

TLZ06 Cassette Tape Drive

Owner's Manual

Order Number: EK-TLZ06-OM. 004

July 1993

The information in this document is subject to change without notice and should not be construed as a commitment by Digital Equipment Corporation. Digital Equipment Corporation assumes no responsibility for any errors that may appear in this document.

No responsibility is assumed for the use or reliability of software on equipment that is not supplied by Digital Equipment Corporation or its affiliated companies.

Restricted Rights: Use, duplication, or disclosure by the U.S. Government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.227-7013.

© Digital Equipment Corporation 1993.

All Rights Reserved.
Printed in the U.S.A.

FCC NOTICE: The equipment described in this manual has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of FCC Rules. Only peripherals (computer input/output devices, terminals, printers, et cetera) certified to comply with the Class B limits may be attached to this computer. Operation with noncertified peripherals may result in interference to radio and television reception. This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Move the computer away from the receiver.
- Plug the computer into a different outlet so computer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: *How to Identify and Resolve Radio-TV Interference Problems*. This booklet is available from the US Government Printing Office, Washington, DC 20402, Stock No. 004-000-00398-5.

The following are trademarks of Digital Equipment Corporation: DECdirect, DECmailer, DECservice, DECstation, Q-bus, SERVICenter, ULTRIX, VAXstation, VMS, and the DIGITAL logo.

Für Bundesrepublik Deutschland

For Federal Republic of Germany

Pour la République fédéral d'Allemagne

BESCHEINIGUNG DES HERSTELLERS/IMPORTEURS

Dieses Gerät ist in Übereinstimmung mit den Bestimmungen der BMPT Vfg.243/1991 und Vfg.46/1992 in Verbindung mit EN55022:1987 (DIN VDE 0878-3:11.89), oder Vfg.1046/1984 mit Vfg. 483/1986, funktentstört. Es trägt als Nachweis der EMV-Konformität entweder eine Konformitätskennzeichnung oder das VDE-Funkschutzzeichen.

Der vorschriftsmäßige Betrieb mancher Geräte (z.B. Meßsender) kann allerdings gewissen Einschränkungen unterliegen. Beachten Sie deshalb die unten aufgeführten Hinweise.

Für Geräte die nicht mit dem VDE-Funkschutzzeichen versehen sind wurde dem Bundesamt für Zulassungen in der Telekommunikation (BZT) das Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmungen eingeräumt.

Betreiberhinweis

Wir sind verpflichtet, Sie auf folgende Fakten hinzuweisen (BMPT-Amtsblattverfügung 243/91 bzw. 1046/84 §2, Abschnitt 5):

Dieses Gerät wurde funktechnisch sorgfältig entstört und geprüft. Wird dieses Gerät innerhalb einer Anlage zusammen mit anderen Geräten betrieben, muß bei Inanspruchnahme der "Allgemeinen Betriebsgenehmigung" nach BMPT-AmtsblVfg. 243/91 bzw. 1046/84 die gesamte Anlage den unter §2, Abschnitt 1, genannten Voraussetzungen entsprechen.

Externe Datenkabel

Sollte ein Austausch der von Digital spezifizierten Datenkabel nötig werden, muß der Betreiber für eine einwandfreie Funkentstörung sicherstellen, daß Austausch kabel im Aufbau und Abschirmqualität dem Digital Originalkabel entsprechen.

この装置は、第二種情報装置(住宅地域又はその隣接した地域において使用されるべき情報装置)で住宅地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会(VCCI)基準に適合しております。しかし、本装置をラジオ、テレビジョン受信機に近接してご使用になると受信障害の原因となることがあります。取扱説明書に従って正しい取り扱いをして下さい。

Contents

1 TLZ06 Cassette Tape Drive Product Description

1.1	Overview	1-1
1.1.1	System Support	1-2
1.2	Design Features	1-2
1.2.1	What is Digital Audio Tape (DAT)?	1-2
1.2.2	What is Digital Data Storage (DDS)?	1-2
1.3	TLZ06 Models	1-3
1.3.1	Checking Your Shipment for Model TLZ06-DA	1-6
1.3.2	Ordering Additional Cassettes	1-6

2 Installing the Tabletop Drives

2.1	General	2-1
2.2	Shut Down, Halt, and Power Off the System	2-1
2.3	Selecting the SCSI Address	2-2
2.4	Connecting a SCSI Signal Cable — Drive to System	2-3
2.5	Adding Another Tabletop Drive — Drive to Drive	2-4
2.6	Connecting the Power Cable	2-4

3 Installing the TLZ06-AA/BA Cassette Tape Drive

3.1	General	3-1
3.2	Shut Down, Halt, and Power Off the System	3-1
3.3	Selecting the SCSI Address for the TLZ06-AA/BA Drive	3-2
3.3.1	Other Optional Switch Settings	3-4
3.4	Connecting a SCSI Signal Cable — Drive to System	3-5
3.5	Connecting the Power Cable and Mounting	3-5

4	Verifying TLZ06 Cassette Tape Drive Installation	
4.1	General	4-1
4.1.1	POST	4-1
5	Using the TLZ06 Cassette Tape Drive	
5.1	General	5-1
5.2	Power Switch	5-1
5.3	Unload Button	5-1
5.4	Write-Protect LED	5-1
5.5	Cassette LED	5-1
5.6	TLZ06 Cassette Tape	5-2
5.7	Indicators	5-2
5.8	Using the Cassette Tape	5-4
5.8.1	Proper Handling of Cassette Tapes	5-4
5.8.2	Setting the Write-Protect Tab on the Cassette Tape	5-5
5.8.3	Inserting a Cassette Tape into the Drive	5-5
6	Preventive Maintenance and Problem Solving	
6.1	Cleaning the Heads	6-1
6.2	Problem Solving	6-3
6.2.1	System-Based Diagnostics	6-4
6.3	Repair Services	6-4
6.3.1	On-Site Service	6-4
6.3.2	BASIC Service	6-4
6.3.3	DECservice	6-5
6.3.4	Carry-In Service	6-5
6.3.5	DECmailer Service	6-5
6.3.6	Per Call Service	6-5
7	TLZ6L Auto Loader	
7.1	Overview	7-1
7.2	Indicators	7-1
7.3	Dot Matrix Display	7-5
7.3.1	Activity Messages	7-5
7.3.2	Status Messages	7-5
7.4	Operation	7-6
7.4.1	Automatic Operations	7-6
7.4.2	Manual Operations	7-6
7.4.3	Single Cassette Operation	7-7

7.5	Switch Settings	7-7
7.5.1	Switchpack 1	7-7
7.5.2	Switchpack 2	7-8
7.6	Routine Maintenance	7-9
7.6.1	Cleaning the Rollers	7-9
7.6.2	Cleaning the TLZ06 Tape Drive	7-9

A Cassette Tape Drive Specifications

B Enabling/Disabling Data Compression Under ULTRIX and VMS

B.1	ULTRIX TLZ06 Compression and Noncompression Modes	B-1
B.2	ULTRIX DUMP Utility	B-1
B.3	VMS TLZ06 Compression and Noncompression Modes	B-2

