Origin™ and Onyx2™ DLT™7000 and 2000XT Tape Drive Owner's Guide

Document Number 007-3530-001

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Unauthorized modifications to this product could void the FCC approval and negate your authority to operate the product.

VDE 0871/6.78
This equipment has been tested to and is in compliance with the Level A limits per VDE 0871.

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; Germany's BZT Class A limits for Information Technology Equipment; and Japan's VCCI Class 1 limits.

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Le présent appareil numérique n'émet pas de perturbations radioélectriques dépassant les normes applicables aux appareils numériques de Classe A prescrites dans le Règlement sur le interferences radioélectriques établi par le Ministère des Communications du Canada.

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About This Guide

This guide is designed to help you install, manage, and troubleshoot your internal-mount and desktop DLT™ drives. Two product variations of the tape drive are documented in this guide:

- DLT7000
- DLT2000XT

The primary functional differences between these drives are tape cartridge compatibility, storage capacity and data transfer rates. These drive products have been specifically configured and tested to work with the following Silicon Graphics® host systems:

- Onyx2™ rackmount or deskside systems
- Origin2000™ rackmount or deskside systems
- Origin200™ deskside tower and rackmount systems

Note: Please consult your Silicon Graphics sales or service representative before using these DLT drives with any other host systems.

With DLT7000 drives, you must have IRIX™ 6.4 or later installed on the host system or the drive is not recognized. DLT2000XT drives are supported with IRIX release 6.2 or later.

Connecting the DLT tape drive to a deskside or rackmount system may require some setup by a qualified service provider. Any XIO SCSI board must be connected and configured by a trained field installer during or after installation of the host system.

Otherwise, the internal-mount and desktop DLT drives and all the procedures in this guide are designed so that customers can install, use, and maintain them without the help of a trained technician. However, do not feel that you *must* work with the hardware yourself. You can always contact your maintenance provider to have an authorized service person work with the hardware instead.

Structure of This Guide

This document is organized as follows:

- Chapter 1, “Introducing the DLT7000 and 2000XT Drives,” gives an overview of the tape drives, their external features, connection guidelines, and SCSI-2 information.
- Chapter 2, “Installing an Internally-Mounted DLT Drive,” explains the configuration and installation procedures for installing the internal-mount version of the DLT inside a deskside Origin Vault (tower), an Origin200 system, or the rackmounted Origin Vault drive enclosure.
- Chapter 3, “Cabling for the DLT Drive Box,” explains how to properly cable the deskside and rackmount Origin Vault drive boxes for DLT use.
- Chapter 4, “Installing a Desktop 7000 or 2000XT DLT Drive,” gives general guidelines for placement, installation, connection, and configuration of the desktop DLT drives. Power-on, power-off, and self-test procedures are covered.
- Chapter 5, “DLT Drive Operation and Troubleshooting,” offers operating instructions for tapes and drives, including LED indicator activity, loading and unloading tapes, and using the cleaning cartridge. This chapter also includes information on simple diagnosis of minor problems and instructions for removing a jammed cartridge.
- Appendix A, “Hardware Specifications,” contains technical specifications for the DLT7000 and 2000XT drives, as well as pinouts for the SCSI connector.

Portions of information in this manual are derived directly from the Quantum® *DLT7000 Tape Drive Product Manual* (P/N 81-111331-01).

Audience for This Guide

The primary audience for this guide is presumed to be end users or administrators who have some basic computer hardware and software knowledge. The document may also provide helpful information to field support personnel and OEM partners.

Additional software-specific information is available in the following software guides:

- *IRIX Admin: Peripheral Devices*
- *Personal System Administration Guide*
- *IRIS Essentials*
- automated backup software instructions: *IRIX NetWorker Installation Guide*, *IRIX NetWorker Administrator's Guide*, and *NetWorker for IRIX User's Guide*

Useful information regarding the host systems that connect to your DLT tape drive can be found in the owner's guides for the specific host system. Note that system-level owner's guides are shipped with the host system and not with the tape drive.

Typographical Conventions

This guide uses these conventions:

- Entries that you are to type exactly as shown are in **`boldface typewriter font`**.
- IRIX filenames are in *italics*.
- Document names are in *italics*.
- Labels on the tape drives are in **Helvetica Bold**.

Chapter 1

Introducing the DLT7000 and 2000XT Drives

The DLT7000 and 2000XT tape drives are high-performance, high-capacity, 1/2-inch streaming cartridge tape products designed and configured for use in Silicon Graphics high-performance servers and graphics systems. The tape medium can endure 500,000 passes and has an estimated shelf life of 30 years. Chapter 5, "DLT Drive Operation and Troubleshooting," contains details on tape cartridges for the DLT drives.

This chapter covers

DLT7000 Drive Features

The DLT7000 tape drive features a native formatted capacity of 35 GB and a sustained user data transfer rate of up to 5 megabytes per second (MBps) uncompressed. Operating in compressed mode, a 70 GB capacity and 10 MBps transfer rate is possible. The DLT7000 tape drive design, a 5.25-inch form factor, includes a dual-channel read/write head, Lempel-Ziv (LZ) high-efficiency data compression, and tape mark directory to maximize data throughput and minimize data access time.

The DLT7000 drive uses the black DLTtape™ IV cartridges that have a capacity of 35.0 GB (native) or 70.0 GB (compressed). Built-in data compression increases cartridge capacity and drive transfer rate by a factor of 2 to 2.5. Actual amounts of data stored in compression mode are dependent on data type. You must use the DLTtape IV cartridge to achieve the data capacity and transfer rates listed.

DLT2000XT Drive Features

The DLT2000XT tape drive features a native formatted capacity of 15 GB and a sustained user data transfer rate of up to 1.25 MBps A capacity of 30 GB, and data transfer rates of up to 2.5 MBps are possible using compressed mode. The DLT2000XT tape drive design, a 5.25-inch form factor, includes a dual-channel read/write head, Lempel-Ziv (LZ) high-efficiency data compression, and tape mark directory to maximize data throughput and minimize data access time.

The DLT2000XT drive uses white DLTtape IIIxt tape cartridges that have a capacity of 15.0 GB (native) or 30.0 GB (compressed). Built-in data compression increases cartridge capacity and drive transfer rate by a factor of 2 to 2.5.

For unattended backups or archiving, the DLT2000XT drive allows you to back up a high data-capacity system at a high speed. In noncompressed mode, the 2000XT has a maximum transfer rate of 1.25 MBps; in compressed mode, the maximum transfer rate is 2.5 MBps on writes and 3.0 MBps on reads. The compaction features of the DLT2000XT include a read/write cache of 2.0 MB; this working space enables maximum use of available tape space.

Table 1-1 summarizes supported DLT drive versions for various chassis.

Table 1-1 DLT Drive Configurations in Silicon Graphics Chassis

Chassis	DLT7000	DLT2000XT	Maximum Number of Drives
Origin2000 deskside	X	X	No internal DLTs; up to 4 external drives
Origin2000 rackmount	X	X	Four
Onyx^2 deskside	X	X	No internal DLTs; up to 4 external drives
Onyx^2 rackmount	X	X	One
Origin Vault	X	X	One
Origin200	X	X	One internal; up to 3 external drives using optional SCSI PCI boards

DLT Drive Operation

As shown in Figure 1-1, the DLT drive uses a lift-handle to load and unload the tape cartridge. The drive has a green “operate handle” LED that indicates when operation of the handle is allowed. This LED is located below or to the right of the handle depending on drive orientation.

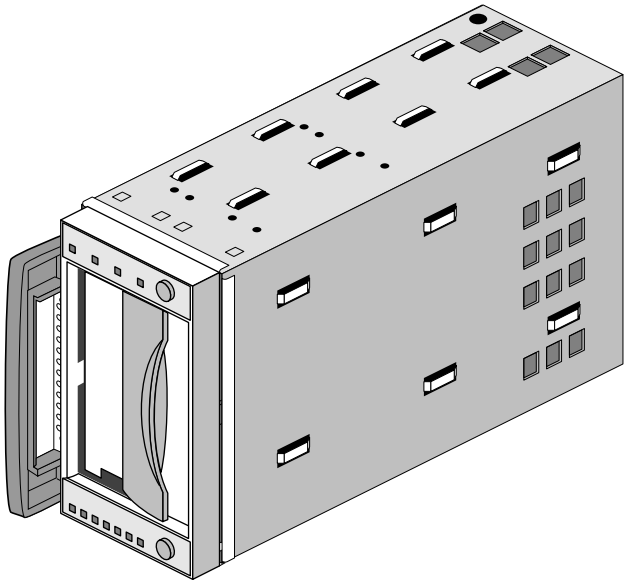


Figure 1-1 DLT7000 Drive

Caution: Never turn off an active DLT drive until after you have removed the tape cartridge, and properly halted the host system. Turning off the drive while it is in active use by the host is likely to result in data loss.

Figure 1-2 shows the DLT2000XT carrier-mounted drive.

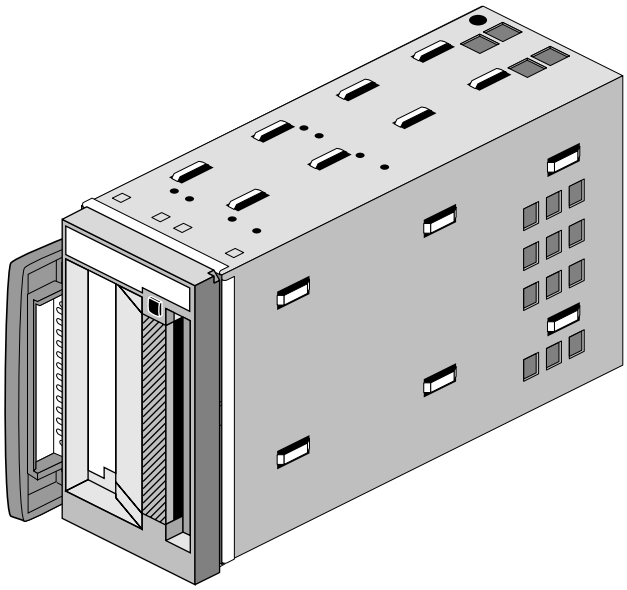


Figure 1-2 DLT2000XT Tape Drive

Connection and Termination Guidelines

Each Origin Vault comes with two SCSI interface cables for connection to the host system. The internal-mount DLT drives install directly into the vault or Origin200, and do not require termination procedures. See Chapter 2 for configuration information on the drives. Always use the SCSI cable supplied with your Origin Vault or desktop DLT.

Caution: The single-ended 2000XT desktop drive is limited to a maximum SCSI cable length of 19.6 feet (6 m) when connected to Silicon Graphics deskside systems. Do not daisy-chain other SCSI devices to the single-ended DLT connection. Never connect the vault containing the DLT drive to a host system with any cable combination that exceeds 19.6 feet (6 m), including any internal cable length. Doing so may result in SCSI bus errors or data loss.

Pinouts for a host system's 68-pin single-ended SCSI connector are in Appendix A, "Hardware Specifications."

Special SCSI Requirements for Deskside Systems

The deskside Origin2000 and Onyx2 products come with only one external single-ended SCSI connector as a standard preconnected feature from the factory. The desktop version of the DLT7000 drive requires a differential SCSI connection which must be ordered and installed as part of the DLT7000 option.

Additional external SCSI connectors must be ordered as an optional XIO board and connected and configured by a trained field installer during or after the installation of the deskside host system.

The Origin200 deskside system uses a PCI based SCSI option board that may be installed by the end user.

Caution: Installation of an optional external XIO SCSI board is not considered an end-user task on Origin2000 and Onyx2 systems. Opening of the XIO I/O panels by anyone other than a trained and qualified service person may violate safety agency requirements and regulations.

Streaming tape drives such as the DLT drive require sustained data throughput from the system and host SCSI bus. To guarantee SCSI bus throughput for sustaining streaming operation of the drive, configure the DLT as the only device on an individual SCSI bus. Performance can be adversely affected when the DLT drive shares the bus with other devices. Sharing the bus with low-utilization devices such as a CD-ROM drive or a 4-mm DAT or 8-mm tape unit can allow acceptable performance.

Chapter 2

Installing an Internally-Mounted DLT Drive

This chapter tells you how to configure and install your internally mounted model 7000 or 2000XT DLT drive in a rack-mounted or standalone Origin Vault mass storage system. The DLT drive used with Origin2000 and Onyx^2 rack and deskside products installs only in an Origin Vault's 5.25-inch option bay. The Origin Vault may be in the rack or ordered as an optional stand-alone deskside drive expansion tower. The Origin200 system's 5.25-inch option bay is the same as the Origin Vault's.

This chapter includes instructions on

If you need help with basic troubleshooting or maintenance procedures, go to Chapter 5, "DLT Drive Operation and Troubleshooting." To set up your system's DLT drive as a network resource, refer to *IRIX Admin: Peripheral Devices* and the IRIX NetWorker guides (*IRIX NetWorker Installation Guide*, *IRIX NetWorker Administrator's Guide,* and the *NetWorker for IRIX User's Guide*).

Checking Your Shipment

The sled-mounted DLT drive is shipped in a single box. Inside, you should find the DLT drive (already mounted to the Origin Vault carrier adapter shell), a data cartridge, a cleaning cartridge, a CD, and this guide. Note that the Origin200 uses the same carrier shell as the Origin Vault.

After you unpack your DLT drive and its parts, make sure you have all the pieces shown in Figure 2-2. The power and SCSI cables at the rear of the unit may already be attached, but you should visually confirm this before installing the unit.

