



# 12/24GB 4mm Internal Tape Drive Installation and User's 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.

**First Edition (April 1998)**

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## **Safety Information**

### **DANGER**

**An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.**

**Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.**

**When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.**

**Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.**

**During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communication lines.**



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## Handling the 12/24GB 4mm Internal Tape Drive

**Attention:** Static electricity can damage your equipment. Leave the 12/24GB 4mm Internal Tape Drive in its static-protective bag until you are ready to install or configure it in your system unit.

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### Electrostatic Discharge Protection

Take the following precautions whenever you handle the tape drive or other static-sensitive devices:

- If you have an anti-static wrist strap, use it while handling the tape drive.
- Limit your movement. Movement can cause static electricity to build up around you.
- With the tape drive still in its anti-static bag, touch it to an unpainted metal part of the system unit, such as an expansion slot.
- Hold the tape drive carefully by its frame or edges. Avoid touching solder joints, pins, or other printed circuitry.
- Do not place the tape drive on the system unit cover or on a metal table. If you must set it aside, put it back into its anti-static bag. Before you pick it up again, touch the bag and metal frame of the system unit at the same time.
- Be very careful when you handle the tape drive during cold weather, as low humidity and heating increase static electricity.





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## **About This Book**

This book provides information about the 12/24GB 4mm Internal Tape Drive, and how to plan your SCSI device layout, set the SCSI address (also called a SCSI ID), install the tape drive, and use the tape drive. Use this book along with your specific system unit and operating system documentation.

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### **ISO 9000**

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

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### **Related Publications**

Refer to your system unit and operating system documentation for information specific to your hardware and software configuration.

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### **Trademarks and Acknowledgments**

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## Chapter 1. Overview

The 12/24GB 4mm Internal Tape Drive is an internal streaming tape drive that provides medium to high capacity backup and archival capability and a high data transfer rate. The 12/24GB 4mm Internal Tape Drive utilizes NARROW bus (8-bit) architecture. Communications on the SCSI bus can be either asynchronous or synchronous. The 12/24GB 4mm Internal Tape Drive is compatible with existing 2.0GB and 4.0GB 4mm tape drives. The 12/24GB 4mm Internal Tape Drive can be used as a boot device.

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 that meets SCSI-2 Standard ANSI X3.131-1994.Rev 10h.

The 12/24GB 4mm Internal Tape Drive's features include:

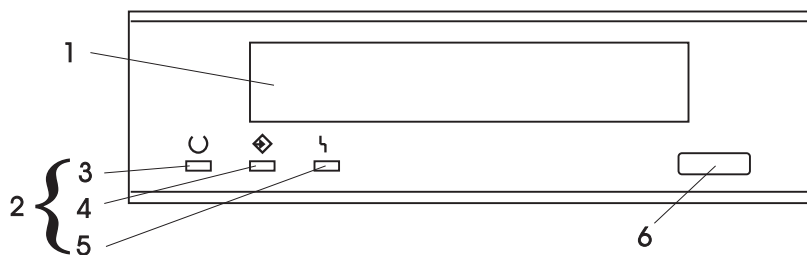
- Use of 12/24GB 4mm data cartridges.
- Data rate of 1.1MB/second.
- Capacity of 12GB.
- Compression capability, effectively doubles the native capacity of 12GB and the effective data rate. The actual capacity per cartridge varies depending on the application and the type of data cartridge being used. The default is compressed. Use 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 the drive is ready to accept tape motion commands.

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## Front View of the 12/24GB 4mm Internal Tape Drive



- 1 Tape Drive Door
- 2 Status lights
- 3 Ready (green)
- 4 Tape Motion (green)
- 5 Disturbance (amber)
- 6 Unload/Reset button

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## Chapter 2. Preparing to Install the 12/24GB 4mm Internal Tape Drive

This chapter covers all the things you need to do before you install your 12/24GB 4mm Internal Tape Drive. Preparing to install the tape drive involves the following tasks:

- Verifying your software requirements
- Making sure your package is complete
- Gathering tools and documentation
- Planning your SCSI device layout
- Determining your SCSI address.

