



# SWXTA-BA/BL/BT 4/8 GB 4mm DAT Tape Drive SBB/Loader/Tabletop Units

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## User's Guide

EK-SM2TC-UG. D01

**Digital Equipment Corporation**  
**Maynard, Massachusetts**

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# Revision Record

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*This Revision Record provides a concise publication history of this guide. It lists the manual revision levels, release dates, and reasons for the revisions. It also describes how the changes to affected pages are marked in the guide.*

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The following revision history lists all revisions of this publication and their effective dates. The publication part number is included in the *Revision Level* column, with the last entry denoting the latest revision. This publication supports the StorageWorks SWXTA-BA tape drive SBB, the SWXTA-BL tape drive autoloader SBB, and the SWXTA-BT Desk Top Tape Drive.

<b>Revision Level</b>	<b>Date</b>	<b>Summary of Changes</b>
EK-SM2TC-UG. A01	October 1994	Original release
EK-SM2TC-UG. B01	October 1994	Added Appendix D (Product Notes for Hewlett-Packard 9000 Series 700)
EK-SM2TC-UG. C01	December 1994	Added Appendix E (Product Notes for IBM RS/6000)
EK-SM2TC-UG. D01	May 1995	Added Chapter 5 (SWXTA-BL 16/32 GB 4-mm DAT Tape Auto-Loader SBB Installation and Operation) and Chapter 6 (SWXTA-BT 4/8 GB 4-mm DAT Desk Top Tape Drive Installation and Operation)

# About This Guide

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*This section identifies the users of this guide and describes its contents and structure. In addition, this section also includes a list of conventions used in this guide.*

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## **StorageWorks SWXTA-BA 4/8 GB, 4 mm, DAT Tape Drive SBB User's Guide**

This guide provides product overview, installation, operation, and maintenance information for the 4/8-GB\*, 4-mm, DAT Tape Drive SBB (StorageWorks Building Block).

### **Intended Audience**

This guide is intended for people who will install, operate, and maintain the tape drive SBB.

### **Document Structure**

This guide contains the following chapters:

#### **Chapter 1: Introduction**

Chapter 1 gives an overview of the tape drive, describes its components, and discusses the drive features. The information describes the 4-GB *uncompressed mode* and the 8-GB *compressed mode* (assuming 2:1 compression).

#### **Chapter 2: Tape Drive SBB Installation**

Chapter 2 describes unpacking, setting the SCSI ID address, and how to install the tape drive SBB in StorageWorks subsystems. The chapter also describes the tape drive's POST (Power-On Self-Test) exercise.

#### **Chapter 3 Operation**

Chapter 3 describes the tape drive LED indicators and how to use them to monitor tape drive operation.

#### **Chapter 4 Maintenance**

Chapter 4 describes how to clean the heads of the tape drive and provides a troubleshooting table to help diagnose common problems.

#### **Chapter 5 SWXTA-BL 16/32-GB 4-mm DAT Tape Auto-Loader SBB Installation and Operation**

Chapter 5 describes the SWXTA-BL Auto-Loader, which contains the same 4-mm DAT tape drive used in the SWXTA-BA Tape Drive unit together with a four-cassette magazine and an associated cassette manipulation mechanism. This chapter provides an overview of the auto-loader unit, followed by operation and maintenance information specific to the auto-loader device.

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\*Storage capacity is 4 GB with uncompressed format; 8 GB compressed (assuming 2:1 compression).

## Chapter 6 SWXTA-BT 4/8 GB, 4 mm DAT Desk Top Tape Drive

This chapter describes the SWXTA-BT Desk Top Tape Drive which contains the same 4-mm DAT tape drive used in the SWXTA-BA Tape Drive SBB. This chapter provides an overview of the Desk Top Tape Drive followed by operation and maintenance information specific to the device.

### Appendix A: Specifications

Appendix A lists the physical, electrical, cooling, environmental, and environmental stabilization specifications for the tape drive.

### Appendix B: Product Notes for Sun™

Appendix B describes the steps the system administrator must take to properly utilize the tape drive in a Sun SPARC system running Solaris™ 2.3 (or later) or SunOS™ 4.1.x.

### Appendix C: Product Notes for NetWare™, MS-DOS™ and Microsoft® WINDOWS™

Appendix C provides information that should be read by the system administrator before installing the tape drive when it will be used with a host operating under Novell™ NetWare, MS-DOS, or Microsoft WINDOWS operating systems.

### Appendix D: Product Notes for Hewlett Packard

Appendix C provides information that should be read by the system administrator before installing the tape drive when it will be used with a HP 9000 Series 700 system host operating under an running HP-UX 9.05 (or later).

### Appendix E: Product Notes for IBM RS/6000 AIX 3.2.5 (or Later)

Appendix C provides information that should be read by the system administrator before installing the tape drive when it will be used with a host operating under Novell™ NetWare, MS-DOS, or Microsoft WINDOWS operating systems.

## Conventions

This guide uses the following conventions:

### Documentation Conventions

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Style	Meaning
<b>boldface type</b>	<b>For emphasis</b>
<i>italic type</i>	<i>For emphasis and manual titles</i>

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## Introduction

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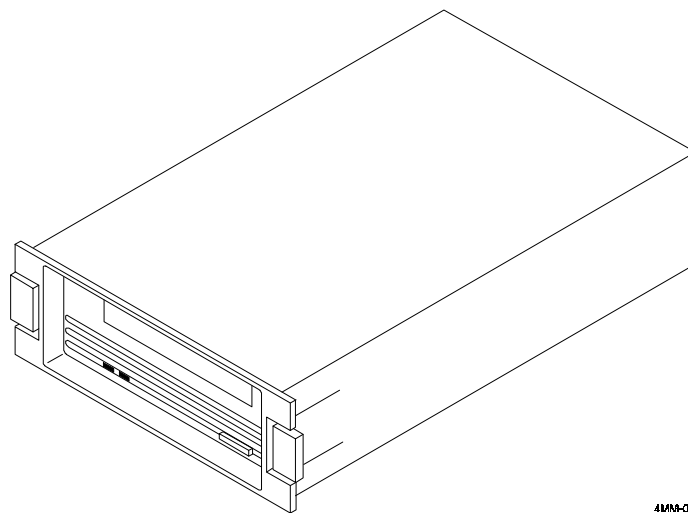
*This chapter provides a product overview of the StorageWorks SWXTA-BA 4/8-GB 4-mm DAT tape drive.*

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### 1.1 Product Overview

The StorageWorks **SWXTA-BA 4/8-GB\*, 4-mm DAT** (Digital Audio Tape) tape drive (Figure 1–1), henceforth referred to simply as the tape drive, provides a high-capacity data storage system. The tape drive is housed in an industry-standard 3.5-inch form factor, called a StorageWorks Building Block (SBB). SBBs are designed to operate in the StorageWorks family of storage expansion enclosures.

**Figure 1–1 StorageWorks 4/8-GB 4-mm DAT Tape Drive**



4MM-01

### 1.2 Design Features

The tape drive uses state-of-the-art technology, incorporating both digital audio tape (DAT) and digital data storage (DDS) recording technologies.

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\*Storage capacity is 4 GB with uncompressed format; 8 GB compressed (assuming 2:1 compression).

### 1.2.1 Digital Audio Tape (DAT) Technology

Digital audio tape takes advantage of the tape drive's helical scan technology. This technology allows data to be stored diagonally on the tape, thereby allowing more data to be stored on the tape. In addition, DAT recording minimizes *crossstalk*, providing enhanced data integrity.

### 1.2.2 Digital Data Storage (DDS) Technology

Digital data storage (DDS) technology uses a recording format that supports the use of digital audio tape for computer applications. The tape drive mechanism accepts or delivers data at a minimum sustained transfer rate of 400 KB per second, with this transfer rate increasing proportionally with the compression factor when the compression mode is enabled.

This capability allows you to back up your data at an average rate of 1 GB/hour with no operator intervention—backing up up to 4.0 GB on a single tape cartridge when using uncompressed format or (assuming a 2:1 compression ratio) up to 8.0 GB with compressed format. (This performance figure will vary, depending on computer hardware, operating systems, CPU utilization, and other application-specific parameters.) Digital's implementation of this format also includes three levels of error correction to ensure a high degree of data integrity.

#### CAUTION

Use of non-DDS media may result in degraded **tape drive** performance and is not recommended by Digital Equipment Corporation.

## 1.3 Data Formats

The tape drive can operate in three formats:

1. DDS (Digital Data Storage, now sometimes called DDS1).
2. DDS2 (an improved format).
3. DDS-DC (which is a data compression technique applied to either of DDS1 or DDS2).

The tape drive automatically detects whether a loaded tape is DDS1 or DDS2 format and adopts the appropriate processing format for that tape. The tape drive defaults to DDS-DC format but will read/write in regular DDS1 or DDS2 formats when so directed by the application software.

#### NOTE

The tape drive is internally set to default to the data compression mode. However, operating system commands or third party application software may change the tape drive's recording function from compressed to non-compressed modes.

When writing in the compressed format, the **tape drive** implements a powerful algorithm that enables it to compress user data at ratios of 2:1 or more. Table 1-1 shows the expected, or average, data capacity of the 60-, 90-, and 120-meter tape cassettes.

**Table 1–1 Tape Drive Storage Capacity**

Cassette Tape Type	Data Storage Capacity without Compression)	Data Storage Capacity with Compression <sup>†</sup>
TLZ04-CB (60 m) <sup>1</sup>	1.3 GB	2.6 GB
TLZ06-CB (90 m) <sup>2</sup>	2.0 GB	4.0
TLZ07-CA <sup>‡</sup> (120 m) <sup>3</sup>	4.0 GB	8.0

<sup>†</sup> Storage capacity measurements are typical for a 2-to-1 compression ratio, but actual data storage capacity depends on data involved.

<sup>1</sup> TLZ04 tapes are DDS1 tapes, made for an earlier Digital Equipment Corporation tape drive.

<sup>2</sup> TLZ06 tapes are DDS1 tapes, made for Digital's SWXTA-AA tape drive, which operates with DDS1 and DC technology.

<sup>3</sup> TLZ07 tapes are DDS2 tapes, made for Digital's SWXTA-BA tape drive, which operates with DDS1, DDS2, and DC technology.

<sup>‡</sup> Individual DAT tapes actually are identified as TLZnn-CA units, but 60-m and 90-m tapes are available only in 5-pack quantities, designated TLZnn-CB. The 120-m tape is available either as an individual unit (-CA) or in 5-pack quantities (-CB).

The actual compression ratio achieved depends on the type of data compressed. This guide assumes an average compression efficiency of 2:1. The tape drive will operate (read and write) with any tape formatted for standard DAT technology (DDS1 or DDS2). Tapes are presently available from 15 m to 120 m in length, but operation with short-length tapes is not recommended.

## 1.4 Support for Partitioned Tapes

Some operating systems provide support for tape partitions. With these systems, the tape drive can read and write tapes containing either one or two partitions. Partitions provide an efficient way to maintain a directory on a tape without the risk of overwriting data when updating the directory.

## 1.5 Enhanced Performance

The efficient use of *streaming mode* will be determined by your operating system and applications software. In the non-compressed format, the transfer rate is at least 400 KB per second, and the tape drive is capable of a burst transfer rate with respect to the I/O bus of 1.5 MB/s using asynchronous SCSI data transfer protocols, or at rates of up to 4 MB/s using synchronous SCSI transfers. While the maximum time to back up (read or write) on a DAT cassette tape in a continual (streaming) mode is system dependent, the tape drive allows you to back up 8.0 GB of data in approximately eight hours with no operator intervention.

## 1.6 Intelligent Data Compression

The compression algorithm is completely contained in an integrated circuit. The tape drive invokes the compression algorithm intelligently, constantly monitoring the compression ratio to determine whether compressing the data will actually decrease the size of the data set.

## **1.7 Sophisticated Error Correction Procedures**

The tape drive performs on-board error correction code (ECC) and error-recovery procedures, along with full read-after-write verification to ensure data integrity. The tape drive also contains a logical-block-CRC feature. By adding two bytes of cyclic redundancy check (CRC) data to every logical block on a compressed format tape, the tape drive can check that user data is compressed accurately.

## **1.8 Additional Features**

The tape drive contains a single-ended SCSI controller and provides SCSI-2 compatibility, synchronous data transfer, an integrated 1-MB speed-matching buffer, full disconnect/reconnect arbitration support, and logical block packing. The tape drive is an easily integrated solution to your journalizing, archiving, data interchange, software distribution, imaging, data acquisition, and backup/restore needs.

