



87691VX VXA320 Tape Autoloader User's Guide

Important: Review the maintenance information in Chapter 5, "Using the media," on page 29 and Chapter 6, "Maintaining the 87691VX Tape Autoloader," on page 39, because periodic maintenance is not covered by the IBM warranty. Repairs or exchanges resulting from improper maintenance or use of unsupported media might result in billable service charges.



87691 VX VXA320 Tape Autoloader User's Guide

Note

Before using this information and the product it supports, read the information in Appendix C, "IBM Statement of Limited Warranty Z125-4753-08 04/2004," on page 71 and Appendix B, "Notices," on page 67.

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Safety

Before installing this product, read the Safety Information.

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Antes de instalar este produto, leia as Informações de Segurança.

在安装本产品之前，请仔细阅读 **Safety Information** (安全信息)。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Ennen kuin asennat tämän tuotteen, lue turvaohjeet kohdasta Safety Information.

Avant d'installer ce produit, lisez les consignes de sécurité.

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

Πριν εγκαταστήσετε το προϊόν αυτό, διαβάστε τις πληροφορίες ασφάλειας (safety information).

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

Prima di installare questo prodotto, leggere le Informazioni sulla Sicurezza.

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

Пред да се инсталира овој продукт, прочитајте информацијата за безбедност.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

Les sikkerhetsinformasjonen (Safety Information) før du installerer dette produktet.

Przed zainstalowaniem tego produktu, należy zapoznać się z książką "Informacje dotyczące bezpieczeństwa" (Safety Information).

Antes de instalar este produto, leia as Informações sobre Segurança.

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si prečítajte Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

Antes de instalar este producto lea la información de seguridad.

Läs säkerhetsinformationen innan du installerar den här produkten.

安裝本產品之前，請先閱讀「安全資訊」。

Statement 1:



DANGER

Electrical current from power, telephone, and communication cables is hazardous.

To avoid a shock hazard:

- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**
- **Connect all power cords to a properly wired and grounded electrical outlet.**
- **Connect to properly wired outlets any equipment that will be attached to this product.**
- **When possible, use one hand only to connect or disconnect signal cables.**
- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**
- **Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.**

To Connect:

1. Turn everything OFF.
2. First, attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

To Disconnect:

1. Turn everything OFF.
2. First, remove power cords from outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

Statement 14:



CAUTION:

Hazardous voltage, current, and energy levels might be present. Only a qualified service technician is authorized to remove the covers where the following label is attached.



Statement 15:



CAUTION:

Make sure that the rack is secured properly to avoid tipping when the server unit is extended.

Statement 23:



CAUTION:

Do not place any object weighing more than 50 kg (110 lb) on top of rack-mounted devices.



>50 kg (110 lb)

About this document

This document describes how to install and use the 87691VX Tape Autoloader. It contains the following chapters:

Chapter 1, "General Information," describes the operator controls, LEDs, connector locations, and hardware specifications of the 87691VX Tape Autoloader.

Chapter 2, "Mounting the 87691VX Tape Autoloader in a Rack," describes how to install the 87691VX Tape Autoloader in a rack.

Chapter 3, "Setting Up the 87691VX Tape Autoloader," describes how to install the 87691VX Tape Autoloader.

Chapter 4, "Using the 87691VX Tape Autoloader," describes the operator controls and how to use them.

Chapter 5, "Using the Media," describes the media to use in the 87691VX Tape Autoloader.

Chapter 6, "Maintaining the 87691VX Tape Autoloader," provides the maintenance procedures for the 87691VX Tape Autoloader.

Chapter 7, "Using the Remote Management utility" provides information about Remote Management utility.

Appendix A, "Error messages" provides information about autoloader error messages.

Store this document with your system documents.

Chapter 1. General information

The 87691VX Tape Autoloader is a SCSI external storage device that can be connected to a server that uses a low voltage differential (LVD) interface. It provides storage for up to 10 data cartridges. Each data cartridge is capable of storing up to 160 GB of native data, or 320 GB of compressed data, on a 230-meter tape using VXA technology.

See Appendix C, "IBM Statement of Limited Warranty Z125-4753-08 04/2004," on page 71 for the warranty terms. 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. The 87691VX Tape Autoloader is a Customer Replaceable Unit (CRU).

For a list of servers that support the autoloader, go to <http://www.ibm.com/servers/eserver/serverproven/compat/us/xseries/storage/tmatrix.html>

Figure 1 shows the front view of the 87691VX Tape Autoloader.

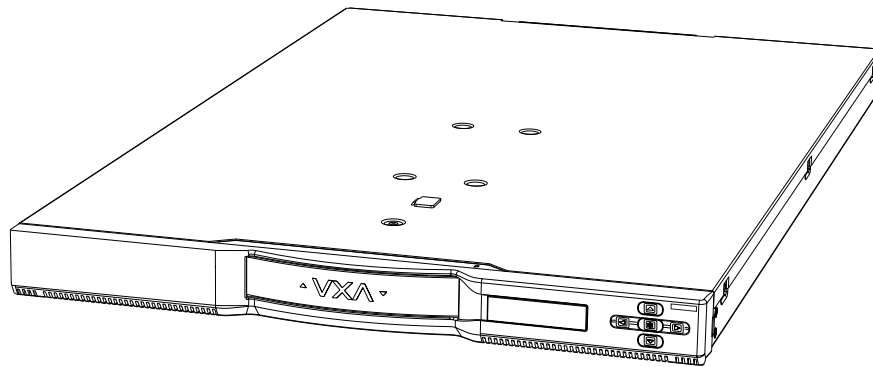


Figure 1. Front view of the 87691VX Tape Autoloader

Note: The illustrations in this document might differ slightly from your hardware.

Front components

Figure 2 shows the front view of the 87691VX Tape Autoloader.

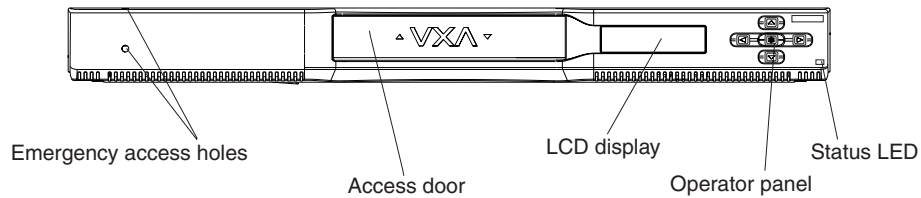


Figure 2. Front view of the 87691VX Tape Autoloader

Status LED

The 87691VX Tape Autoloader has a status LED (see Figure 2), which is located to the right of the operator panel buttons. This LED is lit during normal autoloader activity and flashing when a fault condition occurs.

Operator controls

The 87691VX Tape Autoloader has a five-button operator panel and an LCD screen (see Figure 2) that you can use to monitor the autoloader operations, control tape cartridge movement, and select configuration options. The operator panel is also used to control the insertion and removal of tape cartridges through the access door. See “Using the operator panel” on page 21 for more information about the operator panel.

Use the two emergency access holes to open the access door and remove tape cartridges in the event of a power failure. See “Removing tape cartridges manually” on page 40 for information about this procedure.

Rear components

Figure 3 shows the components on the rear of the 87691VX Tape Autoloader.

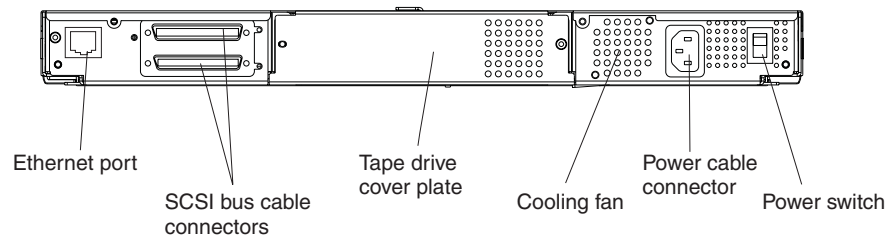


Figure 3. Rear view of the 87691VX Tape Autoloader

Specifications

This section provides the specification for the autoloader.

Table 1. Specifications for the 87691VX Tape Autoloader

| Physical specifications | | |
|---|-------------------------------------|-----------------------------|
| Width | 447 mm (17.6 in.) | |
| Depth | 686 mm (27.0 in.) | |
| Height | 43.6 mm (1.718 in.) | |
| Weight | 10.3 kg (22.8 lb.) | |
| Power specifications | | |
| kVA (typical) | 0.06 at 120 V ac | |
| V ac | 100 to 125 V ac, or 200 to 240 V ac | |
| Hertz | 50 to 60 Hz | |
| Btu maximum (watts) | 77 Btu/hr (23 watts at 240 V ac) | |
| Power factor | 0.4 to 0.6 | |
| Other specifications | | |
| Maximum altitude | 2135 m (7000 ft) | |
| Recommended environment | | |
| Environmental factor | Operating | Non-operating |
| Temperature | 16 to 32°C (60 to 90°F) | 10 to 43°C (50 to 110°F) |
| Relative humidity (noncondensing) | 20 to 80% | 20 to 80% |
| Maximum wet bulb | 23°C (73°F) | 27°C (80°F) |
| Note: The operating limits are also applicable to media. For media storage and shipping limits, see "Storage and shipping tape cartridges" on page 30. | | |

Tape drive environment and use

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

Tape handling and storage

Most tapes are supplied in sealed cartridges so that the tapes will remain in a clean environment. Opening the cartridge allows dirt and airborne particles to enter. The cartridge should be opened only by the tape drive.

The tape is held under correct tension inside the cartridge. If the cartridge is dropped, this tension is relaxed. Inserting a dropped cartridge into a tape device can cause incorrect loading and jamming, which can ruin the tape and can cause physical damage if the cartridge is not removed correctly.

Store tapes in their protective containers and store them on end. The storage area must be clean, dry, at normal room temperature, and away from magnetic fields.

Environmental issues

Tape devices 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 device, 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. You are responsible for providing a clean operating environment for the tape drive and system.

Tape drive cleaning

No matter how clean the environment is, debris might build up on the heads of any tape drive. Every time a tape moves, some of the media surface comes off onto the heads. Over time, this builds up and causes errors in reading and writing. You are responsible for cleaning the tape drive in accordance with the cleaning procedure in “Cleaning the tape drive” on page 36.

Firmware updates

IBM occasionally releases firmware updates for the tape drives. To download firmware updates, go to
<http://www.ibm.com/pc/support/site.wss/document.do?lnocid=TAPE-FILES>

Installing firmware updates is your responsibility.

Chapter 2. Mounting the 87691VX Tape Autoloader in a rack

The 87691VX Tape Autoloader is designed to be installed in a rack, using 1 U of rack space. Rack-mounting hardware is included with the autoloader.

Note: Racks are measured in vertical increments of 4.45 cm (1.75 inches) each. Each increment is call a “U”. A 1-U-high device is 1.75 inches tall.

To install the autoloader in a rack, you need the following tools:

- #1 Phillips screwdriver
- #2 Phillips screwdriver
- 8 mm wrench
- Tape measure

Before you start the installation, read the entire installation procedure.

Removing the shipping key

The robotic cartridge loader inside the autoloader is secured with a small metal shipping key to keep the loader from moving during shipping. Before you operate the autoloader, you must remove this shipping key. To remove the shipping key, complete the following steps:

- ___ 1. Remove the adhesive label that secures the shipping key to the autoloader.

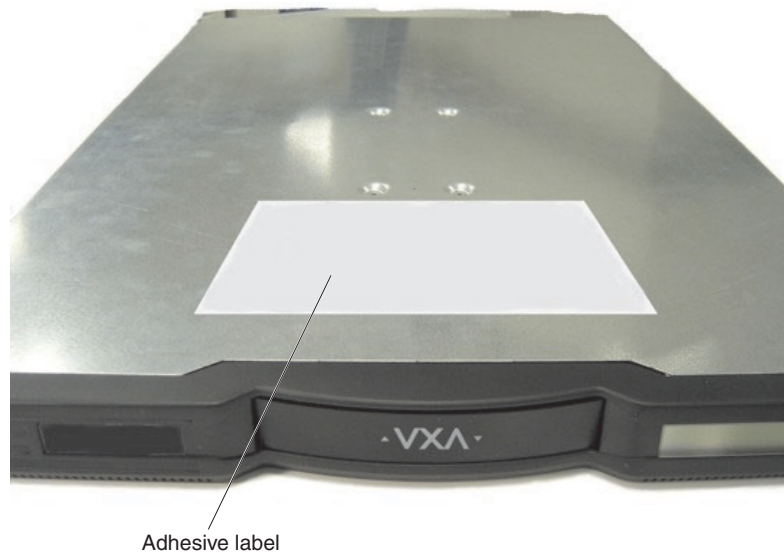


Figure 4. Removing the shipping label

- ___ 2. Lift the shipping key up and out of the autoloader.



Shipping Key

Figure 5. Removing the shipping key

Assembling the rails

To assemble the rails, complete the following steps:

- ___ 1. Using a tape measure, measure the distance from the outside of the front mounting holes of your rack to the outside of the back mounting holes. Record this measurement.
- ___ 2. Locate the front and back rails for the left side. Position the rails as shown in Figure 6, with the front rail on top of the back rail. Spread the rails to the distance that you measured in 1.
- ___ 3. Using a #2 Phillips screwdriver, attach the rails together with two M5 screws (the larger silver screws from the kit), as shown in Figure 6. Leave the screws loose so that you can adjust the reach of the rails, if necessary.

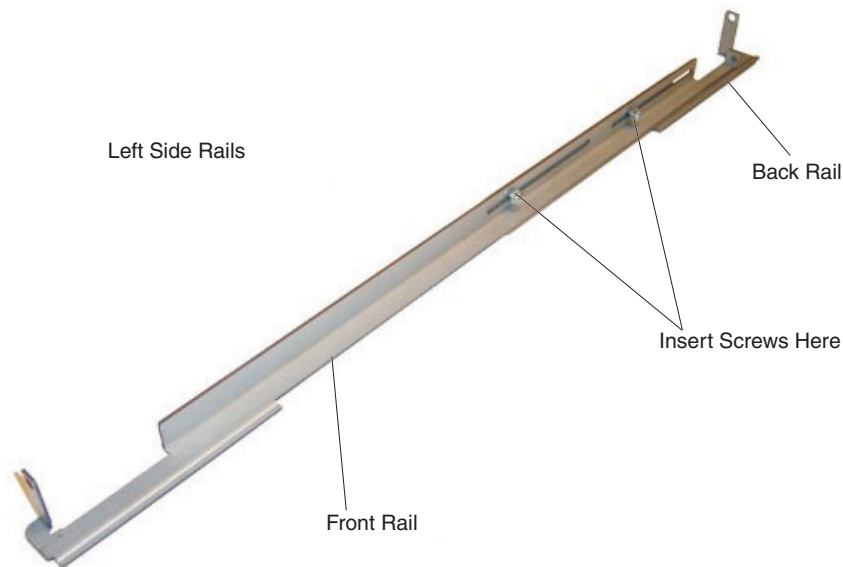


Figure 6. Assembling the left side rail

- ___ 4. Assemble the rails for the right side in the same way (see Figure 7 on page 10).

