

7208 Model 345 External 8mm Tape
Drive



7208 Model 345 8mm Tape Drive Setup and Operator Guide

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Note!

Before using this information and the product it supports, be sure to read the general information under “Notices” on page v.

First Edition (October, 2000)

This edition, SA26-2008-00, applies to Model 345 of the 7208 8mm Tape Drive and to all subsequent releases and modifications until otherwise indicated in new editions. This edition applies only to the specified model of the device.

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Use the following danger notices throughout this book.

DANGER

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DANGER

To prevent a possible electrical shock when adding or removing any devices to or from the system, ensure that the power cords for those devices are unplugged before the signal cables are connected or disconnected. If possible, disconnect all power cords from the existing system before you add or remove a device. (RSFTD203)

DANGER

To prevent a possible electrical shock when installing the device, ensure that the power cord for that device is unplugged before installing signal cables. (RSFTD204)

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Telephone: 1-919-543-2193

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About This Guide

This guide describes how to install and use the 7208 Model 345 8mm Tape Drive. It contains the following chapters:

Chapter 1, "General Information," describes the 7208 Tape Drive, gives the system requirement, and lists hardware specifications.

Chapter 2, "Setting Up the 7208 Tape Drive," tells how to install the autoloader.

Chapter 3, "Using the 7208 Tape Drive," describes the operator controls, indicator lights, and light-emitting diode (LED) display on the autoloader. It also tells how to load and unload a tape cartridge and a magazine.

Chapter 4, "Cleaning the 7208 Tape Drive," tells how to clean the 7208 Tape Drive and its drive. It also describes how to clean the fan filter.

Chapter 5, "Removing the 7208 Tape Drive," tells how to remove the autoloader after it has been installed.

Chapter 6, "Using the Media," describes the media to use in the 7208 Tape Drive.

Appendix A, "Power Cables," provides power cable information for different countries.

Appendix B, "Fault Symptom Codes and Error Recovery Procedure Numbers," describes error codes and provides a numbering code for determining error recovery procedures.

Appendix C, "Error Recovery Procedures," error recovery information for reported LCD errors.

Store this guide with your system manuals.

Related Publications

- *7208 Model 345 8mm Tape Drive Service Guide, SY32-0411*, provides service and maintenance information for the 7208 Model 345 Tape Drive.
- *IBM Externally Attached Devices Safety Information, SA26-2004*, provides translations of danger notices.

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- The publication number of the book.
- The page number or topic to which your comment applies.

Chapter 1. General Information

The 7208 Model 345 8mm Tape Drive is an external storage device that connects to a host system and stores additional data.

The 7208 Tape Drive:

- Saves and restores system data files
- Archives important records
- Distributes upgrades to operating system software

The 7208 Model 345 Tape Drive uses a low voltage differential (LVD) interface and meets the Small Computer Systems Interface-2 (SCSI-2) standard X3.131-1994 of the American National Standards Institute (ANSI).

Figure 1 shows the front view of the 7208 Tape Drive.

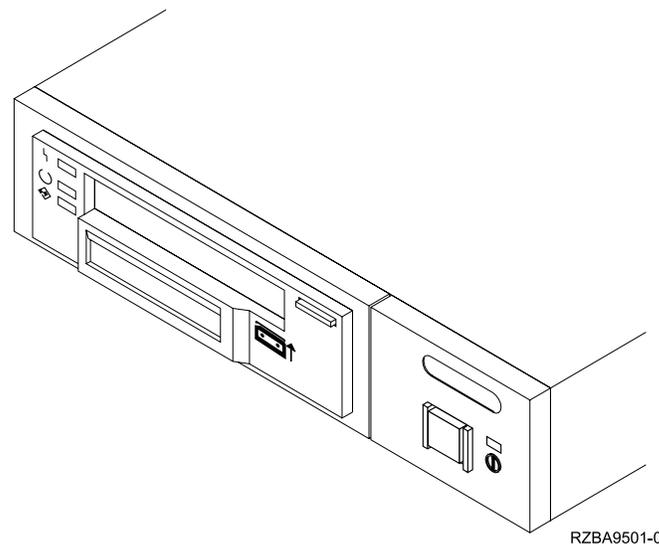


Figure 1. Front View of the 7208 Model 345 Tape Drive

The 7208 Tape Drive features the following:

- Native tape cartridge capacity of up to 60GB per cartridge (where GB equals 1 000 000 000 bytes).
- Native data transfer rate of 12MB per second (where MB equals 1 000 000 bytes).
- Data compression hardware that increases tape cartridge capacity up to 150GB (assuming a 2.5:1 compression ratio) and transfer rate up to 30MB per second. (This feature is controlled by the system software and does not require special handling by the 7208 Tape Drive operator.)

Note: The actual capacity per cartridge varies, depending on the application and the type of data cartridge being used.

- A liquid crystal display (LCD) that provides operating and error messages.

System Requirement

The 7208 Tape Drive must be attached to a supported RS/6000 processor and adapter with an AIX operating system at level:

- 4.1.5 (when installed with authorized program analysis report (APAR) #IX69941)
- 4.2 (when installed with APAR #IX69950) or higher
- 4.3 or higher

For a list of supported processors, contact your IBM marketing representative or business partner.

Specifications

Table 1. Specifications for the 7208 Model 345 Tape Drive

Physical Specifications		
Width	250 mm (9.8 in.)	
Depth	275 mm (10.8 in.)	
Height	55 mm (2.2 in.)	
Weight	3.2 kg (7.1 lb)	
Power Specifications		
kVA	0.023 @ 120 V ac	
V ac	100 to 125, or 200 to 240	
Hertz	50 to 60	
Btu Maximum (watts)	41.6 Btu/hr (12.2 watts) @ 240 V ac	
Power Factor	0.4 to 0.6	
Other Specifications		
Altitude	2135 m (7000 ft)	
Recommended Environment		
Environmental Factor	Operating	Non-operating
Temperature	16 to 32°C	1 to 60°C
	(60 to 90°F)	(34 to 140°F)
Relative Humidity (noncondensing)	20 to 80%	20 to 95%
Maximum Wet Bulb	23°C	27°C
	(73°F)	(81°F)
Note: The operating limits include media. The storage and shipping limits do not include media. For media storage and shipping limits, see "Storage and Shipping Environments" on page 25.		

Tape Drive Environment and Use

IBM's goal is to provide you with a product that you can configure and use reliably. 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 IBM tape drive.

Media Grades

IBM uses two different grades of media. IBM supplies Program Transmittal Fixes (PTFs) on a tape that is designed to be written to only once and read from a few times. This tape is not designed to be used as a backup medium.

IBM also sells media designed to be used for storage. IBM supports the tape that it sells. If IBM service personnel analysis indicates a problem with non-IBM media it may be necessary for the customer to replace the 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 in 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. IBM 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 may 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.

IBM only supports the use of IBM cleaning cartridges for IBM tape drives.

SCSI Hardware Issues

SCSI bus cables and terminators may affect tape drive performance. IBM cables and terminators are designed specifically to keep the SCSI bus as free of noise as possible. Use of non-IBM cables or terminators may adversely affect the SCSI bus performance. If IBM service personnel analysis indicates a problem with non-IBM cables, it may be necessary for the customer to replace them with the appropriate IBM cables.

Microcode Updates

IBM constantly works to provide the best possible tape drive products. To make certain that the drives work their very best, IBM occasionally releases changed microcode for the tape drives. When a microcode change is developed, IBM makes it available to you through the service organization or by electronic delivery.

Microcode changes are available from the following IBM Web sites:

<http://www.rs6000.ibm.com/support/micro>

Microcode can be installed by your IBM authorized service personnel or your system administrator.

Summary

Your tape drive must be installed in the cleanest possible environment. Additionally, IBM tape drives require 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 IBM warranty or service agreement.

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

Chapter 2. Setting Up the 7208 Tape Drive

This chapter provides step-by-step instructions on how to properly install the 7208 Model 345 Tape Drive.

Note: If you need assistance with the installation, contact your trained service personnel. Since this product was designed for customer setup, contacting service for on-site assistance may be a chargeable call.

DANGER

To prevent a possible electrical shock when adding or removing any devices to or from the system, ensure that the power cords for those devices are unplugged before the signal cables are connected or disconnected. If possible, disconnect all power cords from the existing system before you add or remove a device. (RSFTD203)

Before installing the 7208 Tape Drive, let it acclimate to the operating environment for as long as it has been away from the environment or for 24 hours, whichever is less.

Attention: The 7208 Tape Drive is a precision device that requires reasonable care in handling to prevent data loss or permanent damage to the device. Avoid bumping or dropping the 7208 Tape Drive.

