80/160GB VXA-2 Internal Tape Drive

Installation and Using Guide

> **Note**
>
> Before you install this product and use this information, be sure to read the product warranties and notices information included with the system unit into which you are installing the product.

Contents

Safety Information

Handling Static-Sensitive Devices

Attention: Static electricity can damage the device and your system unit. To avoid damage, keep this device in its anti-static protective bag until you are ready to install it. To reduce the possibility of electrostatic discharge, follow the precautions listed below:

- Limit your movement. Movement can cause static electricity to build up around you.
- Handle the device carefully, holding it by its edges or its frame.
- Do not touch solder joints, pins, or exposed printed circuitry.
- Do not leave the device where others can handle and possibly damage the device.
- While the tape drive is still in its anti-static package, touch it to an unpainted metal part of the system unit for at least two seconds. (This drains static electricity from the package and from your body.)
- Remove the device from its package and install it directly into your system unit without setting it down. If it is necessary to set the device down, place it on its static-protective package. (If your device is an adapter, place it component-side up.) Do not place the device on your system unit cover or on a metal table.
- Take additional care when handling devices during cold weather, as heating reduces indoor humidity and increases static electricity.

About This Book

This book provides information about the 80/160GB VXA-2 Internal Tape Drive, and how to plan your SCSI device layout, set the SCSI address, install the tapedrive, and use the tapedrive. Use this book along with your specific system unit and operating system documentation.

ISO 9000

ISO 9000 registered quality systems were used in the development and manufacturing of this product.

References to AIX Operating System

This document may contain references to the AIX operating system. If you are using another operating system, consult the appropriate documentation for that operating system.

This document may describe hardware features and functions. While the hardware supports them, the realization of these features and functions depends upon support from the operating system. AIX provides this support. If you are using another operating system, consult the appropriate documentation for that operating system regarding support for those features and functions.

Related Publications

The following publications contain related information:

- System unit documentation for information specific to your hardware configuration
- AIX operating system documentation for information specific to your software configuration

  The AIX documentation library is available at the following Web address: `http://publib16.boulder.ibm.com/pseries/en_US/infocenter/base`. Select **AIX documentation**. AIX documentation is also contained on the AIX Documentation CD which was shipped with your AIX operating system. The documentation is made accessible by loading the documentation CD onto the hard disk or by mounting the CD into a CD-ROM compatible drive.

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Chapter 1. Overview

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This document may describe hardware features and functions. While the hardware supports them, the realization of these features and functions depends upon support from the operating system. AIX provides this support. If you are using another operating system, consult the appropriate documentation for that operating system regarding support for those features and functions.

The 80/160GB VXA-2 Internal Tape Drive is an internal streaming tape drive that provides medium-to high-capacity backup and archival capability, as well as a high data-transfer rate. The 80/160GB VXA-2 Internal Tape Drive uses wide bus (16-bit) architecture. Communications on the SCSI bus can be either asynchronous or synchronous. The 80/160GB VXA-2 Internal Tape Drive can read and write to VXA tape cartridges that are written by a VXA-1 tape drive. The 80/160GB VXA-2 Internal Tape Drive can be used as a boot device.

Note: This device is available as an auto-docking feature on some systems. See your system documentation for information about the auto-docking feature.

The tape drive is used primarily for:
- Saving and restoring system data files
- Archiving important records
- Distributing operating system software upgrades

The drive conforms to the American National Standards Institute (ANSI) SCSI-2 standard. You can attach the drive to any system that uses a single-ended interface/LVD that meets SCSI-2 Standard ANSI X3.131-1994.Rev 10h.

The 80/160GB VXA-2 Internal Tape Drive features include:
- Use of 80/160 GB VXA data cartridges
- Data rate of 6 MB per second
- Capacity of 80 GB
- Compression capability, which increases the native capacity of 80 GB and the effective data rate by using a compression ration of 2 to 1. The actual capacity per cartridge varies depending on the application and the type of data cartridge being used. The default setting is for compression. Use the System Management Interface Tool (SMIT) to change the default.

  Note: The factory default setting is *Activated*. Data compression is usually controlled by the application software.
- A half-high 5.25-inch form-factor
- Status lights that indicate:

- When it is time to clean the tape drive
- When the tape is in motion
- When there is a problem with the tape drive

Tape Drive Environment and Use

Tape drives require specific maintenance and environmental conditions to operate well over time. Using high-quality, data-grade media, handling and storing this media properly, operating the tape drive in a clean environment and keeping the tape drive properly cleaned can help you to avoid problems with your tape drive.

Media Grades

The following grades of media can be used with your 80/160GB VXA-2 Internal Tape Drive:

- Tape containing Program Transmittal Fixes (PTF) - PTFs are tapes designed to be written to only once and read from a few times. PTF tapes are not designed to be used as a backup medium.
- Storage tapes - Storage tapes are designed to be used for backing up files that may be reused numerous times and also for long-term storage.