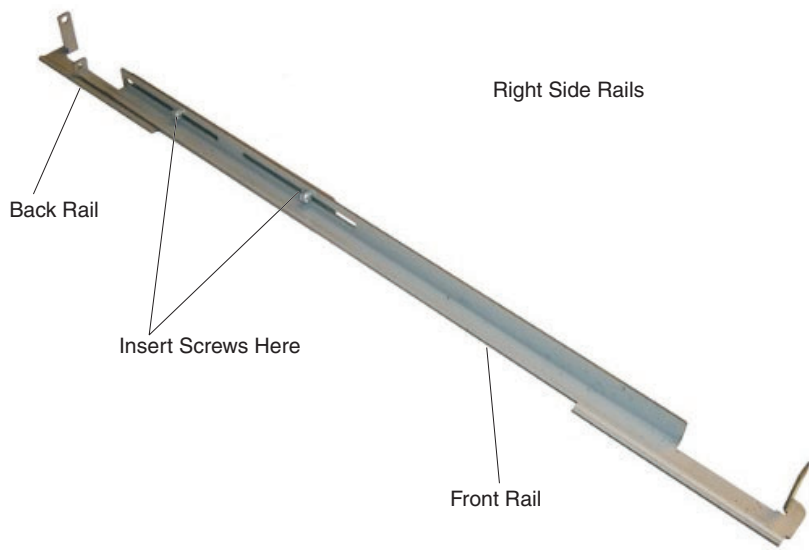


Figure 7. Assembling the right side rail

Attaching the rails to the rack

To attach the rails to the rack, complete the following steps:

1. Position the left-side set of rails in the rack so that the front flange is inside the front screw holes in the rack (see Figure 8).

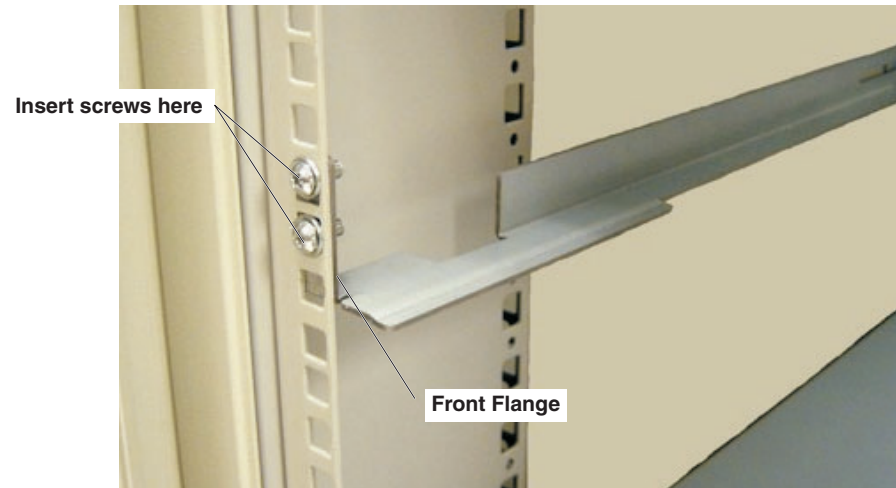


Figure 8. Attaching the left side rail to the front of the rack

2. Insert two M5 screws (the black screws from the kit) through the front flange of the rail (see Figure 8). Attach a nut to each screw. If your rack has square mounting holes or the holes are much larger than the screws that are provided in the kit, use a washer with the nut. Finger-tighten the nut.
3. Adjust the reach of the rails as necessary to position the back flange of the rail outside of the screw holes at the back of the rack (see Figure 9).



Figure 9. Attaching the left side rail to the back of the rack

4. From the back of the rack, insert an M5 screw (the silver screws from the kit) through the back flange of the rail (see Figure 9). Attach a nut to the screw. If your rack has square mounting holes or the holes are much larger than the screws that are provided in the kit, use a washer with the nut. Finger-tighten the nut.

Note: Before you tighten the screws further, make sure that the horizontal shelf that is created by the rails is level.

- ___ 5. Using a #2 Phillips screwdriver and an 8 mm wrench, tighten the screws that secure the rails to the front and back of the rack.
- ___ 6. Using a #2 Phillips screwdriver, tighten the two screws holding the set of rails together.
- ___ 7. Repeat step 1 on page 11 through step 6 for the right-side rails.

Attaching the 87691VX Tape Autoloader to the rails

Statement 15:



CAUTION:

Make sure that the rack is secured properly to avoid tipping when the server unit is extended.

Statement 23:



CAUTION:

Do not place any object weighing more than 50 kg (110 lb) on top of rack-mounted devices.



>50 kg (110 lb)

To attach the autoloader to the rails, complete the following steps:

1. From the front of the rack, place the autoloader onto the shelf that is created by the rails (see Figure 10).



Figure 10. Placing the autoloader on the rails

2. Slide the autoloader all the way back until it makes contact with the small flanges near the back of the rails. The front edge of each shelf piece slides under the metal tabs at the bottom front edge of the autoloader.

3. From the back of the rack, attach the autoloader to the rails by inserting an M3 screw into each of the small flanges (see Figure 11). Tighten the screws, using a #1 Phillips screwdriver.



Figure 11. Attaching the autoloader to the rails

Note: For information about connecting cables and attaching the 87691VX Tape Autoloader to a host system, see Chapter 3, “Installing and setting up the 87691VX Tape Autoloader,” on page 15.

Chapter 3. Installing and setting up the 87691VX Tape Autoloader

This chapter provides step-by-step instructions for installing and setting up the 87691VX Tape Autoloader. If you need assistance with the installation, contact IBM service.

Before you install the 87691VX Tape Autoloader, 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.

Because the autoloader is a low-voltage differential (LVD) device, all other devices on the SCSI bus should also be LVD. These devices include the controller cards, cables, terminators, and any other devices on the bus. Do not mix LVD and high voltage differential (HVD) devices on the same bus.

Attention: The 87691VX Tape Autoloader 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 87691VX Tape Autoloader.

To install the 87691VX Tape Autoloader, complete the following steps:

Step 1. Performing a parts inventory

Make sure that you received the following items:

1. Power cable
2. The *87691VX Tape Autoloader User's Guide* (this document)
3. SCSI bus cable
4. Terminator
5. Cleaning cartridge
6. Package of sample bar code labels
7. Rack mounting hardware

Step 2. Checking the electrical outlets

Make sure that the electrical outlets are properly grounded.

Attention: Electrical current from power, telephone, and communication cables is hazardous. See "Safety" on page v for more information.

Step 3. Determining the SCSI address

The SCSI address identifies the device to the bus and the system. Be careful not to set two devices to the same SCSI address because this will cause errors. The selected address sets the priority of the device on the bus. Tape drives are usually slow devices, compared to hard disk drives, so a tape drives should be set to a high priority to ensure that it gets access to the bus in a timely manner.

The host system has 16 available SCSI address settings. From highest to lowest, the SCSI bus priority 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 87691VX Tape Autoloader, make sure that its SCSI address is not being used by another device. The 87691VX Tape Autoloader 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).

Note: The 87691VX Tape Autoloader is supported only on an LVD SCSI bus.

To determine an unused SCSI address, you need the following information:

- The name and the port number of the host system SCSI I/O controller that you want to connect the autoloader to
- The SCSI address of that SCSI I/O controller
- The SCSI addresses of other devices that are connected to that SCSI I/O controller

Step 4. Setting the SCSI address

The SCSI address is a unique address that identifies the 87691VX Tape Autoloader and drive to your system. The autoloader and the drive that is installed in it each must have its own unique SCSI address. The 87691VX Tape Autoloader is shipped with the autoloader SCSI address set to 0 and the drive address set to 5. If you want to change these settings, use the operator panel and display screen on the front of the device (see Figure 2 on page 2).

To set the autoloader SCSI ID, complete the following steps:

1. On the operator panel, press the Down a Level button to access the main menus.
2. Press the Next Choice button to scroll through the menus until the **Change a Configuration** menu is displayed.
3. Press the Down a Level button once, and then press the Next Choice button until the **Change Library ID** screen is displayed.
4. Press the Down a Level button to set the autoloader SCSI ID.
5. Press the Next Choice or Previous Choice button to scroll through the available values. When the SCSI address that you want to use is shown, press the Select button to select the value. A confirmation screen is displayed.
6. Press the Select button to set the SCSI ID to the selected value or press the Up a Level button to cancel the change. The library SCSI inquiry string is IBM 87691VX.

To set the drive SCSI ID, complete the following steps:

1. On the operator panel, press the Down a Level button to access the main menus
2. Press the Next Choice button to scroll through the menus until the **Change a Configuration** menu is displayed.
3. Press the Down a Level button once, and then press the **Next Choice** button until the Change Drive ID screen is displayed.
4. Press the Down a Level button to set the drive SCSI ID. Set the device at the highest available address. Do not select a SCSI address that is already in use.
5. Press the Next Choice or Previous Choice button to scroll through the available values. When the SCSI address that you want to use is displayed, press the Select button to select the value. A confirmation screen is displayed.
6. Press the Select button to set the SCSI ID to the selected value or press the Up a Level button to cancel the change. The tape drive SCSI inquiry string is IBM VXA-3.

Step 5. Connecting the SCSI bus cable

To connect the SCSI bus cable, complete the following steps:

1. Before you attach the cable, ensure that no connector pins are bent.
2. On the rear of the 87691VX Tape Autoloader (see Figure 12 on page 18), attach the device connector end of the SCSI bus cable to one of the SCSI connectors. Make sure that the connector is fully engaged.

Attention: Electrical current from power, telephone, and communication cables is hazardous. See "Safety" on page v for more information.

- Secure the cable to the 87691VX Tape Autoloader using the thumbscrews on the cable (finger-tighten them only).
- Connect the other end of the SCSI bus cable as follows:
 - If the 87691VX Tape Autoloader is the only device that is attached to the system, connect the cable to the host system (see Figure 12).
 - If the 87691VX Tape Autoloader is part of a multiple-device configuration, connect the cable to the next device.

Step 6. Installing the SCSI bus terminator

A terminator must be installed on the last device in the configuration.

Note: Before you attach the terminator, make sure that no pins on the connector are bent or damaged.

Attention: Electrical current from power, telephone, and communication cables is hazardous. See "Safety" on page v for more information.

To install the SCSI terminator, align it with the unused SCSI connector on the 87691VX Tape Autoloader and push in until the terminator is seated. Secure the terminator with the thumbscrews on the terminator (finger-tighten them only).

- If the 87691VX Tape Autoloader (see Figure 12) is the only SCSI device that is attached to the host system, install the terminator on one of the dual connectors.

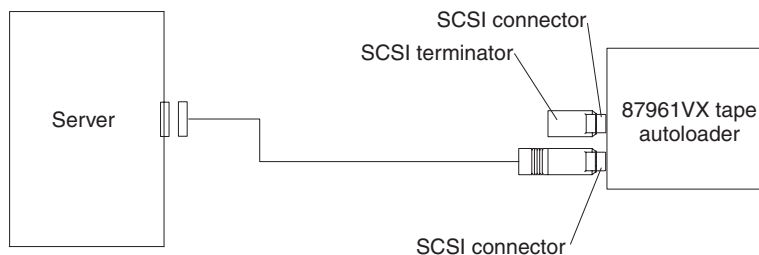


Figure 12. Example of attaching one SCSI device to the system unit

- If more than one device is attached to the host system, move the terminator to the last device on the bus.

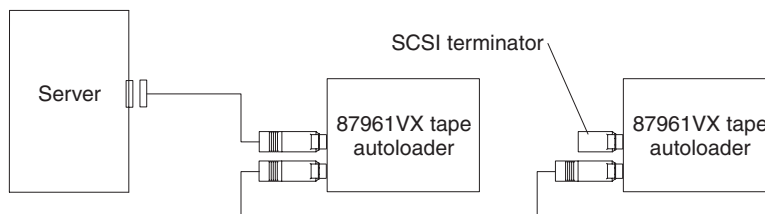


Figure 13. Example of attaching multiple SCSI devices to the system unit

Notes:

- The terminator and the SCSI bus cable can be connected to either the top or the bottom SCSI connector on the 87691VX Tape Autoloader.

2. When the 87691VX Tape Autoloader is the last device on the bus that is attached to a host system, use the terminator that comes with the 87691VX Tape Autoloader.
3. Use only one external terminator to terminate the SCSI bus. You do not have to use the terminator that comes with the 87691VX Tape Autoloader if an IBM-approved terminator has been previously installed.

Step 7. Connecting the power cables

To connect the power cables, complete the following steps:

1. Connect the 87691VX Tape Autoloader power cable to an electrical outlet.

Attention:

- a. Connect the 87691VX Tape Autoloader power cable directly to an electrical outlet to ensure proper grounding. Using extension cords or power strips to supply power to the 87691VX Tape Autoloader does not ensure proper grounding.
 - b. Electrical current from power, telephone, and communication cables is hazardous. See “Safety” on page v for more information.
2. Connect the power cables for all external devices and the system unit to electrical outlets.
 3. Turn on the power to all of the external devices, except the 87691VX Tape Autoloader.
 4. Review the information in “Status LED” on page 2.
 5. Turn on the power to the system unit.
 6. While you observe the LCD screen, turn on the power to the 87691VX Tape Autoloader and watch for the messages that the power-on procedure has been completed successfully.

Step 8. Installing a backup application

If you are using a separate backup application, install it now using the instructions that came with the application. If you are using the native Windows® backup applet, go to the following Web site to get the device drivers:
<http://www.ibm.com/pc/support/site.wss/document.do?lnocid=TAPE-FILES>.

Chapter 4. Using the 87691VX Tape Autoloader

This chapter describes the operator controls on the 87691VX Tape Autoloader and how to use them.

Using the operator panel

Use the five-button operator panel to navigate through the configuration, operation, and information menus. The 87691VX Tape Autoloader menus are organized in a tree structure (see Figure 15 on page 23) that consists of four main menus with submenus and selections. Use the operator panel buttons to move up and down between menu levels, view choices within menus, and make selections.

Figure 14 shows the operator panel buttons on the 87691VX Tape Autoloader.

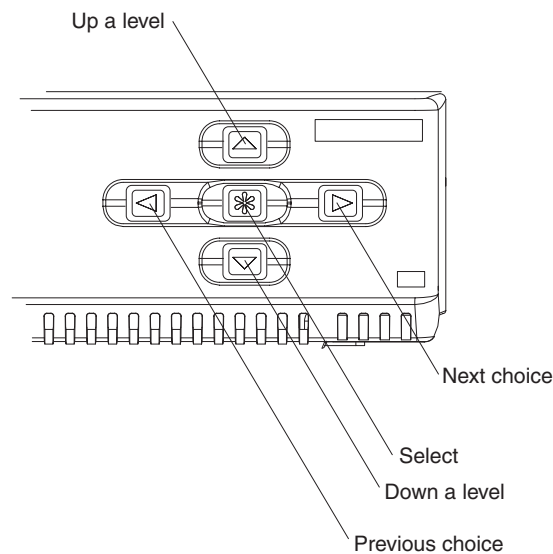


Figure 14. Operator panel buttons on the 87691VX Tape Autoloader

| Button | Function |
|------------------------------|---|
| Next Choice (right arrow) | Press the Next Choice button to move forward through the selections in a menu. Note: If you are entering a password, press the Next Choice button to move forward through the available values at a character position. Press and hold the button to move rapidly through the available values. |
| Previous Choice (left arrow) | Press the Previous Choice button to move backward through the selections in a menu. Note: If you are entering a password, press the Previous Choice button to move backward through the available values at a character position. Press and hold the button to move rapidly through the available values. |

| | |
|---------------------------|--|
| Up a Level (up arrow) | Press the Up a Level button to return to the previous level of menus. At the top level of menus, pressing the Up a Level button returns to the Home screen. Note: If you are entering a password, press the Up a Level button to move backward through the character positions of the password. |
| Down a Level (down arrow) | Press the Down a Level button to move down into a lower level of a menu. For example, if the LCD screen is displaying one of the main menus, press this button to view the submenu for that menu. Note: If you are entering a password, press the Down a Level button to move forward through the character positions of the password. |
| Select | Press the Select button to cause an operation displayed on the LCD screen to take effect. For example, if you are changing a SCSI ID, pressing the Select button causes the new value you have entered to take effect. As confirmation, after you press the Select button, the original LCD screen displays the new value. |

Using the 87691VX Tape Autoloader menus

During normal operation, the Home screen displays the operating status of the autoloader and tape drive. If the autoloader has no current error condition, the status of the tape drive is displayed.

If a menu is displayed on the LCD screen and you want to view the Home screen, press the Up a Level button until the Home screen is displayed.

