digital ™

TZS20 25/50 GB
AIT Cassette Tape Drive

User's Guide

EK–TZS20–UG. B01

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful 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:

- Re-orient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

The table top drive requires shielded interface cables in order to comply with FCC emission limits.

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Revision Record

This Revision Record provides a concise publication history of this guide. It lists the guide revision levels, release dates, and reasons for the revisions.

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 TZS20 AIT Cassette Tape Drive.

Revision Level	Date	Summary of Changes
EK–TZS20–UG. A01	April, 1997	Initial release
EK–TZS20–UG. B01	May, 1997	Update and add regulatory information

About This Manual

This manual describes the installation and operation of the TZS20 AIT Cassette Tape Drive.

Visit Our Web Site for the Latest Information

Check our web for the latest drivers, technical tips, and documentation. We can be found in the technical area of our web page, *http://www.storage.digital.com/*

Audience

This guide supports the user of the TZS20 Cassette Tape Drive. You should be familiar with tape drive terminology and the use of PCs and workstations.

Document Organization

This guide contains the following:

Chapter 1: Introduction

Chapter 1 provides an overview of the TZS20 and identifies the products covered in this manual.

Chapter 2: Installing the Tape Drive

Chapter 2 provides instructions on how to install and configure the tape drive models covered in this guide, including instructions on how to set the SCSI ID.

Chapter 3: Operating the Tape Drive

Chapter 3 addresses operating procedures and controls and indicators.

Chapter 4: Care, Maintenance and Problem Resolution

Chapter 4 describes tape drive head cleaning, tape cartridge care, and provides solutions to common tape drive and media problems.

Appendix A: Supplies

Appendix A provides ordering numbers for the tape head cleaning cartridge and data cartridges.

Appendix B: Specifications

Appendix B lists the physical, electrical, and environmental specifications for the TZS20 tape drive.

Appendix C: Supported SCSI Messages and Commands

Appendix C lists TZS20 tape drive supported SCSI commands and messages.

Conventions

This guide uses the following conventions:

Table 1 Style Conventions

Style	Meaning
boldface type	For emphasis
italic type	For emphasis and manual titles
`monospace type`	Screen text, file names, path names, directories, commands and utilities

1

Introduction

This chapter introduces and describes the TZS20 Cassette Tape Drive. There are four TZS20 models: two embedded (internal) models, a tabletop (external) and an SBB model.

1.1 Product Overview

The TZS20 tape drive is a high capacity data storage device which uses 8mm Advanced Intelligent Tape (AIT) technology. It can store 25 GBs of data (uncompressed) or 50 GBs (compressed, assuming a 2 to 1 compression ratio) on a single tape cartridge.

The TZS20 interfaces to the host computer system by means of a single-ended, 68-pin, wide-SCSI connector. The drive achieves high data reliability through read-after-write and an additional level of Error Correction Code.

TZS20 Features

- 25GB capacity (approximately 50GB to 75GB with Data Compression)
- Sustained transfer rate of 3 MByte/sec (6MByte/sec to 9MByte/sec with Data Compression)
- AIT-1 Format
- Burst transfer rates of 12 MByte/sec asynchronous and 20 MByte/sec synchronous
- A 4-MB buffer memory
- Three levels of Error Correction Code (ECC)
- High speed search rate (75 times normal read/write speed)
- Random read, append write, and N-Group write option

1.2 Data Compression

Tape cartridge capacity and transfer rate are increased by compressing data before writing it to the tape. The TZS20 uses the powerful ALDC data compression algorithm. The AIT-1 Format allows both compressed and uncompressed data to reside on the same tape.

1.3 Operating System Support

TZS20 is fully supported by the following Operating Systems:

- OpenVMS Version 7.1 or higher
- DIGITAL UNIX Version 4.0A or higher (no SCSI ID greater than 7 for all SCSI devices)
- Windows NT versions 4.0 (With DIGITAL provided NT driver or Microsoft NT driver when available)

TZS20 is partially supported by following Operating Systems:

Operating System	Revision	Operating System Restriction
OpenVMS	Lower than 7.1	No SCSI ID greater than 7 (all SCSI devices)
DIGITAL UNIX	3.2G	No SCSI ID greater than 7 (all SCSI devices) and no compression support.
	4.0	No SCSI ID greater than 7 (all SCSI devices), no compression support. Maximum block size is 64K.

Note: If the following message is seen on any version of DIGITAL UNIX, it should be considered an informational message only. No action is required by the user.

```
ctape_ioctl: unmapped scsi density code (0x30)-DDR entry needed
```

1.4   TZS20 Models

There are four TZS20 models:

- DS-TZS20-DB, tabletop, shown in Figure 1–1,
- TZS20-AB, 3 ½-inch embedded, front panel shown in Figure 1–2,
- TZS20-BB, 5 ¼-inch embedded,
- DS-TZS20-VW, SBB unit, shown in Figure 1–3.