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### Verifying Your Software Requirements

The 12/24GB 4mm Internal Tape Drive is supported on several operating systems, including AIX 4.1.5 (with APAR IX69941) or later, AIX 4.2 (with APAR IX69950) or later, or AIX 4.3 or later. Please ensure that your operating system supports this tape drive before you install it. To determine if your system is at the proper level of operating system, enter the following commands:

1. `oslevel` which returns the current level.
2. If it returns **4.1.5.x**, enter `instfix -ik "IX69941"`. If it returns the message: **There was no data for IX69941 in the fix database.**, you need to install APAR IX69941. Contact your customer representative for assistance.
3. If it returns **4.2.x.x**, enter `instfix -ik "IX69950"`. If it returns the message: **There was no data for IX69950 in the fix database.**, you need to install APAR IX69950. Contact your customer representative for assistance.

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## Checking Your Package

Check that your package contains the following items:

- \_\_\_ The 12/24GB 4mm Internal Tape Drive
- \_\_\_ A 16-bit to 8-bit SCSI internal interposer (on selected kits)
- \_\_\_ Media kit containing:
  - 1 data cartridge
  - 1 cleaning cartridge
  - 1 test tape
- \_\_\_ Specific hardware for attaching the tape drive to your specific system, as detailed on the parts listing that comes with your 12/24GB 4mm Internal Tape Drive.

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

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## Gathering Tools and Documentation

To install the 12/24GB 4mm Internal Tape Drive, you need the following items:

- \_\_\_ A flat-blade screwdriver
- \_\_\_ Your system unit documentation, including any service documentation
- \_\_\_ Your operating system documentation.

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## 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.

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## Determining Your SCSI Address

Before you install the 12/24GB 4mm Internal Tape Drive, you must set the SCSI address on the drive. First, you must 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 12/24GB 4mm Internal Tape Drive only supports addresses 6 through 0. You can use any available SCSI address as long as you make sure that 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 2-1 on page 2-4 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, perform the following steps:

- At the system prompt, type `lsdev -C | grep scsi` Then 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, perform the following steps:

- At the system prompt, type:  
`lsattr -El scsi0 | grep id`  
Where `scsi0` is the adapter to which the tape drive is attached. Then press enter. The SCSI id is displayed in the following format:  

id	7	Adapter card SCSI I	True
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To find an available SCSI address:

1. At a system prompt, type:

```
lsdev -Cs scsi
```

then press Enter. The following information displays:

Column 1: device name (for example, `scsi0`)  
Column 2: device status (for example, Available)  
Column 3: SCSI location code (the format is: nn-nn-nn-a,l)  
Column 4: device type (for example, CD-ROM drive, 12/24GB 4mm Internal Tape Drive, etc.)

The `a` in the `nn-nn-nn-a,l` string returned in Column 3 is the SCSI address of the device name displayed in Column 1.

- Find an available SCSI address for the tape drive and choose the highest-priority unused address for your 12/24GB 4mm Internal Tape Drive. On the following table, record the address you picked for your 12/24GB 4mm Internal Tape Drive and the names and addresses of any other installed SCSI devices. Save this information for future reference.

*Table 2-1. 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	



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## Chapter 3. Installing the 12/24GB 4mm Internal Tape Drive

This chapter takes you through the steps of installing your 12/24GB 4mm Internal Tape Drive, which involves the following tasks:

- Handling Recommendations
- Setting the SCSI address
- Installing the tape drive in your system unit
- Connecting the tape drive
- Configuring the tape drive
- Verifying installation.

**Note:** Refer to your system unit documentation for safety information before you install and connect your 12/24GB 4mm Internal Tape Drive.

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### Handling Recommendations

**Attention:** Be sure to read “Handling the 12/24GB 4mm Internal Tape Drive” on page vii before you remove the 12/24GB 4mm Internal Tape Drive from its anti-static bag or any time you handle it. For optimum performance, always follow the recommendations listed below:

- 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 acclimation for each 10 degrees C (18 degrees F) difference between the ship or storage temperature and the room temperature.

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### Setting the SCSI Address

The 12/24GB 4mm Internal Tape Drive is shipped with three factory-installed jumpers. After you choose an available SCSI address, you can install the jumpers on the tape drive to match the selected address. Refer to “Determining Your SCSI Address” on page 2-3 if you need instructions for selecting the SCSI address.

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.