Figure 15 on page 23 shows the menus and submenus that can be used to control the 87691VX Tape Autoloader. The menu tree shows the basic structure of the options. Many of the submenus have several options within them.

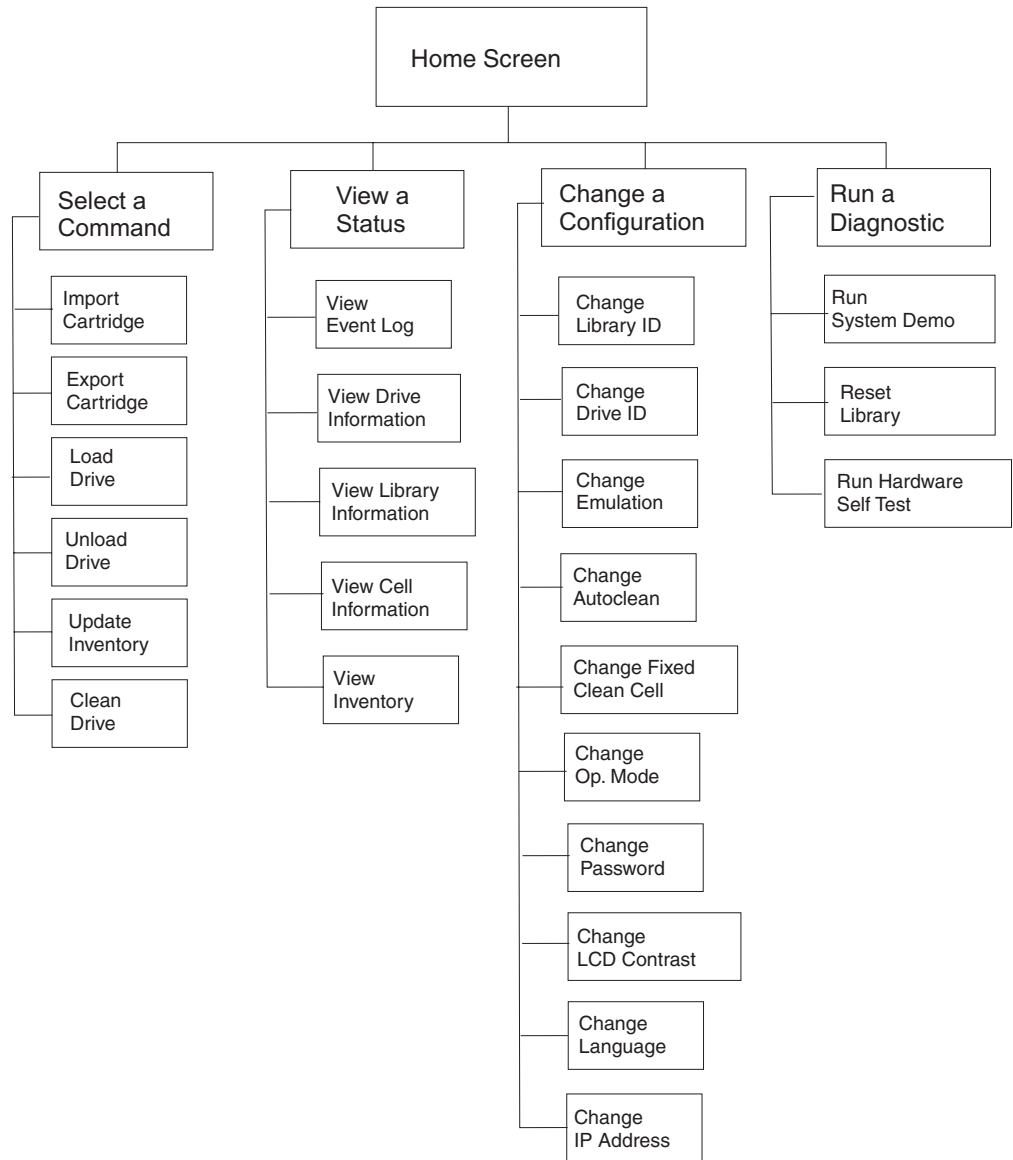


Figure 15. Menus on the 87691VX Tape Autoloader

Overview of the main menus

Below the Home screen are four main menus. Press the Down a Level button on the operator panel to display the main menus. Then, use the Next Choice or Previous Choice buttons to scroll through the main menus. Press the Down a Level button to display submenus within a main menu option.

The following main menus are available.

| Menu | Description |
|------------------|--|
| Select a Command | Use this option to issue commands for basic autoloader operations, including inserting and removing cartridges, loading and unloading cartridges from the tape drive, and cleaning the tape drive. |

| Menu | Description |
|------------------------|---|
| View a Status | Use this option to view an event log for the autoloader, sensor readings, individual cartridge cell statistics, bar code label information, cartridge inventory, firmware versions, and serial numbers for the autoloader and tape drive. |
| Change a Configuration | Use this option to view and change the SCSI IDs, operating mode, emulation mode, autoclean settings, and Ethernet settings. Also use this option to set up a password to restrict access to the operator panel menus. |
| Run a Diagnostic | Use this option to run demonstrations, perform diagnostic tests, and reset the autoloader. |

Setting password protection

You can set up a password for accessing operator panel menus. When you have set a password, access to the following operator panel functions is password-protected:

- Changing configuration settings
- Importing and exporting cartridges
- Loading and unloading the tape drive
- Cleaning the tape drive
- Running demos
- Resetting the autoloader

A password can be up to six characters in length and is not case sensitive.

When password protection is in effect, you must enter the password before you can use the operator panel menus. Each time you return to the Home screen and press the Up a Level button an additional time (or wait 2 minutes), password protection is reactivated; you must enter the password again to access the menus.

Attention: If you set a password, record it in a secure location. The operator panel functions cannot be used without the password.

Setting an operator panel password

To set a password for the operator panel, complete the following steps:

- ___ 1. On the operator panel, press the Down a Level button to display the main menus.
- ___ 2. Press the Next Choice button to scroll through the menus until the **Change a Configuration** menu is displayed.
- ___ 3. Press the Down a Level button once and then press the Next Choice button until the **Change Password Entry?** screen is displayed.
- ___ 4. Press the Down a Level button. The **Select Password Protection** screen is displayed.
- ___ 5. Press the Next Choice button until ON is displayed.
- ___ 6. Press the Select button. The **Select New Password** screen is displayed.
- ___ 7. Press the Next or Previous Choice button to scroll through the available characters for each position. Press the Down a Level or Up a Level button to change character positions. When you have entered the password, press the Select button. The message Set Password Now? is displayed.

Note: You can enter a password of up to six characters, including blanks. The password is not case-sensitive.

- ___ 8. Press the Select button to accept the password (or press the Up a Level button to cancel setting the password).
- ___ 9. Press the Up a Level button until the Home screen is displayed. Press the Up a Level button again or wait 2 minutes without pressing any buttons for the password to take effect.

Note: If you want to continue using menus after you have set a password, do not press the Up a Level button an additional time after the Home screen is displayed. The password will not take effect until you have pressed the Up a Level button an additional time at the Home screen or you have pressed no buttons for 2 minutes.

Accessing password-protected operator panel menus

If you want to have access to the operator menus when the password protection is in effect, complete the following steps:

- ___ 1. On the operator panel, press the Select, Next Choice, Previous Choice, or Down a Level button. The password entry screen is displayed.
- ___ 2. Enter the password. Press the Next Choice or Previous Choice button to scroll through the available characters for each position. Press the Down a Level or Up a Level button to change character positions. When you have entered the password, press the Select button. You can now access the menus.
- ___ 3. After you have finished using the menus, press the Up a Level button until the Home screen is displayed. Then, press the Up a Level button again or wait 2 minutes without pressing any buttons for password protection to be reactivated.

Note: You can try to enter the password 5 times. On the sixth attempt, the autoloader displays an encrypted version of the password. Contact IBM service to have the password decrypted.

Turning off the operator panel password

To turn off password protection for the operator panel, complete the following steps:

- ___ 1. On the operator panel, press the Select, Next, Previous, or Down a Level button. The password entry screen is displayed.
- ___ 2. Enter the password. Press the Next Choice or Previous Choice button to scroll through the available characters for each position. Press the Down a Level or Up a Level button to change character positions. When you have entered the password, press the Select button. You can now access the menus.
- ___ 3. Press the Next Choice button to scroll through the menus until the **Change a Configuration** screen is displayed.
- ___ 4. Press the Down a Level button once.
- ___ 5. Press the Next Choice button until the **Change Password Entry?** screen is displayed.
- ___ 6. Press the Select button. The **Select Password Protection** screen is displayed.
- ___ 7. Press the Next Choice button until OFF is displayed.
- ___ 8. Press the Select button. The message Set Password Protection Off? is displayed.

- ___ 9. Press the Select button to turn off the password protection (or the Up a Level button to cancel the operation).
- ___ 10. Press the Up a Level button until the Home screen is displayed.

Setting the operating mode

The autoloader can operate in either random or sequential mode. In random mode, the tape cartridges are moved into the tape drive according to the commands of a control program. In sequential mode, the tape cartridges are used in sequential order. The default mode that the autoloader comes configured to use is random mode.

Sequential mode can be configured to use the Restart option and Loop option.

Table 2. Sequential mode options

| Option | Description |
|---------|---|
| Restart | The Reset option determines what the autoloader will do after it is reset or the power is turned off and then on. To have the autoloader start at the beginning of the cartridge sequence, select ON. To have the autoloader start with the cartridge that was being used before the power interruption occurred, select OFF. |
| Loop | The reset option will determine what the autoloader does after it has used the last tape cartridge in the sequence. To have the autoloader start using the first cartridge again, select ON. To have the autoloader wait for operator intervention, select OFF. Operator intervention typically means removing the cartridges and inserting new cartridges. |

Changing from Random mode to Sequential mode

To change the autoloader from Random to Sequential mode, complete the following steps:

- ___ 1. On the Home screen, press the Down a Level button to access the main menus.
- ___ 2. Press the Next Choice button to scroll through the menus until the **Change a Configuration** menu is displayed.
- ___ 3. Press the Down a Level button once.
- ___ 4. Press the Next Choice button until the **Change Op. Mode? Now Random** screen is displayed.
- ___ 5. Press the Select button. The **Select Op. Mode Random Mode** screen is displayed.
- ___ 6. Press the Next Choice button or Previous Choice button to change from Random mode to Sequential mode.
- ___ 7. Press the Select button. The message **Set Op.Mode to Sequential Now?** is displayed.
- ___ 8. Press the Select button. The **Restart at First Address: NO** screen is displayed.
- ___ 9. Press the Next Choice button or Previous Choice button to change from YES to NO.
- ___ 10. Press the Select button. The **Loop When Done Set Looping Off** screen is displayed.
- ___ 11. Press the Next Choice button or Previous Choice button to change from OFF to ON.

- ___ 12. Press the Select button. The message Set Op. Mode to SEQUENTIAL Now? is displayed.
- ___ 13. Press the Select button.
- ___ 14. Press the Up a Level button until the Home screen is displayed.

Changing from Sequential mode to Random mode

To change the autoloader from Sequential mode to Random mode, complete the following steps:

- ___ 1. On the Home screen, press the Down a Level button to access the main menu.
- ___ 2. Press the Next Choice button to scroll through the menus until the **Change a Configuration** menu is displayed.
- ___ 3. Press the Down a Level button once.
- ___ 4. Press the Next Choice button until the **Change Op. Mode? Now Sequential** screen is displayed.
- ___ 5. Press the Select button. The **Select Op. Mode Sequential Mode** screen is displayed.
- ___ 6. Press the Next Choice button or Previous Choice button to change from Sequential to Random mode.
- ___ 7. Press the Select button. The message Set Op.Mode to Random Now? is displayed.
- ___ 8. Press the Select button.
- ___ 9. Press the Up a Level button until the Home screen is displayed.

Using the 87691VX Tape Autoloader Ethernet connection

You can connect the 87691VX Tape Autoloader to an Ethernet network to remotely monitor operations through the remote management utility. You can also create diagnostic listings and upgrade autoloader firmware.

Connecting the 87691VX Tape Autoloader to an Ethernet network

To connect the autoloader to an Ethernet network using an Ethernet cable, complete the following steps:

- ___ 1. Insert one end of the cable into the 87691VX Tape Autoloader Ethernet connector until you hear it snap into place. The Ethernet connector is on the back of the autoloader (see Figure 3 on page 3).
- ___ 2. Connect the other end of the cable to the network or directly to the server you will use to run the 87691VX Tape Autoloader remote management utility or to upload firmware.

Setting the Ethernet configuration options

You can use the 87691VX Tape Autoloader Ethernet interface to remotely monitor operations, upgrade firmware, and create diagnostic listings. Configuring the 87691VX Tape Autoloader Ethernet interface typically involves specifying the autoloader IP address, subnet mask, and gateway address. The IP address is used to route information from the autoloader to the server. You can choose between dynamic (server-assigned) or static (user-assigned) addressing for the IP address. If you select dynamic addressing, you can view the current server-assigned IP

address through the **Status** menu. The subnet mask is used to route information to designated devices within the network. The gateway address is used to route information outside the subnet.

The autoloader also includes an FTP interface that you can use to transfer firmware files or create diagnostic listings. You can set up an FTP user name and password for this interface or use the autoloader defaults. You can view and change the FTP settings only through the autoloader remote management utility.

If you plan to use the Ethernet interface, you must obtain an Ethernet cable. Use a shielded Category 5 (10/100BaseT connection) data-grade cable or similar Category 5 cable that is compliant with EIA/TIA 568. The 87691VX Tape Autoloader Ethernet port connector is a pin-through-hole RJ-45 shielded connector. All Ethernet cables that are used with the autoloader must be properly shielded.

Setting the Ethernet addresses

To set Ethernet addresses, complete the following steps:

- ___ 1. On the operator panel, press the Down a Level button to display the main menus.
- ___ 2. Press the Next Choice button to scroll through the menus until the **Change a Configuration** menu is displayed.
- ___ 3. Press the Down a Level button once and then press the Next Choice button until the **Change IP Address?** screen is displayed.
- ___ 4. Press the Down a Level button. Select DHCP is displayed.
- ___ 5. Specify that the IP address is to be server-assigned, or enter a specific IP address.
 - To specify that the address is to be server-assigned, complete the following steps:
 - a. Press the Next Choice or Previous Choice button to toggle to ON, and press the Select button. The message Set DHCP to ON Now? is displayed.
 - b. Press the select button to confirm.
 - To enter a specific IP address, complete the following steps:
 - a. Press the Next Choice or Previous Choice button to toggle to OFF, and press the Select button. The message Set IP Address is displayed.
 - b. Press the Next Choice or Previous Choice button to scroll through the available characters for each position. Press the Down a Level or Up a Level button to change character positions. When the IP address that you want has been entered, press the Select button. The message Set Subnet Address is displayed.
 - c. Press the Next Choice or Previous Choice button to scroll through the available characters for each position. Press the Down a Level or Up a Level button to change character positions. When the Subnet address that you want has been entered, press the Select button. The message Set Gateway Address is displayed.
 - d. Press the Next Choice or Previous Choice button to scroll through the available characters for each position. Press the Down a Level or Up a Level button to change character positions. When the Gateway address that you want has been entered, press the Select button. The message Set DHCP Off and New IP Address Now? is displayed.
 - e. Press the select button to confirm.
- ___ 6. Press the Up a Level button until the Home screen is displayed.

Chapter 5. Using the media

The 87691VX Tape Autoloader uses data cartridges with VXA technology for saving and restoring system data. It only supports VXA X tape cartridges. If any other cartridge is inserted in the drive, it will be ejected.

Types of tape cartridges

The 87691VX Tape Autoloader supports the following media cartridges.

Data cartridge Use VXA data cartridges to save or restore programs or data.

