

# CHALLENGE™ Vault Rack and SCSIBox 2 Owner's Guide

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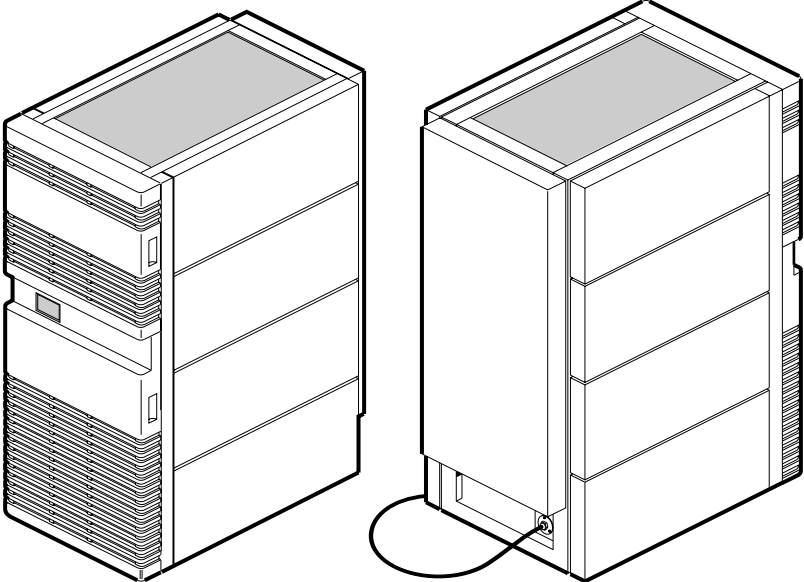


## Introducing the CHALLENGE Vault Rack and SCSIBox 2

This guide provides information to operate the CHALLENGE™ Vault rack (Model No. CMN A012B) and the front-loading SCSIBox 2 (Model No. CMN AS02). These devices provide additional disk storage for the Onyx™ and CHALLENGE deskmount and rackmount systems.

### **CHALLENGE Vault**

The CHALLENGE Vault, or Vault (see Figure 1-1), can house up to 12 SCSIBox 2s (7 in the front of the chassis and 5 in the rear of the chassis). The Vault can also house up to 96 half-height drives or 48 full-height drives.

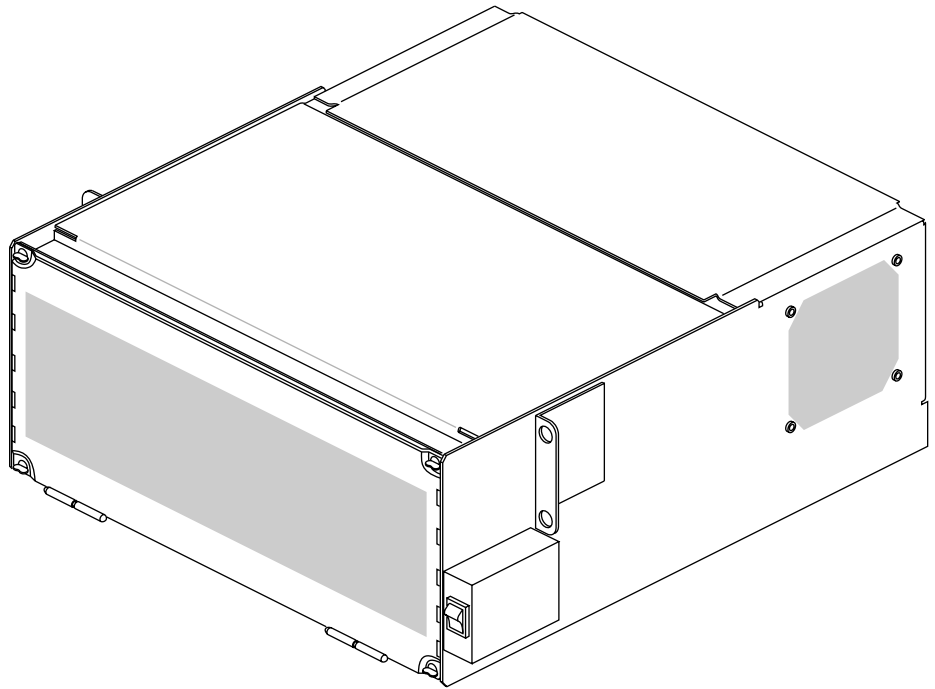


**Figure 1-1** Vault Peripherals Rack

## SCSIBox 2

The SCSIBox 2 shown Figure 1-2, houses SCSI (small computer system interface) drives and installs into the Vault rack. Each SCSIBox 2 holds up to eight half-height drives or four full-height drives.

The SCSIBox 2 is an enhancement over previous Silicon Graphics® SCSI boxes and features improved EMI (electro-magnetic interference) shielding and front-loading drives that make it easier to remove and replace drives.



**Figure 1-2** CHALLENGE Vault SCSIBox 2

## Configurations

The CHALLENGE Vault SCSIBox 2 is available in two configurations:

- single-ended (marketing code P-S-SBX2-XSE)
- differential (marketing code P-S-SBX2-X)

The single-ended drive box supports only single-ended hard disk drives, and the differential drive box supports only differential hard drives. The single-ended drives are normally 8-bit, 50-pin hard disk drives; the differential drives are normally 16-bit, 68-pin hard drives.

**Caution:** If you do not know the type of disks you have, do not attempt to install the disks into the SCSIBox 2 drive box.