Note: Your system supplier may only support the media they sell. If the representative's analysis indicates that your problem is caused by inferior media usage, it is your (the customer's) responsibility to replace the inferior media.

Tape Handling and Storage

Most tape is supplied in a sealed cartridge. It is provided this way so that the tape will remain in a clean environment. Opening the cartridge allows dirt and airborne particles to enter and then become a source of contamination. The cartridge should only be opened by the tape drive and not an operator. The tape also is held under proper tension inside the cartridge. If the cartridge is dropped, this tension will be relaxed. Inserting a dropped cartridge into a tape drive can cause incorrect loading and result in a jam. This will ruin the tape and can cause physical damage if the cartridge is not removed properly.

When the tapes are stored, they must be replaced in their protective containers and stored on their end. The storage area must be clean, dry, normal room temperature and away from any magnetic fields.

Environmental Issues

Tape drives are designed to operate in a clean environment. Problem factors are dirt, dust, fibers and airborne particles. Airborne particles are the most difficult to address. When a tape is installed into the tape drive, the clearance between the heads and the tape is measured in microns. Particles can damage the tape or the head if they come in contact with either. Your service representative offers a tape drive filter enclosure for some systems to solve this problem. The enclosure draws air in through a filter and supplies the tape drive with clean air. Customers are responsible to provide a clean operating environment for the tape drive and system.

Tape Drive Cleaning

No matter how clean the environment, debris can build up on the heads of any tape drive. Every time tape motion occurs, some of the media surface comes off on the heads. Over time, this builds up and causes errors in reading and writing. Customers are responsible to clean the tape drive in accordance with the cleaning information provided with the tape drive.

Note: To identify the only media supported on this tape drive, refer to "Ordering Tape Cartridges" on page 24.

Cleaning cartridges can be used a limited number of times. After a cleaning cartridge has been used to its maximum number of times, the cartridge is considered expired. When cartridges expire, they must be replaced. Never reuse an expired cleaning cartridge. Doing so allows previously removed dirt to be reintroduced to the tape drive. Place a mark on the cleaning cartridge after each use, to best determine when your cleaning cartridge has expired.

SCSI Hardware Issues

Note: If you are installing the auto-docking version of this device on your system, this section does not apply to your system. See your system documentation for information about the auto-docking feature.

SCSI bus cables and terminators can affect tape drive performance. Use cables and terminators that are designed specifically to keep the SCSI bus as free of noise as possible. Generic cables or terminators can adversely affect the SCSI bus performance. If your service representative's analysis indicates a problem with inferior cables, it may be necessary for the customer to replace them.

Microcode Updates

Your system supplier constantly works to provide the best possible tape drive products. To make certain that the tape drives work their very best, your system supplier may release changed microcode for the tape drives. When a microcode change is developed, your system supplier makes the change available to you through its service organization or by electronic delivery.

Microcode changes are available from service Web sites. For more information about supporting Web sites, contact your local service representative.

Microcode can be installed by your service representative or your system administrator.

Summary

Your tape drive must be installed in the cleanest possible environment. Your 80/160GB VXA-2 Internal Tape Drive requires high-quality, data-grade tapes and cleaning on a regular basis. Media must also be stored and handled properly. Improper use, storage, or handling of tape drives or media may void your warranty or service agreement.

If a tape drive stops functioning due to a component failure during the tape drive warranty or maintenance time, the service provider will replace the tape drive unit. The service provider will replace any defective tape drive under the terms and conditions of its warranty or service agreement. It is the service provider's objective to work with you to identify the cause of any tape drive problem and provide a solution.

Front View of the 80/160GB VXA-2 Internal Tape Drive
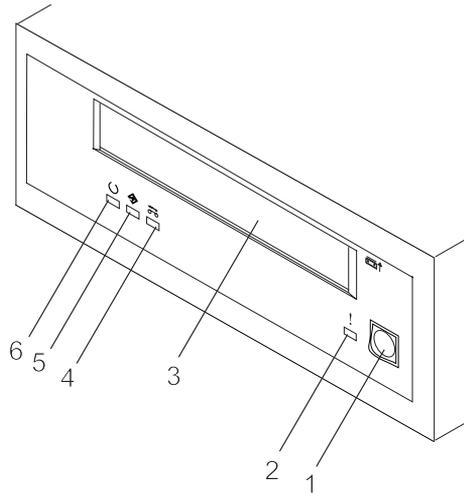
1	Unload button
2	Fault (orange) status light
3	Tape drive door
4	Cleaning (amber) status light
5	Activity (green) status light
6	Ready (green) status light

Chapter 2. Preparing to Install the 80/160GB VXA-2 Internal Tape Drive

This chapter covers the things that you should do before installing the 80/160GB VXA-2 Internal Tape Drive. Preparing to install the tape drive involves the following tasks:

- Verifying your software requirements
- Checking prerequisites
- Gathering tools and documentation
- Planning your SCSI device layout
- Determining your SCSI address

Verifying Your Software Requirements

The 80/160GB VXA-2 Internal Tape Drive is supported on AIX 5.1 or later.