## Tape Drive Installation

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*This chapter tells you how to install the tape drive into a StorageWorks expansion storage enclosure.*

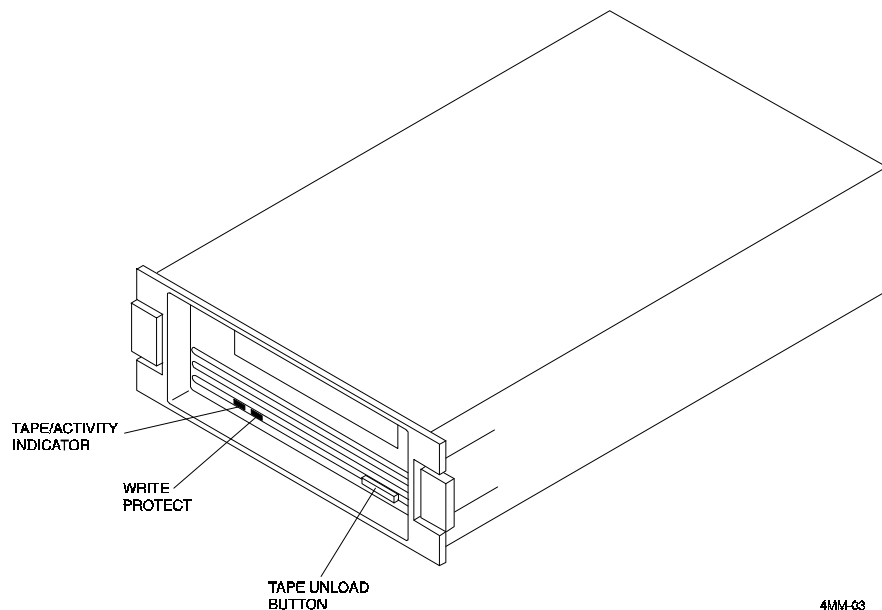
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### 2.1 Introduction

The tape drive (see Figure 2–1) is housed in an SBB storage carrier and is designed for installation into any of the StorageWorks family of expansion enclosures. The drive occupies one slot in the expansion enclosure and is configured as one of up to seven devices on the SCSI bus. This chapter describes how to set the SCSI ID of the tape drive, how to install the device into a StorageWorks enclosure, and how to perform the Power-On Self-Test (POST) procedure. The information in this chapter is divided as follows:

- Unpacking
- Setting the SCSI address of the drive
- Installation into a storage enclosure
- POST test

**Figure 2–1 Location of Tape Activity and Write-Protect LEDs**



4MM-63

## 2.2 Unpacking

Unpack and inspect the contents of your shipment. The package should contain the following items:

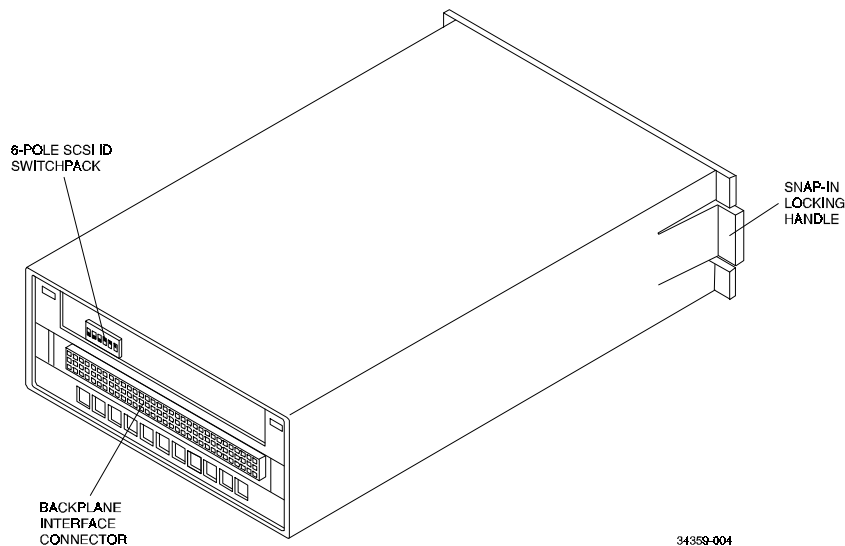
- One tape drive (SWXTA-BA)
- One blank 4 mm x 120 m cassette tape (TLZ07-CA)
- One head-cleaning cassette (TLZ04-HA)
- StorageWorks SBB user's guide
- This guide

Also, check the contents for damaged components. Notify your vendor immediately if any items are damaged. Keep all boxes and packing material for reshipment.

## 2.3 Setting the SCSI ID Address of the Tape Drive SBB

The address switches on the rear of the tape drive SBB (see Figure 2-2) can be used to override the SBB default device address set by the expansion enclosure into which the SBB is installed. Setting these switches to the *automatic* code selection sets the device address of the tape drive to the number corresponding to the expansion enclosure slot in which the tape drive unit is installed. The switches are preset to *automatic* at the factory, but can be set manually to a different address at your option. Refer to Table 2-1 to reset the SCSI address, if required.

**Figure 2–2 Location of Tape Drive SBB’s SCSI ID Switches**



**Table 2–1 Tape Drive SBB SCSI ID Switch Settings**

Address	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6
0	Off	Off	Off	Off	Off	Off
1	On	Off	Off	Off	Off	Off
2	Off	On	Off	Off	Off	Off
3	On	On	Off	Off	Off	Off
4	Off	Off	On	Off	Off	Off
5	On	Off	On	Off	Off	Off
6	Off	On	On	Off	Off	Off
7*	On	On	On	Off	Off	Off
Automatic†	Off	Off	Off	On	On	On

\* Normally reserved for host.

† This setting sets device address to expansion enclosure slot number.

## 2.4 Installing the Tape Drive SBB Into A StorageWorks Expansion Enclosure

### CAUTION

Refer to the applicable documentation (see Appendices B or C) for your host computer and/or your specific operating system before installing the drive. This installation procedure assumes that you have already installed and appropriately cabled the applicable StorageWorks expansion enclosure and have checked out that enclosure as applicable, so that it is ready to receive the tape drive SBB.

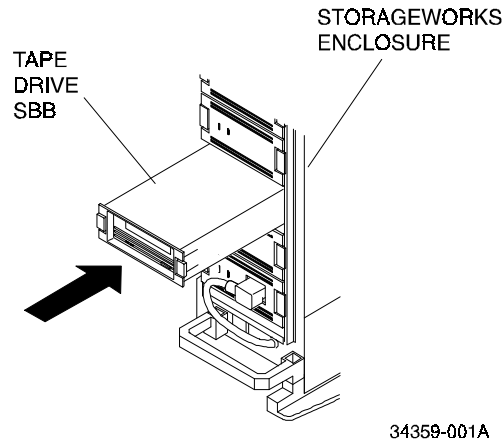
You install the tape drive SBB in an expansion enclosure by inserting the drive so that the backplane interface connector on the rear surface fits into an available SCSI device storage slot. If you have previously set the SCSI ID address for any of addresses 0 through 7 on the rear-panel switchpack, the unit will be identified as being whichever device you set the SCSI ID switches for, regardless of which slots you use. If you set the switchpack setting for the automatic code, conversely, the unit will assume the SCSI ID address associated with whichever slot you put the unit into. The drive can be installed using the *hot-swap* method where the drive is installed with the host system powered on and operating, or with the host system powered off. Before using the *hot-swap* method, consult your system administrator to ensure that your operating system supports this type of installation.

To install the tape drive:

1. Remove the front panel and/or front bezel of the StorageWorks expansion enclosure (refer to the manual pertaining to the type of expansion enclosure you are using).
2. Remove the filler panel (or other previously installed SBB, if applicable) from the desired device slot in the expansion enclosure by squeezing the locking handles at the ends of the filler panel (or SBB) and removing the panel (or SBB).
3. Install the tape drive in the open slot, sliding the rear end of the drive into the slot firmly until the SBB's locking handles snap into place.

4. Perform the POST test, as described in the following subsection, to verify the operational integrity of the tape drive.

**Figure 2-3 Installing the Tape Drive in an Expansion Storage Enclosure**



## 2.5 Power-On Self-Test (POST) Procedure

The POST test verifies the proper installation of the tape drive. The test may be performed with the expansion enclosure power on (*hot-swap* method) if your operating system permits, or with the expansion enclosure powered off. The following procedure assumes that the enclosure power initially is off. Refer to Figure 2-1 for the locations of the front panel LED indicators on the tape drive.

### NOTE

If the Write-Protect indicator flashes amber and the drive indicator flashes green continuously for more than 30 seconds in the following test, then the POST test has failed. Repeat the test to clear the failure (power off and then on). If test still fails, replace drive.

To execute POST:

1. Ensure that there is no cassette in the tape drive.
2. Power on the expansion enclosure and observe that the tape activity and write-protect indicators come on for approximately 1 to 5 seconds and then go out. (If both indicators do not go out, the test has failed.)
3. Load a cassette tape into the drive and observe the left-hand tape activity indicator. The indicator should continue flashing for approximately 20 seconds, until the tape has been moved by the internal mechanism into correct position for read/write operation, and then remain on.

After the unit passes the test, following installation, as confirmed by a steadily lit tape activity indicator, have your system administrator assign a device name to the drive.



## Tape Drive SBB Operation

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This chapter discusses the operation of the switch and LED indicators on the front panel of the tape drive SBB.

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### 3.1 General

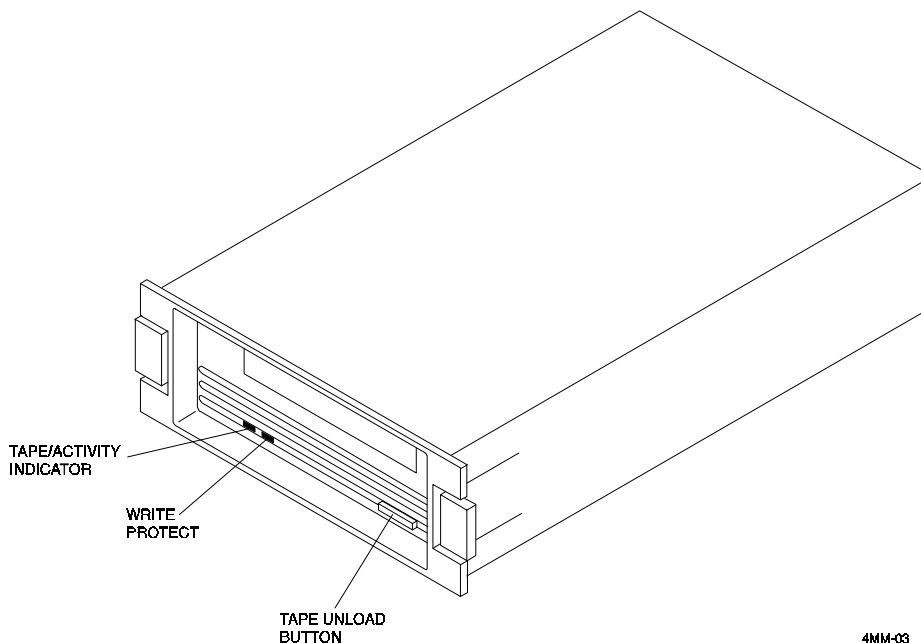
The front panel of the cassette tape drive (Figure 3-1) is equipped with one push-button switch (*unload button*) and two indicators (*write protect* and *cassette* LEDs). The unload button is used to eject the cassette tape (press and hold for 1 to 2 seconds).

#### CAUTION

Pressing the unload button during normal tape operations may halt the tape and result in the loss of data.

The *write protect* indicator is an amber LED that comes on when the cassette tape is write protected. The *cassette* indicator is a green LED that lights continuously when a cassette is loaded, and flashes when there is drive activity.

**Figure 3-1 Front Panel Switch and LED Indicators**



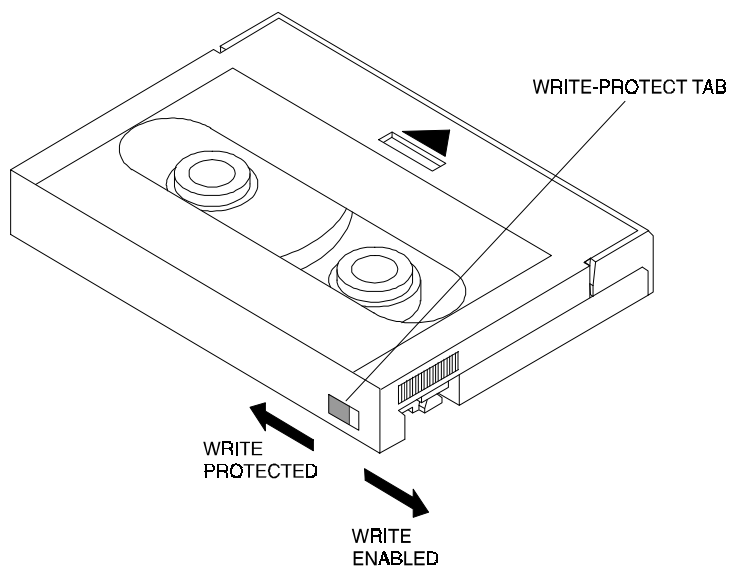
### 3.2 DAT Cassette Tape

The cassette tape (Figure 3-2) contains a write-protect tab, which contrasts in color to the body of the cassette. To "write-protect" the tape, slide the tab to the left. To "write-enable" the tape, slide the tab to the right. The tab is not visible when the cassette tape is loaded in the drive.