**Note:** The SCSIBox 2 does not currently support 16-bit, single-ended drives.



**Warning:** Do not attempt to install the SCSIBox 2 into the Vault. Installation should be performed only by Silicon Graphics-certified personnel.

Installation of these upgrades requires specific training and technical knowledge. This equipment utilizes electrical power internally that is hazardous if the equipment is improperly disassembled.

This equipment is also extremely sensitive and is susceptible to damage caused by electrostatic discharge (ESD). ESD is an electrical discharge (spark) caused by the buildup of electrostatic potential on clothing and other materials.

## Comparing SCSIBox 2s

The SCSI drive box in your Onyx or CHALLENGE rackmount system is also called a SCSIBox 2 (marketing code P-S-SBX2-M); however, the Vault SCSIBox 2 and the drive box in your system are two *different* boxes. You cannot install a Vault SCSIBox 2 into an Onyx or CHALLENGE rackmount system, or install an Onyx or CHALLENGE SCSIBox 2 into a Vault chassis.

The differences between these two drive boxes are: (see also Figure 1-3):

- The Vault SCSIBox 2 is a slighter longer box.
- The two SCSIBox 2s have different power sources. The Vault SCSIBox 2 has a self-contained power supply. The Onyx/CHALLENGE rackmount SCSIBox 2 is powered through the Onyx/CHALLENGE rackmount system.
- The Vault SCSIBox 2 has two internal fans; the Onyx/CHALLENGE rackmount SCSIBox 2 is cooled by two large central fans external to the SCSI box.

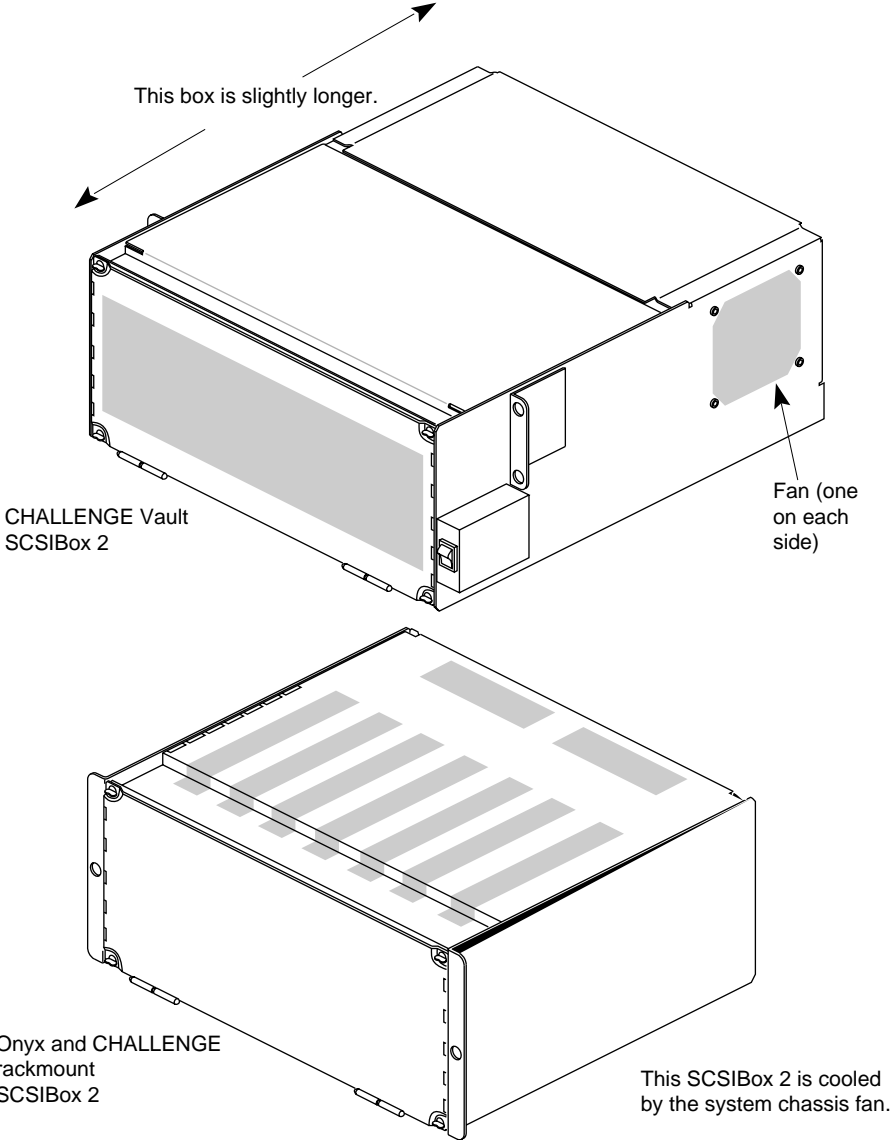


Figure 1-3 Comparing the Two SCSIBox 2s

## Compliance Information

### FCC WARNING

This equipment has been tested and found compliant with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case users will be required to correct the interference at their own expense.

This product requires the use of external shielded cables in order to maintain compliance with Part 15 of the FCC rules.

### International Special Committee on Radio Interference (CISPR)

This equipment has been tested to and is in compliance with the Class A limits per CISPR publication 22, Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment; and Japan's VCCI Class 1 limits.

### Canadian Department of Communications Statement

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

### Attention

Le present appareil numerique n’emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de Classe A prescrites dans le Reglement sur le Brouillage Radioelectrique etabli par le Ministere des Communications du Canada.