Checking Prerequisites

Check that your package contains the following items:

- The 80/160GB VXA-2 Internal Tape Drive
- Media kit containing:
  - 1 data cartridge
  - 1 cleaning cartridge
  - 1 test tape
  - Jumpers (located in a plastic bag)
- Specific hardware for attaching the tape drive to your specific system, as detailed on the parts listing provided with your 80/160GB VXA-2 Internal Tape Drive

Gathering Tools and Documentation

The following tools and documentation are needed to complete the installation:

- A flat-blade screwdriver (if this device is not an auto-docking feature on your system)
- Your system unit documentation, including any service documentation
- Your operating system documentation

Contact the place of purchase if an item is missing or damaged.

Note: If you are installing the auto-docking version of this device on your system, the remainder of this chapter does not apply to your system. See your system documentation for information about the auto-docking feature.

Planning Your SCSI Device Layout

SCSI devices are attached in a daisy-chain configuration to a SCSI adapter inside your system unit. SCSI devices can be installed inside your system unit or connected externally. When you connect more than one SCSI device, it is important that you plan the layout of your SCSI chain. Each device in the chain has a unique SCSI address (also called a *SCSI ID*). A terminator is required at each end of the SCSI chain.

Determining Your SCSI Address

Before you install the 80/160GB VXA-2 Internal Tape Drive, you must set the SCSI address on the drive. First, determine which SCSI addresses are available to use. Then you choose an address and install jumpers on the drive to set the selected address. The 80/160GB VXA-2 Internal Tape Drive supports addresses 6 through 0 and 8 through 15. You can use any available SCSI address as long as no two SCSI devices on the same chain use the same address. Usually, no device can use address 7, which is reserved for the SCSI adapter.

SCSI addresses are in sequential order from highest to lowest priority. Refer to Table 1 on page 9 for the priority associated with each address. All SCSI devices can use SCSI addresses 6 through 0. If your system unit and adapter support the wide (16-data bit, 68-conductor cable) SCSI interface, you may see addresses in the range of 0 through 15.

To determine what SCSI adapters are in your system, type the following at the system prompt:

- `lsdev -C | grep scsi`

  Press Enter. All SCSI adapters in the system are displayed in the following format:

  ```
  scsi0      Available 00-00-0S      Standard SCSI I/O Controller
  scsi1      Available 00-01         SCSI I/O Controller
  ```

To determine the SCSI address for the adapter you will attach to, type the following at the system prompt:

- `lsattr -El scsi0 | grep id`

  Where *scsi0* is the adapter that the tape drive is to be attached to. Press Enter. The SCSI ID is displayed in the following format:

  ```
  id      7                   Adapter card SCSI I          True
  ```

To find an available SCSI address, do the following:

1. To identify the SCSI addresses used by all other devices, type:

   ```
   lsdev -Cs scsi
   ```

   and press Enter. A list of devices displays in the following format:

   ```
   hdisk0    Available   00-00-0S-0,0    2.0GB SCSI Disk Drive
   hdisk1    Available   00-02-01-2,0    4.5GB 16 Bit SCSI Disk Drive
   hdisk2    Available   00-02-01-3,0    SCSI Disk Drive
   rmt0      Available   00-02-01-4,0    SCSI 8mm Tape Drive
   ```

In the fourth position of the third column, locate all instances of the port that you chose in step 1 on page 8. (The list may contain multiple instances of a port. In the following example, for port 2 (identified in step 1 on page 8) there are three instances.) The addresses of the other SCSI devices appear in the seventh position, as highlighted in the example.

For the port chosen in step 1 on page 8, note the addresses of the other SCSI devices attached to your system (in this case, for port 2, the addresses are 2, 3, and 4).

2. Select the highest-priority unused SCSI address for your 80/160GB VXA-2 Internal Tape Drive. Use Table 1 to record the address you chose for your 80/160GB VXA-2 Internal Tape Drive and the names and addresses of any other installed SCSI devices. Save this information for future reference.

Table 1. Data Access Priorities for SCSI Addresses

Priority	SCSI Address	SCSI Device Name
Highest Priority	7 (Default)	Adapter
↓	6	
↓	5	
↓	4	
↓	3	
↓	2	
↓	1	
↓	0	
↓	15	
↓	14	
↓	13	
↓	12	
↓	11	
↓	10	
↓	9	
Lowest Priority	8	

Chapter 3. Installing the 80/160GB VXA-2 Internal Tape Drive

This chapter takes you through the steps of installing your 80/160GB VXA-2 Internal Tape Drive, which involves the following tasks:

- Handling Recommendations
- Setting the SCSI address
- Installing and connecting the tape drive
- Configuring the tape drive
- Verifying the installation
- Updating the micro code levels

Note: Before you install and connect your 80/160GB VXA-2 Internal Tape Drive, refer to your system unit documentation for safety information.