Figure 1–1 DS-TZS20-DB Tabletop Tape Drive
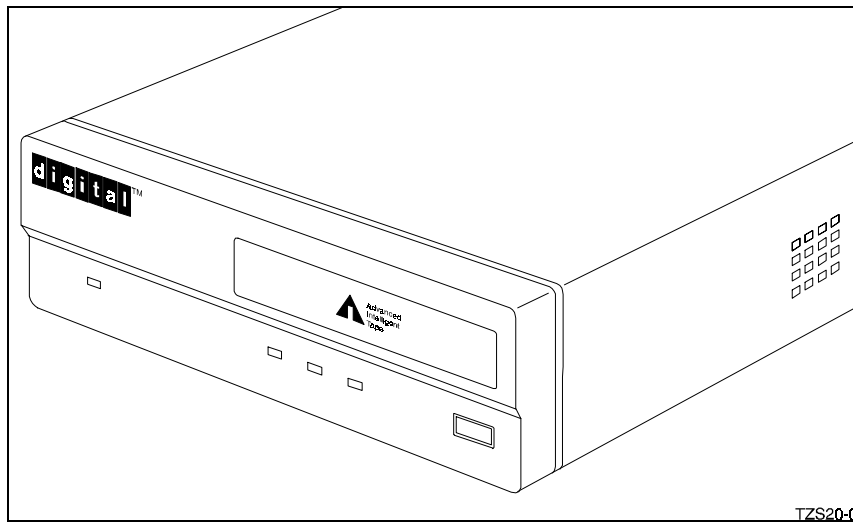
Figure 1–2 Front View of TZS20-AB Embedded Tape Drive
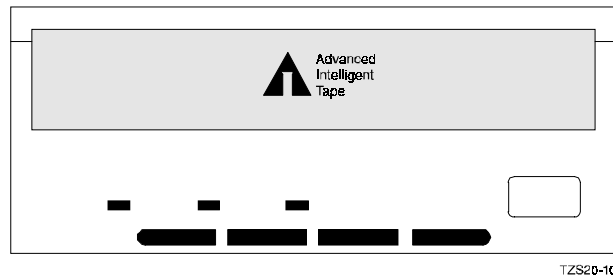
Figure 1–3 DS-TZS20-VB StorageWorks SBB Unit

<div style="text-align: right">

2

</div>

<div style="text-align: right">
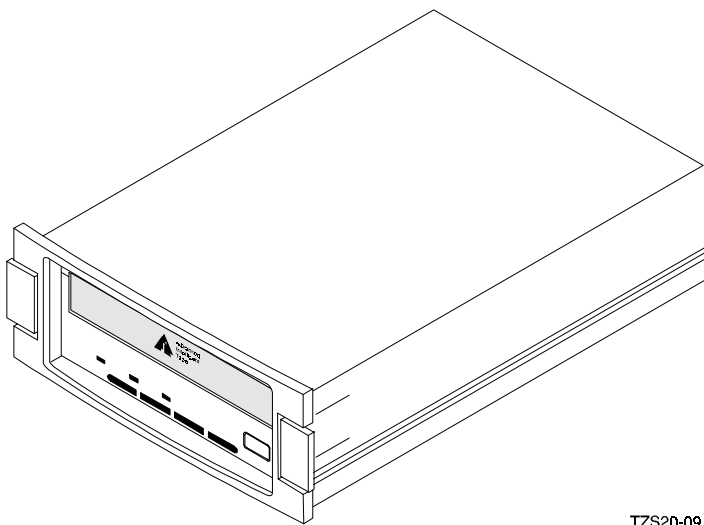
Installing the Tape Drive

</div>

This chapter describes the unpacking and installation of the TZS20 AIT Cassette Tape Drive, including instructions on how to set the SCSI ID.

2.1 Unpacking the Tape Drive

Before unpacking the unit, check the packing slip to ensure that the correct equipment has been shipped. Inspect the shipping carton for damage. The carton and packing material should be retained at the installation site for reshipment.

If you have the tabletop model the box contains the following items.

- The AIT Drive Unit,
- A Power Cable,
- A terminator,
- A cleaning cartridge,
- A media cartridge,
- A floppy disk with Windows NT 4.0 driver
- This Guide,
- Four rubber feet (for operating the drive in the upright position).

2.2 Installing the TZS20 Embedded (Internal) Tape Drive

Install the embedded tape drive as follows:

1. Shut down the operating system

2. Halt the system

3. Set all system power switches off.

4. Examine the space that you intend to mount the drive. The drive has mounting holes on the sides and bottom of the unit. Please refer to your system's documentation for information on how to install the tape drive.

   If the design of your computer case has slide tracks for rails on the sides of mounted devices, use the proper screws and attach them to the sides of the tape drive.

---

5. The embedded (internal) tape drive is pre-configured as SCSI ID 5. If there is a SCSI ID conflict in your system, you must change the jumper setting on the jumper block on the back of the tape drive. Refer to Figure 2–1.

Figure 2–1 Setting the SCSI ID, Embedded Tape Drive
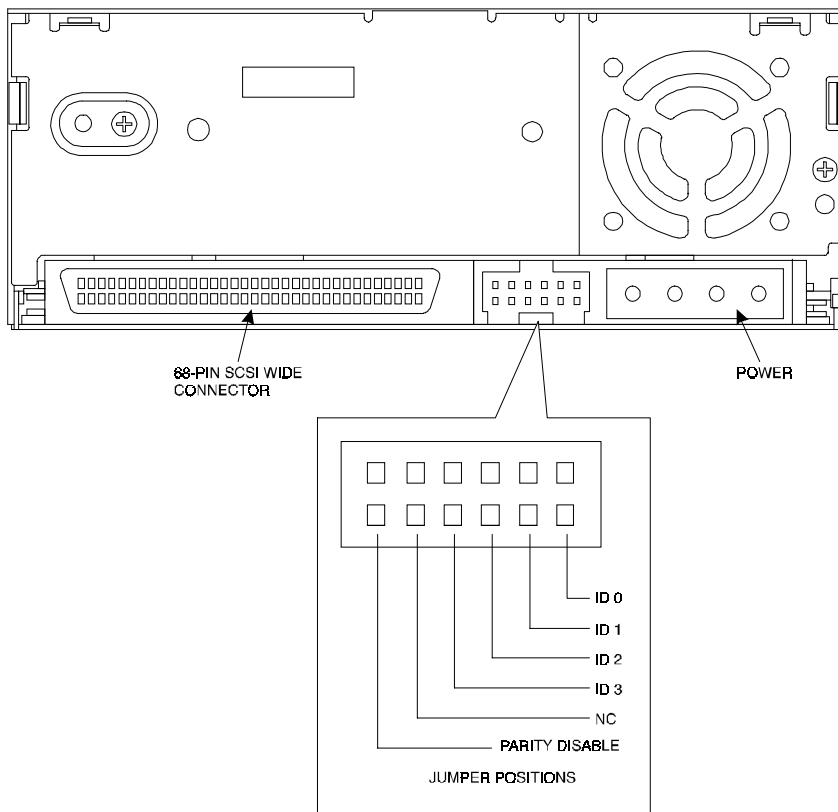
Parity default is enabled (jumper off).

