in the holes closest to the edge of the carrier.

6. Reattach the EMI shielding plate. If you have removed both blanking plates but installed only one half-height peripheral, reinstall the extra blanking plate.

7. Slide the carrier into the bay; note the orientation shown in Figure 2-35.



**Figure 2-35** Inserting the Peripheral Carrier Into the 5.25-Inch Bay

Make sure the peripheral carrier is flush with the front of the Origin Vault. The connectors on the rear of the peripheral carrier mate with connectors on the 5.25-inch backplane.

8. Screw the peripheral carrier in using the screws you reserved when you removed the carrier (see step 1 in "Preparing the Peripheral Carrier" on page 47).

# **Cabling the Tower**

To cable the standalone tower, follow these steps:

- 1. Locate the power cable and SCSI cable(s) included with your Origin Vault tower.
- 2. Locate the SCSI connectors on the tower; see Figure 2-36.

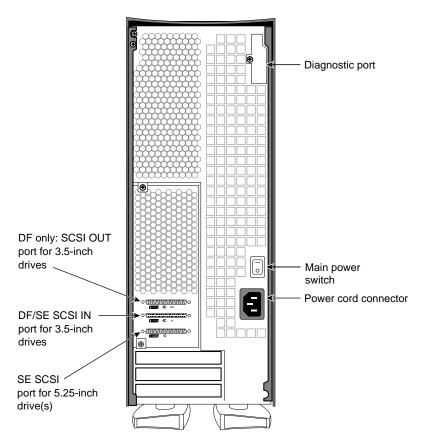


Figure 2-36 Origin Vault Standalone Tower Rear View

**Caution:** Make sure the SCSI driver on the host system matches the type (single-ended or differential) of expansion option that was ordered.

• If you connect a differential SCSI cable to a single-ended expansion option, the entire differential bus will shut down.

If you connect a single-ended SCSI cable to a differential expansion option, none
of the drives in the Origin Vault will work.

By default, the SCSI connector on the BaseIO panel of the Origin2000 host system is single-ended. All Ultra SCSI XIO board channels are differential; channel 0 can be differential or single-ended. The PCI SCSI board option is available in single-ended or differential versions, as indicated by the icon near the board connector (see Figure 2-37).



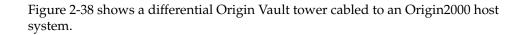
Figure 2-37 PCI SCSI Option Board Icons

- 3. Cable the SCSI connection(s):
  - Single-ended tower: Plug one of the 1-meter SCSI cables into the Origin Vault 3.5-inch controller port. Attach the other end of this cable to a single-ended SCSI connector in the host, such as the SCSI port on an Origin2000 IO6 board or the connector on the single-ended PCI option.
  - Differential tower: Use the Origin Vault 10-meter SCSI cable to connect the 3.5-inch drive controller's IN SCSI port (middle port) to a differential SCSI port on the host.

**Note:** Do not use channel 0 on the optional Ultra SCSI XIO board for single-ended or for differential 3.5-inch drives.

If peripherals are present in the 5.25-inch drive bay, use a 1-meter cable to connect this controller port to a single-ended SCSI port in the host, such as the SCSI port on an Origin 2000 IO6 board or the connector on the single-ended PCI option.

4. For a differential Origin Vault tower, attach a terminator (part number 9660006; included in the differential Origin Vault shipment) to the OUT SCSI connector if it does not already have one, unless you are adding a second host or Origin Vault tower, as explained in "Adding a Second Origin Vault Expansion Option (One Host)" on page 59, "Adding a Second Host to One Origin Vault Expansion Option" on page 61, or "Adding a Second Host and Second Origin Vault Expansion Option" on page 63.



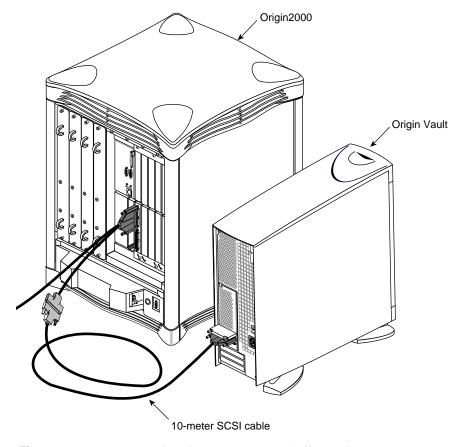
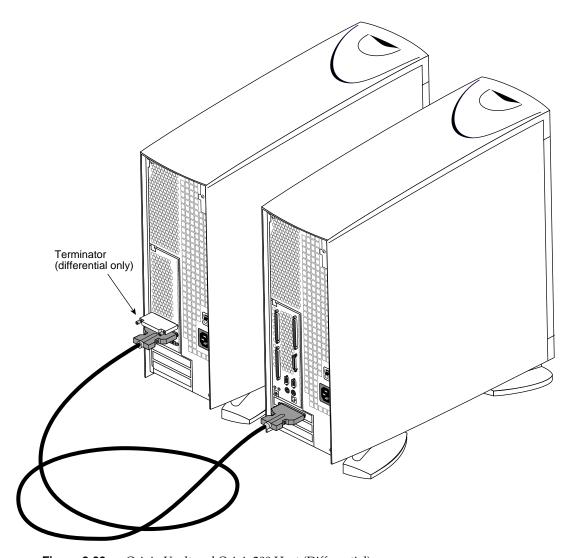


Figure 2-38 Origin Vault and Origin2000 Host (Differential)

Figure 2-39 shows the SCSI cabling between a differential Origin Vault tower and an Origin200 host system.



**Figure 2-39** Origin Vault and Origin200 Host (Differential)

**Caution:** When the standalone tower is connected to an Origin200 system, both systems must be plugged into the same grounded power circuit; otherwise, loss of signal integrity or possible damage can result to components on the Origin200 main system board. Any difference in ground potential greater than 500 millivolts (0.5 volts) between two chassis connected together with CrayLink or XTown cables can cause severe equipment damage, and can create hazardous conditions.

5. Connect the power cable to the tower's power connector (see Figure 2-36) and plug the other end into a properly rated and grounded outlet. Do not turn on the Origin Vault system power at this time.

## **Adding a Second Origin Vault Expansion Option (One Host)**

Figure 2-40 diagrams daisy chaining two Origin Vault expansion options.

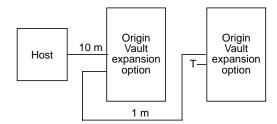


Figure 2-40 Single-Host, Dual-Option: Daisy Chaining

Daisy chaining a second Origin Vault option requires

- differential Origin Vault options only
- different SCSI device IDs for the two Origin Vault options
- a 1-meter cable between the options (one is supplied with each option)
- a terminator on the unused SCSI connector of the second Origin Vault option

#### Follow these steps:

- 1. In the second Origin Vault option, select the alternate SCSI device ID (9-14), as explained in "Jumpering SCSI Device IDs" on page 20. The two Origin Vault options must have different SCSI device IDs.
- 2. If necessary, remove the terminator from the OUT SCSI port of the first Origin Vault option.

- 3. Plug one end of a 1-meter SCSI cable (such as that supplied with the second Origin Vault option) into the 3.5-inch OUT controller port of the first Origin Vault.
- 4. Plug the other end of this cable into the 3.5-inch drive's IN SCSI connector on the second Origin Vault.
- 5. If there is no terminator on the OUT SCSI connector on the second Origin Vault, attach one.

Figure 2-41 shows an example.

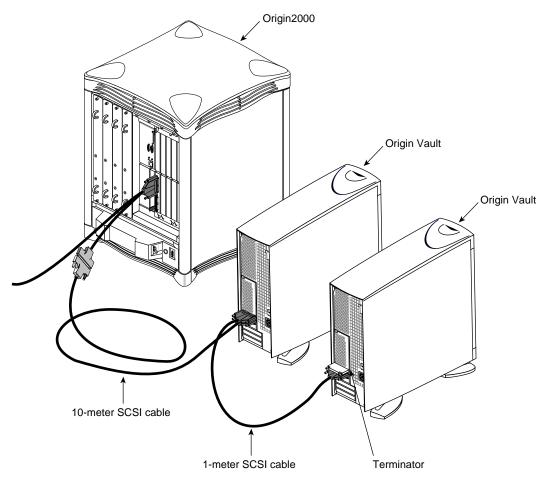


Figure 2-41 Origin2000 System and Daisy-Chained Origin Vault Options

## Adding a Second Host to One Origin Vault Expansion Option

Figure 2-42 diagrams cabling two hosts to one Origin Vault expansion option.