To unpack the 7208 Tape Drive, simply remove the packing material from the box it was shipped in.

Performing the Installation

To install the 7208 Model 345 Tape Drive, complete the following steps.

Step 1. Using the Inventory Checklist

Make sure that you received the following items:

- Power cable (for the appropriate cable, see “Appendix A. Power Cables” on page 29)
- The *External Devices Warranty Information* (U.S., Canada, and Puerto Rico only)
- The *7208 Model 345 8mm Tape Drive Setup and Operator Guide* (this guide)
- The *7208 Model 345 8mm Tape Drive Service Guide* (required for your trained service personnel)
- The *IBM Externally Attached Devices Safety Information* manual
- System-to-device SCSI bus (signal) cable
- Terminator
- Data cartridge
- Test cartridge
- Cleaning cartridge

Step 2. Checking the Electrical Outlets

Make sure that the electrical outlets you use are properly grounded.

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the products that attach to the system. It is the customer's responsibility to ensure that the outlet is correctly wired and grounded to prevent an electrical shock. (RSFTD201)

Step 3. Assembling the Materials

Refer to your system management or system hardware manuals to locate the information that you need to install the 7208 Tape Drive.

1. **Get your system unit manuals now.** You may find the needed information under the topics:
 - Installing an external SCSI tape drive
 - SCSI controllers
 - External SCSI devices
2. **Do not continue** until you have located the manual that describes how to determine where the SCSI controller is located (where you make the cable connection).

Record the controller location here

4310002

Step 4. Determining the SCSI Address

The SCSI address identifies the device to the bus and the system. Care must be taken not to set two devices to the same SCSI address as this will cause errors that are often not easy to detect. The address selected sets the priority of the device on the bus. Tape drives are normally slow devices compared to harddisks and the tape drives should be set to a high priority to insure the tape drive gets access to the bus in a timely manner.

The RS/6000 system has 16 SCSI address settings available. The SCSI bus priority on an RS/6000 system is as follows:

Highest 7 6 5 4 3 2 1 0 15 14 13 12 11 10 9 8 Lowest

Before you install the 7208 Model 345 Tape Drive, you must make sure that its SCSI address is not an address being used by another device. The 7208 Tape Drive, like the RS/6000 computer, is a Wide (16 bit) SCSI device and uses SCSI addresses from 0 through 15 (usually address 7 is reserved for the SCSI I/O controller). Narrow (8 bit) SCSI devices use SCSI addresses 0 through 7 with address 7 usually reserved for the SCSI I/O controller.

Note: If you connect a wide SCSI device to a narrow SCSI device, you are restricted to using only addresses 0 through 7 on both devices.

High Availability (HA) systems often use 5 and 6 as the SCSI adapter address. Some systems restrict the SCSI address, refer to your system manuals to determine any system restrictions.

To determine an unused SCSI address, you must:

- Identify the name and the port of the RS/6000 SCSI I/O controller that you want to attach to
- Identify the SCSI address of that SCSI I/O controller
- Identify the SCSI addresses of other devices connected to that SCSI I/O controller

- ___ 1. To identify the name and the port of an RS/6000 SCSI I/O controller that you want to attach to, at the system prompt type

```
lsdev -C | grep scsi | pg
```

and press Enter.

A list of controllers display in the following format. The names appear in the first column (for example, `scsi0` and `scsi2`). The ports appear in the second column and in the fourth position (highlighted as follows):

```
scsi0    Available 00-00-0S      Standard SCSI I/O Controller
scsi2    Available 00-02      SCSI I/O Controller
```

Note the name and port of the SCSI I/O controller that you want to attach to (for example, the `scsi2` controller on port 2).

- ___ 2. To determine the SCSI address of the SCSI I/O controller that you noted in the previous step, type

```
lsattr -El scsix | grep id
```

(where `x` equals the last character in the name of the SCSI I/O controller) and press Enter. The address of the SCSI I/O controller displays in the following format:

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

Note the address of the SCSI I/O controller (in this case, 7).

- ___ 3. To identify the SCSI addresses used by all other devices, type

```
lsdev -Cs scsi
```

and press Enter. A list of devices appears 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. (The list may contain multiple instances of a port. In the following example, for port 2 (identified in step 1) there are three instances.) The addresses of the other SCSI devices appear in the seventh position (highlighted in the example.)

For the port chosen in step 1, note the addresses of the other SCSI devices attached to the RS/6000 (in this case, for port 2, the addresses are 2, 3, and 4).

- ___ 4. Determine an unused SCSI address for the 7208 Tape Drive (in this case, 1, 5, 6, or 8 through 15, because 7 was used by the SCSI I/O controller and 2, 3, and 4 are used by other devices).

Step 5. Setting the SCSI Address

The SCSI address is a unique address that identifies the 7208 Tape Drive to your RS/6000 system unit. Use the SCSI address switch to set the SCSI address of the 7208 Tape Drive. The switch (**1** in Figure 2) is located on the rear of the tape drive. Figure 2 also shows the SCSI bus cable connectors **2**, the cooling fan **3**, and the power cable connector **4**.

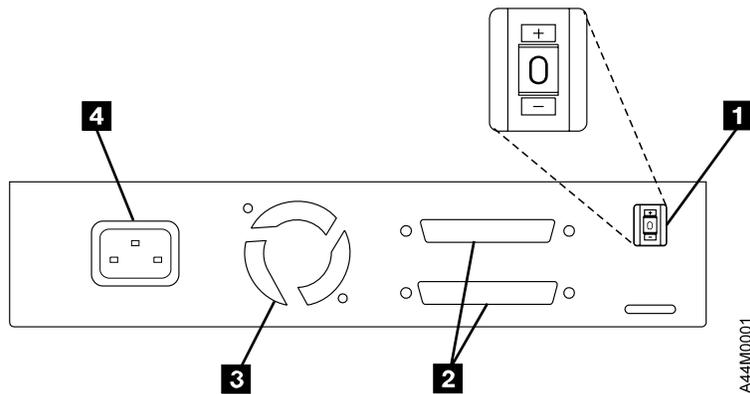


Figure 2. Rear View of the 7208 Tape Drive

Make sure that the SCSI address switch is set to the address determined in “Step 4. Determining the SCSI Address” on page 6. To set the switch, press the + or — push-button.

Step 6. Placing the 7208 Tape Drive

The 7208 Tape Drive can be located anywhere that is convenient to your system unit. The only restrictions are the length of the power cord and the SCSI cable. Recommended locations are:

- In a clean environment
- Away from the floor
- In a horizontal position
- Where the tape cartridge can be easily inserted
- Where the liquid crystal display (LCD) can be easily viewed (for more information about the LCD, see “Liquid Crystal Display” on page 14)
- Where the air flow around the unit is not obstructed

To place the 7208 Tape Drive, do the following:

1. Set the 7208 Tape Drive in the location that you have previously determined.
2. Connect the power cable to the 7208 Tape Drive. **(Do not plug it into the electrical outlet at this time.)**

Some of the external devices that attach to the system unit can be stacked. The 7208 Tape Drive should be placed at the top of the stack.

Step 7. Performing a System Shutdown

Attention: Do not attach the 7208 Tape Drive to a host system unit that is powered on. This can damage the 7208 Tape Drive, the system unit, or both.

To perform a system shutdown of the RS/6000, do the following:

Note: Before doing a controlled shutdown of the system unit, notify other users who may be using the system.

1. If it is on, do a controlled fast shutdown of the system unit as follows:

To do a fast shutdown, type

```
shutdown -F
```

from the console. (You must have root authority to do the shutdown; see your system administrator.) Depending on the host system configuration, the shutdown may take several minutes.

2. When the message

```
Halt Completed
```

displays on the system console, turn off the power to the system unit.

3. Turn off the power to all external devices connected to the system unit.

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the products that attach to the system. It is the customer's responsibility to ensure that the outlet is correctly wired and grounded to prevent an electrical shock. (RSFTD201)

4. Unplug the power cables to all external devices from their electrical outlets.
5. Unplug the system unit power cable from the electrical outlet.

Step 8. Connecting the SCSI Bus Cable

To connect the SCSI bus cable, do the following:

1. If installed, remove the connector covers.
2. On the rear of the 7208 Tape Drive (**1** in Figure 3), attach the device connector end of the SCSI bus cable **2** to one of the SCSI connectors **3**.
3. Push in until the cable is seated.
4. Tighten the two thumbscrews **4** finger tight.