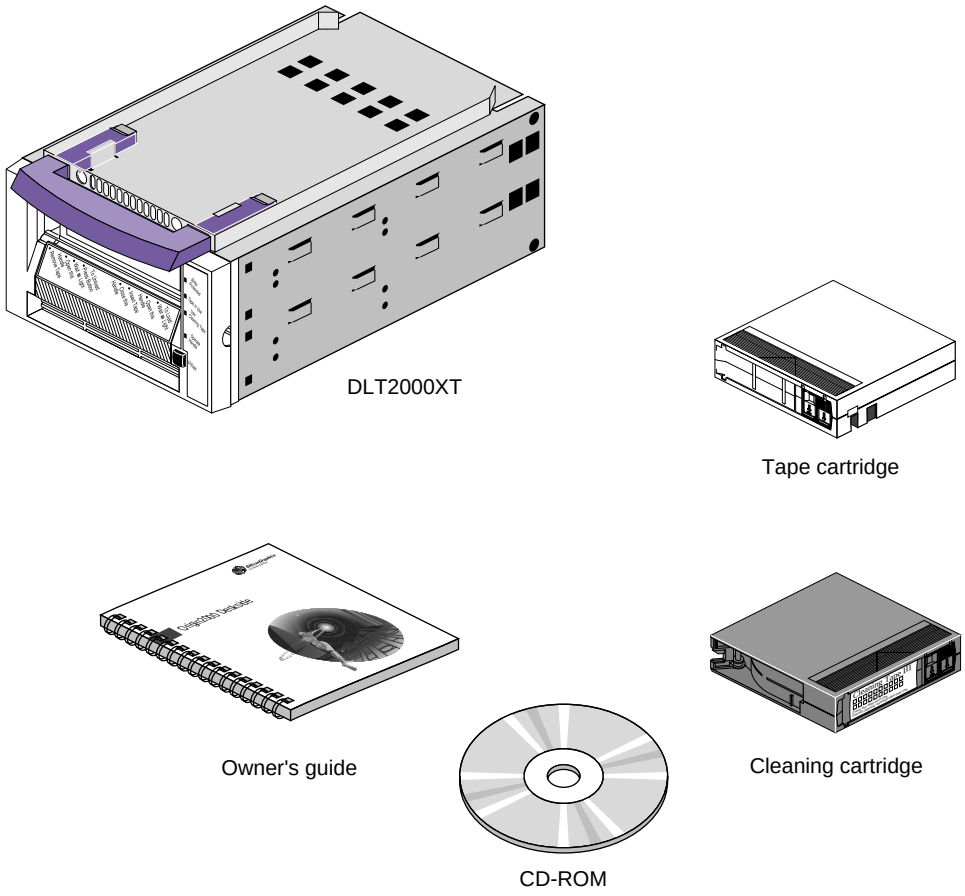


Figure 2-1 Internal-Mount DLT 2000XT Drive Kit Parts

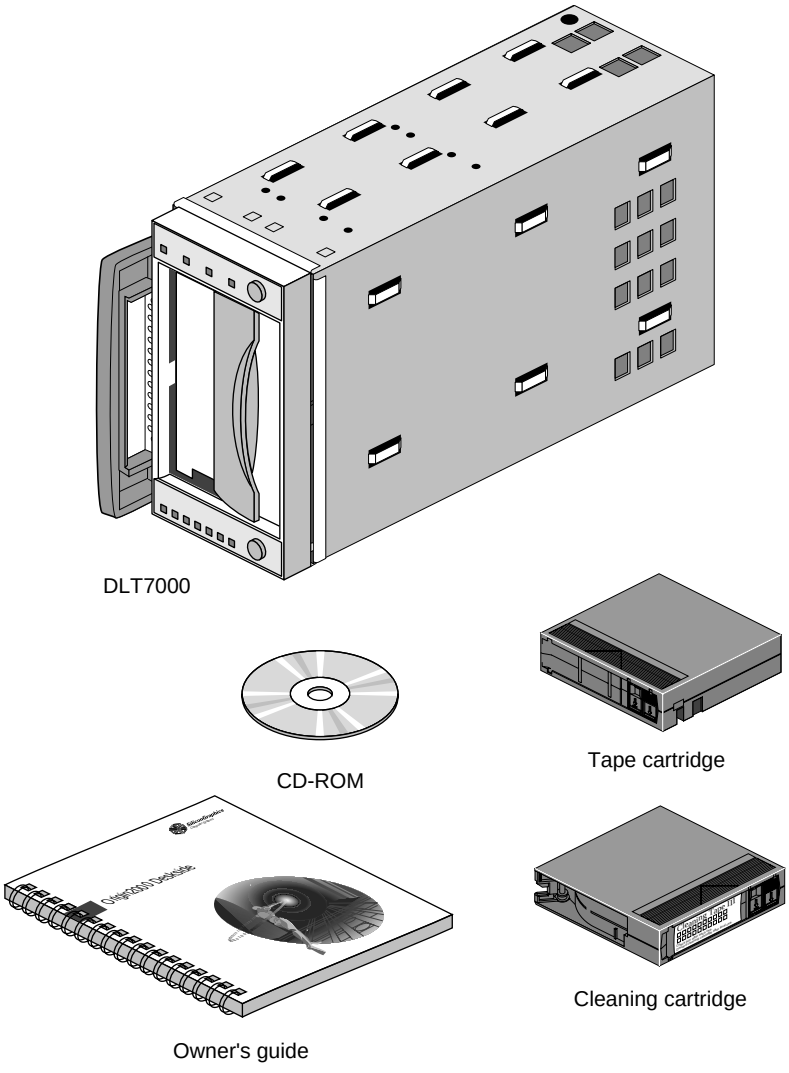


Figure 2-2 Internal-Mount DLT7000 Drive Kit Parts

Checking and Setting the Drive's SCSI ID

Each internally mounted DLT drive is assigned a default SCSI ID of 6 at the factory. If you install a DLT drive on a SCSI bus that supports other devices, use *hinv* to determine if any of them are using ID 6. If so, reconfigure either the DLT or the other drive to a different SCSI address (1-7).

Caution: Improper SCSI implementation causes degraded system performance, a system crash, possible data loss, or all three. Never set the drive to SCSI ID 0; this ID is reserved specifically for the host SCSI controller circuitry. Never set the ID to a number higher than 7.

If you need to remove the DLT drive from its carrier to reset the SCSI ID, obtain a #2 Phillips screwdriver and use the following steps:

1. Remove the two screws on the top and the two screws on the bottom of the carrier, as shown in Figure 2-3. Note the screw hole locations for replacement.
2. Gently slide the DLT drive forward approximately 2.5 inches (5 cm), until you can just access the SCSI ID jumper plug (see Figure 2-4).
3. Use the information on the following pages to set the SCSI ID to the desired number.
4. After setting or confirming the desired ID, reverse the process in step 1.

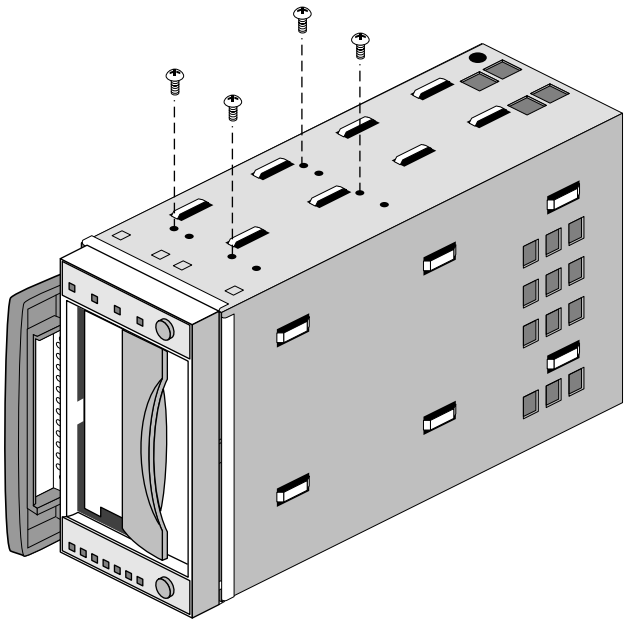


Figure 2-3 Removing the Screws from a Peripheral Carrier

On the left side (near the front) of each internally mounted DLT drive is a 10-pin jumper plug that controls the SCSI ID of the DLT drive.

There are two jumper plugs; the SCSI jumpers install into the one that is nearest the back of the unit. See Figure 2-4 to identify the location of the jumper plugs. Do not place jumpers on any other plugs on the drive.

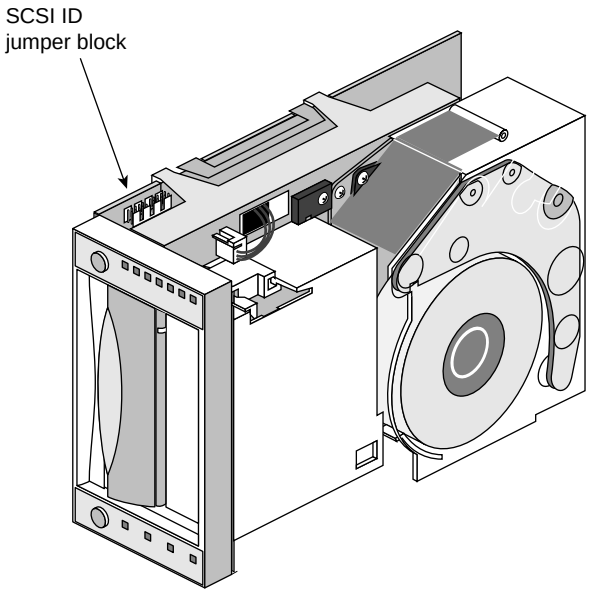


Figure 2-4 SCSI ID Selection Connectors

The SCSI ID selection jumpers are closest to the rear of the drive. Figure 2-5 shows what the pins on the SCSI ID connector represent.

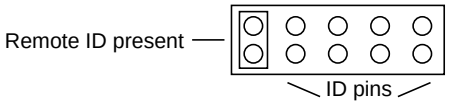


Figure 2-5 Sled-Mounted Drive SCSI ID Connector Pins

Note: A jumper must always be placed on the Remote ID Present position for the host to recognize any ID selection on this connector.

Figure 2-6 shows jumpering for SCSI IDs.

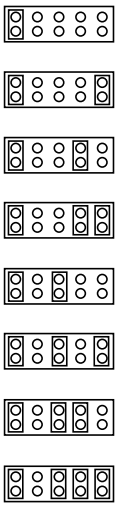


Figure 2-6 Setting the SCSI ID on the Internal-Mount DLT Drive

Note: Never set the drive to SCSI ID zero; that ID is reserved specifically for the host SCSI controller.

As a general rule, hard disk drives are usually numbered up from 1, and removable media drives numbered down from 7.

Caution: Use proper handling and storage procedures to minimize the loss of data and damage to equipment. Be sure to use standard precautions against electrostatic discharge when removing, storing, transporting, or replacing a DLT drive.

The following sections provide specific information on how to install the Origin Vault or Origin200 internally-mounted DLT drive.

Note: You need a #2 Phillips-head screwdriver to install the DLT drive. Follow these guidelines:

- The Origin Vault or Origin200 must be shut down and powered off before you install or remove a DLT drive.
- For best system performance, use a dedicated SCSI bus for each DLT drive.
- Installing more than two DLT drive drives on the same SCSI bus can adversely affect performance.

Installation Preparation

The 5.25-inch DLT drives are housed in a peripheral carrier in the vault or Origin200 host system. These installation procedures require a #2 Phillips screwdriver.

Each internally mounted DLT ships with the Origin Vault peripheral carrier already attached.

Remove any existing 5.25-inch drive bay carrier by following these steps:

1. Use a #2 Phillips screwdriver to unscrew the two screws that secure the front of the peripheral carrier to the Origin Vault or Origin200 chassis, as shown in Figure 2-7. Reserve the screws.
2. Grasp the handle of the peripheral carrier; the handle slides out about an inch.
3. Pull the carrier out of the bay, supporting it with your free hand (see Figure 2-7).

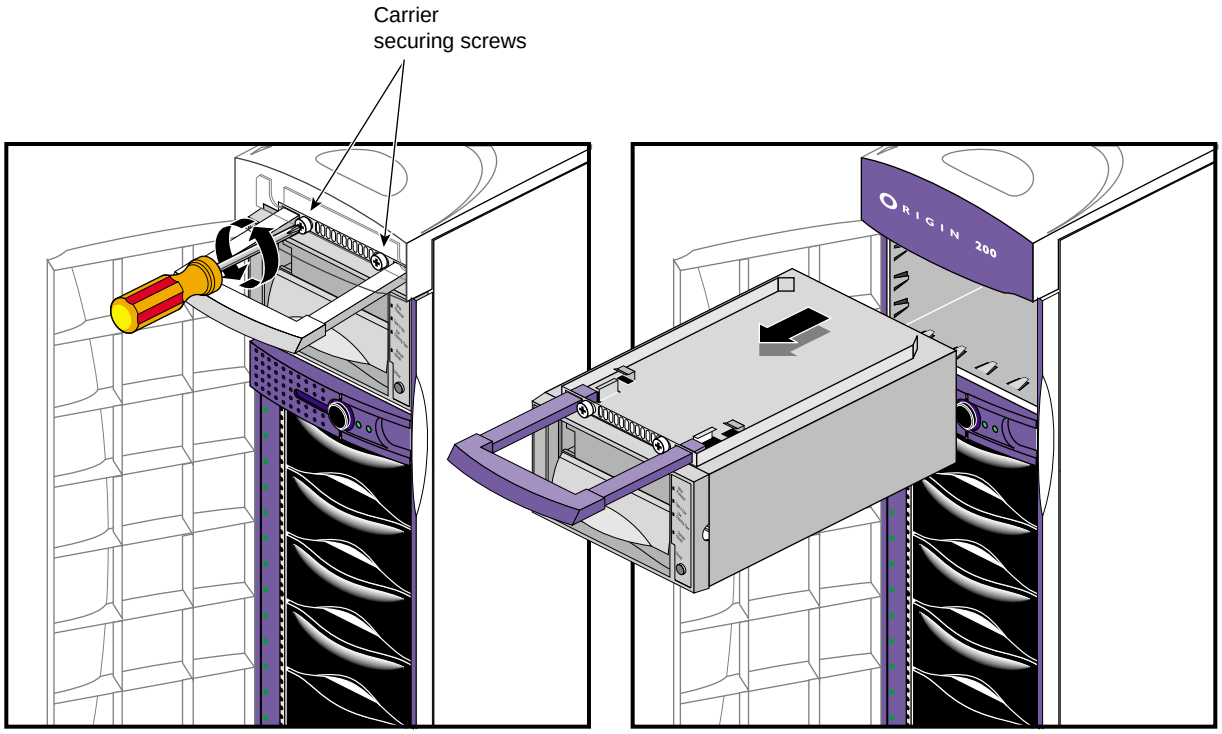


Figure 2-7 Removing an Existing Peripheral Carrier

Retain the original drive carrier and cover plates if there is a possibility that you will need to install half-height drives later. The blanking plates snap into and out of place with tabs at the top and bottom (as in Figure 2-8).

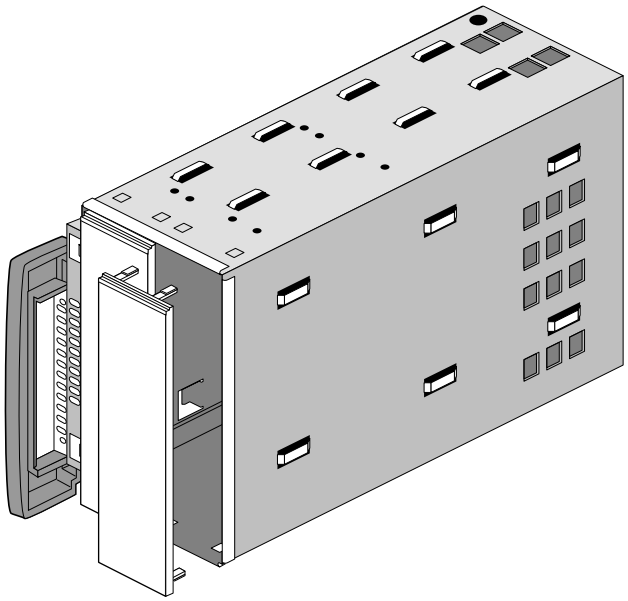


Figure 2-8 Removing a Peripheral Carrier Blanking Plate

Installing the System's DLT Drive

Follow these instructions to install the new DLT drive:

1. Center the DLT and carrier in the 5.25-inch drive bay. The pull-out handle should be on the left for rackmount vaults and on the top for deskside tower models.
2. Slide the DLT and carrier assembly into the bay until the SCSI and power connectors are fully engaged (see Figure 2-9).

   Note: Make sure the peripheral carrier is flush with the front of the Origin200 system or Origin Vault. The connectors on the rear of the peripheral carrier must fully mate with the connectors at the rear of the 5.25-inch drive bay.
3. Use the #2 Phillips screwdriver to tighten the two screws that hold the carrier to the enclosure, then slide the handle all the way in (see Figure 2-10).