Handling Recommendations

Attention: Be sure to read "Handling Static-Sensitive Devices" on page vii before you remove the 80/160GB VXA-2 Internal Tape Drive from its anti-static bag or any time you handle it.

For optimum performance, always follow these recommendations:

- Handle the drive carefully and by its external metal chassis. Keep your hands away from the printed circuit boards, components, and printed circuit (flex) cables.
- If possible, work on a cushioned surface, and do not drop the tape drive onto the work surface.
- If you move the tape drive to an environment that is colder or warmer than its previous environment, keep the drive in its package and allow the package to reach the current room temperature. This prevents potential data loss or damage to the tape drive. Allow one hour of acclimatization for each 10 degrees C (18 degrees F) difference between the ship or storage temperature and the room temperature.

Note: If you are installing the auto-docking version of this device on your system, the remainder of this chapter does not apply to your system. See your system documentation for information about the auto-docking feature.

Setting the SCSI Address

The 80/160GB VXA-2 Internal Tape Drive is shipped with jumpers packaged in a small plastic bag. After you choose an available SCSI address, you can install the jumpers on the tape drive to match the selected address. If you need instructions for selecting the SCSI address, refer to "Determining Your SCSI Address" on page 8.

To set a SCSI address, insert jumpers onto pin positions reserved on the jumper block specifically for setting the address. To set a position to On, insert a jumper onto both the top and bottom pins. To set a position to Off, either insert a jumper onto the top pin only or remove the jumper from the jumper block.

Refer to the figure on page 12 and to Table 2 as you go through the following steps to set the SCSI address on your 80/160GB VXA-2 Internal Tape Drive:

Attention: Be sure to read the handling instructions in "Handling Static-Sensitive Devices" on page vii before you begin.

1. Remove the tape drive from its anti-static bag.
2. Find pin positions **1-2**, **3-4**, **5-6**, and **7-8** located on the jumper block on the back of the tape drive. These positions are always used to set the SCSI address on the 80/160GB VXA-2 Internal Tape Drive.
3. Refer to Table 2 to determine in which positions you install the jumpers to correctly set the SCSI address you chose in step 2 on page 9.

Jumper Pin Positions on the 80/160GB VXA-2 Internal Tape Drive
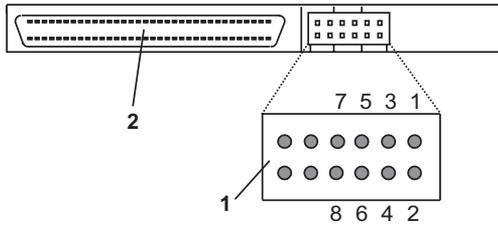
1   SCSI Address Block

2   68-pin SCSI Connector

Note: The 80/160GB VXA-2 Internal Tape Drive is shipped with four jumpers.

Table 2. SCSI Address Settings

Address	Jumper 7-8	Jumper 5-6	Jumper 3-4	Jumper 1-2
0	Off	Off	Off	Off
1	Off	Off	Off	On
2	Off	Off	On	Off
3	Off	Off	On	On
4	Off	On	Off	Off
5	Off	On	Off	On
6	Off	On	On	Off
7*	Off	On	On	On
8	On	Off	Off	Off
9	On	Off	Off	On
10	On	Off	On	Off
11	On	Off	On	On
12	On	On	Off	Off
13	On	On	Off	On

Table 2. SCSI Address Settings (continued)

Address	Jumper 7-8	Jumper 5-6	Jumper 3-4	Jumper 1-2
14	On	On	On	Off
15	On	On	On	On
Note: * = Address 7 is reserved for the adapter.				

Installing and Connecting the Tape Drive

After you set the SCSI address on your drive, you can install the tape drive into your system unit. Follow the instructions provided in your system unit documentation for shutting down your system and for installing an internal device into your system unit.

To install and connect the 80/160GB VXA-2 Internal Tape Drive, do the following:

1. Install the tape drive, following the instructions provided in your system unit documentation for installing devices.
2. Attach the 68-pin SCSI cable connector to the tape drive.
3. Attach the 5/12 V power plug to the drive.
4. Ensure there is a SCSI terminator on the end of the cable or that a terminator is supplied by the last physical SCSI device on the internal chain.

Configuring the 80/160GB VXA-2 Internal Tape Drive

To configure the tape drive after installation, boot your system unit. Device drivers are provided in the AIX operating system and other operating systems that support the 80/160GB VXA-2 Internal Tape Drive. Your operating system recognizes the drive and automatically updates your system unit configuration.