Cleaning cartridge

Use a specially labeled cleaning cartridge to clean the 87691VX Tape Autoloader. For instructions for cleaning the 87691VX Tape Autoloader, see “Cleaning the tape drive” on page 36.

Attention: Use of other than IBM-supported VXA cleaning cartridges can damage your 87691VX Tape Autoloader and might void your warranty.

For a list of supported media, see
<http://www.ibm.com/pc/support/site.wss/document.do?lnocid=MIGR-39931>.

Guidelines for using tape cartridges

The following guidelines will help to protect your data and prolong the life of your tape cartridges and the 87691VX Tape Autoloader:

- Use only IBM-recommended tape cartridges.
- Remove the tape cartridge from the drive when the drive is not in use.
- Back up and then discard any tape cartridge that repeatedly produces error messages. (The error information is in the system error log.)
- On the tape cartridge, do not open the door that covers the tape. The door protects the tape from dirt, dust, and damage.
- Do not touch the tape. Any substance that is transferred to the tape by touching could cause loss of data.
- To avoid problems with loading and unloading, use only one label on a cartridge. Multiple or poorly placed labels can obstruct the drive load mechanism.
- Do not use poor-quality tape cartridges. They can cause excessive read or write errors, and might damage the tape drive.
- Discard any tape cartridges that are dropped, because the impact might damage the tape internally.
- Make sure that the environment is kept clean and constant. Do not operate the autoloader in a dusty environment, and always maintain a constant environment.

Attention:

1. Use only the recommended cleaning cartridge to clean the tape drive. Use of other than recommended cleaning cartridges can damage your drive and might void the warranty.
 2. Operating the autoloader outside of the recommended environment can result in possible loss of data or failure of the drive.
- Printers and copiers can produce paper and toner dust. Locate the autoloader away from these items. High-traffic areas near hallways and doors can also produce excess dust and dirt.
 - Record all important information on the tape label. Include information such as the model and number of the system or tape drive, the date, the density, any error statistics, and a log number. The operating environment and compression mode should also be noted.

Erasing a tape cartridge

Most bulk eraser devices do not have the capability to erase a tape cartridge. To properly erase a VXA tape cartridge with a bulk eraser device, the erasure coercivity rating must be a minimum of 4000 Oersted.

Storage and shipping tape cartridges

Before using a tape cartridge, let it acclimate to the operating environment by placing the cartridge in the operating environment for as long as it has been away from the environment or for 24 hours, whichever is less. (To determine the appropriate operating environment, see “Specifications” on page 3.)

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

Retrieve archived data on a tape unit that is clean and fully operational. Try to make the recovery environment the same as the operating environment. Let the tapes acclimate to the environment of the tape unit for at least 24 hours.

The recommended environment for storage and shipment of VXA data cartridges is shown in Table 3.

Table 3. Recommended environment for VXA data cartridges

| Environmental factor | Storage | Shipping |
|--------------------------------------|------------------------------|-------------------------------|
| Temperature | 5°C to 32°C (41° to 90°F) | -40 to 52°C (-40 to 125°F) |
| Relative humidity (noncondensing) | 20 to 60% | 5 to 80% |
| Maximum wet bulb | 26°C (79°F) | 26°C (79°F) |

Tape drives record data using densities that are similar to those of hard disk drives. Because most computer systems are not in a dust-free, climate-controlled environment, you must use special care when dealing with tape cartridges and tape drives.

Use the following guidelines for storing tape cartridges:

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

Operating in harsh environments

Do not use as an archival tape any tape that has been used outside of the operating ranges that are specified in Table 1 on page 3 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.

Attention: Do not operate the 87691VX Tape Autoloader in a poor air-quality environment. If your environment contains an excessive amount of particulates, contact your IBM service representative for more information.

Setting the write-protect switch

The position of the write-protect switch on the VXA tape cartridge determines when you can write to the tape (see Figure 16).

- When the switch is set to the left, data can be written to and read from the tape.
- When the switch is set to the right, data can only be read.

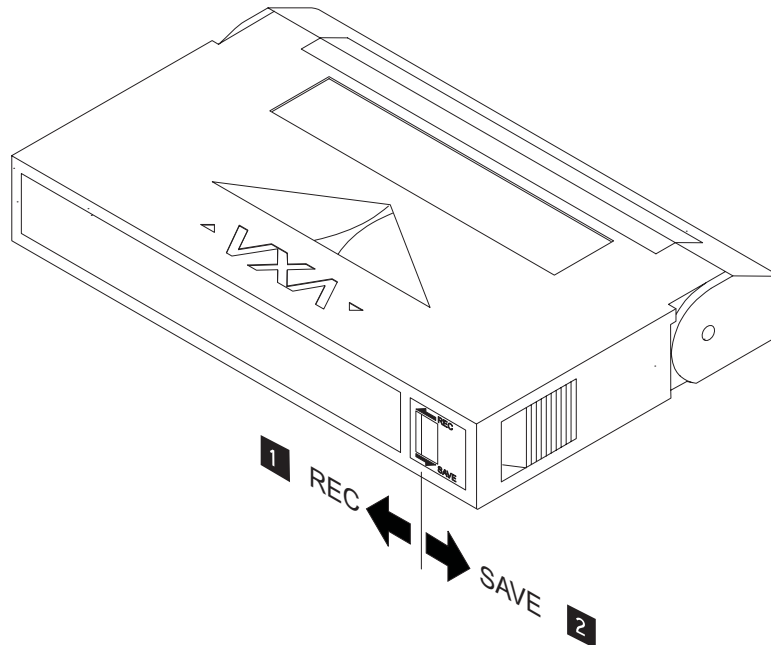


Figure 16. Setting the Write-protect switch

Placing the cartridge labels

Use care when you place the cartridge label on a VXA tape cartridge. Use the following guidelines for tape cartridge labels:

- Use only labels that are provided with the cartridge and place them only in the designated locations.
- IBM VXA tape cartridges come with labels adhered to them. Do not adhere a label on top of an existing label. Poorly placed or multiple labels can clog the drive mechanism.
- Place the larger label on the end of the cartridge in the designated area.
- Place the smaller label on the top of the cartridge in the designated area.

Attention: Use only IBM-supported tape cartridges and labels.

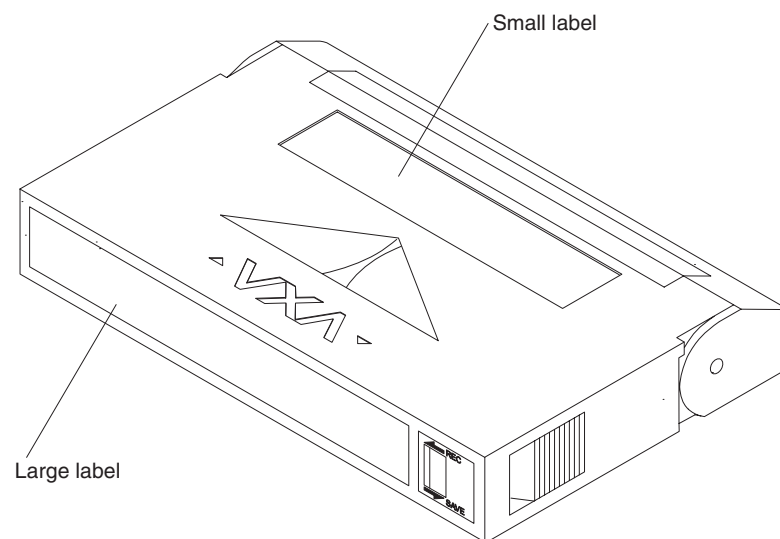


Figure 17. Placing the Tape Cartridge Labels

Importing and exporting cartridges in the autoloader

Use the operator panel and menus to import and export (load and unload) tape cartridges in the 87691VX Tape Autoloader. See “Using the operator panel” on page 21 for information about using the operator panel.

Note: To avoid problems with loading and unloading, use only one label in each label location on a cartridge. Multiple or poorly placed labels can obstruct the drive load mechanism.

Importing tape cartridges

To import cartridges, complete the following steps:

- 1. On the Home screen, press the Down a Level button to access the main menus.
- 2. Press the **Next** button to scroll through the menus until the *Choose a Command* menu is displayed.
- 3. Press the Down a Level button once.
- 4. Press the Next Choice button until the **Import Cartridge** screen is displayed.

- ___ 5. Press the Select button to display the cell selection display.
- ___ 6. Press the Next Choice or Previous Choice button to scroll through the available cartridge cells. When the cell number in which you want to install the cartridge is displayed, press the Select button. The autoloader positions the selected cell and the cartridge access door will open.
- ___ 7. Position the cartridge with the VXA logo up and the side with the bar code label and write-protect switch towards the cartridge access door.

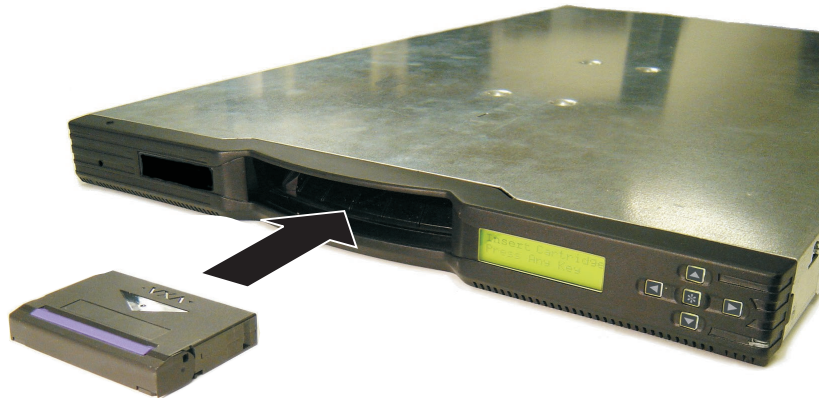


Figure 18. Inserting a tape cartridge

- ___ 8. Slide the cartridge fully through the access door until it snaps into place in the cartridge cell.
- ___ 9. Press the Select button. The cartridge access door closes. The autoloader checks for the presence of a cartridge in the specified cell and makes sure that the cartridge is seated correctly. The cell selection screen displays the next available cell number.
- ___ 10. Continue importing cartridges in the same manner until you have filled as many cells as you want.

Note: If you plan to store a cleaning cartridge in the autoloader, you must store it in cell 10.

- ___ 11. After you have finished importing cartridges, the autoloader automatically scans the affected cartridge cells to update its cartridge inventory. Press the Up a Level button to return to the **Choose a Command** menu.

Exporting tape cartridges

To remove (export) tape cartridges from the autoloader, complete the following steps:

- ___ 1. On the Home screen, press the Down a Level button to access the main menus.
- ___ 2. Press the Next Choice button to scroll through the menus until the **Choose a Command** menu is displayed.
- ___ 3. Press the Down a Level button once.
- ___ 4. Press the Next Choice button until the **Export Cartridge** screen is displayed.
- ___ 5. Press the Select button to display the cell selection screen.
- ___ 6. Press the Next Choice or Previous Choice button to scroll through the available cartridge cells. When the cell number from which you want to

- remove the cartridge is displayed, press the Select button. The autoloader positions the selected cell, and the cartridge access door opens.
- ___ 7. Remove the tape cartridge.
 - ___ 8. Press the Select button. The cartridge access door closes. The autoloader checks for the presence of a cartridge in the specified cell. The cell selection screen displays the next available cell number.
 - ___ 9. Continue exporting cartridges in the same manner until you have removed as many cartridges as you want.
 - ___ 10. After you have finished exporting cartridges, the autoloader automatically scans the affected cartridge cells to update its cartridge inventory. Press the Up a Level button to return to the **Choose a Command** menu.

Loading and unloading cartridges in the tape drive

Use the following instructions to load and unload tape cartridges from the autoloader tape drive.

Note: To avoid problems with loading and unloading, use only one label in each label position on a cartridge. Multiple or poorly placed labels can obstruct the drive load mechanism.

Loading tape cartridges

To load cartridges, complete the following steps:

- ___ 1. On the Home screen, press the Down a Level button to access the main menus.
- ___ 2. Press the Next Choice button to scroll through the menus until the **Choose a Command** menu is displayed.
- ___ 3. Press the Down a Level button once.
- ___ 4. Press the Next Choice button until the **Load Drive** screen is displayed.
- ___ 5. Press the Select button to display the cell selection screen.
- ___ 6. Press the Next Choice or Previous Choice button to scroll through the available cartridge cells. When the cell number from which you want to load the cartridge is displayed, press the Select button. The autoloader positions the selected cell and the cartridge is loaded into the drive. A series of status messages is displayed as the operation proceeds. The **Choose a Command** menu is displayed when the operation is complete.

Unloading tape cartridges

To remove tape cartridges from the autoloader tape drive, complete the following steps:

- ___ 1. On the Home screen, press the Down a Level button to access the main menus.
- ___ 2. Press the Next Choice button to scroll through the menus until the **Choose a Command** menu is displayed.
- ___ 3. Press the Down a Level button once.
- ___ 4. Press the Next Choice button until the **Unload Cartridge** screen is displayed.
- ___ 5. Press the Select button to display the cell selection screen.
- ___ 6. Press the Next Choice or Previous Choice button to scroll through the available cartridge cells. When the cell number into which you want to store the cartridge removed from the drive is displayed, press the Select button. The autoloader positions the selected cell and the drive will unload the

cartridge into the cell. A series of status messages is displayed as the operation proceeds. The **Choose a Command** menu is displayed when the operation is complete.

Cleaning the tape drive

Regular cleaning helps maintain optimal performance of the tape drive and maximizes the life of your VXA tape cartridges. The tape drive monitors its cleaning needs internally and notifies the autoloader when it requires cleaning (after approximately every 75 hours of tape motion). The tape drive can also notify your software application when it requires cleaning if your application supports this feature.

You can clean the tape drive in any of the following ways:

- **Use the Autoclean function.** Set up automatic tape drive cleaning when you configure the autoloader, and store a cleaning cartridge in the autoloader. When the tape drive notifies the autoloader that it requires cleaning, the autoloader loads the cleaning cartridge into the tape drive, waits until the cleaning is finished, unloads the cleaning cartridge, returns it to its cell, and resumes normal operation. Enable the autoclean function by using the **Change Autoclean** menu under the **Change Configuration** main menu.
- **Use the Clean Drive option from the operator panel.** Use the **Clean Drive** option and a cleaning cartridge that is stored in the autoloader to clean the tape drive when the autoloader or software notifies you to do so. When you select the **Clean Drive** option, the autoloader loads the cleaning cartridge into the tape drive, waits until the cleaning is finished, unloads the cleaning cartridge, returns it to its cell, and resumes normal operation. For instruction for using this method, see “Cleaning the drive by using the Clean Drive option.”
- **Insert a cleaning cartridge through the Cartridge Access Door.** Use the **Import Cartridge and Load Drive** options to insert a cleaning cartridge and load it into the tape drive when the autoloader or software notifies you to do so. After the cleaning is finished, use the **Unload Cartridge** and **Export Cartridge** options to remove the cleaning cartridge. For instruction for using this method, see “Cleaning the drive by loading a cleaning cartridge” on page 37.

Note: If you are using all 10 cells in the autoloader for data cartridges, you will need to remove a data cartridge to make room for the cleaning cartridge.

Clean the tape drive whenever the autoloader displays the Clean Drive message on the Home screen or whenever your application software notifies you. (Not all software applications display cleaning requirements.)

Cleaning the drive by using the Clean Drive option

Make sure that the following tasks have been completed before you use the **Clean Drive** option:

- Install a cleaning cartridge in cell 10.
- Activate the cleaning cartridge cell, which designates cell 10 as the storage location for the cleaning cartridge.
- Disable the Autoclean function.

To clean the tape drive, complete the following steps:

- 1. On the Home screen, press the Down a Level button to access the main menus.

- ___ 2. Press the Next Choice button to scroll through the menus until the **Choose a Command** menu is displayed.
- ___ 3. Press the Down a Level button once.
- ___ 4. Press the Next Choice button until the **Clean Drive?** screen is displayed.
- ___ 5. Press the Select button. The confirmation message Start Cleaning Drive Now? is displayed.