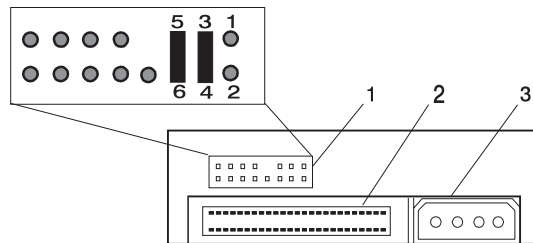
Refer to the figure on page 3-3 and to Table 3-1 on page 3-3 as you go through the following steps to set the SCSI address on your 12/24GB 4mm Internal Tape Drive:

**Attention**

Be sure to read the handling instructions in “Handling the 12/24GB 4mm Internal Tape Drive” on page vii before you begin.

- \_\_\_ 1. Remove the tape drive from its anti-static bag.
- \_\_\_ 2. Find pin positions **1-2**, **3-4**, and **5-6**, located on the jumper block on the back of the tape drive. These positions are always used to set the SCSI address on the 12/24GB 4mm Internal Tape Drive. The figure on page 3-3 shows the SCSI address set to 6.
- \_\_\_ 3. Refer to Table 3-1 on page 3-3 to determine in which positions you install the jumpers to correctly set the SCSI address you chose in step 2 on page 2-4.

## Jumper Pin Positions on the 12/24GB 4mm Internal Tape Drive



- 1 SCSI address block
- 2 50-pin SCSI connector
- 3 Power connector

**Note:** The 12/24GB 4mm Internal Tape Drive is shipped with 3 jumpers, each set to the “off” position (SCSI address 0).

SCSI Address	Jumpers 5-6	Jumpers 3-4	Jumpers 1-2
0	Off	Off	Off
1	Off	Off	On
2	Off	On	Off
3	Off	On	On
4	On	Off	Off
5	On	Off	On
6	On	On	Off
7	On	On	On

**Note:** SCSI Address 7 is normally reserved for the SCSI adapter.

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## Installing and Connecting the Tape Drive

After you set the SCSI address on your drive, you can install it 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 12/24GB 4mm Internal Tape Drive:

- \_\_\_ 1. Remove the covers to your system unit following the instructions provided in your system unit documentation.
- \_\_\_ 2. Install the tape drive following the instructions provided in your system unit documentation for installing devices.
- \_\_\_ 3. If the cable to attach the tape drive has a 68-pin connector, connect the 16-bit to 8-bit SCSI internal interposer (provided in your package) to the tape drive.
- \_\_\_ 4. Attach the appropriate narrow or wide (50-pin or 68-pin) cable connector to the tape drive.
- \_\_\_ 5. Attach the 5/12V power plug to the drive.
- \_\_\_ 6. Ensure there is a SCSI terminator on the end of the cable or that a terminator is supplied by the last SCSI device on the internal chain.
- \_\_\_ 7. After the tape drive is installed, reinstall your system unit covers. Follow the instructions provided in your system unit documentation.

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## Configuring the 12/24GB 4mm Internal Tape Drive

To configure the tape drive after installation, boot your system unit. Device drivers are provided in AIX and other operating systems that support the 12/24GB 4mm Internal Tape Drive. Your operating system should recognize the drive and should automatically update your system unit configuration.

---

## Verifying the Installation

See the instructions provided in your operating system documentation for verifying the successful installation of the 12/24GB 4mm Internal Tape Drive. To verify the installation on an AIX system, type:

```
lsdev -Cs scsi
```

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

---

## Chapter 4. Using the 12/24GB 4mm Internal Tape Drive

This chapter provides information about operating, using and maintaining your 12/24GB 4mm Internal Tape Drive.

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### Operating Recommendations

**Attention:** For optimum performance, always follow the recommendations listed below:

- Use only high-quality data grade 12/24GB 4mm tape cartridges recommended by the manufacturer (see “Obtaining Additional Tape Cartridges” on page 4-11).
  - Tape cartridges that do not carry the proper DDS symbol cannot be written to, and their use will cause the 12/24GB 4mm Internal Tape Drive to report an error.
- Remove the tape cartridge from the tape drive when it is not in use, and store the cartridge in the cartridge case.
- Do not open the door on the data tape cartridge. This door covers and protects the magnetic tape material from dirt, dust, and damage.
- Avoid touching the tape, as doing so can cause loss of data.
- Back up any tape cartridge that repeatedly produces error messages, then discard the old tape cartridge. Error information is saved in the system error log.
- Clean the tape path regularly according to the cleaning procedure described in “Cleaning the Tape Path on the 12/24GB 4mm Internal Tape Drive” on page 4-9. Use only recommended cleaning cartridges. Other cleaning cartridges can permanently damage the tape drive.