Table 2–1 SCSI ID Jumper Settings

SCSI ID	ID3	ID2	ID1	ID0
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1
12	1	1	0	0
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

0 = Jumper Removed; 1 = Jumper On. Default setting is SCSI ID 5.

6. The option switches, located on the bottom of the drive, allow you to enable active termination and terminator power. If you require terminator power, set Option switch 5 to on; to enable active termination set switch 6 to on. Refer to Figure 2–2 and Table 2–2 for switch settings.

7. Slide the tape drive into the computer case to make sure there are no obstructions. Nothing should be forced. If rail mounting does not work, examine how the disk drives have been mounted in your computer and determine a way to mount the drive.

> **NOTE**
>
> Depending on the final location of your tape drive, you may find it easier to plug the flat cable into the tape drive before you install the drive in the computer.

8. Thread the cable into the mounting area first and route it toward the adapter board. Gently guide the cable as you push the drive into place. Handle the ribbon cable carefully to prevent damage to the cable.

9. Before you mount the tape drive in the computer chassis, check to see that you will be able to plug the DC power cable into the unit easily.

10. Mount the tape unit to the computer chassis appropriately and plug the DC power cable into the tape drive's power connector, shown in Figure 2–1. Mate the female connector with the drive's connector and firmly push it all the way into the drive's connector.

11. If you have not already done so, connect the flat ribbon cable to the unit.

12. Replace the computer case cover, being careful not to snag or pinch any cables. Plug the computer and peripherals back into their wall sockets.

Figure 2–2 Option Switch Settings
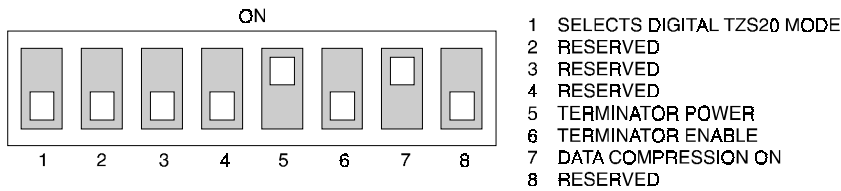
Table 2–2 Option Switch Descriptions

Option Switch	Default Position	Description
1	OFF	Selects Digital TZS20 mode.
2	OFF	Reserved
3	OFF	Reserved
4	OFF	Reserved
5	ON	Terminator power. Switch should be set to OFF if drive is not at the end of the bus.
6	OFF	Active bus termination. If tape drive is the last device on the SCSI bus, should be set to ON unless an external terminator is used.
7	ON	Enables or disables compression. Default setting is ON (compression enabled). Software can override this setting.
8	OFF	Reserved

2.3 Installing the DS-TZS20-DB Tabletop (External) Tape Drive

To install the DS-TZS20-DB tabletop model proceed as follows:

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

Figure 2–3 Connecting the DS-TZS20-DB Tabletop Model
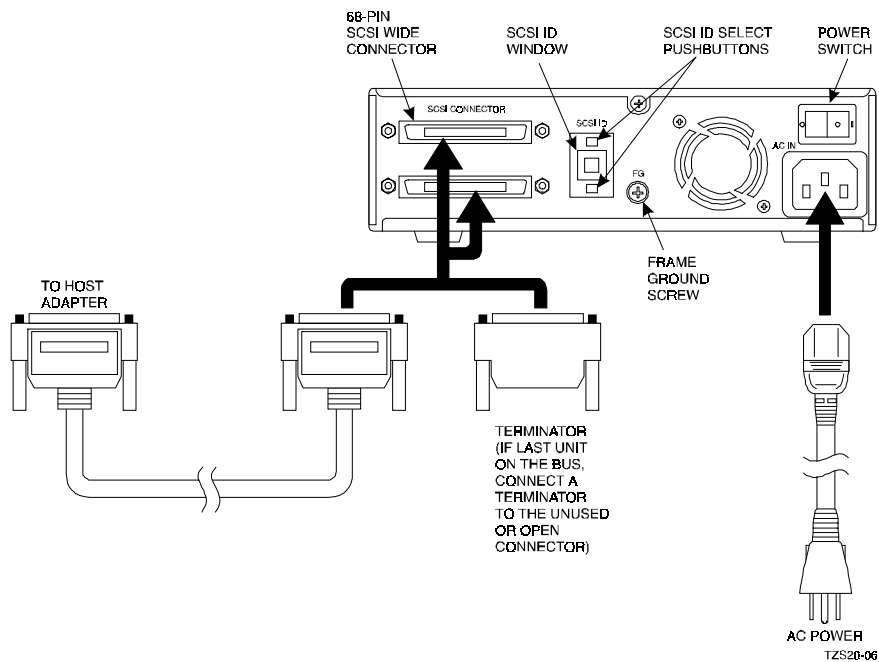
4. Make sure the SCSI ID displayed in the window matches the SCSI ID required by your system. To change the SCSI ID, make sure the unit is off and press the top or bottom pushbutton until the correct SCSI ID is displayed in the window.
5. Connect a wide-SCSI cable from the host computer's SCSI adapter to one of the connectors on the drive. Connect the other connector to the next device on the bus; or, if the drive is the last device on the bus, connect a terminator to the open connector. Refer to Figure 2–3.
6. Connect the power cord to the power receptacle.