Index

Figures

1-1	Model TLZ06-DA (Tabletop)	1-4
1-2	Model TLZ06-AA (3 ½-inch Chassis) and TLZ06-BA (5 ¼-inch Form Factor)	1-5
3-1	SCSI Address Switches	3-3
5-1	TLZ06 Cassette Tape	5-2
7-1	Model TLZ6L-AA, Front View	7-2
7-2	Model TLZ6L-AA, Top View	7-2
7-3	Model TLZ6L-DA, Front View	7-3
7-4	Model TLZ6L-DA, Back View	7-4

Tables

3-1	SCSI ID Switch Settings (0=Up, 1=Down)	3-3
5-1	TLZ06 LED Status	5-3
6-1	Problem Solving	6-3
7-1	Status Messages	7-5
7-2	SW1 Settings and Functions	7-7
7-3	SW1-1 and SW1-2 Settings	7-8
7-4	SW2 Settings and Functions	7-8

A-1	TLZ06 Cassette Tape Drive Specifications	A-1
A-2	TLZ06-DA Noise Declaration	A-2
A-3	TLZ6L Cassette Tape Drive Specifications	A-3
A-4	TLZ6L-DA Noise Declaration	A-4

1

TLZ06 Cassette Tape Drive Product Description

1.1 Overview

The TLZ06 cassette tape drive provides you with high capacity, off-line data storage. Depending on the 4 mm data cassette tape used, the unit can typically store:

Tape Type (see NOTE 1.)	No Compression	Compression
TLZ04-CA (60 m)	1.3 GB	2.6 GB
TLZ06-CA (90 m)	2.0 GB	4.0 GB (see NOTE 2.)

NOTE

1. The TLZ06 is compatible with TLZ04 (60 m) cassette tapes in the noncompressed mode only.
 2. The 4.0 GB measurement is typical for a 2-to-1 data compression ratio, but the actual ratio is dependent on the data.
-

The maximum time to backup (read or write) on a TLZ06 cassette tape in a continual (streaming) mode is system dependent. The efficient use of streaming mode is determined by your operating system. Please refer to your system software documentation.

1.1.1 System Support

As of this printing, the TLZ06 drive is supported by VAXstation systems and DECstation systems. Your particular system must have a standard SCSI (small computer system interconnect) port, or a KZQSA (Q-bus to SCSI adapter).

VAXstation systems can use the VMS or ULTRIX operating systems. DECstation systems use the ULTRIX operating system. Consult with your Digital sales support person for operating systems supporting this device.

1.2 Design Features

The TLZ06 cassette tape drive uses state of the art technology. The TLZ06 cassette tape drive's design incorporates both digital data storage (DDS) and digital audio tape (DAT) recording technologies.

1.2.1 What is Digital Audio Tape (DAT)?

Digital audio tape (DAT), such as TLZ06 cassettes, takes advantage of the TLZ06 tape drive's helical scan technology. This technology allows data to be stored diagonally on tape. As such, DAT allows more data to be stored on tape. Also, DAT recording minimizes "crosstalk," providing you with more data integrity.

1.2.2 What is Digital Data Storage (DDS)?

Digital data storage (DDS) uses a recording format that supports the use of digital audio tape for computer applications. The DDS/DAT format allows you to back up 2 gigabytes of data in approximately 3 hours minimum with no operator intervention. In addition, this format has three levels of error correction, which ensures high data integrity.

NOTE

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

1.3 TLZ06 Models

The TLZ06 drive is available as:

- Model TLZ06-DA (tabletop) — a compact external unit with a built-in power supply (Figure 1-1).
- Model TLZ06-AA — a 3 1/2-inch, half-height drive that mounts internally (Figure 1-2).
- Model TLZ06-BA — consists of a 3 1/2-inch drive in a 5 1/4-inch, half-height form factor allowing the drive to be mounted internally (Figure 1-2).
- Model TLZ6L-AA — a 5 1/4-inch, full-height auto loader that mounts internally (Figure 7-1).
- Model TLZ6L-DA (tabletop) — an external unit with a built-in power supply.

NOTE

All the models have a drive buffer size of 1 MB of memory.

Figure 1-1 Model TLZ06-DA (Tabletop)

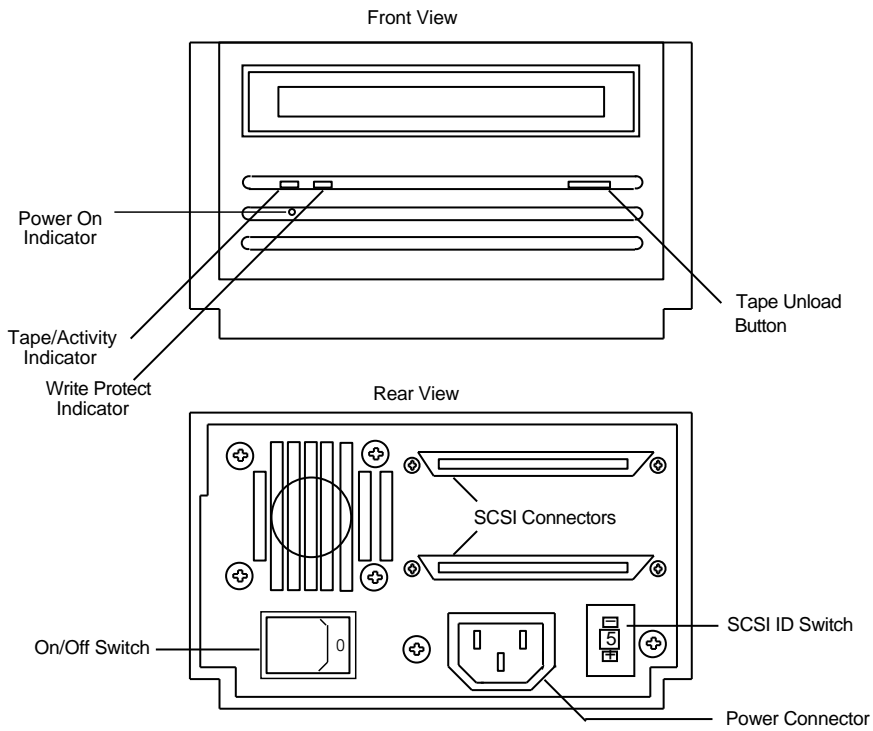
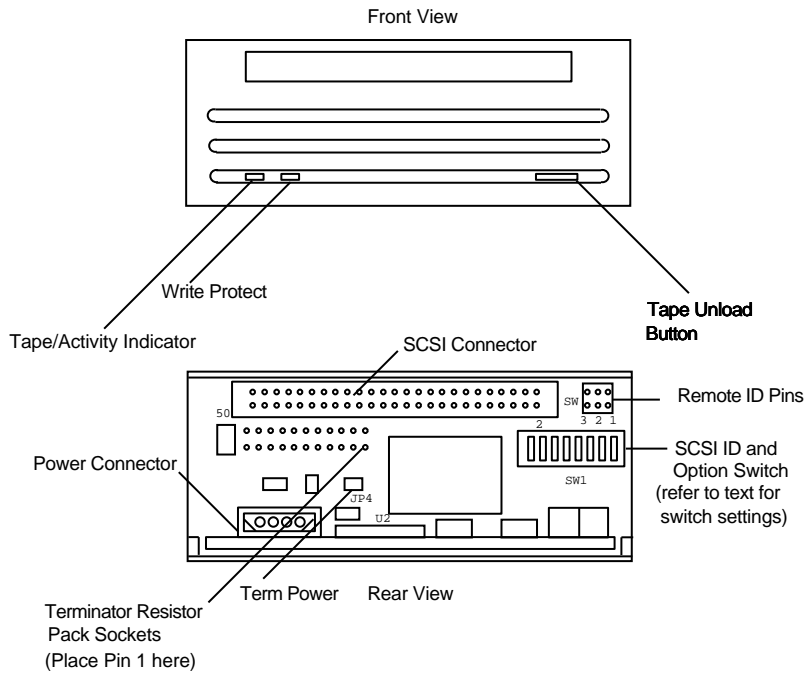