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## 12/24GB 4mm Tape Cartridge Types

There are different types of 12/24GB 4mm tape cartridges that you can use for the following purposes:

Type	Purpose
Test Tape Cartridge:	Checks the operation of the drive or to run diagnostics. Do not use it to save programs or data. This cartridge, which is specially labeled, is included with the 12/24GB 4mm Internal Tape Drive.
Data Tape Cartridge:	Saves your programs or data. This cartridge is included with the 12/24GB 4mm Internal Tape Drive.
Cleaning Tape Cartridge:	Cleans the 12/24GB 4mm Internal Tape Drive. See "Cleaning the Tape Path on the 12/24GB 4mm Internal Tape Drive" on page 4-9. This cartridge is included with the 12/24GB 4mm Internal Tape Drive.

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## Tape Cartridge Compatibility

The 12/24GB 4mm Internal Tape Drive is compatible with existing 12/24GB 4mm tape subsystems that are designed to operate with Digital Data Storage approved media (DDS-1, DDS|||, DDS-2, or DDS-3), which meet the following European Computer Manufacturers Association (ECMA) standards:

- ECMA-139 "3.81 Wide Magnetic Tape Cartridge for Information Interchange" – Helical Scan Recording – DDS Format.
- ECMA-139 "3.81 Wide Magnetic Tape Cartridge for Information Interchange" – Helical Scan Recording – DDS-2 Format.
- ECMA-139 "3.81 Wide Magnetic Tape Cartridge for Information Interchange" – Helical Scan Recording – DDS-3 Format.

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## 4mm Tape Write Density Setting

When reading a tape, the drive automatically determines which format is written on the tape.

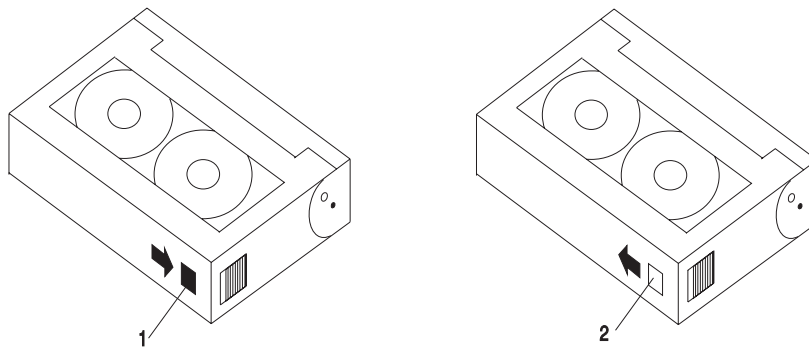
When writing to a tape, it is necessary to change the density setting of the tape drive in SMIT to correspond to the type of media installed. Refer to the following table for information about the specific density setting:

Density Settings for 4mm Media		
Media Type	Device Compatability	SMIT Density Setting
DDS1	Read Only	N/A
DDS	Read / Write (2.0GB Mode Only)	19
DDS2	Read / Write (4.0GB Mode Only)	36
DDS3	Read / Write (12.0GB Mode Only)	37

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## Setting the Write-Protect Tab on 12/24GB 4mm Tape Cartridges

It is necessary to set the write-protect tab on a tape cartridge so that you do not accidentally lose information. The write-protect tab on the tape cartridge controls write-protection. When the write-protect tab on a tape cartridge is closed, information can be read from the tape and written to it. When the write-protect tab on a tape cartridge is open, information can be read from the tape, but not written to it.



- 1 Write-protect tab closed: Write enabled
- 2 Write-protect tab open: Write disabled

## Erasing 12/24GB 4mm Data Cartridge

Most bulk eraser devices cannot erase 12/24GB 4mm data cartridges. In order to properly erase an 12/24GB 4mm data cartridge with a bulk eraser device, the erasure rating must be at least 3900 oersted.

