

# HP DDS-3 Tape Drive User's Guide



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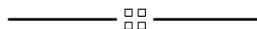
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# Preface

The *HP DDS-3 Tape Drive User's Guide* describes how to install, configure, and use the DDS-3 drive.

We've organized this guide as follows:

- Chapter 1** Provides a general description of the DDS-3 drive and the procedures for installing it into a system.
- Chapter 2** Describes the DDS-3 drive configurations, its controls and features, and provides directions for using it.
- Chapter 3** Provides information on caring for DDS tapes, troubleshooting information, and removal/replacement procedures for the DDS-3 drive.
- Appendix A** Lists the pinouts for the SCSI connector on the DDS-3 drive.

## Audience

This guide is intended for use by anyone familiar with the the HP workstations who wants to install and configure the DDS drive.

## **Safety and Regulatory Statements**

See the Owner's Guide that came with your system for safety information.

### **Federal Communications Commission (FCC)**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules and the Canadian Department of Communications. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

Hewlett-Packard's system certification tests were conducted with HP-supported peripheral devices and HP shielded cables, such as those you receive with your computer. Changes or modifications not expressly approved by Hewlett-Packard could void the user's authority to operate the equipment.

Operation of this device is subject to the following conditions:

- This device may not cause harmful interference.
- This device must accept interference received, including interference that may cause undesired operation.
- Cables used with this device must be properly shielded to comply with the requirements of the FCC.

### **Canadian Department of Communications (CDC)**

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

### **Emissions Regulations Compliance**

Any third-party I/O device installed in HP system(s) must be in accordance with the requirements set forth in the preceding Emissions Regulations statements. In the event that a third-party noncompliant I/O device is installed, the customer assumes all responsibility and liability arising therefrom.

### **Electrostatic Discharge (ESD) Precautions**

Electrostatic charges can damage the integrated circuits on printed circuit boards. To prevent such damage from occurring, observe the following precautions during board unpacking and installation:

- Stand on a static-free mat.
- Wear a static strap to ensure that any accumulated electrostatic charge is discharged from your body to ground.
- Connect all equipment together, including the static-free mat, static strap, routing nodes, and peripheral units.
- Keep uninstalled printed circuit boards in their protective antistatic bags.
- Handle printed circuit boards by their edges, once you have removed them from their protective antistatic bags.

## Installation Notice

Products designated in the applicable Hewlett-Packard price list as customer-installable can be installed by computer-knowledgeable customers who carefully read and follow the instructions provided. Customers who elect to have the product installed by our field personnel are charged the applicable field installation charge, as covered under the standard terms and conditions. For more information, please contact your local sales representative.

## Related Manuals

For more information, refer to the following documents:

- The Owner's Guide that came with your system
- *HP-UX Installing Peripherals: HP 9000 Series 700* (B2355–90006)
- *Using Your HP Workstation* (A2615–90003)
- *HP Visual User Environment User's Guide* (B1171–90061)
- *System Administration Tasks HP 9000 Series 700 Computers* (B2355–90040)
- *Using HP-UX* (B2910–90001)

Documents specific to HP DDS drives:

- *User's Manual*, Vol 1 of HP DDS Technical Manual (C1534–90911)
- *Integration Guide*, Vol 2 of HP DDS Technical Manual (C1534–90912)
- *The SCSI Interface*, Vol 3 of HP DDS Technical Manual (C1534–90913)
- *Background to DDS Products*, Vol 4 of HP DDS Technical Manual (C1534–90914)
- *HP DDS Configuration Guide*, Vol 5 of HP DDS Technical Manual (C1534–90915)

Contact your HP supplier for copies.

## Questions, Suggestions, or Problems

If you have any questions, suggestions, or problems with our hardware, software, or documentation, please call 1-888-301-5932 (U.S. and Canada), or contact the HP Response Center for your country.

## Documentation Conventions

Unless otherwise noted in the text, this guide uses the following symbolic conventions:

**literal values**      Bold words or characters in formats and command descriptions represent commands that you must use literally. Pathnames are also in bold.

*user-supplied values*      Italic words or characters in formats and command descriptions represent values that you must supply. Italics are also used in text for emphasis.

screen display      Information that the system displays appears in this typeface.

      A rectangle with rounded corners and a key label denotes a key on your keyboard. (In this manual we refer to the **Return** key. On your keyboard the key may be labeled either **Return** or **Enter**.)

————— ☐☐ —————      This symbol indicates the end of a chapter or appendix.

————— ☐☐ —————

# Chapter 1

## Introduction

This document describes the HP DDS-3 drive (HP model number C1537A), its installation, operation, troubleshooting, and removal/replacement procedures.

This chapter introduces the DDS-3 drive and contains the following information:

- General description of the drive
- Preparing to install the drive
- Preparing the system
- Powering off the workstation and any peripherals
- Adding or removing the DDS-3 drive bezels or expansion brackets

## General Description

The HP DDS-format drives have been developed by Hewlett Packard for data storage drives that build on DAT technology. The DDS-3 drive has 12-GB native capacity and 24-GB compressed capacity. The DDS-3 drive is compatible with all DDS-1 and DDS-2 drive formats. Figure 1-1 shows the DDS-3 drive.

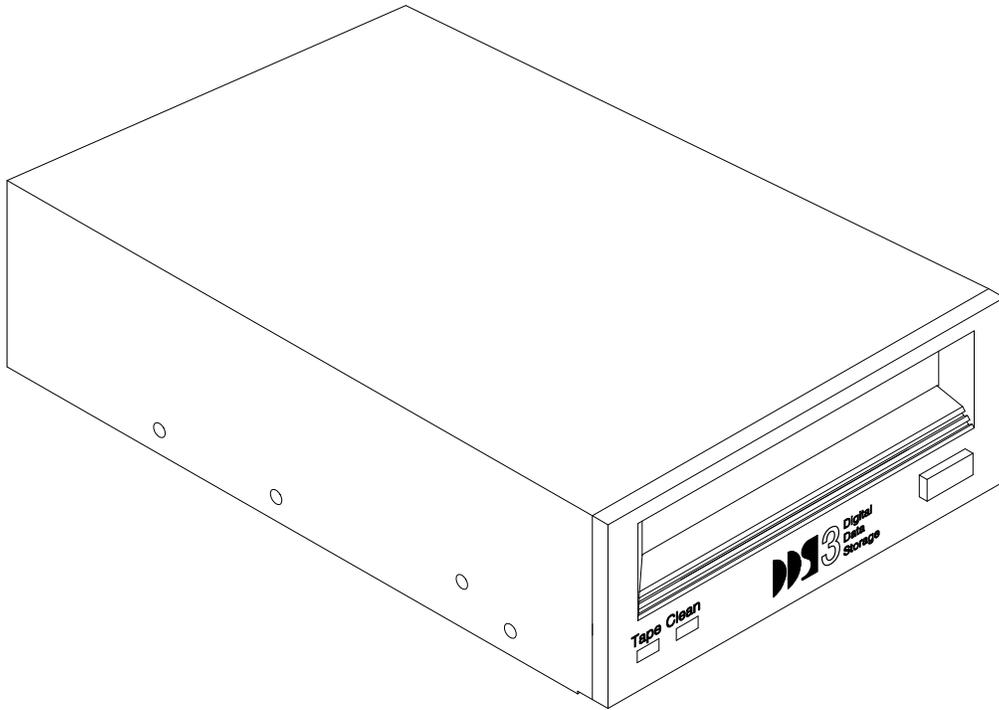


Figure 1-1. HP DDS-3 Drive

## DDS-3 Drive Environmental Requirements

The DDS-3 drive has the following environmental requirements:

- **Ambient Temperature**

Operating	5° C to 40° C (41° F to 104° F)
Non-Operating	-40° C to 70° C (-40° F to 158° F)
  
- **Humidity**

Operating	20% to 80%RH (non-condensing)
Non-Operating	5% to 95%RH Maximum wet bulb temperature = 26° C
  
- **Vibration**

Operating (3 axes for drives, 1 axis for autoloaders)	
Swept Sine	0.3 g peak, 5–500 Hz @ 1 octave/min
Random	5–350 Hz @ 0.00053 g <sup>2</sup> /Hz
HP C1534A/ 36A/53A	350–500 Hz @ -6 dB/octave 500 Hz @ 0.000271 g <sup>2</sup> /Hz (≈0.5 g rms)
Random	5–350 Hz @ 0.0002 g <sup>2</sup> /Hz
HP C1533A/ HP C1537A	350–500 Hz @ -6 dB/octave 500 Hz @ 0.0001 g <sup>2</sup> /Hz (≈0.3 g rms)
Non-Operating	
Swept Sine	0.75 g peak, 5–500 Hz @ 1 octave/min
Random	5–100 Hz @ 0.020 g <sup>2</sup> /Hz 100–137 Hz @ -6 dB/octave 137–350 Hz @ 0.0107 g <sup>2</sup> /Hz 350–500 Hz @ -6 dB/octave 500 Hz @ 0.0052 g <sup>2</sup> /Hz (≈2.41 g rms)

- **Shock**
  - Operating (3 axes for drives) no performance change 5.0 g peak for 3 ms: half sine
  - Operating (3 axes for drives) no data loss 8.0 g peak for 11 ms: half sine
  - Non-Operating (3 axes) no damage 0 km to 15.2 km (0 to 50,000 ft)
- **Altitude**
  - Operating 0 km to 4.6 km (0 to 15,000 ft)
  - Non-Operating 0 km to 15.2 km (0 to 50,000 ft)
- **Transportation**
  - Vibration *Type 1 package (3 axes)*
    - Swept Sine 0.5 g peak, 5–200–5 Hz @ 1 octave/min  
5 min dwell at peak resonance
    - Random 5–100 Hz @ 0.015 g<sup>2</sup>/Hz  
100–200 Hz @ –6 dB/octave  
200 Hz @ 0.0038 g<sup>2</sup>/Hz(≈1.47 g rms)  
(30 min/axis)
  - Impact *Type 1 package*
    - 10 vertical impacts (6 faces and 4 bottom package corners from 910 mm height)
- **Suspended Particles**
  - Operating and Non–Operating Suspended particle environment, particles <200 microgram/cubic meter
- **Acoustic Noise Emissions**
  - <5.0 bel soundpower

## DDS-3 Drive Physical Specifications

Figure 1-2 describes the physical specifications of the DDS-3 drive.

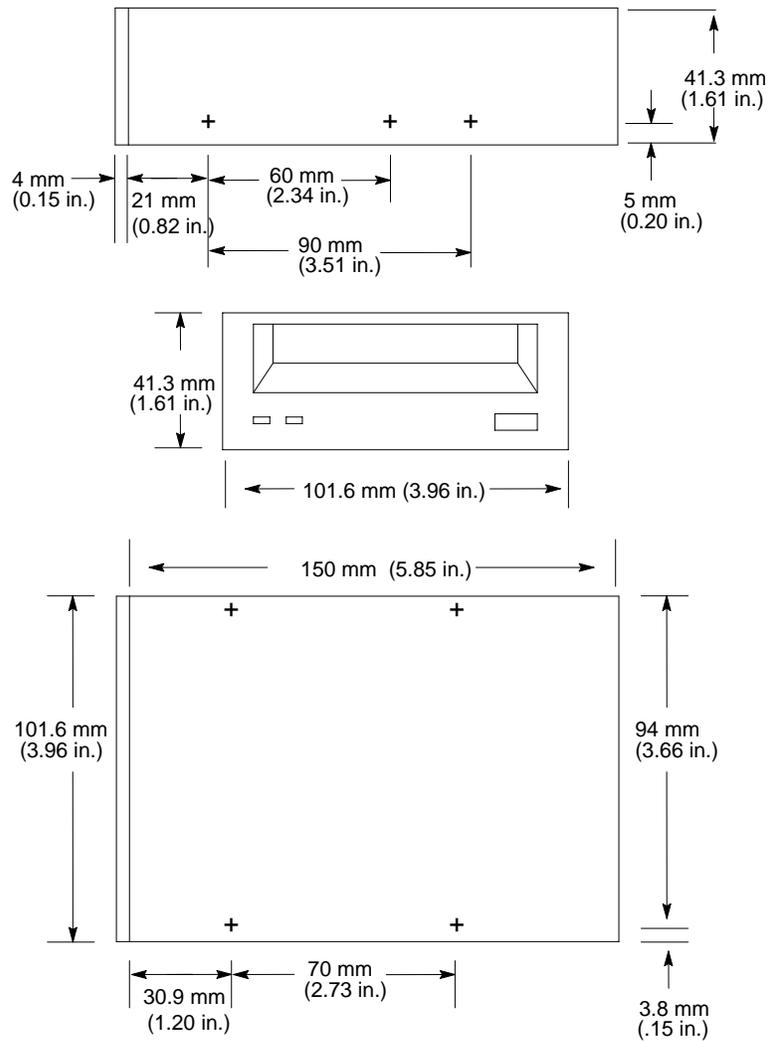


Figure 1-2. HP DDS-3 Drive Physical Specifications

## Preparing to Install a New DDS-3 Drive

The following information describes how to prepare the DDS-3 drive for installation.