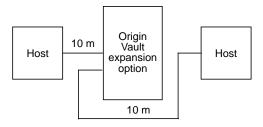


Figure 2-42 Dual-Host, Single-Option Configuration

A configuration in which two hosts share one Origin Vault option (dual-host, single-option) requires

- a differential Origin Vault option only
- different SCSI device IDs for the two hosts
- a 10-meter cable between the second host and the Origin Vault (ordered separately; marketing code X-S-10M)

**Note:** For dual-hosting, such as for an OPS or IRIS FailSafe configuration, qualified Silicon Graphics support personnel should follow configuration instructions in the appropriate manual.

#### Follow these steps:

- 1. Make sure the second host has a different SCSI ID from the first: run *printenv* on each system. For example, the output for the first host might include the line scsihostid=
  - which indicates a SCSI ID of 0, and the output for the second host might include sscsihostid=7
  - The Origin Vault SCSI backplane automatically sets the 3.5-inch SCSI drive IDs to 1 through 6 or 9 through 14.
- 2. If necessary, remove the terminator from the OUT SCSI port of the Origin Vault option.

- 3. Plug one end of a 10-meter SCSI cable into the Origin Vault option's 3.5-inch OUT controller port.
- 4. Attach the other end of this cable to a differential SCSI connector in the second host, such as the Y cable to channel 1, 2, or 3 on the Ultra SCSI XIO board.

Figure 2-43 shows an example.

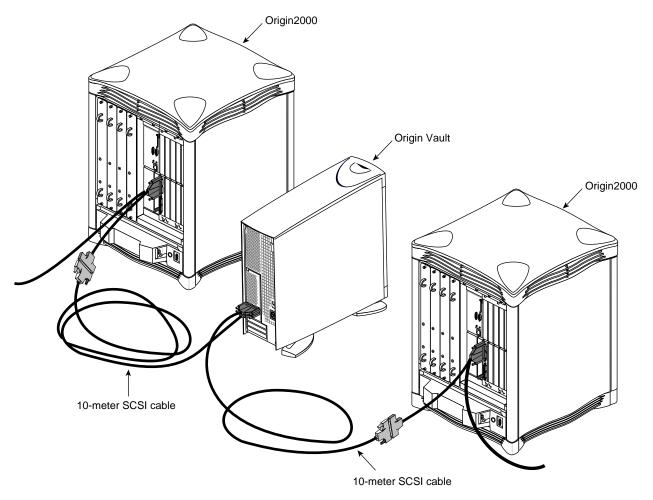


Figure 2-43 Dual-Hosted Configuration Sharing One Origin Vault Option

**Note:** For dual-hosting, such as for an OPS or IRIS FailSafe configuration, qualified Silicon Graphics support personnel should follow configuration instructions in the appropriate manual.

## Adding a Second Host and Second Origin Vault Expansion Option

Figure 2-44 diagrams cabling two hosts to two daisy-chained Origin Vault expansion options.

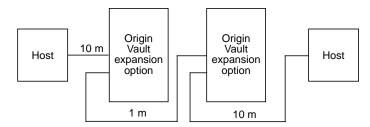


Figure 2-44 Dual-Host, Dual-Option Configuration

A configuration in which two hosts share two Origin Vault options (dual-host, dual-option) requires

- differential Origin Vault options only
- different SCSI device IDs for the two hosts
- different SCSI device IDs for the two Origin Vault options
- a 1-meter cable between the two Origin Vault options

**Note:** For dual-hosting, such as for an OPS or IRIS FailSafe configuration, qualified Silicon Graphics support personnel should follow configuration instructions in the appropriate manual.

To add a second host and second Origin Vault option to the host and Origin Vault option you have just set up, follow these steps:

- 1. In the second Origin Vault option, select the alternate SCSI device ID (9-14), as explained in "Jumpering SCSI Device IDs" on page 20. The two Origin Vault options must have different SCSI device IDs.
- 2. Make sure the second host has a different SCSI ID from the first: run *printenv* on each system. For example, the output for the first host might include the line scsihostid=

which indicates a SCSI ID of 0, and the output for the second host might include sscsihostid=7

The Origin Vault SCSI backplane automatically sets the 3.5-inch SCSI drive IDs to 1 through 6 or 9 through 14.

- 3. Set up and cable the first host-option pair, attaching the 10-meter cable to the Origin Vault option's 3.5-inch IN controller port. Remove the terminator from the first option's OUT port.
- 4. Set up and cable the second host-option pair, attaching the 10-meter cable to the Origin Vault option's 3.5-inch IN controller port. Remove the terminator from the second option's OUT port.
- 5. Connect the two Origin Vault options with the 1-meter cable, cabling the two OUT ports.

Figure 2-45 shows an example.

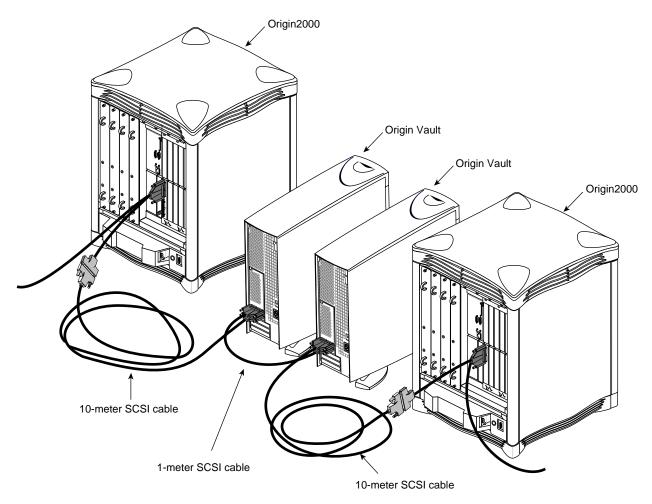


Figure 2-45 Dual-Hosted Configuration Sharing Two Origin Vault Options

**Note:** For dual-hosting, such as for an OPS or IRIS FailSafe configuration, qualified Silicon Graphics support personnel should follow configuration instructions in the appropriate manual.

## **Turning On the Origin Vault Expansion Option**

Follow these steps to turn on the Origin Vault expansion option:

**Caution:** For Origin Vault options that are part of a failover system, follow the startup instructions for that system.

- 1. Make sure that the host system to which the Origin Vault is connected is powered off.
- 2. For an Origin Vault mounted in an Origin Rack, turn on the breaker for the rack if necessary.
- 3. At the rear of the tower or chassis, turn on the Origin Vault main power switch, as shown in Figure 2-46.

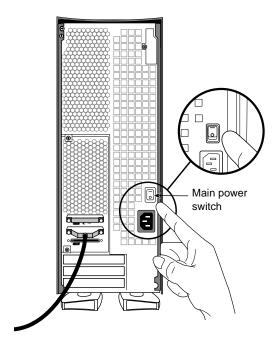


Figure 2-46 Main Power Switch

4. At the front of the tower or chassis, press the power button next to the 5.25-inch drive bay. The LED next to the button lights.

**Note:** When the main power switch is on, a small amount of power flows to the expansion option even if the power button has not been pressed on (its LED is dark).