**NOTE**

You can order the data cartridge (Part No. TLZ07-CA for 120-m length, TLZ06-CB for 90-m length, TLZ04-CB for 60-m length) and the cleaning cartridge (Part No. TLZ04-HA) by contacting your reseller.

**Figure 3-2 DAT Cassette Tape Write Enable/Protect Tab**



34359-007

### 3.3 Tape Drive LEDs

The status of the tape drive is indicated by the *write-protect* and *cassette* LEDs. In the normal operating state, the *write-protect* LED only indicates the write-protect status and the *cassette* LED only indicates the drive activity and load status. Table 3-1 describes the status conditions represented by the LEDs. (Refer to Figure 3-1 for LED identification.)

**Table 3–1 Tape Drive LED Status**

Status	Write-Protect LED	Cassette LED
No tape loaded.	Off	Off
Tape loaded, write enabled.	Off	Green
Tape loaded, write-protected.	Amber	Green
No SCSI/drive activity.	Off <sup>†</sup>	Green
SCSI/drive activity.	Off <sup>†</sup>	Activity
Load sequence.	Off <sup>†</sup>	Flashes green @ 1 Hz, 25% on. Green continuously when done. Indicates drive activity.
Unload sequence	Off <sup>†</sup> , goes off.	Flashes green @ 1 Hz, 25% on. Goes off when done. Indicates drive activity.
Reset sequence	Amber Off <sup>†</sup>	Green, flashing. Normal indications.
Power on self test (POST) Level 1 (basic) self test.	Flashes amber @ 2 Hz for length of test. Write protected when self test complete.	Flashes green @ 2 Hz for length of test. Normal activity indications when test complete.
Level 2 (extended) self test.	Off <sup>†</sup>	Flashes green until test complete (1 to 4 min.). Same as normal activity indication.
Test complete, no failure.	Resume normal operation, off <sup>†</sup> .	
Test failure, drive fault.	Flashes amber @ 2 Hz.	Flashes green @ 2 Hz.

<sup>†</sup> If DAT cassette is write-protected, the amber write-protect LED will be lit during operation.

### 3.4 Using and Handling Cassette Tapes

To ensure optimal performance from your cassettes tapes, observe the following guidelines when using and handling the tapes.

- Avoid placing the cassette tapes near sources of electromagnetic radiation such as terminals, video, or X-ray equipment. Radiation from this type of equipment can erase or corrupt data on the tape
- Keep cassette tapes out of direct sunlight and away from heaters and sources of heat
- Store cassette tapes and cleaning cassette at temperatures between 5° C and 32 C (40° F through 90° F)
- Store cassette tapes in a dust-free environment where the relative humidity is 20 to 60%.

**CAUTIONS**

Always place the label in the recessed area on the cassette, after first removing any previously used label. Never place a label over another label or affix any gummed label or adhesive material to the cassette.

Use of non-DDS media could result in degraded performance of the drive.

### **3.5 Write-Protect Tab and Loading Cassette Tape**

To read or copy from the cassette tape, slide the write-protect tab to the left to “write-protect” the data (refer to Figure 3-2). This prevents writing to the tape and ensures that data will not be accidentally overwritten. Always use a pen, rather than a pencil, to change the setting of the write-protect tab on the cassette tape. Use the following guidelines when setting the write-protect tab:

- If you are reading data (copying from tape), set the write-protect tab to “write protected” (left).
- If you are writing data (writing to tape), set the write-protect tab to “write-enabled” (right).
- When loading the cassette tape into the drive, ensure that the front of the cassette, with the write-protect tab on the right side, is facing you.

## Maintenance

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*This chapter provides preventive maintenance and troubleshooting information for the tape drive SBB.*

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### 4.1 Cleaning the Heads

This section describes how to clean the heads of a DAT tape drive. The heads are the components that physically read and write data to and from the cassette tape (media). We recommend that you perform the head cleaning procedure approximately every two weeks, or after every 50 hours of drive usage. Under normal conditions, it should not be necessary to exceed this cleaning schedule. If a particular cassette causes problems, you should try another data cassette.

**CAUTION**

Never attempt to clean the heads in a manner other than described herein. Doing so will void the product warranty.

To clean the heads, use the head-cleaning cassette as follows:

1. Power on the storage subsystem to apply power to the tape drive.
2. Insert the head-cleaning cassette (Part No. TLZ04-HA) into the drive.
3. With the head-cleaning cassette inserted, the drive automatically executes its head-cleaning operation, completing this action and ejecting the head-cleaning cassette after approximately 30 seconds.
4. Place a check mark on the cross-off card enclosed with the head-cleaning cassette in lieu of a label to keep track of the number of times the head-cleaning cassette has been used.

Under normal conditions, the head-cleaning cassette is effective for about 25 cleanings. If the head-cleaning cassette has been overused, both the *cassette* LED and the *write-protect* LED will flash. Press the *eject* button to remove the cleaning cassette. Since no cleaning action will have occurred, you should obtain and use a different head-cleaning cassette before returning the drive to operation.

## 4.2 Troubleshooting

Table 4-1 describes some common drive problems and suggests possible solutions.

**Table 4–1 - Tape Drive SBB Troubleshooting Table**

Symptom	Probable Cause	Possible Solution
Unable to back up or copy data to tape.	<ol style="list-style-type: none"> <li>1. Cassette write-protected.</li> <li>2. No tape in drive.</li> </ol>	<p>Set write-protected tab on cassette to write-enabled.</p> <p>Insert tape.</p>
Write-protect LED flashes amber.	Excessive tape errors.	Perform head cleaning procedure (Section 4.1) . If the error repeats, try another tape.
Both LEDs flash rapidly in unison	<ol style="list-style-type: none"> <li>1. Dirty heads or bad media.</li> <li>2. Drive error, possibly a hard failure.</li> </ol>	<p>Eject tape. Perform head cleaning procedure (Section 4.1) . If the error repeats, try another tape.</p> <p>Eject tape. Power the drive off and on. If the error repeats, replace the drive.</p>
After applying power, nothing happens. All indicators remain off.	No tape loaded.	Load tape.
Drive not available to system.	<ol style="list-style-type: none"> <li>1. Drive not plugged in.</li> <li>2. SCSI ID switches set to incorrect address.</li> <li>3. Defective SCSI cable.</li> <li>4. Incorrect SCSI cable termination</li> </ol>	<p>Check ac power source.</p> <p>Check SCSI ID switch.</p> <p>Ensure power cable is plugged in and that the SCSI cable is seated properly.</p> <p>Check information supplied in Deskside or Desktop Enclosure manuals to verify that current cable termination scheme is correct.</p>

## SWXTA-BL 16/32 GB 4-mm DAT Tape Auto-Loader SBB Installation and Operation

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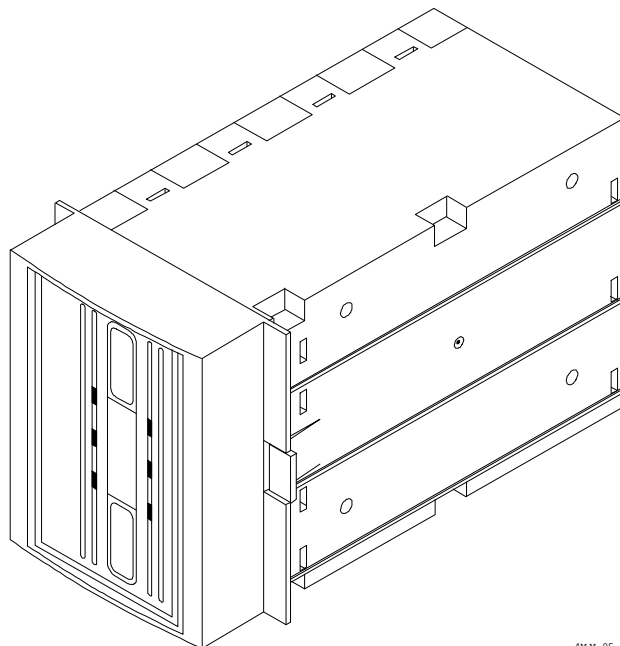
*This chapter describes the SWXTA-BL Auto-Loader, which contains the same 4-mm DAT tape drive used in the SWXTA-BA Tape Drive unit together with a four-cassette magazine and an associated cassette transport mechanism. This chapter provides an overview of the auto-loader unit, followed by operation and maintenance information specific to the auto-loader device.*

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### 5.1 Overview

The SWXTA-BL 16/32-GB 4-mm DAT Tape Auto-Loader SBB (Figure 5-1) provides very high-capacity unattended backup. It also supports the full SCSI-2 Random Access Command set. Packaged in an industry standard 5.25-inch full-height form factor, the auto-loader contains a 4-mm DAT tape drive (the same unit used in the SWXTA-BA model). The SWXTA-BL version is configured with an automatic four-cartridge magazine; when the unit is loaded with four 120-m tapes. It can provide up to 32 gigabytes of storage (compressed).

**Figure 5-1 SWXTA-BL Tape Drive Auto-loader SBB**



4M H -05

## 5.2 Unpacking

Unpack and inspect the contents of your shipment. The package should contain the following items:

- One SWXTA-BL 16/32-GB 4-mm DAT Auto-Loader cassette tape drive.
- Four blank 4-mm x 120-m cassette tapes (TLZ07-CA).
- One head-cleaning cassette.
- This guide.

Also, check the contents for damaged components. Notify your vendor immediately if any items are damaged. Keep all boxes and packing material for reshipment.

## 5.3 Preinstallation Procedures

### 5.3.1 Indicators and Controls

The SWXTA-BL Auto-Loader has four LED indicators and two pushbuttons on the front panel. Labels for these indicators are provided in four languages (English, French, German, and Spanish) and in two orientations (vertical and horizontal). Install the appropriate labels (Figure 5-2 shows the vertical English selection).

- **WRITE PROTECT** – an amber LED that comes on when the currently loaded tape cassette is write-protected.
- **CASSETTE** – a green LED that lights continuously when a cassette is loaded (that is, after the tape feeding mechanism has the tape in correct position for recording or reading). It flashes when there is drive activity (that is, while the tape feeding mechanism is moving the tape in or out of position or while data is being read to or from the tape).
- **DDS-2** – a green LED indicator that lights continuously when the cassette tape inside the auto-loader is a DDS2 tape.
- **The DC (data compression)** – a green LED that lights when data compression is enabled. Both the DC indicator and the DDS-2 indicator flash rapidly when a loader fault occurs.
- **The EJECT pushbutton** terminates any ongoing read/write operation, causes any tape cassette currently loaded in the internal tape drive to be unloaded and returned to the magazine, and then opens the carriage drawer to allow operator intervention, maintenance, tape changing, etc.
- **The SLOT SELECT pushbutton** is used to manually select a desired cassette for read/write activity.

If no cassette currently is mounted in the tape drive (the SEL SLOT message is displayed), tapping the SLOT SELECT pushbutton causes the mechanism to load Tape 1 into the tape drive.



If a cassette currently is mounted in the tape drive (the READY $n$  message is displayed, where “ $n$ ” identifies which tape is loaded), pressing the SLOT SELECT pushbutton once causes the mechanism to load the next-higher numbered tape. Similarly, pressing the SLOT SELECT pushbutton twice causes the mechanism to select and load the second-next-higher numbered tape, tapping the pushbutton three times will select and load the third-next-higher numbered tape, etc.

### 5.3.2 LED Message Display

The LED message display shows **activity** messages when the drive mechanism is performing any activity and shows **status** messages when the drive mechanism is not active.

#### 5.3.2.1 Activity Messages

The display has several activity messages

- READ when the drive is reading
- REWIND when the tape is being rewound in the cassette
- SCANNING when the magazine mechanism is checking the cartridge placement
- and so forth.

#### 5.3.2.2 Status Messages

When the drive is not active, the dot matrix display shows the current status of the auto-loader. Table 5-1 lists and describes the status messages.