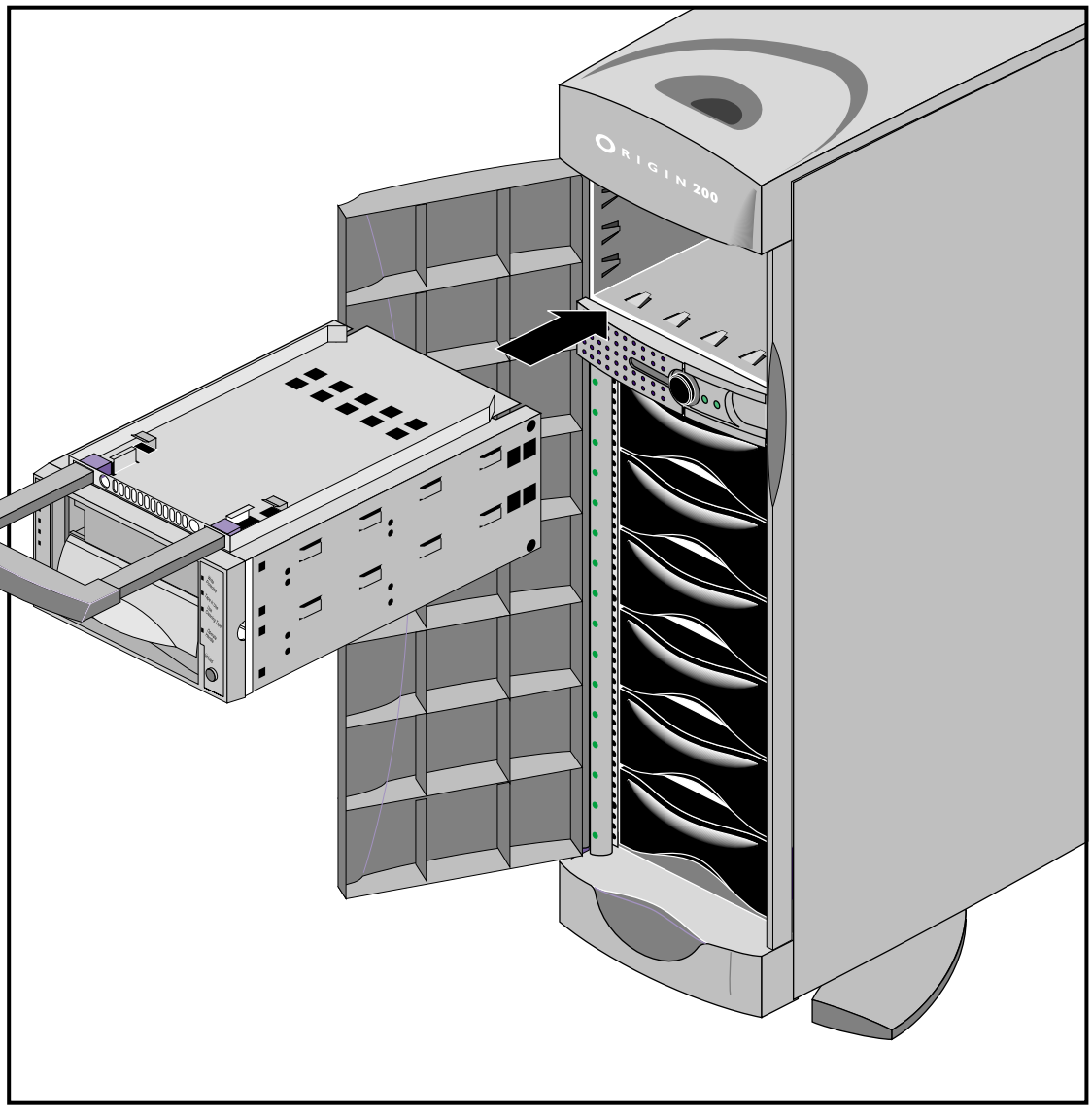


Figure 2-9 Installing the Peripheral Carrier and DLT Drive

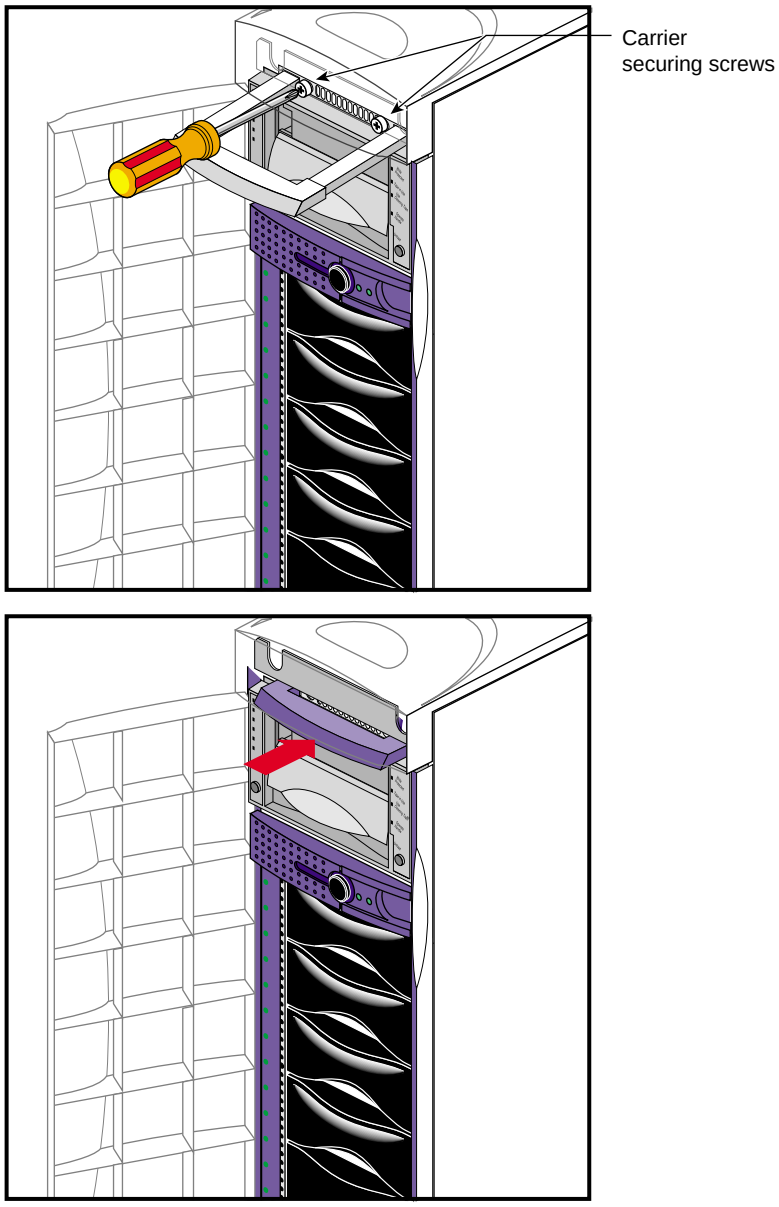


Figure 2-10 Securing the Carrier and DLT Assembly

Configuring the Host System to Recognize the DLT Drive

Depending on how many sled-mounted DLT drives you installed on the system, some configuration steps may be necessary. The *hinv* command can confirm if your system recognizes the new sled-mounted DLT drive(s). Chapter 5 provides sample *hinv* listings from DLT units.

If you installed only a DLT drive, it should be ready to use with your deskside or rackmount system. For information on backing up and restoring data using the new tape drive, see the *Personal System Administration Guide*.

Additional information is available in *IRIX Admin: Peripheral Devices* and the IRIX NetWorker guides.

Installing SCSI Patches

If your DLT option shipped as a field upgrade, you may need to install software "patches" from the product release CD. Once you have installed the DLT drive, load the CD supplied with the tape drive. Check the information in the release notes to determine which patches to install for your system; install the patch(es) with the *Inst* utility, (see the *IRIX Admin: Software Installation and Licensing* manual).

Alternately, you can use the graphical user interface called Software Manager, (documented in the *Personal System Administration Guide*).

Chapter 3

Cabling for the DLT Drive Box

The internally mounted DLT drive used with Origin2000 products always mounts in the rackmount or deskside (tower) Origin Vault drive enclosure. In Origin200 products, the DLT drive mounts in the removable media bay. This chapter tells you how to cable your deskside or rackmount Origin Vault after the DLT drive is installed. It includes instructions on

To set up your system's DLT drive as a network resource, refer to *IRIX Admin: Peripheral Devices* and the IRIX NetWorker guides (*IRIX NetWorker Administrator's Guide* and *NetWorker for IRIX User's Guide*). If you need help with basic troubleshooting or maintenance procedures, go to Chapter 5, "DLT Drive Operation and Troubleshooting."

Connecting the Drive to the Host System

The Origin Vault drive enclosure ships with two SCSI cables:

- The first supports the 3.5-inch hard disk drive backplane and any installed drives.
- The second supports the 5.25-inch full-height removable media bay.

The DLT drive kit is shipped with the presumption that the original cable is available and can be connected to a single-ended SCSI connector.

Note: If there is no cable available for connecting the 5.25-inch bay, you can obtain one from Silicon Graphics. North American customers can call 1-800-800-7441. International customers should contact their local Silicon Graphics support office.

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

- For rackmount applications, the host to which you are cabling the Origin Vault enclosure should be in the same rack as the DLT drive.
- Make sure the SCSI channel from the host system is single-ended.
- Don't restart the vault's power until all the cables are in place.

Caution: If you connect a differential SCSI cable to a single-ended expansion option (such as the internal-mount DLT), the entire differential bus will shut down. If you connect a single-ended SCSI cable to a differential expansion option, none of the drives on the bus will work.

By default, the Origin2000 host system SCSI connector on the BaseIO board is single ended. Ultra SCSI XIO board output channels 1, 2, and 3 are always differential; channel 0 on the SCSI XIO board is auto-sensing to work with either differential or single-ended SCSI devices.

Rackmount Cabling

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

Figure 3-1 shows the SCSI connectors on the rackmounted enclosure rear panel.

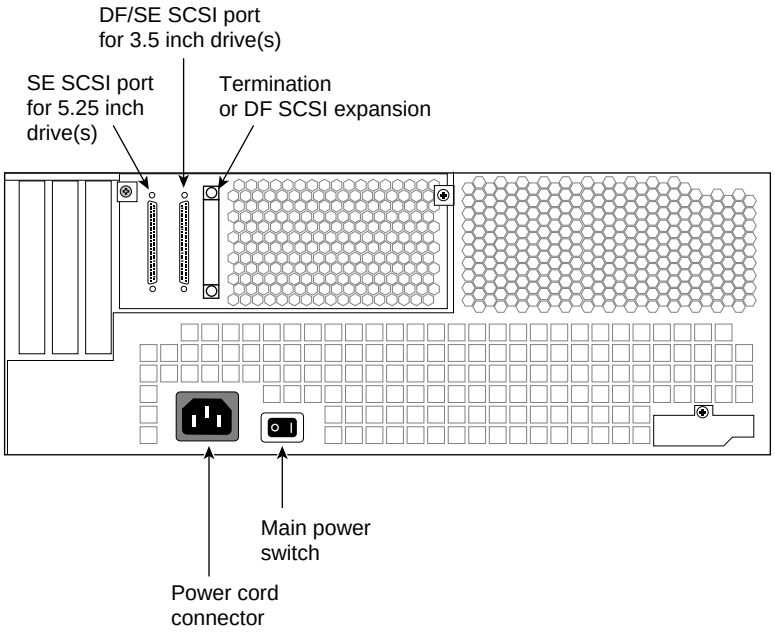


Figure 3-1 Origin Vault Rackmounted Enclosure Rear View

If the vault does not have its power and SCSI cables connected, follow these steps:

1. Connect the Origin Vault power cord to the rack's power distribution unit (PDU); see the example in Figure 3-2.
2. Cable the SCSI connection to the SCSI port on the module's BaseIO board; you can also cable it to a single-ended SCSI port on an option board, such as channel 0 on the optional Ultra SCSI XIO board or (PCI option PCI-SCSI-Q-SE-1P).

If the Origin Vault enclosure is interfacing with the Ultra SCSI option board, you cable the Origin Vault SCSI port to SCSI connector 0 on the Y cable supplied with the XIO Ultra SCSI board option.

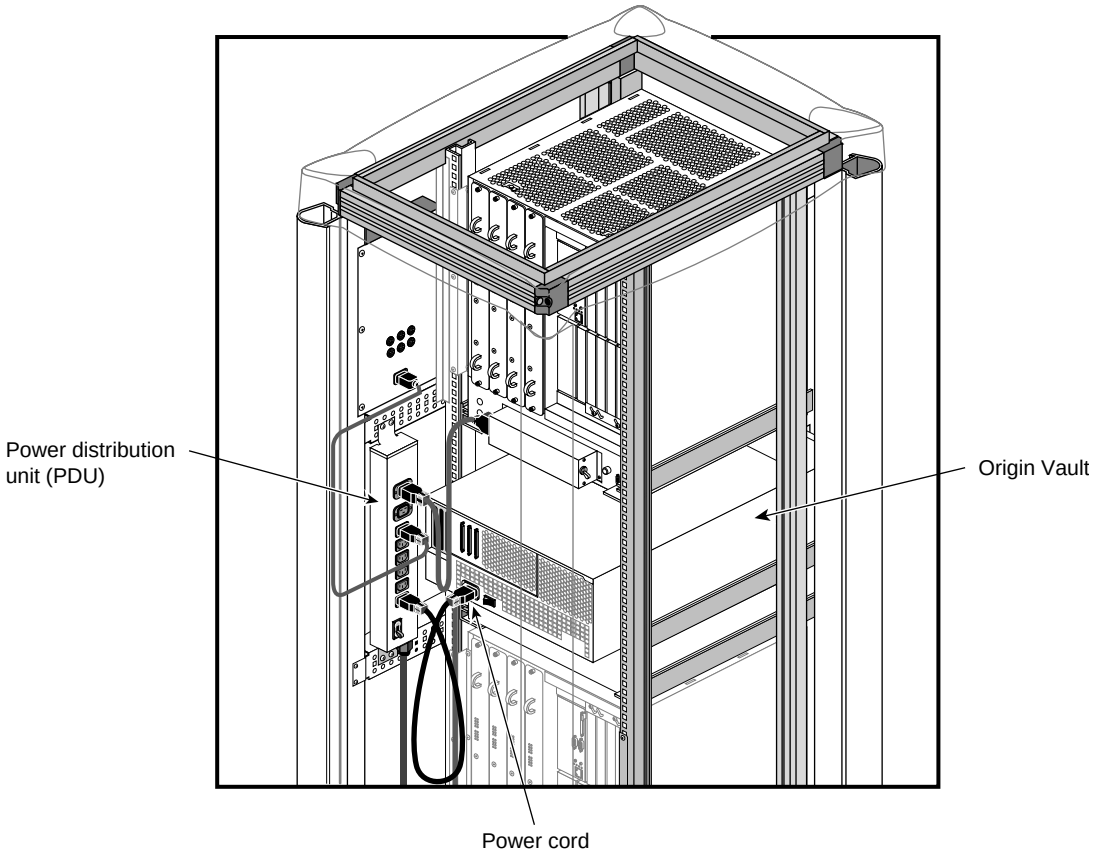


Figure 3-2 Connecting the Rackmount Power Cable

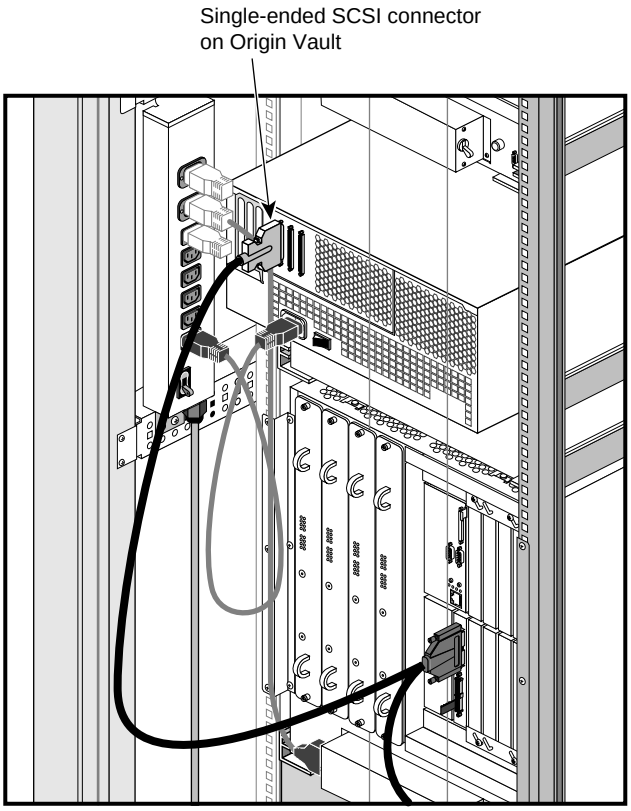


Figure 3-3 Connecting the Rackmount SCSI Cable to an Origin2000 Host

Figure 3-4 shows cabling to a PCI option board (PCI-SCSI-Q-SE-1P) in an Origin200 deskside tower.

