

# TZK11 Tape Backup System

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## User Guide

Order Number: EK-TZK11-UG.A01

**Revision Update Information:** This is a new manual

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**First Edition, July 1993**

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# Preface

This document describes the installation and operation of the TZK11 Tape Backup System.

## Document Organization

This manual is comprised of the following chapters:

- Chapter 1, Introduction—Provides an introduction to TZK11 Tape Backup System. Also provides information about the operational environment of TZK11 Tape Backup System.
- Chapter 2, Installing a SCSI Interface Unit—Provides information on installing a TZK11 Tape Backup System on a PC. Also provides information on getting started.
- Chapter 3, Operating Procedures—Addresses operating procedures, controls and indicators, tape cartridge handling, and jumper settings used with TZK11 Tape Backup System.
- Chapter 4, Operating System Support—Addresses operating system support and compatibility.
- Chapter 5, Preventive Maintenance and Problem Resolution—Describes preventive maintenance and diagnostics.
- Appendix A—Contains information on related supplies for the TZK11 Tape Backup System.
- Appendix B—Contains specifications for the TZK11 Tape Backup System.

## Conventions

The following table lists the conventions used in this manual.

Convention	Meaning
<b>Note</b>	Contains important information.
<b>WARNING</b>	Contains safety or other critical information.
<span style="border: 1px solid black; padding: 0 2px;">Return</span>	Indicates the key you are to press, e.g., the Return key.
<i>Italic type</i>	Emphasizes important information, indicates variables, and indicates complete titles of documents.
<b>Boldface type</b>	Indicates user input.
Monospaced type	Represents text that the system displays on the screen.

# 1

---

## Introduction

The TZK11 Data Cartridge Tape Drive is a half-height, 5-¼ inch, Quarter-Inch Cartridge (QIC) streaming tape drive for use with PC, low-end, desktop, and Digital Equipment Corporation workstation systems. The TZK11 Data Cartridge Tape Drive provides archival storage/retrieval and data collection activities. The TZK11 Data Cartridge Tape Drive is Small Computer System Interface (SCSI-2) compliant.

The TZK11 Data Cartridge Tape Drive consists of one main component: the tape drive. The controller logic is located within the TZK11 Data Cartridge Tape Drive itself.

### 1.1 Operating System Support

TZK11 is configurable to work with either Digital operating systems (VAX/VMS, OpenVMS, DEC OSF/1, Windows NT (AXP)) or non-Digital operating systems (DOS/Windows, OS/2, SCO UNIX, Windows NT, Novell Netware, etc.) via a jumper on an Embedded unit or a micro switch on a Table Top unit.

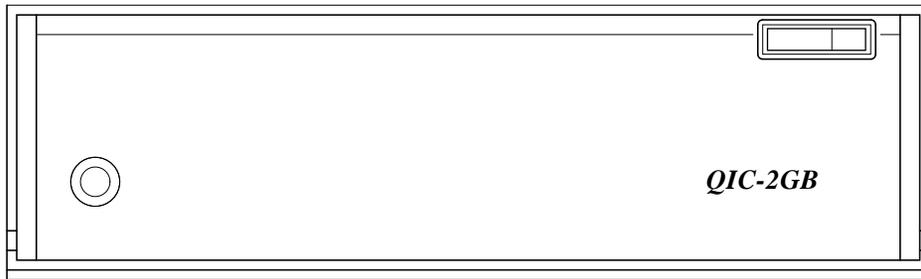
### 1.2 TZK11 Models

The TZK11 tape drive is available as:

- Model TZK11-AA (Embedded) (See Figure 1-1 and Figure 1-2.)
- Model TZK11-DA (Table Top) (See Figure 1-3.)

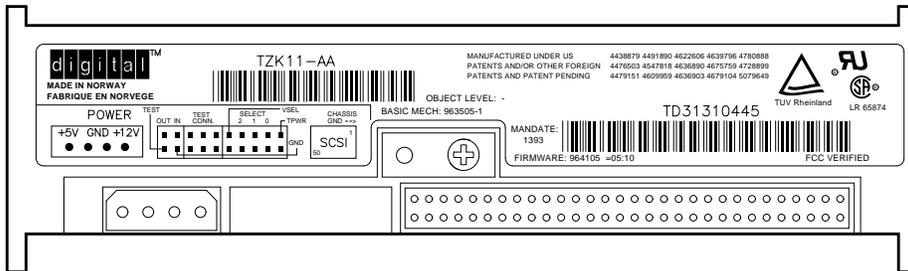
**Introduction**  
**1.2 TZK11 Models**

**Figure 1–1 TZK11-AA Embedded Drive (Front View)**



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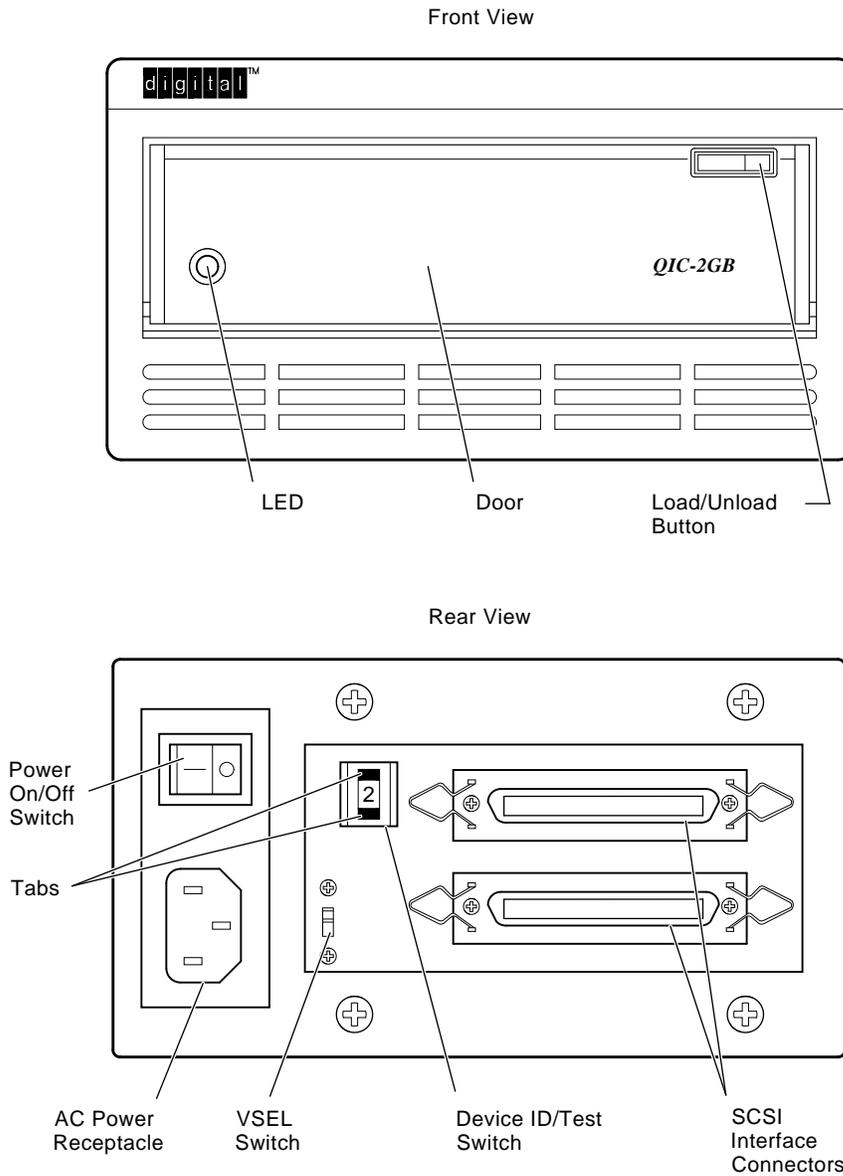
**Figure 1–2 TZK11-AA Embedded Drive (Rear View)**



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**Introduction**  
**1.2 TZK11 Models**

**Figure 1-3 TZK11-DA Table Top Drive**



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# 2

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## Installing a SCSI Interface Unit

### 2.1 Preparing to Install

Before installing the SCSI Interface Unit, take the following steps:

1. Ensure that you have all the parts needed for your tape system.
2. Unplug the power cords from your computer and all system units.

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**WARNING**

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Failure to remove power to the computer and all attached devices before removing the cover of the computer case could cause exposure to high voltages and increase the possibility of damaging peripheral equipment in the event of an accidental short circuit. This installation should be performed by a qualified technician.

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3. Remove the computer cover.