## **Verifying Drive Installation**

Use the following checklist to determine if a drive is installed correctly in the Origin Vault tower or rackmounted enclosure:

- When you power on the system, watch the drive LEDs. The LEDs should blink one after the other as they are accessed: first the 3.5-inch drives (sequentially), and then the 5.25-inch drives.
- Check the system console; drives that are malfunctioning generate an error message on the system console as the system boots.
- When the system boots in either single-user mode or multiuser mode, use *hinv* to see what is available. The drives should be listed; for example:

```
FPU: MIPS R10010 Floating Point Chip Revision: 0.0
CPU: MIPS R10000 Processor Chip Revision: 2.6
2 190 MHZ IP27 Processors
Main memory size: 64 Mbytes
Instruction cache size: 32 Kbytes
Data cache size: 32 Kbytes
Secondary unified instruction/data cache size: 1 Mbyte
Integral SCSI controller 0: Version QL1040B
  Disk drive: unit 1 on SCSI controller 0
  Disk drive: unit 2 on SCSI controller 0
  Disk drive: unit 3 on SCSI controller 0
  Disk drive: unit 4 on SCSI controller 0
  Disk drive: unit 5 on SCSI controller 0
Integral SCSI controller 1: Version QL1040B
Integral SCSI controller 7: Version OL1040B
  Disk drive: unit 1 on SCSI controller 7
  Disk drive: unit 2 on SCSI controller 7
  Disk drive: unit 3 on SCSI controller 7
  Disk drive: unit 4 on SCSI controller 7
  Disk drive: unit 5 on SCSI controller 7
  Disk drive: unit 6 on SCSI controller 7
  Disk drive: unit 9 on SCSI controller 7
  Disk drive: unit 10 on SCSI controller 7
  Disk drive: unit 11 on SCSI controller 7
  Disk drive: unit 12 on SCSI controller 7
  Disk drive: unit 13 on SCSI controller 7
```

```
Disk drive: unit 14 on SCSI controller 7
Integral SCSI controller 8: Version QL1040B
Integral SCSI controller 9: Version QL1040B
Integral SCSI controller 10: Version QL1040B
IOC3 serial port: tty1
IOC3 serial port: tty2
Integral Fast Ethernet: ef0, version 1
IOC3 external interrupts: 1
```

## **Configuring Drives**

Peripherals provided by Silicon Graphics are all recognized by the IRIX operating system and are ready to be configured for use with the system. For general reference on disks and filesystems, consult the latest edition of *IRIX Admin: Disks and Filesystems*.

Table 2-2 indicates where to get more information about configuring drives, depending upon how you want to use the drives in your system.

**Table 2-2** Information for Drive Configuration

Operation	Reference (Man) Pages or Commands		
Creating device files	MAKEDEV(1M) (IRIX 6.2 and earlier only)		
	mknod(1M)		
Disks			
Formatting and initializing	fx(1M)		
Volume header files, adding and removing	dvhtool(1M)		
Displaying partitions	prtvtoc(1M)		
	fx(1M)		
Repartitioning	fx(1M)		
	xdkm graphical tool		
System (boot) disk creation	PROM monitor (from the System Maintenance Menu)		
	fx(1M), mkfs(1M), MAKEDEV(1M)		
	dump(1M), xfsdump(1M)		
Mounted filesystem, adding	Add_disk(1)		

 Table 2-2 (continued)
 Information for Drive Configuration

Operation	Reference (Man) Pages or Commands
Use quotas	quota(1)
Filesystems	
Creating an EFS or XFS	mkfs(1M)
Spanning across multiple disks	xlv(7M)
Mounting and unmounting	mount(1M), umount(1M) fstab(4)
Automatically mounting (automount)	automount(1M) exportfs(4) chkconfig(1M)

# Operating the Origin Vault Expansion Option

#### This chapter explains

- "Powering Off the Origin Vault Expansion Option" on page 71
- "Locking the Origin Vault Expansion Option" on page 73
- "Replacing and Adding a Disk Drive Module" on page 74
- "Warm Swapping Drives (Administrative Warm Swap)" on page 75
- "Removing and Adding a 5.25-Inch Drive Option" on page 79
- "Adjusting the Feet" on page 84

For information on powering on the Origin Vault, see "Turning On the Origin Vault Expansion Option" on page 66 in Chapter 2. For information on handling Origin Vault expansion option problems, see Chapter 4, "Replacing Origin Vault Components."

## **Powering Off the Origin Vault Expansion Option**

An LED next to the Origin Vault power button lights up to indicate that power is being supplied to the option.

Follow these steps to turn off the Origin Vault expansion option:

- 1. Make sure no users are using the data stored in the expansion option. Check the status LEDs for all drives to make sure they are not active.
- 2. Turn off the power button at the front; the LED goes dark. The power button is between the 5.25-inch drive bay and the 3.5-inch drives.
- 3. Turn off the main power switch at the rear of the Origin Vault, as shown in Figure 3-1.

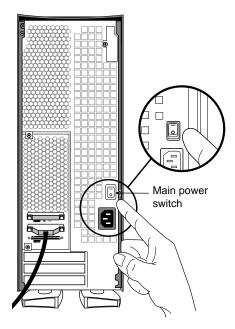


Figure 3-1 Main Power Switch

4. Disconnect the power cable.

**Note:** When you press the power button off (soft power off), residual power is still supplied to the unit as long as the main power switch at the rear is on. The main power switch is a circuit breaker that cuts off all power to the Origin Vault system.

## **Locking the Origin Vault Expansion Option**

Included in the shipment of your Origin Vault expansion option are two metal tabs that you can use with a padlock to lock the expansion option. To lock the Origin Vault, follow these steps:

- 1. Obtain a padlock that fits the holes in the tabs.
- 2. Insert the tabs in the slot at the rear of the chassis; the slot location is indicated in Figure 3-2.
- 3. Spread the tabs apart so that the holes line up.
- 4. Insert the padlock through the holes in the tabs.

Figure 3-2 shows the tabs, their insertion point on the chassis, and their use with a padlock.

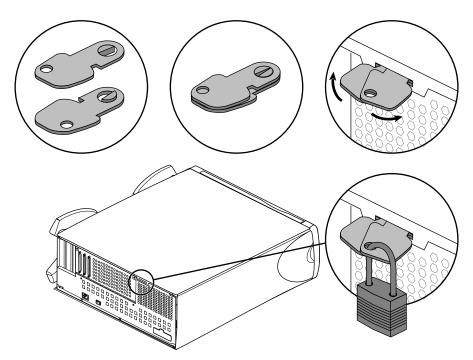


Figure 3-2 Locking the Origin Vault

## Replacing and Adding a Disk Drive Module

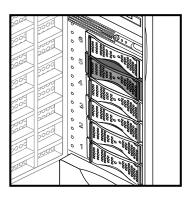
To remove a disk drive module, follow the steps below.

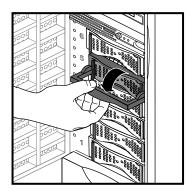
**Caution:** Origin Vault drives are not hot-pluggable. However, you can exchange a 3.5-inch disk drive module (except for the system disk) in the Origin Vault option without powering it off; this procedure is known as administrative warm swap. See "Warm Swapping Drives (Administrative Warm Swap)" on page 75.

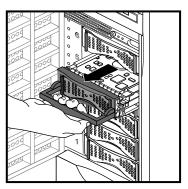
- 1. Make sure no users are using the data stored in the expansion option. Check the status LEDs for all drives to make sure they are not active.
- 2. If you are removing more than one disk drive module at a time and the modules are unlabeled, attach labels to them identifying the slots from which they came.

**Caution:** Replacing drives in slots other than their original slots can cause loss of data.

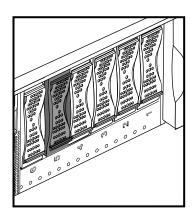
- 3. Turn off the power button at the front; the LED goes dark. Turn off the power on the back of the Origin Vault expansion option; see Figure 3-1.
- 4. For the disk drive you are removing, pull the drive handle down (tower) or leftward (rackmounted enclosure) as shown in Figure 3-3 and Figure 3-4.

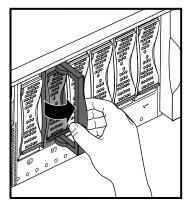


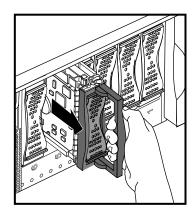




**Figure 3-3** Removing a 3.5-Inch Disk, Standalone Tower







**Figure 3-4** Removing a 3.5-Inch Disk, Rackmountable Enclosure

To insert a disk drive module, follow these steps:

- 1. Make sure no users are using the data stored in the expansion option. Check the status LEDs for all drives to make sure they are not active.
- 2. If the Origin Vault has not already been powered off, turn off the power button at the front; the LED goes dark. Turn off the power on the back of the Origin Vault expansion option; see Figure 3-1.
- 3. Follow instructions in "Installing 3.5-Inch Drives" in Chapter 2.
- 4. To update the system software to recognize a new drive, reboot. Consult the latest edition of *IRIX Admin: Disks and Filesystems* if necessary.

## **Warm Swapping Drives (Administrative Warm Swap)**

You can exchange a 3.5-inch disk drive module (except for the system disk) in the Origin Vault option without powering it off; this procedure is known as administrative warm swap. In the Origin Vault option, only 3.5-inch drives can be warm swapped.

Administrative warm swap utilizes *scsiadminswap*. When this command is in effect, the SCSI bus for the drive you are swapping is quiesced; that is, all commands for this bus are held off. The default bus-quiesce time is 300 seconds (5 minutes), but you can reset this time limit.