Verifying the Installation

To verify the successful installation of the 80/160GB VXA-2 Internal Tape Drive, see the instructions provided in your operating system documentation. To verify the installation on an AIX system, type:

```
lsdev -Cs scsi
```

Press Enter. A list of SCSI devices displays. An *Available* status indicates that the drive is installed and ready to use.

Updating Microcode Levels

This device contains microcode that you can update. Contact your service representative for instructions on how to get the latest microcode levels for your device. To install the microcode, follow the instructions in the readme file included with the update.

Chapter 4. Using the 80/160GB VXA-2 Internal Tape Drive

This chapter describes the operator controls and status lights on the 80/160GB VXA-2 Internal Tape Drive. It also provides instructions for loading and unloading a tape cartridge, and describes how to clean the tape drive.

The following figure shows the front view of the 80/160GB VXA-2 Internal Tape Drive.
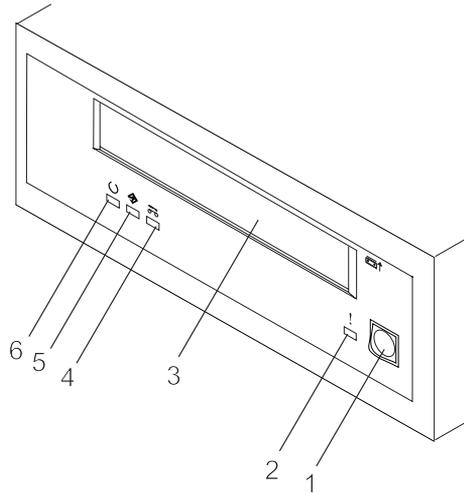
1	Unload button
2	Fault (orange) status light
3	Tape drive door
4	Cleaning (amber) status light
5	Activity (green) status light
6	Ready (green) status light

Operator Controls

The 80/160GB VXA-2 Internal Tape Drive has the following operator control.

Unload Button
> The Unload button enables the tape cartridge to be ejected. The Unload button operates only when the 80/160GB VXA-2 Internal Tape Drive's power is on. To remove a cartridge, press and hold the Unload button for approximately one second.

Status lights

Three status lights and their ISO symbols are on the 80/160GB VXA-2 Internal Tape Drive as follows:

○ **Ready** (green)

◇ **Activity** (green)

⊶ **Cleaning** (amber)

! **Fault** (orange)

The combinations of the status lights and their definitions are shown in Table 3 on page 17.

Table 3. Definition of Status Light Combinations

Operation	Ready (green)	Activity (green)	Cleaning (amber)	Fault (orange)
Power-on self-test	Flashing	Off	Off	Off
Power On LED Test	On for 2.0 seconds	On for 2.0 seconds	On for 2.0 seconds	On for 2.0 seconds
No tape loaded	Off	Off	On[1]/Off	Off
Tape loaded, no activity	On	Off	On[1]/Off	Off
Data or Cleaning Cartridge loaded, activity	On	Flashing	On[1]/Off	Off
Cleaning Cartridge loaded, cleaning failed[1]	Off	Off	On[1]	Off
Tape loading or unloading[1]	Off	Flashing	On[1]/Off	Off
Unrecoverable drive failure[2]	On/Off	Off	On[1]/Off	Flashing[2]
Firmware Download	Flashing	Off	On[1]/Off	Off
Firmware Update	Flashing	Flashing	On[1]/Off	Off
Microcode Download failure[3]	Off	Off	On[1]/Off	Flashing[2]
Over Temperature[4]	Off	Off	On[1]/Off	On

Notes:

1. A solid amber status light indicates the drive needs cleaning. The drive will continue to function, but needs to be cleaned as soon as possible. A power cycle will not turn off this indicator.

2. The Fault status light will flash to indicate an unrecoverable error. An unrecoverable error is an error condition that results in the drive not being able to function unless initiator, operator, or service intervention is applied. An unrecoverable drive failure is usually the result of a hardware error condition. One of the following actions will be needed to clear the flashing Fault status light:

   - Hard SCSI Reset
   - Cartridge Eject
   - Power Cycle
   - Retry Microcode Download

   An unrecoverable cartridge (media) failure is usually the result of a defective cartridge, media, or cartridge state and will require the drive to eject the cartridge (if possible) to clear the flashing status light.

3. The firmware download failed and the drive is not functional. The drive boot code is in control and the microcode download should be retried.

4. The Fault status light will be on solid to indicate an over-temperature condition (see "Over-Temperature Conditions" on page 18).

Over-Temperature Conditions

If the 80/160GB VXA-2 Internal Tape Drive becomes too hot due to environmental or other conditions, the drive will experience an over temperature condition. When the internal temperature of the drive becomes greater than 47 degrees C, the Fault status light will stay on solid to indicate an over temperature condition. If a tape cartridge is in the drive when this condition occurs, it will be immediately ejected. The Fault status light will remain on until the drive temperature drops below 47 degrees C.