**Table 5–1 Status Messages for SWXTA-BL Auto-Loader LED Display**

Message	Meaning
READY $n$	The cassette from magazine slot $n$ is loaded in the internal drive, and the drive is ready to accept commands.
EMPTY	There is no magazine in the loader, and there is no cassette in the drive.
SEL SLOT	A magazine is present in the loader, but there currently is no tape cassette in the drive. Use the SLOT SELECT button to choose and load any desired tape.
OPERATOR	Same as EMPTY, except that the drawer is open.
DISMOUNT	The drawer is open with the magazine unloaded (moved to the end of the carriage rollers). Remove the magazine from the carriage or press the EJECT button (or push the magazine into the carriage) to remount the magazine.
CHK MAG	A cassette is loaded in the magazine incorrectly. (This message alternates with the number of the slot you should check after dismounting the magazine.) Press Eject, dismount the magazine, and check the tape in that slot.
0 TAPES	The magazine you just loaded does not have any tape cassettes in it.

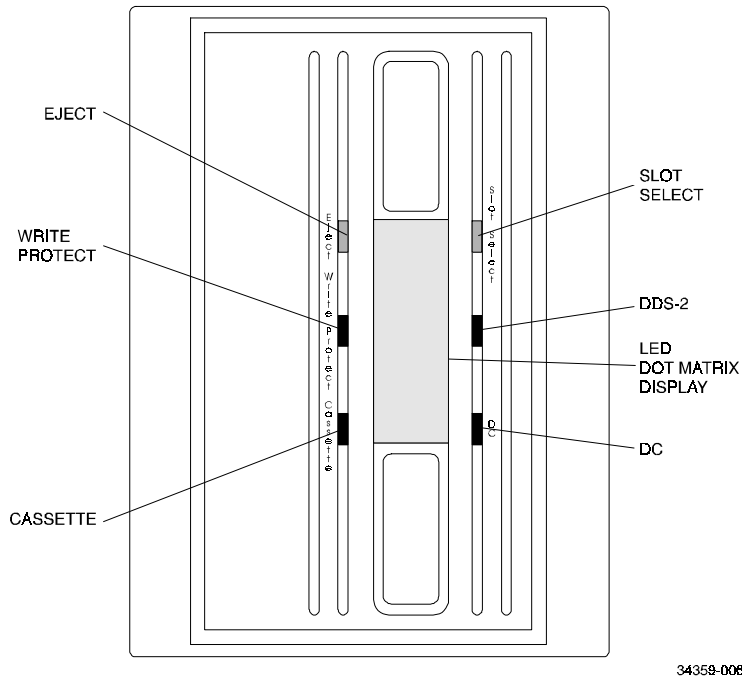
### 5.3.3 Setting the SCSI ID

The address switches on the rear of the auto-loader SBB (Figure 5-3) can be used to override the SBB default device address set by the storage subsystem. The StorageWorks Expansion

Storage Pedestal assigns a successive physical address to each successive mounting slot, 0 through 6 from top to bottom (slot 7 is reserved for the power supply).

The switches in the rear-panel switchpack are preset to the *automatic* code selection at the factory; this means that the auto-loader SBB has the device address number corresponding to the middle of the three contiguous storage subsystem slots in which the SBB is installed. Refer to Table 5-2 if you wish to set the SBB address to a specific SCSI ID.

**Figure 5-2 SWXTA-BL Tape Auto-loader Front Panel**

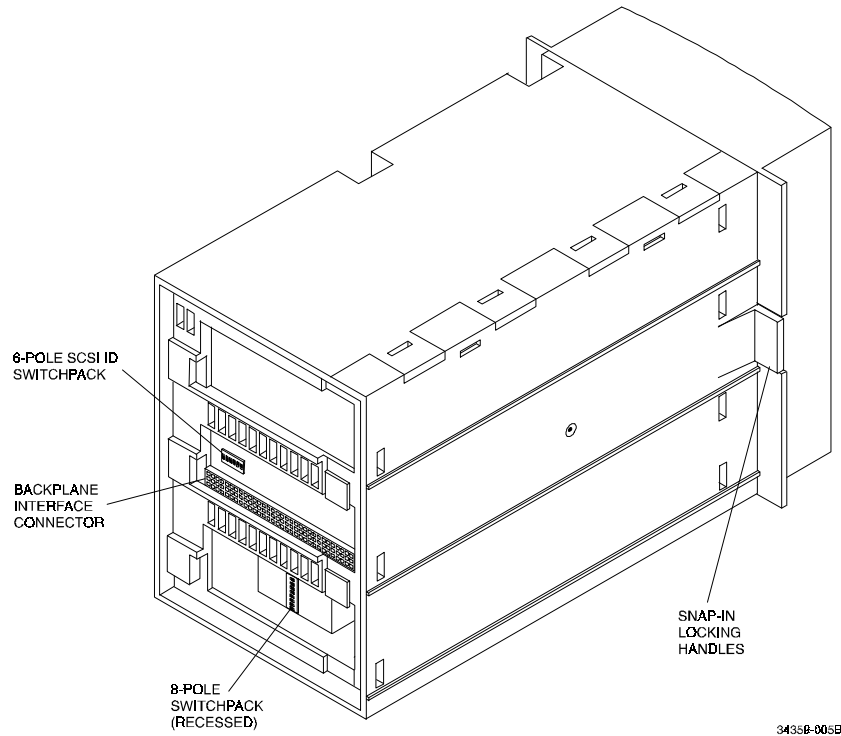


**Table 5-2 SWXTA-BL Auto-Loader SCSI ID Switch Settings**

Address	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6
0	Off	Off	Off	Off	Off	Off
1	On	Off	Off	Off	Off	Off
2	Off	On	Off	Off	Off	Off
3	On	On	Off	Off	Off	Off
4	Off	Off	On	Off	Off	Off
5	On	Off	On	Off	Off	Off
6	Off	On	On	Off	Off	Off
7*	On	On	On	Off	Off	Off
Automatic†	Off	Off	Off	On	On	On

\* Normally reserved for host.

† This setting sets the device address to the number of the storage subsystem slot in which the SBB is connected.

**Figure 5-3 SWXTA-BL Auto-Loader SBB SCSI ID Switch Location**

### 5.3.4 Internal Settings on Contained Tape Drive

Two switchpacks are located on the rear of the auto-loader SBB (Figure 5-3). One contains 3 switches and the other contains 8 switches. The 6-switch switchpack is described full in the previous paragraph.

Three of the switches on the 8-switch switchpack can be used to set the SCSI-ID (Table 5-3). These three switches must be off if you are using the 6-switch switchpack to set the SCSI ID.

The 8-switch switchpack is accessible through the lower opening on the rear of the auto-loader SBB. The switches should be left in the factory-set default settings as shown by the bold type in Table 5-3.

**Table 5-3 Switch Settings On Internal Tape Drive Unit**

Switch	Function	Default Settings & Explanation		
<b>S1</b>	SCSI ID-0	(lsb)	Off	These three switches should be <b>Off</b> at all times, leaving SCSI ID control to rear-panel switches.
<b>S2</b>	SCSI ID-1		Off	
<b>S3</b>	SCSI ID-2	(msb)	Off	
<b>S4</b>	MRS	Off = MRS; <b>On</b> = All (Reads DDS2 format)		
<b>S5</b>	Parity	Off = Disabled; <b>On</b> = Enabled		
<b>S6</b>	Pass-Thru	<b>Off</b> = DOS-DC (Compression enabled); On = DOS (Compression disabled)		
<b>S7</b>	Mode	<b>Off</b> = DEC; On = Archive		
<b>S8</b>	Self-Test	<b>Off</b> = Disabled; On = Enabled		

## 5.4 Installing the Auto-Loader SBB Into A StorageWorks Storage Subsystem

### CAUTION

Refer to the applicable documentation (see Appendices B, C, D, or E) for your host computer and/or your specific operating system before installing the drive. This installation procedure assumes that you have already installed and appropriately cabled the applicable StorageWorks storage device and have test that device so that it is ready to receive this SBB unit.

Install the auto-loader SBB in a StorageWorks storage device by inserting the drive so that the backplane interface connector in the center of the rear surface fits into the center of three slots. If the SCSI ID address is set on the rear-panel switchpack, the unit will always be identified as being at that address regardless of which slots it is mounted in.

If you set the switchpack setting for automatic, the unit assumes the SCSI ID address associated with the slot of the backplane interface connector.

The drive can be installed using the *hot-swap* method, where the drive is installed with the host system powered on and operating, or with the host system powered off. Before using the *hot-swap* method, consult your system administrator to ensure that your operating system supports this type of installation.

To install the auto-loader SBB is an Expansion Storage Pedestal:

1. Open the door on the front bezel of the Pedestal subsystem (refer to the instructions contained in the documentation that came with the pedestal) and remove the front bezel.
2. Remove the filler panels (or other SBBs) from any desired three adjacent device slots in the storage subsystem by squeezing the locking handles at the ends of the panels (or SBBs) and removing the panels (or SBBs).
3. Install the auto-loader SBB by sliding the unit into the open slots. Push the unit in firmly until its locking handles snap into place with an audible click.
4. Perform the POST test, as described in the Section 5.6, to verify the operational integrity of the auto-loader unit.

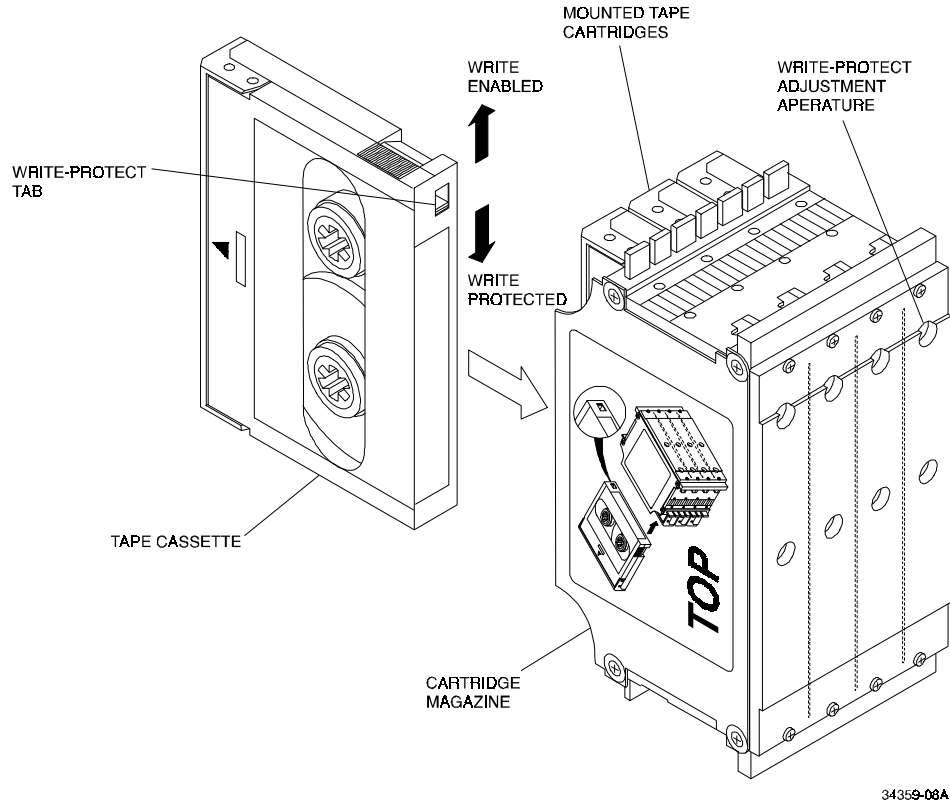
## 5.5 DAT Cassette Tapes

The SWXTA-BL Auto-Loader SBB uses the same cassette tapes (Figure 5-4) as the SWXTA-BA Tape Drive SBB. The auto-loader SBB handles up to four different tapes at once in its magazine. The tape cassettes slide into individual slots in the cartridge and are identified by the auto-loader mechanism as Tapes 1 through 4 (left to right when the unit is mounted in its vertical orientation, as in a "pedestal" storage subsystem; top to bottom when the unit is mounted in its horizontal orientation, as in a storage shelf).

Each tape cassette contains a write-protect switch (a plastic tab with a contrasting color with respect to the body of the cassette). When mounted in the magazine, the write-protect switch is visible and accessible through a round hole in the plastic front face of the magazine. To "write-protect" the tape, slide the tab toward the center of the cassette ("down" in the vertical orientation, "left" in the horizontal orientation). To "write-enable" the tape, slide the tab away from the center ("up" in the vertical orientation, "right" in the horizontal orientation).

Check each tape cassette carefully for wear before mounting it in the magazine, or, whenever a CHK MAG status message is presented by the LED message display. A worn tape cassette shows a wear line across the gear-like grooved edges at the ends of the tape cassette where the rollers come into contact with the tape. When you find this wear line to be occurring, replace the tape.