2.4   Installing and Removing the SBB Tape Drive

Use the following procedure to install or remove the SBB tape drive.

1. Insert the replacement SBB into the guide slots and push it in until it is fully seated and the mounting tabs lock into the shelf.

2. After power is applied, the LEDs should blink in sequence from left to right. When the diagnostics are completed and if the media is loaded, the Tape LED stays on (see Figure 3-1 to identify the Tape LED).

3. To remove the SBB tape drive press the two mounting tabs together to release the SBB, and using both hands, pull the drive out of the shelf.

2.5   Verifying the Installation of the Tape Drive

2.5.1 Verifying the Installation at the Console Level

To verify that VMS/UNIX recognizes the tape drive, at the console prompt, enter the command:

`>>> SHOW DEVICE`

An example of the screen display is as follows:

```
        MKA100.1.0.9.0    MKA100  TZS20  xxxx
```

Where in the string 1.0.9.0, 1 indicates the ID, 0 the Bus, and 9 the slot number, MKA100 is the system name for the drive, TZS20 is the device name and "xxxx" will indicate the firmware revision.

NOTE

If the device is not recognized by the system, at the console level enter the `INIT` command; then re-enter the `SHOW DEVICE` command.

2.5.2 Verifying the Installation Under VMS

After booting the system, to verify the configuration, at the OpenVMS level enter:

`$` **`SHOW DEVICE`**

The screen displays:

```
     Device       Device     Error   Volume     Free
      Name         Status     Count   Label     Blocks
 $ SCT$MKA100      Online       0
```

The Volume label and number of free blocks will be displayed if a tape is loaded.

2.5.3 Verifying the Installation Under UNIX

After booting the device, to verify that UNIX recognizes the drive enter:

> # **`file /dev/rmt*h`**

For 4.0x, the screen displays the following (in a single line):

```
/dev/rmt1h  character special (9/3074) SCSI #0 TZS20 tape #
(SCSI ID #1)(SCSI LUN # 0)  offline
```

For 3.2G, the screen displays the following (in a single line):

```
/dev/rmt1h  character special (9/68610)SCSI #0 TZxx tape #8
(SCSI ID #1)  offline
```

> **NOTE**
>
> The system displays "offline" if a tape is not loaded, otherwise it displays 6666_bpi as the default value. Density will be correctly reported as 116000 bpi in a future release.

2.5.4 Verifying the Installation Under Windows NT

Click on Device Manager; then click on Tape Drives. The drive's name, DEC TZS20 © DEC, should appear.

3

Operating the Tape Drive

This chapter provides operating instruction for the TZS20 Tape Drive.

3.1 Controls and Indicators

All TZS20 tape drive models have Busy, Tape and Status indicator LEDs and an Eject pushbutton. In addition to the three LEDs and the Eject pushbutton, the tabletop model has a Power On LED on the front panel and a Power switch on the back of the unit.

Figure 3–1 TZS20 Tabletop Tape Drive
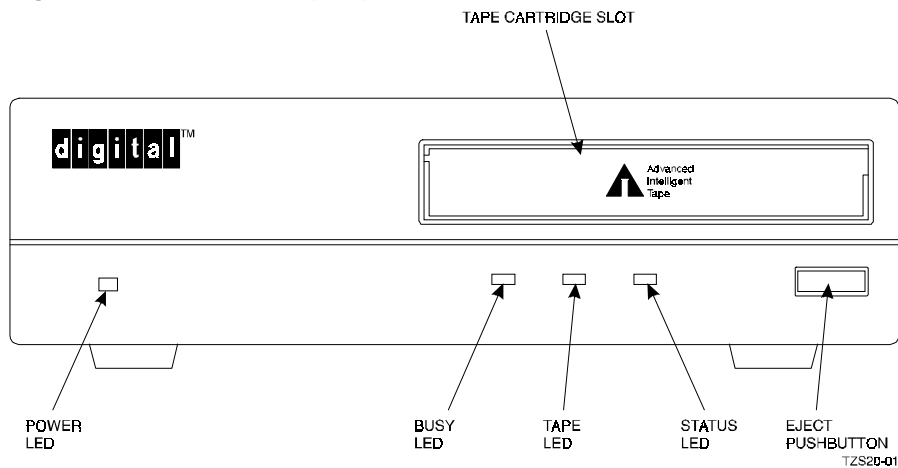
Tape Cartridge Slot

Receives 8-mm AIT data grade tape cartridges or AIT cleaning cartridge.

Eject Pushbutton

Unloads cartridge from the drive.

The basic functions of the Status, Tape and Busy LEDs are as follows. See Table 3-1 for additional details.

Status LED

Lights when an inserted cartridge is write-protected. This indicator also flashes rapidly when the tape head needs cleaning; flashes a code to indicate drive failure.

Tape LED

Lights when a cartridge is loaded. Also flashes to indicate other conditions.

Busy LED

Lights when data is being transferred over the SCSI bus. Also flashes when the drive is reading or writing normally.

Power LED (tabletop model only)

Lights while the drive is on.