### Tools Required

The following tools are needed to install the DDS-3 drive:

- #2 Phillips screwdriver
- Small needlenose pliers
- T10 torx wrench

### Verifying Kit Contents

Verify that the kit contains one of each of the following:

- DDS-3 drive (part number 0950–2650) and bezel.
- Set of 4 screws (M4x6)
- Power adapter cable
- Set of two expansion brackets and four screws (M3x6 T10) (*not included in all kits*)
- SCSI I/O cable
- Static strap
- *HP DDS-3 Tape Drive User's Guide (A1658–90702)*

**NOTICE:** If any contents of your kit are missing, contact your sales representative.

### Operating System Support

The HP DDS-3 drive supports HP-UX 10.01 and later. This drive requires patches PHSS\_7894 (or equivalent replacement) for support of the Support Tools Manager, and patch PHSS\_7583 (or equivalent replacement) for offline SCSI testing..

### Setting the SCSI-2 Address

The DDS-3 drive must have a unique SCSI-2 target address. The DDS-3 drive jumpers are set at the factory to the SCSI-2 default address of 3, as shown in Figure 1–3. We recommend that you keep the default address, if possible.

You must also ensure that the Operation Mode jumpers are set for correct drive operation, as shown in Figure 1–4. We ship the drive with the Operation Mode jumpers set to operate correctly with your system.

**CAUTION:** SCSI tape drives are susceptible to mechanical and electrostatic shock. When handling a DDS-3 drive, always wear the static-grounding wrist strap that comes in the DDS-3 drive kit, and always handle the drive carefully.

Electrostatic charges can damage drives. To prevent such damage from occurring, observe the following precautions during unpacking and installation:

- Stand on a static-free mat.
- Wear a static strap to ensure that any accumulated electrostatic charge discharges from your body to ground.
- Connect all equipment together, including the static-free mat, static strap, routing nodes, and peripheral units.
- Keep uninstalled DDS-3 drives in their protective antistatic bags.

If you need to change the DDS-3 drive address or operation mode, follow these instructions, referring to Figures 1–3 and 1–4:

1. Locate the jumpers at the back of the DDS-3 drive.
2. To change the jumper settings, use needlenose pliers to set the drive's SCSI ID to an address that is not used by another SCSI device. Check that the other jumpers are set correctly.

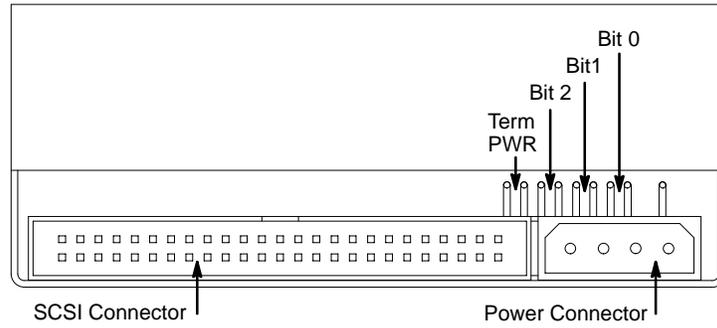
3. If you need to change the Operation Mode switches, locate the switches on the underside of the DDS-3 tape drive. Switches 1 and 2 are used to configure the data compression operation mode. Switches 3 through 8 are used to specify drive connectivity and functionality according to host or customer requirements. The default setting is all switches ON.

### Address Jumpers

To set the drive's address, use the SCSI-2 address jumpers, and perform the following steps:

1. Attach the static-grounding wrist strap by following the instructions on the package. Attach one end of the strap to the system chassis.
2. Locate the address jumpers on the rear of the DDS-3 drive. Figure 1-3 shows the rear of the DDS-3 drive with the significant bits identified.
3. Set the drive's SCSI-2 target address to an address that's not used by another SCSI-2 device. Using Figure 1-3 as a guide, use needlenose pliers to set the jumpers. When finished, refer to "Preparing the System," later in this chapter, for information on verifying the jumpers have been set correctly and your system sees the drive.

**NOTICE:** **Do not** use SCSI-2 address 7 because the system's SCSI-2 controller uses address 7 by default. We advise that you **do not** use SCSI-2 address 6 because the root disk drive uses it.



SCSI ID	Term PWR*	Bit 2	Bit 1	Bit 0	SCSI ID	Term PWR*	Bit 2	Bit 1	Bit 0
0	<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/>	4	<input type="radio"/> <input type="radio"/>	<input checked="" type="radio"/> <input checked="" type="radio"/>	<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/>
1	<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/>	<input checked="" type="radio"/> <input checked="" type="radio"/>	5	<input type="radio"/> <input type="radio"/>	<input checked="" type="radio"/> <input checked="" type="radio"/>	<input type="radio"/> <input type="radio"/>	<input checked="" type="radio"/> <input checked="" type="radio"/>
2	<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/>	<input checked="" type="radio"/> <input checked="" type="radio"/>	<input type="radio"/> <input type="radio"/>	6	<input type="radio"/> <input type="radio"/>	<input checked="" type="radio"/> <input checked="" type="radio"/>	<input checked="" type="radio"/> <input checked="" type="radio"/>	<input type="radio"/> <input type="radio"/>
3 (Default)	<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/>	<input checked="" type="radio"/> <input checked="" type="radio"/>	<input checked="" type="radio"/> <input checked="" type="radio"/>					

\*Term PWR is not used in HP workstation configurations.