Figure 1-2 Model TLZ06-AA (3 1/2-inch Chassis) and TLZ06-BA (5 1/4-inch Form Factor)



1.3.1 Checking Your Shipment for Model TLZ06-DA

In addition to this manual, make sure that your shipment includes the following:

- One TLZ06-DA tabletop cassette tape drive
- One 50-pin to 50-pin SCSI signal cable (PN 17-01351-01) for drive to drive connections only
- Power cable
- One blank cassette tape (4 mm x 90 m), (PN TLZ06-CA)
- One head cleaning cassette (PN TLZ04-HA)
- SCSI terminator (PN 12-30552-01)

If your shipment is incomplete, please contact your Digital sales representative.

1.3.2 Ordering Additional Cassettes

To order additional blank cassette tapes and head cleaning cassettes, contact your Digital sales representative or DECdirect. Refer to the following part numbers.

- Five blank cassette tapes (4 mm x 60 m) (PN TLZ04-CB)
- Five blank cassette tapes (4 mm x 90m) (PN TLZ06-CB)
- One head cleaning cassette (PN TLZ04-HA)

2

Installing the Tabletop Drives

2.1 General

This chapter shows you how to install the TLZ06-DA tabletop cassette tape drive or TLZ6L-DA tabletop auto loader on systems with an external SCSI connector. Read the following sections to complete the installation.

2.2 Shut Down, Halt, and Power Off the System

If you are installing a TLZ06-DA tabletop cassette tape drive or TLZ6L-DA tabletop auto loader on a running system, have your system manager perform the following steps:

1. Shut down the operating system.
2. Halt the system.
3. Set all system power switches off.

2.3 Selecting the SCSI Address

To familiarize yourself with the TLZ06 drive:

1. Refer to Figure 1–1 for the location of the buttons, switches, and connectors on the tabletop drives.
2. Note that all connections are made at the rear of the drive.

Your system uses a SCSI ID switch (Figure 1–1) to identify, or address, the drive. The SCSI ID is factory set at **5**. If you are installing the drive on a system that is already using SCSI ID 5, use any available SCSI ID. (You may have to consult your system manager.)

To set/change the SCSI address:

1. Locate the SCSI address switch at the rear of the drive.
2. Select the SCSI address for the drive:
 - TLZ06-DA — Press the + or - button until the desired address (0 through 7) appears in the window.
 - TLZ6L-DA — Set the switches according to Table 3–1.

NOTE

If you are installing any other drive variant, refer to Chapter 3.

Turn off all power before connecting the cables and the terminator.

The drive must be turned off and then on for switch settings to take effect, or a SCSI bus reset must be received.

The tabletop drives provide two SCSI connectors to allow daisy chaining. Either connector can connect to the host computer or any SCSI device in a daisy chain.

- If the tabletop is the last drive in the chain, a single interface cable is attached to one connector and a SCSI terminator (PN 12-30552-01) is installed in the other connector.
- If the drive is within the chain, the interface cable from the preceding device is connected in one connector; an interface cable is also connected from the other connector to the following device.

NOTE

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

2.4 Connecting a SCSI Signal Cable — Drive to System

If you are connecting a TLZ06-DA drive or TLZ6L-DA auto loader directly to your system, you should use the SCSI signal cable supplied as part of your system installation kit.

If you do not have this cable, contact your Digital sales representative. You should use a cable supplied by Digital Equipment Corporation. Failure to do so can result in degraded performance of your tabletop drive.

To connect a SCSI cable — drive to system — perform the following:

1. Connect one end of the cable to the system SCSI connector.
2. Connect the other end of the SCSI signal cable to either SCSI connector on the rear of the TLZ06-DA drive or TLZ6L-DA auto loader.
3. Secure the SCSI cable by snapping the wire cable clamps (on either side of the SCSI connector) into place.
4. Connect the SCSI terminator to the other SCSI connector on the rear of the TLZ06-DA drive or TLZ6L-DA auto loader.
5. Secure the terminator by snapping the wire cable clamps (on either side of the SCSI connector) into place.

2.5 Adding Another Tabletop Drive — Drive to Drive

If you have one SCSI device already connected to your system, you can connect the TLZ06-DA drive or TLZ6L-DA auto loader to that device. For drive to drive connections, use the 50-pin to 50-pin SCSI signal cable (PN 17-01351-01) supplied with the tabletop drive.

1. If present, remove the SCSI terminator from the existing SCSI drive.
2. Connect one end of the SCSI signal cable (PN 17-01351-01) to the existing SCSI drive, observing the correct orientation of the cable connector.
3. Secure the SCSI cable by snapping the wire cable clamps (on either side of the SCSI connector) into place.
4. Connect the other end of the SCSI signal cable to either SCSI connector on the TLZ06-DA drive or TLZ6L-DA auto loader, observing the correct orientation of the cable connector.
5. Secure the SCSI cable by snapping the wire cable clamps (on either side of the SCSI connector) into place.
6. Connect the SCSI terminator to the other SCSI connector on the TLZ06-DA drive or TLZ6L-DA auto loader, observing the correct orientation of the cable connector.

2.6 Connecting the Power Cable

The tabletop drives have an autoranging power supply. Refer to Table A-1 for voltage specifications.

To connect the power cable, proceed as follows:

1. Be sure that the TLZ06-DA drive or TLZ6L-DA auto loader power switch is off (0).
2. Connect the power cable to the TLZ06-DA drive or TLZ6L-DA auto loader power connector.
3. Connect the other end of the power cable to a nearby ac outlet.

NOTE

Multivendor Customer Services personnel: The power cable disconnects the drive from the main ac power source.

Proceed to Chapter 4.

3

Installing the TLZ06-AA/BA Cassette Tape Drive

3.1 General

This chapter shows you how to install the TLZ06-AA (3 ½-inch) and TLZ06-BA (5 ¼-inch form factor) cassette tape drives in a system enclosure or external expansion box. Read the following sections to complete the installation.