Power Switch (tabletop model only)

Located on the back of the drive unit, this switch turns the drive on or off.

SCSI Pushbuttons (tabletop model only)

Used to select the drive's SCSI ID.

3.2   Summary of Tape Drive LED Indications

The TZS20 LEDs indicate the status of the drive as defined in Table 3–1.

Table 3–1 Possible LED Indications and Their Meaning

LED			STATE		
Busy	**Tape**	**Status**	**Activity**	**Cartridge**	**Other**
OFF	OFF	OFF	None	None	None
ON	OFF	OFF	SCSI	None	None
Flashing-1	Flashing-1	OFF	Drive	Loading/ Unloading	None
Flashing-1	Flashing-1	ON	Drive	Loading/ Unloading	Write Protected
OFF	ON	Flashing-1	None	Loaded	Cleaning Tape at EOM
OFF	ON	OFF	None	Loaded	None
ON	ON	OFF	SCSI	Loaded	None
Flashing-1	ON	OFF	SCSI/Drive	Loaded	None
—	ON	ON	—	Loaded	Write Protected
—	Flashing-2	—	—	Loaded	Media Error Rate Warning
—	—	Flashing-2	—	—	Cleaning Request
—	—	Flash Code 2	—	—	Self Test Failure
Flash Code 1	—	—	—	—	Waiting for Reset
—	Flash Code 1	—	—	—	Waiting for Eject

OFF		ON	
Flashing-1		1 pulse (0.25 sec on/ 0.25 sec off)	
Flash Code 1		1 pulse (0.25 sec on/1.0 sec off)	
Flashing-2		1 pulse (3.5 sec on/0.5 sec off)	
Flash Code 2		2 pulses (0.25 sec on/0.5 sec off)	
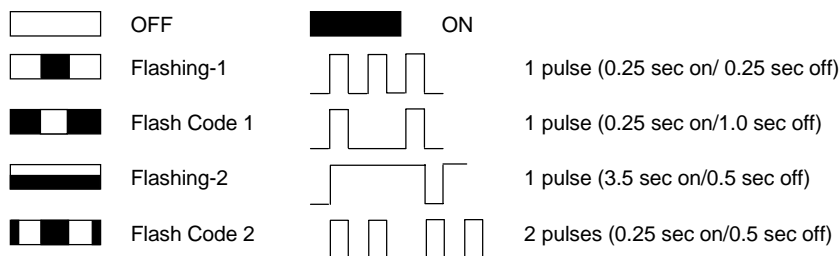
3.3 Powering Up the Tape Drive

Before applying power to the TZS20, check the installation. When power is turned on, the drive performs Power On Self Test (POST). It steps through its built-in diagnostic program checking the drive's functionality until it reaches normal status. If a failure is detected during diagnostics, the LEDs show that the TZS20 is out of order and needs to be repaired. Refer to Table 3–2 for the normal display sequence.

Table 3–2 Power On Self Test LED Display Sequence

DURATION	LED		
	BUSY	TAPE	STATUS
.25 sec	ON	ON	ON
.25 sec	OFF	OFF	OFF
.25 sec	ON	ON	ON
.25 sec	OFF	OFF	OFF
.25 sec	ON	OFF	OFF
.25 sec	OFF	ON	OFF
.25 sec	OFF	OFF	ON
.25 sec	ON	OFF	OFF
.25 sec	OFF	ON	OFF
.25 sec	OFF	OFF	ON
.25 sec	ON	OFF	OFF
.25 sec	OFF	ON	OFF
.25 sec	OFF	OFF	ON

Cycle repeats until the end of test.

3.4 Setting the Write-protect Switch

Cassettes can be write-protected by sliding the switch on the back of the cassette open, the SAFE position. When write-protected, data can be read from the tape but not written to it, preventing the tape from being accidentally erased. When a write-protected tape is loaded into the drive the Tape and Status LEDs light.

Observe the following guidelines when setting the Write-protect switch.

- If you are reading data or copying data from a tape, set the Write-protect switch to the SAFE (write-protected) position. See Figure 3–2.

- If you are writing data, set the write-protect switch to the REC (write-enabled) position.

NOTE

The Tape Log, which contains a history of usage of the tape, will not be updated when the cassette is write-protected.

Figure 3–2 Setting the Write-protect Switch on the Tape Cartridge
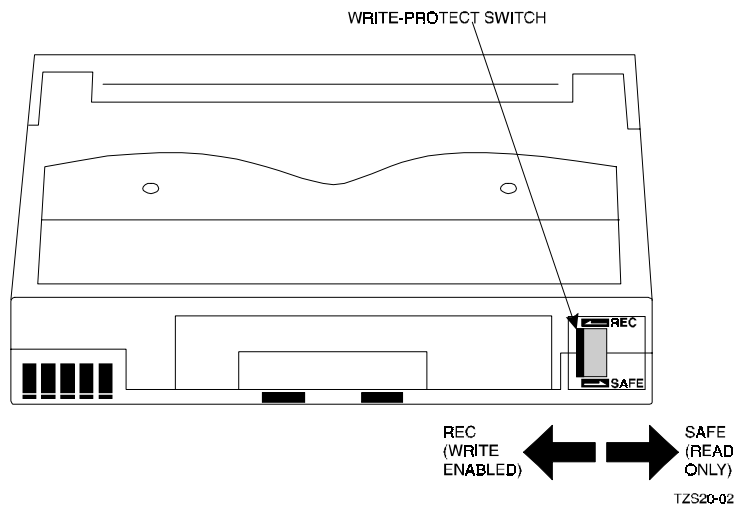
3.5 Loading a Cartridge into the Drive

A cassette is inserted into the slot on the front panel with the write-protect switch on the right-hand side, and the arrow on the cassette pointing towards the drive. When the cassette is inserted, the drive takes it and automatically loads it into the drive mechanism. To load a cartridge into the drive:

1. Apply power to the drive. For the tabletop model turn on the Power switch on the rear of the drive. The Status, Busy and Tape LEDs flash as POST is performed.