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## Environmental Considerations for 12/24GB 4mm Data Cartridges

This section describes operating and storage conditions including temperature, relative humidity, and maximum wet bulb data.

**Attention:** The manufacturer specifies a set of temperature and humidity ranges in which the 12/24GB 4mm data cartridge can operate with ease. Only regular cleaning procedures are required when operating the cartridge within this range. The risk of possible data loss is increased if 12/24GB 4mm tape cartridges are operated, stored, or shipped outside the temperature or humidity ranges shown in Table 4-1 on page 4-5.



Condition	Operating Ranges	Storage	Shipping
Temperature	60°F-90°F (16°C-32°C)	41°F-90°F (5°C-32°C)	-40°F-126°F (-40°C-52°C)
Relative Humidity (non-condensing)	20%-80%	20%-80%	20%-80%
Maximum Wet Bulb	79°F (26°C)	79°F (26°C)	79°F (26°C)

Always let a cartridge acclimate to the operating environment before you use it. Acclimation is necessary for any data cartridge that has been exposed to a different humidity environment or to a temperature change of 11°C (20°F) or more. Place the cartridge, with its container, in the operating environment for as long as it has been away from the operating environment or for 24 hours, whichever is less.

### Operating the 12/24GB 4mm Internal Tape Drive in Harsh Environments

The 12/24GB 4mm Internal Tape Drive is ideally suited to streaming operations rather than tape movement operations involving multiple stops and starts and random searches. You should use streaming movement whenever possible.

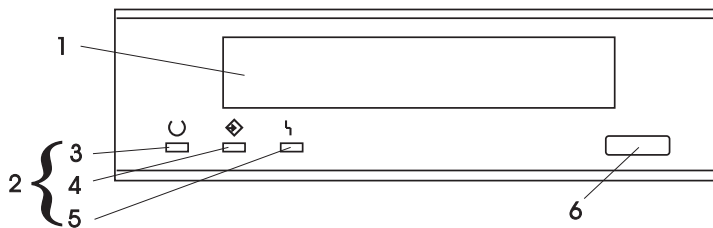
Do not use for archiving any tape that was previously used outside the ranges specified in Table 4-1 for an extended period of time. Exposure to the new environment deteriorates the magnetic and physical strength of the tape. Do not store important data on a tape that was used outside the specified ranges. For reliable archiving, transfer the data to a new tape.

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## Status Lights

The 12/24GB 4mm Internal Tape Drive has two green status lights and one amber status light. The on and off combinations of the status lights indicate the conditions of the 12/24GB 4mm Internal Tape Drive.

Each of the International Organization for Standards (ISO) symbols located above a status light indicates a specific condition of the tape drive as follows:



- 1 Tape Drive Door
- 2 Status lights
- 3 Ready (green)
- 4 Tape Motion (green)
- 5 Disturbance (amber)
- 6 Unload/Reset button

---

## Status Light States

The following tables explain the meaning of the green and amber status lights.

	Ready (green)	Tape Motion (green)	Disturbance (amber)
Off	No cartridge installed or error condition	No cartridge or no activity	No error condition
Steady	Cartridge installed or loading/unloading		Cleaning required or worn media
Flashing	Power-on self- test in progress	Cartridge activity	Error condition

<b>Status Lights on the 12/24GB 4mm Internal Tape Drive</b>			
<b>Status</b>	<b>Ready (green)</b>	<b>Tape Motion (green)</b>	<b>Disturbance (amber)</b>
LED test.	On 2 seconds at power on	On 2 seconds at power on	On 2 seconds at power on
The power-on self-test (POST) is running or the diagnostic cartridge is running.	Flashing	Off	Off
One of the following has occurred: <ul style="list-style-type: none"> <li>The power is off.</li> <li>The POST has completed successfully, but no tape cartridge has been loaded.</li> </ul> (See note 2 below.)	Off	Off	Off/On
A tape cartridge has been inserted and the 12/24GB 4mm Internal Tape Drive is ready to receive commands from the system. (See note 2 below.)	On	Off	Off/On
The tape is in motion and the 12/24GB 4mm Internal Tape Drive is running a device operation or cleaning. (See note 2 below.)	On	Flashing	Off/On
The 12/24GB 4mm Internal Tape Drive has detected an internal error that requires corrective action such as tape cartridge failure, high humidity. (See note 1 below.)	Off	Off	Flashing
The tape path requires cleaning, or a poor quality tape cartridge is being used. See "Cleaning the Tape Path on the 12/24GB 4mm Internal Tape Drive" on page 4-9.	Off or On	Off or Flashing	On