3.2 Shut Down, Halt, and Power Off the System

If you are installing a TLZ06 drive on a running system, have your system manager perform the following steps:

1. Shut down the operating system.
2. Halt the system.
3. Set all system power switches off.

3.3 Selecting the SCSI Address for the TLZ06-AA/BA Drive

To familiarize yourself with the TLZ06 drive:

1. Refer to Figure 1–2 for the location of the buttons, switches, and connectors on the TLZ06 drive.
2. Note that all connections are made at the rear of the drive.

Your system uses a SCSI ID switch (Figure 1–2) to identify, or address, the TLZ06-AA/BA. The SCSI ID is factory set at **0**. If you are installing the TLZ06-AA/BA on a system that is already using SCSI ID 0, use any available SCSI ID. (You may have to consult your system manager.)

To set/change the SCSI address:

1. Select a unique address number with the first three switches on the right.
2. To set a switch, use a pen (NOT A PENCIL) to push the switch up for **OFF** or down for **ON**.

Table 3–1 shows the SCSI IDs (0 through 7) and Figure 3–1 shows a close-up view of the switches.

NOTE

If you are installing the tabletop variant, refer to Chapter 2.

Turn off all power before connecting the cables and the terminator.

The drive must be turned off and then on for switch settings to take effect, or a SCSI bus reset must be received.

NOTE

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

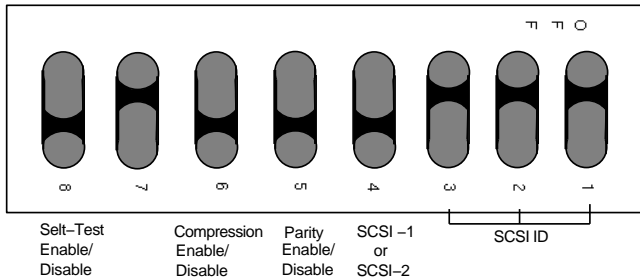
CAUTION

If you are using a remote ID cable, you must use the default SCSI ID of 0.

Table 3-1 SCSI ID Switch Settings (0=Up, 1=Down)

SCSI ID	S3	S2	S1
0	0	0	0 (factory setting)
1	0	0	1
2	0	1	0
3	0	1	1
4	1	0	0
5	1	0	1
6	1	1	0
7	1	1	1

Figure 3-1 SCSI Address Switches



- Default Settings:**
- S1 - S3 SCSI ID (All OFF, ID = 0)
 - S4 SCSI-1 or 2 (ON, SCSI-2)
 - S5 Parity (ON, Enabled)
 - S6 Compression (ON, Disabled)
 - S7 (OFF, Reserved for future use)
 - S8 Self-Test (ON, Enabled)

NOTE: The drive must be powered down and then powered up for new switch settings to take effect.

3.3.1 Other Optional Switch Settings

Switches S4 through S8 allow you to set up the following configuration options:

- SCSI mode at power-up (S4): Default = SCSI-2 (S4 = ON)
- Parity enable/disable (S5): Default = Parity Enabled (S5 = ON)
- Compression enable/disable (S6): Default = compression disabled (S6 = ON)
- (S7): Reserved

NOTE

Switch S7 is reserved for future use and should remain set to OFF.

- Power-on self-test (POST) diagnostic mode enable/disable (S8): Default = POST mode enabled (S8 = ON)

Figure 3-1 shows the default settings for these switches.

NOTE

The drive must be turned off and then on for switch settings to take effect, or a SCSI bus reset must be received.

If the default settings are correct for your system, go to the next section.

NOTE

Although S6 is the default on (compression disabled), you may turn compression on and off with a software switch. Consult Appendix B for the command format.

3.4 Connecting a SCSI Signal Cable — Drive to System

If you are connecting a TLZ06 drive directly to your system, you should use a SCSI signal cable supplied as part of your system installation kit.

If you do not have this cable, contact your Digital sales representative. You should use a cable supplied by Digital Equipment Corporation. Failure to do so can result in degraded performance of your TLZ06 drive.

To connect a SCSI cable — drive to system — perform the following:

1. Connect one end of the cable to the system SCSI connector.
2. Connect the other end of the SCSI signal cable to the SCSI connector on the rear of the TLZ06 drive (Figure 1-2).

3.5 Connecting the Power Cable and Mounting

Connect the system internal power cable located at the rear of the drive (Figure 1-2).

NOTE

Digital service personnel: The power cable disconnects the drive from the main ac power source.

CAUTION

Always use M3 screws with a maximum thread length of 5 mm to mount the TLZ6L auto loader.

Verifying TLZ06 Cassette Tape Drive Installation

4.1 General

To verify successful installation of the TLZ06 drive, execute the power-on self-test (POST).

4.1.1 POST

To execute POST:

1. For a tabletop unit, press the power switch to the ON or | position (Figure 1-1).
For a drive in a system enclosure, turn ON the system power source.
2. Observe that, with no cassette in the drive, the Cassette and Write-Protect indicators light for approximately 1 to 5 seconds and then extinguish.
With a cassette in the drive, the Cassette indicator will continue flashing (approximately 20 seconds) until the cassette is loaded.
3. After successful completion of POST, the Cassette and Write-Protect indicators turn off.
4. If the Write-Protect indicator flashes amber and the drive indicator flashes green continuously for more than 30 seconds, then POST failed. Attempt to clear the failure by re-executing POST. (Power off and power on the drive.) If the failure repeats itself, call Multivendor Customer Services.

After successful execution of POST, have your system manager restart the system and assign a device name to your TLZ06 drive. Optionally, you can run a full system or SCSI bus test. See your system owner's manual for specific instructions.

NOTE

If a tape is loaded, the Cassette indicator stays on.

5

Using the TLZ06 Cassette Tape Drive

5.1 General

This chapter shows you how to use the TLZ06 drives, buttons, and indicators (Figure 1-1). It also shows you how to use cassette tapes.

5.2 Power Switch

For a tabletop unit, press the power switch to turn the TLZ06 drive on or off. If you are not using the TLZ06 drive for prolonged periods of time, check with your system manager for the correct procedure to shut down your system or power off the drive.

5.3 Unload Button

Press and hold the unload button for 1 to 2 seconds to eject the cassette tape.

CAUTION

Pressing the unload button during normal tape operations may halt the tape operation in progress.

5.4 Write-Protect LED

This indicator comes on amber when the cassette is write protected.

5.5 Cassette LED

This indicator comes on green when a cassette is loaded. It flashes when there is drive activity.

5.6 TLZ06 Cassette Tape

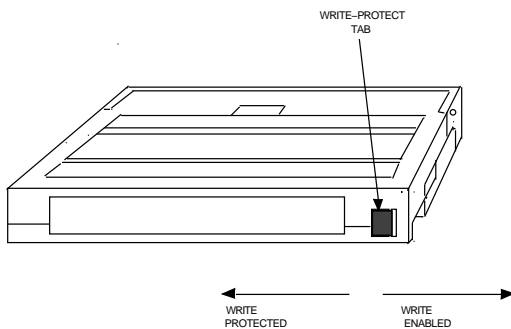
The cassette tape includes a write-protect tab (Figure 5–1), which contrasts in color to the cassette tape body. Use a pen (NOT A PENCIL) to set the write-protect tab.