**Figure 5-4 4-mm DAT Tape Cassette with Write Enable/Protect Tab shown with 4-Cartridge Magazine Used in SWXTA-BL Auto-Loader**



#### NOTE

You can order additional 4-cartridge magazines (Part No. TLZ6L-04), or data cartridges (Part No. TLZ07-CA for single 120-m length tapes; Part No. TLZ07-CB for 5-cartridge packages of 120-m length; TLZ06-CB for 5-cartridge packages of 90-m length, TLZ04-CB for 5-cartridge packages of 60-m length) or cleaning cartridges (Part No. TLZ04-HA), by contacting your reseller or calling DECdirect at 800-DIGITAL. In Canada, dial 800-267-6215.

## 5.6 Power-On Self-Test (POST)

The POST verifies the proper installation of the auto-loader including both the tape drive and the associated cassette-loading mechanism. The test may be performed with your host computer powered on and connected (*hot-swap* method) if your operating system permits, or with the host system powered off or disconnected (*cold-swap* method). The following procedure assumes that the host is off or not connected. Refer to Figure 5–2 for the locations of the front panel LED indicators on the drive.

### CAUTION

Do not install an auto-loader SBB containing a loaded magazine and do not apply power to an auto-loader SBB containing a magazine holding one or more tape cassettes. The physical energy of pushing the auto-loader SBB into place in the storage subsystem can cause one or more loaded cassettes to slide backward in the magazine. The resulting extension of the cassette(s) could interfere with the magazine scanning mechanism and even jam that mechanism, causing damage to the tape cassette(s). Always install the auto-loader SBB empty and then mount the magazine after the cassette-loading mechanism has completed its preliminary cycle as described in the following procedure.

### NOTE

In the following test, if the WRITE-PROTECT indicator flashes amber and the CASSETTE indicator flashes green continuously for more than 30 seconds, the Auto-Loader SBB has failed. Press EJECT to dismount the cartridge then repeat the full procedure (power off and then on) to clear the failure. If the AUTO-LOADER SBB unit still fails, replace the unit.

To execute POST:

1. Ensure that there are no tape cassettes in the auto-loader (keep magazine outside).
2. Power on the storage subsystem (or insert empty auto-loader SBB into powered storage subsystem) and observe the following sequence:
  - a. The amber WRITE-PROTECT and green CASSETTE indicators flash repeatedly while the mechanism checks the successive slot positions, after which the indicators remain off.
  - b. The front-panel LED dot matrix display presents EMPTY message.
3. Press front-panel EJECT push-button switch and observe following sequence:
  - a. Front-panel LED dot matrix display presents OPENING message.
  - b. Auto-loader drawer slides forward out of SBB to its full extended position.
  - c. LED dot matrix display presents OPERATOR message.
4. Holding the tape cassette magazine with clear plastic front towards you and the free back ends of tape cassettes towards the front of the auto-loader SBB, align the right side of the magazine with the cutout aperture in the left side of the extended drawer and gently slide

the magazine to the right, pushing it into the aperture until the rollers accept the magazine (as confirmed by display of the SCANNING message). Observe the following sequence:

- a. LED display shows the SCANNING message.
  - b. Mechanism pulls the magazine laterally into the carriage.
  - c. LED display shows the CLOSING message.
  - d. Auto-loader drawer slides back into the SBB.
  - e. LED display shows the 4 TAPES message (or lesser number count, as appropriate).
  - f. LED display shows the SEL SLOT message.
5. Select the cassette you wish to access by pressing the SLOT SEL pushbutton.
- a. LED display shows the SEL n message, where “n” is the digit corresponding to the slot number you selected, with this message flashing.
  - b. LED display shows the LOAD n message, where “n” is the digit corresponding to the slot number you selected.
  - c. Amber WRITE PROTECT indicator flashes and goes off.
  - d. Green CASSETTE indicator flashes at 2-Hz rate while carriage mechanism moves magazine into position and slides tape cassette into internal tape drive.
  - e. Green Cassette indicator flashes at 2-Hz rate while the tape drive moves the tape to the designated position.  
If the write-protect slide switch on the selected tape cassette was previously pushed down (or left, in the case of a cassette being mounted in the horizontal orientation) to its write-protect position, the amber Write Protect indicator flashes during this same period.
  - f. LED display shows the READY n message, where “n” is the digit corresponding to the slot number you selected, and the DC and Cassette indicators steadily lit. If the selected tape cassette is set for write protection, the amber WRITE PROTECT indicator is also steadily lit.

At this point, the auto-loader SBB has passed the power-on self-test and is ready for operation.

If you wish to check out the autoloader’s capability to select a different tape cassette or to eject the present magazine, you can continue by performing either or both of the following steps:

1. To select a different cassette in the same magazine, select the cassette by pressing the SLOT SELECT pushbutton until the desired cassette is selected. Following your selection, observe the following sequence:
  - a. LED display shows the EJECT n message, where “n” is the digit corresponding to the slot number currently selected.
  - b. The green CASSETTE indicator blinks and then all indicators go out.
  - c. The amber WRITE PROTECT indicator flashes and goes off.
  - d. The green CASSETTE indicator flashes at 2-Hz rate while carriage mechanism moves the magazine into position, withdraws the cassette from the internal tape

- drive, moves the magazine to new position, and feeds the selected cassette into internal tape drive.
- e. The LED display shows the LOAD n message, where “n” is the digit corresponding to the new slot number.
  - f. The green Cassette indicator flashes at 2-Hz rate while the tape drive moves the cassette into position.
  - g. The LED displays the SEL n message, where “n” is the digit corresponding to the slot number selected, with this message flashing on and off.
  - h. The amber WRITE PROTECT indicator flashes and goes off.
  - i. The green CASSETTE indicator flashes at 2-Hz rate while the carriage mechanism moves the magazine into position, and slides the cassette into the internal tape drive.
  - j. If the write-protect slide switch on the newly selected tape cassette is in the write-protect position, the amber Write Protect indicator flashes during this same period.
  - k. The LEDs display the READY n message, where “n” is the digit corresponding to the new slot number and the DC and Cassette indicators are steadily lit. If the selected tape cassette is set for write protection, the amber WRITE PROTECT indicator also remains lit.
- 2 To dismount the presently loaded magazine from the auto-loader SBB, press the EJECT pushbutton and observe following sequence:
- a. The EJECT n message is displayed, where “n” is the digit corresponding to the currently selected slot number.
  - b. The green CASSETTE indicator blinks and the DC OK indicator is lit.
  - c. The green CASSETTE indicator flashes at 2-Hz rate while carriage mechanism moves the magazine into position and withdraws the cassette from the internal tape drive and then goes off.
  - d. The OPENING message is displayed.
  - e. The auto-loader carriage drawer slides forward out of the SBB.
  - f. The EJECTING message is displayed.
  - g. Carriage mechanism slides the magazine laterally to the left, extending the magazine approximately 1/2-inch out of the left side of the carriage assembly.
  - h. The DISMOUNT message is displayed. You can now remove the magazine from the carriage by grasping the extended portion of the magazine and then pulling it sideways out of the carriage assembly if the unit is mounted vertically or pulling it upward if the unit is mounted horizontally.

Replace the front bezel of the storage subsystem and have your system administrator assign a device name to the auto-loader SBB.

## 5.7 Operational Options

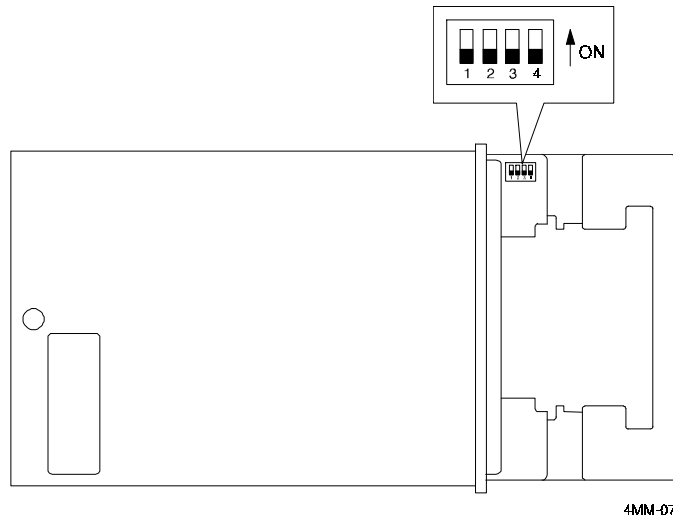
The following paragraphs describe options that can be selected for the SWXTA-BL Auto-Loader SBB. These options are established by setting switches on the SW2 switchpack. The switchpack is accessible only when the auto-loader drawer is open. Figure 5-5 shows a top view of the auto-loader and the location of the SW2 switchpack, which is located beneath a



rubber dust cover inside the drawer. To gain access to the SW2 switchpack, pry up one corner of the rubber dust cover and lift the cover away from the switches.

Table 5-4 lists the settings and functions of the SW2 auto load/display switches. Two of the switches (SW2-1 and SW2-2) are functional and the other two (SW2-3 and SW2-4) are reserved.

**Figure 5-5 Location of SW2 Switchpack on SWXTA-BL Auto-Loader SBB**



**Table 5-4 SW2 Switchpack Switch Settings and Functions**

Switch	Function
SW2-1	Display Orientation
SW2-2	Auto-load
SW2-3	Reserved
SW2-4	Reserved

You can select a vertical or horizontal orientation of the Message Display by setting switch SW2-1. When you set this switch to ON, the Message Display is vertical as desired when the Auto-Loader SBB is being used in a StorageWorks Expansion Storage Pedestal. When this switch is OFF, the display is horizontal, as desired when the Auto-Loader is being used in a StorageWorks storage shelf.

SW2-2 controls the loading function of the first cassette into the loader. When you set this switch to ON, the auto-loader automatically loads the cassette in the magazine's first slot.

The SW2-3 and SW2-4 switches are reserved for future use and should be left OFF.

## 5.8 Operation

The SWXTA-BL Auto-Loader can be operated two ways: automatically or manually. It has two modes: sequential and random access

### 5.8.1 Automatic Operations

During automatic operations, the SWXTA-BL Auto-Loader can function in *sequential* and *random access* modes at the same time.

By default, the loader performs in a sequential access mode. Upon receipt of the SCSI UNLOAD command, the current tape is removed from the drive and replaced into the magazine. The loader mechanism increments to the next position. The drive will now load the new tape into the drive mechanism and proceed to BOT.

#### CAUTION

The logic that stops the incrementation process after the last tape is selected does not inhibit the manual process of selecting the next tape cassette in sequence by pressing the SLOT SELECT switch. This means that manual operation may result in overwriting data, as the tape loading mechanism will simply keep rotating through the same four tape cassettes.

In addition, the loader responds to all SCSI random access commands. These commands can be intermixed with sequential mode operation.

### 5.8.2 Manual Operations

Manual operations are performed from the front of the auto-loader.

To load a magazine, press the EJECT pushbutton. This opens the drawer and ejects any magazine that is in the drive. Place the magazine in the mouth of the loader until the rollers engage the magazine. The loader automatically scans the magazine to make sure the cassettes are loaded correctly and to count the number of cassettes loaded. The drawer then closes and the LED matrix display produces an “n TAPES” message to report how many cartridges are loaded. If the magazine is empty, the matrix displays a CHK MAG message.

To load a cassette, press the SLOT SELECT pushbutton. Press it once to load the first cassette, twice to load the second cassette, and so on. If you make a mistake, continue pressing the SLOT SELECT pushbutton until the current state is shown on the message display. When you make a selection with the SLOT SELECT button, the message display first identifies the slot number of the currently loaded tape cassette, then reports the slot number of the tape cassette that has been selected to be loaded while the cassettes are being moved out from and into the internal tape drive, and then reports when the newly selected tape cassette is ready for any desired operation.

To eject the magazine, press the EJECT pushbutton. This ejects any cassette that is in the drive, opens the drawer, and ejects the magazine. You can then remove the magazine.

### 5.8.3 Single Cassette Operation

Under certain circumstances, you may want to work with a specific tape cassette without using the magazine. If a magazine is in the drive, press EJECT to eject the magazine. When the mouth of the loader is empty, you can load a single cassette in the drive, which should accept the cassette and load it. To eject that cassette, press the EJECT pushbutton; the mechanism will move the cassette into to the mouth of the loader (where the magazine normally would be), allowing you to remove the cassette.

## 5.9 Routine Maintenance

### 5.9.1 Cleaning the Rollers

It is recommended that the rollers be cleaned once every six months, or after every 10,000 load/unload cycles. To clean the rollers, proceed as follow:

1. Press the front-panel EJECT pushbutton to open the drawer and then remove the magazine.
2. Dip one end of a lint-free cotton swab in ethyl alcohol.
3. Press the SLOT SELECT pushbutton three times within a 3-second period. This sequence starts rotation of the cassette rollers. They will rotate for 15 seconds and the message display reads **CLEAN 1**.
4. During the first few seconds of this rotation period, wipe the rollers with the wet end of the swab for a few seconds.
5. During the next few seconds of this same rotation period, use the dry end of the swab to wipe the rollers dry as they rotate.
6. Press the SLOT SELECT pushbutton three times within a 3-second period for a second time. This sequence starts rotation of the left-side magazine rollers. They will rotate for 15 seconds and the message display reads **CLEAN 2**.
7. Repeat steps 4 and 5 for the left-side magazine rollers.
8. Press the SLOT SELECT pushbutton three times within a 3-second period for a third time. This new sequence starts rotation of the right-side magazine rollers. They will rotate for 15 seconds and the message display reads **CLEAN 3**.
9. Repeat steps 4 and 5 for the right-side magazine rollers.