**Note:** This procedure also uses system commands that are fully explained in *IRIX Admin: Disks and Filesystems*; have this publication available before you start the procedure. If the disk is part of an XLV volume, see that publication or reference pages for fuser(1M), xlv\_mgr(1M), xlv\_make(1M), xlv\_assemble(1M), and xlv\_shutdown(1M). For information on *scsiadminswap*, see scsiadminswap(1M).

An administrative warm swap consists of

- "Removing and Replacing the 3.5-Inch Disk Drive Module" on page 76
- "Configuring Filesystems on the Replacement Disk Drive Module" on page 78

#### Removing and Replacing the 3.5-Inch Disk Drive Module

Follow these steps:

- 1. Make sure that the disk drive module you want to swap is not the system disk. To replace the system disk, you must power down the Origin Vault, as explained in "Replacing and Adding a Disk Drive Module" on page 74.
- 2. Have ready a grounding strap and the replacement disk drive module.
  - Disk drive modules ordered from Silicon Graphics are preconfigured; you can install them in the bays with no additional configuration. If you are installing third-party peripherals, or wish to change the configuration of a Silicon Graphics-supplied drive, follow guidelines at the beginning of "Installing 3.5-Inch Drives" on page 43 in Chapter 2.
- 3. Make sure no users are using any filesystems on the disk.
- 4. Determine the SCSI bus for this drive.

**Note:** Once the command for the administrative warm swap is issued, the bus for this drive is quiesced; that is, all commands on this bus are held off for the default bus-quiesce time of 300 seconds (5 minutes) or the time you set. If appropriate, inform users that the bus is not available for this period.

- 5. As root, unmount all filesystems of the disk you wish to replace; see umount(1M). Use *fuser* to find and kill processes that use a filesystem.
- 6. For XLV volumes, enter commands as follows:
  - If a filesystem on the disk is an unmirrored XLV volume, enter *xlv\_shutdown*.
  - If a filesystem on the disk is a mirrored XLV volume, enter *xlv\_mgr* and perform a detach of the plex that uses this disk.

**Note:** See *IRIX Admin: Disks and Filesystems* or reference pages for xlv\_mgr(1M), xlv\_make(1M), xlv\_assemble(1M), or xlv\_shutdown(1M).

#### 7. Enter

```
    where
    indicates that this operation is an unplug
    # specifies the SCSI bus for the device
    d # specifies the drive's slot number
```

scsiadminswap -u -b # -d # -t #

-t seconds changes the time to quiesce the bus from the default 300 seconds to the number of seconds specified; there are no lower or upper limits

**Caution:** This command must be allowed to complete. Once you have pressed Enter for this command, use of the bus for this disk is held off. If the disk drive module cannot be replaced within five minutes (or the time set with the -t option), do not kill the *scsiadminswap* command, which leaves the SCSI bus in a bad state. Let the command finish, and retry the process later.

The following example sequence of commands is used for swapping a disk in slot 2, with partition 7 mounted as /x:

```
umount /x
scsiadminswap -p -u -b 0 -d 2
mount -t xfs /dev/dsk/dks0d2s7 /x
```

8. Attach the grounding strap to ground yourself to a metal part of the Origin Vault.

**Note:** Be prepared to remove the disk drive module and insert its replacement within five minutes, or the time set with the **-t** option in step 7.

- 9. Remove the disk drive module by pulling the drive handle down (tower) as shown in Figure 3-3, or leftward (rackmounted enclosure) as shown in Figure 3-4, earlier in this chapter.
- 10. With the grounding strap attached, insert the replacement disk drive module until it is almost flush with the edge of the drive bay.
- 11. Latch the drive: For a tower, pull the handle up to latch the drive; for an enclosure in a rack, pull the handle to the left. Remove the grounding strap.
- 12. Enter

```
scsiadminswap -p -b # -d #
```

where -p indicates that this operation is a plug operation. If desired, you can use the -t option to change the default bus-quiesce time.

#### Configuring Filesystems on the Replacement Disk Drive Module

Set up the filesystems on the replacement disk depending on the type of filesystem that goes on it:

- non-XLV volume:
  - Mount the filesystem using *mount*.
- unmirrored XLV volume with no prior XLV information on the drive:
  - 1. Use *xlv\_make*.
  - 2. Use *xlv\_mgr* and perform an attach.
  - 3. Mount the filesystem using *mount*.
- mirrored XLV volume with no prior XLV information on the drive:
  - 1. Mount the filesystem using *mount*.
  - 2. Use xlv assemble.
- unmirrored XLV volume with prior XLV information on the drive:
  - 1. Use *xlv\_mgr*.
  - 2. Delete the old XLV label information.
  - 3. Use *xlv\_make*.
  - 4. Use *xlv\_mgr* and perform an attach.
  - 5. Mount the filesystem using *mount*.
- mirrored XLV volume with prior XLV information on the drive:
  - 1. Use *xlv\_mgr*.
  - 2. Delete the old XLV label information.
  - 3. Mount the filesystem using *mount*.
  - 4. Use xlv\_assemble.

**Note:** After you have set up the filesystems, notify users that they can write to the disk and the SCSI bus.

The following example sequence of commands is used to swap a disk containing old XLV information in slot 2 with partition 7 mounted as an unmirrored XLV volume named /lvl:

```
umount /lv1
xlv_shutdown -n sample_vol
scsiadminswap -p -u -b 0 -d 2
xlv_mgr -xc "delete label /dev/rdsk/dks0d2vh"
xlv_make (see xlv_make man page for examples)
xlv_mgr (perform attach)
mount -t xfs /dev/dsk/dks0d2s7 /lv1
```

## Removing and Adding a 5.25-Inch Drive Option

These procedures require a #2 Phillips screwdriver.

**Caution:** Origin Vault drives are not hot-pluggable. You must power the Origin Vault expansion option off to remove or add 5.25-inch drive options.

To remove a drive option from the 5.25-inch bay, follow these steps:

- 1. If you are removing a peripheral and not replacing it with a new one, locate the blanking plate(s) for the carrier (one plate for one half-height peripheral, two for a full-height peripheral).
- 2. Make sure no users are using the data stored in the expansion option. Check the status LEDs for all drives to make sure they are not active.
- 3. Turn off the power button at the front; the LED goes dark.
- 4. Turn off the power on the back of the Origin Vault expansion option; see Figure 3-1.
- 5. To remove the peripheral carrier from its bay, use a #2 Phillips screwdriver to unscrew the two screws that secure the peripheral carrier to the Origin Vault chassis, as shown in Figure 3-5. Reserve the screws.

6. Grasp the handle of the peripheral carrier; the handle slides out about an inch. Pull the carrier out of the bay, supporting it with your other hand. See Figure 3-5.

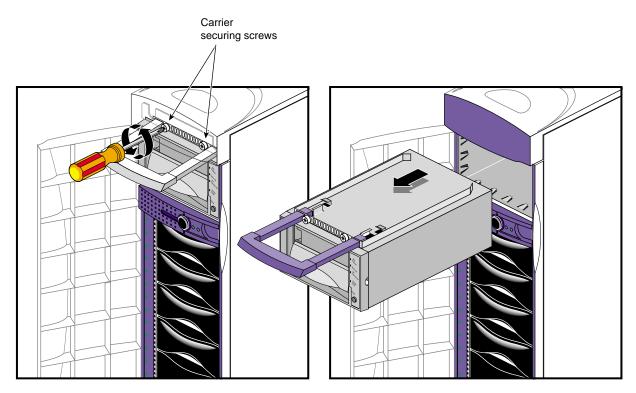


Figure 3-5 Unscrewing the Peripheral Carrier

- 7. Place the peripheral carrier on a work surface. Remove the EMI shielding plate from the rear of the peripheral carrier:
  - Unscrew the screw at the bottom of the EMI shielding plate on either side of the carrier, as shown in Figure 3-6.

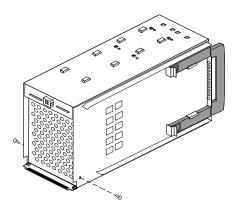


Figure 3-6 Removing Peripheral Carrier EMI Shielding Plate

- Pull the shielding plate out from the bottom and then down. This plate has tabs that hook into slots at the top of the carrier.
- 8. Unscrew the two screws (for a half-height peripheral) or four screws (for full-height peripheral) on the top and bottom of the carrier that secure the peripheral in the carrier, as shown in Figure 3-7.