- Slide the tab to the left to write-protect the tape.
- Slide the tab to the right to write-enable the tape.

NOTE

The tab is not visible when the cassette tape is loaded in the TLZ06 drive.

Figure 5–1 TLZ06 Cassette Tape



5.7 Indicators

Table 5–1 describes the Write-Protect and Cassette LEDs.

- In the normal operating state, the Write-Protect LED is used to indicate write-protect status only.
- In the normal operating state, the Cassette LED is used to indicate drive activity and tape load status.

Table 5–1 TLZ06 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	Write-protect	Green
SCSI/drive activity	Write-protect	Activity
Load sequence	Off, goes to write-protected.	Flashes green, 1 Hz, 25% on. Goes to steady green when done. Indicates drive activity.
Unload sequence	Write-protected, goes to off.	Flashes green, 1 Hz, 25% on. Goes to off when done. Indicates drive activity.
Reset sequence	Amber Amber Write-protected	Green, both blink on. Green, both blink off. Normal indications.
Power-On Self-test (POST): Lvl 1 (Basic) self-test	Flashes amber, 2 Hz, for duration of test. Write-protected when self-test complete.	Flashes green, 2 Hz for duration of test. Normal activity indications when self-test complete.
Lvl 2 (Extended) self-test	Write-protected	Flashes green until test complete (1 to 4 minutes). Same as normal activity indication.
Test complete, no failure.	Resume normal operation, write-protected.	
Test failure, drive fault.	Flashes amber, 2 Hz.	Flashes green, 2 Hz.

5.8 Using the Cassette Tape

Digital Equipment Corporation recommends that you use DDS certified tapes. The following sections describe how to:

- Handle and store tape (Section 5.8.1)
- Write-protect tape (Section 5.8.2)
- Insert and remove tape (Section 5.8.3)

WARNING

Always place the tape label in the recessed area on the cassette. Never place one label on top of another label.

NOTE

Use of non-DDS media may result in degraded drive performance. We recommend the use of Digital Equipment Corporation media.

5.8.1 Proper Handling of Cassette Tapes

To ensure optimal performance from your cassette tapes, observe the following guidelines when handling them.

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

5.8.2 Setting the Write-Protect Tab on the Cassette Tape

If you are using the tape to read or are copying from the tape, set the write-protect tab to write-protected. This disables writing to tape, and ensures that data will not be accidentally overwritten. Use a pen (NOT A PENCIL) to set the write-protect tab (Figure 5–1) to the desired position.

Observe the following guidelines when setting the write-protect tab.

- If you are reading data (copying from the tape), set the write-protect tab to write-protected.
- If you are writing data, set the write-protect tab to write-enabled.
- The write-protect tab position is shown on the front panel Write-Protect indicator.

5.8.3 Inserting a Cassette Tape into the Drive

Insert the TLZ06 cassette tape into the drive with the cassette's write-protect tab on the right, facing you.

6

Preventive Maintenance and Problem Solving

This chapter describes preventive maintenance and problem solving for the TLZ06 cassette tape drive. Preventive maintenance involves periodic head cleaning. Problem solving is described in Table 6-1.

Statistics show that over 90% of drive-related problems are associated with the media. Therefore, Digital Equipment Corporation strongly recommends that you follow the instructions for handling cassette tapes and cleaning the heads of the drive.

6.1 Cleaning the Heads

This section shows you how to perform TLZ06 head cleaning. The heads are the components that physically read and write data to and from the media (in this case, a cassette tape).

Digital Equipment Corporation recommends that you perform the head cleaning procedure about every 2 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 data cassette causes problems, try changing to 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. Press the power switch ON to apply power to the drive.
2. Insert the head cleaning cassette (PN TLZ04-HA) into the drive.
3. With the head cleaning cassette inserted, the drive automatically executes head cleaning. The drive ejects the head cleaning cassette after approximately **30 seconds**.
4. Locate the card enclosed with the head cleaning cassette. Place a check mark on the card every time you use the head cleaning cassette.

Under normal conditions, the head cleaning cassette is used for about 25 cleanings. Additional cassettes are available from your Digital sales representative or DECdirect.

If the head cleaning cassette has been overused, both the Cassette and the Write-Protect LEDs will flash. Press the eject button to remove the cleaning cassette. No cleaning action will have occurred.

6.2 Problem Solving

Table 6–1 describes drive problems and possible solutions.

Table 6–1 Problem Solving

Symptom	Probable Cause	Possible Solution
Unable to back up or copy data to cassette tape.	Cassette write-protected.	1. Set write-protect tab on cassette to write-enabled.
Write-Protect LED flashes amber	No tape in drive.	2. Insert tape.
	Excessive tape errors.	Perform head cleaning procedure (see Section 6.1). If error repeats, try another tape.
Both LEDs flash rapidly, in unison.	Dirty heads or bad media.	Eject tape. Perform head cleaning procedure (see Section 6.1). If error repeats, try another tape.
	Drive error, possibly a hard failure.	Eject tape. Power off and power on the drive. If error repeats, call Multivendor Customer Services.
After applying power, nothing happens. All indicators off.	No tape loaded.	Load tape.
Unit not available to system.	Drive not plugged in.	1. Check ac power.
	SCSI ID switches set to incorrect address.	2. Check SCSI ID switch.
	Defective SCSI cable.	3. Make sure power cable is plugged in. 4. Be sure SCSI cable connections are secure.

6.2.1 System-Based Diagnostics

Your system has system-based diagnostics that can be used to test the TLZ06 drive.

System-based diagnostics are usually referred to in your system owner's manual as *console-based diagnostics, self-tests, or system exercisers*. Refer to your system documentation for information about these diagnostics.

Before calling Multivendor Customer Services, you can execute system diagnostics to test the TLZ06 drive.

NOTE

Some system-based diagnostics are subject to software licensing. Consult your Digital sales representative.

6.3 Repair Services

Digital Equipment Corporation Customer Services offers a range of flexible service plans.

6.3.1 On-Site Service

On-site service offers the convenience of service at your site and insurance against unplanned repair bills. For a monthly fee, you receive personal service from our service specialists. Within a few hours, the specialist is dispatched to your site with equipment and parts to give you fast and dependable maintenance.

6.3.2 BASIC Service

BASIC Service offers full coverage from 8 a.m. to 5 p.m., Monday through Friday. Options are available to extend your coverage to 12-, 16- or 24-hour periods, and to include Saturdays, Sundays, and holidays. Under the BASIC service plan all parts, materials and labor are covered in full.

6.3.3 DECservice

DECservice offers a premium, on-site service for producing committed response to remedial service requests made during contracted hours of coverage. Remedial maintenance will be performed continuously until the problem is resolved, which makes this service ideal for customers requiring maximum service performance. Under DECservice all parts, materials, and labor are covered in full.