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**WARNING**

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Prior to handling any circuit boards, practice proper electrostatic discharge techniques by wearing a ground strap or by touching a metal part of plugged-in appliance that uses a three-prong plug. Failure to discharge static electricity can damage integrated circuits.

---

### 2.2 Configuring and Installing the Host Adapter Boards

This section provides instructions for configuring and installing AT/ISA, EISA, and MCA Host Adapter Boards.

## Installing a SCSI Interface Unit

### 2.2 Configuring and Installing the Host Adapter Boards

#### 2.2.1 AT/ISA Host Adapter Boards

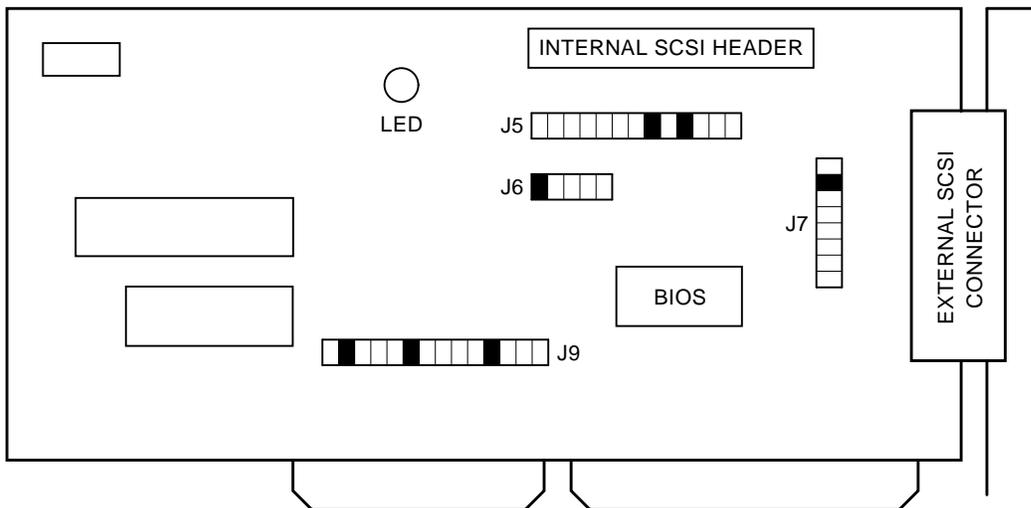
This section addresses configuring and installing the following AT/ISA Host Adapter Boards:

- ADAPTEC AHA1540
- V570
- ADAPTEC AHA1510

##### 2.2.1.1 Configuring AT/ISA Host Adapter Boards

**2.2.1.1.1 ADAPTEC AHA1540** Figure 2–1 shows the AHA1540 SCSI-interface Host Adapter Board which has parallel internal and external connectors for use in either internal or external systems.

**Figure 2–1 The AHA1540 Host Adapter Board**



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Before you install the Host Adapter Board in your computer (see Section 2.2.1.2), you must preset the hardware configuration of the board. Make sure that the chosen configuration is not in conflict with other set-ups in your system.



## Installing a SCSI Interface Unit

### 2.2 Configuring and Installing the Host Adapter Boards

**Figure 2-3 Jumper Field J5: General Control**

Default	Pin No.	Alternatives/Description								
<input type="checkbox"/>	1	Synchronous transfer negotiation enable								
<input type="checkbox"/>	2	Diagnostics (used only at ADAPTEC)								
<input type="checkbox"/>	3	SCSI parity disable								
<input type="checkbox"/>	4	<table border="1"> <tr> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> </table>	<input type="checkbox"/>	<input checked="" type="checkbox"/>						
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<input type="checkbox"/>	5	<table border="1"> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> </table>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
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<input type="checkbox"/>	6	<table border="1"> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> </table> <p>7 6 5 4 3 2 1 0 = SCSI Device ID</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
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<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>							
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<input type="checkbox"/>	11	<table border="1"> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> </table> <p>9 10 11 12 14 15 = Interrupt Channel (see also jumper field J9)</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					
<input type="checkbox"/>	12	<table border="1"> <tr> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> </table>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>							
<input type="checkbox"/>	13	<table border="1"> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> </table> <p>5.0 5.7 6.7 8.0 = DMA Transfer Rate in MBytes/second</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>							

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## Installing a SCSI Interface Unit

### 2.2 Configuring and Installing the Host Adapter Boards

Figure 2-4 Jumper Field J6: BIOS/Auto Sense Control

Default	Pin No.	Alternatives/Description
	1	BIOS (enabled)
	2	Not used
	3	Not used
	4	Not used
	5	Auto Sense (enabled)

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#### Note

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Remove Jumper pin 1 on J6 to disable the default BIOS, as this is not needed for running a streamer. When the BIOS is enabled, it will increase the boot-up time for your computer.

---

## Installing a SCSI Interface Unit

### 2.2 Configuring and Installing the Host Adapter Boards

**Figure 2-5 Jumper Field J7: Address Selection**

Default	Pin No.	Alternatives/Description
<input type="checkbox"/>	1	Not used
<input checked="" type="checkbox"/>	2	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
<input type="checkbox"/>	3	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<input type="checkbox"/>	4	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
		334 330 234 230 134 130 = I/O Address (hex)
<input type="checkbox"/>	5	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
<input type="checkbox"/>	6	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
		0 100 200 300 = BIOS Wait State (nanoseconds)
<input type="checkbox"/>	7	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
<input type="checkbox"/>	8	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
		DC000 CC000 D8000 C8000 = BIOS Address (hex)

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## Installing a SCSI Interface Unit 2.2 Configuring and Installing the Host Adapter Boards

Figure 2-6 Jumper Field J9: DMA/Interrupt Selection

Default	Pin No.	Alternatives/Description
<input type="checkbox"/>	1	DMA Request 0
<input checked="" type="checkbox"/>	2	DMA Request 5
<input type="checkbox"/>	3	DMA Request 6
<input type="checkbox"/>	4	DMA Request 7
<input type="checkbox"/>	5	DMA Acknowledge 0
<input checked="" type="checkbox"/>	6	DMA Acknowledge 5
<input type="checkbox"/>	7	DMA Acknowledge 6
<input type="checkbox"/>	8	DMA Acknowledge 7
<input type="checkbox"/>	9	Interrupt Channel 9
<input type="checkbox"/>	10	Interrupt Channel 10
<input checked="" type="checkbox"/>	11	Interrupt Channel 11
<input type="checkbox"/>	12	Interrupt Channel 12
<input type="checkbox"/>	13	Interrupt Channel 13
<input type="checkbox"/>	14	Interrupt Channel 14

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**Note**

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The DMA channel must be the same for both the DMA Request and Acknowledge signals.

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## Installing a SCSI Interface Unit

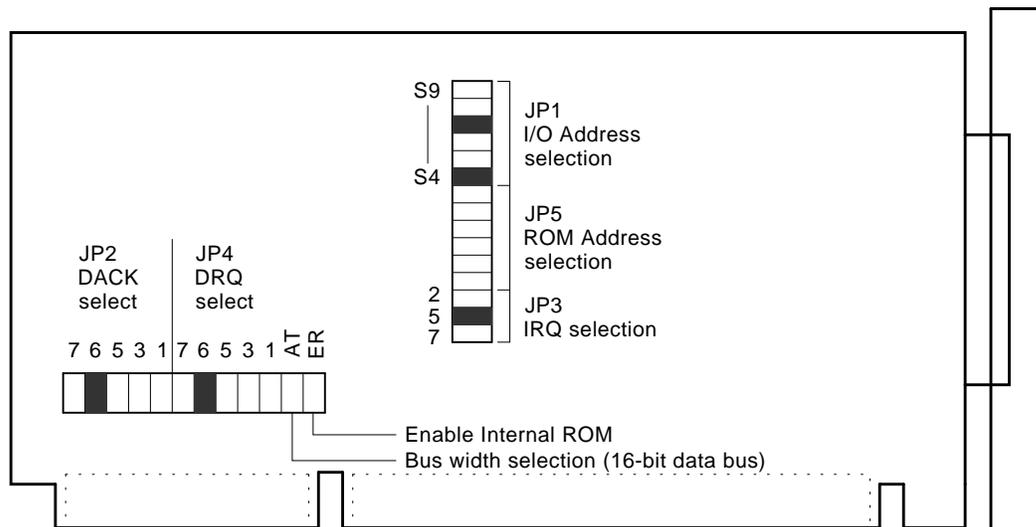
### 2.2 Configuring and Installing the Host Adapter Boards

**2.2.1.1.2 V570** Figure 2–7 shows the V570 SCSI-interface Host Adapter Board, which has parallel internal and external connectors for use in either internal or external systems.