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Figure 1-4 VCCI Information



Figure 1-5 CE insignia

### Manufacturer’s Regulatory Declarations

This workstation conforms to several national and international specifications and European directives as listed on the “Manufacturer’s Declaration of Conformity,” which is included with each computer system and peripheral. The CE insignia displayed on each device is an indication of conformity to the European requirements.

**Caution:** Your workstation has several governmental and third-party approvals, licenses, and permits. Do not modify this product in any way that is not expressly approved by Silicon Graphics, Inc. If you do, you may lose these approvals and your governmental agency authority to operate this device.



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## Touring the Chassis

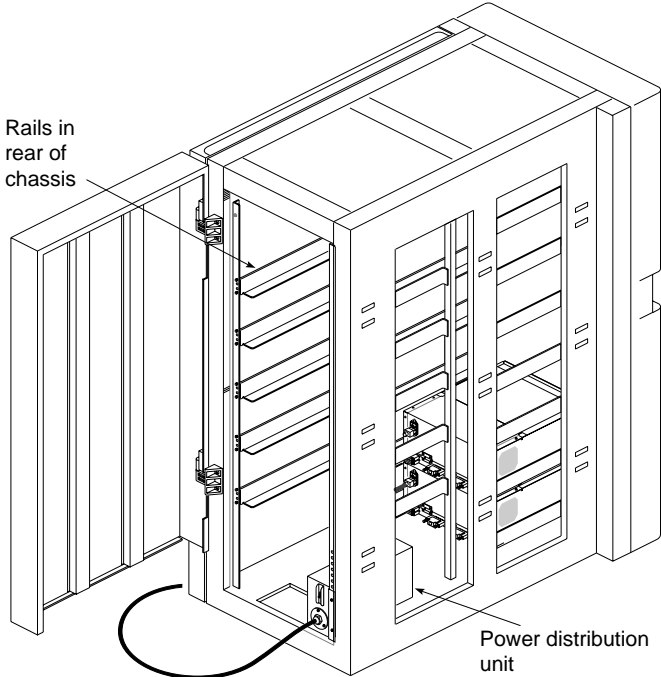
This chapter discusses the controls and connectors of the Vault and SCSIBox 2.

### **Vault Chassis Tour**

Figure 2-1 shows the major components of the Vault.

### **SCSIBox 2 Chassis Tour**

This section describes the front and rear components of the SCSIBox 2. Figure 2-2 and Figure 2-3 show the major components of the box.



**Figure 2-1** Major Components of the Vault

## Front View

These components are located on the front of the SCSIBox 2 (see Figure 2-2):

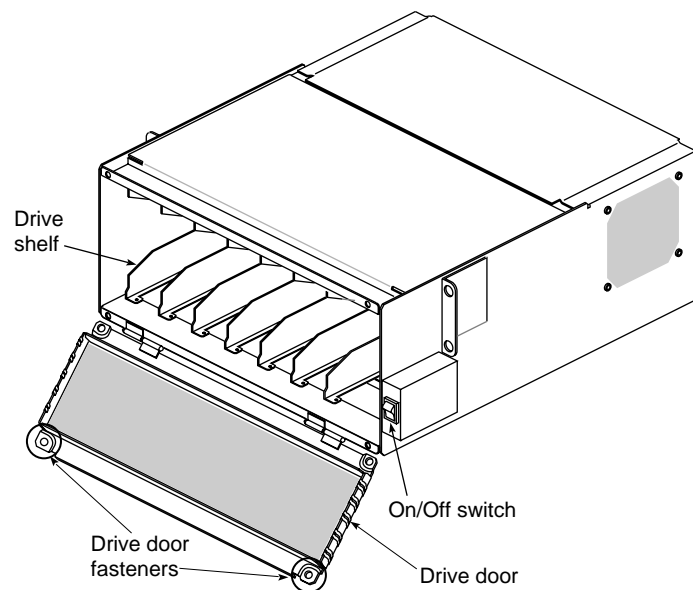
**Drive door** opens and closes using two quarter-turn, wing-nut fasteners near the top corners of the box. *Be careful not to overturn the fasteners or else they may break off.*