6.3.4 Carry-In Service

Carry-in service offers fast, personalized response, and the ability to plan your maintenance costs for a smaller monthly fee than on-site service. When you bring your unit to one of the many Digital SERVICenters worldwide, factory-trained personnel repair your unit within 2 days. This service is available on selected terminals and systems. Contact your local unit. Digital SERVICenters are open during normal business hours, Monday through Friday.

6.3.5 DECmailer Service

DECmailer offers expert repair at a per use charge. This service is designed for users who have the technical resources to troubleshoot, identify, and isolate the module causing the problem. Mail the faulty module to our Customer Returns Center where the module is repaired and mailed back to you within 5 days.

6.3.6 Per Call Service

Per call service offers a maintenance program on a noncontractual, time-and-materials-cost basis. It is appropriate for customers who have to perform first-line maintenance, but may occasionally need in-depth support from Digital Customer Services.

TLZ6L Auto Loader

7.1 Overview

The TLZ6L auto loader (Figures 7-1, 7-2, 7-3, and 7-4) provides very high capacity unattended backup, as well as support for the full Random Access Command Set as defined by SCSI-2. It is packaged in an industry standard 5.25-inch full-high form factor with an embedded TLZ06 tape drive. The TLZ6L auto loader model is **not** a field upgrade option for the TLZ06 tape drive; it must be purchased as a single unit.

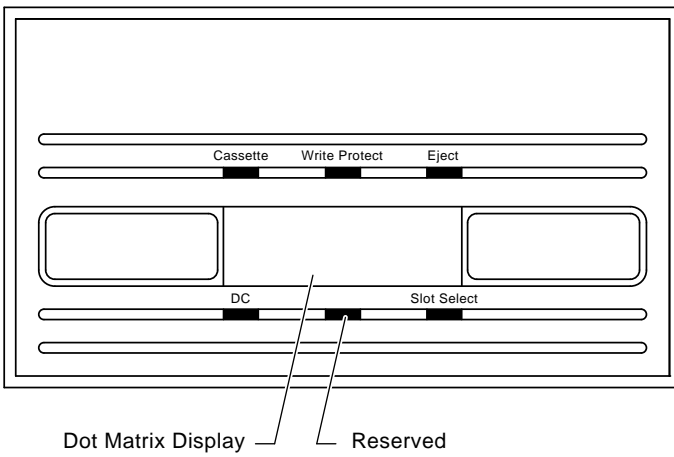
With a 4-cartridge magazine, the TLZ6L auto loader provides up to 16 gigabytes of storage. With an 8-cartridge magazine, the TLZ6L auto loader provides 32 gigabytes of storage; and with a 12-cartridge magazine, it provides 48 gigabytes of storage.

7.2 Indicators

The TLZ6L auto loader has four LED indicators. The labels for these LED indicators come with the auto loader. They are provided in four languages: English, French, German, and Spanish; and two orientations: vertical and horizontal. Choose your labels and place them on the bezel as shown in Figure 7-1. (The dot matrix display also supports the same four languages.)

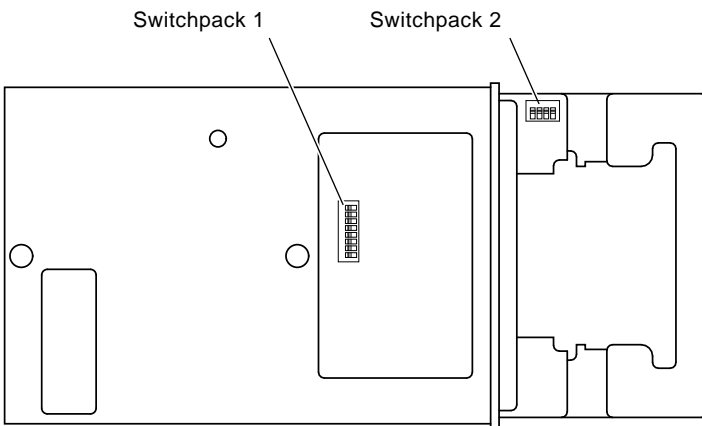
The Data Compression LED is lit when data compression is enabled on the TLZ06 tape drive. Both the Data Compression LED and the LED to its right flash rapidly when a loader fault occurs. The Reserved LED is reserved for future use. The Write Protect and Cassette LEDs are described in Chapter 5, Using the TLZ06 Cassette Tape Drive.