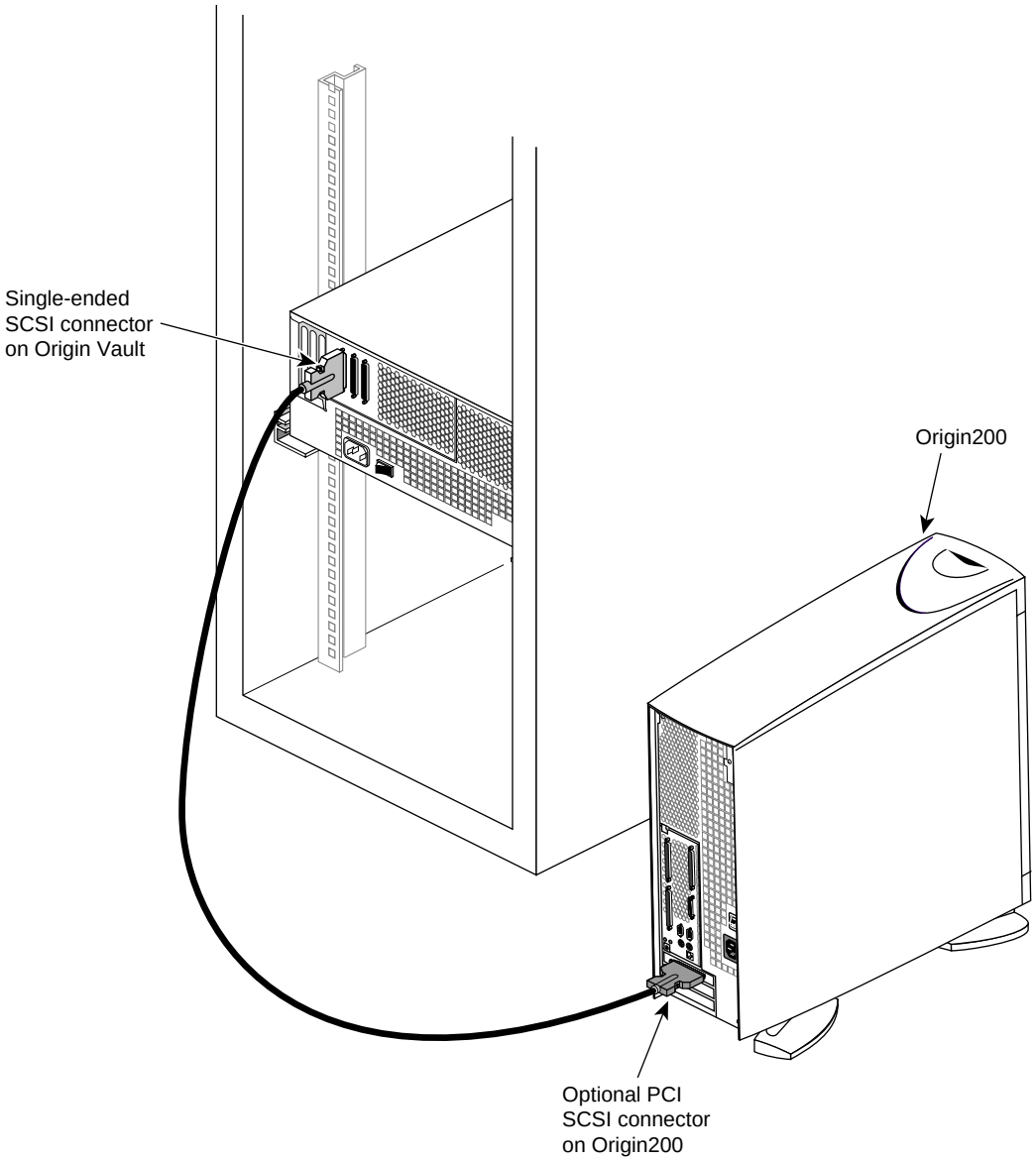


Figure 3-4 Connecting Rackmount Origin Vault to an Origin200 Host

Cabling an Origin Vault Standalone Tower

To cable the standalone tower, follow these steps:

1. Confirm the power cable and SCSI cable(s) included with the Origin Vault are plugged in properly.
2. Locate the 5.25-inch drive SCSI connector on the tower (see Figure 3-5). You must have a SCSI connection to the lower (5.25-inch drive) SCSI port from the host system.

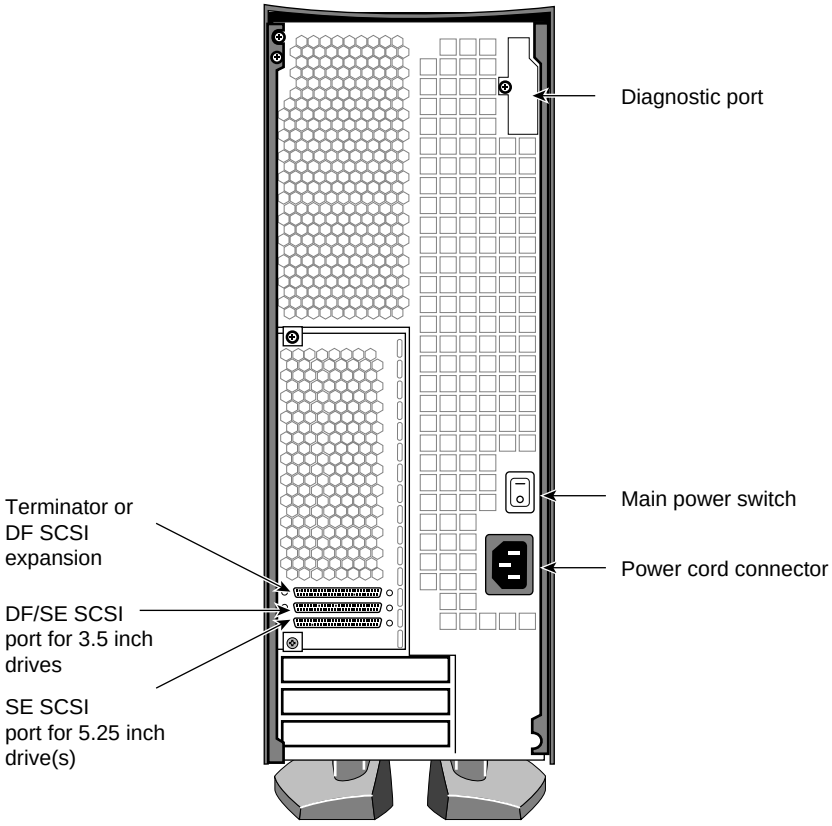


Figure 3-5 Origin Vault Standalone Tower Rear View

Caution: Make sure the SCSI connector on the host system matches the type (single ended) needed for the DLT drive. If you cable a differential SCSI connector to a single-ended expansion option, the entire differential bus shuts down.

By default, the Origin2000 or Onyx2 host system SCSI connector (on the BaseIO) is always single-ended. The optional XIO Ultra SCSI board's channels 1, 2, and 3 are differential; channel 0 auto-selects for differential or single-ended devices.

3. Cable the SCSI connection by plugging the 1-meter SCSI cable into the Origin Vault's 5.25-inch drive bay controller port. You can also order and use the optional 2-meter cable (P/N 018-0546-401), marketing code X-S-2M.
4. Attach the other end of the SCSI cable to the host system's single-ended SCSI connector (see Figure 3-6 for an example). You may also make the connection to channel 0 on the Ultra SCSI XIO board or PCI option board (PCI-SCSI-Q-SE-1P).

   Note: No additional SCSI devices should be daisy-chained with a vault-mounted DLT drive, or performance can be adversely affected.
5. Power on the host system and its console or monitor.

Caution: Never connect the DLT drive to a host system with any cable combination that exceeds 19.6 feet (6 m), including any internal cable length. Doing so may result in SCSI bus errors or data loss.

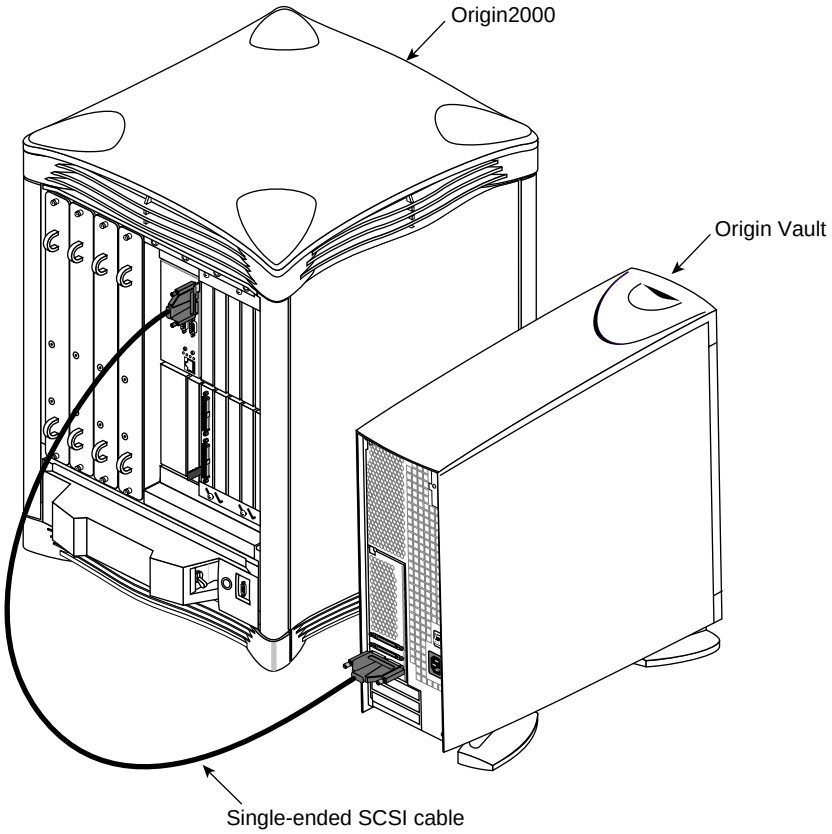


Figure 3-6 Origin Vault and Origin2000 Host

Using the Power-On Self-Test

The power-on self-test (POST) starts automatically at power-on. Observe the LEDs on the front panel, making sure that they light in the following order:

1. All LEDs on the right front panel light sequentially from top to bottom as the DLT's POST begins. The LEDs remain on for a few seconds.
2. All LEDs on the left front panel light simultaneously for about three seconds, and then turn off.
3. The green Operate Handle, the orange Write Protected, and the yellow Use Cleaning Tape LEDs turn off. The yellow Tape in Use LED blinks as the tape drive initializes.
4. After initialization, if no tape cartridge is loaded, the yellow Tape in Use LED turns off, the green Operate Handle LED turns on, the handle unlatches, and the beeper sounds.

Figure 3-7 shows the LEDs on the DLT 2000XT and DLT 7000 front panel. Note that LED and control button placement on the 7000 is different from that on the 2000XT.

Note: The density selection switch on the front of the DLT7000 is not used and is completely nonfunctional.

The power-on self-test takes about 15 seconds. However, the media might require more time to become ready for use.

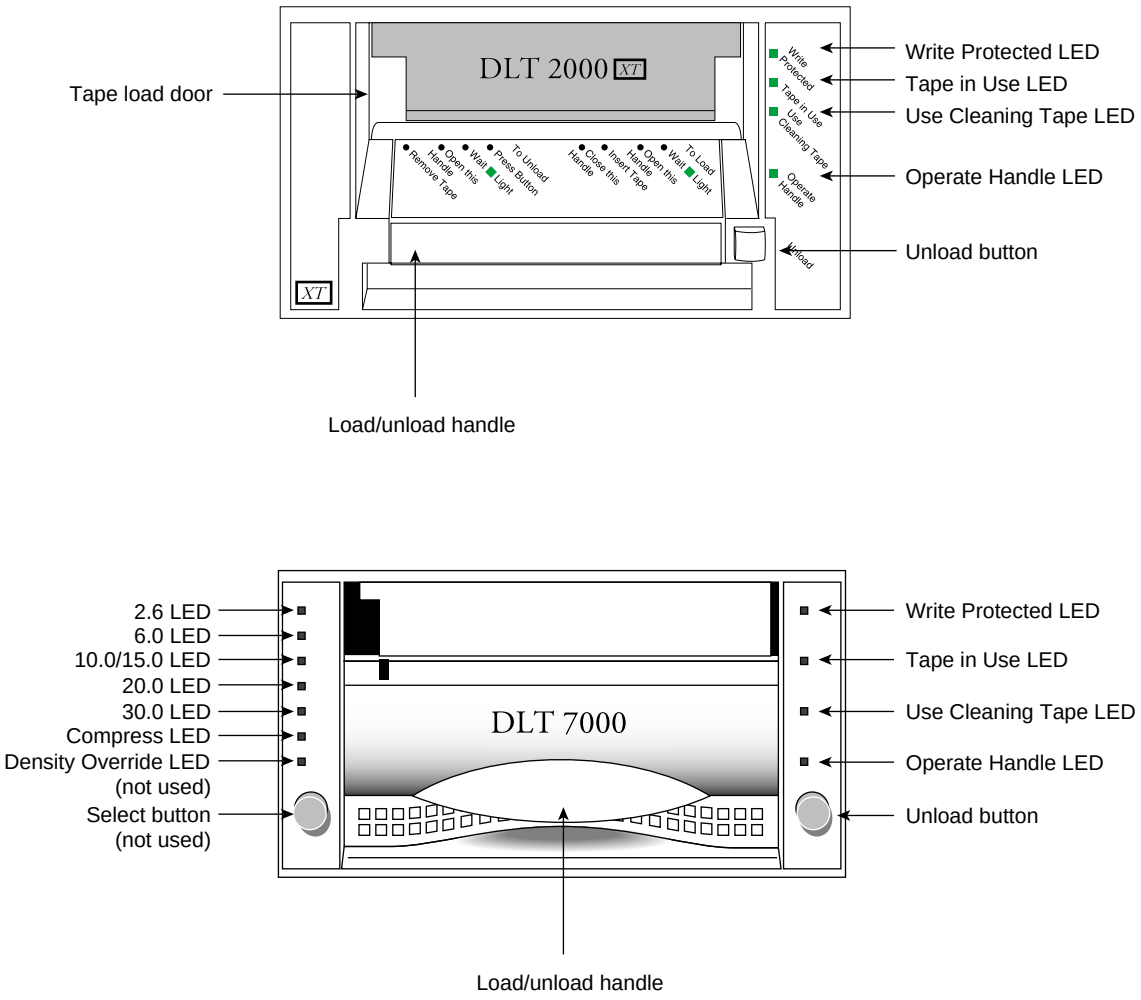


Figure 3-7 DLT 2000XT and 7000 Front Panels

After initialization, the DLT drive is in one of the states shown in Table 3-1.