Note: If cell 10 is empty, you are prompted to insert a cleaning cartridge. Follow the instructions to insert a cleaning cartridge. If you have not activated cell 10, an error message is displayed. Activate the cleaning cell and begin the cleaning process again.

- ___ 6. Press the Select button to begin the cleaning process. When the cleaning operation is completed, the drive ejects the cleaning cartridge, and it is stored in cell 10.
- ___ 7. Confirm that the cleaning was completed successfully by looking at the operator screen. If there is no message, the cleaning was successful. If the cleaning was not successful, a message that explains the failure is displayed. You might be prompted to insert a new cleaning cartridge.

Attention: Cleaning cartridges can be used for only 20 cleaning procedures. If you attempt to use a depleted cleaning cartridge, the drive detects the error and immediately ejects the cartridge. Do not attempt to rewind the cartridge and reuse it. This can cause debris to be deposited back onto the drive heads, causing damage and errors.

Cleaning the drive by loading a cleaning cartridge

Complete the following steps if you do not want to store a cleaning cartridge in the 87691VX Tape Autoloader.

Note: Before you insert a cleaning cartridge through the cartridge access door, make sure that you have disabled the Autoclean function.

- ___ 1. If data cartridges are in all 10 cells, use the **Export Cartridge** option to remove a cartridge from the autoloader (see “Exporting tape cartridges” on page 34). Before you press a button to close the door, insert the cleaning cartridge. Then, press the Select button.

Note: If you do not have to export a cartridge to make room for the cleaning cartridge, use the **Import Cartridge** option to insert the cleaning cartridge into the autoloader (see “Importing tape cartridges” on page 33.)

- ___ 2. On the Home screen, press the Down a Level button to access the main menus.
- ___ 3. Press the Next Choice button to scroll through the menus until the **Choose a Command** menu is displayed.
- ___ 4. Press the Down a Level button once.
- ___ 5. Press the Next Choice button until the **Load Drive** screen is displayed.
- ___ 6. Press the Select button to display the cell selection screen.
- ___ 7. Press the Next Choice or Previous Choice button to scroll through the available cartridge cells. When the cell number that contains the cleaning cartridge is displayed, press the Select button. The autoloader positions the selected cell and the cleaning cartridge is loaded into the drive. The tape drive automatically performs the cleaning and ejects the cartridge when the cleaning operation is completed. Confirm that the cleaning completed

successfully by looking at the operator screen. If there is no message, the cleaning operation was successful. If the cleaning was not successful, a message that explains the failure is displayed. You might be prompted to insert a new cleaning cartridge.

- ___ 8. Use the **Unload Drive** option to return the cleaning cartridge to its cell.
- ___ 9. Use the **Export Cartridge** option to remove the cleaning cartridge from the autoloader. Before you press a button to close the door, insert the data cartridge that you removed previously (if applicable). Then, press the Select button.

Chapter 6. Maintaining the 87691VX Tape Autoloader

This chapter describes autoloader maintenance tasks that you can perform on-site without the aid of a service technician. It also describes troubleshooting procedures to help you solve autoloader problems without service assistance.

Using the repair identification (RID) tag

An RID tag maintains the original serial number record of your 87691VX Tape Autoloader and is used by IBM to entitle the device to future warranty service. If the autoloader is replaced, you must retain the serial number of the original device to use the warranty.

To retain the serial number, complete the following steps:

1. Locate the RID tag that is included in the autoloader CRU package.
2. Read the instructions for the RID tag.
3. Copy the serial number from the original 87691VX Tape Autoloader onto the RID tag.
4. Attach the RID tag to the replacement 87691VX Tape Autoloader in an appropriate location.

Handling static-sensitive devices

Attention: Static electricity can damage the tape drive and other electronic devices. To avoid damage, keep static-sensitive devices in their static-protective packages until you are ready to install them.

To reduce the possibility of damage from electrostatic discharge, observe the following precautions:

- Limit your movement. Movement can cause static electricity to build up around you.
- The use of a grounding system is recommended. For example, wear an electrostatic-discharge wrist strap, if one is available.
- Handle the device carefully, holding it by its edges or its frame.
- Do not touch solder joints, pins, or exposed circuitry.
- Do not leave the device where others can handle and damage it.
- Remove the device from its package and install it directly into the autoloader without setting down the device. If it is necessary to set down the device, put it back into its static-protective package. Do not place the device on the autoloader cover or on a metal surface.
- Take additional care when handling devices during cold weather. Heating reduces indoor humidity and increases static electricity.

Removing tape cartridges manually

If you have to remove cartridges from the autoloader when power is unavailable, either due to a general power failure or a failure of the autoloader power supply, you can operate the cartridge access door manually. The autoloader has a small hole in the front bezel that provides access to a gear shaft attached to the cartridge access door. Using a small Phillips screwdriver, you can turn the gear shaft to open the cartridge access door.

If a cartridge is loaded in the tape drive when power to the autoloader fails and must remove that cartridge, you must remove the tape drive from the autoloader.

Attention: Electrical current from power, telephone, and communication cables is hazardous. See “Safety” on page v for more information.

For security, you can block access to the gear shaft from the hole in the front of the faceplate. A screw that is accessible from the hole in the top of the faceplate (see Figure 19) can be lowered in front of the gear shaft. To lower this screw, use a small Phillips screwdriver to turn the screw clockwise until it blocks access to the gear shaft.

To remove cartridges from the autoloader without power, complete the following steps:

- ___ 1. Carefully insert a small Phillips screwdriver into the top access hole (see Figure 19) on the top front of the autoloader. Unscrew the security blocking screw.
- ___ 2. Carefully insert a small Phillips screwdriver into the bottom access hole (see Figure 19) on the front of the autoloader. Make sure that the screwdriver engages the head of the gear shaft.

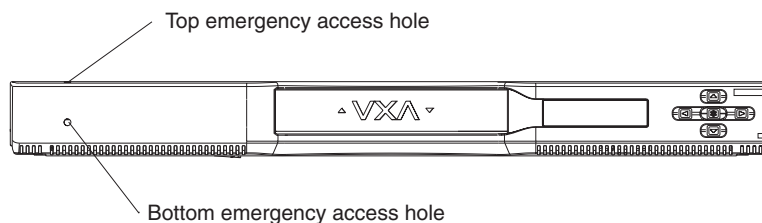


Figure 19. Access hole locations

- ___ 3. Turn the gear shaft counterclockwise to open the cartridge access door.
- ___ 4. When the door is fully open, you can remove cartridges by hand from the autoloader. To move cartridge cells into position in front of the door, gently rotate the cartridge carousel with your fingers.

Reach inside the door and gently rotate the carousel toward the left or right to access tapes in the remaining cells. If the carousel binds or will not move freely, a cartridge might be incorrectly seated in one of the cells. An incorrectly seated cartridge can be resolved only by a service call or a replacement unit.

- ___ 5. When you are finished removing cartridges from the autoloader, close the cartridge access door by turning the gear shaft clockwise.

Resetting the autoloader

If the autoloader is not operating correctly, you might have to reset it. To reset the autoloader, complete the following steps

- 1. On the Home screen, press the Down a Level button to access the main menus.
- 2. Press the Next Choice button to scroll through the menus until the **Perform a Diagnostic** menu is displayed.
- 3. Press the Down a Level button once.
- 4. Press the Next Choice button until the **Reset library?** screen is displayed.
- 5. Press the Select button. The confirmation message Reset the LIBRARY Now? is displayed.
- 6. Press the Select button to begin the library reset process. The autoloader resets and performs a cartridge inventory. When the process is complete, the Home screen is displayed.

Updating firmware and creating diagnostic logs using FTP

You can use the optional autoloader Ethernet connection and the file transfer protocol (FTP) utility to upgrade the autoloader firmware. You must have the following hardware and software to use this utility:

- A Category 5 (100BaseT connection) data-grade cable
- Software that supports the FTP utility (RFC 959)
- A host system or network connection that uses a pin-through-hole RJ-45 shielded Ethernet connector

Updating firmware

To update the firmware using FTP, complete the following steps:

1. Ensure that the autoloader Ethernet cable is connected and that it is configured to use the Ethernet. See Chapter 3, “Installing and setting up the 87691VX Tape Autoloader,” on page 15 for more information.
2. Download the latest autoloader firmware or Ethernet firmware from <http://www.ibm.com/pc/support/site.wss/document.do?Indocid=TAPE-FILES>.
3. From the host system, start the FTP utility.
4. Log on to FTP. The default user name is anonymous and the default password is IBM. The user name and password are case-sensitive.
5. Ensure that the FTP file transfer type is set to binary.
6. Enter the following command: `is`. The following information is displayed:

Table 4. Autoloader file description

| Autoloader file | Description |
|--------------------------------------|-------------------------------|
| packetloader.bin or packetloader.img | Autoloader firmware files |
| enet_APP.s19 or enet.hex | Ethernet module firmware file |

7. Rename the firmware files that you downloaded in step 2 to match the names of the files you are replacing.
8. Enter the following command: `put xxxxxxxx.xxx`; where `xxxxxxx.xxx` is the file you replacing.

Note: The put command is a common FTP command; however, your FTP utility might not use the put command. Use the command for your FTP utility that functions the same as the put command.

Creating diagnostic logs

To create a diagnostic log, complete the following steps:

1. Ensure that the autoloader Ethernet cable is connected and that it is configured to use the Ethernet. See Chapter 3, “Installing and setting up the 87691VX Tape Autoloader,” on page 15 for more information.
2. From the host system, start the FTP utility.
3. Log on to FTP. The default user name is anonymous and the default password is IBM. The user name and password are case-sensitive.
4. Ensure that the FTP file transfer type is set to binary.
5. Enter the following command: `get libdump.bin`

Solving problems

This section provides information for solving problems that might occur when you are installing and operating the autoloader. “Troubleshooting hints” provides a list of potential problems and solutions. “Maintenance analysis procedures” on page 44 provides detailed troubleshooting information.

Troubleshooting hints

This section provides a list of problems and suggested solutions. If the information in this section does not solve your problem, see “Maintenance analysis procedures” on page 44.

Installation problems

If the autoloader and application software are not communicating after installation, check the following possible causes:

Power

Make sure that the autoloader power cord is inserted correctly, and that the power switch is on. Make sure that the host computer system is turned on.

SCSI IDs (SCSI autoloader)

Make sure that the SCSI IDs that you selected for the autoloader and tape drive are not the same as the IDs that are used by any other devices on the SCSI bus, including the SCSI adapter.

SCSI connections (SCSI autoloader)

Make sure that you have securely connected the SCSI cables and terminator to the SCSI connectors on the back of the autoloader. Make sure that the SCSI connections to the host computer and other devices on the bus are also secure.

LVD SCSI devices (SCSI autoloader)

Because the autoloader is a low-voltage differential (LVD) device, all other devices on the SCSI bus should also be LVD. These devices include the controller cards, cables, terminators, and any other devices on the bus. Do not mix LVD and high voltage differential (HVD) devices on the same bus.

SCSI cable lengths (SCSI autoloader)

Make sure that the cabling for the SCSI bus that is attached to the autoloader does not exceed the maximum length restriction.

Termination (SCSI autoloader)

Make sure that the SCSI bus is correctly terminated. If another device previously terminated the SCSI bus and is no longer at the physical end of the bus, be sure to remove the terminator from that device.

Compatibility

Make sure that the autoloader and tape drive are compatible with the SCSI adapter and application software that you plan to use.

Host adapter installation

Make sure that your host adapter is correctly installed. See the documentation that came with your adapter for installation and troubleshooting instructions. Pay special attention to instructions for setting various jumpers and switches on the adapter. Make sure that the adapter is correctly seated.

Software installation

Make sure that the application software is installed correctly. (See your software documentation.) Pay special attention to instructions that describe how to configure the software for use with the autoloader and tape drive.

Control mode

Make sure that the control mode is set correctly. Use SCSI mode (the default) with an application that controls the autoloader. Use Sequential mode only if you do not plan to use autoloader software. In Sequential mode, the autoloader automatically processes cartridges in sequential order without direction from an application.

Autoloader operation problems

If the autoloader has been working correctly, but is now malfunctioning, check the following:

Control mode

If you are using application software to control the autoloader, make sure that the control mode is set to SCSI. Use Sequential mode only if you are not using autoloader software.

Hardware operation

Use the options in the **Diagnostics** menu to check specific autoloader functions.

Firmware level

Make sure that the autoloader and tape drive contain the latest versions of firmware.

Tape drive problems

If the application software and autoloader have been working correctly, but are now having problems reading and writing data, check the following possible causes:

Write-protect switch

If you are writing data, make sure that the cartridge is write-enabled.

Cartridge type

Use the correct cartridges for your tape drive. See Chapter 5, "Using the media," on page 29 for information about selecting cartridges.

Cartridge age

If the cartridge has been in use for a long time or if it has been used frequently, try using a new cartridge.

Cleaning

Clean the tape drive as described in “Cleaning the tape drive” on page 36.

Maintenance analysis procedures

This section provides step-by-step procedures for isolating problems with the 87691VX Tape Autoloader.

Purpose of the MAPs

Use the maintenance analysis procedures (MAPs) to check the following items:

| | | |
|--------------|-------------------------|------------|
| Power cable | SCSI address | Tape drive |
| Power supply | SCSI bus (signal) cable | Fan |
| Terminator | Configuration | Drive head |

If a problem is detected, the procedure isolates the problem to the customer replaceable unit (CRU), either the taped drive or the autoloader. For instructions for removing and replacing a CRU, see “Removal and replacement procedures” on page 47.

Step 1: Power and fan

To determine whether the power and the fan are operating correctly, complete the following steps:

Attention: Electrical current from power, telephone, and communication cables is hazardous. See “Safety” on page v for more information.

1. Make sure that the 87691VX Tape Autoloader power cable is connected to an electrical outlet.
2. Make sure that the LCD screen is on and there is air flow from the fan at the rear of the unit.

Is the LCD screen on and is there airflow from the fan?

NO While watching for the LED screen to turn on, turn the power switch off and back on again. Repeat this procedure several times. If the status LED fails to come on or if there is no airflow from the fan, call IBM service.

YES Go to Step 3: Cooling fan.

Step 2: Power cable

This step determines whether the power cable is functional.

Make sure that all of the conductors in the power cable have continuity and that there are no short circuits.

Does the power cable have continuity and are there no short circuits?

NO Replace the power cable.

YES Call IBM service.

Step 3: Cooling fan

If the fan is not operating correctly, the autoloader might be overheating. To check the cooling fan, complete the following steps:

1. Press the power switch to turn off the power.
2. Press the power switch to turn on the power.
3. Observe the cooling fan, which is mounted to the back of the internal chassis. Make sure that the airflow is not impeded and that the fan operates correctly, providing good airflow.

Does the LCD screen turn on and stay on, and is there airflow from the fan?

NO The cooling fan is faulty. Replace the autoloader unit.

YES Go to Step 4: Tape drive.

Step 4: Tape drive

To determine whether the tape drive is the problem, complete the following steps:

1. Press the power switch to turn off the power.
2. Press the power switch to turn on the power.
3. Listen to and observe the installed tape drive. Make sure that it is functioning and not emitting abnormal noises.

Does the drive power-on appear to operate normally?

NO Turn off the 87691VX Tape Autoloader and then replace the drive. See "Replacing the autoloader tape drive" on page 47.

Note: If a cartridge is still in the drive that you are replacing, you can remove it manually. See "Removing tape cartridges manually" on page 40.

YES Go to Step 5: SCSI address.

Step 5: SCSI address

Make sure that the SCSI address setting is correct.

Is the SCSI address set correctly?

NO Set the SCSI address to the correct address and then go to Step 6: External SCSI cable connection. To set the SCSI address, see the instructions in "Step 4. Setting the SCSI address" on page 17.