Figure 7-1 Model TLZ6L-AA, Front View



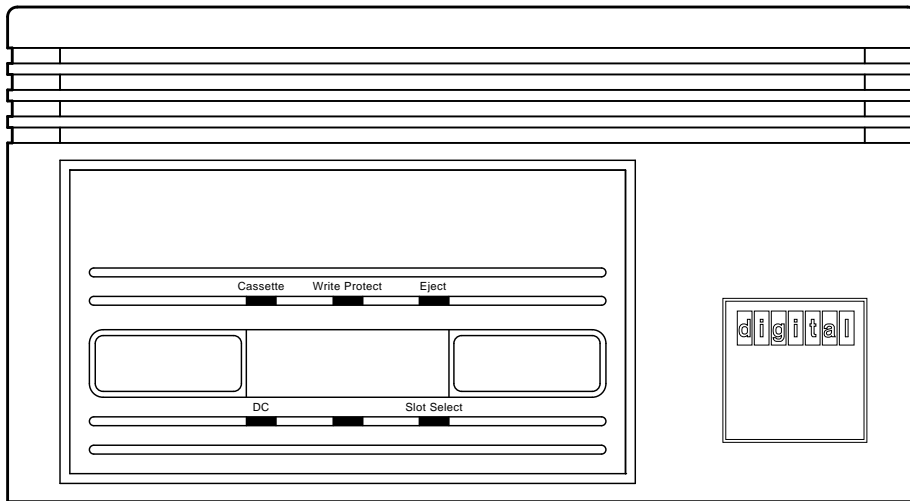
LJ-03001-T10

Figure 7-2 Model TLZ6L-AA, Top View



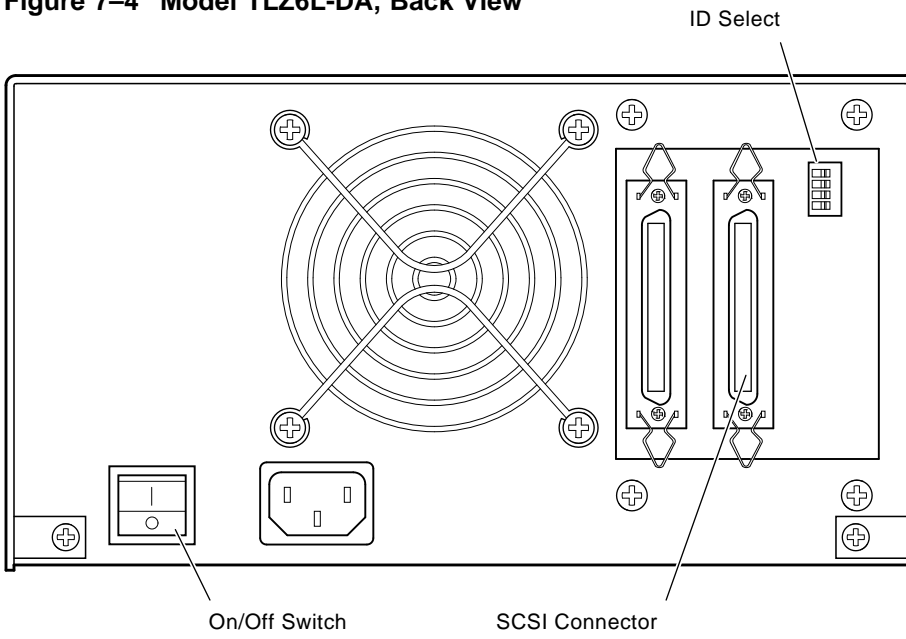
LJ-03002-T10

Figure 7-3 Model TLZ6L-DA, Front View



LJ-03387-T10

Figure 7-4 Model TLZ6L-DA, Back View



LJ-03386-T10

7.3 Dot Matrix Display

The indicators (Section 7.2) and the dot matrix display support the same four languages. The dot matrix display shows two types of messages: activity and status.

7.3.1 Activity Messages

The dot matrix display has several activity messages: READ when the drive is reading, REWIND when it is rewinding, and so forth.

7.3.2 Status Messages

The dot matrix display shows the current status of the auto loader when the drive is not active. Table 7–1 lists the status messages.

Table 7–1 Status Messages

Message	Meaning
READY n	A cassette is loaded in slot n . The drive is ready to accept commands.
EMPTY	There is no magazine in the loader and no cassette in the drive.
SEL SLOT	A magazine is present in the loader, but there is no cassette in the drive. Use the select slot button to choose a slot to load.
OPERATOR	Same as EMPTY, but the drawer is open.
DISMOUNT	The drawer is open and the magazine has been unloaded. Remove the magazine or press the eject button to reinitialize the magazine.
CHK MAG	A cassette is loaded in the magazine incorrectly. This message alternates with the number of the slot you should check.
0 TAPES	The magazine you just loaded has no tapes in it.

7.4 Operation

The TLZ6L auto loader can be operated two ways: automatically or manually. It has two modes: Sequential and Random Access.

7.4.1 Automatic Operations

During automatic operations, the TLZ6L auto loader can function in Sequential and Random Access modes at the same time.

In Sequential mode, upon receipt of a SCSI unload command, the loader unloads the current cassette and automatically cycles to the next cassette in the magazine. It continues to unload and cycle to the next cassette until the last cassette has been unloaded. When this process is complete, the magazine stops to prevent accidental overwrite of data. Then the magazine may be unloaded.

In Random Access Mode, the loader responds to all of the SCSI Random Access Commands.

7.4.2 Manual Operations

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

To load a magazine, press the eject button. This opens the drawer and ejects any magazine that is in the drive. Then 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 loader displays the number of cassettes loaded. If a 4-cartridge magazine is installed, the drawer closes. If an 8- or 12-cartridge magazine is installed, the drawer latches in the open position.

To load a cassette, press the slot button. 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 button until the current state is shown on the dot matrix display. When you press the slot button, the loader displays the selected slot and allows some time for changes. Then the selected slot is automatically loaded and the drive becomes ready.

To eject the magazine, press the eject button. This ejects any cassette that is in the drive, opens the drawer, and ejects the magazine. Then you can remove the magazine.

7.4.3 Single Cassette Operation

If a magazine is in the drive, eject the magazine. When the mouth of the loader is empty, you can load a single cassette in the drive. The drive should accept the cassette and load it.

To eject the cassette, press the eject button. The cassette moves into the mouth of the loader. Then you can remove the cassette.

7.5 Switch Settings

7.5.1 Switchpack 1

Switchpack 1, or SW1 (Table 7–2), is located at the top of the drive. It is accessible through a cutout in the top cover of the drive. The drawer must be in the open position when you access this switchpack.

Table 7–2 SW1 Settings and Functions

Switch	Function
SW1-1	Language Select
SW1-2	Language Select
SW1-3	Continuous Cycle
SW1-4	Display Intensity
SW1-5	Reserved
SW1-6	Reserved
SW1-7	Reserved
SW1-8	Reserved

SW1-1 and SW1-2

The dot matrix display on the TLZ6L auto loader supports four languages: English, French, German, and Spanish. You select the language of the dot matrix display by setting switches SW1-1 and SW1-2 (Table 7–3).

Table 7-3 SW1-1 and SW1-2 Settings

Language	SW1-1	SW1-2
English	Off	Off
French	Off	On
German	On	Off
Spanish	On	On

SW1-3

You select the Continuous Cycle mode by setting switch SW1-3. When you set this switch to on, the auto loader loads the first cassette after unloading the last cassette in Sequential mode.

CAUTION

Continuous Cycle mode may overwrite existing data.

SW1-4

You select the intensity of the dot matrix display by setting switch SW1-4. When you set this switch to on, the dot matrix display is set to high intensity.

7.5.2 Switchpack 2

Switchpack 2, or SW2 (Table 7-4), is located inside the drawer. It is accessible when the drawer is open.

Table 7-4 SW2 Settings and Functions

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

SW2-1

You select vertical or horizontal orientation of the dot matrix display by setting switch SW2-1. When you set this switch to on, the dot matrix display is vertical (left side down).

SW2-2

You select automatic load of the first cassette by setting switch SW2-2. When you set this switch to on, the auto loader automatically loads the first cassette upon magazine insertion.

7.6 Routine Maintenance

7.6.1 Cleaning the Rollers

Digital Equipment Corporation recommends that you clean the rollers about once every 6 months or after 10,000 load/unload cycles. Follow these steps:

1. Open the drawer and remove the magazine.
2. Dip a cotton swab in ethyl alcohol.
3. Press the slot select button three times in a 3-second period. This starts rotation of the cassette rollers. They rotate for 15 seconds while the display reads CLEAN 1.
4. Wipe the rollers with the wet end of the swab for a few seconds as they rotate.
5. Wipe the rollers with the dry end of the swab for a few seconds as they rotate.
6. Again, press the slot select button three times in a 3-second period. This starts rotation of the left magazine rollers. They rotate for 15 seconds while the display reads CLEAN 2.
7. Repeat steps 4 and 5.
8. Again, press the slot select button three times in a 3-second period. This starts rotation of the right magazine rollers. They rotate for 15 seconds while the display reads CLEAN 3.
9. Repeat steps 4 and 5.

7.6.2 Cleaning the TLZ06 Tape Drive

Refer to Chapter 6, Preventive Maintenance and Problem Solving for information on cleaning the TLZ06 tape drive.

A

Cassette Tape Drive Specifications

The following tables list the TLZ06 and TLZ6L cassette tape drive specifications.