Table 3-1 DLT Drive States

Drive State	Indicator Displays and Actions
No cartridge present	Yellow Tape in Use LED turns off; green Operate Handle LED turns on. Handle unlatches; drive beeps momentarily. You can raise the handle and insert a cartridge.
Cartridge present, handle down	The drive loads the cartridge. The drive is ready for use.
Cartridge present, handle up (not recommended); no cartridge present, handle could be up (not recommended)	Yellow Tape in Use LED turns off; green Operate Handle LED flashes. When you lower the handle, the cartridge loads.
Drive detects error condition	All right panel LEDs blink repeatedly. Try to unload the cartridge and reinitialize the drive by pressing the Unload button, or power-cycle the drive (turn the drive power off and then on again). The right panel LEDs stop blinking and the drive attempts to reinitialize. If the self-test is successful, the LEDs remain on, and then turn off.

If the power-on self test fails, or if you want to run optional system tests, see Chapter 5.

Configuring the Host System to Recognize the DLT Drive

Depending on how many DLT drives you installed, some configuration steps may be necessary. The *hinv* command can confirm if your system recognizes the new DLT drive(s) installed. Chapter 5 provides a sample *hinv* listing.

If you installed only a DLT drive, it should be ready to use with your system. For information on backing up and restoring data using the new tape drive, see the IRIX NetWorker guides (*IRIX NetWorker Administrator's Guide* and *NetWorker for IRIX User's Guide*).

Installing the SCSI Patch

Once you have installed the DLT drive in the chassis, load the CD supplied with the tape drive. Follow information in the release notes for which patches to install for your system; install the patch(es) with the Inst utility.

Powering Off Your DLT Drive

To power off the tape drive, follow these steps:

Caution: Do not shut down the Origin Vault containing the DLT drive until you are certain that nobody is logged in and accessing files stored on the drive, or unless there is an emergency and you must turn off the system immediately.

1. Always shut down the host system before powering off the DLT drive. This order is important to prevent potential data loss.
2. Remove the tape cartridge from the DLT drive and turn off the power to the Origin Vault (as applicable).
3. 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.
4. Press the power switch located at the rear of the enclosure (the master power switch) to shut down all power to the system.

   Facing the back of the chassis, press the “O” side of the rocker switch (see Figure 3-8). The power turns off and the drive’s front LEDs go dark.

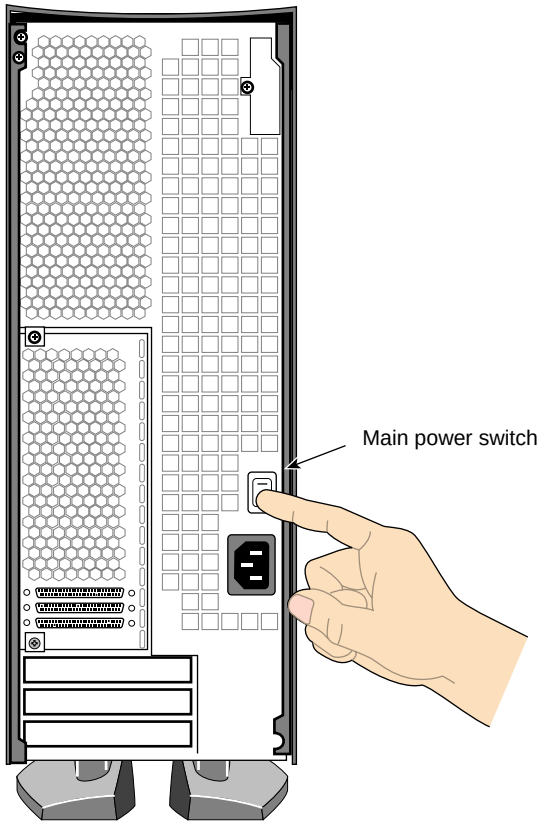


Figure 3-8 Main Power Switch on the Origin Vault

Chapter 4

Installing a Desktop 7000 or 2000XT DLT Drive

This chapter tells you how to set up your desktop DLT drive. It includes information on the following topics:

To set your system's DLT drive up as a network resource, refer to *IRIX Admin: Peripheral Devices* and the IRIX NetWorker guides (*IRIX NetWorker Administrator's Guide* and *NetWorker for IRIX User's Guide*). If you need help with basic troubleshooting or maintenance procedures, go to Chapter 5.

Desktop 7000 and 2000XT Overview and Differences

If you have read the information in Chapter 1, "Introducing the DLT7000 and 2000XT Drives," you know the differences in storage capacity and transfer rates between the two models of drive. You should read and understand this information before installing and using your desktop DLT drive.

The desktop 7000 and 2000XT drives install, look, and operate in a very similar manner. However, there are operational differences between the two models that require understanding and careful attention during the installation process.

The desktop 7000

- uses differential SCSI and *must* be connected to a differential SCSI controller
- uses a SCSI ID number between 1 and 15
- can daisy-chain *only* to one additional differential desktop DLT 7000 (no other daisy-chained SCSI devices are supported)

The desktop 2000XT

- is single-ended and *must* be connected to a single-ended SCSI controller
- uses a SCSI ID number between 1 and 7
- never daisy chains to another desktop DLT drive (or any other SCSI device)

Always verify the model of your desktop drive before installation.

Selecting a Site

The desktop DLT drive is designed to sit on your desk, on top of your deskside system, on a table, or on another flat and level surface. It is *not* designed to be placed on the floor.

Select a site using these guidelines:

- For North American applications, place the DLT drive so that its power cord can reach a 110 VAC, three-pronged (grounded) electrical outlet.
- For international applications, place the DLT drive so that its power cord can reach an approved electrical outlet.

  Note: The desktop DLT drive has an autoranging power supply that works with 110 or 220 VAC. No operator voltage switch selection is required.
- Place the desktop DLT so that it is directly on top of, or next to, the host system. The SCSI cable measures 12 feet (3.7 m). Always use the SCSI cable shipped with your DLT drive for proper connection.
- Always allow at least 3 inches (7.6 cm) of clearance at the back of the desktop DLT drive to provide proper ventilation space and cable clearance. Provide for easy access to the front and the back of the unit.
- Always place the single-ended active terminator on the top SCSI connector of a desktop 2000XT DLT drive or SCSI errors may result.

  Caution: Never connect the desktop DLT2000XT drive to a host system with any cable combination that exceeds 19.6 feet (6 m), including any internal cable length. Doing so may result in SCSI bus errors or data loss. Consult your system owner's guide for other specific SCSI bus requirements.
- Do not place the DLT drive in a small, enclosed area, such as a closet, or it may overheat. It is important not to block the vents.
- Do not drape anything, such as a jacket or blanket, over the DLT drive.
- Avoid placing the DLT drive in a dusty or humid location.

Checking Your Shipment

The desktop DLT drive is shipped in a single box. Inside, you should find

- the DLT desktop tape drive
- a 12-foot (3.7-meter), 68-pin SCSI cable
- a patch CD
- one data cartridge and one cleaning cartridge
- this owner's guide
- a set of international labels
- a power cord
- a single-ended SCSI terminator (for DLT2000XT only)
- a differential SCSI terminator (for DLT7000 only)

  Note: The single-ended and differential terminators are not interchangeable.

Any required international power cord or other optional equipment that you ordered is shipped in separate additional boxes.

After you unpack your DLT drive and its parts, make sure you have all the pieces shown in Figure 4-1.

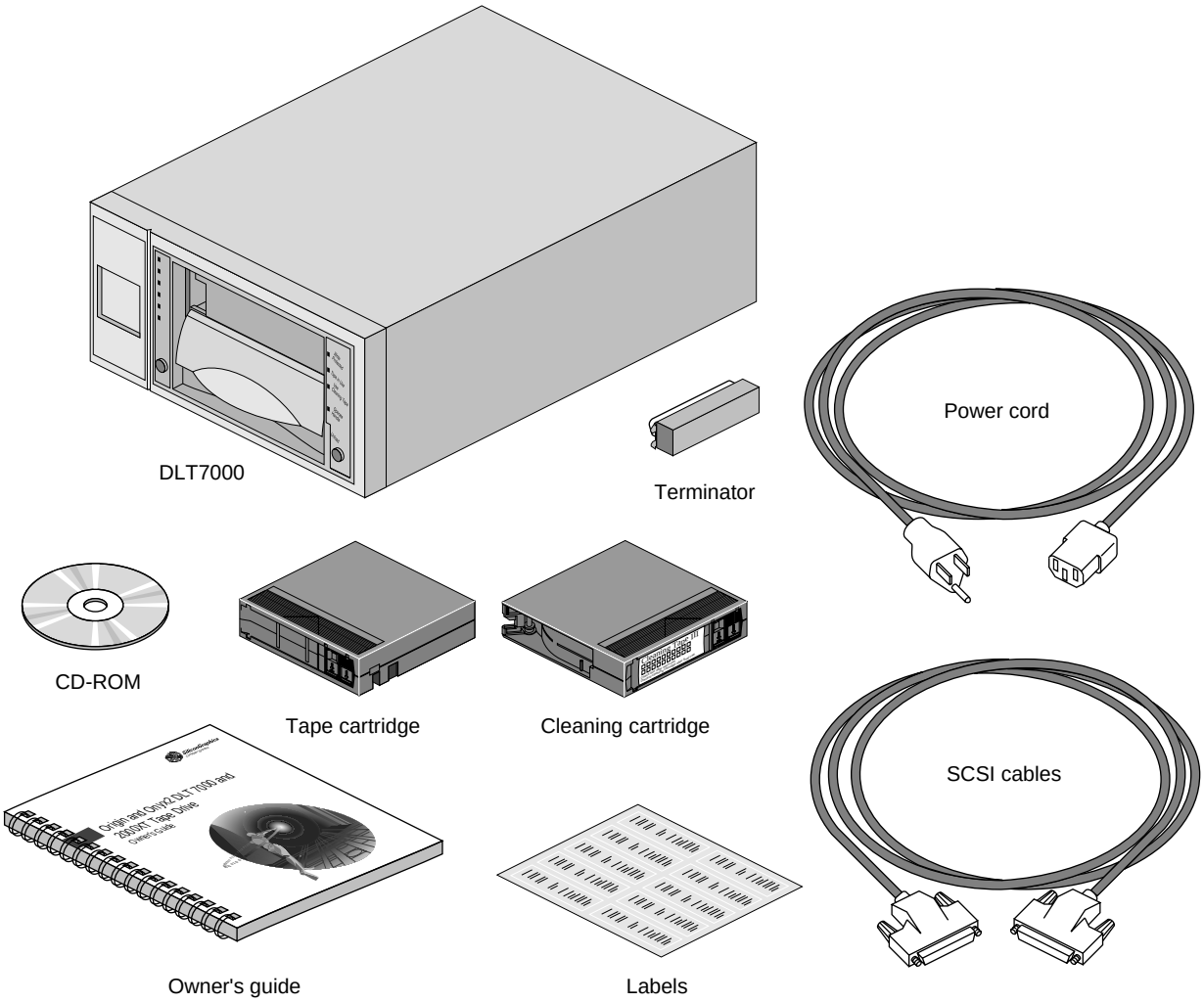


Figure 4-1 Desktop DLT Drive Parts

Checking and Setting the DLT Drive's SCSI ID

Each desktop DLT drive must be properly configured, or SCSI bus errors and possible data loss may result when you bring the desktop DLT drive online. Each desktop DLT drive is assigned a default SCSI ID setting of 6 at the factory. You can leave it configured as it was shipped (providing no other devices on the bus use SCSI ID 6).

On the back of each desktop DLT drive is a SCSI ID switch with two buttons for setting the SCSI ID number. Only the SCSI IDs 1 through 7 can be used on the DLT2000XT. Press the top switch button to increase the number; press the bottom button to decrease the number.

Caution: Never set the drive to SCSI ID 0; that ID is reserved specifically for the host SCSI controller. Improper SCSI ID implementation can cause degraded system performance, a system crash, and possible data loss.

As a general rule, hard disk drives are usually numbered up from 1, and removable media drives numbered down from 7.

Placing the Desktop DLT Drive

After you have selected a site following the guidelines in "Selecting a Site" on page 37, and have completed all the configuration procedures, you are ready to install the desktop DLT drive.

After placing the DLT drive in its intended location, go on to the following sections for SCSI cable and power cord connection information.

You can position the DLT drive

- on a work surface area near the host system
- on top of an Origin2000 or Onyx2 deskside chassis

  Caution: Do not stand the desktop DLT drive on its side and do not place it on the floor.

Connecting the Desktop DLT7000 Drive to the Host

The desktop DLT7000 drive uses a differential SCSI connection only. You should note that it does *not* work with the BaseIO SCSI connector on your Origin or Onyx2 host system. The single-ended BaseIO SCSI connector is shown in Figure 4-3 in the next section “Connecting the Desktop DLT2000XT Drive to the Host” on page 42.

The optional Ultra SCSI XIO board supplies four differential (DF) SCSI connections (see Figure 4-2). You may connect the DLT7000 to any of these connections. The optional differential PCI SCSI board (P/N 9980984) may also be used to control the DLT7000.

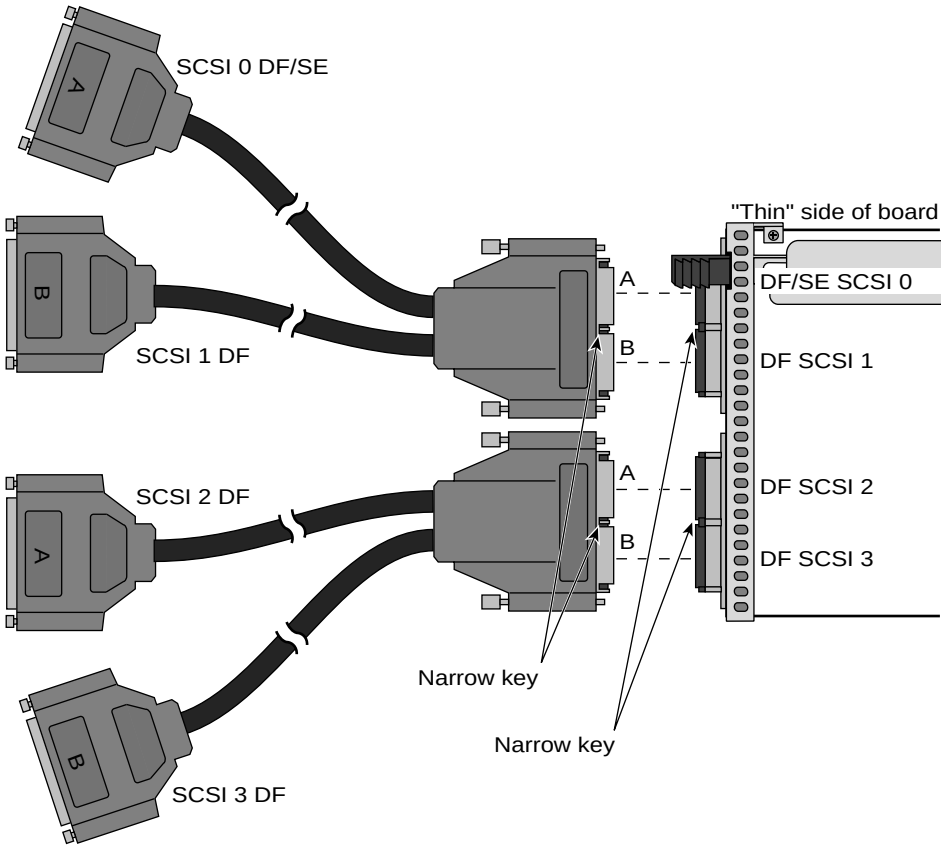


Figure 4-2 Optional Ultra SCSI Cable Connections

To connect your desktop DLT7000 drive to the Origin2000 or Onyx2 host system, follow these steps:

1. Power off the host system.
2. Plug one end of the SCSI cable into port 0 (or the next available port) on the optional Silicon Graphics Ultra SCSI XIO board. Figure 4-2 shows the port 0 cable on the Ultra SCSI board. Alternately, you can connect the DLT7000 drive to a differential Silicon Graphics PCI SCSI option board (P/N 9980984).