Note: Turn the power to the 87691VX Tape Autoloader off and then back on again to ensure the SCSI address setting is recognized.

YES Go to Step 6: External SCSI cable connection.

Step 6: External SCSI cable connection

Make sure that the SCSI bus cable is correctly connected to the system unit and to the 87691VX Tape Autoloader.

Is the SCSI bus cable correctly connected to the system unit and to the 87691VX Tape Autoloader?

NO Connect the SCSI bus cable into the system unit and to the 87691VX Tape Autoloader, then go to Step 7: Terminator connection.

YES Go to Step 7: Terminator connection.

Step 7: Terminator connection

Make sure that the terminator is correctly connected to the last device on the SCSI bus.

Is the terminator correctly connected to the last device on the SCSI bus?

NO Connect the terminator to the last device on the SCSI bus, and then go to Step 8: Configuration.

YES Go to Step 8: Configuration.

Step 8: Configuration

Verify that the 87691VX Tape Autoloader has been correctly configured to the host system. For more information, see Chapter 3, "Installing and setting up the 87691VX Tape Autoloader," on page 15.

Is the 87691VX Tape Autoloader correctly configured to the host system?

NO Correct the configuration.

YES Go to Step 9: Diagnostics.

Step 9: Diagnostics

This step runs the diagnostics to determine the problem. Run the diagnostics on the 87691VX Tape Autoloader from the command prompt by entering : diag at the host system command prompt. For additional information about running diagnostics, see your system documentation.

Do all of the diagnostics routines pass?

NO Replace the CRU isolated by the diagnostics and identified by the service request number.

Note: If the tape drive is the CRU that was isolated by the diagnostics, check that the cable on the back of the tape drive is connected correctly. If the drive has recently been replaced because of a similar problem, contact IBM service.

YES If no problem was identified, the problem may be intermittent, related to the tape quality, or relating to the environment. If a CRU was replaced or changed and no more errors occur, the problem is fixed.

Step 10: Operation retry

Clean the tape drive (see "Cleaning the tape drive" on page 36). Then, attempt the failing operation again.

Does the 87691VX Tape Autoloader perform the failing operation correctly?

NO Replace the 87691VX Tape Autoloader.

YES Cleaning the 87691VX Tape Autoloader corrected the problem.

CRU list

This section lists the customer replaceable units (CRUs) that can be replaced.

Table 5.

| CRU part number | Description | Tier |
|-----------------|--------------------------|--------|
| 39M3640 | Tape drive | Tier 1 |
| 40K2556 | 87691VX Tape Autoloader | Tier 1 |
| 01K6484 | External SCSI cable | Tier 1 |
| 3510145 | External SCSI terminator | Tier 1 |
| 6952300 | US power cord | Tier 1 |
| 36L8861 | PDU power cord | Tier 1 |
| 42C3911 | Rack mounting rails | Tier 1 |

Removal and replacement procedures

If you are instructed to return a device or component, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Replacing the autoloader tape drive

This section describes how to replace the autoloader tape drive.

Note: If your autoloader is installed in a rack, it is not necessary to remove the autoloader from the rack to replace the tape drive. It is also not necessary to disconnect the SCSI cable, terminator, or Ethernet cable from the back of the autoloader if they do not interfere with your access to the tape drive.

Removing a tape drive

To remove the tape drive, complete the following steps:

- ___ 1. Make sure that the environment is free of conditions that could cause electrostatic discharge (ESD). If possible, use an antistatic mat and a grounded static protection wristband during installation. If a mat and wristband are not available, touch a known grounded surface, such as a metal computer chassis.
- ___ 2. Turn off the autoloader and disconnect the power cord.

Attention: Electrical current from power, telephone, and communication cables is hazardous. See "Safety" on page v for more information.

- ___ 3. Locate the tape drive cover plate at the back of the autoloader.
- ___ 4. Using a #1 Phillips screwdriver, remove the two screws that secure the cover plate (see Figure 20 on page 48). Set the cover plate and screws aside.

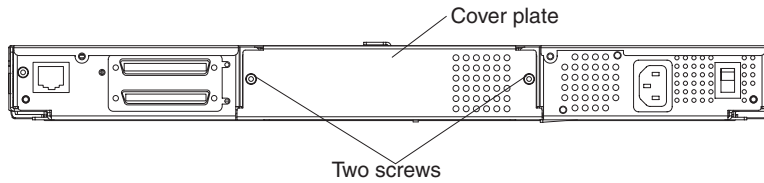


Figure 20. Removing the tape drive cover plate

- 5. Disconnect the power cable, SCSI cable, and serial cable from the tape drive. Route the cables downward and away from the sides of the tape drive.

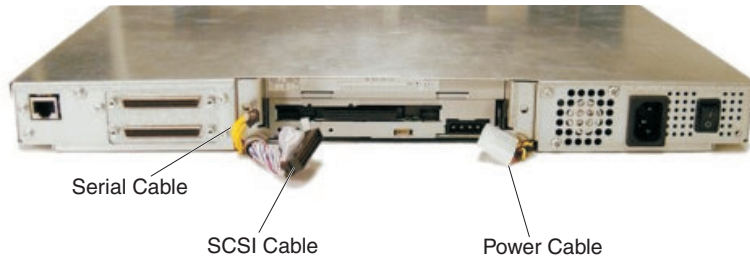


Figure 21. Disconnecting the tape drive cables

- 6. Pull on the tabs on the tape drive brackets and slide the tape drive out of the autoloader.

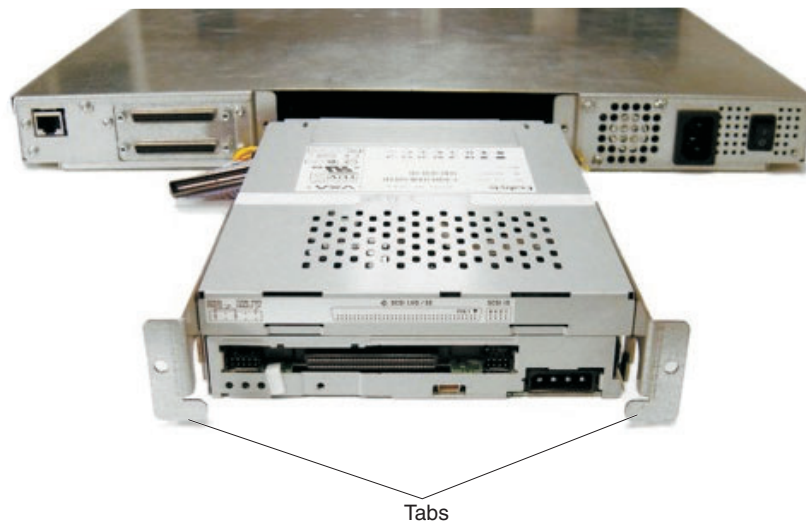


Figure 22. Removing the tape drive from the autoloader

- 7. Using a #1 Phillips screwdriver, remove the two screws from each of the brackets that are attached to the tape drive (see Figure 23 on page 49). Save the brackets and screws. You will attach the brackets to the new tape drive.

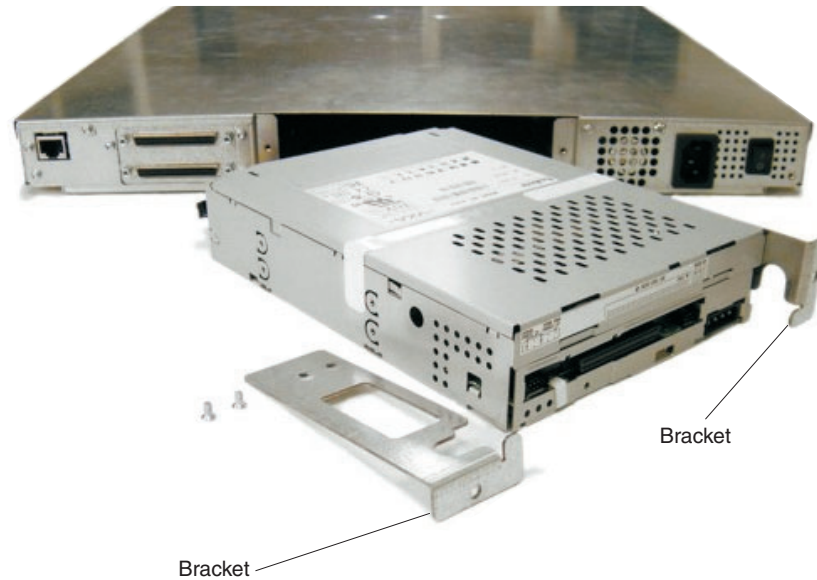


Figure 23. Removing the tape drive mounting brackets

Installing a tape drive

To install the tape drive, complete the following steps:

- ___ 1. If your new tape drive has a bezel attached, remove the bezel before you install the tape drive in the autoloader:
 - To remove the bezel:
 - a. Using a small flat-blade screwdriver, push the bezel side catch tabs on each side of the tape drive inward until they clear the metal tabs attached to the tape drive chassis.
 - b. With the bezel side catch tabs clear of the metal tabs that are on the tape drive chassis, rotate the bottom of the bezel out and up from the front of the drive.
 - c. Disengage the upper tabs from the top of the tape drive chassis and lift the bezel up and away from the drive.
- ___ 2. Place the tape drive right side up (check the labels on the tape drive). Place the brackets you removed from the original tape drive on the new tape drive and attach them, using the two screws for each bracket.
- ___ 3. With the tape drive right side up, slide the tape drive into the autoloader until the bracket flanges rest against the flanges on the autoloader back panel.
- ___ 4. Connect the serial cable to the tape drive. The connector is keyed to ensure the correct orientation.

Note: Before you connect the SCSI cable in the following step, make sure that none of the pins on the SCSI cable are bent.

- ___ 5. Connect the SCSI cable and power cable. The connectors are keyed to ensure the correct orientation.
- ___ 6. Route the cables into the notch in each bracket, and make sure that the cables do not hang below the tape drive. Make sure that the serial cable is not pinched between the SCSI cable and the side of the notch.

- ___ 7. Place the tape drive cover plate on the autoloader back panel. Make sure that the cables are not pinched by the cover plate. Insert and tighten the two screws.

Replacing the autoloader

This section describes how to replace the autoloader.

Removing the autoloader

To remove the tape drive, complete the following steps:

- ___ 1. Make sure that the environment is free of conditions that could cause electrostatic discharge (ESD). If possible, use an antistatic mat and a grounded static protection wristband during installation. If a mat and wristband are not available, touch a known grounded surface, such as a metal computer chassis.

Attention: Electrical current from power, telephone, and communication cables is hazardous. See “Safety” on page v for more information.

- ___ 2. Turn off the autoloader and disconnect the power cord.
- ___ 3. Disconnect the SCSI cable, SCSI terminator, and Ethernet cable from the back of the autoloader.
- ___ 4. Remove the autoloader from the rack.
- ___ 5. Locate the tape drive cover plate at the back of the autoloader.
- ___ 6. Using a #1 Phillips screwdriver, remove the two screws securing the cover plate (see Figure 24). Set the cover plate and screws aside.

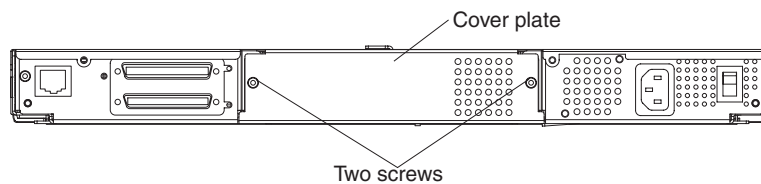


Figure 24. Removing the tape drive cover plate

- ___ 7. Disconnect the power cable, SCSI cable, and serial cable from the tape drive. Route the cables downward and away from the sides of the tape drive.

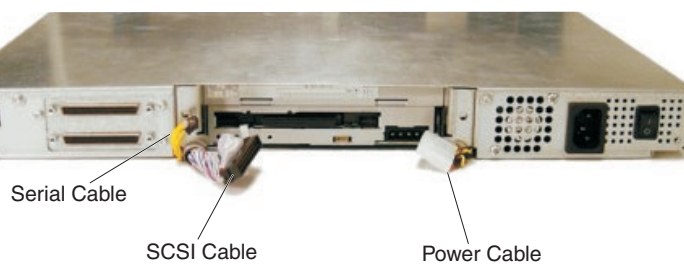


Figure 25. Disconnecting the tape drive cables

- ___ 8. Pull on the tabs on the tape drive brackets and slide the tape drive out of the autoloader.

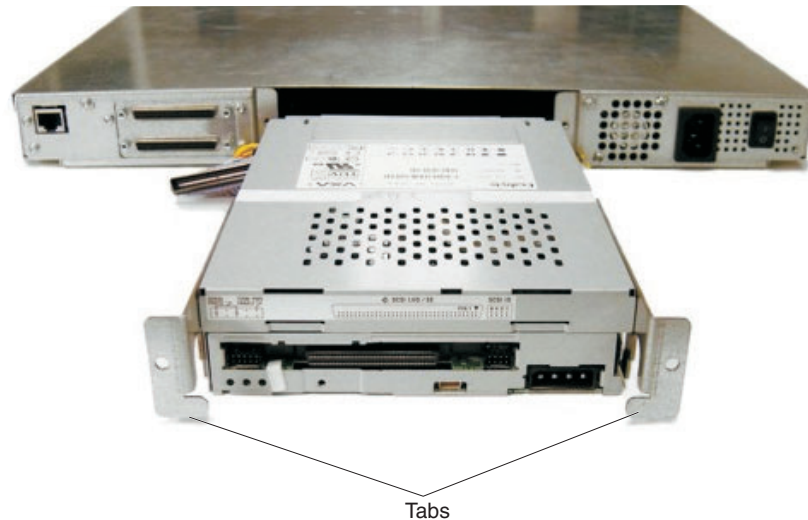


Figure 26. Removing the tape drive from the autoloader

Installing the autoloader

To install the autoloader, complete the following steps:

- ___ 1. With the tape drive right side up, slide the tape drive into the autoloader until the bracket flanges rest against the flanges on the autoloader back panel.
- ___ 2. Install the autoloader in the rack.
- ___ 3. Connect the serial cable to the tape drive. The connector is keyed to ensure the correct orientation.

Note: Before you connect the SCSI cable in the following step, make sure that none of the pins on the SCSI cable are bent.

- ___ 4. Connect the SCSI cable and power cable to the tape drive. The connectors are keyed to ensure the correct orientation.
- ___ 5. Route the cables into the notch in each bracket, and make sure that the cables do not hang below the tape drive. Make sure that the serial cable is not pinched between the SCSI cable and the side of the notch.
- ___ 6. Place the tape drive cover plate on the autoloader back panel. Make sure that the cables are not pinched by the cover plate. Insert and tighten the two screws.
- ___ 7. Connect the SCSI cable, SCSI terminator, Ethernet cable, and power cable to the autoloader.

Manually Removing a Tape Cartridge

This section provides information about manually removing a tape cartridge.

Attention: This procedure might damage your tape cartridge, the 87691VX Tape Autoloader, or both. Use this procedure only after you have attempted the following tasks:

- Eject the cartridge by performing the cartridge unload procedure using the operator panel and display screen menus.
 - Turn the power to the 87691VX Tape Autoloader off and on again to clear potential hang conditions.
 - If available, issue the Unload SCSI command from your system command menu.
 - Disconnect the 87691VX Tape Autoloader from the system, and turn the power to the 87691VX Tape Autoloader on and off again several times.
1. Remove the drive from the 87691VX Tape Autoloader (see “Replacing the autoloader tape drive” on page 47).