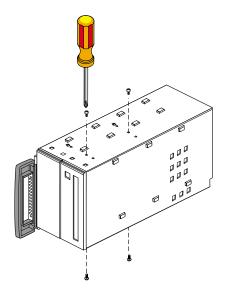
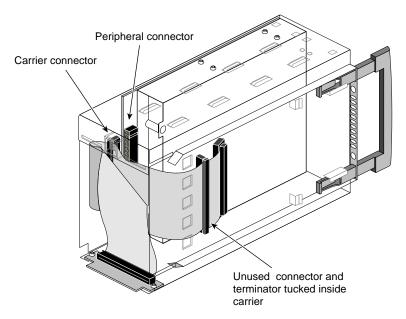
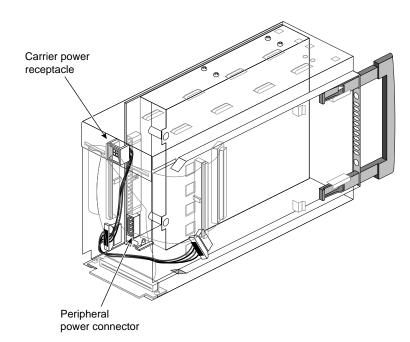


Figure 3-7 Unscrewing a Peripheral

- 9. Gently slide the peripheral out of the carrier. It is attached to the inside of the carrier with cables.
- 10. Detach the SCSI connector (on the flat ribbon cable inside the peripheral carrier) from the peripheral; Figure 3-8 shows an example.



**Figure 3-8** Detaching a SCSI Connector From a Peripheral Inside the Carrier: Example



11. Detach the power cable from the peripheral; Figure 3-9 shows an example.

**Figure 3-9** Detaching a Power Cable Connector From a Peripheral: Example

12. If you are removing a peripheral and not replacing it with a new one, reinstall the blanking plate(s) for the carrier. Reinstall the peripheral carrier in its bay, using the reserved screws.

If you are installing a new peripheral, follow instructions in "Installing 5.25-Inch Options" on page 47 in Chapter 2, starting with step 3 in "Preparing the Peripheral Carrier."

To add a 5.25-inch option to the Origin Vault, follow these steps:

- 1. Make sure no users are using the data stored in the expansion option. Check the status LEDs for all drives to make sure they are not active.
- 2. Turn off the power button at the front; the LED goes dark. Turn off the power on the back of the Origin Vault expansion option; see Figure 3-1.
- 3. Follow instructions in "Installing 5.25-Inch Options" in Chapter 2.

4. To update the system software to recognize a new drive, reboot. Consult the latest edition of *IRIX Admin: Disks and Filesystems* if necessary.

## **Adjusting the Feet**

Both the front and rear feet on an Origin Vault tower can be swiveled in or out. See Figure 3-10.

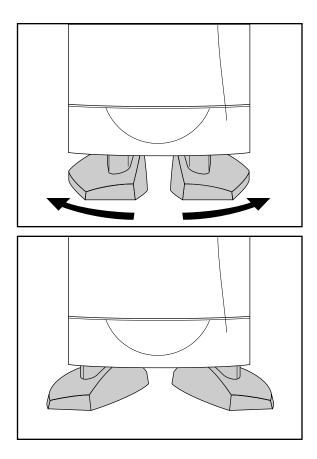


Figure 3-10 Adjusting the Feet

To adjust the feet, raise the tower slightly, or tilt it to one side. Rotate the feet inward or outward, as desired.

# Replacing Origin Vault Components

#### This chapter explains

- "Preparing the Option for Component Replacement" on page 85
- "Replacing the SCSI Backplane" on page 90
- "Replacing a Fan" on page 92
- "Replacing the Differential/Single-Ended Converter Board" on page 94
- "Replacing the System Controller Board" on page 98
- "Checking the Power Supply" on page 101
- "Replacing the Power Supply" on page 102

#### For the procedures in this chapter, you need

- the grounding wrist strap supplied with your Origin Vault option
- a #2 Phillips screwdriver

## **Preparing the Option for Component Replacement**

Follow the steps in this section to prepare the Origin Vault rackmounted enclosure or standalone tower for component replacement.



**Warning:** Removing the rackmountable Origin Vault enclosure from a rack or lifting the Origin Vault standalone tower requires two people.

- 1. Have ready a clear work surface big enough to accommodate the option.
- 2. Have ready the replacement component and the grounding strap. If you are replacing anything besides the SCSI backplane, or if you have a standalone tower, have ready a #2 Phillips screwdriver.

- 3. Make sure no users are using the data stored in the expansion option. Check the status LEDs for each drive to make sure they are not active. If appropriate, follow proper shutdown procedures for the host to which the Origin Vault is cabled.
- 4. Turn off the power button at the front; the LED goes dark.
- 5. Turn off the master power switch at the rear of the Origin Vault.
- 6. If desired, remove drives from the option so that it is lighter when you move it to the work surface. If you do so, attach labels to them identifying the slots from which they came.

**Caution:** Replacing drives in different slots from their original slots can cause loss of data.

- 7. Detach the power cable and SCSI cable(s) from the Origin Vault.
- 8. If the Origin Vault is padlocked, unlock it; see "Locking the Origin Vault Expansion Option" in Chapter 3.

#### **Removing a Rackmounted Origin Vault**

If your Origin Vault is rackmounted, slide the enclosure out of the front of the rack with the help of another person.



**Warning:** Removing the rackmountable Origin Vault option from a rack requires two people.

Place the rackmountable enclosure top-side up on the work surface, as shown in Figure 4-1. If the option is locked, unlock it; see "Locking the Origin Vault Expansion Option" on page 73 in Chapter 3.

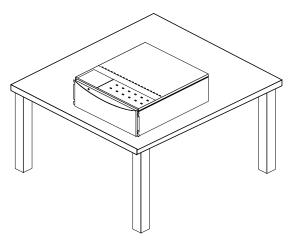


Figure 4-1 Rackmountable Origin Vault Option

# Preparing an Origin Vault Standalone Tower for Component Replacement

If your Origin Vault is a standalone tower, follow these steps:

1. Remove the tower's side panels as shown in Figure 4-2.

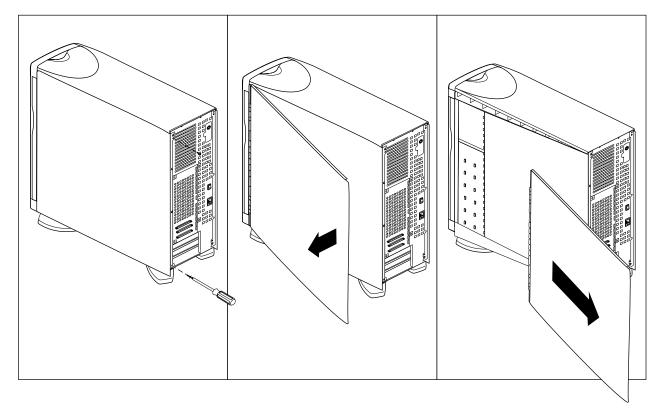


Figure 4-2 Removing Tower Side Panels

2. Lay the tower on a work surface with the top cover facing up, as shown in Figure 4-1.



#### **Warning:** Lifting the Origin Vault standalone tower requires two people.

You may wish to place a thin, soft pad (such as a cloth or piece of cardboard) under the top edge of the system to keep the top cap from becoming marred or scratched.

- 3. If the tower is locked, unlock it.
- 4. Remove the two screws at the rear of the chassis that secure the top cover and remove the top cover. See Figure 4-3.

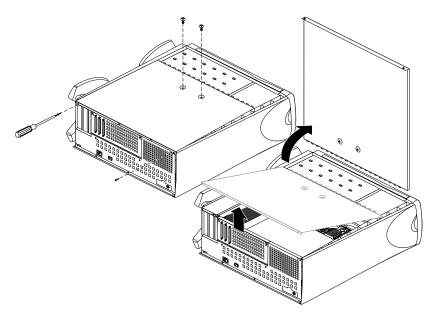


Figure 4-3 Removing the Origin Vault Cover

Be careful not to touch components within the chassis.



**Warning:** Do not attempt to open the power supply at any time.

## Replacing the SCSI Backplane

If you have a replacement backplane for the 3.5-inch drives, remove the old one and install the new one following these steps:

- 1. Prepare the Origin Vault for component replacement following procedures in "Preparing the Option for Component Replacement," earlier in this chapter.
- 2. Ground yourself with a wrist strap, as shown in Figure 4-4.