Before you install the Host Adapter Board in your computer (see Section 2.2.1.2), you must preset the hardware configuration of the board. Make sure that the chosen configuration is not in conflict with other set-ups in your system.

The hardware set-up includes the I/O address, the interrupt number, and the DMA channel. The plinths on the Host Adapter Board are used for this purpose.

**Figure 2–7 The V570 Host Adapter Board**



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#### Default Settings

The V570 Host Adapter supports the following default settings:

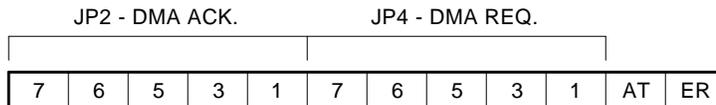
- I/O Address 360H
- Interrupt No. 5
- DMA Channel 6

## Installing a SCSI Interface Unit 2.2 Configuring and Installing the Host Adapter Boards

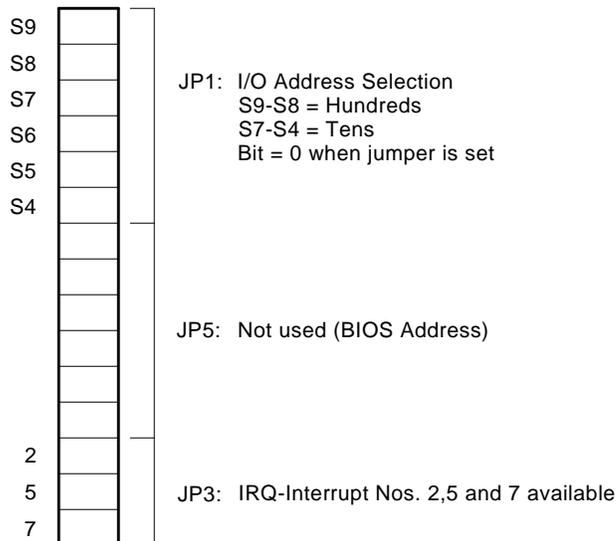
### Alternative Settings

Figure 2-8 shows how to set the jumpers; Figure 2-9 is an example of a setting.

**Figure 2-8 Jumper Setting Guidelines**



- DMA ACK. (DACK): 1,3,5,6 and 7 are available
- DMA REQ. (REQ): 1,3,5,6 and 7 are available
  
- AT: No jumper installed for 16-bit AT-bus. (Jumper in this position only for 8-bit XT-bus).
  
- ER: For enabling of default BIOS. Do NOT install any jumpers here!

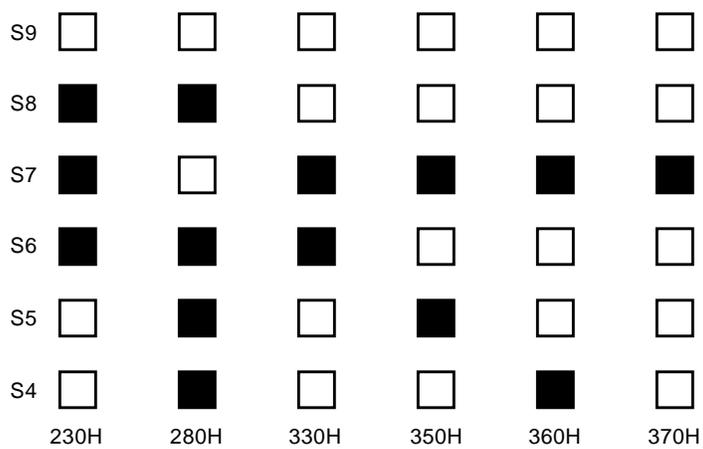


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## Installing a SCSI Interface Unit

### 2.2 Configuring and Installing the Host Adapter Boards

Figure 2-9 Example of I/O Address Jumper Setting



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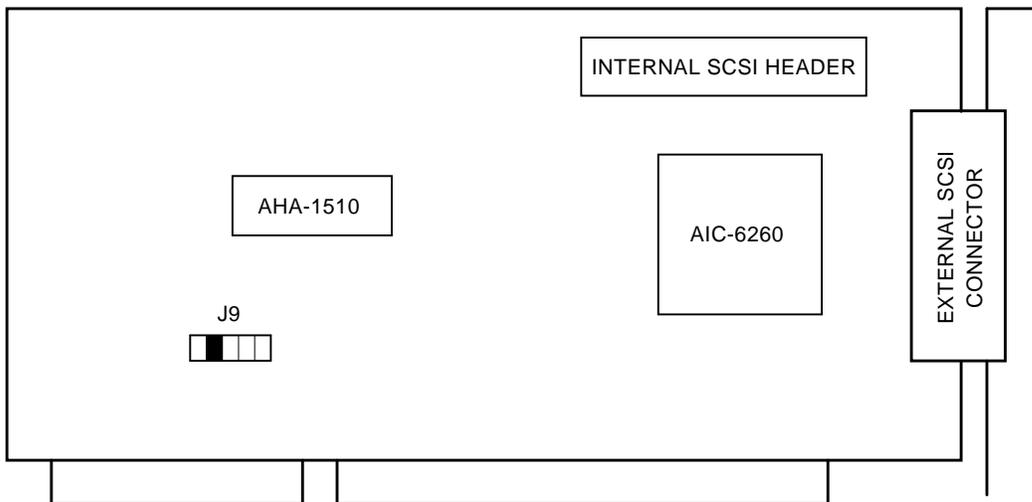
## Installing a SCSI Interface Unit

### 2.2 Configuring and Installing the Host Adapter Boards

**2.2.1.1.3 ADAPTEC AHA1510** Figure 2–10 shows the AHA1510 SCSI-interface Host Adapter Board, which has parallel internal and external connectors for use in either internal or external systems.

Before you install the Host Adapter board in your computer (see Section 2.2.1.2), you must preset the hardware configuration of the board. Make sure that the chosen configuration is not in conflict with other set-ups in your system.

**Figure 2–10 The AHA1510 Host Adapter Board**



LJ-03317-T10

#### **Default Settings**

The AHA1510 Host Adapter supports the following default settings:

- I/O Address 340H
- Interrupt No. 11
- SCSI Device ID 7
- Data Transfer Mode PIO

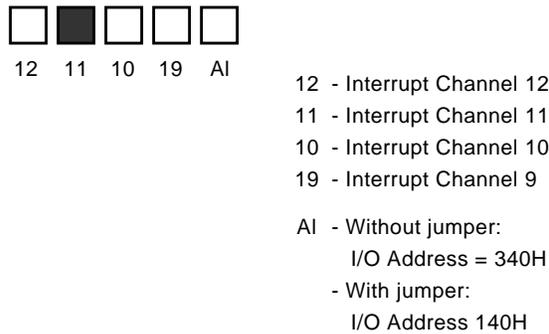
## Installing a SCSI Interface Unit

### 2.2 Configuring and Installing the Host Adapter Boards

#### Alternative Settings

Figure 2–11 shows alternative jumper settings.

**Figure 2–11 Alternative Jumper Settings for the AHA1510**



LJ-03309-T10

#### 2.2.1.2 Installing AT/ISA Host Adapter Boards

To install the Host Adapter Board, take the following steps:

1. Select the expansion slot you wish to use. Any 16-bit empty slot will work.
2. Remove the rear panel slot cover for the expansion slot you will use. The cover is held in place by a single screw. Save the screw to attach the adapter board after it is plugged into the expansion slot.
3. Plug the adapter board into the slot and secure it with the screw that you saved after removing the slot cover.
4. If you are installing an external tape unit, you may now replace the cover on your computer case. Be careful not to snag or pinch any wires or cables. Proceed to Section 2.2.5, Installing an External Tape System.
5. If you are installing an internal unit, leave the computer cover off and proceed to Section 2.2.4, Installing the Internal Tape Unit.

## Installing a SCSI Interface Unit 2.2 Configuring and Installing the Host Adapter Boards

### 2.2.2 EISA Host Adapter Boards

This section describes how to configure and install an EISA host adapter.

#### 2.2.2.1 Configuring the EISA Host Adapter Board

Figure 2-12 shows the AHA1740 SCSI-interface Host Adapter Board, which has parallel internal and external connectors for use in either internal or external systems.

The AHA1740 SCSI board requires no manual configuration to operate correctly in all situations.

After installing the board and the tape system, boot up your system with a **copy** of the bootable configuration diskette and start the EISA configuration program. It will *auto-configure* the system.