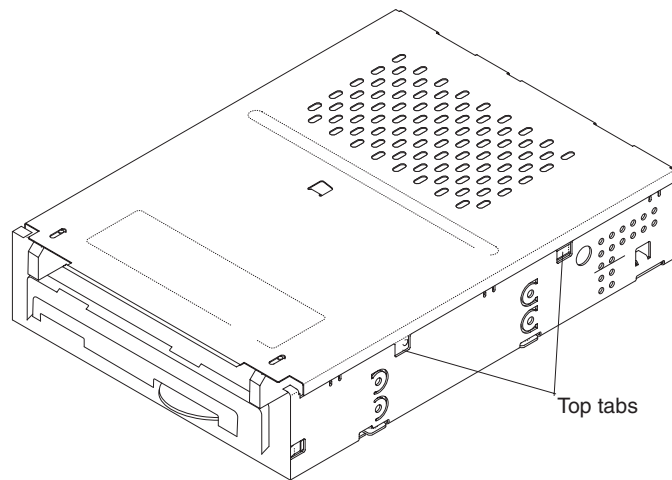


Figure 27. Removing the top cover from the drive

2. To remove the top cover of the drive mechanism, complete the following steps:
 - a. Use a small screwdriver to press the top tabs (see Figure 27) on each side of the drive.
 - b. Slide the cover approximately 5 mm to the rear, and then lift off the cover.
3. Locate the large thumb wheel that is located below the right side of the data cartridge.
4. Gently rotate the thumb wheel (see Figure 28 on page 53) counterclockwise to remove slack from the tape by winding the media onto the take-up reel.
5. Insert a Phillips head screwdriver in the load motor access hole (see Figure 28 on page 53). Rotate the load motor clockwise to unwind the tape path. Unwind the mechanism until tape slack appears.

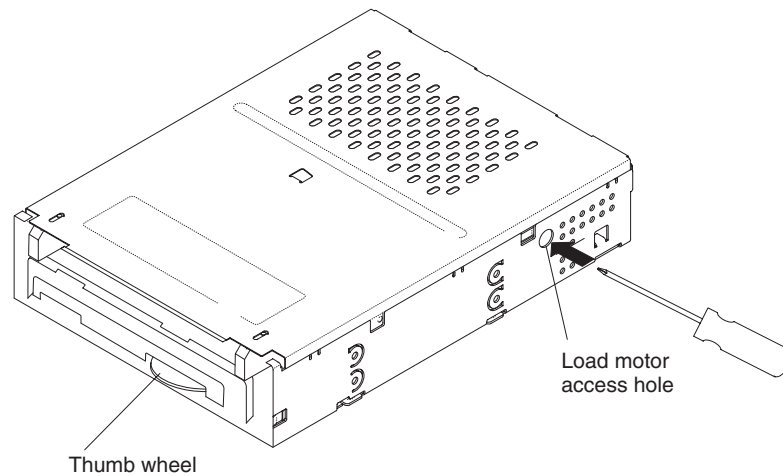


Figure 28. Turning the load motor to release the cartridge

6. Gently rotate the thumb wheel again to remove the slack from the tape by winding the media onto the take-up reel.
7. Repeat steps 5 on page 52 and 6 until all of the tape media is wound onto the cartridge take-up wheel.
8. When the tape is completely rewound into the cartridge, turn the load motor clockwise until the tape cartridge is lifted out of the drive mechanism and ejected.
9. Remove the tape cartridge and attach the top cover.

Chapter 7. Using the Remote Management utility

You can use the Remote Management utility to perform the following tasks:

- View information about the autoloader
- Configure the autoloader and Ethernet connection (see “Setting configuration options” on page 57)
- View autoloader statistics (see “Viewing statistics” on page 60)
- Run diagnostics (see “Running diagnostics” on page 61)

To access the Remote Management Utility, complete the following steps:

1. Make sure that the autoloader is connected to an Ethernet network, and that it is correctly configured.
2. Make sure that the autoloader is turned on.
3. Open a Web browser and enter the IP address of the autoloader in the following format:`http://IPADDRESS`. The Remote Management Utility home page is displayed.

The Remote Management Utility home page displays information in the following sections:

- Library information
- Library status (see Table 7)
- Tape drive status (see Table 8 on page 56)
- Inventory information (see Table 9 on page 56)

Note: The term *library* is synonymous with the term autoloader.

Table 6 provides a description of the information that is provided in the library information section.

Table 6. Library information

| Information | Description |
|-------------------|---|
| Vendor | Indicates the vendor identification value of the autoloader and tape drive. |
| Product | Indicates the product identification value of the autoloader and tape drive. |
| Serial number | Indicates the serial number of the autoloader of the autoloader and tape drive. |
| Firmware revision | Indicates the firmware level of the autoloader and tape drive. |
| SCSI ID | Indicates the SCSI ID of the autoloader and tape drive. |

Table 7 provides a description of the information that is provided in the Library Status information section.

Table 7. Library status information

| Information | Description |
|--------------------|--|
| Robot control mode | Indicates the current operating mode of the autoloader. (random or sequential) |

Table 7. Library status information (continued)

| Information | Description |
|----------------------|--|
| Door open sensor | Indicates the current reading of the door open sensor of the cartridge access door: <ul style="list-style-type: none"> • 1: Door completely open • 0: Door not completely open |
| Door closed sensor | Indicates the current reading of the door closed sensor of the cartridge access door. <ul style="list-style-type: none"> • 1: Door completely closed • 0: Door not completely closed |
| Library temperature | Indicates whether the internal temperature of the autoloader is within the normal operating temperature range. |
| Front door status | Indicates whether the front door is locked by an application. |
| Language | Indicates the current language that is being used on the LCD screen. |
| Auto clean | Indicates whether the automatic cleaning function is on or off. |
| Clean tape installed | Indicates whether a cleaning tape is installed in cell 10. |
| LCD | Indicates the current message that is displayed on the LCD screen. |
| Motion | Indicates whether the autoloader is in motion. |

Table 8 provides a description of the information that is provided in the Tape Drive Status section.

Table 8. Tape drive status information

| Information | Description |
|-------------|---|
| Index | Indicates the element index of the tape drive. Element indexes identify locations within the autoloader that can accept cartridges. |
| Status | Indicates whether tape motion is occurring. Possible values are active and inactive. |

The inventory section provides an inventory of tape cartridges that tracks where tape cartridges are located in the autoloader. An inventory is performed each time one of the following events occurs

- The autoloader is turned on.
- A tape cartridge is inserted into the autoloader
- A tape cartridge is removed from the autoloader
- A tape cartridge is loaded in the tape drive
- A tape cartridge is unloaded from the tape drive

Table 9 provides a description of the information that is provided by the Inventory section.

Table 9. Inventory information

| Information | Description |
|-------------|---|
| Index | Index specifies the element index number of the following autoloader components. Autoloader components that can accept tape cartridges are called elements. The following element index information is provided: <ul style="list-style-type: none"> • The slot index number. Possible values are 1 - 10. • The tape drive index number. This value is always 82. • The robot element index. This value is always 86. |

Table 9. Inventory information (continued)

| Information | Description |
|----------------|--|
| What | Indicates the type of element. Possible values are slot, tape drive, or robot. |
| P (present) | Indicates whether the element is present. <ul style="list-style-type: none"> • 1: Present • 0: Not present |
| O (occupied) | Indicates whether the element contains a tape cartridge: <ul style="list-style-type: none"> • 1: Contains a tape cartridge • 0: Does not contain a cartridge |
| V (valid) | Indicates whether the information is considered valid or not valid: <ul style="list-style-type: none"> • 1: The information is valid. • 0: The information is not valid. <p>Note: The information is considered not valid for the time after the autoloader has been turned on until it has completed an initial tape cartridge inventory.</p> |
| A (accessible) | Indicates whether the element is accessible: <ul style="list-style-type: none"> • 1: The element is accessible. • 0: The element is not accessible. <p>Notes:</p> <ol style="list-style-type: none"> 1. The value for the cartridge cell element is always 1. 2. For the tape drive the value 1 means that the tape drive is either empty or a cartridge has been ejected. The value 0 means that a tape cartridge is loaded in the tape drive. |
| R (reserved) | Indicates whether the element is reserved by a host system: <ul style="list-style-type: none"> • 1: The element is reserved. • 0: The element is not reserved. |
| Label valid | Indicates whether the bar code label information is considered valid or not valid: <ul style="list-style-type: none"> • 1: The information is valid. • 0: The information is not valid. <p>Note: The information is considered questionable if the autoloader had a problem reading the label.</p> |
| Label | If the element contains a tape cartridge, the field provides the bar code label information for the tape cartridge. |

Setting configuration options

Configuration options can be set using either the operator panel or the Remote Management Utility. For information about using the operator panel to set configuration options, see Chapter 4, “Using the 87691VX Tape Autoloader,” on page 21.

You can use the Configuration page to perform the following tasks:

- Change the library configuration
- Change the Ethernet configuration
- Change the Web access password

To specify or change a configuration value, specify or change the value and click **Update**.

To access the Configuration page, click **Configuration**. To return to the Status page, click **Status**.

The Configuration page displays information in the following sections:

- Change Library Configuration
- Change Ethernet Configuration (see Table 11 on page 59)
- Change Web Access Password (see “Changing the Web access password” on page 60)

Changing the library configuration

Table 10 provides a description of the information that can be viewed and changed in the library configuration section.

Table 10. Library configuration information

| Information | Description |
|---|---|
| Library SCSI ID | Indicates the SCSI ID of the library. Specify a value that meets the needs of your installation. |
| Drive SCSI ID | Indicates the SCSI ID of the tape drive. Specify a value that meets the needs of your installation. |
| New Control Mode | Indicates the control mode of the autoloader: <ul style="list-style-type: none"> • SCSI: This option cannot be selected. • LCD: This option cannot be selected. • Sequential: Indicates that you want the autoloader to process the cartridges sequentially without input from a control program. Sequential mode has the following sub-options: <ul style="list-style-type: none"> – Random: Indicates that you want the autoloader to randomly select tapes under the control of your autoloader control program. – Sequential: Indicates that you want the autoloader to use the tapes sequentially. |
| <ul style="list-style-type: none"> • New Front Panel Access Password • Confirm New Access Password • Current[®] Access Password | Access to the operator panel functions can be controlled with a password. Use these fields to specify, change, or cancel the operator panel password: <ul style="list-style-type: none"> • To create a new password, type the new password in the New Front Panel Access Password and Confirm New Access Password field. • To change a password, type the new password in the New Front Panel Access Password and Confirm New Access Password, and type the current password in the Current Access password field. • To cancel a password, type the current password in the Current Access Password field. |
| Emulation Mode | Specify an emulation mode if your autoloader control program has not been certified. Select one of the following emulation modes: <ul style="list-style-type: none"> • Exabyte AutoPak 1x10 autoloader • EZ17 autoloader • 210 library |
| Language | Indicates that language that is displayed on the LCD screen. The default language is English. |
| <ul style="list-style-type: none"> • Fixed Cleaning Spot Enabled • Autoclean On | Indicates whether you want to use the autoclean mode. To use the autoclean mode, select both the Fixed Cleaning Spot Enabled and the Autoclean On fields. |

Table 10. Library configuration information (continued)

| Information | Description |
|---------------------|--|
| Cleanings Remaining | Indicates the number of time the cleaning cartridge can be used. Discard the cleaning cartridge when 0 is displayed. |

Changing the Ethernet configuration

Table 11 provides a description of the information that can be viewed and changed in the Ethernet configuration section.

Table 11. Ethernet configuration information

| Information | Description |
|-------------------------|--|
| IP Address | Indicates the IP address if static addressing is being used. If DHCP is be used, 0 is specified. |
| Subnet Mask | Indicates the subnet mask if static addressing is being used. If DHCP is be used, 0 is specified. |
| Gateway | Indicates the gateway address if static addressing is being used. If DHCP is be used, 0 is specified. |
| DHCP Assigned Address | Indicates the DHCP-assigned IP address if DHCP Is being used. If static addressing is used, 0 is specified. |
| SNMP Read Password | Indicates the SNMP read password if SNMP is used. The default value is public. The password is case sensitive. |
| SNMP Write Password | Indicates the SNMP write password if SNMP is used. The default value is private. The password is case sensitive. |
| SNMP Broadcast Password | Indicates the SNMP broadcast password if SNMP is used. The default value is private-traps. The password is case sensitive. |
| SNMP Trap Address | Indicates the SNMP trap address if SNMP is used. The default value is 0.0.0.0. |
| SNMP Trap Port | Indicates the SNMP trap port if SNMP is used. The default value is 162. |
| FTP User Name | Indicates the FTP user name. The default value is anonymous. |
| FTP User Password | Indicates the FTP user password. The default value is Exabyte. The password is case sensitive. |
| E-Mail Server Address | Indicates the e-mail server address that you want to send E-mail alerts to. |
| E-Mail Server User Name | Indicates the e-mail user that you want to send e-mail alerts to. |
| E-mail Address | Indicates the e-mail address of the e-mail address that you want to send E-mail alerts to. |
| E-mail Server Sender | Indicates the text that you want displayed in the e-mail "From" field. |
| Web Access Password | If you have specified that a password must be used when changes are made to the configuration page, type the password in this field. See Table 12 on page 60 for more information. |

Changing the Web access password

Web access passwords are used to control who can change the autoloader configuration values using the configuration page. Passwords can be from 1 to 6 characters and can contain spaces. The password is not case-sensitive.

Table 12 provides a description of the information that is provided in the Web Access Password section.

Table 12. Web access password information

| Information | Description |
|---------------------------------|---|
| Current Web Access Password | Specify the current Web access password if you want to change the existing Web access password. To cancel a password, specify only the current Web access password. Do not specify the New Web Access Password or the Confirm New Web Access Password. |
| New Web Access Password | Specify a new password if you want to create an initial password or change the existing Web access password. |
| Confirm New Web Access Password | Specify the new password to confirm that you want to create an initial password or change the existing password. |

Viewing statistics

The Statistics page provides statistical information about the autoloader. To access the Statistics page, click **Statistics**.

Table 13 provides a description of the information that can be specified in the Statistics section.

Table 13. Statistics information

| Information | Description |
|--------------------|--|
| Move Count | Indicates the number of moves the autoloader has made. A <i>move</i> is when a tape cartridge is either removed from a tape cartridge cell and placed in the tape drive, or removed from the tape drive and placed in the tape cartridge cell. |
| Pick Retry Counts | Indicates the number of times the tape cartridge loader has tried removing a tape cartridge from either a tape cartridge cell or the tape drive. |
| Put Retry Counts | Indicates the number of times the tape cartridge loader has tried to place a tape cartridge in either a tape cartridge cell or the tape drive. |
| Scan Count | Indicates the number of times the bar code scanner has scanned a bar code label. |
| Scan Retry Count | Indicates the number of times the bar code scanner has tried to scan a bar code. |
| Scan Fail Count | Indicates the number of times the bar code scanner has failed to scan a bar code. |
| Drive Load Count | Indicates the number of time the tape cartridge loader has placed a tape cartridge in the tape drive. |
| Drive Reload Count | Indicates the number of time the tape cartridge loader has tried to place a tape cartridge in the tape drive. |

Running diagnostics

You can run diagnostics to determine the state of the autoloader. The diagnostics rotate the tape carousel to each tape cartridge position. If a tape is installed, the tape is placed in the tape drive and then removed. When the diagnostics are complete, the Diagnostics Results page is displayed.

To run the diagnostics, complete the following steps:

1. Click **Diagnostics**. The Library Diagnostics window opens.
2. Click **Run Test**.

Appendix A. Error messages

This section provides information about error messages on the LCD screen. The following information is provided for each message:

- The error message
- A description of the problem that caused the error message
- The corrective action for the error message

Some corrective actions advise you to reset power or turn the autoloader off and then on. Read the following information to avoid problems:

- To avoid disrupting communication between the host system and other devices on the communication bus, make sure that there is no activity on the communication bus before you turn off the autoloader.
- Unload the tape from the tape drive before you turn off the autoloader. If you turn off the autoloader with a tape loaded in the tape drive, the tape drive might have to perform a format recovery process that can take 2 - 3 hours.

Table 14 provides an alphabetical list of the error messages. If the corrective action does not resolve the problem, contact IBM service.