2. When the LEDs stop flashing, insert an AIT data cartridge, shown in Figure 3–3.

Figure 3–3 Inserting the Tape Cartridge
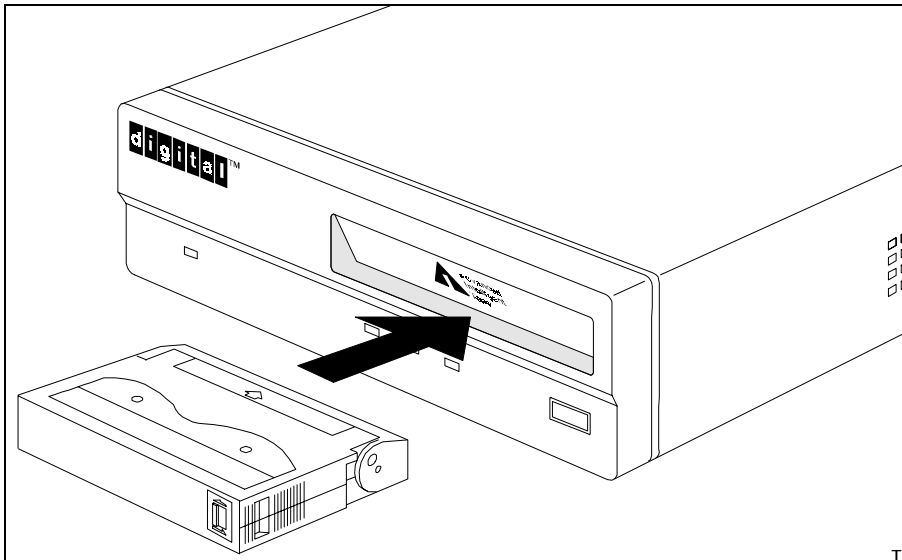
3.6 Removing the Tape Cartridge from the Tape Drive

The tape cartridge can be removed manually by pressing the Eject pushbutton or dismounted by means of software control. Refer to the operating system documentation on software control of this function. During the unload sequence, the drive rewinds the tape to Beginning of Media (BOM) and then ejects the cassette. Wait until the cassette ejects part way out of the slot; then remove it from the drive.

NOTE

Pushing the eject button during a write command will cause the write to be incomplete. However, EOD will be written so that the tape can be read. The aborted record may be shorter than what was requested in the write command.

Figure 3–4 Removing the Tape Cartridge
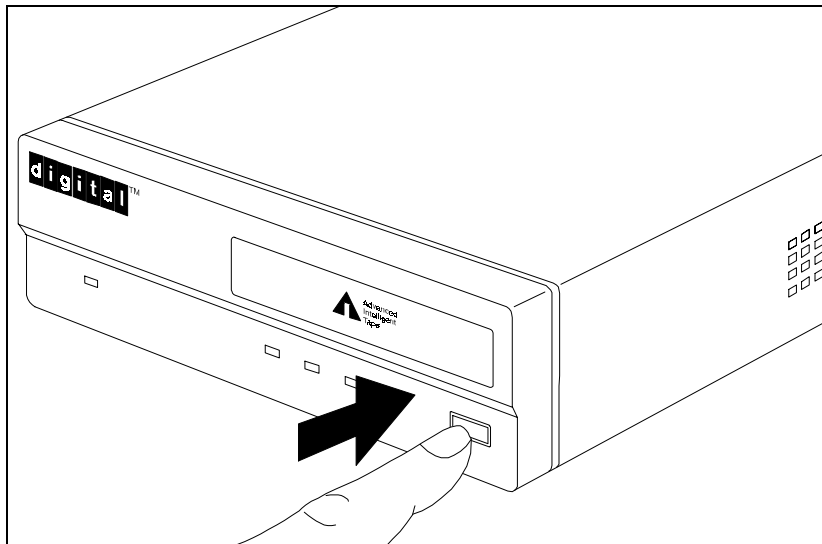
3.7 Media Error Rate Warning

The TZS20 provides an internal error rate monitoring feature that serves to notify the user of a potential problem with the media. When a media error rate warning threshold is exceeded the drive will indicate this by flashing the Tape LED. The flashing duration is 3.5 seconds on and 0.5 seconds off. This indication should be seen only very occasionally. It can sometimes occur with a relatively new

cartridge but is more likely to occur on a tape with several thousand media passes completed. If it occurs with a relatively new cartridge, it is likely caused by some debris on the tape or head. In this case, it is recommended that a cleaning cycle be performed as soon as convenient (i.e., at the conclusion of the present backup operation). With an older tape, it is more likely an indication that the tape is becoming worn (i.e., used beyond the media spec of 20000 passes). In this case, the user should consider replacing the tape with a new one.

The media error rate warning indication will be cleared when the cassette is unloaded.

4

Care, Maintenance and Problem Solving

This chapter provides tape drive head cleaning instructions and information on how to fix common tape drive and media problems.

4.1   Cleaning the Tape Drive Head

The head is the component in the drive that physically reads and writes data to and from the media (the tape cartridge).

Digital recommends using a Digital cleaning tape, Part Number TZS20-HA. One cleaning cassette can be used approximately 35 times.

The cleaning interval depends on three main factors:

- How often the drive is used,
- The quality of the data tapes used,
- The quality of the environment.