---

#### Note

---

Always make a **copy** of your configuring diskette!

---

The configuration file for the AHA1740 board is called:

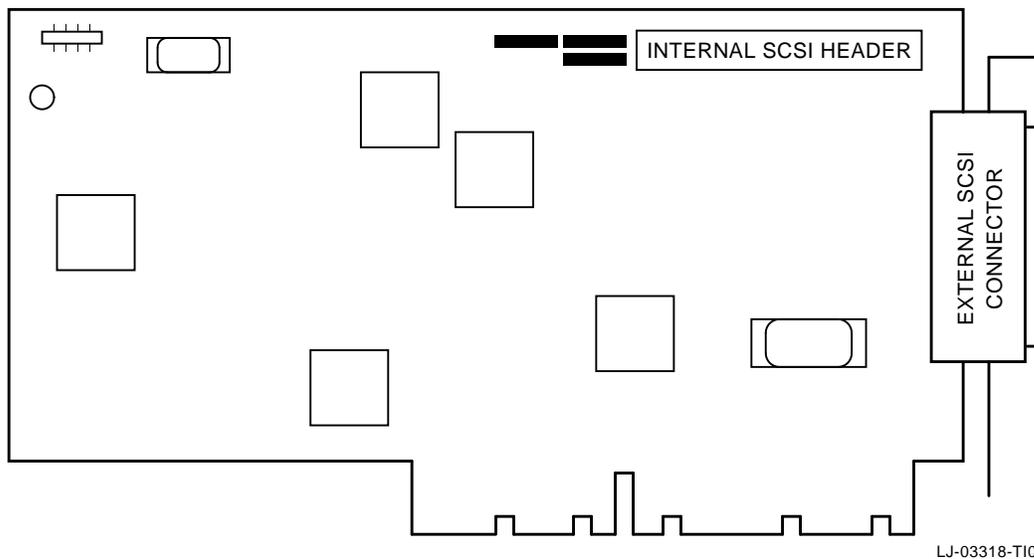
!ADP0000.CFG

If you are using the AHA1740 for the tape drive only (with no hard disk connected), disable the host adapter BIOS from the configuration program.

## Installing a SCSI Interface Unit

### 2.2 Configuring and Installing the Host Adapter Boards

Figure 2-12 The AHA1740 Host Adapter Board



#### 2.2.2.2 Installing the EISA Host Adapter Board

To install the EISA Host Adapter Board, take the following steps:

1. Select the expansion slot you wish to use.
2. Remove the rear panel slot cover for the expansion slot you will use. The cover is held in place by a single screw. Save the screw to attach the adapter board after it is plugged into the expansion slot.
3. Plug the adapter board into the slot and secure it with the screw that you saved after removing the slot cover.
4. If you are installing an external tape unit, you may now replace the cover on your computer case. Be careful not to snag or pinch any wires or cables. Proceed to Section 2.2.5, Installing an External Tape System.
5. If you are installing an internal unit, leave the computer cover off and proceed to Section 2.2.4, Installing the Internal Tape Unit.

## Installing a SCSI Interface Unit

### 2.2 Configuring and Installing the Host Adapter Boards

#### 2.2.3 MCA Host Adapter Boards

This section describes how to configure and install an MCA Host Adapter Board.

##### 2.2.3.1 Configuring the MCA Host Adapter Board

The AHA1640 Host Adapter Board (shown in Figure 2–13) and the IBM MCA-SCSI Host Adapter Board (shown in Figure 2–14) are both configured via software and, therefore, require no manual hardware configuration.

After installing the board and the tape system, start up the PS/2 from your **copy** of the configuring diskette and follow the instructions displayed on the screen to achieve a proper, automatic system configuration.

---

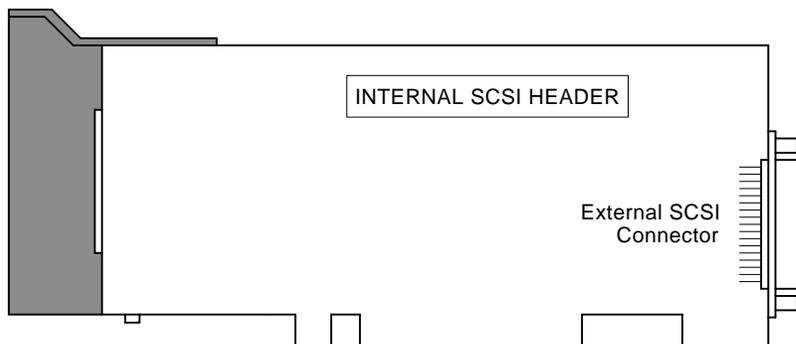
**Note**

---

Always make a **copy** of your configuring diskette!

---

**Figure 2–13 The AHA1640 Host Adapter Board**

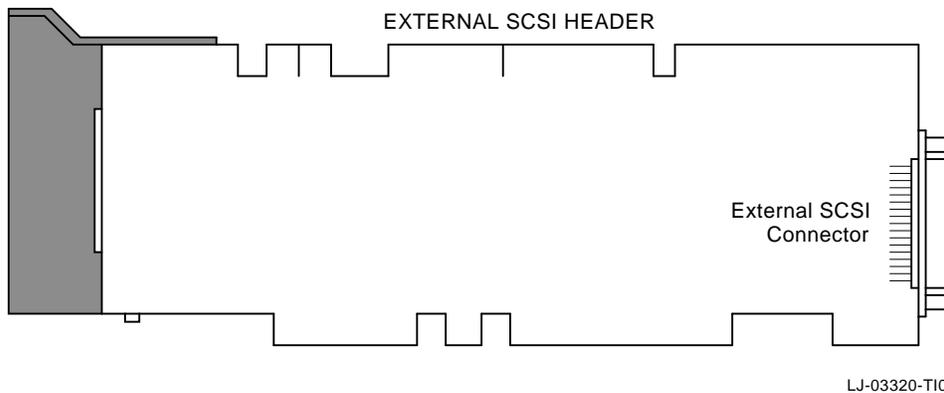


LJ-03319-T10

## Installing a SCSI Interface Unit

### 2.2 Configuring and Installing the Host Adapter Boards

Figure 2–14 The IBM MCA-SCSI Host Adapter Board



#### 2.2.3.2 Installing the MCA Host Adapter Board

To install the Host Adapter Board, take the following steps:

---

#### WARNING

---

Exposure to hazardous voltages may occur! Refer installation to qualified personnel only. Before you begin installation, position the system unit and any external option power switches to Off, then unplug the system unit and all other options from the wall outlet.

---

1. Follow steps 1 through 4 of Section 2.1, Preparing to Install.
2. Select an empty slot in the system unit.
3. Remove the cover in front of the empty slot before installing the Host Adapter Board. Loosen the screw and lift out the cover. (Keep cover for later use.)
4. Insert the Host Adapter Board by pressing it firmly into the connector of the empty slot. It will snap into place. Fasten the screw.
5. If you are installing an external tape unit, you may now replace the cover on your computer case. Be careful not to snag or pinch any wires or cables. Proceed to Section 2.2.5.

## Installing a SCSI Interface Unit

### 2.2 Configuring and Installing the Host Adapter Boards

#### 2.2.4 Installing the Internal Tape Unit

To install the Internal Tape Unit, take the following steps:

1. Examine the space that you intend to mount the drive. If the design of your computer case incorporates slide tracks for rails on the sides of mounted devices, attach the plastic rails provided with your system to the sides of the tape unit. Select the proper size screws for your tape unit.
2. The internal drive unit left the factory strapped as Drive 5. If there is a Device ID conflict in your system, you must add or remove jumpers to the jumper block on the back of the unit to reorganize some other drive address (1 through 7). See Figure 2–15 and Figure 2–16 for details.