**Caution:** The door must be in place during operation to comply with FCC regulations and for proper air flow.

**On/Off switch** controls power to all the drives.

**Drive shelves** house the SCSI drives and drive sleds. The shelves are removable to accommodate full-height drives.

**Note:** Each full-height drive occupies two half-height slots.



**Figure 2-2** CHALLENGE Vault SCSIBox 2 (Front View)

### Rear View

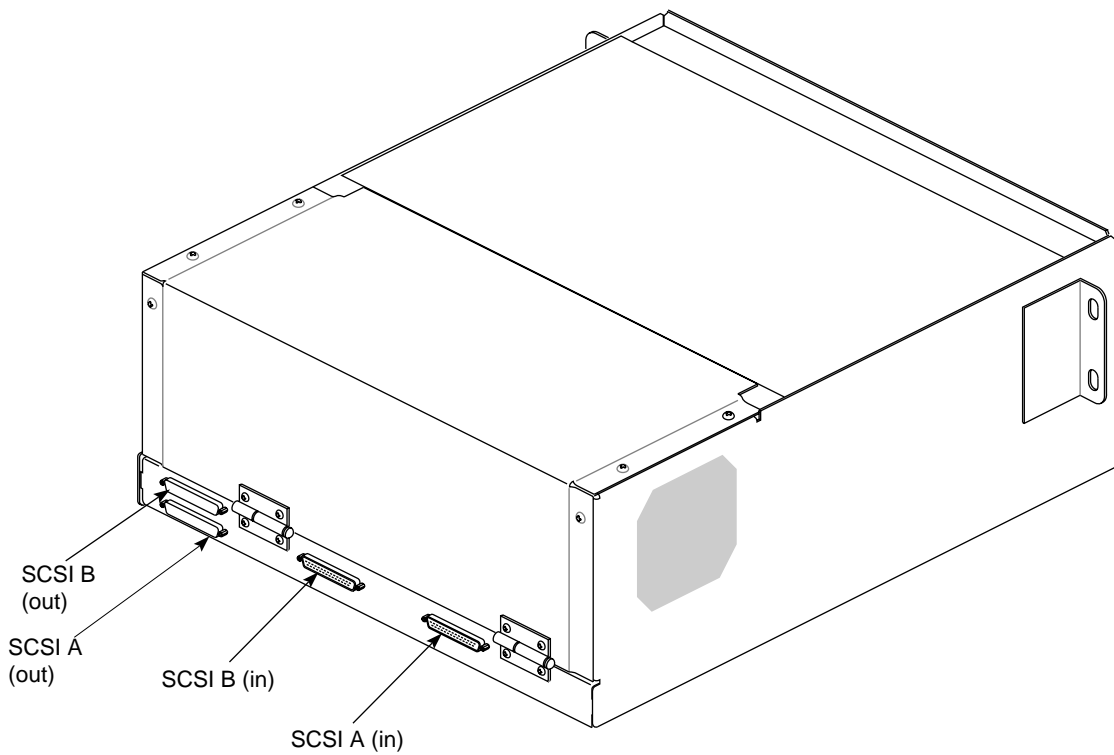
These major components are located on the back of the SCSIBox 2 (see Figure 2-3):

SCSI In (A/B) provides a 68-pin SCSI-2 differential connector.

**Note:** Each SCSI box provides two SCSI In connectors for disk striping and increased I/O throughput.

SCSI Out (A/B)

provides connection for SCSI termination or a daisy-chain connection to another SCSI box.



**Figure 2-3** CHALLENGE Vault SCSIBox 2 (Rear View)

## Operating the SCSIBox 2 and Vault Rack

After a Silicon Graphics-certified system support engineer (SSE) has installed the SCSIBox 2 and Vault rack, you can add compatible drives to the drive boxes as shown in this chapter.

### Installing and Removing Drives

This section describes how to install and remove drives for the SCSIBox 2; but before you install the drives, you need to perform these tasks:

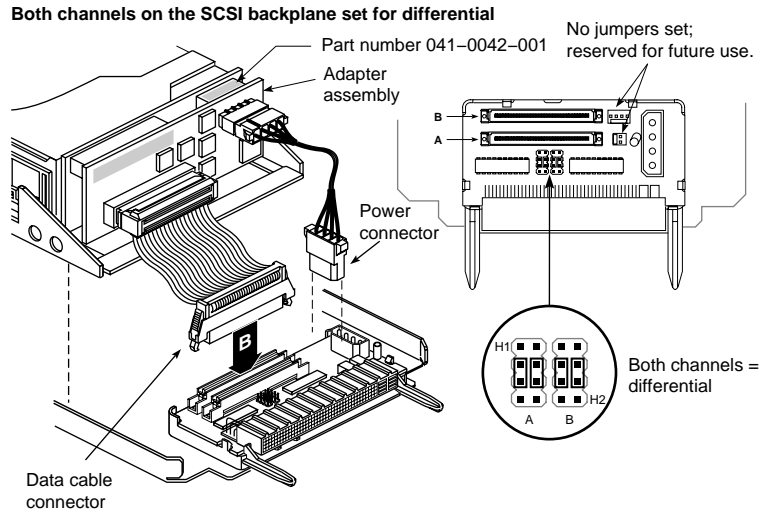
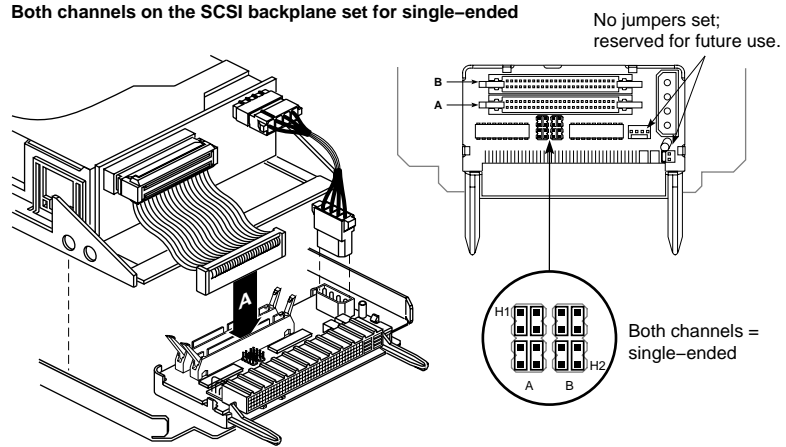
- select the SCSI ID for the drives
- select the correct channel (A or B) on the drive sled
- ensure that the drive sled jumpers are set correctly

#### Selecting the SCSI ID

Jumper the SCSI ID for each drive to avoid addressing conflicts.