When the drive detects that the head needs cleaning, the Status LED flashes (flashing-2 code) (see Table 3-1). To clean the head:

1. Remove the data cartridge.
2. Insert the head cleaning tape into the tape slot. Head cleaning starts automatically. When the cleaning tape finishes, it ejects automatically.

Head cleaning using the cleaning tape is not typically required with the TZS20 due to the inclusion of a highly effective automatic head cleaner. However, there may be instances when a head cleaning cycle should be executed.

- When the drive requests a head cleaning cycle via flashing Status LED
- In some cases when media error rate warning occurs (Section 3-7)
- When read/write errors occur

4.2 Taking Care of Tape Cartridges

To maximize the life of recorded or unrecorded cartridges, store cartridges in a clean environment with the following conditions:

- Do not drop or bang the cartridge.
- Keep tape cartridges out of direct sunlight and away from heaters and other heat sources.
- Store tape cartridges in temperatures between 10^oC and 40^oC (50^oF to 104^oF).
- If the tape cartridge has been exposed to heat or cold extremes, stabilize the cartridge at room temperature prior to use.
- Do not place cartridges near electromagnetic interference sources, such as motors, video, or X-ray equipment. Data stored on the tape can be altered by the electromagnetic interference created by such sources.
- Store tape cartridges in a dust-free environment where the relative humidity is between 20% and 60%.
- Store cartridge in its protective container when not in the drive.
- Always place the identification label in the space provide for the label on the cartridge.

4.3 Tape Drive Problem Solving

Some of the tape drive problems you may encounter are listed in this section, along with potential corrective actions to correct the problems.

The tape drive will not accept a tape cartridge:

1. Withdraw the tape cassette and turn the power to drive off, wait 5 seconds, then turn the power back on, and check for a normal power up sequence.

   If the LEDs do not light, check the power supply and power cable connection. If the drive completes the power on sequence normally but still won't accept the tape cassette, the drive may be defective.

2. A tape is already in the drive. Press the Eject pushbutton to remove the first tape.

3. The power has been removed from the drive with a tape loaded. When the power is restored to the drive, it will detect the tape and rewind the tape to BOM (Beginning of Medium). Press the Eject pushbutton to remove the cassette.

A tape is in the drive and will not eject:

If the SCSI command PREVENT/ALLOW MEDIA REMOVAL (with Prevent bit set to one) has been sent to the drive, the cartridge will be retained in the drive even after an UNLOAD command. The Eject pushbutton is also disabled. Send a PREVENT/ALLOW MEDIA REMOVAL (with prevent bit clear) command, issue a SCSI bus reset, or bus device reset message, or power the drive off and back on to override this condition.

If this fails to clear the tape, the drive has a serious problem and should be returned to Digital for repair with the tape in place.

The drive powers up properly and loads and unloads tapes but will not respond to any SCSI commands:

If SCSI bus reset does not cause the drive to reset (same as power-on self test),

- Check the SCSI cable connectors,
- Check that SCSI cable pin one is aligned with the SCSI connector pin one,
- Check for a broken cable or defective connector,
- Try another known good SCSI device in the same location.

If SCSI bus reset causes the drive to reset, then the problem is most likely with the SCSI bus addressing or termination:

- Check that the SCSI bus ID jumper is set for the proper address,
- Check SCSI bus termination (only the SCSI devices at the ends of the bus should be terminated).

A read/write error occurs:

If a read/write error occurs, a combination of the following steps should correct the problem:

- Remove the tape,
- Clean the drive with the AIT-1 cleaning cartridge (DIGITAL Part Number TZS20-HA) Status LED may or not be flashing.
- Retry the operation.

If read/write errors persist, replace the tape cartridge.

4.4   Emergency Tape Removal Procedure

CAUTION

This procedure should only be executed if other methods for tape ejection have been tried and failed. If done improperly, drive damage could result.

1. Remove the drive from the chassis or enclosure to allow access to the bottom and right side of the drive.

2. Remove the drive's top cover.

3. Locate the small opening in the bottom of the drive and insert the tip of a precision screwdriver so that the Threading motor shaft can be rotated.

4. Rotate the motor shaft counterclockwise to bring the threading mechanism back to the initial position.

5. Before manual eject procedure, tape slack must be removed in order to prevent tape damage. Rotate the gear mechanism located on the right side of the drive clockwise to tighten the tape.

6. After the tape slack has been removed, turn the screw located on the right side of the drive clockwise by a precision screwdriver until the tape cartridge is lifted out of the drive mechanism and is ejected.

Figure 4–1 Emergency Tape Cartridge Removal Procedure

3. TURN SCREW CLOCKWISE UNTIL TAPE EJECTS.

2. TURN GEAR MECHANISM TO TIGHTEN TAPE.

1. TURN THREADING MOTOR SHAFT COUNTERCLOCKWISE.
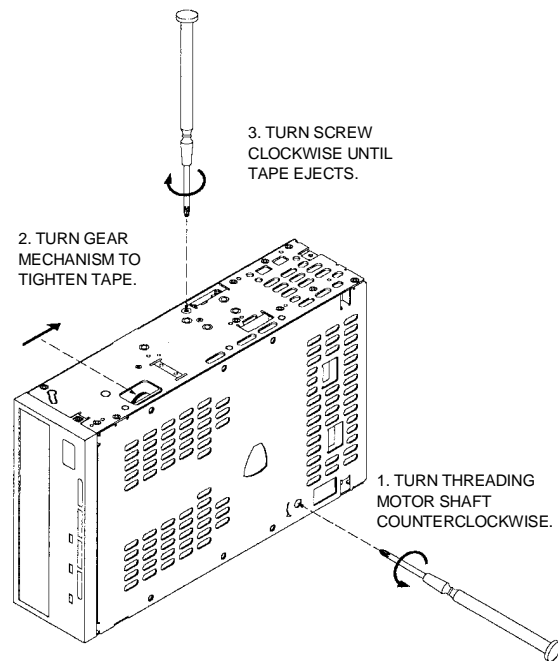
4.5 Service Offerings

Digital offers a wide-range of flexible service plans. For the type of plans available and plan details, contact your local Digital service representative.