---

**Note**

---

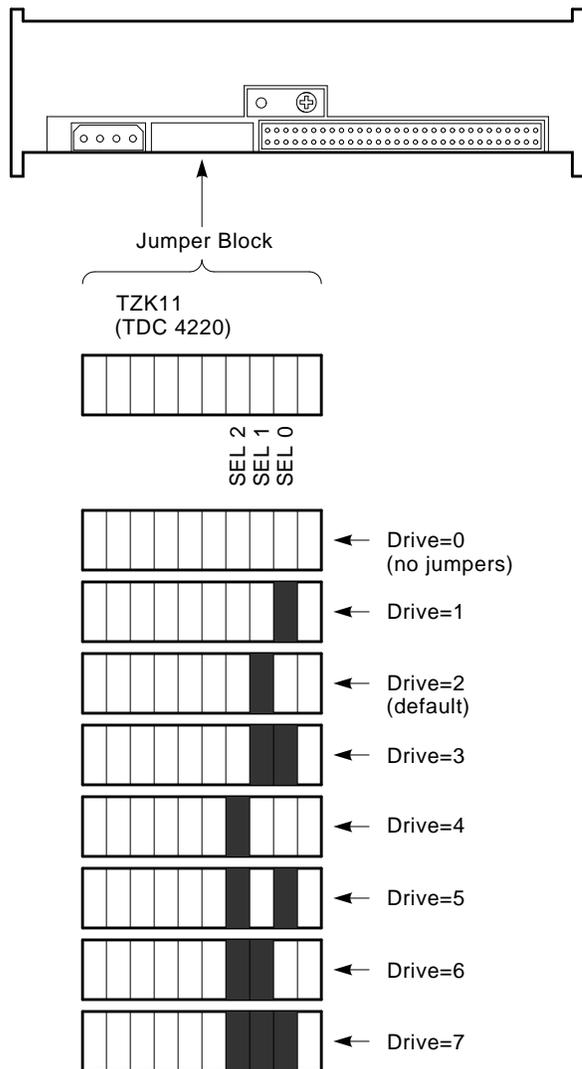
If you are using the V570 Host Adapter Board, set the drive SCSI ID to 2.

---

## Installing a SCSI Interface Unit

### 2.2 Configuring and Installing the Host Adapter Boards

Figure 2-15 Internal Device ID (Drive No.) Jumpering



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## Installing a SCSI Interface Unit

### 2.2 Configuring and Installing the Host Adapter Boards

3. Slide the tape 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. There are too many different case designs on the market to be able to give exact mounting instructions.

---

**Note**

---

Depending on the final location of your tape drive, you may find it easier to plug the flat cable into the tape drive (see step 5 for cable connector orientation) before you mount the drive in the computer. 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. *Be careful; Ribbon cables are delicate!*

---

4. 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.
5. Mount the tape unit to the computer chassis appropriately and plug the DC power cable in the drives power connector. See Figure 2-16. The mating connector is keyed so it will only go together one way.
6. If you have not already done so, connect the flat ribbon cable to the unit.
7. Route the other end of the flat ribbon cable over to the adapter board and plug it into the board connector.

---

**Note**

---

The connectors are keyed to prevent incorrect connections.

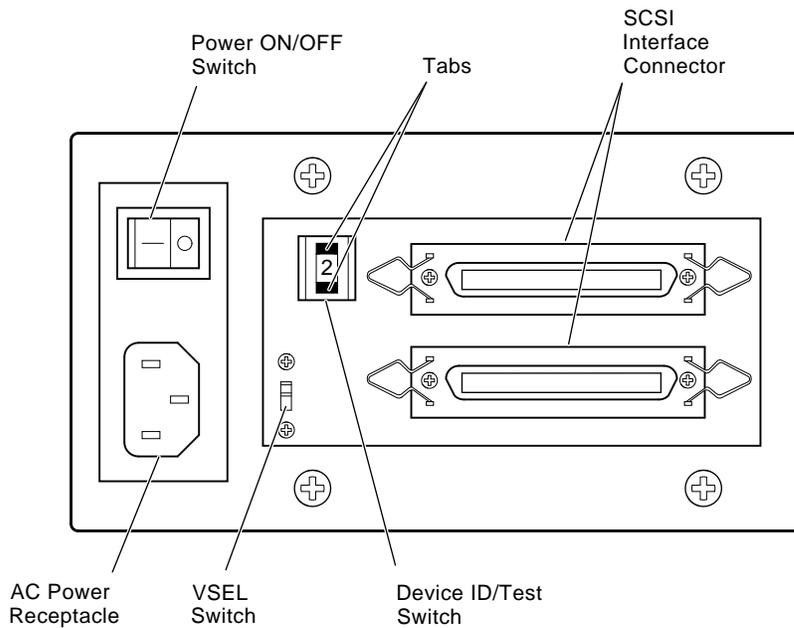
---

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

## Installing a SCSI Interface Unit

### 2.2 Configuring and Installing the Host Adapter Boards

Figure 2-16 Tape Drive Connector Locations



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#### 2.2.5 Installing an External Tape System

To install an external tape system, do the following.

1. Be sure you have followed steps 1 through 4 of Section 2.1.
2. Connect the round cable from the external tape unit cabinet to the Host Adapter Board connector (which is accessible from the rear panel of your computer). Connect the other end of the cable to the SCSI interface connector on the back of the tape unit. See Figure 2-16.
3. Make sure the thumbwheel rotary switch on the back of the tape unit matches the SCSI ID or the system. If it does not, press either one of the two tabs (above and below switch dial) to advance the switch.

---

**Note**

If you are using the V570 Host Adapter, set the drive SCSI ID to 2.

---

4. Set the VSEL switch to the PC position.

## Installing a SCSI Interface Unit

### 2.2 Configuring and Installing the Host Adapter Boards

5. Plug the line cords for the computer, all peripherals, and the tape cabinet into wall sockets.

---

**Note**

---

For 230 V applications, this product employs a single fuse and a single-pole switch. It requires an additional two-pole disconnect device when the neutral in the mains supply cannot be identified.

The socket outlet must be installed near the equipment and must be easily accessible.

---



# 3

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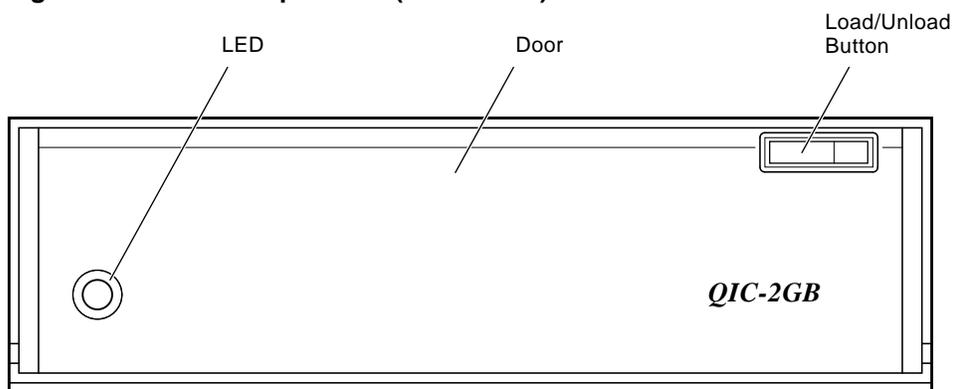
## Operating Procedures

This chapter provides operating instructions for the TZK11 cartridge tape drive.

### 3.1 Controls and Indicators

The TZK11 cartridge tape drive, shown in Figure 3–1, has one dual-color (green and amber) LED and an eject button.

**Figure 3–1 TZK11 Tape Drive (Front View)**



LJ-03330-T10

## Operating Procedures

### 3.1 Controls and Indicators

#### 3.1.1 LED

Table 3–1 summarizes possible conditions of the LED.

**Table 3–1 LED Conditions Summary**

LED	Condition
Off	Tape is not present or tape is present but has been unloaded via software
Solid Green <sup>1</sup>	Tape is loaded
Blinking Green	Tape is in motion
Solid Amber <sup>2</sup>	Fault

<sup>1</sup>Cartridge is auto-loaded upon insertion.

<sup>2</sup> See Section 5.3.

#### 3.1.2 Eject Button

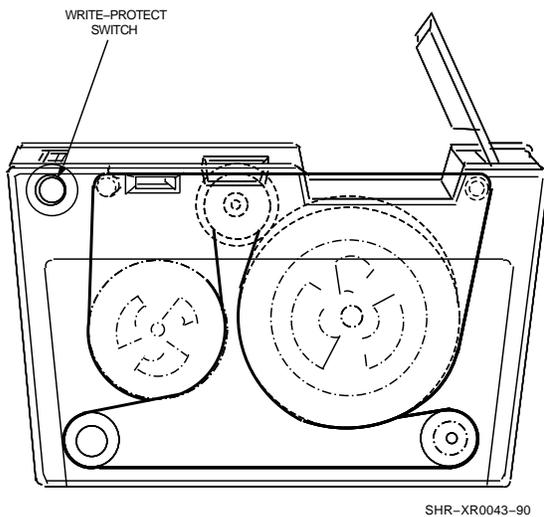
The eject button unlocks the door and partially ejects the tape cartridge from the drive.

### 3.2 Tape Cartridge

The TZK11 Data Cartridge Tape Drive is shipped with a TZK1X-CE (QIC 2.0GB, Magnus 2.0) Tape Cartridge (shown in Figure 3–2), however, the TZK11 can be used with other standard format cartridges. See Table 3–2.