   Note: Do not use the host system's BaseIO single-ended SCSI connector.
3. Plug the other end of the SCSI cable into the lower SCSI connector on the back of the desktop DLT drive. Figure 4-4 shows an example.

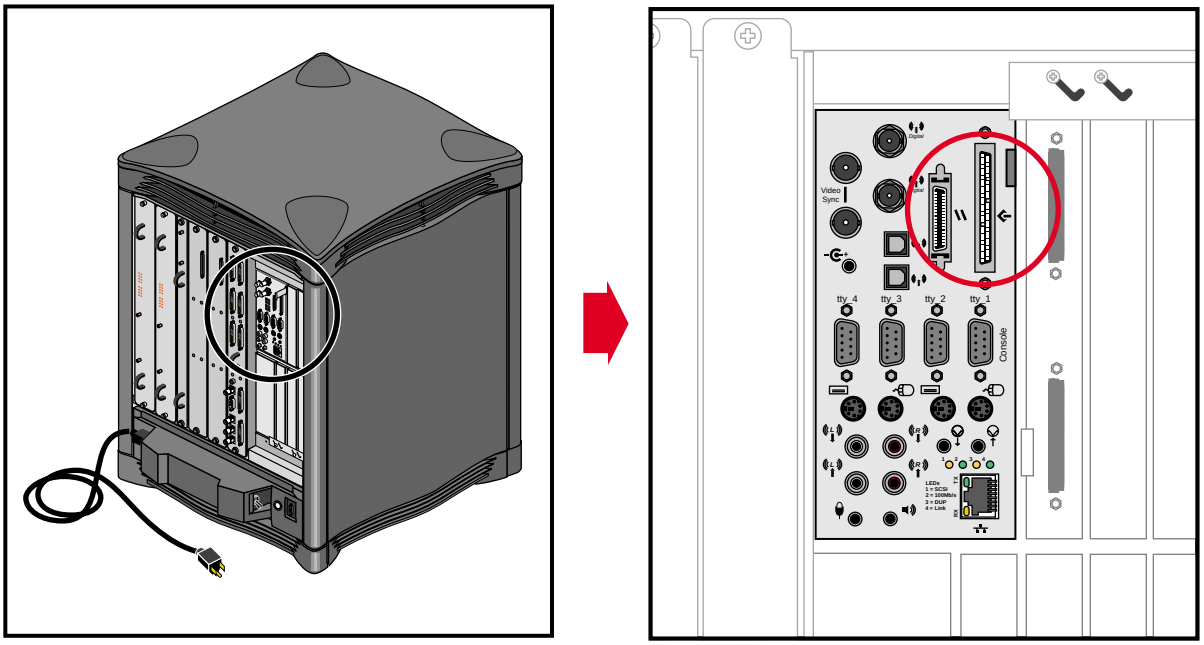
   Always plug the incoming SCSI cable into the lower SCSI connector on the back of the unit. The upper connector should be used for termination or expansion.
4. Terminate the bus by installing the terminator included in the shipment to the top SCSI connector, as shown in Figure 4-4.

Connecting the Desktop DLT2000XT Drive to the Host

To connect your desktop DLT2000XT drive to the Origin2000 or Onyx2 host system, follow these steps:

1. Power off the host system.
2. Plug one end of the SCSI cable into the host's external single-ended SCSI connector on the BaseIO board. Alternately, you can connect the DLT2000XT drive to a single-ended Silicon Graphics PCI SCSI option board (P/N 9980983) or port 0 on the Silicon Graphics Ultra SCSI XIO board. Figure 4-2 shows the port 0 cable on the Ultra SCSI board.

   Note: See Figure 4-3 if you are not sure of the location of the BaseIO single-ended SCSI connector. For additional information, consult the owner's guide for your system or your service representative.
3. Plug the other end of the SCSI cable into the lower SCSI connector on the back of the desktop DLT drive. Figure 4-4 shows an example. Always use the upper SCSI connector for termination.
4. Terminate the bus by installing the terminator included in the shipment to the top SCSI connector, as shown in Figure 4-4.



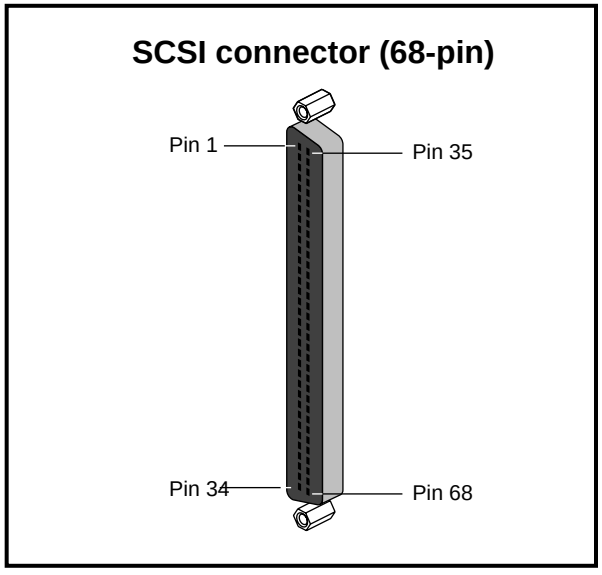


Figure 4-3 Single-Ended (2000XT) SCSI Connection on a Deskside Host System

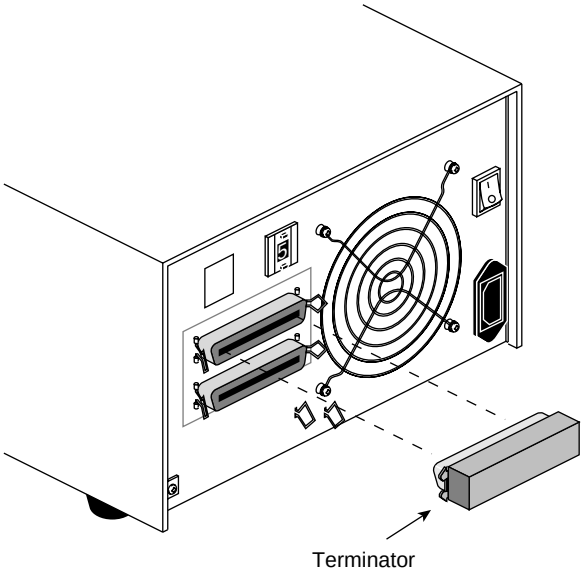


Figure 4-4 Terminating the DLT Desktop Tape Drive

Attaching the Power Cord and Turning On the Desktop DLT Drive

To attach the power cord, follow these steps:

1. Connect the socket end of the cord to the power connector on the back of the desktop DLT drive chassis (see Figure 4-5).
2. Plug the other end into a three-pronged (or other approved type) grounded electrical outlet.

   Note: Always power on the desktop DLT drive before powering on the host system. Always leave the DLT drive powered on while the host system is operational. Failure to follow these procedures can result in SCSI errors on the bus; for more information, see Table 5-4 in Chapter 5.

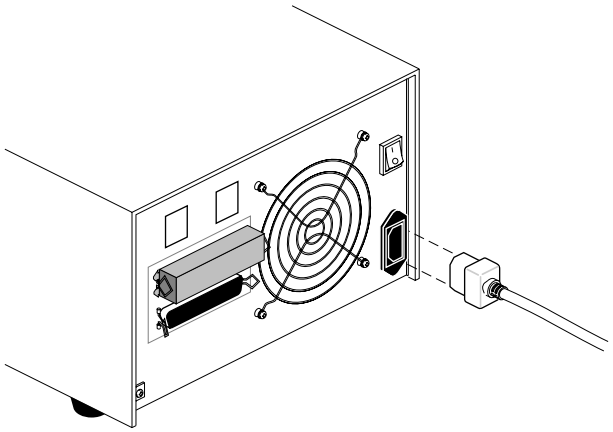


Figure 4-5 Attaching the Power Cord to the Desktop DLT Drive Chassis

3. At the rear of the unit, turn on the DLT drive by pressing the side of the rocker switch with the "|" (see Figure 4-6.)
4. Power on the host system and its console or monitor.

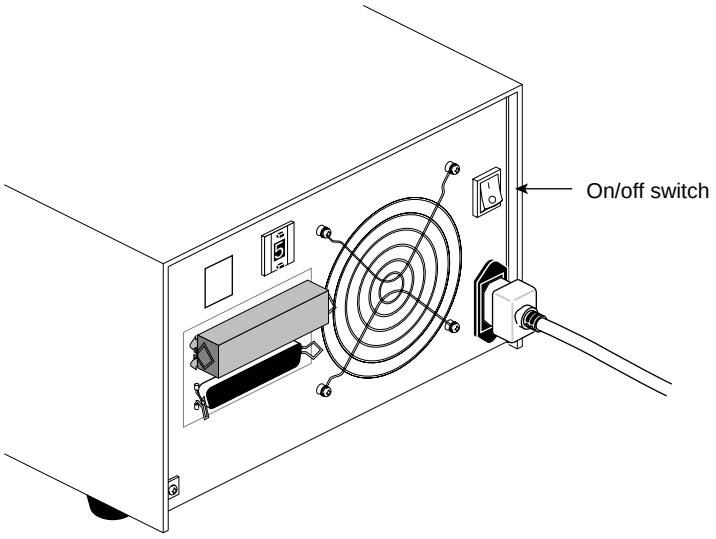


Figure 4-6 Desktop DLT2000XT Power Switch

Using the Power-On Self-Test

The power-on self-test (POST) starts automatically at power-on. Observe the LEDs on the front panel, making sure that they light in the following order:

1. All LEDs on the right front panel light sequentially from top to bottom as the POST begins. The LEDs remain on for a few seconds.
2. All LEDs on the left front panel light simultaneously for about three seconds, and then turn off.
3. The green Operate Handle, the orange Write Protected, and the yellow Use Cleaning Tape LEDs turn off. The yellow Tape in Use LED blinks as the tape drive initializes.
4. After initialization, if no tape cartridge is loaded, the yellow Tape in Use LED turns off, the green Operate Handle LED turns on, the handle unlatches, and the beeper sounds. Figure 4-7 shows the LEDs on the front panel.

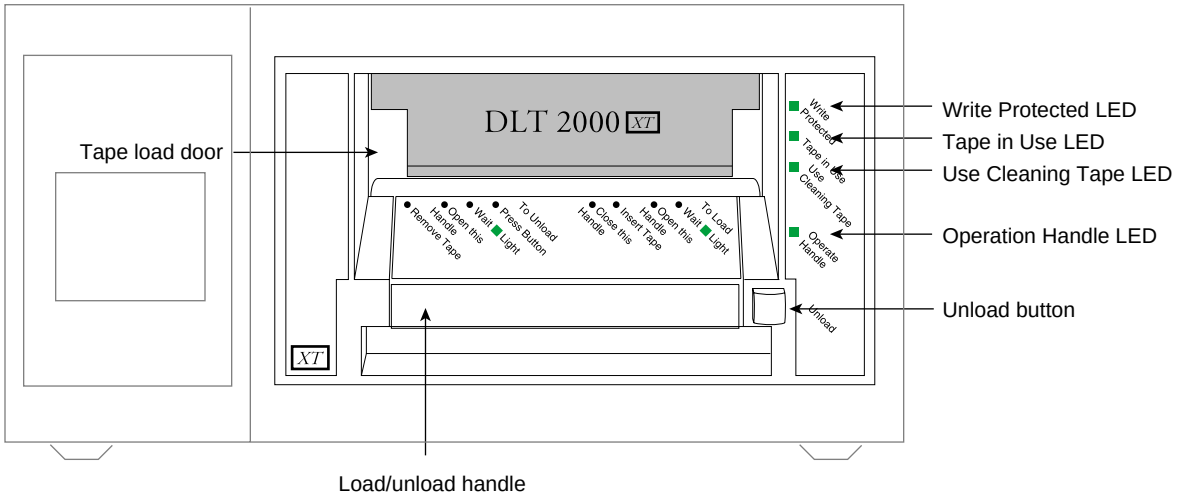


Figure 4-7 DLT2000XT Desktop Front Panel

The power-on self-test takes about 15 seconds. However, the media might require more time to become ready for use.

After initialization, the drive is in one of the states shown in Table 4-1.

Table 4-1 Drive States

Drive State	Indicator Displays and Actions
No cartridge present	Yellow Tape in Use LED turns off; green Operate Handle LED turns on. Handle unlatches; drive beeps momentarily. You can raise the handle and insert a cartridge.
Cartridge present, handle down	The drive loads the cartridge. The drive is ready for use.
Cartridge present, handle up (not recommended); no cartridge present, handle could be up (not recommended)	Yellow Tape in Use LED turns off; green Operate Handle LED flashes. When you lower the handle, the cartridge loads.
Drive detects error condition	All right-panel LEDs blink repeatedly. Try to unload the cartridge and reinitialize the drive by pressing the Unload button, or power-cycle the drive (turn the drive power off and then on again). The right panel LEDs stop blinking and the drive attempts to reinitialize. If the self-test is successful, the LEDs remain on, and then turn off.

If the power-on self test fails, or to run optional system tests, see Chapter 5.

Configuring the Host System to Recognize the Desktop DLT Drive

Depending on how many desktop DLT drives you installed, some configuration steps may be necessary. The *hinv* command can confirm if your system recognizes the new DLT drives installed. Chapter 5 provides a sample *hinv* listing.

If you installed only a DLT drive, it should be ready to use with your system. For information on backing up and restoring data using the new tape drive, see the IRIX NetWorker guides (*IRIX NetWorker Administrator's Guide* and *NetWorker for IRIX User's Guide*).

Installing the SCSI Patch

Once you have installed the DLT drive in the chassis, load the CD supplied with the tape drive. Check the information in the release notes for which patches to install for your system; install the patch(es) using the *Inst* utility.

Powering Off Your Desktop DLT Drive

Caution: Do not shut down the DLT drive until you are certain that nobody is logged in and accessing files stored on the DLT drive, or unless there is an emergency and you must turn off the system immediately.

To power off the tape drive, follow these steps:

1. Always shut down the host system before powering off the desktop DLT drive.
2. Always remove the tape cartridge from the DLT drive before turning off power to the drive.
3. Use only the power switch located at the rear of the desktop DLT drive to shut down the system.

Facing the back of the desktop DLT chassis, press the “O” side of the rocker switch. The power turns off and the desktop DLT drive’s front LEDs go dark.