Figure 1-3. Rear View of DDS-3 Drive and SCSI Address/Jumper Settings

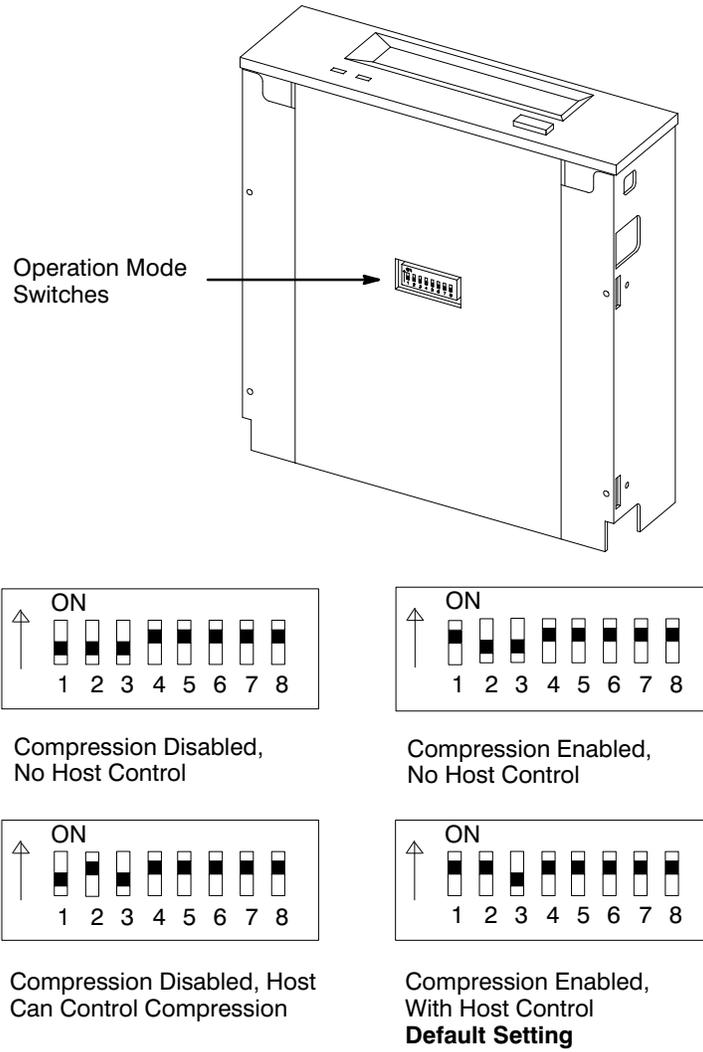


Figure 1-4. Switch Settings for Data Compression Operation Mode

## Preparing the System

Perform the following steps to prepare the system for the DDS-3 drive installation:

1. Determine the existing SCSI-2 address settings currently in use on your system by completing the following steps.
2. Enter the following at the prompt:

```
/usr/sbin/ioscan RETURN
```

After a few moments the **ioscan** utility lists all of the SCSI I/O devices it could find.

The list appears similar to the following:

```
H/W Path      Class          Description
=====
                bc
8             bc          I/O Adapter
8/0           ext_bus       GSC built-in Fast/Wide SCSI Interface
8/0.0        target
8/0.0.0      disk         QUANTUM LPS1080WD
8/0.5        target
8/0.5.0     disk         DEC      DSP3210SW
8/0.6        target
8/0.6.0     disk         DEC      DSP3210SW
8/12        ba           Core I/O Adapter
8/12/5      ext_bus       Built-in SCSI
8/12/5.3    target
8/12/5.3.0  tape.         HP C1537A
8/12/5.4    target
8/12/5.4.0  disk.         SEAGATE ST3600N
8/12/5.6    target
```

```
8/12/5.6.0          disk      MICROP  2112
10                  bc         I/O Adapter
10/12              ext_bus   GSC add-on Fast/Wide SCSI Interface
10/12.4            target
10/12.4.0          disk      SEAGATE ST31200W
```

### 3. Shut down the system.

If you are running HP-UX under HP VUE, shut down your system according to the shutdown procedure described in the owner's guide that came with your workstation.

If you are running HP-UX without HP VUE, shut down your system by typing the following command:

```
# /etc/shutdown -h 
```

You must have superuser privileges to use the `/etc/shutdown` command. If you do not have superuser privileges, contact your system administrator.

If your workstation is part of a cluster, refer to *Managing Clusters of HP 9000 Computers* for instructions on shutting down.

### SCSI-2 Connection and Termination

Only single-ended SCSI-2 configuration is supported.

Only unshielded connectors can be used.

The DDS-3 drive does not support termination on the device itself. Normally, drives such as this are not required to be at the end of a bus, but if this is unavoidable, HP recommends using a feed-through SCSI terminator that plugs directly into the rear of the drive.

If you do not already have a SCSI terminator, you must order either terminator K2291 (bale-lock style) or terminator C2904A (thumbscrew style).

**NOTICE:** Use care when inserting and removing feed-through terminators to avoid damaging the end walls of the terminator and the drive.

## **Powering Off the Workstation and Any Peripherals**

To power off the workstation and any peripherals, perform the following steps:

- 1.** Power off the workstation, using the power switch on the front of the workstation.

**CAUTION:** Do not power off your workstation without first shutting down HP-UX. Powering off with HP-UX still running could damage the data on the disks associated with your workstation.

If you are already at the boot-administration level (the level used to check the SCSI-2 IDs), you do not need to shut down before powering off.

If you accidentally rebooted HP-UX while determining the address settings, see “Preparing the System,” earlier in this chapter, for instructions on shutting down HP-UX.

- 2.** Disconnect the power cord from the rear of the workstation and the wall outlet.
- 3.** Power off any external peripherals attached to your workstation, and unplug their power cables from the wall outlet.

## Adding or Removing the DDS-3 Drive Bezels or Expansion Brackets

Depending on the size of the drive opening in your system, you may need to add or remove a bezel or expansion brackets to ensure that your DDS-3 drive fits in your system.

Part numbers for the HP bezels are as follows:

- C1533-60104 – 3 1/2 inch Dove Grey
- C1533-60204 – 5 1/4 inch Dove Grey
- C1533-60105 – 3 1/2 inch Flint Grey
- C1533-60205 – 5 1/4 inch Flint Grey

**NOTICE:** Before performing any of these changes, make sure there is not a cassette in the drive.

To add a bezel (it can be a 3.5-inch bezel, or a 5.25-inch bezel) to your drive, push the bezel onto the drive, making sure the tabs click into place. Refer to Figure 1-5.

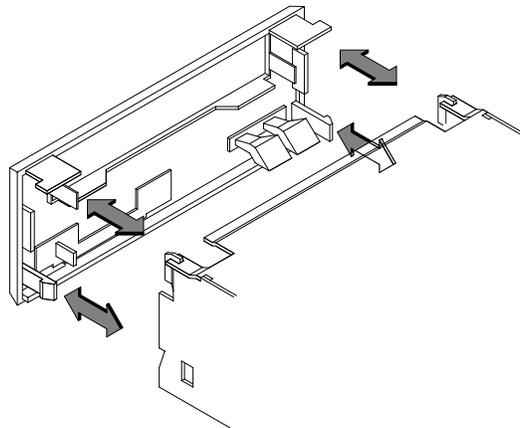
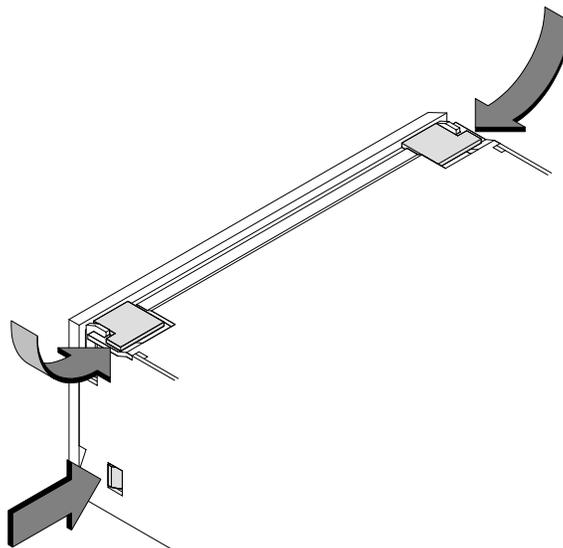