## Operating Procedures 3.2 Tape Cartridge

**Figure 3-2 The Quarter-inch Tape Cartridge**



The tape cartridge has a write-protect switch to prevent accidental overwrite of data. When the switch is rotated to Safe, (Figure 3-3), data cannot be written to the tape.

The TZK1X-CE Tape Cartridge contains approximately 950 feet of magnetic tape wound on two reels. This tape cartridge has a formatted capacity of up to 2 Gigabytes of data.

The TZK11 Data Cartridge Tape Drive reads and writes according to the following table, however the density selection and ability to write lower densities on higher density tape is operating system dependent (see Table 3-3 and Chapter 4).

## Operating Procedures

### 3.2 Tape Cartridge

**Table 3–2 Cartridge Compatibility**

Cartridge	Capacity <sup>1</sup>	Format	Capability <sup>2</sup>
Magnus 2.5/DC9200XL	up to 2.5 GB	QIC-2GB	Read/Write
Magnus 2.0/DC9200	up to 2.0 GB	QIC-2GB	Read/Write
Magnus 1.2/DC9100L	up to 1.2 GB	QIC-1GB	Read/Write
Magnus 1.0/DC9100	up to 1.0 GB	QIC-1GB	Read/Write
DC6525	up to 525 MB	QIC-525	Read/Write
DC6320	up to 320 MB	QIC-525	Read/Write
DC6250	up to 250 MB	QIC-150	Read/Write
DC6150/DC600XTD	up to 150 MB	QIC-150	Read/Write
DC615/DC600A	up to 120 MB	QIC-120	Read/Write
DC300/DC300XLP	up to 45 MB	QIC-24	Read only

<sup>1</sup>See Table 3–3 for information about writing lower densities on a higher density tape.

<sup>2</sup>Operating system dependent. See Chapter 4.

**Table 3–3 QIC Format Compatibility**

Cartridge <sup>1</sup> /Format <sup>2</sup>	QIC-24	QIC-120	QIC-150	QIC-525	QIC-1GB	QIC-2GB
DC300,DC300XLP	OK	Illegal	Illegal	Illegal	Illegal	Illegal
DC615,DC600A	Illegal	OK	Illegal	Illegal	Illegal	Illegal
DC6150,DC600XTD	Illegal	OK	OK	Illegal	Illegal	Illegal
DC6250	Illegal	OK	OK	Illegal	Illegal	Illegal
DC6320,DC6525	Illegal	OK	OK	OK	Illegal	Illegal
Magnus 1.0,DC9100	Illegal	Illegal	Illegal	Illegal	OK	Illegal
Magnus 1.2,DC9100L	Illegal	Illegal	Illegal	Illegal	OK	Illegal
Magnus 2.0,DC9200	Illegal	Illegal	Illegal	Illegal	Illegal	OK
Magnus 2.5,DC9200XL	Illegal	Illegal	Illegal	Illegal	Illegal	OK

<sup>1</sup>See Table 3–2 for densities and capacities.

<sup>2</sup>Operating system dependent. See Chapter 4.

### **3.3 Using the Tape Cartridge**

This section explains how to insert a tape cartridge into, and remove a tape cartridge from, the TZK11 drive and how to write protect a tape. This section also explains proper tape cartridge handling.

#### **3.3.1 Tape Cartridge Handling**

Take the following measures to prevent damage to your tape cartridge and to ensure continued tape drive reliability:

- Avoid dropping or banging cartridge.
- Keep cartridge out of direct sunlight and away from heaters and other sources of heat.
- Store cartridge where the temperature is between 10 and 40°C (50 to 104°F).
- After exposure to extreme heat or cold, allow the cartridge to stabilize at room temperature for the same amount of time it was exposed—up to 24 hours.
- Avoid placing cartridge near sources of electromagnetic interference, such as terminals, motors, and video or X-ray equipment. Any tape exposed to a magnetic field can lose information.
- Store cartridge in a dust-free environment where the relative humidity is between 20 to 80 percent.
- Store cartridge in its protective container, on edge or stacked. However, when stacking cartridges, do not stack more than five high.
- Place an identification label only in the space provided for the label on the top of cartridge.

#### **3.3.2 Setting the Write-Protect Switch**

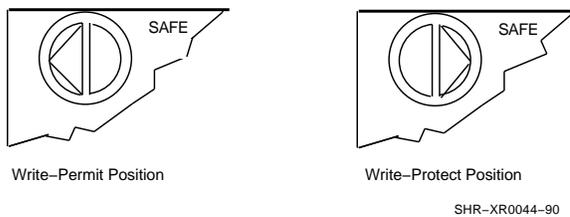
Observe the following guidelines when setting the write-protect switch. See Figure 3-3.

- If you are reading data or copying data from a tape, set the write-protect switch to Safe (write protected).
- If you are writing data, set the write-protect switch to the write-permit position.

## Operating Procedures

### 3.3 Using the Tape Cartridge

**Figure 3-3 Setting the Write-Protect Switch**

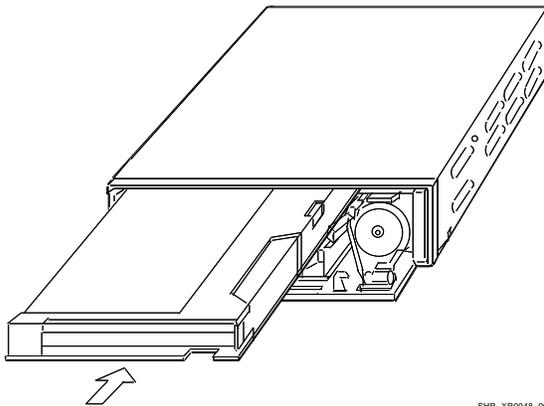


#### 3.3.3 Inserting the Tape Cartridge into the Drive

Open the drive door by pressing the eject button. Insert the tape cartridge into the drive with the cartridge's write-protect switch in the upper right corner (see Figure 3-4.) Slide the cartridge straight into the cartridge area until you feel resistance. Then, close the cartridge door.

When the tape is properly inserted, the LED will be solid green and you can issue host operating system commands.

**Figure 3-4 Inserting the Tape Cartridge**



## Operating Procedures 3.3 Using the Tape Cartridge

### 3.3.4 Removing the Tape Cartridge from the Drive

After the tape is dismounted via software, the LED changes from blinking green to either solid green or off, and you can remove the tape from the drive.

Press the eject button. The door will open and the cartridge will eject part way. Pull down on the cartridge door, grasp the cartridge, and slide it out of the drive.

### 3.3.5 Retensioning

For satisfactory performance we recommend that the cartridge be retensioned (running the tape one complete end-to-end pass) in any of the following cases:

- Each time it is inserted in the drive
- After prolonged operation over a limited area
- After exposure to a temperature change greater than 30°F (16°C)
- After one hour of start-stop or shuffle operation

The retension function is supported for the TZK10/TZK11 tape drives only. The retension command may be different for other operating systems or tape utilities. Please refer to the appropriate system documentation.

#### 3.3.5.1 VAX/VMS and OpenVMS

Retension the tape by performing the following VMS/OpenVMS commands:

1. Mount the drive /FOREIGN

For example: \$ **MOUNT/FOREIGN MKA500**

2. Issue one of the following commands:

- SET MAGTAPE/REWIND/RETENSION

Rewinds tape to BOT after a retension is performed.

- SET MAGTAPE/UNLOAD/RETENSION

The tape will be left "unloaded," not dismounted.

For example: \$ **SET MAGTAPE/REWIND/RETENSION MKA500**

---

#### Note

---

Retension for the TZK11 is not supported in VAX/VMS 5.5-2. However, support for the command is planned for subsequent releases.

---

## Operating Procedures

### 3.3 Using the Tape Cartridge

#### 3.3.5.2 DEC OSF/1

Retention the tape by performing the following DEC OSF/1 command:

```
mt -f /dev/rmt $n$  ret
```

where **n** equals the drive unit number.

#### 3.3.5.3 SCO UNIX

Retention the tape by typing the following SCO UNIX command:

```
$ tape reten
```

## 3.4 Jumper/Switch Settings

This section shows how TZK11 tape drive is configured via jumpers (Embedded unit) or switch (Table Top unit).

### 3.4.1 SCSI ID Settings

This section shows how each Small Computer Systems Interface (SCSI) device's ID is determined and set. TZK11 tape drives are preset to the appropriate SCSI ID for the system during manufacturing. The SCSI IDs only have to be changed when a TZK11 tape drive is installed as an add-on to a system.