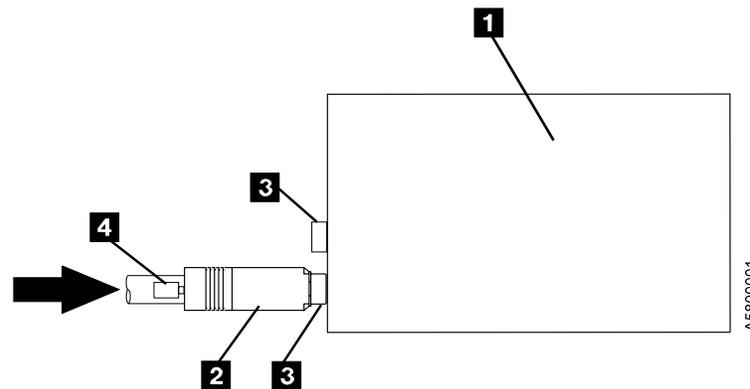


Figure 3. Connecting the SCSI Bus Cable to the 7208 Tape Drive. The view is from the side.

5. Connect the other end of the SCSI bus cable to one of the SCSI controllers on the host system (**4** in Figure 6 on page 11).

Note: Make a note of the number of the host system SCSI controller to which you attach the SCSI bus cable; this information will be used later in “Step 11. Performing the Checkout Procedure.”

The following figures illustrate multiple attachment configuration examples:

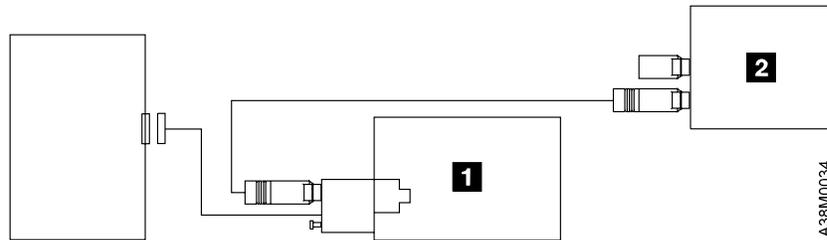


Figure 4. Example of Attaching Multiple Devices, with the Single Connector Device as the First Device in the Sequence of External Devices

Note: The SCSI bus should be configured as narrow if it is possible to change.

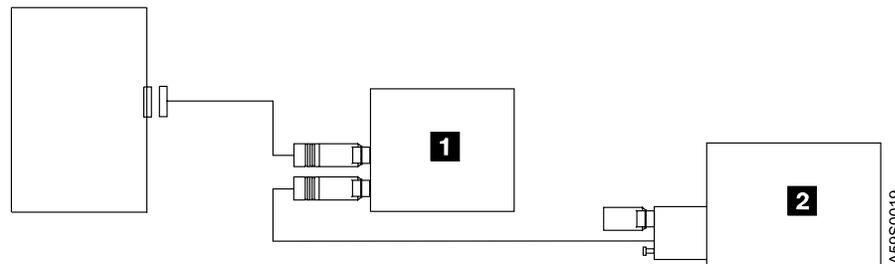


Figure 5. Example of Attaching Multiple Devices, with the Dual-Connector Device as the First Device in the Sequence of External Devices

Step 9. Installing the SCSI Bus Terminator

Make sure to install a SCSI bus terminator on the 7208 Tape Drive.

DANGER

To prevent a possible electrical shock when installing the device, ensure that the power cord for that device is unplugged before installing signal cables. (RSFTD204)

To install the terminator (**1** in Figure 6 on page 11), align it with the unused SCSI connector (in this case, **2** on the 7208 Tape Drive **3**) and push in until the terminator is seated. Tighten the thumbscrews finger tight.



Figure 6. Attaching a Terminator to the 7208 Tape Drive. The view is from the side. The thumbscrews are not shown.

Note: The terminator and the SCSI bus cable can be connected to either the top or bottom SCSI connector on the 7208 Tape Drive.

Step 10. Connecting the Power Cables

To connect the power cables, do the following:

1. Plug the 7208 Tape Drive power cable into the tape drive and into an electrical outlet.

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the products that attach to the system. It is the customer's responsibility to ensure that the outlet is correctly wired and grounded to prevent an electrical shock. (RSFTD201)

2. Plug the power cables for all external devices into electrical outlets.
3. Plug the power cable for the system unit into an electrical outlet.
4. Turn on the power to all of the external devices other than the 7208 Tape Drive.
5. Review the information in "Indicator Lights" on page 14 and "Liquid Crystal Display" on page 14. Then watch for the following while turning on the power to the 7208 Tape Drive:
 - The power-on light comes on and stays on.
 - All three status lights come on, then turn off after approximately 35 seconds (indicating that the Power-On Self Test (POST) has completed successfully).
 - A series of messages display on the LCD, ending with the message READY-NOTAPE. (If you change the display language while powering on, the READY-NOTAPE message and all subsequent messages appear in the chosen language. For more information, see "Changing the Display Language" on page 16.)

Note: If the POST does not complete successfully, the 7208 Tape Drive has detected an internal fault and the problem should be investigated. Contact your service representative. **Do not continue with the installation at this time.**

6. Turn on the power to the system unit.

Step 11. Performing the Checkout Procedure

To perform the 7208 Tape Drive checkout procedure verify that the 7208 Tape Drive has been configured to the RS/6000 operating system by doing the following:

1. If not already logged on, log into the RS/6000 (AIX operating system).

Note: You must have root authority to install or remove the 7208 Tape Drive from the system. To obtain root authority, see your system administrator.

2. At the system prompt, type

```
lsdev -Cs scsi | pg
```

and press Enter. The command lists all of the SCSI devices that are connected to the RS/6000. Figure 7 shows an example of the screen that displays. The screen lists:

- 1 Device name
- 2 Device status
- 3 SCSI adapter slot number (the 4th digit)
- 4 Description of the SCSI device
- 5 SCSI address (begins with 7th digit)

1	2	3	4
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
rmt1	Available	00-02-01-5,0	SCSI 4mm Tape Drive

A5900002

Figure 7. Screen Display of SCSI Devices Attached to the RS/6000

3. From the list of SCSI devices, identify the 7208 Tape Drive (listed as the SCSI 8mm Tape Drive):
 - If the status of the 7208 Tape Drive is displayed as *Available*, the device has successfully been configured.
 - If the status is not displayed as *Available*, refer to Chapter 3, “Maintenance Analysis Procedures,” in the *7208 Model 345 8mm Tape Drive Service Guide*. For more information about configuring the 7208 Tape Drive to the system software, refer to your AIX or RS/6000 manuals.
4. This completes the 7208 Tape Drive installation.
5. Run the system diagnostics using the test tape cartridge to ensure the device is working properly.

This completes the 7208 Tape Drive installation.

Chapter 3. Using the 7208 Tape Drive

This chapter describes the operator controls and indicator lights on the 7208 Tape Drive. It also describes the liquid crystal display, gives instructions for loading and unloading a tape cartridge, and tells how to clean the tape drive.

Figure 8 shows a front view of the 7208 Tape Drive.

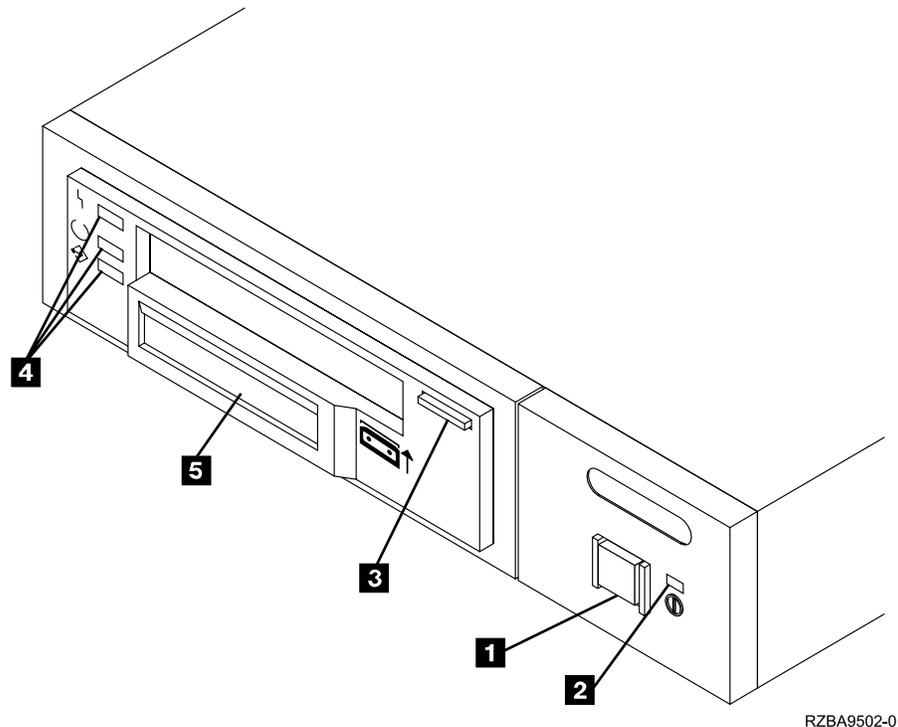


Figure 8. Front View of the 7208 Model 345 Tape Drive

Operator Controls

The 7208 Tape Drive has the following operator controls.