### 5.9.2 Cleaning the SWXTA-BL Auto-Loader Read/Write Heads

Refer to Chapter 3, Section 3.1, for information on cleaning the read/write heads in the SWXTA-BA tape drive SBB. This information applies to the internal tape drive inside the SWXTA-BL tape auto-loader SBB.

## SWXTA-BT 4/8 GB, 4 mm DAT Desk Top Tape Drive

---

*This chapter describes the SWXTA-BT Desk Top Tape Drive which contains the same 4-mm DAT tape drive used in the SWXTA-BA Tape Drive SBB. This chapter provides an overview of the Desk Top Tape Drive followed by operation and maintenance information specific to the device. Chapters 1 through 4 are applicable to the tape drive mounted in the table top unit and to the tape cassettes used with the drive (exception, refer to "Data Formats" in this chapter.*

---

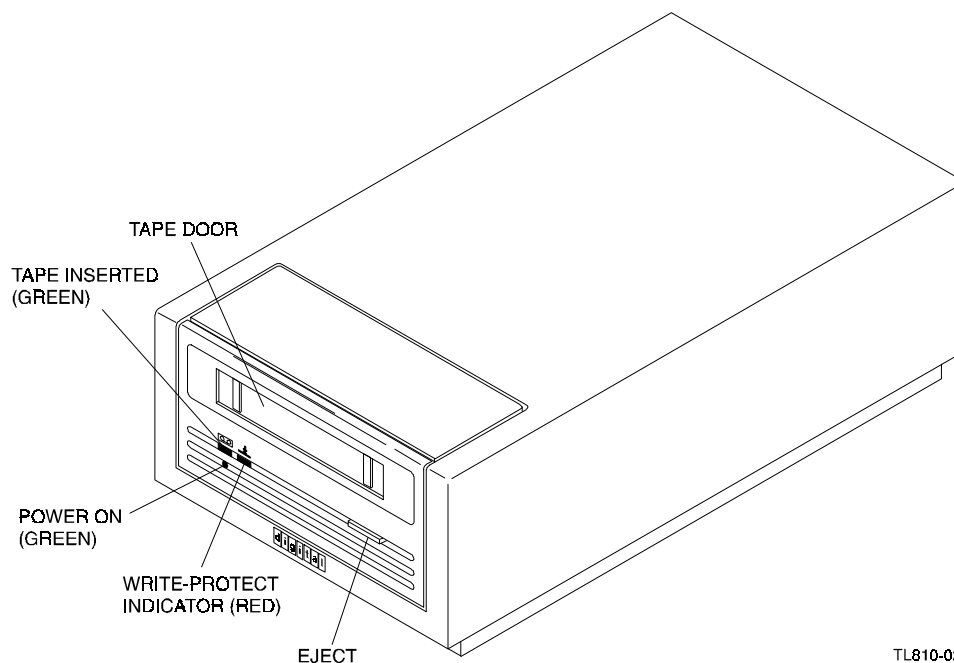
### 6.1 Overview

The SWXTA-BT 4/8 GB, 4 mm DAT Desk Top Tape Drive provides a high-capacity tape drive in a desk top package. It supports the full SCSI-2 Random Access Command set. The desk top unit contains a 4-mm DAT tape drive and a built-in power supply.

#### 6.1.1 Front Panel Features

Figure 6-1 shows the front panel of the Desk Top Tape Drive. The callouts show the various indicator lights and the Tape Unload Button.

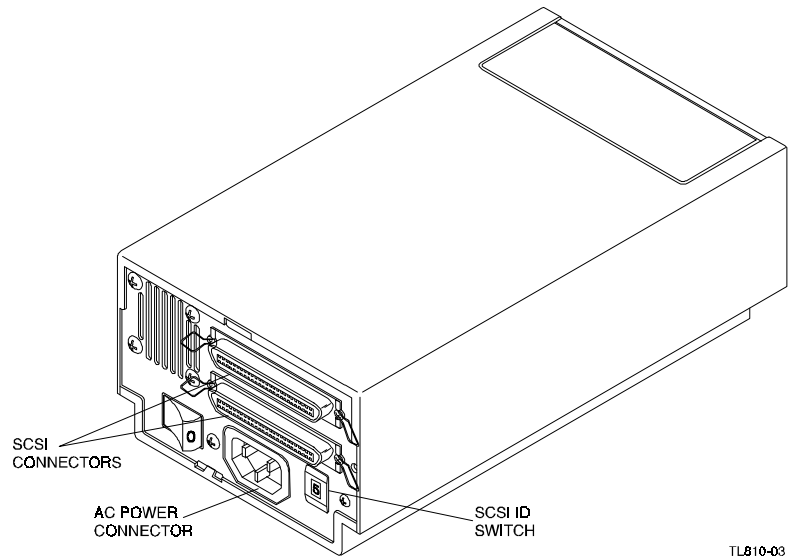
**Figure 6-1 SWXTA-BT 4/8 GB, 4 mm DAT Desk Top Tape Drive**



### 6.1.2 Rear Connectors and Switches

Figure 6-3 shows the connectors and switches that are on the rear of the Desk Top Tape Drive.

**Figure 6–2 Desk Top Tape Drive Rear Connectors and Switches**



## 6.2 Data Formats

### NOTE

This is an exception to the data format explained in Chapter 1.

The tape drive can operate in three formats:

1. DDS (Digital Data Storage, now sometimes called DDS1).
2. DDS2 (an improved format).
3. DDS-DC (which is a data compression technique applied to either of DDS1 or DDS2).

The desk top tape drive automatically detects whether a loaded tape is DDS1 or DDS2 format and adopts the appropriate processing format for that tape. The tape drive defaults to DDS2 format but will read/write in DDS1 or DDS-DC<sup>1</sup> formats when so directed by the application software.

### NOTE

The desk top tape drive is internally set to default to the DDS2 mode. However, operating system commands or third party application software may change the tape drive's recording function from non-compressed to compressed modes.

<sup>1</sup> Exception: HP9000 Series 700 systems running HP-UX or later - see note at bottom of page D-2.

## 6.3 Installation

If you are installing the SWXTA-BT Desk Top Tape Drive on a running system, have your system manager perform the following:

- Shut down the operating system
- Halt the system
- Set all system power switches off

### 6.3.1 Setting the SCSI ID

Refer to Figure 1 and locate the SCSI ID switch on the rear of the desk top unit. The unit is preset from the factory with the SCSI ID set to 5. If you want to change the setting, press the + or - buttons on the SCSI ID switch until the desired ID number appears in the window.

### 6.3.2 Connecting and Terminating the SCSI Bus

The table top tape drive contains two SCSI cable connectors on the rear of the unit. Either connector can be used to connect the table top tape drive to the host computer or another SCSI device. Table 6-1 contains a list of the possible cables that can be used to connect the table top tape drive to the host computer and/or to another SCSI device.

**Table 6-1 SWXTL-BT Interface Cables**

Application	Drive-end Connector	Host-end Connector	Digital SCSI Cable Part Number	
Low-density to Low-density cable <sup>1</sup>	Low-density 50-pin	Low-density 50-pin	BC19J-03	1.0 meters
			BC19J-06	2.0 meters
Low-density to High-density cable <sup>2</sup>	Low-density 50-pin	High-density 50-pin	BN23G-01	1.0 meters
			BN23G-02	2.0 meters

1. The 50-pin low-to-low density cable is compatible with most ISA-type SCSI adapters.

2. The 50-pin low-to-high density cable is compatible with either of:

- a. Most EISA-bus SCSI adapters.
- b. Daisy-chain connections to other StorageWorks expansion enclosures.

#### 6.3.2.1 Connecting the Tape Drive to the Host Computer

If the tape drive is the last (or only) SCSI device on the SCSI bus, a single interface cable is attached to one of the connectors and a SCSI bus terminator is installed in the second connector.

1. Connect one end of the cable to the host computer SCSI output connector.
2. Connect the other end of the cable to either connector on the rear of the table top tape drive. Use the clips attached to the SCSI connector to secure the cable connectors to the host and tape drive.
3. Check that a SCSI bus terminator is installed in the bottom connector. If this is the last device on the SCSI bus, do not remove the terminator. If the table top tape drive is in the middle of the SCSI bus, remove the terminator and make sure that the last device on the SCSI bus is terminated properly.

### 6.3.2.2 Connecting the Tape Drive Between Two Existing SCSI Devices

If the drive is connected between two existing SCSI devices (or the host computer and another SCSI device, the interface cable from the preceding device is attached to one connector and the interface to the following device is attached to the second connector.

1. If present, remove the SCSI terminator from the existing SCSI device
2. Connect one end of the cable to the existing SCSI device. Use the clips attached to the SCSI connector to secure the cable connector to the device.
3. Connect the other end of the cable to either connector on the rear of the table top tape drive. Use the clips attached to the SCSI connector to secure the cable connector to the tape drive.
4. Install the SCSI bus terminator into the other SCSI connector on the rear of the table top tape drive. Use the clips attached to the SCSI connector to secure the terminator the tape drive.
5. If another SCSI device follows the tape drive, use an appropriate SCSI cable to connect the tape drive to the following device. Use the clips attached to the SCSI connector to secure the cable connectors to the tape drive and the following SCSI device.

**NOTE**

Make sure that the last SCSI device on the SCSI bus is terminated properly.



## Specifications

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*This appendix describes the physical, electrical, and environmental specifications for the various tape drive configurations.*

---

**Table A–1 Tape Drive Specifications.**

Characteristic	Specification(s)
Tape Drive Dimensions (SWXTA-BA)	216 x 127 x 48 mm (8.5 x 5 x 1.875 in.)
Tape Drive Weight (SWXTA-BA)	1 kg. (2.2 lbs.)
Autoloader Dimensions (SWXTA-BL)	216 x 127 x 48 mm (8.5 x 5 x 1.875 in.)
Autoloader Weight (SWXTA-BL)	3.45 kg (7.6 lbs.)
Mode of Operation	Streaming, and start/stop
Drive Interface	SCSI-2/single-ended/async/sync/narrow/fast
Media (4 mm x 60 m)	TLZ04-CA cassette tape
Media (4 mm x 90 m)	TLZ06-CA cassette tape
Media (4 mm x 120 m)	TLZ07-CA cassette tape
Reposition Time	1.4 secs (average)
Media Bit Density	114 Mbits per square inch
Transfer Rate (sustained)	800 KB/s, compressed <sup>1</sup> 400 KB/s (minimum), uncompressed (1.5 MB/s async burst; 4.0 MB/s sync burst)
Recording Format	Digital data storage (DDS, DDS2, and DDS-DC)
Cassette Capacity (typical)	4 GB with 120-meter tape, uncompressed; 8 GB (typical) with 120-m tape and data compression <sup>2</sup>
Passes Per Cassette Tape	300
Power Consumption	9 W average, 12 W maximum
Power Requirements SWXTA-BA:	+5 Vdc, 0.89 A typical; 1.2 A maximum +12 Vdc, 0.2 A typical; 1.15 A maximum
SWXTA-BT:	100 to 240 Vac, 0.3 A typical, 12 Watts
Operating Temperature	10 °C to 40 °C (50 °F to 104 °F)
Non-Operating Temperature	-40 °C to 70 °C (-40 °F to 158 °F))
Operating Humidity	10 to 90% RH, maximum, non condensing
Operating Altitude	0 to 2.4 km (0 to 8,000 ft.)

<sup>1</sup> Varies with compressibility of data. Given value of 800 KB/s assumes 2:1 compression ratio.  
<sup>2</sup> Assumes a 2:1 compression ratio.



**Table A-2 4/8-GB 4-mm DAT Tape Drive Noise Declaration**

<b>Acoustics – declared values per ISO 9296 and ISO 7779:</b>		
<b>Operating Mode</b>	<b>LwAd</b>	<b>LpAm (bystander positions)</b>
Idle	4.2 B <sup>†</sup>	34 dBA
Operating	4.3 B <sup>†</sup>	35 dBA
† 1B = 10 dBA		



## *Product Notes for Sun™*

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*This appendix describes how to include the single DAT tape drive SBB (SWXTA-BA) in a Sun SPARC system running Solaris™ 2.3 (or later) or SunOS™ 4.1.x. The information covers configuration of the host system to communicate with the tape drive.*

---

### **B.1 General Information**

You must rebuild your kernel, with the parameters given, to ensure that your device functions properly.