#### Selecting a Channel on the Drive Sled

Determine which channel (A or B) you want the drive to occupy, then plug the SCSI cable from the drive into the proper channel connector. See Figure 3-1.



**Figure 3-1** SCSI Drive Sled Assembly



## Setting the Drive Sled Board Jumpers

Depending on the SCSIBox 2 type, the drive sled board jumpers should be set for either single-ended or differential operation. See Figure 3-1 for the jumper configurations.

## Installing the Drives

Follow these directions to install the drive and drive sled assembly in the drive box. The drive and drive sled assembly are one modular unit.

**Caution:** There are two types of SCSIBox 2s and two types of drives, single-ended and differential. If you do not know which type of SCSIBox 2 or drive type you have, do not install drives into the drive box. Contact your field support or sales office, as required, to help determine your SCSIBox 2 or drive type.

1. Orient the front-loading drive relative to the SCSIBox so that the drive is facing toward the right. See Figure 3-2.
2. Carefully insert the device into the drive bay until it seats firmly into the lever catch and the locking lever has moved all the way down.
3. After you have installed all of the drives, you can power on the drive box and rack. See Figure 3-2 if you do not know where the power switch is located.

**Caution:** Be sure to recheck the SCSI ID of the drives to make sure you do not duplicate numbers.

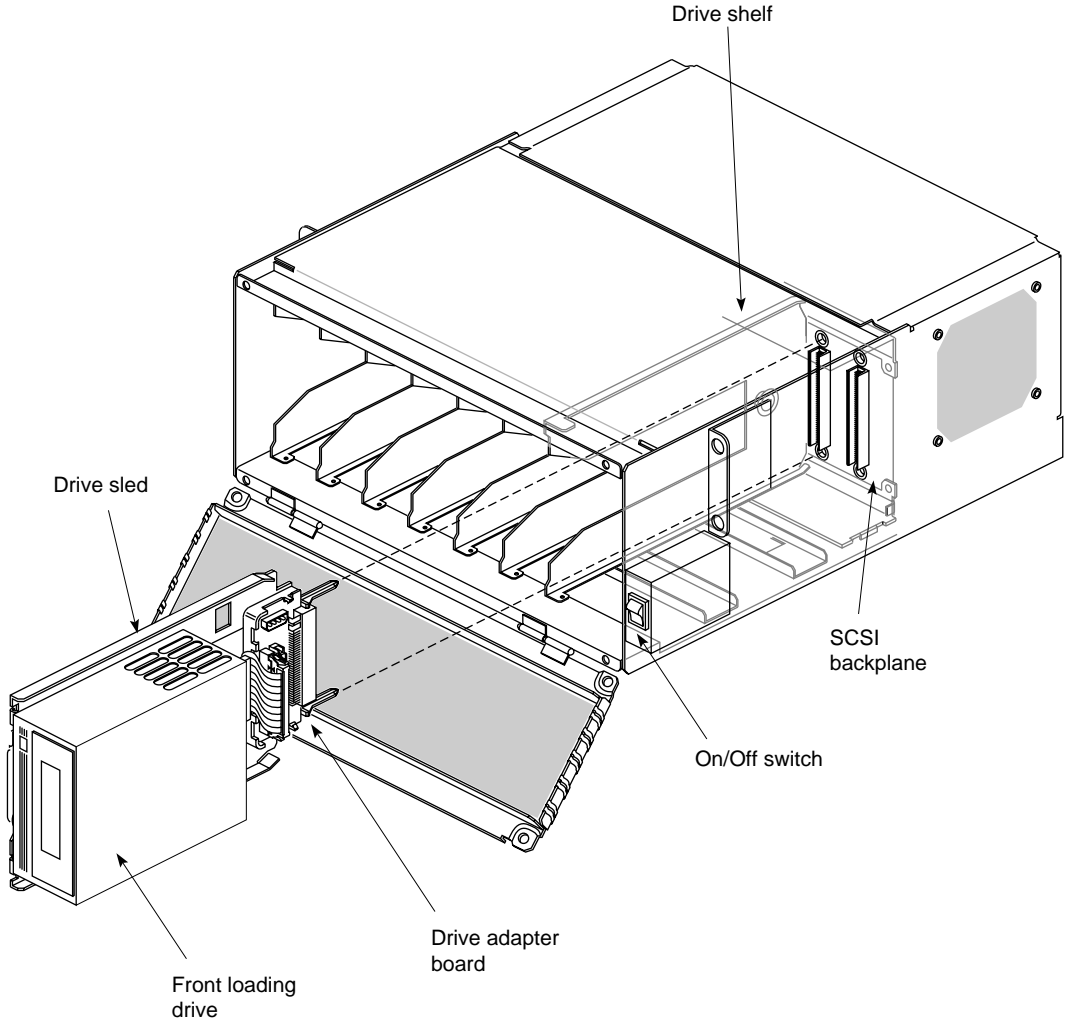
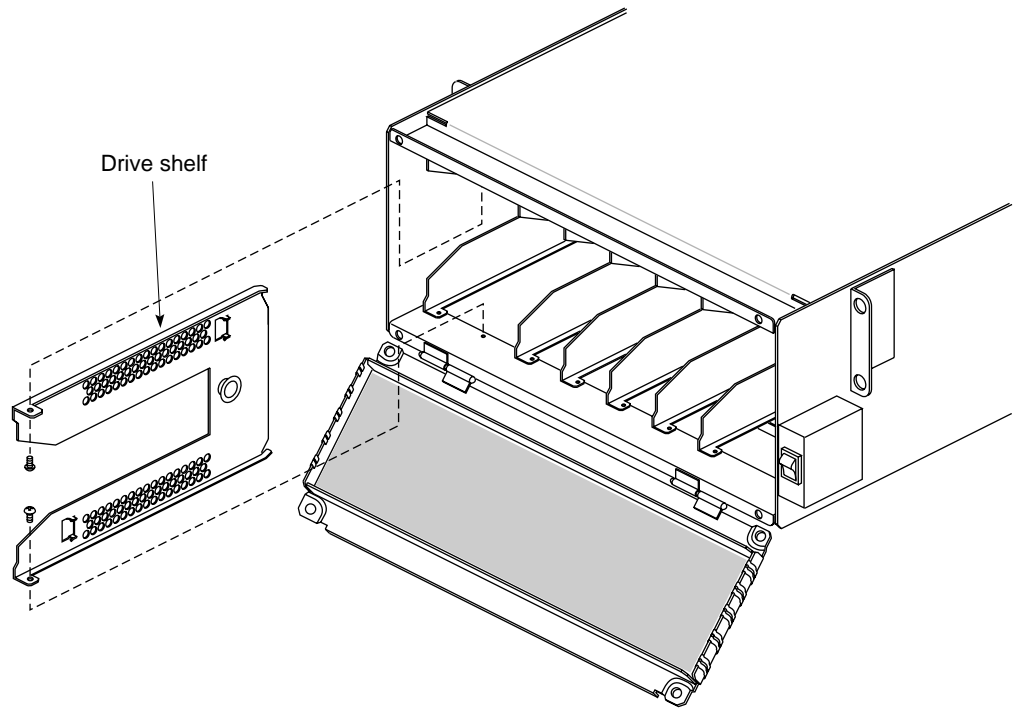