Power Switch

The power switch (**1** in Figure 8) is a push button switch that enables the power to be turned on or off. When the 7208 Tape Drive is on, the power-on light **2** is on.

Note: The $\text{\textcircled{I}}$ symbol beside the power switch is an International Organization for Standardization (ISO) symbol for a push button switch.

Unload Button

The unload button **3** enables a tape cartridge to be ejected. The unload button operates only when the 7208 Tape Drive power is on. To remove a tape cartridge, press and hold the unload button for about one second.

Indicator Lights

The 7208 Model 345 Tape Drive has the following indicator lights.

Power-On Light

When the 7208 Tape Drive is turned on, the power-on light **2** comes on and stays on.

Status Light

Three status lights **4** and their ISO symbols appear on the 7208 Tape Drive as follows:

- ⌋ Fault (amber)
- Ready (green)
- ◊ Activity (green)

The combinations of the lights and their definitions are shown in Table 2.

Table 2. Status Lights on the 7208 Tape Drive

Tape Drive State								
LED	POST or Reset	Error or Failed POST	Ready (No Tape Loaded)	Ready (Tape Loaded)	Normal Tape Motion	High Speed Motion	Time to Clean	Clean in Progress
Top LED (Fault)	on	flash	n/a	n/a	n/a	n/a	on	on
Middle LED (Ready)	on	off	off	on	on	on	n/a	on
Bottom LED (Activity)	on	off	off	off	flash	fast flash	n/a	flash

Liquid Crystal Display

The 7208 Tape Drive features a liquid crystal display (LCD) (**5** in Figure 8 on page 13). The LCD provides operating and error messages.

Table 3 shows a list of messages that display on the LCD.

Table 3. LCD Messages

Reset Messages	
RESET	The first message to appear during the power-on sequence.
MODEL:	Variable information about the tape drive, in this case IBM-60GB.
SUBMOD:	The submodel number of the tape drive.
SN:	The serial number of the tape drive.
CODE:	The level of the tape drive's firmware.
LAST CLN:	The number of tape motion hours since the last cleaning.
COMPRESSION:	Whether data compression is turned on (the default) or turned off.

Table 3. LCD Messages (continued)

SINGLE ENDED <i>or</i> DIFFERENTIAL	The type of SCSI input/output electrical interface.
WIDE	The width of the SCSI bus (measured in bits or bytes).
SCSI ID:	The SCSI address of the tape drive (0 through 15). The default is 0.
LANGUAGE:	The current language used on the LCD. To change the language, turn off the power to the tape drive. Press and hold the unload button immediately after turning the power back on. When the desired language displays, release the unload button.
Tape Drive Status Messages	
READY-NOTAPE	The tape drive is ready to accept a cartridge.
○ [¯] ○ LOADING. . . .	The tape drive is loading the tape.
○ [¯] ○ READY-TAPE	The tape drive successfully loaded the tape and is ready for read or write operations.
○ [¯] ○ ILLEGAL TAPE	An unsuitable tape has been loaded and rejected.
<< EJECT=====	The unload button was pressed. The tape drive will eject the cartridge as soon as it finishes the current operation.
○ [¯] ○ EJECT PREVNT	The unload button was pressed, and the system software has issued a command to prevent the eject function.
Tape Motion Messages	
○↑○ READ+*****=	The tape drive is reading data. The + sign appears when the data is compressed. The boxes (*) represent the amount of tape processed (out of a total of six boxes). The = sign represents the amount of unprocessed tape.
○↓○ WRITE+*****=	The tape drive is writing data. The + sign appears when the data is compressed.
○/○ PROTECTED	The tape drive cannot write data because the data cartridge is write-protected.
○/○ ILLEGAL WRT	The tape drive cannot write to the type of data cartridge inserted. This message remains until a proper tape is inserted or a tape motion command is issued.
>> SEARCH***** << SEARCH*****	A high-speed search is in progress.
<< REWIND*****	The rewind function is in progress.
○×○ ERASE*****	The tape drive is erasing data on the tape. As the data is erased, the equal signs (=) change to boxes (*).
Cleaning Messages	
○``○ CLEAN SOON	The tape drive needs to be cleaned.
○``○ MUST CLEAN	The tape drive must be cleaned when advanced metal-evaporated (AME) media is inserted after using metal particle (MP) media.
○``○ CLEANING	Cleaning is in progress.
○``○ DEPLETED	The cleaning tape in the cartridge is used up and the tape drive will eject it. Insert a new cleaning cartridge.
Error Conditions	

Table 3. LCD Messages (continued)

LAST 3 ERRORS ERR 1: xx yy zz ERR 2: xx yy zz ERR 3: xx yy zz	A hardware error has occurred. The LCD displays the last three error codes, with ERR 1: xx yy zz as the most recent. xx = the fault symptom code (FSC). yy and zz = additional information for product support personnel (the information may or may not be present). To resolve the error, refer to “Appendix B. Fault Symptom Codes and Error Recovery Procedure Numbers” on page 31.
--	---

Changing the Display Language

The text on the 7208 Tape Drive LCD is available in English, French, German, Italian, Portuguese, and Spanish. To change the language:

1. Turn off the power to the 7208 Tape Drive.
2. Press and hold the unload button immediately after turning on the power to the 7208 Tape Drive.
3. The LCD cycles through the available languages. When the desired language displays, release the unload button.

Loading and Unloading Tape Cartridges

To load and unload a tape cartridge, do the following. For information about the type of media to use, refer to “Chapter 5. Using the Media” on page 23.

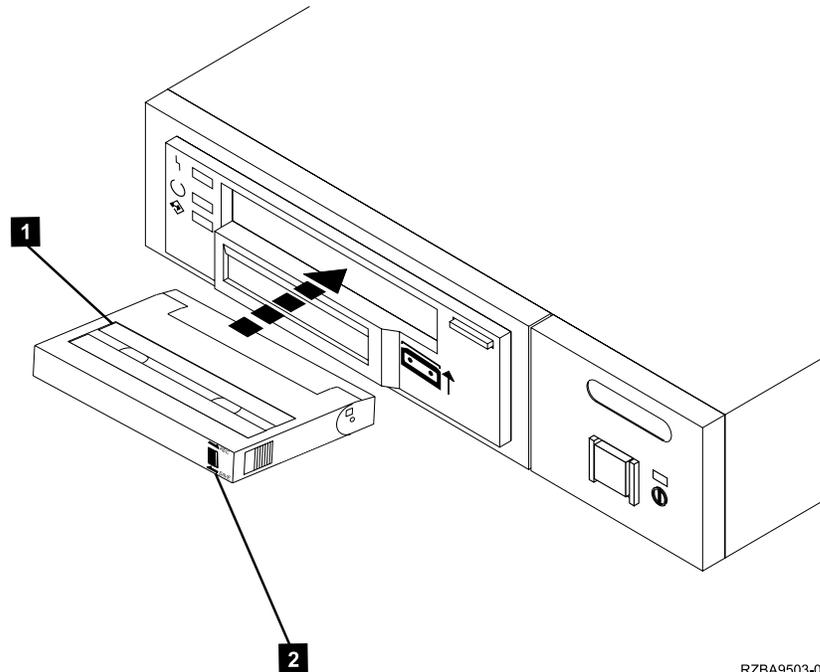
Note: To avoid problems with loading and unloading, use only one label on a cartridge.

Loading a Tape Cartridge

To load a tape cartridge:

1. Make sure that the 7208 Tape Drive power is on (the power-on light should be on).
2. Grasp the cartridge **1** by the outer edges, with the window side up and the write-protect switch **2** facing you.

Note: See “Setting the Write-Protect Switch” on page 27 to make sure that the write-protect switch is properly set.



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Figure 9. Loading a Tape Cartridge into the 7208 Tape Drive

3. Slide the cartridge into the opening on the front of the 7208 Tape Drive until the loading mechanism pulls the cartridge into the drive and the drive door closes (see Figure 9). The message **LOADING** displays.

To indicate that the load operation was successful, the message **READY-TAPE** displays and the Ready status light comes on.