Loading and Unloading a Tape Cartridge

Use the following instructions to load and unload a tape cartridge. For information about the type of media to use, refer to Chapter 5, "Using the Media", on page 21.

Note: To avoid problems with loading and unloading, use only one label on a cartridge. Multiple or poorly placed labels can clog the drive-load mechanism.
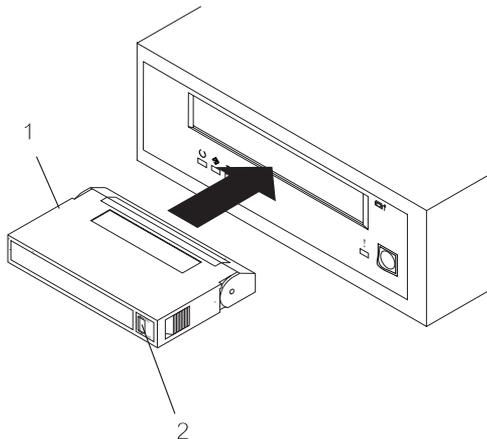
| **1** | Tape cartridge |
| **2** | Write-protection switch |

Loading a Tape Cartridge

To load a tape cartridge, do the following:

1. Make sure that the 80/160GB VXA-2 Internal Tape Drive power is on.
2. Grasp the cartridge by the outer edges, with the window-side up and the write-protect switch facing you.

   Note: See "Setting the Write-Protect Switch" on page 23 to make sure that the write-protect switch is properly set.

3. Slide the cartridge into the opening on the front of the 80/160GB VXA-2 Internal Tape Drive until the loading mechanism pulls the cartridge into the drive and the drive door closes.

To indicate that the load operation was successful, the Ready status light comes on.

Unloading a Tape Cartridge

To unload a tape cartridge, do the following:

1. Make sure that the tape drive power is on.
2. Press the Unload button.

The 80/160GB VXA-2 Internal Tape Drive rewinds, unloads, and ejects the tape cartridge. The process may take from 15 seconds to several minutes, depending on the position of the tape and the amount of data written. During this task, the status lights do the following:

- The Ready status light turns off.
- The Activity status light flashes during the unload operation.
- The Activity status light turns off when the cartridge is ejected from the tape drive.

Cleaning the Tape Drive

Clean the 80/160GB VXA-2 Internal Tape Drive whenever the Cleaning status light comes on or a system I/O error related to the device occurs.

Attention: Use only the recommended cleaning cartridge to clean the tape drive. Use of other than recommended cleaning cartridges can damage your drive and may void the warranty.

To clean the 80/160GB VXA-2 Internal Tape Drive, do the following:

1. Make sure that 80/160GB VXA-2 Internal Tape Drive power is on.
2. If a tape cartridge is in the 80/160GB VXA-2 Internal Tape Drive, eject and remove the cartridge.

   Note: Some cleaning cartridges have small rectangles on the window side that can be used to log the use of the cartridge. Each time the cartridge is used, mark one of the rectangles on the cartridge with a pen or marker. When all of the rectangles have been marked, discard the cleaning cartridge.

3. Grasp the cleaning cartridge by the outer edges, with the window side up and the write-protect switch facing you.
4. Slide the cartridge into the opening on the front of the 80/160GB VXA-2 Internal Tape Drive until the loading mechanism pulls the cartridge into the drive and the drive door closes.

After the cleaning cartridge has been inserted, the remainder of the cleaning process is automatic. The 80/160GB VXA-2 Internal Tape Drive does the following:

1. Loads the cleaning cartridge into the tape drive.
2. Cleans the drive by moving the cleaning tape forward for approximately 30 seconds.
3. Unloads the cleaning cartridge when the cleaning operation is complete.
4. Indicates a successful cleaning operation by turning off the Cleaning status light (if the Cleaning status light was on prior to the cleaning process. Otherwise, the Cleaning status light remains solid to indicate that the cleaning cartridge is no longer usable. Obtain a new cleaning cartridge and repeat the process.)

   Note: If the cleaning operation completes but the Cleaning status light remains on, repeat the cleaning procedure with a new cleaning cartridge. If the status light still remains on, contact your authorized service representative.

To determine how many times a cleaning cartridge can be used, check the information printed on the cartridge. If you attempt to use a depleted cleaning cartridge, the 80/160GB VXA-2 Internal Tape Drive automatically detects the error and ejects the cartridge. If the Cleaning status light was on prior to the cleaning process, it stays on; if the Cleaning status light was off, the depleted cartridge causes the status light to come on.

If a system error occurs, clean the drive and retry the operation. If the operation fails, replace the data cartridge, clean the drive again, then retry the operation.

Chapter 5. Using the Media

Use only VXA cartridges with the 80/160GB VXA-2 Internal Tape Drive.