Figure 3-2 Installing or Removing a Drive from the SCSIBox 2

## Removing a Drive Shelf

Full-height drives require two half-height drive slots. To install a full-height drive, you must first remove a drive shelf from the SCSIBox 2 using these instructions:

1. Open the front door of the SCSIBox 2.
2. Select a drive shelf for removal, then remove the two screws that secure the drive shelf to the top and bottom of the SCSIBox 2 chassis (see Figure 3-3).
3. Pull the drive shelf out of the chassis and store it for later possible use.
4. Follow the instructions in the previous section, "Installing the Drives," to insert a full-height drive in the SCSIBox 2.



**Figure 3-3** Removing a Drive Shelf from the SCSIBox 2

## Removing a Drive From the Chassis

To remove a SCSI drive:

1. Push the drive lever up; this action disengages the drive assembly from the shelf.
2. Carefully slide the drive and sled assembly out of the slot.

## Updating the Software to Recognize the New Drives

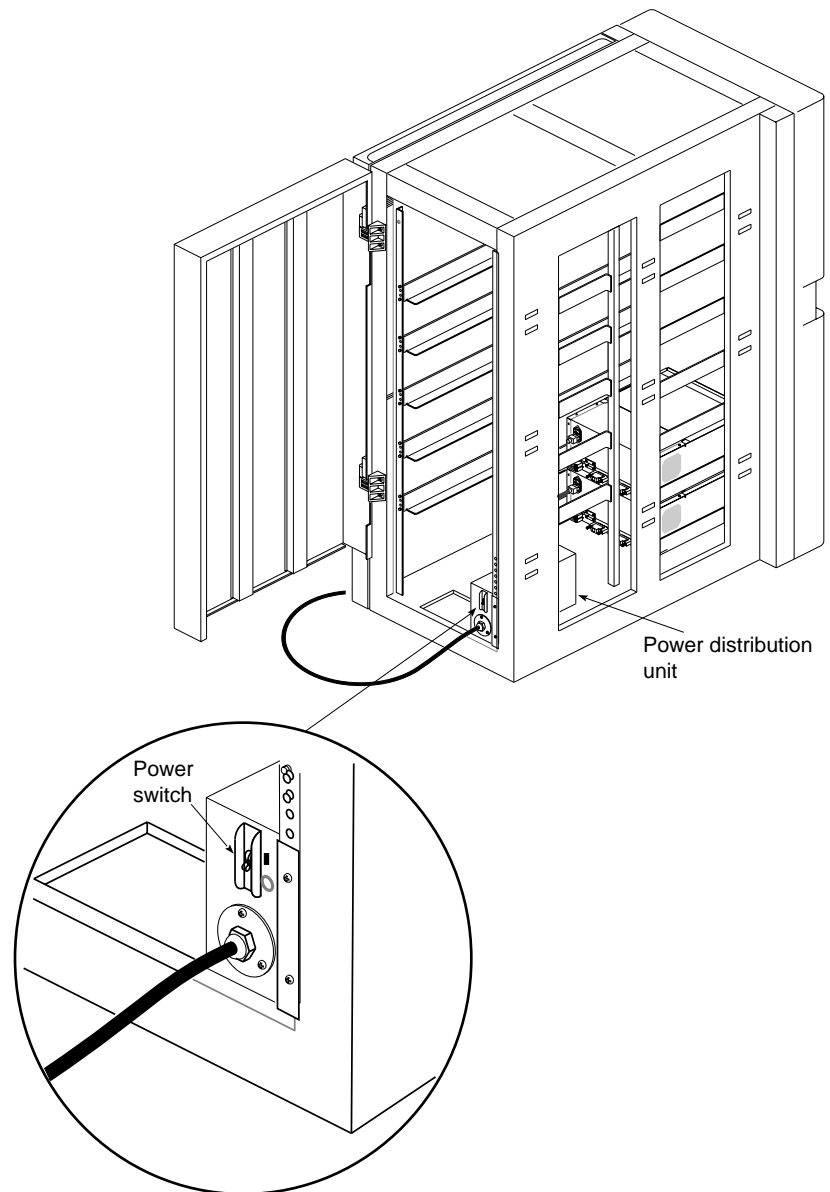
To notify the operating system of the new drives, you must run the *MAKEDEV* command, which creates the required device files for the software. If you do not know how to run *MAKEDEV*, refer to your system administrator's documents.