Unloading a Tape Cartridge

To unload a tape cartridge:

1. Make sure that the 7208 Tape Drive power is on (the power-on light should be on).
2. Press the unload button.

The 7208 Tape Drive rewinds, unloads, and ejects the tape. The process may take from 15 seconds to several minutes, depending on the position of the tape and the amount of data written. On the LCD, the message **EJECT** displays, followed by the message **READY-NOTAPE**. The status lights respond as follows:

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

Resolving Unload Error Messages

If the tape cartridge fails to eject and the LCD displays the last three error messages (ERR 1 being the most recent), an error condition has occurred. To resolve the error condition:

1. Write down the error message shown on the LCD. This may be helpful if additional analysis is needed.
2. Press the 7208 Tape Drive power switch to turn off the power.
3. Manually reset the drive by pressing the 7208 Tape Drive power switch (to turn on the power).
 - a. Wait approximately 35 seconds for the POST to complete.
 - b. Wait for the READY-TAPE message to display.
4. Press the unload button.
5. When the cartridge ejects, refer to “Appendix B. Fault Symptom Codes and Error Recovery Procedure Numbers” on page 31 to resolve the error message that you wrote down in Step 1.

If the cartridge does not eject, refer to the section on manually removing a tape cartridge in the *7208 Model 345 8mm Tape Drive Service Guide*.

Emergency Tape Cartridge Eject

Certain conditions may require that you eject a tape cartridge immediately. This situation may occur if you need to stop data transfer quickly, if a tape cartridge is being damaged by the drive, or a similar situation.

Attention: You can lose data if you perform an emergency ejection of a tape. The tape may also end up incorrectly formatted, because EOD (End of Data) mark may not have been written. Only eject the cartridge immediately as a last resort to recover a cartridge. Never use it as a quick way of ejecting the cartridge.

If you need to unload a cartridge urgently, even at the risk of losing data, use the following steps:

1. Make sure that the 7208 Tape Drive power is on (the power-on light should be on).
2. Press and the **Unload** button for 15 seconds. The drive will stop operations and immediately eject the tape cartridge.

Note: Because the ejection may interrupt any operation, it is possible that the drive will not write EOD (End of Data) before the cartridge is ejected. This will cause loss of data, and result in a cartridge with an incorrect format. However, it should still be possible to read such a cartridge up to the point where the ejection interrupted the writing.

Cleaning the Tape Drive

Clean the 7208 Tape Drive when the fault light comes on solid (see Table 2 on page 14), or when the LCD indicates cleaning is required (see Table 3 on page 14).

Note: If you use AME with SmartClean cartridges exclusively, the IBM M2 tape drive automatically performs the cleaning operation using the cleaning material in the cartridges. If you do not use SmartClean cartridges exclusively, the drive may require regular cleaning with an IBM AME 8mm cleaning cartridge.

The 7208 Tape Drive counts the number of hours of tape motion and indicates when it is time to clean the tape drive by displaying the message CLEAN SOON and turning on the Fault status light.

To clean the tape drive, use only the IBM AME 8mm Cleaning Cartridge (part number 35L1409). For uninterrupted operation, have one or more spare cleaning cartridges available.

Attention: Do not operate the 7208 Model 345 Tape Drive in a poor air-quality environment. If your environment contains an excessive amount of particulates, they may permanently damage the media, the drive, or both.

To load the cleaning cartridge:

1. Make sure that the 7208 Tape Drive power is on and the Power-On Self Test has completed.
2. Eject any cartridge that may be in the 7208 Tape Drive.
3. Grasp the cleaning cartridge by the outer edges, with the window side up and the write-protect switch facing you (refer to Figure 9 on page 17).
4. Slide the cartridge into the opening on the front of the 7208 Tape Drive until the loading mechanism pulls the cartridge into the drive and the drive door closes.

After the cleaning cartridge has been fully inserted into the 7208 Tape Drive, the remainder of the cleaning process is automatic. The 7208 Tape Drive:

1. Loads the cleaning tape into the tape drive
2. Turns on the Fault status light (if the light is off)
3. Cleans the drive by moving the cleaning tape forward for approximately two minutes (the Fault status light comes on and the message CLEANING displays)
4. Unloads and ejects the cleaning tape when the cleaning operation is complete

The cleaning cartridge can be used for a maximum of 18 cleaning operations. If you attempt to use a cleaning cartridge that has used all of its cleaning operations, the 7208 Tape Drive automatically detects the error, ejects the cartridge, and displays the message DEPLETED. The Fault status light remains on to indicate that cleaning is still required. Replace the depleted cartridge with a new cleaning cartridge.

Note: The Fault status light will be turned on if you attempt to use a depleted cleaning cartridge.

Chapter 4. Removing the 7208 Tape Drive

This chapter describes how to remove the 7208 Model 345 Tape Drive after it has been installed.

DANGER

To prevent a possible electrical shock when adding or removing any devices to or from the system, ensure that the power cords for those devices are unplugged before the signal cables are connected or disconnected. If possible, disconnect all power cords from the existing system before you add or remove a device. (RSFTD203)

Attention: Damage as a result of improper handling may void your equipment warranty.

Removal Checklist

When removing the 7208 Tape Drive, perform the following steps:

Attention: Failure to perform the following steps in sequence before you add or delete a device may result in data loss or system failure.

- ___ 1. If loaded, remove the tape cartridge from the drive by pressing the unload button while the 7208 Tape Drive power is on.
- ___ 2. Do a controlled system shutdown of the system unit (see “Step 7. Performing a System Shutdown” on page 8).
- ___ 3. Remove the 7208 Tape Drive from the system configuration (for instructions, refer to your system manuals).

Attention: Failure to inform the operating system before you add or delete a device may result in data loss or a system fault.

- ___ 4. Turn off the power to the 7208 Tape Drive.
- ___ 5. Turn off the power to all external devices attached to the system.
- ___ 6. Turn off the power to the system unit.
- ___ 7. Unplug the power cable for the 7208 Tape Drive from the electrical outlet.
- ___ 8. Unplug the system unit power cable from the electrical outlet.

Attention: When SCSI bus (signal) cables are connected to a system unit, they **must** also be connected to a device. Do not leave the SCSI bus cable connected to the system if the device for that cable has been removed. If other SCSI devices are connected to the cable, make sure the last device on the bus is terminated.

- ___ 9. Disconnect the SCSI bus cable from the system unit.
- ___ 10. Disconnect the SCSI bus cable from the 7208 Tape Drive.
- ___ 11. Remove the 7208 Tape Drive and place it in the new location.
- ___ 12. Reinstall the 7208 Tape Drive (see “Chapter 2. Setting Up the 7208 Tape Drive” on page 5).

Chapter 5. Using the Media

Use only IBM 8mm cartridges with the 7208 Tape Drive.

Types of 8mm Cartridges

The 7208 Model 345 Tape Drive is shipped with an advanced metal-evaporated (AME) SmartClean data cartridge, an AME test cartridge, and a cleaning cartridge.

The 7208 Tape Drive reads and writes to new Advanced Metal Evaporated (AME) data cartridges with SmartClean technology. SmartClean cartridges are designed to combine the extremely reliable AME recording media with a short segment of tape drive head cleaning material. The new SmartClean cartridges are easily identified by their cobalt-blue color and are available from in 75m, 150m, and 225m lengths.

Although extensive use is not recommended, M2 can write to AME cartridges designed for the first-generation MammothTape technology tape drives. When these cartridges are used, M2 requires regularly scheduled manual cleaning using a MammothTape cleaning cartridge. Such maintenance is greatly reduced by using only SmartClean media in M2.

Data Cartridge

Use the AME SmartClean 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 and place the label in location **1** shown in Figure 10. Place the large label on the cartridge container.

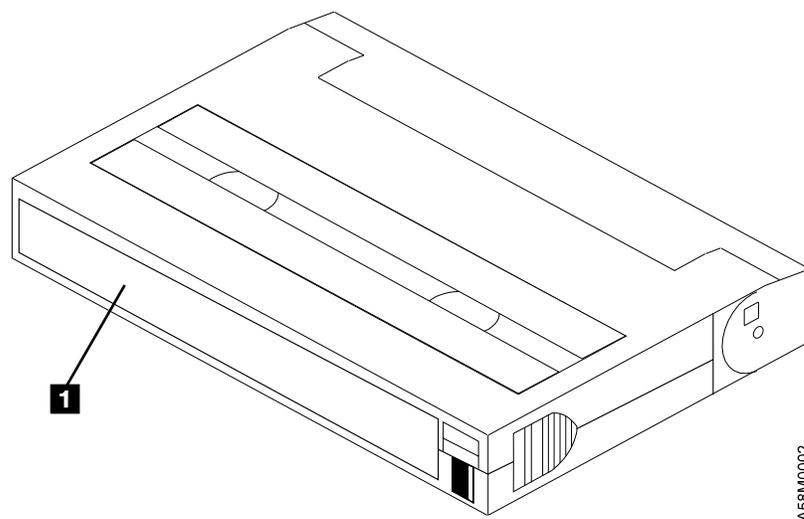


Figure 10. Placement of Label on an 8mm Data Cartridge

Test Cartridge

Use the specially labeled test cartridge to perform diagnostics on the drive. Do not use it to save or restore programs or data.