Table A-1 TLZ06 Cassette Tape Drive Specifications

Characteristic	Specification(s)
Mode of operation	Streaming, and start/stop
Drive interface	Small computer system interconnect (SCSI)
Dimensions	22.5 mm × 12 mm × 29.5 mm (9 in × 5 in × 3.25 in)
Weight	2.2 kg (4.7 lb)
Media (4 mm x 60 m)	TLZ04-CA cassette tape
Media (4 mm x 90 m)	TLZ06-CA cassette tape
Bit density	114 Mbits per square inch
Transfer rate (sustained)	183 Kbyte/s noncompression
Recording format	Digital data storage (DDS, DC)
Cassette capacity (typical)	2 gigabytes with 90 meter tape 4 gigabytes with 90 meter tape and data compression
Operating temperature	10°C to 40°C (50°F to 104°F)
Nonoperating temperature	-40°C to 70°C (-40°F to 158°F)
Operating humidity	20% to 80% RH maximum, noncondensing
Nonoperating humidity	5% to 95% RH maximum, noncondensing
Operating altitude	0 to 4.6 km (0 to 15,000 ft)
Nonoperating altitude	0 to 15.2 km (0 to 50,000 ft)

(continued on next page)

Table A-1 (Cont.) TLZ06 Cassette Tape Drive Specifications

Characteristic	Specification(s)
Internal SCSI cable length (TLZ06-DA)	130 mm
Passes per cassette tape	300
Power consumption	
Tabletop	12 W
Drive	9 W
Power requirements	
Tabletop (TLZ06-DA)	100 to 240 Vac, 0.3 A
Drive (TLZ06-AA/BA)	+5 Vdc, 0.89 A
Drive (TLZ06-AA-BA)	+12 Vdc, 0.2 A

Table A-2 TLZ06-DA Noise Declaration

Acoustics - declared values per ISO 9296 and ISO 7779:		
	LwAd	LpAm (bystander positions)
Idle	4.5 B	32 dBA
Operating	4.7 B	33 dBA

NOTE

Current values for specific configurations are available from Digital representatives. 1 B = 10 dBA.

Table A-3 TLZ6L Cassette Tape Drive Specifications

Characteristic	Specification(s)
Mode of operation	Start/stop
Drive interface	SCSI 2
Dimensions	Industry standard 5¼-inch form factor
Media	See Table A-1
Bit density	See Table A-1
Transfer rate	See Table A-1
Recording format	See Table A-1
Cassette capacity (typical)	See Table A-1
Magazine capacity, 4-cartridge (typical)	8 gigabytes 16 gigabytes with data compression
Magazine capacity, 8-cartridge (typical)	16 gigabytes 32 gigabytes with data compression
Magazine capacity, 12-cartridge (typical)	24 gigabytes 48 gigabytes with data compression
Operating temperature	See Table A-1
Nonoperating temperature	See Table A-1
Operating altitude	See Table A-1
Nonoperating altitude	See Table A-1
Passes per cassette tape	See Table A-1
Power consumption (loader)	30.6 W
Power requirements	See Table A-1

Table A-4 TLZ6L-DA Noise Declaration

Acoustics - declared values per ISO 9296 and ISO 7779:		
	LwAd	LpAm (bystander positions)
Idle	6.2 B	47 dBA
Operating	6.2 B	47 dBA

Schallemissionswerte - Werteangaben nach ISO 9296 und ISO 7779/DIN EN27779:		
	LwAd	LpAm (Zuschauerpositionen)
Leerlauf	6,2 B	47 dBA
Betrieb	6,2 B	47 dBA

NOTE

Current values for specific configurations are available from Digital representatives. 1 B = 10 dBA.

Aktuelle Werte für spezielle Ausrüstungsstufen sind über die Digital Equipment Vertretungen erhältlich. 1 B = 10 dBA.

B

Enabling/Disabling Data Compression Under ULTRIX and VMS

B.1 ULTRIX TLZ06 Compression and Noncompression Modes

The default mode for the TLZ06 tape drive is noncompression mode. To use the TLZ06 tape drive in compression mode, specify the device as:

`/dev/rmt?h` or `/dev/rmt?m`

To use the TLZ06 tape drive in noncompression mode, specify the device as:

`/dev/rmt?l` or `/dev/rmt?a`

B.2 ULTRIX DUMP Utility

The parameters that should be used when running the DUMP utility on a TLZ06 tape drive in compressed and noncompressed mode are as follows:

Noncompressed Mode:

density = 61000 effective tape length (with 90 meter tape) = 57440

Example: `dump Odsf 61000 57440/dev/rmt?l/dev/rrz0g`

Compressed Mode:

density = 61000 effective tape length (with 90 meter tape) = 57440 ×
compression (which, for most cases is 2)

Example: `dump Odsf 61000 114880/dev/rmt?h/dev/rrz0g`

NOTE

You must type ULTRIX commands using lowercase characters.

B.3 VMS TLZ06 Compression and Noncompression Modes

The default mode for the TLZ06 tape drive is noncompression mode. To use the TLZ06 tape drive in compression mode, specify:

```
MEDIA_FORMAT=COMPACT software switch
```

To use the TLZ06 tape drive in noncompression mode, specify:

```
MEDIA_FORMAT=NOCOMPACT software switch
```

Examples for enabling/disabling compression are:

```
INIT/MEDIA_FORMAT=(NO) COMPACT MKx#:  
MOUNT/MEDIA_FORMAT=(NO) COMPACT MKx#:  
BACKUP/MEDIA_FORMAT=(NO) COMPACT MKx#:
```

NOTE

To be sure that the compression is enabled/disabled, you should include the correct software switch with each command line.

Index

C

- Cassette tape
 - handling of, 5-4
 - setting the write-protect tab, 5-5
- Checking your shipment, 1-6

D

- Design features, 1-2
- Diagnostics
 - console-based or self-tests, 6-4
- Digital audio tape (DAT), 1-2
- Digital data storage (DDS), 1-2
- Digital repair services, 6-4
- Drive indicator, 5-2

E

- Enabling/Disabling Data Compression, B-1

H

- Head cleaning, 6-1
- Head cleaning cassette, 6-2

I

- Inserting a cassette tape into the drive, 5-5
- Installing the TLZ06-AA/BA cassette tape drive, 3-1

O

- Ordering additional cassettes, 1-6

P

- Power button, 5-1
- Power cable, 2-4, 3-5
- Power-on self-test, 4-1
- Preventive maintenance, 6-1
- Problem solving, 6-3
- Product description, 1-1

S

- SCSI signal cable
 - drive to drive, 2-4
 - drive to system, 2-3, 3-5
- System support, 1-2

T

- Tape indicator, 5-2
- TLZ06 cassette tape drive
 - indicators, 5-2
 - installation verification, 4-1
 - location of buttons, switches connectors, 3-2
 - location of buttons, switches, connectors, 2-2
 - power button, 5-1
 - specifications, A-1
 - unload button, 5-1
 - using, 5-1

TLZ06 cassette tape drive (cont'd)

write-protect LED, 5-1

TLZ6L cassette tape drive
specifications, A-1

U

Unload button, 5-1

W

Write-protect LED, 5-1

Write-protect tab, 5-5