**Notes:**

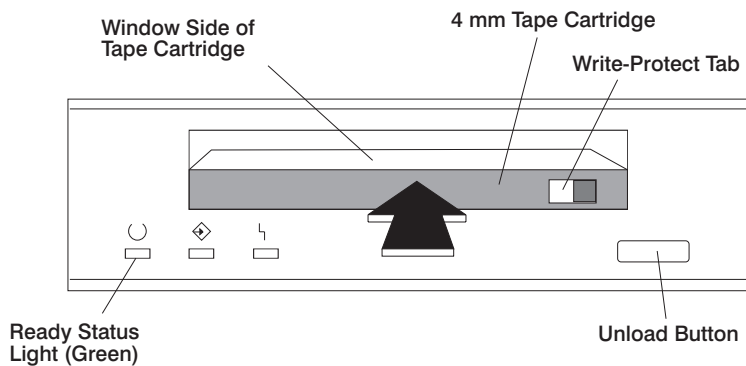
1. If a fault or an error condition occurs, press the unload button for approximately 15 seconds to reset the drive. If the disturbance light still flashes after the reset, contact your service representative for assistance.
2. If the disturbance light is on, cleaning is required. See "Cleaning the Tape Path on the 12/24GB 4mm Internal Tape Drive" on page 4-9.

## Loading the 12/24GB 4mm Tape Cartridge

Before loading the tape cartridge, make sure the power is on and the write-protect tab on the tape cartridge is properly set. Refer to “Setting the Write-Protect Tab on 12/24GB 4mm Tape Cartridges” on page 4-4. The tape drive loads the tape from the cartridge and prepares it for reading and writing.

To load the 12/24GB 4mm tape cartridge, do the following:

1. Grasp the edges of the 12/24GB 4mm tape cartridge with the write-protect tab towards you and the window side of the cartridge facing up.
2. Slide the tape cartridge into the opening on the front of the 12/24GB 4mm tape drive until the loading mechanism pulls the cartridge into the drive and the drive door closes. The ready status light (green) goes on if the load operation was successful.



The 12/24GB 4mm Internal Tape Drive is ready for data operations when the tape cartridge is inserted. After the cartridge is inserted into the tape drive, the tape takes about 15 seconds to load.

## Unloading the 12/24GB 4mm Tape Cartridge

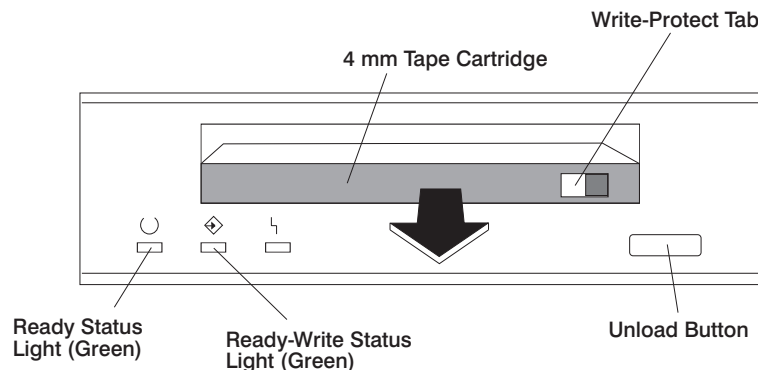
Before performing the unload operation, make sure the power to the system unit is on.

To unload and eject the tape cartridge, press the unload button. The 12/24GB 4mm Internal Tape Drive rewinds the tape and then ejects the tape cartridge from the tape drive.

After you press the unload button, the following occurs:

1. The Ready status light turns off.

2. The Tape Motion status light flashes during the unload operation.
3. The Tape Motion status light turns off when the cartridge is ejected from the tape drive.



The time required for a tape to rewind and unload is between 10 seconds and 1.5 minutes, depending on the position of the tape when the unload button is pushed.

If a fault or an error condition occurs and you cannot eject the tape, press the unload button for approximately 8 seconds to reset the drive.