Note: Your system supplier may only support the media they sell. If the representative's analysis indicates that a problem is caused by inferior media usage, it is your (the customer's) responsibility to replace the inferior media.

Types of VXA Cartridges

The 80/160GB VXA-2 Internal Tape Drive is shipped with a VXA data cartridge, test cartridge, and cleaning cartridge. The 80/160GB VXA-2 Internal Tape Drive reads and writes to VXA data cartridges.

Data Cartridge

Use the VXA data cartridge for saving or restoring your programs or data.

Large and small labels are shipped with the data cartridge. To avoid problems with loading and unloading a tape, use only the small label on the tape cartridge, as shown in the following illustration. Place the large label on the cartridge container.
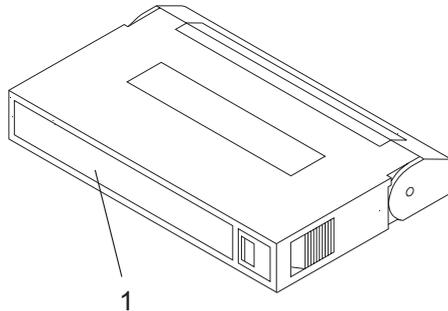
1   Location for small label

Storage and Shipping Environments

Before using a tape cartridge, let it acclimatize to the operating environment by placing the cartridge in the operating environment for as long as it has been away from the environment or for 24 hours, whichever is less. (To determine the appropriate operating environment, see "Tape Drive Environment and Use" on page 3.)

Acclimatization is necessary for any data cartridge exposed to a different humidity environment or to temperature changes of 11°C (20°F) or more.

Retrieval of archived data should be performed on a tape unit that is clean and fully operational. Try to make the recovery environment the same as the operating environment. Allow tapes at least 24 hours to acclimatize to the environment of the tape unit.

The recommended environment for storage and shipment of VXA data cartridges is shown in Table 4.

Table 4. Recommended Environment for VXA Data Cartridges

Environmental Factor	Storage	Shipping
Temperature	5°C to 32°C (41° to 90°F)	−40 to 52°C (−40 to 125°F)
Relative Humidity (noncondensing)	20 to 60%	5 to 80%
Maximum Wet Bulb	26°C (79°F)	26°C (79°F)

Tape Cartridge Storage

Tape drives record data using densities similar to hard disk drives. Because most computer systems are not located in a dust-free, climate-controlled environment, you must exercise special care when dealing with tape cartridges and tape drives. They must be treated as a valuable asset used to protect your business data.

Use the following guidelines for storing your tape cartridges:

- Temperature and humidity should be kept at a levels listed in Table 4.
- Tape cartridges should always be stored in their protective cases. The storage case helps prevent damage from dust and physical misuse. When the tape cartridges are not in use or being stored, they should be in their storage cases and stood on edge in a designated storage location. Do not stack cartridges on the flat side or stack other items on top of the tape cartridges. Handle your tape cartridges with care to reduce archival problems.
- Protective cases for tape cartridges should be kept closed except when inserting or removing a cartridge. Contamination can build up and be transferred to the tape cartridge if the protective case is left open.
- Stored tapes should be exercised at least once every 12 months. Run the tape from Beginning of Data (BOD) to End of Data (EOD) and back to BOD at normal operating speeds. Tapes stored in a warmer environment should be exercised more frequently.
- Sunlight can damage the tape and the cartridge shell. Store tape cartridges out of the direct sunlight.

Attention: Operation outside of the recommended environment can result in possible loss of data or failure of the drive.

Operating in Harsh Environments

The 80/160GB VXA-2 Internal Tape Drive is suited to streaming operations, as opposed to multiple stop-and-start, random-search tape operations. When the tape is used for frequent stop-and-start operations, it is beneficial to still have as much streaming movement as possible. This can be accomplished by ensuring that any save or restore operation is the only active operation being performed.

Do not use any tape for archival purposes if it has been used outside of the ranges specified in Table 4 on page 22 for an extended period of time. The magnetic and physical strength of the tape will have deteriorated as a result of its exposure to the environment. Do not store important data on such a tape; transfer the data to a newer tape for reliable archiving.

Setting the Write-Protect Switch

The position of the write-protect switch on the 8-mm tape cartridge determines when you can write to the tape.

- When the switch is set to the right (REC), data can be written to and read from the tape.
- When the switch is set to the left (SAVE), data can only be read.
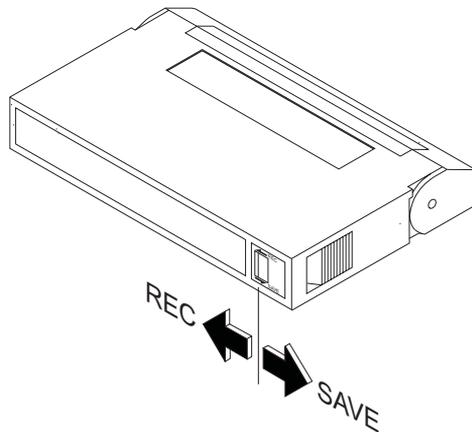
Ordering Tape Cartridges

All tape cartridges are not alike. The tape composition and length, and the construction of the cartridge itself can all affect the quality and capacity of the recording and the performance of your tape drive. A poor quality tape cartridge may appear to work adequately in your system, yet it can leave contamination in the tape path or impede the speed of the recording.