Chapter 5

DLT Drive Operation and Troubleshooting

This chapter explains

- tape cartridges and compatibility
- drive operation
- cleaning, maintenance, and troubleshooting procedures

Tape Cartridges

This section explains

- tape compatibility
- tape cartridge care
- tape cartridge write protection

Note: To purchase additional data or cleaning tapes for your DLT drive, contact your Silicon Graphics sales or service representative for information.

Tape Compatibility

The DLT7000 drive normally uses the DLTtape IV cartridge. This black plastic cartridge stores up to 35 GB of native (uncompressed) data, or 70 GB of compression mode data. The DLT7000 can also read and write the DLTtape IIIxt cartridge (15 GB native and 30 GB compressed), or the DLTtape III cartridge (10 GB native or 20 GB compressed).

The tape cartridges for the DLT2000XT drive are the white DLTtape IIIxt cartridges. The DLT2000XT drive stores and reads up to 15 GB native and 30 GB compressed data on each tape. Note that the DLT2000XT drive will *not* write more than this amount even if you use a higher capacity cartridge. Never use the DLTtape IV cartridge in a 2000XT drive.

The DLT7000 drive is capable of backward-format compatibility with previous generations of DLT tape cartridges, providing forward and backward data interchange with systems having older drives. For example, a system with a DLT2000 tape drive can interchange data with a system having a DLT7000 drive by using a CompacTape III cartridge.

Tape drives are not forward-compatible with respect to tape cartridges; for example, the DLT2000 tape drive cannot read DLTtape IV or DLTtape IIIxt cartridges.

Tape Cartridge Care

To make tape cartridges last as long as possible, store them in a clean environment. Follow these guidelines for storing and using the tapes:

- Store cartridges in temperatures between 41 and 113˚F (5-45˚C). For longer cartridge life, always store cartridges in their plastic containers in room environment conditions of 65˚F to 80˚F (18˚C to 26˚C).
- Keep tape cartridges out of direct sunlight and away from heat sources.
- Stabilize the tape if it has been exposed to extreme heat or cold by leaving it at operating room temperature for the same period of time (up to 24 hours).
- Store tape cartridges in a dust-free environment with the relative humidity between 20% and 80%. For longer cartridge life, store cartridges at 20% to 60% relative humidity.
- Do not apply labels to the top or bottom of tape cartridges, because incorrectly placed labels can cause cartridge jams. Place labels only in the slide-in slot on the front of the cartridge that is designed to accommodate them. Do not use adhesive tapes on top of the labels.

Observe the following precautions when handling or storing a tape:

- Never place or store cartridges near electromagnetic sources such as terminals, electric motors, or video or X-ray equipment. Data on a tape may be altered or corrupted if it is placed in such an environment.
- Do not leave a cartridge in a vehicle parked in the sun.
- Never handle the cartridge roughly or drop it. You might displace the tape leader, make the cartridge unusable, or damage the DLT drive.
- If you do drop a tape cartridge:
  - Examine the cartridge case for any damage, dents, cracks, etc. Never use a damaged tape cartridge.
  - Shake the cartridge to check for loose or broken internal parts; do not use the tape if it has parts rattling inside.

Tape Cartridge Write Protection

The tape cartridge has a write-protect switch that functions as follows:

- When the write-protect switch is moved to the left, the tape is write-protected and the orange indicator shows.
- When the write-protect switch is moved to the right, the tape is write-enabled and the orange indicator is hidden.

Figure 5-1 shows the write-protect switch and the indicator.

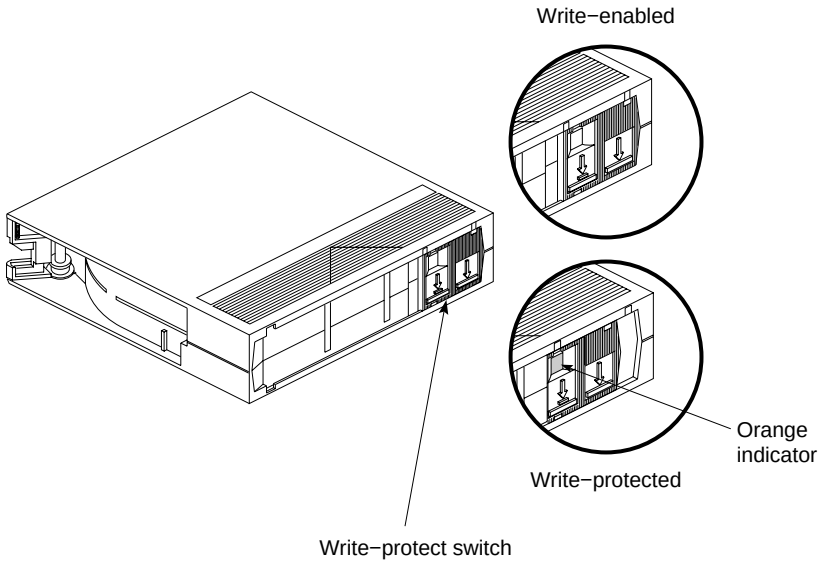


Figure 5-1 Tape Cartridge Write-Protect Switch

Note: Do not move the write-protect switch during tape operation.

DLT Drive Operation

This section explains

- drive LEDs
- loading and removing a tape cartridge
- tape operation
- tape data block transfer sizing

Drive LEDs and Controls

The DLT tape drives have front-mounted LEDs that indicate the status of the unit. Figure 5-2 shows the front panel of the DLT20000XT and 7000 drives.

The DLT7000 front bezel has a density select button on the lower left that is not supported (and does not function) in Silicon Graphics systems. All DLT7000 density selection changes are made through software.

Note: For information on the power-on self test LED sequences, see "Using the Power-On Self-Test" in Chapter 3.

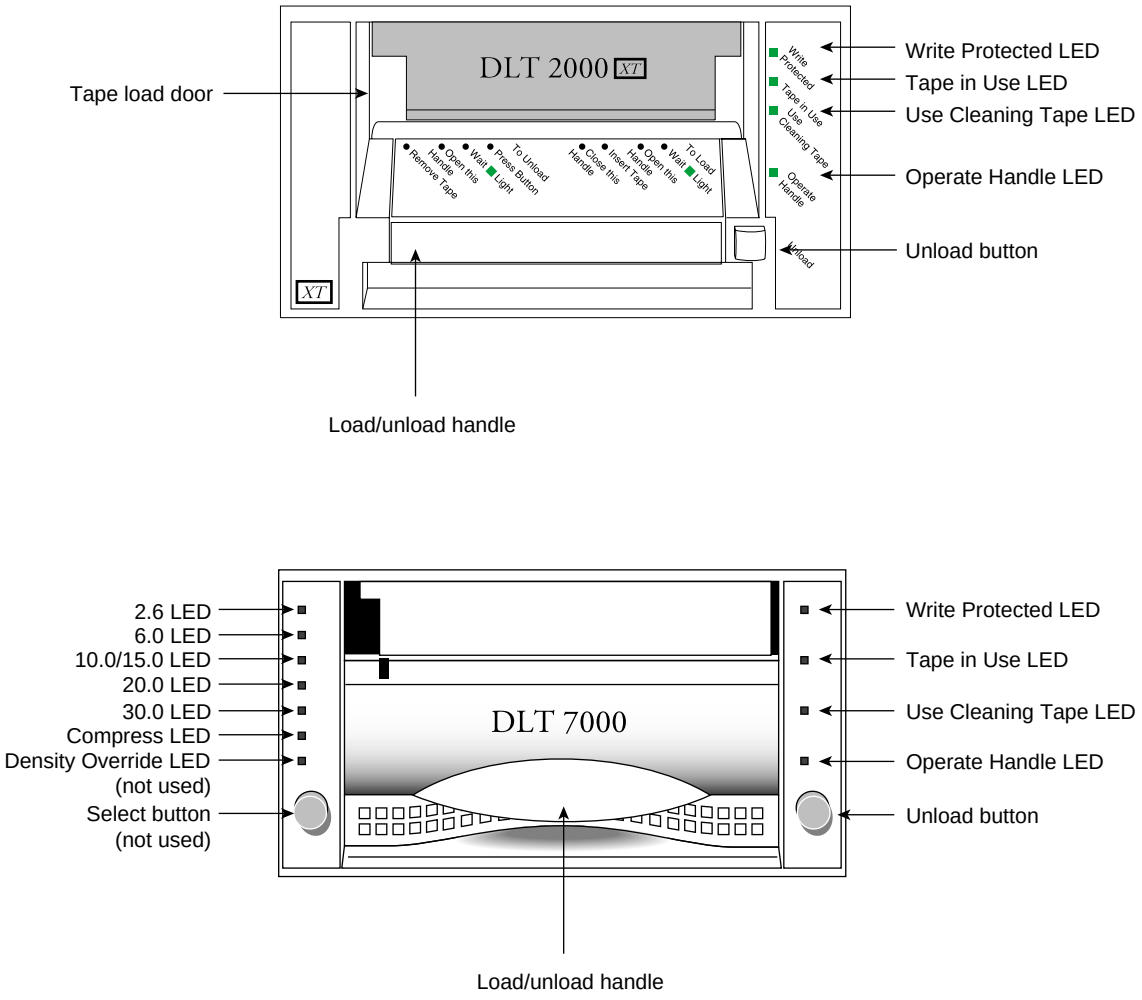


Figure 5-2 DLT2000XT and 7000 Front Panels

Table 5-1 summarizes front panel LEDs.

Table 5-1 DLT Drive Right Front LEDs and Controls

LED	Action	Meaning
All LEDs	Light up in sequence from top to bottom	Drive is starting power-on self-test (POST).
	Remain on	Drive is running POST.
	Blink	Error condition; press the **Unload** button and the error condition should clear.
Write Protected (orange)	Remains on	Data cartridge is write-protected.
	Off	Data cartridge is write-enabled.
Tape in Use (yellow)	Blinks	Tape is moving.
	Remains on	Tape is loaded and ready for use.
Use Cleaning Tape (yellow)	Remains on	Drive head needs cleaning or the tape is bad.
	Remains on after you unload the cleaning tape	Cleaning tape attempted to clean the drive head, but the tape expired, so cleaning was not completed.
	Turns on again when you reinsert cartridge after cleaning	Possible data cartridge problem; try loading another one.
	Off	Cleaning is complete, or cleaning is unnecessary.
Operate Handle (green)	Remains on	After beeper sounds, it's OK to operate the cartridge load/unload handle.
	Off	Do not operate the cartridge load/unload handle.
	Blinks	Drop handle to finish POST.

Table 5-2 summarizes middle front panel LEDs on the 2000XT.

Table 5-2 DLT2000XT Tape Drive Front Panel LEDs and Controls

Area	LED	Meaning
To Load	Wait	Wait until the light goes off.
	Open this Handle	If the green Operate Handle light is on and the beeper has sounded, open the handle.
	Insert Tape	It's OK to insert the tape cartridge.
	Close this Handle	Close the handle.
To Unload	Press Button	Push the **Unload** button.
	Wait	Wait until the light goes off.
	Open this Handle	If the green Operate Handle light is on and the beeper has sounded, open the handle.
	Remove Tape	It's OK to remove the tape cartridge.

After initialization, the drive is in one of the states shown in Table 5-3.

Table 5-3 Drive States

Drive State	Indicator Displays and Actions
No cartridge present	Yellow Tape in Use LED turns off; green Operate Handle LED turns on. Handle unlatches; drive beeps momentarily. You can raise the handle and insert a cartridge.
Cartridge present, handle down	The drive loads the cartridge. The drive is ready for use.
Cartridge present, handle up (not recommended) No cartridge present, handle could be up (not recommended)	Yellow Tape in Use LED turns off; green Operate Handle LED flashes. When you lower the handle, the cartridge loads.
Drive detects error condition	Right or left panel LEDs blink repeatedly. Try to unload the cartridge and reinitialize the drive by pressing the **Unload** button, or power-cycle the drive (turn the drive power off and then on again). The right or left panel LEDs stop blinking and the drive attempts to reinitialize. If the self-test is successful, the LEDs remain on (up to 15 seconds), and then turn off.

Loading and Removing a Tape Cartridge

Load the tape cartridge as follows:

1. When the DLT drive beeps and the green Operate Handle LED is on steadily, lift up the cartridge load/unload handle, as shown in Figure 5-3.
2. Hold the tape with the write-protect switch closest to you and insert the cartridge into the drive.
3. Push the handle closed.

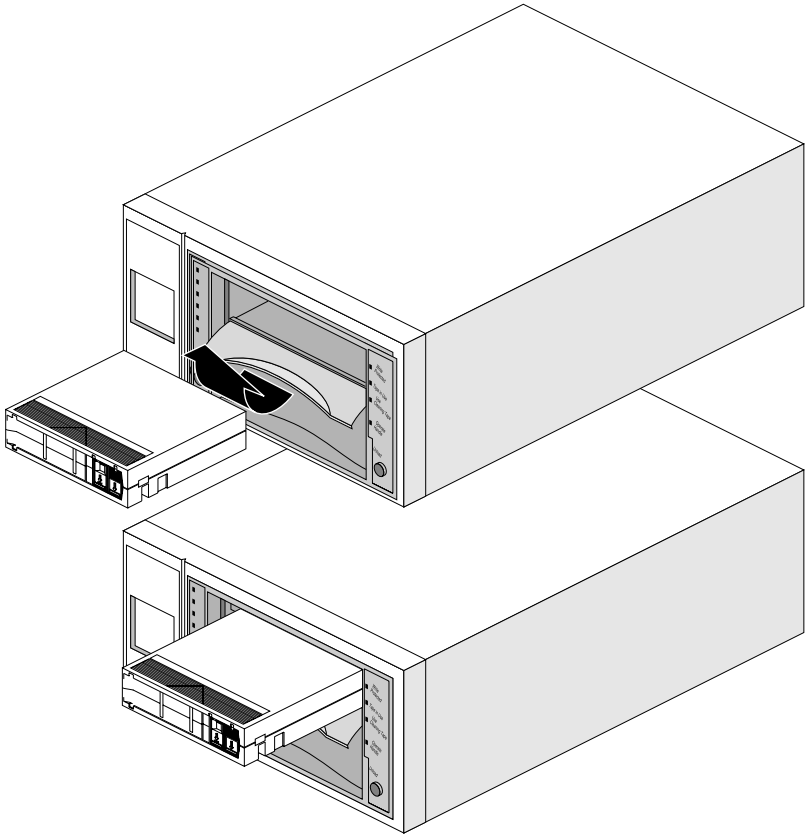


Figure 5-3 Loading a Tape Cartridge in the DLT Drive

The green Operate Handle LED goes off and the yellow Tape in Use LED blinks to indicate that the tape is loading. When the tape is at the beginning-of-tape (BOT) marker, the yellow Tape in Use LED glows steadily. The tape is now ready for use.

When the tape is being read, written, or rewound, the yellow Tape in Use LED blinks (see Table 5-2).

Remove a tape cartridge as follows:

1. When the yellow Tape in Use LED glows steadily, press the **Unload** button; the LED starts to blink.
2. When the green Operate Handle LED comes on, lift the handle and remove the tape.
3. Return the tape to its plastic container.

The green Operate Handle LED must be on before you open the handle or remove a tape.

Note: Always remove the tape cartridge from the DLT before turning off power to the drive.

Tape Operation

You can select compression from the host using the appropriate SCSI tape interface; see the tps reference page for more information. The default selection is the native tape density for the cartridge type you insert.

For interchange compatibility with earlier drives, the tape drive can write lower-capacity tape formats. On a write from BOT, the tape drive automatically reformats the tape cartridge to match the maximum native (uncompressed) capacity the drive can write on the cartridge. The drive automatically reads the media regardless of the format.