If the tape cartridge cannot unload and has to be removed manually from the drive, contact your service representative.

### **Cleaning the Tape Path on the 12/24GB 4mm Internal Tape Drive**

The 12/24GB 4mm tape path should be cleaned either approximately every 30 hours of tape motion or once a month, whichever occurs first. The 12/24GB 4mm tape drive monitors the recording quality of the tape cartridge and indicates that the tape path requires cleaning when the disturbance status light (amber) is on.

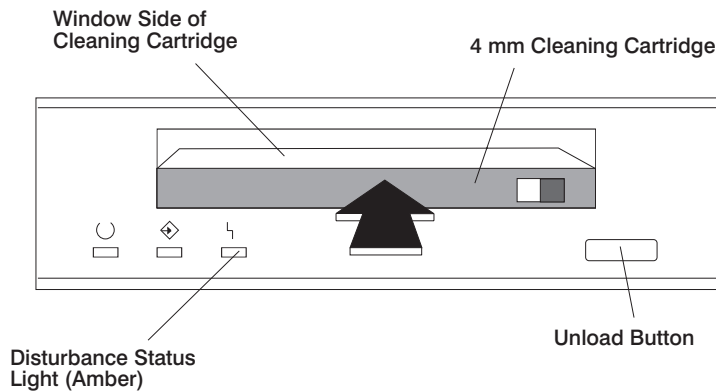
More frequent cleaning may be required if the drive is operated in a dusty environment or in humid conditions. If the dust is allowed to accumulate, the drive has to perform more reads and writes. This can cause data loss, and may be prevented by regularly scheduled cleaning of the drive. The amber Disturbance status light also comes on automatically after 30 hours of tape motion without cleaning.

If you attempt to use a 12/24GB 4mm cleaning cartridge beyond 20 cleanings, the tape drive automatically detects an error and ejects the cleaning cartridge with the disturbance status light (amber) remaining on.

Before loading the cleaning cartridge, make sure the power to the system unit is on.

To load the 12/24GB 4mm cleaning cartridge, do the following:

1. Grasp the edges of the 12/24GB 4mm cleaning cartridge with the window side of the cartridge facing up.
2. Slide the cleaning cartridge into the opening on the front of the 12/24GB 4mm tape drive until the loading mechanism pulls the cartridge into the drive.



After the 12/24GB 4mm cleaning cartridge has been fully inserted into the 12/24GB 4mm Internal Tape Drive, the following cleaning operations are performed automatically:

1. The cleaning tape is loaded into the tape path.  
The cleaning cycle lasts approximately 30 seconds.
2. The tape is unloaded and the cleaning cartridge is ejected from the tape drive when the cleaning operation is complete.
3. A successful cleaning operation is indicated when the disturbance status light (amber) goes off (if it was activated before the cleaning operation).

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## Obtaining Additional Tape Cartridges

The following table lists the tape cartridges that you can order for the 12/24GB 4mm Internal Tape Drive. Contact your customer service representative or the place of purchase to obtain the recommended tape cartridges.

Tape Cartridges for the 12GB 12/24GB 4mm Tape Drive		
Part Number	Type of Cartridge	Length
59H3465	12GB 12/24GB 4mm Data Cartridge	160 m (525 ft)
59H3466	12/24GB 4mm Test Cartridge	11.5 m (37.7 ft)
59H3090	12/24GB 4mm Cleaning Cartridge	N/A





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## 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.

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### Federal Communications Commission (FCC) Statement

**Note:** The 4mm Tape Drive has 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



Tested to Comply  
With FCC Standards

FOR HOME OR OFFICE USE

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### **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.

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### **International Electrotechnical Commission (IEC) Statement**

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

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### **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.

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## **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.

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## **Canadian Department of Communications Compliance Statement**

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

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## **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）の基準に基づきクラス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.

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## **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.

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## Reader's Comments — We'd Like to Hear From You

12/24GB 4mm Internal Tape Drive Installation and User's Guide

Order Number: 07L8797

Overall how satisfied are you with the information in this book?

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Easy to find	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Please tell us how we can improve this book:

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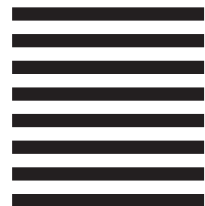
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