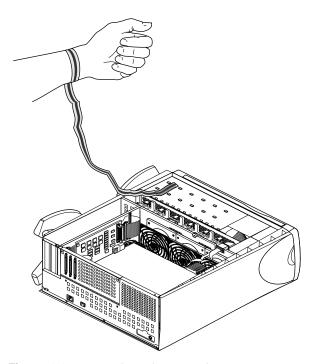


Figure 4-4 Attaching the Grounding Strap

- 3. Detach the power cables from the SCSI backplane.
  - Note that the power cable plugs differ from each other. Figure 4-5 shows their location.
  - If you are able, detach the SCSI cable from its connector; otherwise, wait until the backplane is partway out of the chassis.

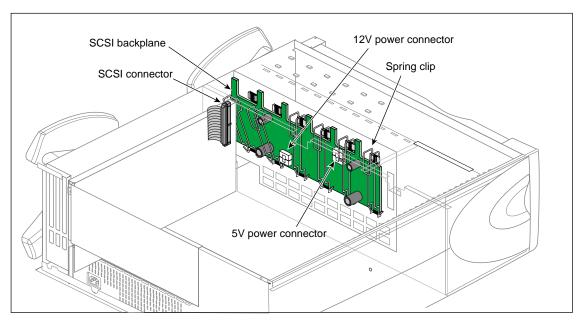


Figure 4-5 Cable Connections and Spring Clips on SCSI Backplane

- 4. Snap down the six spring clips (see Figure 4-5) on the SCSI backplane.
- 5. Grasping the SCSI backplane by the edges, tilt it out. The backplane hangs on two pins; pull the backplane up off the pins.
- 6. With the board partway out of the chassis, unhook the SCSI cable at the left side of the SCSI backplane, if you have not already done so. Remove the backplane from the chassis and set it aside.
- 7. To insert the new SCSI backplane, hang it over the two pins and gently push it in at the bottom. Push the top of the board back as far as it will go.
- 8. Reattach the cables. Snap the six spring clips back up into place.

9. If you are finished replacing components, remove the wrist strap, replace the Origin Vault cover, and restore the Origin Vault to its working position.

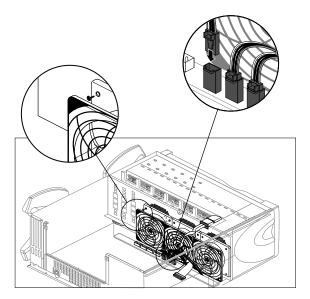


**Warning:** Inserting the rackmountable Origin Vault option into a rack or lifting the Origin Vault standalone tower requires two people.

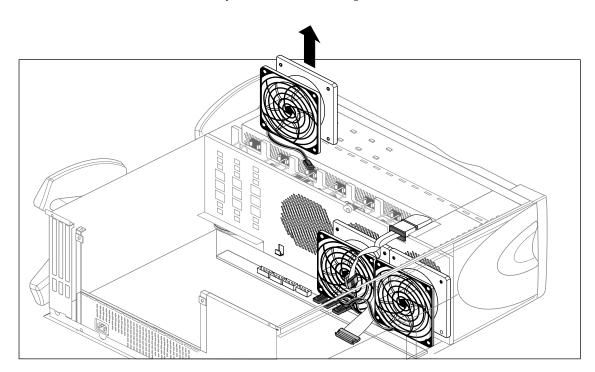
## Replacing a Fan

To replace a fan, follow these steps:

- 1. Prepare the Origin Vault for component replacement following procedures in "Preparing the Option for Component Replacement" on page 85.
- 2. Ground yourself with a wrist strap, as shown in Figure 4-4.
- 3. Unplug the power connector from the fan to the power supply, as shown in Figure 4-6.
- 4. Remove the two plastic rivets that hold the fan to the sheet metal, as shown in Figure 4-6. Push them out from behind the sheet metal with your fingertip.



**Figure 4-6** Disconnecting the Fan and Fan Power Cable



5. Lift the fan out of the system, as shown in Figure 4-7.

**Figure 4-7** Removing the Fan From the System

**Note:** Figure 4-7 shows other components removed for clarity.

Follow these steps to install a fan:

- 1. If you have not already done so, prepare the Origin Vault for component replacement following procedures in "Preparing the Option for Component Replacement" on page 85.
- 2. If you have not already done so, ground yourself with a wrist strap, as shown in Figure 4-4.
- 3. Lower the new fan straight onto its connectors.

- 4. Snap a plastic rivet in the top corners of the fan to secure it to the sheet metal, as shown in Figure 4-6.
  - The rivet has two parts: a sleeve and a pin. Place the pin partway inside the sleeve, and then slide both through the hole in the fan.
  - Press the pin and sleeve together towards the sheet metal. The pin and sleeve slide into place with the ends of both protruding through the sheet metal.
- 5. Cable the fan, as shown in Figure 4-6.
- 6. If you are finished replacing components, remove the wrist strap, replace the Origin Vault cover, and restore the Origin Vault to its working position.



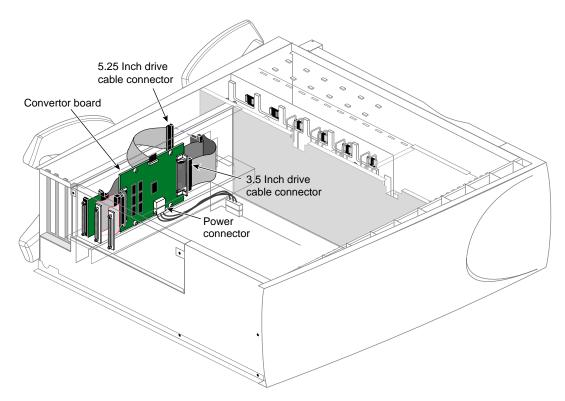
**Warning:** Inserting the rackmountable Origin Vault option into a rack or lifting the Origin Vault standalone tower requires two people.

### Replacing the Differential/Single-Ended Converter Board

To replace the board that converts the 3.5-inch drive controller from single-ended to differential, you remove the L-shaped converter board carrier (also known as the logic carrier—very different from the Origin200 server's logic carrier) from the chassis and remove the converter board from it. Follow these steps:

- 1. Prepare the Origin Vault for component replacement following procedures in "Preparing the Option for Component Replacement" on page 85.
- 2. Ground yourself with a wrist strap, as shown in Figure 4-4.

3. Detach the SCSI cable from the right end of the converter board and push the cable away from the board. See Figure 4-8.



**Figure 4-8** Detaching Cables From the Converter Board and Carrier

4. Detach the cable to the 5.25-inch drive from the connector at the edge of the converter board carrier, as shown in Figure 4-8. Leave in place the 5.25-inch drive cable connecting the other side of this connector to the SCSI port on the converter board carrier.

5. With a #2 Phillips screwdriver, unscrew the four screws that secure the converter board carrier, as shown in Figure 4-9. The two screws toward the rear are retained in the carrier; reserve the other two screws.

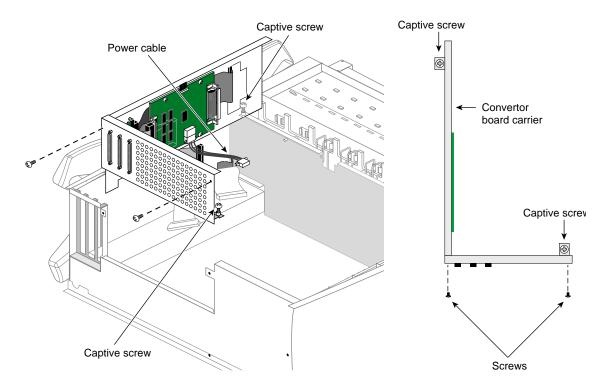


Figure 4-9 Unscrewing the Converter Board Carrier: Two Views

- 6. Detach the converter board's power cable and place the converter board carrier on the work surface.
- 7. Unscrew the four screws that secure the converter board to the carrier, as shown in Figure 4-10. Reserve the two screws.