**Caution:** Only a qualified system administrator or someone familiar with IRIX™ commands should execute *MAKEDEV*.

## Operating the Vault Rack

The Vault has a power switch located in the rear of the rack as shown in Figure 3-4. It is recommended that you always power up the rack first before powering up the host system. If you need to bring down the entire system, turn off the rack first before shutting down the host system.

**Note:** The SCSIBox 2s have on/off switches as well (see Figure 2-2). It does not matter if you turn these on or off before you turn the main Vault switch on or off.



**Figure 3-4** Vault Power Switch



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## Specifications

This appendix provides physical, electrical, and environmental specifications for the Vault rack and SCSIBox 2.

### Vault Specifications

Table A-1 lists the Vault specifications.

**Table A-1** Vault Rack Specifications

Parameters	Characteristics
Dimensions (Height x Width x Depth)	62.3 inches (158 cm) x 27 inches (69 cm) x 48 inches (122 cm)
Weight	320 lb (145 kg)—without drive boxes or drives 1200 lb (544 kg)—fully loaded
<b>Electrical</b>	
Voltage	208 to 230 VAC, single phase
Frequency Range (single phase)	50 Hz (minimum) 60 Hz (maximum)
Current	220 VAC at 16 amps, single phase
Connector	NEMA L6-30P, 2-P, 3-2 30A, 250V (U.S., Canada, and Japan); IEC-309 2-P, 3-W, 30A, 240V (International)
<b>Safety and Regulatory</b>	
UL	Listed under UL 478—Data Processing Equipment, Electronic

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<b>Table A-1 (continued)</b>	
Vault Rack Specifications	
<b>Parameters</b>	<b>Characteristics</b>
Canadian Standards Association (CSA)	Certified under CSA 220-M1986–Information Processing and Business Equipment
TUV	Licensed under CENELEC European Norm EN 60 950/09.87
EMI	FCC Class A VDE Level A DOC Class A VCCI Class 1 CISPR-22 Class 1
Product Model No.	CMN A012B
<b>Environmental</b>	
Temperature	5 to 35 degrees C at sea level (operating) –15 to +65 degrees C at sea level (nonoperating)
Relative Humidity	20 to 80%, noncondensing (operating) 10 to 90%, noncondensing (nonoperating)
No. of SCSI Boxes	1 to 12
No. of Drives	Up to 96 half-height drives or up to 48 full-height drives
Peripherals Supported (SCSI only)	780 MB Fast 1.2 GB 1.6 GB full-height 2.0 GB half-height 2.4 GB full-height 8-mm tape RAID (redundant array of inexpensive disks)



## SCSIBox 2 Specifications

Table A-2 lists the SCSIBox 2 specifications.

**Table A-2** SCSIBox 2 Specifications

<b>Parameters</b>	<b>Characteristics</b>
Dimensions (Height x Width x Depth)	7.5 inches (19.05 cm) x 17.25 inches (43.82 cm) x 20.5 inches (52.07 cm)
Weight	35 lb (15.88 kg)–without drives
Device Weight	4.5 to 7.6 lb (2.04 to 3.45 kg)
<b>Electrical</b>	
Power Supplies	5 VDC at 16 A 12 VDC at 20 A
Voltage	208 to 230 VAC
Frequency	50/60 Hz, single phase
Line Current	1.5 A (maximum)
<b>Safety and Regulatory</b>	
UL	UL 1950
CSA	CSA C22.2 No. 154-M1983 or CAN/CSA-C22.2 No. 950-M89
TUV	Licensed under CENELEC European Norm EN 60 950/09.87
EMI	FCC, Part 15, Class A VDE 0871/6.78, Level A V.C.C.I., Class 1 Limits
Product Model No.	CMN AS02
<b>Environmental</b>	
Temperature	5 to 35 degrees C at sea level (operating) –15 to +65 degrees C at sea level (nonoperating)
Relative Humidity	20 to 80%, noncondensing (operating) 10 to 90%, noncondensing (nonoperating)



## Software Guidelines

This chapter provides software guidelines to operate the Vault and SCSIBox 2. This upgrade requires IRIX 5.0 or later.