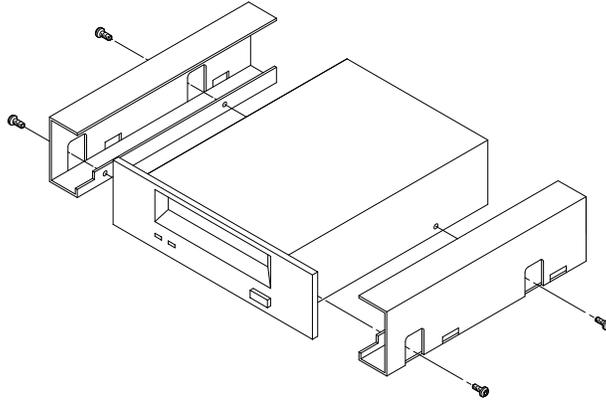
Figure 1-5. Adding a Bezel to the DDS-3 Drive

To remove a bezel from a drive, use a straight blade screwdriver to lift the bezel tabs from the top of the drive, and push in the tabs at the sides of the drive. Refer to Figure 1-6.



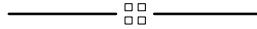
*Figure 1-6. Removing a Bezel from the DDS-3 Drive*

To add expansion brackets to the drive or to remove them, use a T10 torx wrench to either tighten or remove the four torx screws that hold each expansion bracket to the drive. Refer to Figure 1-7.



*Figure 1-7. Adding or Removing Expansion Brackets*

You are now ready to begin the hardware installation of your DDS-3 drive. The step-by-step instructions for installing the drive are found in the owner's guide that came with your workstation.



# Chapter 2

## Using the DDS-3 Drive

This chapter provides the following information on using your DDS-3 drive:

- DDS-3 drive configuration
- Controls and features of the DDS-3 drive
- Using the DDS-3 drive

To verify HP-UX system operation, see the owner's guide that came with your workstation.

For more information on checking or reconfiguring the kernel for a device driver or file, see *System Administration Tasks Manual: HP 9000 Series 700 Computers*.

## Your DDS-3 Drive Configuration

Your HP-UX operating system comes with preconfigured device files and drivers. If you use these preconfigured device files and drivers, you won't need to configure your DDS-3 drive with the operating system.

To find out more about creating and using device files, see the owner's guide that came with your system.

## Controls and Features of the DDS-3 Drive

Your DDS-3 tape drive is either a 3 1/2-inch form factor, or a 5 1/4-inch form factor DDS-3 tape drive with data compression and a SCSI interface. It conforms to the DDS-3 format standard for storing computer data. It's a high-capacity, high transfer-rate device for data storage on tape.

Figure 2-1 shows the LEDs and eject button of the DDS-3 drive.

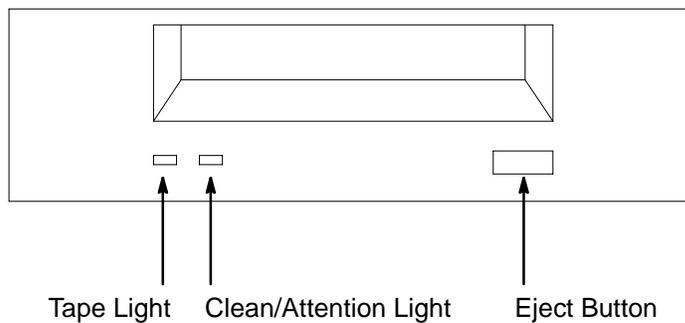


Figure 2-1. DDS-3 Drive Controls and Indicators

## LEDs

The front panel has two colored LEDs: the Tape Light and the Clean/Attention Light. The Tape Light flashes **green** to show activity (loading, unloading, reading, and writing). Steady green means a cartridge is loaded.

The Clean/Attention Light flashes **amber** to indicate head cleaning is needed or a cartridge is near the end of its life. Steady amber means a hard fault.

Table 2-1. LED Display Codes

Tape Light	Clean/Attention	Meaning	Key	
		Activity – load or unload		OFF
		Activity – read or write		Steady Green
		Cartridge loaded		Steady Amber
Any		Cleaning needed		Flashing Green 1/2 sec on, 1/2 sec off
Any		Fault		Flashing Amber 1/2 sec on, 1/2 sec off
				Fast Flash Green 1/4 sec on, 1/4 sec off

## Data Cassettes

### Media Life

HP DDS data cassettes are currently specified to 2000 passes over any part of the tape under optimal environmental conditions (50% relative humidity, 22 degrees C). During a tape operation, any one area of the tape may have multiple passes over the heads. This translates into approximately 200 to 300 backups or restores.

Under certain conditions, the life of your data cassette is less than 200 to 300 backups or restores. Replace your data cassettes after 100 backups or restores if your operating conditions meet any of the following criteria:

- The relative humidity in your operating environment is consistently less than 50%.
- You know that the backup software you are using makes multiple passes over sections of the tape during backups or restores.
- You notice that when you do backups and restores the tape stops and starts frequently.

#### *Cleaning the Tape Heads*

Clean the heads of your tape drive after every 25 hours of tape drive use or if the Media Wear (Caution) signal is displayed on the LED.

**NOTICE:** Only use HP Cleaning Cassettes (HP92283K) to clean the tape heads. Do not use swabs or other means of cleaning the tape heads.

Follow this procedure to clean the tape heads:

- 1.** Insert the cleaning cassette into the drive. The tape automatically loads the cassette and cleans the heads. At the end of the cleaning cycle, the drive ejects the cassette.
- 2.** Write the current date on the cleaning cassette label so that you know how many times you have used it. Discard the cleaning cassette after you have used it 50 times.

#### *Media Restrictions*

If you interchange media between other HP workstation DDS tape drives, note that data cassettes with compressed data can only be read by tape drives that have data compression capabilities. This includes data cassettes that contain both compressed and noncompressed data.

#### *Setting the Write-Protect Tab on a Data Cassette*

You can only store or change information on a data cassette when the write-protect tab is in the *write* position. So, before trying to write to the data cassette, make sure that the write-protect tab is in the *write* position, as shown in Figure 2-2.