When using the **dump** utility under SunOS 4.1.x, you must supply the correct “d bpi” (density code) and “s size” tape length for **dump** to calculate the correct number of tapes required. The “b factor” (blocking factor) is of less importance, and we recommend a value of 126 for that parameter.

Compression can be enabled/disabled at any time by selecting the appropriate device file. See the following sections on “st\_conf.c” and “st.conf” for details on how we configure density codes.

In general, the density code hex value 0xfd turns off compression and the code 0xfe turns it on. Since four driver variations are created, a number of combinations are possible. We configured our systems for two drivers without compression and two drivers with compression; you may decide that some other combination is more suitable for your system.

### **B.2 Modifications Required for SunOS 4.1.x**

#### **B.2.1 Installation Procedure**

##### **NOTES**

1. The "DEC TLZ07" designation in the following procedure is the StorageWorks internal name for the tape drive, as incorporated in and used by the firmware.
2. In order to support the addition of this device, your system's /sys/scsi/targets/st\_conf.c file must contain the applicable drive information. For additional information on this requirement, read the **man** pages for "st".

---

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### B.2.1.1 System Modification

Perform the following steps to modify the system for communication with the tape drive:

1. From the command line, type:

```
cd /sys/scsi/targets
```

2. Edit the "**st\_conf.c**" file and *carefully* add the following structure before the "/\* TLZ07 4mm 4GB \*/" entry:

```
/* Entry for DEC TLZ07. DAT 4mm Helical Scan tape drive, /w Compression.
*/
{
    "DEC 4GB 4mm Helical Scan", 13, "DEC^^^^^TLZ07",
    ST_TYPE_DEFAULT, 512,
    (ST_VARIABLE | ST_BSF | ST_BSR | ST_LONG_ERASE | ST_KNOWS_EOD),
    5000, 5000,
    { 0xfd, 0xfd, 0xfe, 0xfe },
    { 0, 0, 0, 0 }
},
```

3. Verify that the above entry is added to the `st_conf.c` file correctly.

Where,

- The first parameter (DEC 4GB 4mm Helical Scan) is the name given to the drive.
- The second parameter (13) is the length of the vendor ID provided by the "inquiry" command.
- The third parameter (DEC^^^^^TLZ07) is the vendor ID. (Ensure that five spaces are included between "DEC" and "TLZ07" elements.)
- The fourth parameter (ST\_TYPE\_DEFAULT) is the drive type for the driver.
- The fifth parameter (512) is the block size in bytes.
- The sixth parameter (ST\_VARIABLE | ST\_BSF | ST\_BSR | ST\_LONG\_ERASE | ST\_KNOWS\_EOD) comprises the drive options.
- The seventh parameter (5000) is the maximum number of read retries.
- The eighth parameter (5000) is the maximum number of write retries.
- The ninth parameter (0xfd, 0xfd, 0xfe, 0xfe) comprises the density codes (low \_ hi) as defined below:
  - 0xfd is the vendor-unique density code for the 120-m DDS2 tape in the uncompressed mode (4.0 GB).
  - 0xfe is the vendor-unique density code for the 120-m DDS2 tape in the compressed mode (8.0 GB).
- The tenth parameter ( 0, 0, 0, 0 ) is the speed code (not used).

### B.2.1.2 Rebuilding of Kernel

After you have edited the "**st\_conf.c**" file and added the above entry, rebuild the kernel using the standard procedure (for further help, refer to the **man** pages of the **config** command).

### B.2.1.3 Installation of tape drive

Install the tape drive into the storage subsystem and power on the workstation. We recommend that the tape drive's SCSI device address be set to ID 4 or to ID 5.

#### NOTE

If your SCSI host adapter is supported by the "probe-scsi" command, you can use this command at the boot prompt to verify that the connected device is correctly attached to the system.

### B.2.1.4 Rebooting of system

Reboot the system, using the following command at the boot prompt:

```
>boot
```

The system reboots with the newly compiled kernel and creates special files in **/dev** so that it can communicate with the tape drive. Verify that "DEC 4GB 4mm Helical Scan" is displayed as a target when the system is booting.

At this time the tape is configured in the **/dev** directory with "**rst**" (rewind on close) and "**nrst**" (no rewind on close) format. If the entry in the kernel configuration file for the tape drive were **st0**, for example, then "**rst**" would be "**rst0, rst8, rst16, rst24**" and **nrst** would be "**nrst0, nrst8, nrst16, nrst24**".

- **Rst0** and **nrst0** correspond to the **0xfd** density mode (120-m DDS2 tape, *uncompressed* format).
- **rst8** and **nrst8** correspond to the **0xfd** density mode (120-m DDS2 tape, *uncompressed* format).
- **rst16** and **nrst16** correspond to the **0xfe** density mode (120-m DDS2 tape, *compressed* format).
- **rst24** and **nrst24** correspond to the **0xfe** density mode (120-m DDS2 tape, *compressed* format).

### B.2.1.5 Testing the Tape Drive

To test the tape drive, back up the "**passwd**" file to tape using the "tar" command, as follows:

```
tar -cvf /dev/rst0 /etc/passwd
```

The system responds with something similar to the following:

```
a /etc/passwd 1 blocks
```

Note that depending on the size of the file, a different number of blocks may be reported.

### B.2.1.6 Verification

Verify that the "**passwd**" file was written to tape using the following command:

```
tar tvf /dev/rst0
```

The system responds with something similar to the following:

```
rw-r--r-- 0/10 535 Mar 23 16:31 1994 /etc/passwd
```

The installation and verification procedure is now complete.

### B.2.2 Dump Parameters for the Tape Drive

The parameters that should be used when running the dump utility with the tape drive are:

density = 61000 (for DDS1 or DDS2 tapes)

size = one of the following, as appropriate:

6656 (for 60 meter tapes)

10240 (for 90 meter tapes)

20480 (for 120 meter tapes)

blocking factor = 126

#### *Example 1*

The following example shows the command for backing up an entire disk partition onto the tape drive, using a 120-meter tape:

```
dump 0dsbf 61000 20480 126 /dev/rst0 /dev/sd0g
```

For further help, refer to **man** pages of the **dump** command.

## B.3 Modifications Required for Solaris 2.3 (or later)

### B.3.1 Installation Procedure

#### NOTES

1. The "DEC TLZ07" designation in the following procedure is the StorageWorks internal name for the tape drive, as incorporated in and used by the firmware.
2. In order to support the addition of this device, drive information must be supplied in the */kernel/drv/st.conf* file as global properties that apply to each of the targets, or as properties that are applicable to one target only. The "st driver" looks for the property called "tape-config-list". For additional information, read the **man** page "st". We recommend here the use of the global properties approach.

#### B.3.1.1 System Modification

Perform the following steps to modify the system to communicate with the tape drive:

1. From the command line, type:

```
cd /kernel/drv
```

2. Edit the “**st.conf**” file by adding the following before the first occurrence of “name=”:

```
# entry for TLZ07 tape drive
tape-config-list = "DEC^^^^^TLZ07",
" DEC 4GB 4mm Helical Scan", "TLZ07-data";
TLZ07-data = 1,0x34,0,0x1639,4,0xfd,0xfd,0xfe,0xfe,3;
```

where:

In the “**tape-config-list**” parameter:

- The first parameter (DEC^^^^^TLZ07) is the parameter returned by the tape drive on a SCSI inquiry command. (There should be five spaces between “DEC” and “TLZ07” elements.)
- The second parameter (DEC 4GB 4mm Helical Scan) is a *nickname* for the tape drive.
- The third parameter is defined as follows:

In the “TLZ07-data” string:

- The first parameter (1) is the revision level of the software and is set to 1.
- The second parameter (0x34) is the tape type, specifying “other” tape drive. (This is defined in /usr/include/sys/mtio.h.)
- The third parameter (0) is the block size in bytes.
- The fourth parameter (0x1639) defines the options selected. The 0x1639 value represents the following options:
 

ST_VARIABLE	= 0x0001
ST_BSF	= 0x0008
ST_BSR	= 0x0010
ST_LONG_ERASE	= 0x0020
ST_KNOWS_EOD	= 0x0200
ST_UNLOADABLE	= 0x0400
ST_LONG TIMEOUTS	= 0x1000
- The fifth parameter (4) defines the number of densities. The maximum definable number of densities is 4.\*
- The sixth through ninth parameters (0xfd, 0xfd, 0xfe, 0xfe) comprise the density codes (low\_hi) as defined below:
  - 0xfd is the vendor-unique density code for the 120-m DDS2 tape in the *uncompressed* mode (4.0 GB).
  - 0xfe is the vendor-unique density code for the 120-m DDS2 tape in the *compressed* mode (8.0 GB).
- The last parameter in the data string is the default density of 3 for the 120-m DDS2 tape in the compressed mode.

\*This maximum definable number of densities is a Sun Operating System limitation.

### B.3.1.2 System Shutdown

After you have edited the “**st.conf**” file, shut down the system as follows:

```
sync
cd /
shutdown -i0 -g0 -y
```

### B.3.1.3 Installation of the Tape Drive

Install the tape drive into the storage subsystem and power on the workstation. We recommend that the tape drive’s SCSI device address be set to ID 4 or to ID 5.

#### NOTE

If your SCSI host adapter is supported by the “`probe-scsi`” command, then you can use this command at the boot prompt to verify that the connected device is correctly attached to the system.

### B.3.1.4 Rebooting of System

Reboot the system using the following command at the boot prompt:

```
>boot -rv
```

Note that the switch “**r**” forces the kernel to be re-configured, and switch “**v**” enables a display of the system configuration at boot time.

The system compiles the kernel and creates special files in **/dev** so that it can communicate with the tape drive. Since you booted the system using the verbose switch, the system displays all of its SCSI targets. Verify that “DEC 4GB 4mm Helical Scan” is displayed as a target when the system is booting.

At this time, the tape drive is configured in the **/dev** directory in two ways: **rmt** format, and **rst** format.

#### “rmt” format

In this format, the drive is configured with various options. For further explanations, see the man pages on “**st**” (the modes are **x**, **xl**, **xm**, **xh**, **xc**, and **xu**, where **x** is the **rmt** number).

- Options **x**, **xh**, **xu**, and **xc**, correspond to the **0xfe** density mode (120-m DDS2 tape, *compressed* format).
- Options **xl** and **xm** correspond to the **0xfd** density mode (120-m DDS2 tape, *uncompressed* format).
- Option **b** associates with the BSD behavior and is for backward compatibility on all of the above options. For further information, refer to the man pages of “**mtio**”.

The **n** option provides access to the device with **no rewind**, similar to **nrst** (below), and is also applicable to all of the above options.

#### “rst” format

Special files “**rst**” (rewind on close) and “**nrst**” (no rewind on close) are also built and reside in the **/dev** directory. For example, if the SCSI target ID for the tape drive is 4 and the drive

is connected to the native SCSI bus, then “**rst**” will be “*rst4, rst12, rst20, and rst28*” and *nrst* will be “*nrst4, nrst12, nrst20, and nrst28*”.

- *rst4* and *nrst4* correspond to the 0xfd density mode (120-m DDS2 tape, *uncompressed* format)
- *rst12* and *nrst12* correspond to the 0xfd density mode (120-m DDS2 tape, *uncompressed* format)
- *rst20* and *nrst20* correspond to the 0xfe density mode (120-m DDS2 tape, *compressed* format)
- *rst28* and *nrst28* correspond to the 0xfe density mode (120-m DDS2 tape, *compressed* format)

### B.3.1.5 Test

To test the tape drive, back up the “**passwd**” file to tape using the “**tar**” command, as follows:

```
tar cvf /dev/rst4 /etc/passwd
```

The system responds with:

```
a /etc/passwd 1 blocks
```

Note that, depending on the size of the file, a different number of blocks may be reported.

### B.3.1.6 Verification

Verify that the “**passwd**” file was saved to tape using the following command:

```
tar tvf /dev/rst4
```

The system responds with

```
rw-r--r-- 0/10 535 Mar 23 16:31 1994 /etc/passwd
```

The installation and verification procedure is now complete.

## B.3.2 Dump Parameters for the Tape Drive

The parameters that should be used when running the **ufsdump** utility with the tape drive are as follows:

density (d) = 61000 (BPI)

blocking factor = 126

*Example,*

The following parameter is an example of the command for backing up an entire disk partition (/dev/rdisk/c0t3d0s6) onto the tape drive:

```
ufsdump 0dbfo 61000 126 /dev/rmt2 /dev/rdisk/c0t3d0s6
```



## **B.4 Using the SWXTL-BL 5-Cartridge Tape Loader**

The tape loader can be utilized under Solaris 2.3 and SunOS 4.1.3 using the following instructions.