Note: After a bus reset, the tape drive responds within a bus selection timeout period. Although the system manager backup and restore tool may report the DLT drive as "unknown," it works correctly.

Tape Data Block Transfer Sizing

The DLT drive default data block transfer size is 4KB (4096 bytes). To achieve better performance, adjust block size to 32K bytes or higher when using a fixed block device.

Depending on your particular applications, the fullest data transfer performance (throughput) can be obtained by specifying a variable block size during backups or other data transfer operations.

To use the variable setting when performing backups, use the *v* addition to the device identifier when specifying data for backup.

For example, the following command copies all files in the current directory to a DLT drive that is installed as SCSI unit 6 on controller 1:

```
% tar -cvf /dev/mt/tps1d6v *
```

The *v* added at the end of the device identifier *tps1d6* allows the system to vary the block transfer size to achieve the most efficient transfer of data.

The addition of the *v* can also provide variable block size transfers for use with other backup commands such as *cpio, dd, dump,* or *restore*. See the reference (man) page for a particular data transfer command for additional information on its use.

Cleaning the Drive Head

When a drive head is dirty and needs cleaning, or the data cartridge is bad, the Use Cleaning Tape LED lights on the front of the DLT drive.

To clean a drive, use only an approved cleaning cartridge (see Figure 5-4). You can use a DLT cleaning cartridge approximately 20 times before you must replace it. The cleaning cartridge and data cartridges are always different colors.

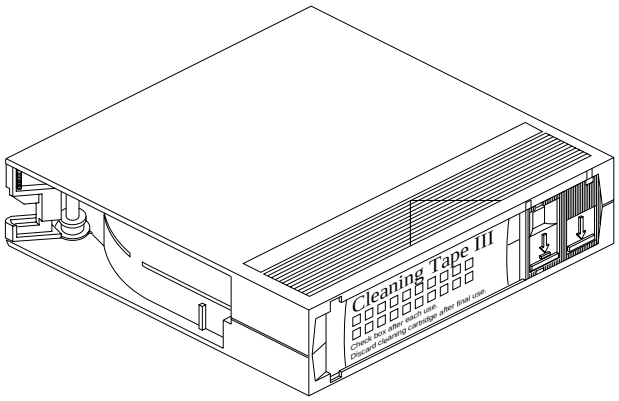


Figure 5-4 Cleaning Cartridge

Every time you use the cleaning cartridge, the drive uses a new, unused portion of the tape. After approximately 20 cleanings, the entire tape is used and you must obtain a new cartridge. Therefore, it is a good idea to keep track of the number of times you use each cartridge.

To clean a DLT drive, follow these steps:

1. Load the cleaning cartridge into the drive and close the handle. The drive automatically detects that the cartridge is a cleaning cartridge; it buzzes, then loads and runs the cartridge. The Tape in Use LED lights.

   After the cleaning is complete, the Use Cleaning Tape LED goes dark, and the beeper sounds.

2. When the cleaning cycle is finished, press the **Unload** button and wait for the green Operate Handle LED to light before opening the handle.
3. Remove the cartridge from the DLT tape drive unit.
4. Make a note in a log or on the cartridge itself that you used the cleaning cartridge.

Note: Do not attempt to remove the cleaning tape from the drive while it is going through the cleaning cycle.

If a data cartridge causes the Use Cleaning Tape LED to light frequently, the data cartridge may be damaged. Back up this data onto another cartridge and discard the old cartridge.

Troubleshooting DLT Drives

The following sections explain how to identify and troubleshoot simple problems with a DLT7000 or 2000XT drive after it has been installed.

Topics covered include

- solving problems
- removing a jammed tape cartridge
- updating firmware from a tape cartridge

Solving Basic Problems on the DLT Drive

This section lists some malfunctions that might occur with the DLT7000 or 2000XT tape drive, and some simple things you can do to resolve them.

Note: When a problem is beyond the general scope of an end user or administrator, contact your service provider.

A number of basic problems you might encounter could cause the DLT drive to be partly or completely nonfunctional:

- The hardware may not be connected properly.
- The Origin Vault may be powered off.
- The operating system may not be configured (updated) to recognize the DLT drive.
- SCSI cabling or termination may be incorrect.
- SCSI device IDs may be improperly configured.
- The SCSI cable may be pinched or damaged.
- The Origin200 power supply may have problems.
- The Origin Vault power supply may be malfunctioning or dead.

If you suspect the problem originates with a faulty power supply in the Origin Vault, see the *Origin Vault Owner's Guide* (P/N 007-3455-xxx). If the DLT is mounted in an Origin200 system, see the *Origin200 Owner's Guide* (P/N 007-3415-xxx).

The easiest way to tell if the host system sees a DLT drive you have installed is to use the *hinv* (hardware inventory) command. The *hinv* command lists all the information contained in the host system's hardware inventory table. This table is generated and updated each time the host system is rebooted. If the system was not fully rebooted after the new DLT drive was installed, the inventory table will not have information about it.

Using hinv -c tape

The *hinv -c tape* inquiry to a deskside or rackmount system provides information on every tape drive connected to that host. Use the command to determine if the DLT drive(s) you installed are recognized by the host.

```
%hinv -c tape
  Tape drive: unit 5 on SCSI controller 7: 8mm(8500) cartridge
  Tape drive: unit 6 on SCSI controller 6: DLT
  Tape drive: unit 5 on SCSI controller 6: DLT
```

Tip: If you installed a DLT drive, and the *hinv* list shows that the host system does not see it attached to any SCSI controller, read the next section "What to Do If hinv Does Not See the Tape Drive." Also see Table 5-4 for additional solutions.

What to Do If hinv Does Not See the Tape Drive

Under certain circumstances, the drive may not show up in the *hinv* listing after you connect the DLT drive to the host system. Some common causes for this problem are listed in the first two columns of Table 5-1. If none of the solutions listed in Table 5-4 are applicable, try the following procedures:

1. Confirm that the host system is running operating system release 6.4 or later. At the system prompt, enter

```
% uname -r
```

If the host is running an IRIX operating system release older than those listed, the system will not recognize the DLT7000 tape drive and may not recognize the 2000XT drive. Upgrade the host system to the appropriate release. Contact your sales or service representative if a copy of the proper operating system is not available.

In the output, look for the newly installed DLT drive. If the tape drive is not recognized, recheck all the solutions listed in the first two columns of Table 5-4.

2. If you cannot read or write tapes in the DLT drive even though it is listed in *hinv,* it is possible that the device driver was not properly created during system startup. You can determine the status of the available system drivers by entering

```
% ls /dev/mt
```

3. To determine the status of a DLT drive, enter

```
% mt stat
```

See the *mt* and *mtio* reference (man) pages for additional information on these topics.

4. You can try manually making the device by becoming root and using the following commands:

```
% su
# cd /dev
# MAKEDEV tape
# exit
```

5. Reboot the host system and try *hinv -c tape* again. After trying all the troubleshooting tips in this section and checking all the solutions listed in Table 5-4, contact your system administrator or service provider if the system still does not recognize or allow access to the DLT drive.

Symptoms and Possible Solutions

Table 5-4 lists general potential problems and possible solutions. If none of the offered solutions helps, consult your system administrator or service provider.

Table 5-4 General DLT Drive Problem Symptoms and Possible Solutions

Symptom	Possible Solutions				
The host does not see an externally connected tape drive.	Is the SCSI cable connection secure?	Is the external SCSI cable pinched or damaged?	Is the DLT drive's SCSI ID set properly?	Is the Origin Vault (or desktop unit) powered on?	Is the proper SCSI terminator (if applicable) installed?
The host does not see an internally-mounted DLT drive.	Is the DLT drive's power cable plugged securely?	Is the drive's SCSI cable connector plugged in?	Are there any bent pins on the SCSI connector?	Is the DLT drive's SCSI ID set properly?	Is the DLT carrier completely seated in the drive bay?
The host is registering numerous SCSI errors.	Are the SCSI cables firmly connected? Are there any bent SCSI pins?	Is the proper SCSI terminator in place?	Is the Vault's SCSI cable within acceptable length limits?	Are there any duplicate SCSI IDs on the SCSI bus?	Is there more than one additional device connected to the DLT's SCSI bus?
External SCSI device or cable diagnostic fails at power on.	Was the DLT drive powered on before the host system?	Are the SCSI cables firmly connected to the DLT drive and host?	Are there any bent SCSI pins on the connectors?		
Error message "...resetting SCSI bus" after power interruption or power on.	Was the DLT drive powered on before the host system?	Was there an unplanned power interruption to the DLT drive?			

If none of the offered solutions helps, consult your system administrator or service provider.

Removing a Jammed Tape Cartridge

The following instructions are intended to help you if a tape cartridge becomes jammed in the DLT drive and will not unload. Before calling your service provider, try the following:

1. If the tape fails to unload, power the unit off and then on again, and push the **Unload** button again.
2. Power the unit off and on again while pressing on the **Unload** button.

If these steps fail, contact your system administrator or service provider for assistance.

Appendix A

Hardware Specifications

This appendix contains

- DLT7000 and 2000XT drive specifications
- timing characteristics
- tape specifications
- BaseIO SCSI pinouts

DLT7000 and 2000XT Drive Specifications

Physical, electrical, environmental, and power specifications for the DLT7000 and 2000XT drives are listed in Table A-1.

Table A-1 DLT Drive Hardware Specifications

Parameter	Unmounted Drive	Table Top Drive
Height	3.25 inches (8.25 cm) without bezel, 3.4 inches (8.63 cm) with bezel [3.85 inches (9.8 cm) in carrier shell]	4.87 inches (12.4 cm)
Width	5.7 inches (14.48 cm) behind bezel, 5.7 inches (14.7 cm) with bezel. [5.78 inches (14.7 cm) in carrier shell]	9 inches (22.9 cm)
Depth	9 inches (22.86 cm) from back of front bezel, 9.6 inches (24.4 cm) including bezel [10.4 inches (26.5 cm) in carrier shell]	12.75 inches (32.5 cm)
Weight	6 lbs, 7 oz (2.9 kg)	14 lbs, 9 oz (6.63 kg)
Operating temperature range	+10° C to +40° C (50° F to 104° F) at 20% to 80% humidity (noncondensing)	Same

Table A-1 (continued) DLT Drive Hardware Specifications

Parameter	Unmounted Drive	Table Top Drive
Nonoperating temperature range	–40° C to +66° C (-40° F to +151° F) at 10% to 95% humidity (non-condensing) (excludes tape media)	Same
Altitude (operating)	Up to 8,000 feet (2440 m)	Same
Altitude (nonoperating)	30,000 feet (9150 m) maximum	Same
Electrical rating (autoranging)	DC supply	100 to 240 VAC
Power requirements	DC: 22 W steady state/ 33 W maximum	44 W, 0.67A at 110 VAC
Power consumed		N/A
+5 V bus	2.5 A steady state/ 3.0 A maximum	
+12 V bus	0.8 steady state/3.0 A maximum	
Mean time between failures (MTBF)	80,000 hours (approximate) for DLT2000XT 200,000 hours (approximate) for DLT7000	Same

Timing Characteristics

Table A-2 summarizes timing characteristics for the DLT2000XT tape drive.

Table A-2 DLT2000XT Drive Characteristics

Parameter	Quantity
Read/write tape speed	110 inches (279.4 cm) per second
Rewind tape speed	150 inches (381 cm) per second
Linear search tape speed	150 inches (381 cm) per second
Average rewind time	60 seconds
Maximum rewind time	120 seconds

Table A-2 DLT2000XT Drive Characteristics

Parameter	Quantity
Average access time (from BOT)	45 seconds
Maximum access time (from BOT)	90 seconds
Load to BOT (previously written)	48 seconds; if tape is blank, time is slightly longer
Unload from BOT	17 seconds

Table A-3 summarizes timing characteristics for the DLT7000 drive.

Table A-3 DLT7000 Drive Characteristics

Parameter	Quantity
Read/write tape speed	160 inches (406.4 cm) per second
Rewind tape speed	175 inches (444.5 cm) per second
Linear search tape speed	175 inches (444.5 cm) per second
Average rewind time	60 seconds
Maximum rewind time	120 seconds
Average access time (from BOT)	60 seconds
Maximum access time (from BOT)	120 seconds
Load to BOT (previously written)	48 seconds; if tape is blank, time is slightly longer
Unload from BOT	17 seconds

Tape Specifications

Table A-4 summarizes the DLT IIIXT and DLTtape IV tape specifications.

Table A-4 Tape Specifications

Parameter	Quantity
Width	0.5 in (1.27 cm) metal particle
Length	1778 feet (542.3 m)
Cartridge dimensions	4.1 inch by 4.1 inch by 1.0 inch (10.4 by 10.4 by 2.54 cm)
Shelf life	30 years minimum at 20° C (68° F) and 40% relative humidity (noncondensing)
Usage	500,000 passes

Single-Ended High-Density SCSI Pinouts (68-Pin) Pinouts

This section summarizes pinouts for the single-ended high-density SCSI (68-pin).

Figure A-1 shows the 68-pin connector.

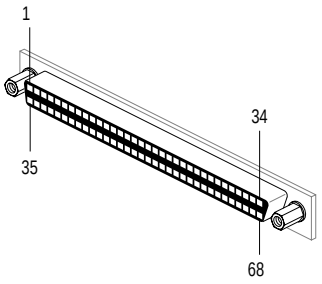


Figure A-1 68-Pin Connector

In Table A-5, the hyphen preceding a signal name indicates that the signal is active-low. Eight-bit devices that connect to the P cable leave these signals open: -DB(8), -DB(9), -DB(10), -DB(11), +DB(12), +DB(13), +DB(14), +DB(15), +DB(P1).

All other signals are connected as shown in Table A-5.

Table A-5 Host System 68-Pin Single-Ended, High-Density SCSI Pinouts

Pin	Signal Name	Pin	Signal Name
1	Ground (Open for DLT drive)	35	-DB(12) (Open for DLT drive)
2	Ground (Open for DLT drive)	36	-DB(13) (Open for DLT drive)
3	Ground (Open for DLT drive)	37	-DB(14) (Open for DLT drive)
4	Ground (Open for DLT drive)	38	-DB(15) (Open for DLT drive)
5	Ground (Open for DLT drive)	39	-DB(P1) (Open for DLT drive)
6	Ground	40	-DB(0)
7	Ground	41	-DB(1)
8	Ground	42	-DB(2)
9	Ground	43	-DB(3)
10	Ground	44	-DB(4)
11	Ground	45	-DB(5)
12	Ground	46	-DB(6)
13	Ground	47	-DB(7)
14	Ground	48	-DB(P)
15	Ground	49	Ground
16	Ground	50	Ground
17	TERMPWR	51	TERMPWR
18	TERMPWR	52	TERMPWR
19	Reserved	53	Reserved
20	Ground	54	Ground
21	Ground	55	-ATN
22	Ground	56	Ground
23	Ground	57	-BSY

Table A-5 (continued) Host System 68-Pin Single-Ended, High-Density SCSI Pinouts

Pin	Signal Name	Pin	Signal Name
24	Ground	58	-ACK
25	Ground	59	-RST
26	Ground	60	-MSG
27	Ground	61	-SEL
28	Ground	61	-C/D
29	Ground	63	-REQ
30	Ground	64	-I/O
31	Ground (Open for DLT drive)	65	-DB(8) (Open for DLT drive)
32	Ground (Open for DLT drive)	66	-DB(9) (Open for DLT drive)
33	Ground (Open for DLT drive)	67	-DB(10) (Open for DLT drive)
34	Ground (Open for DLT drive)	68	-DB(11) (Open for DLT drive)

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