A

Supplies

This appendix lists the supplies available for the TZS20 tape drive.

A.1   Ordering Information

To order additional blank cartridges and head cleaning cartridges, call Digital Equipment at 1-800-344-4825 or your authorized Digital Distributor. Refer to the following table for part numbers.

A–1 Ordering Numbers

Order Number	Description
TZS20-HA	Cleaning Tape (quantity 1)
TZS20-CA	Blank Data Tape (quantity 1)
TZS20-CB	Blank Data Tape (quantity 5)
12-41768-01	68-pin, single-ended, active terminator

B

Specifications

This appendix contains the technical specifications for the TZS20 tape drive.

Table B–1 TZS20 Tape Drive Specifications

Characteristic	Specification
Media and format	8-mm tape cartridge, AIT
Drive Interface	Wide SCSI, high-density, single-ended
Buffer Size	4 MB
Dimensions:	
Embedded (3 ½-inch form factor)	
Height	41.2mm (1.62 in)
Width	101.6mm (4.0 in)
Depth	155mm (6.1 in)
Embedded (5 ¼-inch form factor)	
Height	41.2mm (1.62 in)
Width	146mm (5.75 in)
Depth	155mm (6.1 in)
Tabletop	
Height	58mm (2.28 in)
Width	189mm (7.43 in)
Depth	262mm (10.3 in)
Weight:	
Embedded, 3 ½-inch	750 g (1.6 lbs)
Embedded, 5 ¼-inch	1.0 kg (2.3 lbs)
Tabletop	2.2 kg (4.9 lbs)

Table B–1 TZS20 Tape Drive Specifications (Continued)

Characteristic	Specification
Transfer Rate, Uncompressed	3 Mbytes/sec
Transfer Rate, Compressed	6–9 Mbytes/sec
Transfer Rate, burst	20 Mbytes/sec
Storage Capacity	25 Gbytes (uncompressed, using special AIT tape) 50 Gbytes (compressed)
Bit Error Rate	Less than 1 in 10^{17}
Initialize Time	Less than 5 seconds
Load Time	24 seconds
Unload Time	30 seconds
Rewind Time	Less than 80 seconds
Power Requirements (embedded)	+5 VDC 1.55 A (typical) 2.5A (max.) +/- 5% Including ripple +12 VDC .35 A (typical) 1.2 A (max.) +/- 10% including ripple
Current Consumption (Tabletop)	0.5 A/0.3A max. (100-120V/220-240V)
Power Input (Tabletop)	100-120 V/200-240V, 50/60 Hz
Environmental:	
Operating Temperature	10º to 40º C
Non-operating Temperature	-40º to 66º C
Operating Humidity	20% to 80% RH maximum (non-condensing)
Non-operating Humidity	10% to 90% RH maximum
Media life spec (average)	20,000 passes (Movement of the tape past the head in one direction constitutes a pass. Example: A read followed by a rewind equals two passes.)

Table B–2 TZS20 Noise Declaration

Acoustics – declared value per ISO 9296 and ISO 7779:			
<u>Product</u>		<u>LwAd</u>	<u>LpAm</u> (bystander positions)
TZS20–AB	Idle		
	Operating	4.9 B	36 dBA
DS–TZS20–DB	Idle	5.3 B	34 dBA
	Operating	5.4 B	37 dBA
DS–TZS20–VB	Idle		
	Operating	4.9 B	35 dBA

Schallemissionswerte – Werteangaben nach ISO 9296 und ISO 7779/DIN EN27779:			
<u>Gerät</u>		<u>LwAd</u>	<u>LpAm</u> (Zuschauerpositionen)
TZS20–AB	Leerlauf		
	Betrieb	4,9 B	36 dBA
DS–TZS20–DB	Leerlauf	5,3 B	34 dBA
	Betrieb	5,4 B	37 dBA
DS–TZS20–VB	Leerlauf		
	Betrieb	4,9 B	35 dBA

Note: Current values for specific configurations are available from DIGITAL representatives. 1B = 10 dBA
Aktuelle Werte für spezielle Ausrüstungsstufen sind über die Digital Equipment Vertretungen erhältlich. 1B = 10 dBA.

C

Supported SCSI Messages and Commands

This appendix lists TZS20 supported messages and commands.

C.1   Supported SCSI Messages

Abort	Identify (with and without disconnect)
Bus Device Reset	Ignore Wide Residue
Command Complete	Message Parity Error
Disconnect	Message Reject
Extended Message	No Operation
–Synchronous Data Transfer Request	Restore Pointers
–Wide Data Transfer Request	Save Data Pointer

C.2   Supported SCSI Commands

Erase	Receive Diagnostic Results
Inquiry	Release Unit
Load/Unload	Request Block Address
Locate	Request Sense
Log Select	Reserve Unit
Log Sense	Rewind
Mode Select	Seek Block
Mode Sense	Send Diagnostic
Prevent/Allow Media Removal	Space
Read	Test Unit Ready
Read Block Limits	Verify
Read Buffer	Write
Read Position	Write Buffer
Report Density Support	Write Filemarks