**Caution:** Take care not to damage the 5.25-inch drive cable behind the board.

8. Detach the left-hand SCSI cable from the converter board.

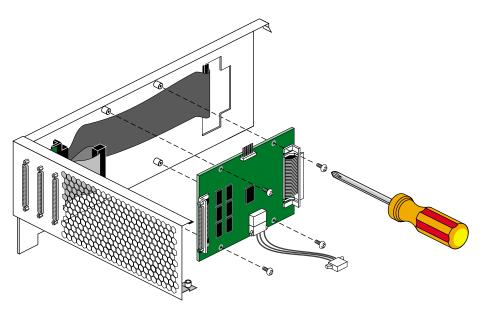


Figure 4-10 Unscrewing the Converter Board

- 9. Lift the old converter board away from the carrier.
- 10. Attach the left-hand SCSI cable to the new board's left-hand connector and insert the board; screw it in place, using the reserved screws.
- 11. Position the carrier so that you can reattach the converter board's power cable; plug it in
- 12. Insert the carrier into the chassis; screw it in.
- 13. Reattach the cable to the 5.25-inch drive to the connector at the edge of the converter board carrier, as shown in Figure 4-8.
- 14. Reattach the SCSI cable to the right end of the converter board.
- 15. If you are finished replacing components, remove the wrist strap, replace the Origin Vault cover, and restore the Origin Vault to its working position.



**Warning:** Inserting the rackmountable Origin Vault option into a rack or lifting the Origin Vault standalone tower requires two people.

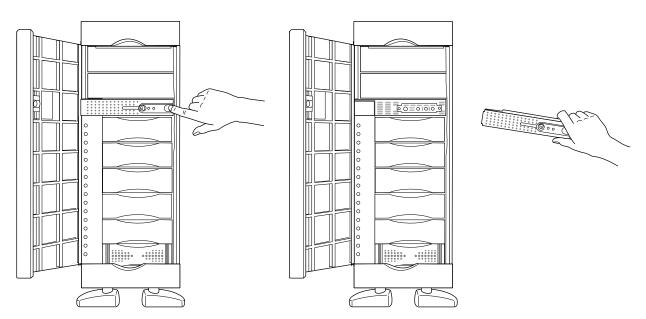
# Replacing the System Controller Board

If the Origin Vault system controller board LED does not light up when the expansion option is powered on, you must replace it.

The system controller board is mounted on a carrier board. Inside the chassis, an edge connector on the system controller board is plugged into a connector on the backplane.

To remove the system controller board, follow these steps:

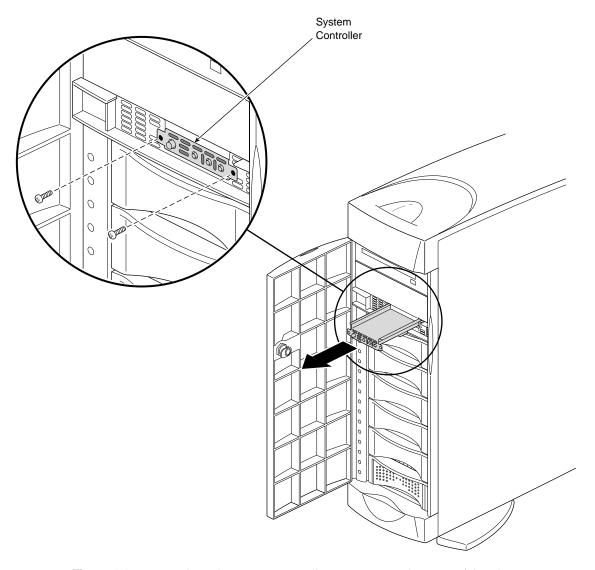
- 1. Make the system controller panel accessible by opening the door (standalone tower).
- 2. Ground yourself with a wrist strap, as shown in Figure 4-4.
- 3. For the tower, or for a rackmounted Origin Vault option with the bottom-opening door, remove the crossbar, as shown in Figure 4-11, and set it aside.



**Figure 4-11** Removing the Crossbar (Origin Vault Standalone Tower)

For a rackmounted Origin Vault option with the side-opening door, snap the door and faceplate out of the brackets at the sides of the rack.

4. Unscrew the two screws that secure the system controller carrier to the front of the chassis, as shown in Figure 4-12.



**Figure 4-12** Detaching the System Controller Carrier From the Front of the Chassis

5. Pull out the system controller assembly and lay it on a work surface.

**Caution:** Be careful not to touch the board's edge connector (gold fingers).

- 6. Remove the system controller board from its carrier; it is secured by a screw and two pins, as shown in Figure 4-13.
  - Remove and reserve the screw.
  - Push the board so that you can lift it off the pins.

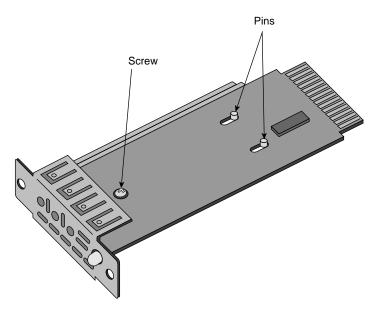


Figure 4-13 Detaching the System Controller Board From the Carrier

To install the replacement system controller board, follow these steps:

- 1. Position the replacement controller board over the pins; grasping the board by its sides, slide it so that the pins lock, making sure that the LED and button go through the proper holes. Screw in the reserved screw, as shown in Figure 4-13.
- 2. Remove disk modules 5 and 6 so that you can see the socket in the backplane into which the system controller's edge connector must go. If necessary, label the disks so that they are reinserted into the correct drive bays.
- 3. Insert the system controller assembly into its bay. If necessary, guide the board's edge connector into the socket.

**Caution:** Grasp the sides of the board only; do not touch the edge connector.

When the edge connector is fully seated in the socket, the carrier should be flush with the front of the chassis.

- 4. Screw in the two screws that secure the system controller carrier to the front of the chassis, as shown in Figure 4-12.
- 5. Replace the crossbar and the faceplate with door.

# **Checking the Power Supply**

To check whether the power supply is functional, follow these steps:

- 1. Prepare the Origin Vault for component replacement following procedures in "Preparing the Option for Component Replacement" on page 85.
- 2. Ground yourself with a wrist strap, as shown in Figure 4-4.
- 3. Connect the power cord to the Origin Vault.
- 4. To check the health of the power supply, press the small button next to the power supply's LED, as shown in Figure 4-14.

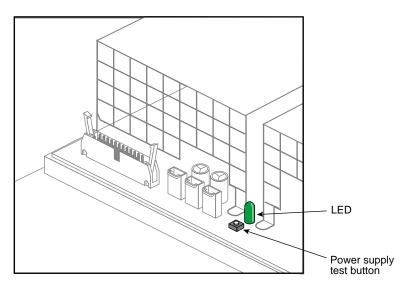


Figure 4-14 Power Supply Button

If the LED fails to light, call your service provider to arrange for a replacement.

# Replacing the Power Supply

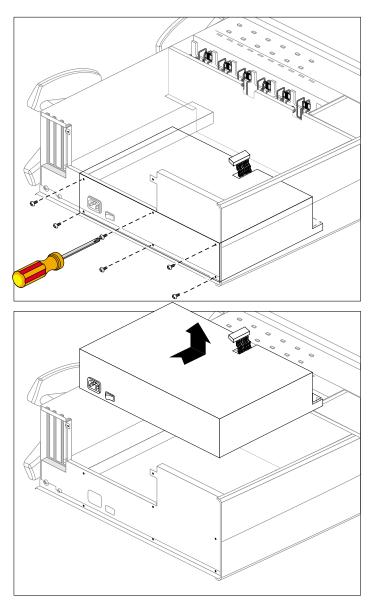
To replace the power supply, follow these steps:

- 1. Prepare the Origin Vault for component replacement following procedures in "Preparing the Option for Component Replacement," earlier in this chapter. Make sure that the power cable is disconnected.
- 2. Ground yourself with a wrist strap, as shown in Figure 4-4.



## **Warning:** Do not attempt to open the power supply at any time.

- 3. Disconnect all internal cables from the power supply. If necessary, make a diagram for reference for when you reconnect the cables.
- 4. Remove the L-shaped converter board carrier (logic carrier) as explained in "Replacing the Differential/Single-Ended Converter Board" in this chapter.
- 5. Disconnect the screws that secure the power supply to the chassis; see Figure 4-15.
- 6. Slide the power supply forward (towards the fans) until it unlatches from the chassis.
- 7. Lift the power supply out of the system. See Figure 4-15.



**Figure 4-15** Removing the Power Supply

Follow these steps to replace the power supply:

- 1. If you have not already done so, ground yourself with a wrist strap, as shown in Figure 4-4.
- 2. Lower the power supply into the system and slide it back, away from the fans.