Cleaning Cartridge

Use the specially labeled cleaning cartridge to clean the tape drive (see “Cleaning the Tape Drive” on page 19).

To order additional cartridges, refer to “Ordering Tape Cartridges” on page 26.

Table 4 shows the compatability of Mammoth tape cartridges in the 7334 Tape Library.

Table 4. Tape Cartridge Compatability

AME Tape Usage				
	Mammoth-1	Mammoth-1 IBM	Mmmoth-1 LT	Mammoth-2
Tape Length				
22m AME	ok	ok	ok	ok ³
45m AME	ok ¹		ok ¹	ok ³
75m AME				ok ⁴
125m AME	ok ²		ok ²	ok ³
150m AME				ok ⁴
170m AME	ok	ok		ok ³
225m AME				ok ⁴
¹ 45m tape recognition enabled with V41b code and higher. This tape size is valid for generic drives and certain OEM configurations.				
² 125m tape recognition enabled with V39e or higher. Mammoth-1 LT's initial release code was V39e. This tape size is valid for generic drives and certain OEM configurations.				
³ M2 can read Mammoth-1 format tapes. M2 can write a blank tape in M2 format or overwrite starting at LBOP a Mammoth-1 formatted tape with M2 formatted data. M2 formatted tapes are treated as blank tapes by Mammoth-1 drives and can be overwritten by Mammoth-1 drives.				
⁴ M2 Smart Clean Media (Cobalt Blue cartridge shell)				

Guidelines for Using Tape Cartridges

Observe the following guidelines for using media with the 7208 Model 345 Tape Drive:

Attention: Do not use video-grade cartridges, as they are hazardous to the 7208 Tape Drive and will void your warranty.

Before using a cartridge, let it acclimate to the operating environment for as long as it has been away from the environment or for 24 hours, whichever is less.

Use only IBM 8mm cartridges with the 7208 Model 345 Tape Drive. IBM only supports the use of IBM media. To order tape cartridges, see “Ordering Tape Cartridges” on page 26.

Attention: Clean the 7208 Tape Drive:

- Whenever you replace a worn tape
- Whenever you replace a defective tape
- Whenever the CLEANING message displays

For more information, see “Cleaning the Tape Drive” on page 19.

Do not write to previously written software distribution tapes. Often these tapes will not support being rewritten without modifications to the cartridge. If the cartridge is modified, it is possible to cause tape jams or tape misalignment.

Back up and then discard any tape that repeatedly produces error messages. (The error information is in the System Error Log.)

Do not open the door that covers the tape in the data cartridge. This door protects the magnetic tape from dirt, dust, and damage.

Do not touch the tape material. Any substance transferred to the tape by touching could cause loss of data.

Do not operate the 7208 Tape Drive in a dusty environment.

Do not store tape cartridges or the 7208 Tape Drive in a dusty environment.

Do not store tape cartridges flat. Store tape cartridges vertically on the long narrow spine in their protective case.

Storage and Shipping Environments

Before using an 8mm tape cartridge, let it acclimate 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.

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

The 8mm data cartridge can be stored and shipped in a wide variety of environments. Table 5 provides a description of these environments.

Table 5. Recommended Environment for 8mm Data Cartridges

Environmental Factor	Storage	Shipping
Temperature	5 to 32°C (41 to 90°F)	-40 to 45°C (-40 to 113°F)
Relative Humidity (noncondensing)	20 to 80%	20 to 80%
Maximum Wet Bulb	26°C (79°F)	26°C (79°F)

Operating in Harsh Environments

The 7208 Tape Drive is ideally 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 as an archival tape any tape that has been used outside of the ranges specified in Table 5 on page 25 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.

Ordering Tape Cartridges

Table 6 lists the tape cartridges that you can order for the 7208 Model 345 Tape Drive. To order cartridges in the United States and Canada, call 1-888-IBM-MEDIA. To order cartridges in other locations, contact your local provider of IBM storage products.

Table 6. Tape Cartridges for the 7208 Model 345 Tape Drive

IBM Part Number	Type of Cartridge	Length
35L1044	20 GB 8mm AME with SmartClean Data Cartridge	75 m (246 ft)
09L5323	40 GB 8mm AME with SmartClean Data Cartridge	150 m (492 ft)
09L5321	60 GB 8mm AME with SmartClean Data Cartridge	225 m (738 ft)
35L1409	8mm Cleaning Cartridge	--

Setting the Write-Protect Switch

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

- When the switch is set to the left in the SAVE position **1**, data cannot be written to or read from the tape (data is saved).
- When the switch is set to the right in the REC (Record) position **2**, data can be written to and read from the tape.

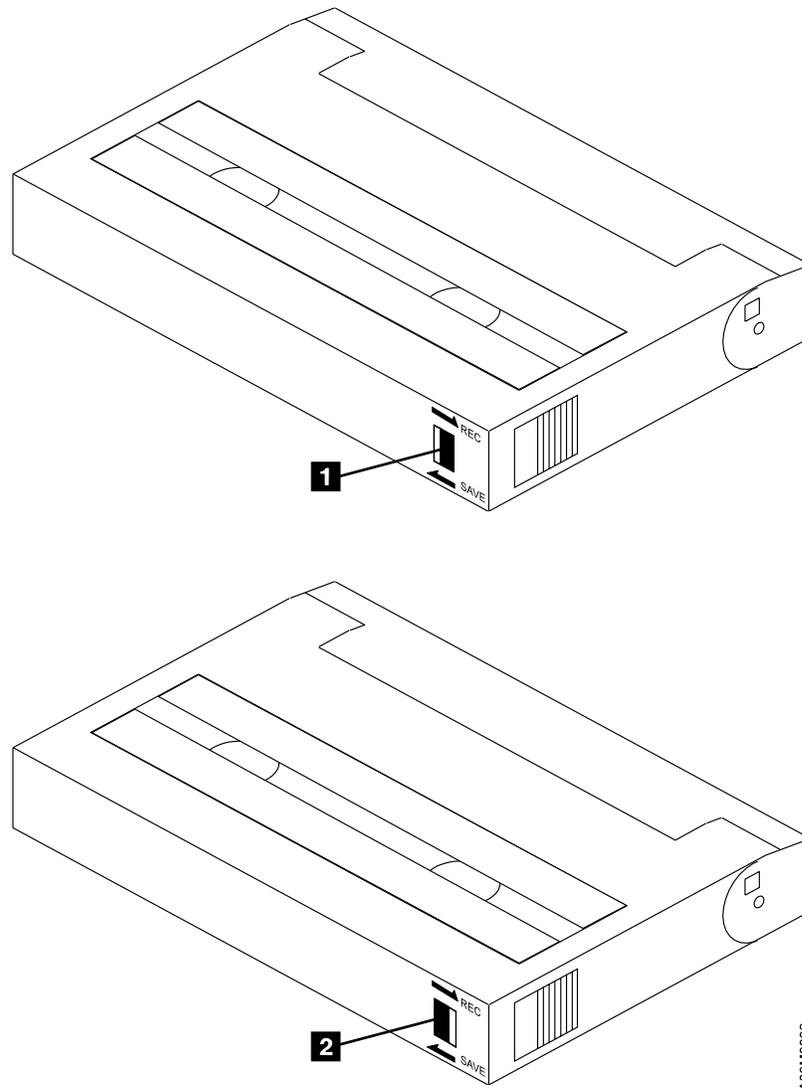


Figure 11. Setting the Write-Protect Switch

Appendix A. Power Cables



To avoid electrical shock, a power cable with a grounded attachment plug has been provided. Use only properly grounded outlets.