---

**Note**

---

*Each* SCSI device must have a unique SCSI ID.

---

The SCSI ID for the TZK11 Embedded unit is set or changed by adding jumpers to, or removing jumpers from, a connector at the rear of the tape drive. This connector is illustrated in Figure 3-5.

The TZK11 Table Top unit is set or changed by micro switch on the rear of the unit. See Figure 3-6. Each ID is represented by decimal digit. The valid SCSI ID is 0-7.

Table 3-4 lists the jumper settings necessary to configure the TZK11 tape drive for a particular SCSI ID.

**Operating Procedures**  
**3.4 Jumper/Switch Settings**

**Table 3–4 TZK11 Embedded SCSI ID Jumper Settings**

SCSI ID	SCSI ID Jumper† Positions		
	SEL2	SEL1	SEL0
0	Out	Out	Out
1	Out	Out	In
2	Out	In	Out
3	Out	In	In
4	In	Out	Out
5§	In	Out	In
6	In	In	Out
7	In	In	In

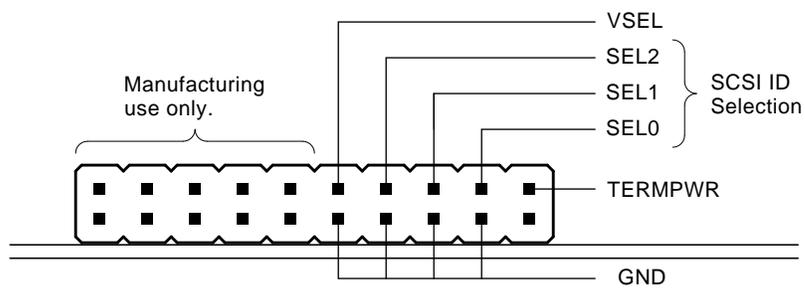
§Default ID for the TZK11 tape drive in most Digital systems (Default).

†Jumper Part Number - 12-14314-00

## Operating Procedures

### 3.4 Jumper/Switch Settings

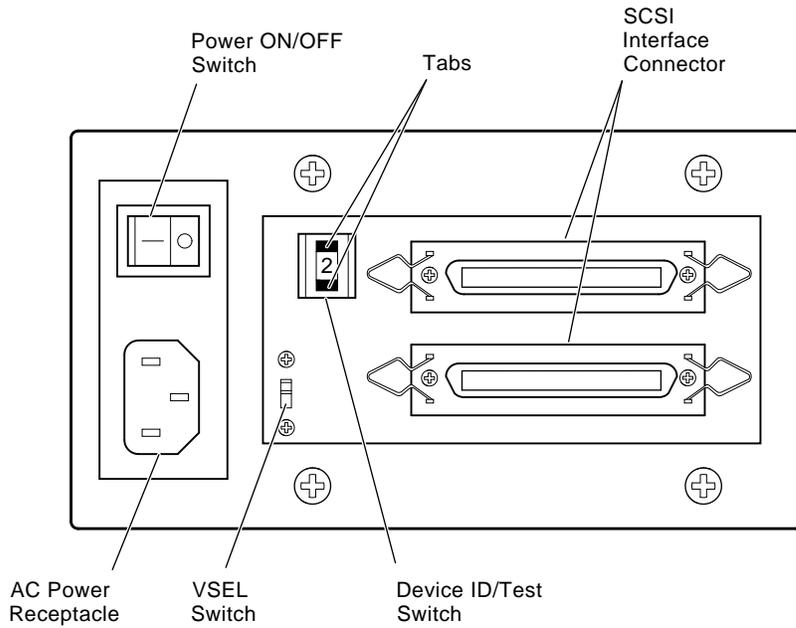
Figure 3-5 Layout of the Jumper/Strap Connector



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## Operating Procedures 3.4 Jumper/Switch Settings

Figure 3-6 TZK11 Table Top Drive (Rear Panel)



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## Operating Procedures

### 3.4 Jumper/Switch Settings

#### 3.4.2 Vendor/Product ID Select and Terminator Power

On the TZK11 Embedded unit, the Vendor/Product ID Select and Terminator Power are set or changed by installing jumpers to, or removing jumpers from, the connector illustrated in Figure 3-5.

The default setting for the Vendor/Product ID Select (VSEL) jumper is TZK11. For the Terminator Power (TERMPWR) jumper, the default is Enable. When the unit is installed in a system with a non-Digital operating system, the VSEL jumper should be removed.

On the TZK11 Table Top unit, the Vendor/Product ID Select is set via the micro switch on the rear of the unit that is shown in Figure 3-6. The Terminator Power is set as the default and is not selectable without removing the Table Top enclosure.

The default setting for the Vendor/Product ID Select (VSEL) switch is to the Digital position, which configures the unit to be a TZK11. When the unit is installed in a system with a non-Digital operating system, the VSEL switch should be set to the PC position.

---

**Note**

---

TZK11 in PC position is equivalent to Tandberg TDC 4200/4220.

---

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## Operating Systems Support

### 4.1 TZK11 Operating Systems Support

The material in this chapter is for your reference. Because operating system commands are a complex tool, this chapter is not intended to teach you all the details involved in using such commands.

The TZK11 cartridge tape drive reads and writes tapes in many different densities and formats that are specified by the International Quarter-inch Cartridge (QIC) Standards Committee. The drive also supports an auto density selection feature that is used differently by different operating systems. This chapter describes the way different operating systems use the following features:

- The 512-bytes/1KB Block Sizes versus Variable Block Sizes
- Auto Density Selection in the Read case
- Density Selection in the Write case
- Vendor/Product ID Select

#### 4.1.1 Digital Operating Systems Support

##### 4.1.1.1 VAX/VMS and OpenVMS Support

The TZK11 cartridge tape drive is supported by VAX/VMS version 5.5-2 or higher, OpenVMS/VAX version 6.0 or higher, and OpenVMS/AXP version 1.5 or higher.

##### 4.1.1.2 DEC OSF/1 Support

The TZK11 Data Cartridge Tape Drive is supported by DEC OSF/1 version 1.3 or higher.

## Operating Systems Support

### 4.1 TZK11 Operating Systems Support

#### 4.1.1.3 Windows NT (AXP) Support

The TZK11 Data Cartridge Tape Drive is supported by Windows NT (AXP) 3.1 or higher. Windows NT (AXP) supports TZK11 in PC mode.

#### 4.1.2 Non-Digital Operating Systems Support

When configured as a PC device, the TZK11 cartridge tape drive will be equivalent to a TDC 4200/4220. It is supported by non-Digital operating systems, such as:

- MS-DOS/Windows, OS/2, Novell Netware, etc., when running from popular Backup Utilities such as SYTOS Plus, Conner Backup Exec Software, CorelSCSI, CPBackup, Norton Backup, Fastback, etc. (Check the correct version and device support list from listed Software Supplier's literature.)
- Windows NT 3.1 supports NT Tape Backup Utility.
- SCO UNIX supports with UNIX Tape Archive Retrieval (TAR) Utility.

#### 4.1.3 512-Byte Blocks, 1KB Blocks, and Variable Bytes Records

The QIC standards specify three formats for QIC-525/1GB/2GB cartridges. In all three cases the on-tape data format is 1K fixed blocks.

<b>512-byte fixed block</b>	The 512-byte fixed-block format takes two 512-byte user data blocks and writes one 1K block on tape. This format has the advantage that all other density QIC tapes are written in 512-byte blocks. Replacing older QIC tape drives with new density drives takes little or no operating system changes.
<b>1K fixed block</b>	This format is the native format for this density. User data is written directly as 1K data blocks.
<b>Variable-byte record tapes</b>	This format takes user data and creates one or more fixed-length blocks. The byte count is recorded in the first block and the last block is zero filled. In this way, the drive appears to read and write variable length records.

The following sections address the effects that the three formats have on operating systems.

##### 4.1.3.1 VAX/VMS and OpenVMS

VAX/VMS and OpenVMS systems will only support the drive in variable block mode. This mode allows the drive to be used like any other VAX/VMS or OpenVMS tape drive.

## Operating Systems Support

### 4.1 TZK11 Operating Systems Support

#### 4.1.3.2 DEC OSF/1 Operating System

The DEC OSF/1 operating system will operate the TZK11 tape drive in both fixed-block 512-byte and variable block mode. Fixed-block mode is supported for QIC-120/150. Variable block mode is supported for QIC-320/525/1GB/2GB.