The length and composition of the tape, and the size, shape, and construction of the cartridge shell must all be considered when selecting the tape cartridge to be used with your system. Data grade tape media is the only type of tape media that should be used for backup and data processing. Saving money by using generic media for data purposes will do little to save your business if your data is destroyed and your backup tapes fail because of inferior media.

Table 5 lists quality tape cartridges that you can order for the 80/160GB VXA-2 Internal Tape Drive. To order cartridges contact your local provider of storage products. The following table provides you with part numbers of quality tape cartridges that can be purchased from your local provider.

Table 5. Recommended VXA Data Cartridges

Part Number	Type of Cartridge	Length
19P4876	80 GB VXA Data Cartridge	230 m (754 ft)
19P4877	59 GB VXA Data Cartridge	170 m (557 ft)
19P4878	20 GB VXA Data Cartridge	62 m (203 ft)
19P4879	VXA Test Cartridge	– –
19P4880	VXA Cleaning Cartridge	– –

Appendix A. Communications Statements

The following statement applies to this product. The statement for other products intended for use with this product appears in their accompanying documentation.

Federal Communications Commission (FCC) Statement

Note: The VXA Tape Drive been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. 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:

- Reorient 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 an authorized dealer or service representative for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from authorized dealers. Neither the provider nor the manufacturer are responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Responsible Party:
- International Business Machines Corporation
- New Orchard Road
- Armonk, New York 10504
- Telephone: (919) 543-2193

FC Tested to Comply
With FCC Standards

FOR HOME OR OFFICE USE

European Union (EU) Statement

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. The manufacturer cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of option cards supplied by third parties. Consult with your dealer or sales representative for details on your specific hardware.

This product has been tested and found to comply with the limits for Class B Information Technology Equipment according to CISPR 22 / European Standard EN 55022. The limits for Class B equipment were derived for typical residential environments to provide reasonable protection against interference with licensed communication devices.

International Electrotechnical Commission (IEC) Statement

This product has been designed and built to comply with IEC Standard 950.

United Kingdom Telecommunications Safety Requirements

This equipment is manufactured to the International Safety Standard EN60950 and as such is approved in the UK under the General Approval Number NS/G/1234/J/100003 for indirect connection to the public telecommunication network.

The network adapter interfaces housed within this equipment are approved separately, each one having its own independent approval number. These interface adapters, supplied by the manufacturer, do not use or contain excessive voltages. An excessive voltage is one which exceeds 70.7 V peak ac or 120 V dc. They interface with this equipment using Safe Extra Low Voltages only. In order to maintain the separate (independent) approval of the manufacturer's adapters, it is essential that other optional cards, not supplied by the manufacturer, do not use main voltages or any other excessive voltages. Seek advice from a competent engineer before installing other adapters not supplied by the manufacturer.

Avis de conformité aux normes du ministère des Communications du Canada

Cet appareil numérique de la classe B est conform à la norme NMB-003 du Canada.

Canadian Department of Communications Compliance Statement

This Class B digital apparatus complies with Canadian ICES-003.

VCCI Statement

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に
基づくクラスＢ情報技術装置です。この装置は、家庭環境で使用することを目的
としていますが、この装置がラジオやテレビジョン受信機に近接して使用される
と、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。

The following is a summary of the VCCI Japanese statement in the box above.

This product is a Class B Information Technology Equipment and conforms to the standards set by the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). This product is aimed to be used in a domestic environment. When used near a radio or TV receiver, it may become the cause of radio interference. Read the instructions for correct handling.

Radio Protection for Germany

Dieses Gerät ist berechtigt in Übereinstimmung mit dem deutschen EMVG vom 9.Nov.92 das EG–Konformitätszeichen zu führen.

Der Aussteller der Konformitätserklärung ist die IBM Germany.

Dieses Gerät erfüllt die Bedingungen der EN 55022 Klasse B.

Appendix B. Notices

This information was developed for products and services offered in the U.S.A.

The manufacturer may not offer the products, services, or features discussed in this document in other countries. Consult the manufacturer's representative for information on the products and services currently available in your area. Any reference to the manufacturer's product, program, or service is not intended to state or imply that only that product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any intellectual property right of the manufacturer may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any product, program, or service.

The manufacturer may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to the manufacturer.

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Part Number: 00P5097

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(1P) P/N: 00P5097