Power cables used in the United States and Canada are listed by Underwriter's Laboratories (UL) and certified by the Canadian Standards Association (CSA). The power cables consist of:

- Electrical cables, type SVT or SJT.
- Attachment plugs complying with National Electrical Manufacturers Association (NEMA) 5-15P, that is:
 - “For 115 V operation use a UL Listed Cable Set consisting of a minimum 18 AWG, Type SVT or SJT three conductor cable a maximum of 15 feet in length and a parallel blade, grounding type attachment plug rated at 15 A, 125 V.”
 - “For 230 V operation in the United States use a UL Listed Cable Set consisting of a minimum 18 AWG, Type SVT or SJT three conductor cable a maximum of 15 feet in length, and a tandem blade, grounding type attachment plug rated at 15 A, 250 V.”
- Appliance couplers complying with International Electrotechnical Commission (IEC) Standard 320, Sheet C13.

Power cables used in other countries consist of:

- Electrical cables, type HD21.
- Attachment plugs approved by the appropriate testing organization for the specific countries where they are used.
 - “For units set at 230 V (outside of U. S.): Use a Cable Set consisting of a minimum 18 AWG cable and grounding type attachment plug rated 15 A, 250 V. The Cable Set should have the appropriate safety approvals for the country in which the equipment is to be installed and marked 'HAR'.”

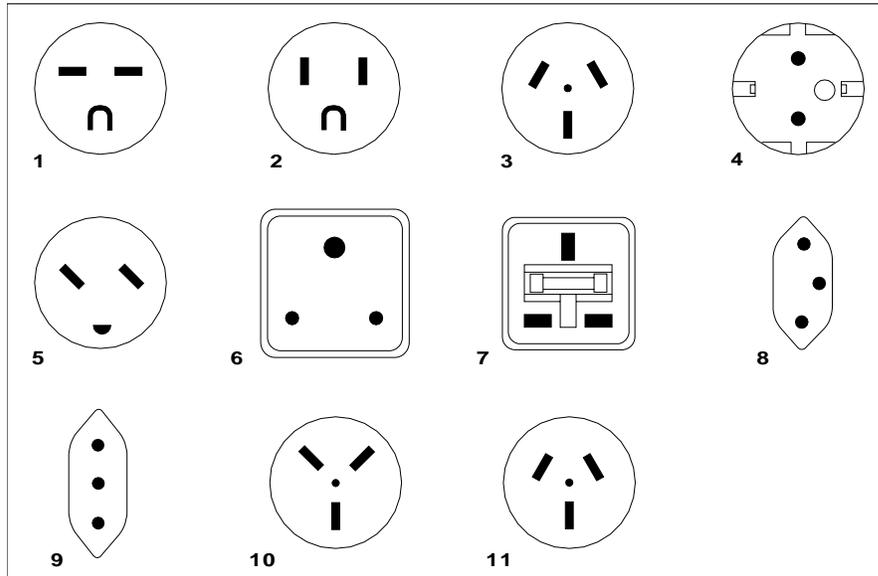
Table 7 lists the power cable part number, the country where the power cable can be used, and an index number to be matched with the receptacles shown in Figure 12 on page 30. If your power cable does not match this information, contact your local dealer.

Table 7. Power Cable Information

Part Number	Country	Index
1838574 Japan	Bahamas, Barbados, Bolivia, Brazil, Canada, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Netherlands Antilles, Panama, Peru, Philippines, Taiwan, Thailand, Tobago, Trinidad, U.S.A. (except Chicago), Venezuela	1
6952300 US/Canada	Bahamas, Barbados, Bermuda, Bolivia, Brazil, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Korea (South), Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Puerto Rico, Saudi Arabia, Suriname, Taiwan, Trinidad, U.S.A. (except Chicago), Venezuela	2
6952301 6 ft Chicago	Chicago, U.S.A.	2
13F9940 Australia	Argentina, Australia, New Zealand, Uruguay	3

Table 7. Power Cable Information (continued)

Part Number	Country	Index
13F9979 France	Abu Dhabi, Austria, Belgium, Bulgaria, Botswana, Egypt, Finland, France, Germany, Greece, Iceland, Indonesia, Korea (South), Lebanon, Luxembourg, Macau, Netherlands, Norway, Portugal, Saudi Arabia, Spain, Sudan, Sweden, Turkey, Yugoslavia	4
13F9997 Denmark	Denmark	5
14F0015 South Africa	Bangladesh, Burma, Pakistan, South Africa, Sri Lanka	6
14F0033 United Kingdom	Bahrain, Bermuda, Brunei, Channel Islands, Cyprus, Ghana, Hong Kong, India, Iraq, Ireland, Jordan, Kenya, Kuwait, Malawi, Malaysia, Nigeria, Oman, People's Republic of China, Qatar, Sierra Leone, Singapore, Tanzania, Uganda, United Arab Emirates (Dubai), United Kingdom, Zambia	7
14F0051 Switzerland	Liechtenstein, Switzerland	8
14F0069 Italy	Chile, Ethiopia, Italy	9
14F0087 Israel	Israel	10
6952291 Colombia	Colombia, Paraguay	11



26415-00

Figure 12. Types of Receptacles

Appendix B. Fault Symptom Codes and Error Recovery Procedure Numbers

Use Table 8 to resolve error messages that appear on the LCD of the 7208 Model 345 Tape Drive:

1. Determine the fault symptom code (FSC) in the error message (the first two digits in the message). For example, in error message ERR 1: AD 58 C0, the FSC is AD.
2. Locate the FSC in Table 8 and identify the error recovery procedure (ERP) number for that FSC.
3. Locate the ERP number in Table 9 on page 39, and identify the recommended error recovery procedure.

Note: Abbreviations in the Description column are defined as follows:

EOD End Of Data

EOT End Of Tape

LBOT Logical Beginning Of Tape

LEOT Logical End Of Tape

PBOT Physical Beginning Of Tape

PEOT Physical End Of Tape

PEOP Physical End Of Partition

Note: Items in the Cause column are defined as follows:

A = Application software

B = Bus (SCSI)

D = Drive

I = Informational message

O = Operator

S = System

T = Tape

Table 8. Fault Symptom Codes (FSC) and Error Recovery Procedure (ERP) Numbers

FSC	Description	ERP Number	Cause
02	Invalid position for WRITE	2	O = 50% S = 50%
03	Tape is write protected for WRITE	5	D = 5% O = 90% T = 5%
04	LEOT encountered on current WRITE	10	I
05	Operation has aborted (as requested)	11	D = 50% O = 50%
06	LEOT encountered on the last WRITE	10	I
08	Compression data integrity check failed	12	D = 100%
09	Detected LEOT during READ	10	I

Table 8. Fault Symptom Codes (FSC) and Error Recovery Procedure (ERP) Numbers (continued)

FSC	Description	ERP Number	Cause
0A	Length mismatch on READ	15	I
0B	Uncorrectable block on READ	8,6	D = 10% T = 90%
0C	EOD encountered on READ	13	I
0D	Filemark encountered during a READ	10	I
0E	Illegal condition for READ	2	D = 50% S = 50%
0F	READ issued at blank tape	4	I
10	READ operation has aborted (as requested)	11	D = 50% O = 50%
11	Too many permanent READ errors, cannot sync	8,6	D = 10% T = 90%
14	PEOT or PEOP encountered on a READ or VERIFY	2,8,6	D = 50% O = 50%
15	Bad filemark encountered during a READ	8,6	T = 100%
16	Medium error detected during a READ	8,6	D = 10% T = 90%
17	Hardware error during a READ	12	D = 100%
18	READ decompression failed — HW error	12	D = 100%
19	READ decompression CRC failed	12	D = 100%
1C	Unknown or incompatible format	14	T = 100%
1D	Hit setmark on READ	10	I
26	Not at legal place to WFM	2	O = 50% S = 50%
27	Tape is write protected for WFM	5	I
28	LEOT encountered during WFM	10	I
31	Setmark detected on SPACE/LOCATE	10	I
32	Filemark detected during SPACE/LOCATE	10	I
33	EOD encountered on SPACE/LOCATE	10	I
34	PEOT encountered on SPACE/LOCATE	8,6	T = 100%
35	PBOT encountered on SPACE/LOCATE	2	I
36	Format error during SPACE/LOCATE	8,6	D = 20% T = 80%
37	Uncorrectable block during a SPACE/LOCATE	8,6	D = 10% T = 90%

Table 8. Fault Symptom Codes (FSC) and Error Recovery Procedure (ERP) Numbers (continued)