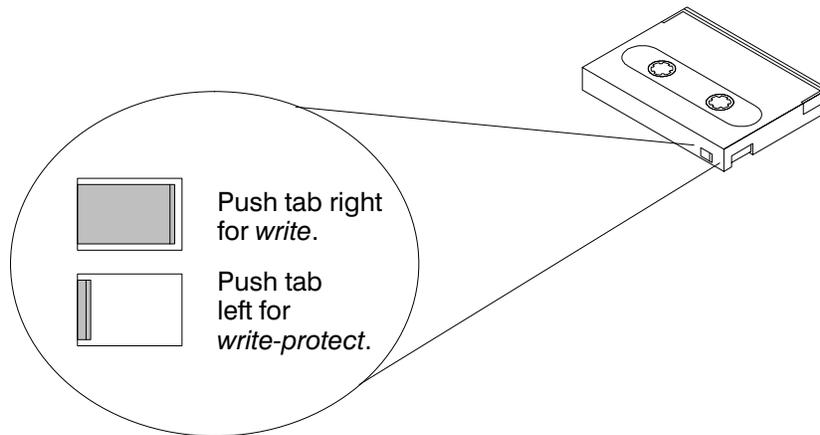


Figure 2–2. Setting the Write-Protect Tab on a DDS Tape

To protect information on a data cassette from being overwritten, set the write-protect tab to the *write-protect* position, as shown in Figure 2–2.

**NOTICE:** The write-protect tab should always be in the *write* position for transferring data to a cassette.

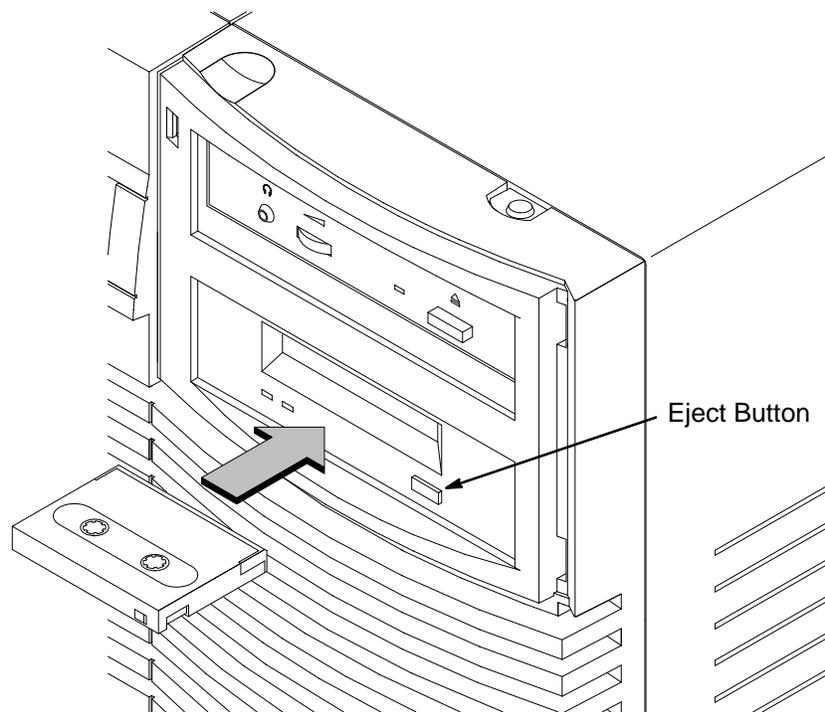
## **Using the DDS-3 Drive**

This section describes how to perform tasks with your DDS-3 tape drive.

### **Loading and Unloading a Data Cassette**

Follow these steps to load and unload a data cassette from the DDS-3 tape drive:

- 1.** Insert the data cassette into the drive, as shown in Figure 2-3.



*Figure 2-3. Loading a Data Cassette*

2. Push the data cassette about three quarters of an inch into the drive. The drive automatically pulls the data cassette the rest of the way in. When the Tape LED on the left front of the drive stops flashing, the drive has loaded the data cassette.
3. To remove the data cassette, press and release the eject button on the front of the drive, as shown in Figure 2-3. The Tape LED on the drive flashes on and off. Ten to twenty seconds later, the data cassette slides partway out of the drive. Remove the cassette from the drive.

### Verifying the DDS-3 Tape Drive Operation

To verify that your workstation can communicate with the DDS-3 tape drive, type the following:

```
/usr/sbin/ioscan -d stape Return
```

After a few moments the **ioscan** utility returns a message similar to the following:

```

H/W Path      Class          Description
=====
                bc
8             bc          I/O Adapter
8/12          ba          Core I/O Adapter
8/12/5        ext_bus      Built-in SCSI
8/12/5.3      target
8/12/5.3.0    tape        HP          HPC1537A

```

If your DDS-3 drive is not listed, go to Chapter 3, “Troubleshooting and Removal/Replacement Procedures.”

For information on using device files or archiving data to or from the DDS-3 drive, see the owner’s guide that came with your workstation.

### Media Interchangeability Restrictions

If you interchange media between DDS-format tape drives, note that data cassettes with compressed data can only be read by tape drives that have data compression capabilities.

Refer to Tables 2–2 and 2–3 for information on which tapes you can use with each of HP’s DDS drives.

*Table 2–2. HP DDS Tape Drive Capability Without Data Compression*

<b>Tape Length</b>	<b>Full Height 5 1/4 inch DDS Tape Drive</b>	<b>DDS-DC Tape Drives</b>	<b>DDS-2 Tape Drives</b>	<b>DDS-3 Tape Drives</b>
60 meter	1.3 GB	1.3 GB	1.3 GB	1.3 GB
90 meter	Not Supported	2.0 GB	2.0 GB	2.0 GB
120 meter	Not Supported	Not Supported	4.0 GB	4.0 GB
125 meter	Not Supported	Not Supported	Not Supported	12.0 GB

*Table 2–3. HP DDS Tape Drive Capability With Data Compression*

<b>Tape Length</b>	<b>Full Height 5 1/4 inch DDS Tape Drive</b>	<b>DDS-DC Tape Drives</b>	<b>DDS-2 Tape Drives</b>	<b>DDS-3 Tape Drives</b>
60 meter	2.6 GB	2.6 GB	2.6 GB	2.6 GB
90 meter	Not Supported	4.0 GB	4.0 GB	4.0 GB
120 meter	Not Supported	Not Supported	8.0 GB	8.0 GB
125 meter	Not Supported	Not Supported	Not Supported	24.0 GB

### **Ordering Information**

To order Hewlett-Packard data cassettes and cleaning cassettes for use in your DDS-3 tape drive, use the following order numbers:

- HP92283A     Box of five 60-meter DDS data cassettes
- HP92283B     Box of five 90-meter DDS data cassettes
- HP92300A     Box of five 120-meter DDS data cassettes
- HPC1517A     Box of five 125-meter DDS data cassettes
- HP92283K     Package of two head-cleaning cassettes
- HP92283L     Lockable storage box for 12 cassettes

**CAUTION:** Use only data cassettes labeled as DDS (Digital Data Storage) cassettes. Never use audio cassettes labeled DAT (Digital Audio Tape) in your DDS-format drive. Using DAT cassettes could damage your drive.