### Disk Striping

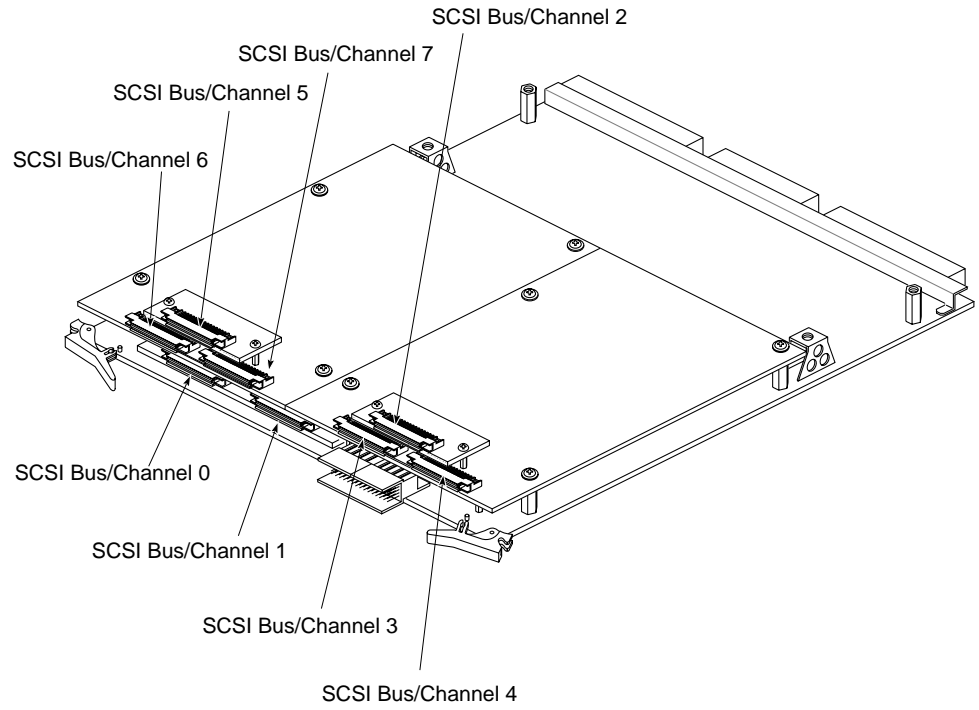
Disk striping increases workstation throughput by distributing file data across multiple disk drives through logical volumes. For detailed software descriptions of how hard drives are configured to support disk striping, see the “Logical Volumes” subsection in the *IRIX Advanced Site and Server Administration Guide*.

**Caution:** Systems utilizing disk striping must have a well-tested and maintained backup plan. If a single disk drive failure occurs, the entire file structure can be affected because sections of the filesystem are distributed among different disk drives.

### New Addressing Scheme for Drives

An IO4 board can have up to eight SCSI bus interfaces (or channels). See Figure B-1. Compare this with the IO3, the predecessor to the IO4, which has only two channels (or SCSI bus interfaces). In addition, the new, wider 68-pin SCSI connector on the chassis now enables connectivity with up to 15 devices per channel.

Due to this expanded connectivity, the IRIX and PROM monitor drive addressing scheme has been modified to accommodate the increased number of drives and channels.



**Figure B-1** SCSI Channels, or Bus Interfaces, on an IO4 Board With Two Mezzanine Boards

## Addressing Drives Using the PROM

The previous PROM drive addressing format remains in place; for example:

*dksc(a,b,c)*

where *a* represents the SCSI bus number, *b* refers to the drive number, and *c* refers to the drive's partition number. The *dksc* designation is the monitor's name for SCSI.

**Note:** The PROM can address only the master IO4 board in a system. In a desktide system, the master IO4 resides in either slot 3 (Onyx) or slot 5 (CHALLENGE). In a rackmount system, the master IO4 resides in slot 15. If you need to address a drive connected to another IO4 board, you must do so under IRIX.

## Addressing Drives Under IRIX

Under IRIX, the addressing scheme has changed as shown in the following new format:

*/dev/dsk/dksSSsDdSsP*

where */dev/dsk* references the IRIX file directory of the drives and *dk*s designates SCSI. The *SSs* designator represents the slot number of the IO4 board and/or the SCSI bus number (see Note below), *dD* refers to the drive number, and *sP* refers to the drive's partition number.

**Note:** If you are addressing a drive on the master IO4 board system, you need to specify *only* the applicable SCSI bus number. If you are addressing a drive on another IO4 board, you must specify both the slot number of the board and the applicable SCSI bus number.

If, for example, you are addressing a drive connected to an IO4 board in slot 4 and SCSI bus number 5 (on a desktide system), the *SSs* number would be 45.

With the earlier IO3 boards, the software required only single digits to differentiate drives; however, with the IO4 and new version of the software, the SCSI bus or *SSs* number can contain up to three digits. If *SSs* is a two- or

three-digit number, the first one or two digits identify the IO4 board by the Ebus slot number. The final digit identifies which of the eight possible SCSI buses (0 through 7) on the IO4 board is used. Figure B-1 illustrates how the buses are physically laid out on the IO4 board.

### **Forming the Drive Address**

The software drive identification number uses the same form as in the addressing scheme described earlier. Insert the IO4 board slot number and/or the SCSI bus number, followed by the drive number and partition number, as required.

#### **PROM Addressing**

Assume that you want to address partition 0 on SCSI drive number 6. This drive connects to SCSI bus number 6. You can also assume that the master IO4 resides in slot number 15 in a rackmount system.

The PROM drive address is:

*dksc(6,6,0)*

#### **IRIX Addressing**

Assume that you want to address partition 0 on SCSI drive (number 6). This drive connects to SCSI bus number 6. Also assume that the IO4 resides in slot number 14.

The IRIX drive address is:

*/dev/dsk/dks146d6s0*

#### **Using the New Address**

You must know this new drive addressing and identification method to run the disk maintenance programs such as *fx* and *MAKEDEV*. For information on running these programs, see the system administration documents for your computer.



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