  The latches on the bottom of the power supply and mating catches on the base of the chassis sheet metal should slide together.



### **Warning:** Do not attempt to open the power supply at any time.

- 3. Reconnect the power cord and test the new power supply as explained in "Checking the Power Supply" on page 101.
- 4. Replace the screws that secure the power supply to the chassis.
- 5. Replace the L-shaped converter board carrier (logic carrier) as explained in "Replacing the Differential/Single-Ended Converter Board" on page 94
- 6. Reconnect the internal cables.
- 7. If you are finished replacing components, remove the wrist strap, replace the Origin Vault cover, and restore the Origin Vault to its working position.



**Warning:** Inserting the rackmountable Origin Vault option into a rack or lifting the Origin Vault standalone tower requires two people.

# **Technical Specifications**

This appendix summarizes technical specifications for the Origin Vault tower and rackmountable enclosure.

Table A-1 lists the various physical and environmental specifications that apply to the Origin Vault expansion option.

 Table A-1
 Origin Vault Specifications

Category	Tower	Rackmountable Enclosure
Height	22.4 inches (56.9 cm)	6.8 inches (17.3 cm)
Width	7.5 inches (19 cm) without feet	18.9 inches (22.6 cm)
Length	26 inches (66 cm)	24.3 inches (61.7 cm)
Weight Minimum Maximum Drive module	35 lbs (15.9 kg) 60 lbs (27 kg) 1 to 5 lbs (0.45 to 11 kg)	30 lbs (13.6 kg) 55 lbs (25 kg) 1 to 5 lbs (0.45 to 11 kg)

Table A-2 lists (conservative) power specifications for the Origin Vault tower and rackmountable enclosure.

 Table A-2
 Origin Vault Power Specifications

Category	Value
Power	Typically, 350 watts drawn from wall (460-watt power supply)
Frequency	50/60 Hz
Voltage	$110/220~\mathrm{V}$ for tower; 208-230 V for rackmountable at $50/60~\mathrm{Hz}$
Inrush current	140 amps maximum
Cooling	1,200 Btu/hr (0.1-ton AC load) maximum required

Table A-3 lists operating environment conditions for the Origin Vault tower and rackmountable enclosure. For more detail on electrical and thermal issues, see *Site Preparation for Origin Family, Onyx2, OCTANE, and O2*.

 Table A-3
 Origin Vault Operating Environment Specifications

Category	Operating	Nonoperating
Air temperature	< 5000 ft: 41° to 95° F (5° to 35° C) > 5000 ft: 41° to 86° F (5° to 30° C)	-4° to 140° F (0 to 60° C)
Thermal gradient	18° F (10° C)/ hour maximum	N/A
Altitude	10,000 ft (3,048 m) MSL, maximum	40,000 ft (12,192 m) MSL, maximum
Humidity	10% - 90% (noncondensing)	10% - 95% (noncondensing)
Humidity gradient	10% relative humidity/hour maximum	N/A
Acoustics	55 dBa	N/A
Vibration	Maximum sustained: $5-10  \text{Hz} \@ .01''$ total excursion, $10-500  \text{Hz} \@ 0.1  \text{g}  \text{N/A}$ Maximum peak: $5-10  \text{Hz} \@ .01''$ total excursion, $10-500  \text{Hz} \@ 0.1  \text{g}$ Sensitive frequency: $8-33  \text{Hz}$ (varies with configuration)	

Table A-4 summarizes Origin Vault media.

 Table A-4
 Origin Vault Expansion Option Features

Feature	Configuration
3.5-inch disk drives	Up to six, maximum height 1.6 inches (4 cm)
	Single-ended; differential with converter board
	With differential converter board, two connectors provided, allowing daisy-chaining; otherwise one connector only
	Termination: if two connectors (differential converter board) external termination required; if only one connector, terminated on backplane
	FAST-20 SCSI (40 megatransfers/sec) or SCSI-2; 16-bit wide
5.25-inch drives	One full-height or two half-height, maximum height 1.6 inches (4 cm)
	Terminated on backplane; no daisy chaining
	Single-ended
	Fast-10 SCSI (20 megatransfers/sec) or SCSI-2

 Table A-4 (continued)
 Origin Vault Expansion Option Features

Feature	Configuration
5.25-inch SCSI drive bay	Up to two drives, no daisy-chain option
SCSI channels (internal)	One 68-wire single-ended, or two with differential converter board
	One single-ended, 50-wire
SCSI channels (external)	Two 68-pin (FAST-20); three 68-pin with differential converter board

Table A-5 gives 3.5-inch disk drive specifications.

 Table A-5
 Origin Vault Expansion Option 3.5-Inch Drives

Feature	4.5 MB	9.1 MB
Connector	SCA-2 80-pin	SCA-2 80-pin
Formatted capacity (MB)	4,550	9,100
Heads/disks	10/5	18/9
Track density (tpi)	6,160	6,160
Average seek time (ms)	<9.5	<10
Burst transfer rate (MB/sec)	40	40
Buffer size (KB)	256	256
Rotational speed (rpm)	7,200	7,200
1 (1	,	,

The external 68-pin SCSI connector on the rear of the Origin Vault chassis for the 3.5-inch drives supports both Ultra SCSI and SCSI-2 devices. It sends single-ended SCSI signals or differential signals, depending on the Origin Vault version. The external 68-pin SCSI connector for the 5.25-inch drives supports SCSI-2 devices only and sends single-ended signals only.

Table A-6 lists pinouts for the single-ended connection. In this table, the hyphen preceding a signal name indicates that the signal is low.

 Table A-6
 68-Pin Single-Ended High-Density SCSI Pinouts

Table A-0	00-1 III Shigle-Ended Tright-Delisity SCSIT II		
Signal Name	Pin Number	Pin Number	Signal Name
Ground	1	35	-DB(12)
Ground	2	36	-DB(13)
Ground	3	37	-DB(14)
Ground	4	38	-DB(15)
Ground	5	39	-DPARH
Ground	6	40	-D0
Ground	7	41	-D1
Ground	8	42	-D2
Ground	9	43	-D3
Ground	10	44	-D4
Ground	11	45	-D5
Ground	12	46	-D6
Ground	13	47	-D7
Ground	14	48	-DPAR
Ground	15	49	Ground
Ground	16	50	Ground
TERMPWR	17	51	TERMPWR
TERMPWR	18	52	TERMPWR
SPACING	19	53	Reserved
Ground	20	54	Ground
Ground	21	55	-ATN
Ground	22	56	Ground
Ground	23	57	-BSY
Ground	24	58	-ACK
Ground	25	59	-RST
Ground	26	60	-MSG
Ground	27	61	-SEL
Ground	28	62	-C/D
Ground	29	63	-REQ
Ground	30	64	-I/O
Ground	31	65	-DB(8)
Ground	32	66	-DB(9)
Ground	33	67	-DB(10)
Ground	34	68	-DB(11)

Table A-7 lists pinouts for the differential connection. In this table, the hyphen preceding a signal name indicates that the signal is low.

 Table A-7
 68-Pin Differential High-Density SCSI Pinouts

Signal Name	Pin Number	Pin Number	Signal Name
+DB(12)	1	35	-DB(12)
+DB(13)	2	36	-DB(13)
+DB(14)	3	37	-DB(14)
+DB(15)	4	38	-DB(15)
+DPARH	5	39	-DPARH
+Ground	6	40	-Ground
+D0	7	41	-D0
+D1	8	42	-D1
+D2	9	43	-D2
+D3	10	44	-D3
+D4	11	45	-D4
+D5	12	46	-D5
+D6	13	47	-D6
+D7	14	48	-D7
+DPAR	15	49	-DPAR
DIFFSENS	16	50	Ground
TERMPWR	17	51	TERMPWR
TERMPWR	18	52	TERMPWR
Reserved	19	53	Reserved
+ATN	20	54	-ATN
Ground	21	55	Ground
+BSY	22	56	-BSY
+ACK	23	57	-ACK
+RST	24	58	-RST
+MSG	25	59	-MSG
+SEL	26	60	-SEL
+C/D	27	61	-C/D
+REQ	28	62	-REQ
+I/O	29	63	-I/O
Ground	30	64	Ground
+DB(8)	31	65	-DB(8)
+DB(9)	32	66	-DB(9)
+DB(10)	33	67	-DB(10)
+DB(11)	34	68	-DB(11)

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