FSC	Description	ERP Number	Cause
38	Medium error during SPACE/LOCATE	8,6	D = 20% T = 80%
3A	Bad filemark during SPACE (2.3GB mode only)	3	T = 100%
3B	SPACE/LOCATE has aborted (as requested)	11	D = 50% O = 50%
3D	Lost in space	8,6	D = 20% T = 80%
47	Incompatible medium rejected after loading	14	O = 90% T = 10%
4B	Illegal position for ERASE	2	O = 50% S = 50%
4C	Tape is write protected for ERASE	5	D = 5% O = 90% T = 5%
4E	ERASE has aborted (as requested)	11	D = 5% O = 90% S = 5%
58	Hardware error during SEND DIAGNOSTIC	12	D = 100%
61	Header in wrong format when loading ucode	8,6	T = 100%
63	Control load image not valid	8,6	T = 100%
65	EEPROM load image not valid	8,6	T = 100%
66	Boot code old	8,6	T = 100%
67	Cannot program one of the memories	12	D = 100%
69	CRC in load image was not correct	8,6	T = 100%
6D	Read buffer command failed	12	D = 100%
71	Illegal position to format partition	2	D = 50% O = 50%
72	Partitions are too big for tape	2	O = 100%
74	Partition format of tape failed	8,6	T = 100%
75	Partition format aborted	8,6	D = 5% O = 90% S = 5%
79	Failed position to a new partition	8,6	T = 100%

Table 8. Fault Symptom Codes (FSC) and Error Recovery Procedure (ERP) Numbers (continued)

FSC	Description	ERP Number	Cause
7A	Partition switch aborted	11	D = 5% O = 90% S = 5%
8C	Software hang, we are very confused	12	D = 100%
8D	Software detects a hardware problem	12	D = 100%
93	Detect PEOB	10	A = 100%
94	Write Setmark failure	6	T = 100%
95	WRITE failure after retry limit exceeded	8,6	D = 30% T = 70%
96	WFM failure after retry limit exceeded	8,6	D = 30% T = 70%
97	Write EOD failure after retry limit exceeded	8,6	D = 30% T = 70%
98	Fill error, invalid BRT	12	D = 100%
99	Fill error, buffer empty	12	D = 100%
9A	Deformatter interrupt timeout on search	12	D = 100%
9B	Overwrite (bad readback; check block type)	8,6	D = 50% T = 50%
9C	Formatter interrupt timeout on WRITE	12	D = 100%
9D	Permanent write error, write recovery fail	8,6	D = 30% T = 70%
9E	Permanent write error rewrite threshold	8,6	D = 30% T = 70%
9F	Servo zone readback check failure	8,6	D = 30% T = 70%
A1	Head sync error during WRITE	8,6	D = 90% T = 10%
A2	Underrun error during WRITE	12	D = 100%
A3	IPOINT write buffer parity error	12	D = 100%
A4	DPOINT WRITE parity error	12	D = 100%
A5	PPOINT WRITE parity error	12	D = 100%
A6	IPOINT READ parity error	12	D = 100%
A7	DPOINT READ parity error	12	D = 100%
A8	PPOINT READ parity error	12	D = 100%
AC	Servo software error	12	D = 100%

Table 8. Fault Symptom Codes (FSC) and Error Recovery Procedure (ERP) Numbers (continued)

FSC	Description	ERP Number	Cause
AD	Servo hardware error	8,6	D = 10% T = 90%
AE	Not tracking	8,6	D = 40% T = 60%
AF	EOT encountered during a motion command	2	D = 100%
B0	Not tracking — loss of PLL	8,6	D = 40% T = 60%
B3	LBOT WRITE failure	8,6	D = 30% T = 70%
B4	LBOT ATM write failure	8,6	D = 30% T = 70%
B5	Read manager could not read LBOT	8,6	D = 30% T = 70%
B6	EOT encountered during buffer flush	2	I
C0	Power-on reset occurred	3	I
C1	Tape may have been changed	3	I
C2	Mode Select parameters have changed	3	I
C3	New ucode was loaded	3	I
C4	Operator requested media removal	11	I
C5	Incompatible media was rejected	14	I
C6	Not ready, cause not known	7,3	I
C7	Not ready, in process of becoming ready	3	I
C8	A backup positioning command is required	2	I
C9	Command requires a tape and none is loaded	7,3	I
CA	Log Threshold met	3	I
CB	Log Parameter changed	3	I
CC	Parameter List Length error in CDB	2	D = 50% S = 50%
CD	Illegal Operation Code	2	D = 50% S = 50%
CE	Invalid field or reserved bits set in CDB	2	D = 50% S = 50%
CF	This LUN is not supported	2	D = 50% S = 50%

Table 8. Fault Symptom Codes (FSC) and Error Recovery Procedure (ERP) Numbers (continued)

FSC	Description	ERP Number	Cause
D0	Invalid field in Parameter List (Mode Data)	2	D = 50% S = 50%
D1	Illegal bit set in identify message	2	D = 50% S = 50%
D2	Media removal is prevented	2	D = 50% S = 50%
D3	Command has mode mismatch (variable/fixed)	2	D = 50% S = 50%
D4	Illegal Transfer Length in CDB	2	D = 50% S = 50%
D6	Tried to change Mode Params and not at LBOT	2	D = 50% S = 50%
D7	Can't read medium incompatible format	14	D = 50% S = 50%
D8	Overlapped commands attempted bad ITL nexus	2	D = 50% S = 50%
DA	Illegal bits set in ID message	2	D = 50% S = 50%
DB	Cannot write to tape not AME	10	I
DC	Rounding has occurred	7	I
DD	Not ready — head sync tape	2	D = 50% S = 50%
DE	Density not supported	2	D = 50% S = 50%
E0	Aborted in CDB phase, parity or other error	12	B = 100%
E1	Aborted prior to Data phase, bad message	12	B = 100%
E2	Aborted in Data phase, init detected error	12	B = 100%
E3	Aborted in Data phase, bad message	12	B = 100%
E4	Aborted after Data phase, bad message	12	B = 100%
E5	Aborted after Data phase, other error	12	B = 100%
E6	ABORT caused by SCSI Bus Parity Error	12	B = 100%
E7	ABORT sent by initiator has been completed	12	B = 100%
E8	Drive needs cleaning	1	I
EA	Invalid mode (2.3GB) for data compression	2	D = 50% S = 50%

Table 8. Fault Symptom Codes (FSC) and Error Recovery Procedure (ERP) Numbers (continued)

FSC	Description	ERP Number	Cause
EB	Download in progress	3	D = 50% S = 50%
EC	Log parameter overflow (recovered error)	10	I
EE	Service may be required	12	D = 90% T = 10%
FA	Serial number invalid or blank	12	D = 100%
FC	Head sync value in EEPROM out of range	12	D = 100%
FD	EEPROM contains meaningless information	12	D = 100%

Appendix C. Error Recovery Procedures

Use Table 9 to resolve error messages that appear on the LCD of the 7208 Model 345 Tape Drive:

1. Determine the fault symptom code (FSC) in the error message (the first two digits in the message). For example, in error message ERR 1: AD 58 C0, the FSC is AD.
2. Locate the FSC in Table 8 on page 31 and identify the error recovery procedure (ERP) number for that FSC.
3. Locate the ERP number in Table 9, and identify the recommended error recovery procedure. If two or more ERP codes are listed for the fault symptom code in Table 8 on page 31, perform the action for the first code, then perform the action for the second code, and so on.

Table 9. Error Recovery Procedures

ERP Number	Recommended Error Recovery Procedure
1	Warning Message, clean drive.
2	Application program error or user error using application. Retry operation. If this problem continues, notify application provider.
3	Reissue the failed command or command sequence.
4	Application attempted to read a blank tape. Either write to the tape or replace the tape with a tape containing data.
5	Tape is write protected and a write or erase was attempted. Either write-enable the tape or insert a write-enabled tape.
6	Perform the following until the operation can be completed: <ol style="list-style-type: none"> 1. Clean the drive 2. Retry the operation 3. Clean the drive 4. Replace the tape cartridge 5. If the error persists and there is an error in the system error log, call your service representative
7	Insert a data cartridge into the tape drive.
8	Perform one of the following actions: <ul style="list-style-type: none"> • Reset the tape drive by holding down the unload button until the RESET message appears; then release the button. • Send a SCSI bus reset (a hard reset).
9	Clean the tape drive and repeat the operation.
10	No action is necessary.
11	User has pushed the unload button. No action is required; the tape drive performed the requested operation.
12	The tape drive requires maintenance.
13	The tape drive has encountered the end of the media on a read or write operation. Mount the next tape and continue the tape operation.
14	The media type is not supported. Clean the drive and retry the operation with supported media.
15	The block size requested on the read operation does not match the block size that the tape was written at. Change the application's block size.

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7208 Model 345 8mm Tape Drive
Setup and Operator Guide

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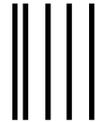
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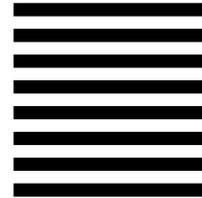
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