#### 4.1.3.3 Windows NT (AXP) Support

Windows NT (AXP) supports TZK11 in fixed-block mode, which is the same as Windows NT native mode.

#### 4.1.3.4 Non-Digital Operating Systems

Systems running OS/2, MS-DOS/Windows, Windows NT, and SCO UNIX support 512-byte or 1KB fixed block depends on backup utility.

#### 4.1.4 Auto Density Select in the Read Case

The TZK11 tape drive performs automatic density selection when the tape drive is positioned at Beginning of Tape (BOT) and receives a read command. Because there are two formats of fixed-block operations, the drive can be set up in the factory to default to either format. The TZK11 is set to 512-byte block format.

#### 4.1.5 Density Select in the Write Case

This feature allows the TZK11 tape drive to select the density the tape is written start from BOT. In default mode, TZK11 is auto density select the format and density of the inserted cartridge. The auto density select enabled the TZK11 to write the tape in the highest density supported by the current cartridge. When other density which different than default is selected, TZK11 will write the selected density on tape if the inserted cartridge supports the selected density. This feature is OS dependent.

#### 4.1.6 Vendor/Product ID Select

This feature is controlled by a jumper and micro switch on the back of the embedded and table top drive respectively.

When the Vendor/Product ID Select (VSEL) jumper is installed or switch set to the Digital position, the drive will be a TZK11. This configuration is recommended for Digital operating systems.

When the Vendor/Product ID Select (VSEL) jumper is not installed or when the switch is set to the PC position, the drive will be a TDC 4200. This configuration is recommended for non-Digital operating systems.



# 5

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## Preventive Maintenance and Problem Resolution

This chapter describes preventive maintenance and problem solving for the TZK11 cartridge tape drive. Preventive maintenance involves periodic head cleaning. Problem solving is described in Section 5.3.

Digital Equipment Corporation strongly recommends that you follow the instructions for handling cartridge tapes, retensioning the cartridge tapes, and cleaning the heads of the drive.

### 5.1 Cleaning the Heads

The heads are the components in a drive that physically read and write data to and from the media (in this case, a cartridge tape).

Recommended equipment for head cleaning is **Digital Cleaning Cartridge, part number TZK1X-HA**. Refer to the tape head cleaning instructions included with the cleaning cartridge.

The cleaning interval depends on three main factors:

1. How often the drive is used
2. The quality of the tape
3. The quality of the environment

However, the following can be used as a recommended guideline: Clean the head after every 8 hours of use.

### 5.2 System-Based Diagnostics

Your system has system-based diagnostics that can be used to test the TZK11 tape 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.

## Preventive Maintenance and Problem Resolution

### 5.2 System-Based Diagnostics

Prior to calling Customer Services, you can execute system diagnostics to test the TZK11 drive. Always try cleaning the head and using a different cartridge before calling Customer Services.

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#### NOTE

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

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### 5.3 Tape Drive and Media Errors

If a drive error occurs during an operation, you may be able to clear the fault, rewind, unload, and remove the tape cartridge.

If the amber LED goes out when you remove the cartridge, the error is likely media related or due to a dirty head. Clean the head and try another cartridge.

If the amber LED stays on when you remove the cartridge, call your authorized Digital Equipment Corporation Customer Services representative.

### 5.4 Repair Services

Digital Equipment Customer Services offer a range of flexible service plans.

#### 5.4.1 On-Site Service

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

#### 5.4.2 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 days, and to Saturdays, Sundays, and holidays. Under the basic service plan, all parts, materials, and labor are covered in full.

## **Preventive Maintenance and Problem Resolution**

### **5.4 Repair Services**

#### **5.4.3 DECservice**

DECservice offers a premium, on-site service providing 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.

#### **5.4.4 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 160 Digital SERVICenters worldwide, factory-trained personnel repair your unit within 2 days. This service is available on selected terminals and systems. Contact your local Digital Equipment Customer Services office to see if this service is available for your unit. Digital SERVICenters are open during normal business hours, Monday through Friday.

#### **5.4.5 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 Equipment Customer Services.



# A

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## Related Supplies

To order additional blank cartridges and head cleaning cartridges, contact either your Digital Equipment sales representative or DECdirect™. Refer to the following part numbers.

**Table A-1 Ordering cartridges**

<b>Part No.</b>	<b>Cartridge</b>
TZK1X-CA	One blank 320 megabyte data cartridge
TZK1X-CB	Five blank 320 megabyte data cartridges
TZK1X-CC	One blank 525 megabyte data cartridge
TZK1X-CD	Five blank 525 megabyte data cartridges
TZK1X-CE	One blank 2.0GB data cartridge
TZK1X-CF	Five blank 2.0GB data cartridges
TZK1X-HA	One head cleaning cartridge



# B

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## TZK11 Cartridge Tape Drive Specifications

The following table lists the TZK11 cartridge tape drive specifications.

**Table B-1 TZK11 Cartridge Tape Drive Specifications**

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Mode of Operation:	Streaming
Drive Interface:	SCSI-2
Buffer Size:	256KB with Parity
Dimensions	
Embedded:	5-¼ inch Half-height Form Factor
Height	43 mm (1.69 in)
Width	149 mm (5.87 in)
Depth	216 mm (8.51 in)
Weight (w/o cartridge)	1.1 kg (2.4 lbs)
Table Top:	
Height	98 mm (3.66 in)
Width	167 mm (6.58 in)
Depth	360 mm (14.18 in)
Weight (w/o cartridge)	3.73 kg (8.2 lbs)

(continued on next page)

## TZK11 Cartridge Tape Drive Specifications

**Table B-1 (Cont.) TZK11 Cartridge Tape Drive Specifications**

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Media:	DC9200/DC9200XL or Digital-approved equivalent see Table 3-2
Data Density:	40,640 bpi
Number of Tracks:	42
Transfer Rate:	300 Kbytes/s at average streaming mode 3 Mbytes/s Burst, Sync. and Async. SCSI
Tape Speed	
Read/Write:	
QIC-2GB:	70.9 ips (inch-per-second)
QIC-1GB:	53.3/80 ips
QIC-320/525	120 ips
QIC-24/120/150	96 ips
Wind/Rewind:	120 ips
Track Format:	Multiple track serpentine recording
Cartridge Capacity:	2.0 Gbytes, formatted (approx.) - DC9200 (950') 2.5 Gbytes, formatted (approx.) - DC9200XL (1200')

(continued on next page)

## TZK11 Cartridge Tape Drive Specifications

**Table B-1 (Cont.) TZK11 Cartridge Tape Drive Specifications**

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Power Requirements: +12 V  $\pm$  5% @ 1.0 A (2.0 A surge),  
150 mV ripple peak-to-peak  
+5 V  $\pm$  5% @ 1.2 A (1.8 A surge),  
150 mV ripple peak-to-peak

Power Consumption

Nominal: 20 W

Peak: 33 W

Environmental

Operating Temperature: 5°C (50°F) to 40°C (104°F)

Non-operating Temperature: -30°C (-22°F) to +60°C (151°F)

Operating Humidity: 20% to 80% RH maximum

Non-operating Humidity: 10% to 90% RH maximum

Operating Altitude: 2.4 km (13,000 ft)

Non-operating Altitude: 4.9 km (40,000 ft)

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## TZK11 Cartridge Tape Drive Specifications

**Table B-2 Acoustic Noise Declaration for German Noise Declaration Labor: Declared Values per ISO 9296 and ISO 7779**

Product	Sound Power Level $L_{WAd}$ , B		Sound Pressure Level $L_{pAm}$ , dBA (bystander positions)	
	Idle	Operate	Idle	Operate
TZK11-DA	5.0	5.9	36	47

Product	Sound Power Level $L_{WAd}$ , B		Sound Pressure Level $L_{pAm}$ , dBA (operator position)	
	Idle	Operate	Idle	Operate
TZK11-AA	–	5.9	–	51

**Note**

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

**Table B-3 Schallemissionswerte - Werteangaben nach ISO 9296 und ISO 7779 /DIN EN27779:**

Gerät	Schalleistungspegel $L_{WAd}$ , B		Schalldruckpegel $L_{pAm}$ , dBA (Bediener position)	
	Leerlauf	Betrieb	Leerlauf	Betrieb
TZK11-DA	5.0	5.9	36	47

Product	Schalleistungspegel $L_{WAd}$ , B		Schalldruckpegel $L_{pAm}$ , dBA (Zuschauerpositionen)	
	Idle	Operate	Idle	Operate
TZK11-AA	–	5.9	–	51

## TZK11 Cartridge Tape Drive Specifications

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### Hinweis

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

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