# Chapter 3

## Troubleshooting and Removal/Replacement Procedures

This chapter provides the following information on troubleshooting and removal/replacement procedures for your DDS-3 drive:

- Checking the address settings
- Checking the hardware installation
- Verifying system operation
- Field Replaceable Units
- Powering off the system
- Removing and replacing the DDS-3 drive
- Adding or removing DDS-3 drive bezels and expansion brackets

## **Troubleshooting**

If you have trouble with any of these procedures, see the owner's guide that came with your system.

This chapter explains what to do if you experience problems during the configuration process. It also explains how to run the Support Tools Manager or the Extended Self Test to verify your system.

If you are experiencing difficulty booting the system, reconfiguring HP-UX, or using the DDS-3 drive, complete each of the following tasks, in the order they are presented, until you discover and correct the problem:

- Check the address settings of any single-ended SCSI-2 devices.
- Check that you have installed the hardware correctly.
- Recheck the device list.
- Run verification tests.

**NOTICE:** To run `xstm` on HP-UX 10.01, you need to install patch PHSS\_7894.

### **Checking the Address Settings for Single-Ended Drives**

Check the address settings of each single-ended SCSI-2 device on the bus. Make sure that no device has the same address setting as another. If you find two devices with the same address, change one of the devices to a different, unused address setting. To check the address settings for each single-ended SCSI-2 device, type the following in a terminal window or HP-UX command line:

```
/usr/sbin/ioscan 
```

After a few moments the **ioscan** utility lists all of the SCSI I/O devices it could find. The list appears similar to the following:

H/W Path	Class	Description
	bc	
8	bc	I/O Adapter
8/0	ext_bus	GSC built-in Fast/Wide SCSI Interface
8/0.0	target	
8/0.0.0	disk	QUANTUM LPS1080WD
8/0.5	target	
8/0.5.0	disk	DEC DSP3210SW
8/0.6	target	
8/0.6.0	disk	DEC DSP3210SW
8/12	ba	Core I/O Adapter
8/12/5	ext_bus	Built-in SCSI
8/12/5.3	target	
8/12/5.3.0	tape	HP C1537A
8/12/5.4	target	
8/12/5.4.0	disk	SEAGATE ST3600N
8/12/5.6	target	
8/12/5.6.0	disk	MICROP 2112
10	bc	I/O Adapter
10/12	ext_bus	GSC add-on Fast/Wide SCSI Interface
10/12.4	target	
10/12.4.0	disk	SEAGATE ST31200W

### Checking the Hardware Installation

Perform the following steps to check the hardware installation:

**CAUTION:** The DDS-3 drive is susceptible to mechanical and electrostatic shock. When handling the drive, always wear the static strap that came in the DDS-3 drive kit. Always handle the drive carefully.

1. Check that the SCSI-2 terminator is connected to the single-ended SCSI-2 port on the rear I/O panel of the system unit (if there are no external SCSI-2 devices), or that the last external single-ended SCSI-2 device is terminated.

2. Attach the static-grounding wrist strap by following the instructions on the package that contains the strap.

3. Shut down HP-UX.

**NOTICE:** If you are already at the boot administration level, you do not need to shut down; skip this step and go on to Step 4.

If you are running HP-UX under HP VUE, shut down your system by performing the shutdown procedure described in the owner's guide that came with your workstation.

If you are running HP-UX without HP VUE, shut down your system by typing the following command:

```
# /etc/shutdown -h 
```

You must have superuser privileges to use the **/etc/shutdown** command. If you do not have superuser privileges, contact your system administrator.

If your workstation is part of a cluster, refer to *Managing Clusters of HP 9000 Computers* for instructions on shutting down.

4. Power off the workstation, using the power switch on the front of the workstation.

**CAUTION:** Do not power off your workstation without first shutting down HP-UX. Powering off with HP-UX still running could damage the data on the disks associated with your workstation.

5. Remove the drive and check the jumpers, as described in "Removal/Replacement Procedures" at the end of this chapter.
6. Replace the drive.
7. Check the cable connections of your DDS-3 drive. Make sure that the connectors are aligned and seated correctly.

8. Recheck the device list (see “Rechecking the Address Settings” below).

### **Rechecking the Address Settings**

Check the address settings again to see if the drive is now listed (see “Checking the Address Settings for Single-Ended Drives,” earlier in this chapter).

If the DDS-3 drive and all other SCSI-2 devices available to you before you installed the DDS-3 drive are now listed, run the system verification test for your software version, as explained in the next sections.

If the DDS-3 drive is still not listed, or one of the SCSI-2 devices available to you before you installed the DDS-3 drive is still not listed, contact your service representative.

### **Verifying the System Operation Using the Support Tools Manager**

HP-UX uses a diagnostics product called the Support Tools Manager that allows system operation verification.

You can access the Support Tools Manager in a terminal window. If you are using HP VUE as your interface, you can also access the Support Tools Manager through the **sys\_admin** directory.

Three interfaces are available with the Support Tools Manager: a command line interface (accessed through the **cstm** command), a menu-driven interface (accessed through the **mstm** command), and the graphical user interface (accessed through the **xstm** command).

For more information on these user interfaces, see the online man pages by entering the following at a command line prompt:

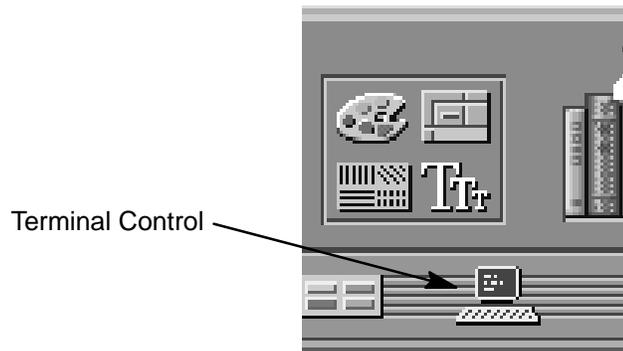
```
man cstm 
```

```
man mstm 
```

```
man xstm 
```

To access the Support Tools Manager, perform the following steps:

1. Click on the **Terminal Control** on the **Front Panel** of your Workspace.



A terminal window opens.

2. Move the mouse cursor into the terminal window and click the left mouse button.
3. Enter the following at the prompt:

```
cstm 
```

The following screen appears:

```
Support Tool Manager      Version A.01.00  
  
Type 'help' for a list of available commands.  
  
CSTM>
```

At the **CSTM>** prompt, you can enter several commands. To see what commands are available, type the **help** command.

4. To verify the system operation, type the following at the CSTM> prompt:

```
CSTM> verify all RETURN
```

Messages similar to the following appear:

```
Verification has started on device (CPU).  
Verification has started on device (FPU).
```

```
CSTM>Verification of (FPU) has completed.  
CSTM>Verification of (CPU) has completed.
```

5. Press **RETURN** to return to the CSTM> prompt after all test results are reported.
6. To exit the Support Tools Manager, type the following:

```
CSTM> exit RETURN
```

If any tests failed, further diagnosis is necessary by qualified service personnel. Contact your designated service representative.