### **B.4.1 Solaris 2.3**



## *Product Notes for Novell™ NetWare™ , MS-DOS™ Microsoft® WINDOWS™ and WINDOWS NT™*

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*This appendix provides information for the system administrator, who should read this material before installing and using the tape drive SBB with a host system operating under the Novell NetWare, MS-DOS, or Microsoft WINDOWS operating systems.*

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### **C.1 Host SCSI Interface**

The tape drive SBB uses the standard SCSI-2 command set to interface to the PC-based host system. The host system thus must be equipped with a SCSI adapter to properly interface the tape drive with the host. For example, the host SCSI adapter might interface the computer's EISA bus to the SCSI-2 port of the SBB.

A host PC SCSI adapter is normally supplied with a compatible software driver for use with its operating system. When operating under the Novell NetWare or MS-DOS or MS-DOS/WINDOWS operating systems, the software driver must be pre-loaded in accordance with the SCSI adapter manufacturer's installation procedure to ensure a proper interface between the SBB and the host. In addition, a user-level tape read/write software program may be required to implement tape support under the NetWare, MS-DOS, or MS-DOS/WINDOWS environments. There are many commercial software products available that provide for host or network-based data backup and restore, archiving, data logging, etc. for these operating systems.

Before purchasing a user-level software product, ensure that the tape drive or tape loader SBB is supported by that product (see note below). Commercial software vendors usually publish a supported hardware list, or have telephone technical support personnel who will answer questions regarding compatibility of a particular tape drive or other storage devices. When choosing a software product suitable for your application, follow the software vendor's installation procedure to implement support for your tape drive SBB.

This product is supported only under Windows NT version 3.5 by adding the "4 millimeter DAT drive" tape device option. Follow the Windows NT "Add/Remove Tape Devices" procedure to add this support.

If your host is operating under NetWare, Novell, Inc., provides a software product called "Server Backup" with some of its operating system products. This program has been found to work well with the tape drive.

Native tape support (that is, the tape support supplied in the operating system) for Windows NT or Netware will support the functions of a single drive. Limited tape loader support (manual or sequential mode) is also provided as native support.

**NOTE**

The SWXTA-BA/BL/BT tape drive SBBs are functionally equivalent to the TLZ07-AA/TLZ7L/TLZ07-DA (Digital Equipment Corporation part no.) tape drives. Although commercial software products which support the TLZxx products will also support the tape drive SBBs, the TLZxx units have the compression mode turned off as a default, whereas the tape drive SBBs have the compression mode enabled.

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# D

## *Product Notes for Hewlett-Packard*

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*This appendix describes how to include the single DAT tape drive SBB (SWXTA-BA) in an HP 9000 Series 700 system running HP-UX 9.05 (or later). The information covers configuration of the host system to communicate with the tape drive.*

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### **D.1 General Information**

If the necessary drivers are not already built into your existing kernel, you will need to rebuild your kernel.

When using the **dump** utility, you must supply the correct density code and tape length size for **dump** to use in its calculations. Refer to Section D.3.2 for details. We recommend a value of 126 for the blocking factor parameter.

Compression can be enabled/disabled at any time by selecting the appropriate device file name. See Section D.2.2 for device names.

### **D.2 Modifications Required**

#### **D.2.1 Installation Procedure**

##### **NOTES**

The "DEC TLZ07" designation returned in response to SCSI inquiry during performance of the following procedure is the StorageWorks internal name for the tape drive, as incorporated in and used by the firmware.

##### **D.2.1.1 Installation of Tape Drive**

Install the tape drive into the StorageWorks enclosure and power-on the workstation. Ensure that the address of the tape drive does not conflict with the address of any other device on that SCSI bus.

##### **D.2.1.2 System Modification**

Enter the System Administration Manager (SAM) as superuser. From the first-level menu, choose **Peripheral Devices**. From the second-level menu, choose **Tape Drives**. The system's hardware will be scanned, and the "available tape drives" window will identify the tape drive SBB as a SCSI tape drive with the appropriate hardware path. Highlight that selection and then pull down the **Actions** menu and select the **Add** function. The program at this time will check the kernel to determine if the necessary drivers are built in, displaying the results.

If necessary, the program will rebuild the kernel. If this occurs, you will have to reboot the system in order to use the tape drive.

For further information on adding tape devices, refer to Hewlett-Packard's *Installing Peripherals* manual, P/N B2355-40041.

### D.2.2 Series 700 System Device Files

The System Administration Manager program automatically creates the appropriate device files and places them in the `/dev/rmt` directory.

The following naming convention is used for the DDS-format tape drive SBB, as shown in the examples listed below:

`/dev/rmt/c#d#[hlmc][n][b]`

where:

**c#** specifies the controller designation, which may contain either two or three characters, specifies the following:

where **#** is **sc[f]**, in accordance with the following:

**s** is the system bus module:

**2** = core I/O (the default)

**4** = EISA SCSI

**c** is the slot number:

**0** for core I/O

**n** for EISA, the value is determined by the slot number as reported by the H/W path reported by "ioscan."

**f** is the function number. This value identifies the location on the core I/O bus. For the SCSI interface, the value is **1**. If you are using the EISA SCSI interface, the **f** value is **0**.

**d#** designates the SCSI address of the tape drive, where **#** here identifies a number value.

**h/l/m/c** specifies density, with **h** meaning high density, **l** meaning low density, **m** meaning standard DDS format, and **c** meaning data compression.<sup>1</sup>

**n** specifies no rewind.

**b** specifies Berkeley behavior.

For additional information about DDS tapes, refer to **mt(7)** of the *HP-UX Reference* manual (P/N B 2355-90033).

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<sup>1</sup> The **h**, **l**, **c**, and **m** device designations all yield the same results. The **c** device designation enables compression on the SWXTA-BA and BL. The **c** drive designation is not specified to operate with the SWXTA-BT Table Top variant of this product set.

**Examples**

For a tape drive SBB installed in slot location 4 of the StorageWorks SWXSE-02 expansion enclosure connected to the main (core) SCSI bus, the following device files would be produced in the directory **/dev/rmt**:

<b>c201d4c</b>	<b>c201d4l</b>	<b>c201d4cb</b>	<b>c201d4lb</b>
<b>c201d4cn</b>	<b>c201d4ln</b>	<b>c201d4cnb</b>	<b>c201d4lnb</b>
<b>c201d4h</b>	<b>c201d4m</b>	<b>c201d4hb</b>	<b>c201d4mb</b>
<b>c201d4hn</b>	<b>c201d4mn</b>	<b>c201d4hnb</b>	<b>c201d4mnb</b>

For a tape drive SBB installed in slot location 4 of the StorageWorks SWXSE-02 expansion enclosure connected to a SCSI adapter in EISA slot 1, the following device files would be produced in the directory **/dev/rmt**:

<b>c410d4c</b>	<b>c410d4l</b>	<b>c410d4cb</b>	<b>c410d4lb</b>
<b>c410d4cn</b>	<b>c410d4ln</b>	<b>c410d4cnb</b>	<b>c410d4lnb</b>
<b>c410d4h</b>	<b>c410d4m</b>	<b>c410d4hb</b>	<b>c410d4mb</b>
<b>c410d4hn</b>	<b>c410d4mn</b>	<b>c410d4hnb</b>	<b>c410d4mnb</b>

**D.3 Testing the Tape Drive**

To test the tape drive, back up the “passwd” file to tape using the “tar” command, as follows (assuming that you installed the drive in accordance with the first preceding example):

```
tar cvf /dev/rmt/c201d4h /etc/passwd
```

The system responds with something similar to the following:

```
a /etc/passwd 1 blocks
```

Note that depending on the size of the file, a different number of blocks may be reported.

**D.3.1 Verification**

Use the following command to verify that the “passwd” file was written to tape:

```
tar tvf /dev/rmt/c201d4h
```

The system responds with something similar to the following:

```
rw-r--r-- 0/10 535 Mar 23 16:31 1994 /etc/passwd
```

The installation and verification procedure is now complete.

### D.3.2 Dump Parameters for the Tape Drive

The parameters that should be used when running the dump utility with the tape drive are:

density = 61000 (for DDS1 or DDS2 tapes)

size = one of the following, as appropriate:

6656 (for 60 meter tapes)

10240 (for 90 meter tapes)

20480 (for 120 meter tapes)

blocking factor = 126 (recommended)

#### *Example*

The following example shows the command for backing up an entire disk partition onto the tape drive, using a 120-meter tape:

```
dump 0dsbf 61000 20480 126 /dev/rmt/c201d4h /usr
```

For further help, refer to man pages of the **dump** command.

## *Product Notes for IBM<sup>TM</sup> RS/6000*

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*This appendix provides information for the system administrator. It should be read before installing and using the SWXTA-BA tape drive SBB with a host system with the AIX 3.2.5 (or later) operating system.*

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### **E.1 Modifications Required to Operate the SWXTA-BA with AIX 3.2.5 (or later)**

After the SWXTA-BA tape drive has been properly attached to the SCSI bus, install the device using "smit" or by executing specific commands while logged into the root account. Section E.1.1 below describes how to install the tape drive using the fast-path command (`smit dev`). Section E.1.2 describes how to install the device using the command-line interface.

#### **E.1.1 Installing the SWXTA-BA Using the SMIT Command**

- ➊ From the command line, type:

```
# smit dev
```

- ➋ Select menu entry "Configure the devices you have added after the IPL."

- ➌ Select menu entry "Change/show the characteristics."

- a) Select the entry that matches the controller and target ID of your installation.

*Example:* rmt1 available 00-03-00-50 other SCSI tape drive

where **3** is the SCSI controller number and **5** is the SCSI target ID

- b) On the menu, change the settings of the "BLOCK size", "DENSITY setting #1", and "DENSITY setting #2":

Set "BLOCK size" to **1024**.

Set "DENSITY setting # 1" to **254**.

Set "DENSITY setting #2" to **255**.

- c) Accept the changes.

#### **E.1.2 Installing the SWXTA-BA Using Command-Line Interface**

- ➊ From the command line, type:

```
# cfmgr
```

- ➋ To determine which *rmt* has been added, type:

```
# lsdev -Cc tape
```



*Example:*

```
# lsdev -Cc tape
Name      Status      Location      Description
rmt0     Available  00-03-00-50  Other SCSI Tape Drive
```

③ Next, type:

```
# chdev -l <rmt*> -a density_set_1=254 -a density_set_2=253
```

④ Finally, type the following:

```
# chdev -l <rmt*> -a block_size=<SIZE> -a rwttimeout=<SEC>
```

*Example:*

```
# chdev -l rmt0 -a block_size=1024 -a rwttimeout=300
rmt0 changed
```

where,

<rmt \*> is the tape drive added as shown by the lsdev command.

<SIZE> is the fixed block size (0 = variable, 1024 is suggested).

<SEC> is timeout in seconds, (300 seconds recommended).

Code	Density Code Meanings
0	Default density.
19	DAT DSS format

The files that are created are:

Tape Drive Special File Characteristics			
Special File Name	Rewind-on-Close	Retention-on Open	Bytes-per-Inch
/dev/rmt*	Yes	No	Density Setting # 1
/dev/rmt*.1	No	No	Density Setting # 1
/dev/rmt*.2	Yes	Yes	Density Setting # 1
/dev/rmt*.3	No	Yes	Density Setting # 1
/dev/rmt*.4	Yes	No	Density Setting # 2
/dev/rmt*.5	No	No	Density Setting # 2
/dev/rmt*.6	Yes	Yes	Density Setting # 2
/dev/rmt*.7	No	Yes	Density Setting # 2

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**NOTES**

1. Both density code values are functionally equal.
2. IBM-supplied tape drives default to a block size of 1024 while tape drives from other manufacturers default to a block size of 512. StorageWorks recommends changing the block size of the SWXTL-AA to be compatible with the IBM-supplied drives. However, for some uses such as making bootable tapes or transferring tapes between host systems, a value of 512 or 0 (variable size) may be needed.

**E.1.3 Using the SWXTA-BA 4mm Tape Drive to Install AIX**

- ❶ Perform the installation procedure as described in *AIX, version 3.2, Installation Guide (SC23-2341)*, Chapter 1, ending after completing step F.5.c of the procedure.
- ❷ If the tape device is displayed as "defined" instead of "available", then enter the following:

```
# mkdev -l <rmt*>
```

*Example:*

```
# mkdev -l rmt0  
rmt0 Available
```

- ❸ Continue with step F.5.d in the *AIX Installation Guide* until the installation is completed.

# Reader's Comments

**Manual Order Number:**

EK-SM2TC-UG. D01

SWXTA 4/8-GB 4-mm DAT Tape Drive

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