## **Removal/Replacement Procedures**

The removal/replacement procedures for the DDS-3 drive follow.

**CAUTION:** Electrostatic charges can damage the integrated circuits on printed circuit boards. To prevent such damage from occurring, follow proper ESD precautions.

### **Field Replaceable Units**

The following components are authorized for field replacement.

<b>Description</b>	<b>Part Number</b>
DDS-3, Replacement	C1537-67201
DDS-3, Exchange	C1537-69201

### **Powering Off the System**

Before performing the removal/replacement procedures, observe the following precautions:

- 1.** Refer to the owner's guide that came with your system for the procedures to power off the system.
- 2.** Unplug the system unit power cord and the power cords of any peripheral devices from the power source.
- 3.** Unplug the system unit power cord from the back of the system unit.

**WARNING:** Failure to properly shut down and remove power from the system can create a personal hazard, or may result in hardware damage or data corruption.

### **Removing and Replacing the DDS-3 Drive**

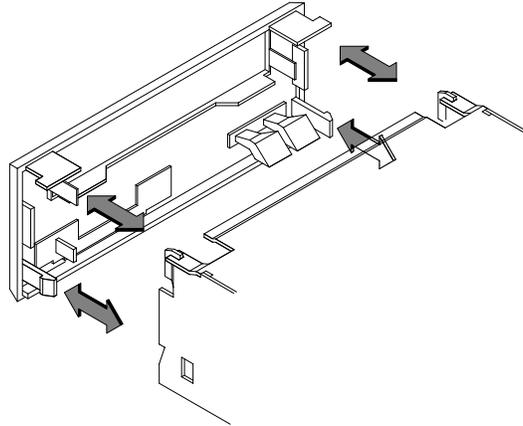
To open your system and to remove and reinstall the DDS-3 drive, refer to the owner's guide that came with your system. Read "Preparing to Install the DDS-3 Drive" in Chapter 1 of this guide before beginning an installation.

### **Adding or Removing the DDS-3 Drive Bezels and Expansion Brackets**

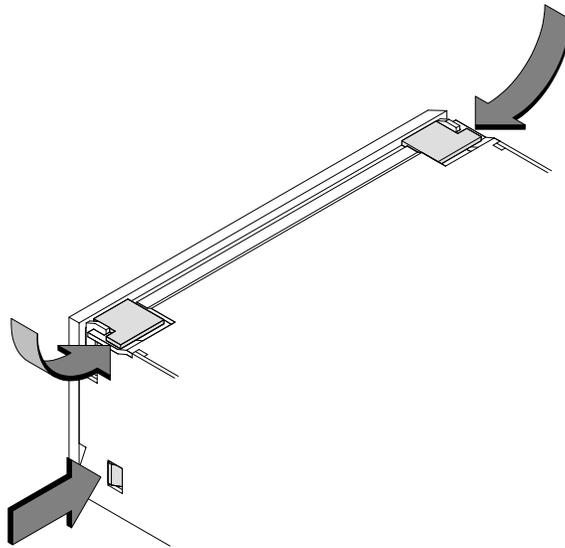
Depending on the size of the drive opening in your system, you may need to add or remove a bezel or expansion brackets to ensure that your DDS-3 drive fits in your system.

**NOTICE:** Before performing any of these changes, make sure there is not a cassette in the drive.

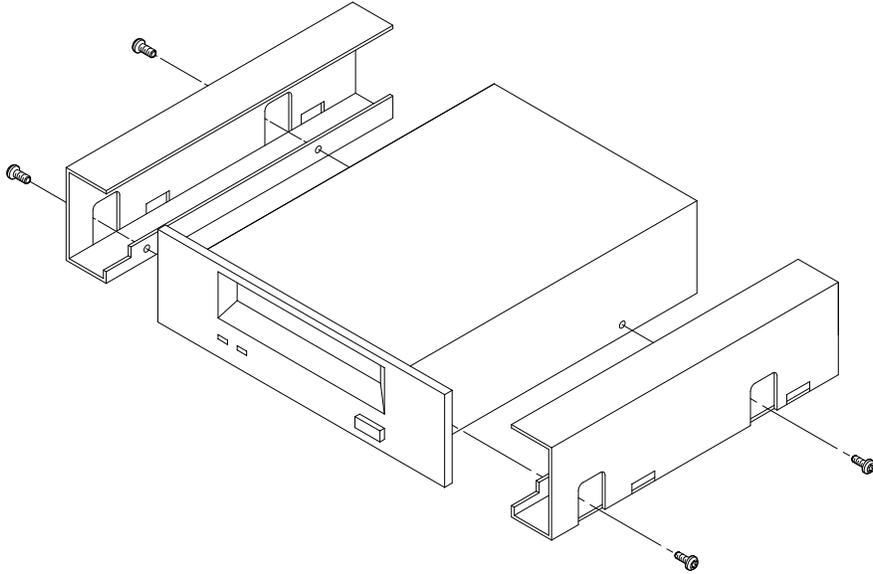
- To add a bezel (it can be a 3.5-inch bezel, or a 5.25-inch bezel) to your drive, push onto the drive, making sure the tabs click into place. Refer to Figure 3-1.
- To remove a bezel from a drive, use a straight blade screwdriver to lift the bezel tabs from the top of the drive, and push in the tabs on the sides of the drive. Refer to Figure 3-2.
- To add or remove expansion brackets to the drive, use a T10 torx wrench to either tighten or remove the four torx screws that hold each expansion bracket to the drive. Refer to Figure 3-3.



*Figure 3-1. Adding a Bezel to the DDS-3 Drive*



*Figure 3-2. Removing a Bezel from the DDS-3 Drive*



*Figure 3-3. Adding or Removing Expansion Brackets*



# Appendix A

## SCSI Connector Pinouts

Table A-1. SCSI Connector Pinouts

PIN	SIGNAL	PIN	SIGNAL
1	GND	26	TERMPWR
2	DB(0)	27	GND
3	GND	28	GND
4	DB(1)	29	GND
5	GND	30	GND
6	DB(2)	31	GND
7	GND	32	-ATN
8	DB(3)	33	GND
9	GND	34	GND
10	DB(4)	35	GND
11	GND	36	-BSY
12	DB(5)	37	GND
13	GND	38	-ACK
14	DB(6)	39	GND
15	GND	40	-RST
16	DB(7)	41	GND
17	GND	42	-MSG
18	DB(P)	43	GND
19	GND	44	-SEL
20	GND	45	GND
21	GND	46	-C/D
22	GND	47	GND
23	GND	48	-REQ
24	GND	49	GND
25	OPEN	50	-I/O



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