Table 14.

| Message | Description | Corrective action |
|--|---|--|
| BOOTBLOCK | An error occurred while firmware was being uploaded to the autoloader. | Verify that you loaded the correct firmware. Do not load firmware from one model of autoloader or library into another autoloader. Reset the autoloader and reload the firmware. See "Resetting the autoloader" on page 41 for more information. |
| CELL MISLOADED MUST REMOVE TAPE (followed by: REMOVE TAPE AND PRESS ANY KEY) | The autoloader displays this message after it has exported a cartridge and you have not removed it from the autoloader. | Remove the exported cartridge and press any key to continue. |
| CELL MISLOADED REINSERT TAPE | A tape was inserted through the cartridge access port in the wrong orientation. | Position the cartridge as shown in Figure 18 on page 34. |
| CHOICE REJECTED DRIVE IS FULL | A command was issued from the operator panel to load a cartridge into the tape drive when the tape drive already contained a cartridge. | Wait until the current cartridge is unloaded by the application, or use the operator panel to unload it from the tape drive. See "Loading and unloading cartridges in the tape drive" on page 35 for more information. |

Table 14. (continued)

| Message | Description | Corrective action |
|------------------------------------|---|--|
| COMMAND FAILED CHECK SHIP LOCK | The cartridge loader could not move. This might be caused by the shipping key. | Remove the shipping key. See "Removing the shipping key" on page 7 for more information. |
| COMMAND REJECTED CAROUSEL FULL | A command was issued from the operator panel to insert a cartridge into the autoloader when all of the cartridge cells were already full. | Export a cartridge from the autoloader to make room for a new cartridge. See "Importing and exporting cartridges in the autoloader" on page 33 for more information. |
| COMMAND REJECTED EMPTY CAROUSEL | A command was issued from the operator panel to either load a tape cartridge into the tape drive or remove a tape cartridge from the autoloader when there were no tape cartridges in the cartridge carousel. | Wait until the cartridge is ejected from the tape drive, or use the operator panel to import cartridges into the autoloader. See "Loading and unloading cartridges in the tape drive" on page 35 for more information. |
| CONFIGURATION LOCKED BY HOST | The application is currently controlling the autoloader (a SCSI command is active) or the Remote Management utility is controlling the autoloader. | Wait for the command from the application to complete. |
| DEMO ILLEGAL IN SEQUENTIAL MODE | The autoloader displays this message when you attempt to run the demo from the Selftest menu while the autoloader is set to Sequential mode. | Change the autoloader from sequential mode to random mode and continue your operation. |
| DEVICE NOT READY | The autoloader is not ready to perform the requested operation because it is performing diagnostics or a power-on self-test (POST). | Wait until the autoloader has finished, then retry the operation. |
| DRIVE CMD ERROR | The tape drive received an invalid command. | Turn the autoloader off and then on to reset the tape drive. |
| DRIVE LOAD FAIL | The cartridge could not be loaded into the tape drive because of a mechanical problem or because of a broken tape | Export the tape from the autoloader and verify that it is in good condition. Retry the operation. See "Importing and exporting cartridges in the autoloader" on page 33 for more information. |
| DRIVE TIMEOUT | The tape drive took too long to load or unload a tape, or the tape drive is not responding. | Turn the autoloader off and on to reset the tape drive. |

Table 14. (continued)

| Message | Description | Corrective action |
|----------------------------------|--|--|
| DRV UNLOAD FAIL | The cartridge could not be unloaded from the tape drive because of a mechanical problem. | Power the autoloader off and on to reset the tape drive. Retry the operation. |
| HARDWARE ERROR | An operation could not be completed because of a mechanical problem. | Reset the autoloader and retry the operation. See "Resetting the autoloader" on page 41 for more information. |
| H/W INOPERABLE | An operation could not be completed because of a mechanical problem. | Reset the autoloader and retry the operation. See "Resetting the autoloader" on page 41 for more information. |
| IN ENET MODE | The autoloader is executing a command issued from the Remote Management utility when a command is issued from the operator panel. | Wait until the autoloader has finished its current operation, then retry the operation. |
| IN SECURITY MODE CHOICE REJECTED | Autoloader security has been set from the application. | Disable autoloader security from the application. |
| INSERT A NEW CLEANING CART | The cleaning cartridge has reached the end of its useful life. | Insert a new cleaning cartridge and press any key to continue the operation. |
| LIBRARY IS BUSY | The autoloader is executing a command issued from the application when a command is issued from the operator panel. | Wait until the autoloader has finished its current operation, then retry the requested operation. |
| LIBRARY IS EMPTY NO BAR CODES | The autoloader displays this message when it is in the cell information menu and there are no cartridges loaded in the autoloader. | No recovery action is needed. Load a data cartridge to perform a write and read or tape drive cleaning operation. |
| MEDIA REMOVAL IS LOCKED BY HOST | Media removal from the autoloader has been prevented by the application. | Turn off media removal prevention from the application. |
| OVER TEMPERATURE | The temperature limit of the tape drive has been exceeded, and the cartridge has been ejected from the tape drive. | Wait until the autoloader has cooled. Unload the cartridge to a cell and reload it into the tape drive. Check the room temperature. The ambient temperature must be no more than 40°C (104°F). |
| POST FAILED | The autoloader encountered an error during its power-on self-test. | Reset the autoloader. See "Resetting the autoloader" on page 41 for more information. |

Table 14. (continued)

| Message | Description | Corrective action |
|---------------------------------|--|---|
| POST ILLEGAL IN SEQUENTIAL MODE | The autoloader displays this message if you attempt to run the power-on self-test from the Selftest menu while the autoloader is in sequential mode. | Change the autoloader from sequential mode to random mode and continue your operation. |
| REMOVE TAPE AND PRESS ANY KEY | This message is displayed after the CELL MISLOADED MUST REMOVE TAPE message. | Remove the tape cartridge and press any key to continue. |
| SEQUENTIAL MODE | An application tried to issue commands to the autoloader while it was in Sequential mode. | Set the autoloader to Random mode. |
| SERVO ERROR | There is a problem with the autoloader carousel. | Reset the autoloader (see page 79) and retry the operation. See "Resetting the autoloader" on page 41 for more information. |
| SERVO TIMEOUT | There is a problem with the autoloader carousel. | Reset the autoloader (see page 79) and retry the operation. See "Resetting the autoloader" on page 41 for more information. |
| SYSTEM ERROR | There is a problem with the autoloader. | Reset the autoloader and retry the operation. See "Resetting the autoloader" on page 41 for more information. |
| SYSTEM TIMEOUT | An autoloader operation took too long. | Reset the autoloader and retry the operation. See "Resetting the autoloader" on page 41 for more information. |
| WAIT FOR COMMAND TO COMPLETE | The autoloader is executing a command issued from the application or the Remote Management utility when a command is issued from the operator panel. | Wait until the autoloader has finished its current operation, then retry the operation. |

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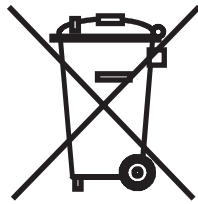
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Federal Communications Commission (FCC) statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not 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.

Industry Canada Class A emission compliance statement

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

Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Australia and New Zealand Class A statement

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

United Kingdom telecommunications safety requirement

Notice to Customers

This apparatus is approved under approval number NS/G/1234/J/100003 for indirect connection to public telecommunication systems in the United Kingdom.

European Union EMC Directive conformance 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. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a nonrecommended modification of the product, including the fitting of non-IBM option cards.

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

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Taiwanese Class A warning statement

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Chinese Class A warning statement

聲 明
此為 A 級產品。在生活環境中，該產品可能會造成無線電干擾。在這種情況下，可能需要用戶對其干擾採取切实可行的措施。

Japanese Voluntary Control Council for Interference (VCCI) statement

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Appendix C. IBM Statement of Limited Warranty Z125-4753-08 04/2004

Part 1 - General Terms

Part 1 - General Terms

This Statement of Limited Warranty includes Part 1 - General Terms, Part 2 - Country-unique Terms, and Part 3 - Warranty Information. The terms of Part 2 replace or modify those of Part 1. The warranties provided by IBM in this Statement of Limited Warranty apply only to Machines you purchase for your use, and not for resale. The term "Machine" means an IBM machine, its features, conversions, upgrades, elements, or accessories, or any combination of them. The term "Machine" does not include any software programs, whether pre-loaded with the Machine, installed subsequently or otherwise. Nothing in this Statement of Limited Warranty affects any statutory rights of consumers that cannot be waived or limited by contract.

What this Warranty Covers

IBM warrants that each Machine 1) is free from defects in materials and workmanship and 2) conforms to IBM's Official Published Specifications ("Specifications") which are available on request. The warranty period for the Machine starts on the original Date of Installation and is specified in Part 3 - Warranty Information. The date on your invoice or sales receipt is the Date of Installation unless IBM or your reseller informs you otherwise. Many features, conversions, or upgrades involve the removal of parts and their return to IBM. A part that replaces a removed part will assume the warranty service status of the removed part. Unless IBM specifies otherwise, these warranties apply only in the country or region in which you purchased the Machine.

THESE WARRANTIES ARE YOUR EXCLUSIVE WARRANTIES AND REPLACE ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. SOME STATES OR JURISDICTIONS DO NOT ALLOW THE EXCLUSION OF EXPRESS OR IMPLIED WARRANTIES, SO THE ABOVE EXCLUSION MAY NOT APPLY TO YOU. IN THAT EVENT, SUCH WARRANTIES ARE LIMITED IN DURATION TO THE WARRANTY PERIOD. NO WARRANTIES APPLY AFTER THAT PERIOD. SOME STATES OR JURISDICTIONS DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

What this Warranty Does not Cover

This warranty does not cover the following:

- any software programs, whether pre-loaded or shipped with the Machine, or installed subsequently;
- failure resulting from misuse (including but not limited to use of any Machine capacity or capability, other than that authorized by IBM in writing), accident, modification, unsuitable physical or operating environment, or improper maintenance by you;
- failure caused by a product for which IBM is not responsible; and

- any non-IBM products, including those that IBM may procure and provide with or integrate into an IBM Machine at your request.

The warranty is voided by removal or alteration of identification labels on the Machine or its parts.

IBM does not warrant uninterrupted or error-free operation of a Machine.

Any technical or other support provided for a Machine under warranty, such as assistance with “how-to” questions and those regarding Machine set-up and installation, is provided **WITHOUT WARRANTIES OF ANY KIND**.

How to Obtain Warranty Service

If the Machine does not function as warranted during the warranty period, contact IBM or your reseller to obtain warranty service. If you do not register the Machine with IBM, you may be required to present proof of purchase as evidence of your entitlement to warranty service.

What IBM Will Do to Correct Problems

When you contact IBM for service, you must follow the problem determination and resolution procedures that IBM specifies. An initial diagnosis of your problem can be made either by a technician over the telephone or electronically by access to an IBM website.

The type of warranty service applicable to your Machine is specified in Part 3 - Warranty Information.

You are responsible for downloading and installing designated Machine Code (microcode, basic input/output system code (called “BIOS”), utility programs, device drivers, and diagnostics delivered with an IBM Machine) and other software updates from an IBM Internet Web site or from other electronic media, and following the instructions that IBM provides.

If your problem can be resolved with a Customer Replaceable Unit (“CRU”) (e.g., keyboard, mouse, speaker, memory, hard disk drive), IBM will ship the CRU to you for you to install.

If the Machine does not function as warranted during the warranty period and your problem cannot be resolved over the telephone or electronically, through your application of Machine Code or software updates, or with a CRU, IBM or your reseller, if approved by IBM to provide warranty service, will either, at its discretion, 1) repair it to make it function as warranted, or 2) replace it with one that is at least functionally equivalent. If IBM is unable to do either, you may return the Machine to your place of purchase and your money will be refunded.

IBM or your reseller will also manage and install selected engineering changes that apply to the Machine.

Exchange of a Machine or Part

When the warranty service involves the exchange of a Machine or part, the item IBM or your reseller replaces becomes its property and the replacement becomes yours. You represent that all removed items are genuine and unaltered. The replacement may not be new, but will be in good working order and at least

functionally equivalent to the item replaced. The replacement assumes the warranty service status of the replaced item.

Your Additional Responsibilities

Before IBM or your reseller exchanges a Machine or part, you agree to remove all features, parts, options, alterations, and attachments not under warranty service.

You also agree to:

1. ensure that the Machine is free of any legal obligations or restrictions that prevent its exchange;
2. obtain authorization from the owner to have IBM or your reseller service a Machine that you do not own; and
3. where applicable, before service is provided:
 - a. follow the service request procedures that IBM or your reseller provides;
 - b. backup or secure all programs, data, and funds contained in the Machine;
 - c. provide IBM or your reseller with sufficient, free, and safe access to your facilities to permit IBM to fulfill its obligations; and
 - d. inform IBM or your reseller of changes in the Machine's location.
4. (a) ensure all information about identified or identifiable individuals (Personal Data) is deleted from the Machine (to the extent technically possible), (b) allow IBM, your reseller or an IBM supplier to process on your behalf any remaining Personal Data as IBM or your reseller considers necessary to fulfill its obligations under this Statement of Limited Warranty (which may include shipping the Machine for such processing to other IBM service locations around the world), and (c) ensure that such processing complies with any laws applicable to such Personal Data.

Limitation of Liability

IBM is responsible for loss of, or damage to, your Machine only while it is 1) in IBM's possession or 2) in transit in those cases where IBM is responsible for the transportation charges.

Neither IBM nor your reseller are responsible for any of your confidential, proprietary or personal information contained in a Machine which you return to IBM for any reason. You should remove all such information from the Machine prior to its return.

Circumstances may arise where, because of a default on IBM's part or other liability, you are entitled to recover damages from IBM. In each such instance, regardless of the basis on which you are entitled to claim damages from IBM (including fundamental breach, negligence, misrepresentation, or other contract or tort claim), except for any liability that cannot be waived or limited by applicable laws, IBM is liable for no more than

1. damages for bodily injury (including death) and damage to real property and tangible personal property; and
2. the amount of any other actual direct damages, up to the charges (if recurring, 12 months' charges apply) for the Machine that is subject of the claim. For purposes of this item, the term "Machine" includes Machine Code and Licensed Internal Code ("LIC").

This limit also applies to IBM's suppliers and your reseller. It is the maximum for which IBM, its suppliers, and your reseller are collectively responsible.

UNDER NO CIRCUMSTANCES IS IBM, ITS SUPPLIERS OR RESELLERS LIABLE FOR ANY OF THE FOLLOWING EVEN IF INFORMED OF THEIR POSSIBILITY: 1) THIRD PARTY CLAIMS AGAINST YOU FOR DAMAGES (OTHER THAN THOSE UNDER THE FIRST ITEM LISTED ABOVE); 2) LOSS OF, OR DAMAGE TO, DATA; 3) SPECIAL, INCIDENTAL, OR INDIRECT DAMAGES OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES; OR 4) LOST PROFITS, BUSINESS REVENUE, GOODWILL OR ANTICIPATED SAVINGS. SOME STATES OR JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU. SOME STATES OR JURISDICTIONS DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

Governing Law

Both you and IBM consent to the application of the laws of the country in which you acquired the Machine to govern, interpret, and enforce all of your and IBM's rights, duties, and obligations arising from, or relating in any manner to, the subject matter of this Statement of Limited Warranty, without regard to conflict of law principles.

THESE WARRANTIES GIVE YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE OR JURISDICTION TO JURISDICTION.

Jurisdiction

All of our rights, duties, and obligations are subject to the courts of the country in which you acquired the Machine.

Part 2 - Country-unique Terms

AMERICAS

ARGENTINA

Jurisdiction: *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the Ordinary Commercial Court of the city of Buenos Aires.

BOLIVIA

Jurisdiction: *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the courts of the city of La Paz.

BRAZIL

Jurisdiction: *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the court of Rio de Janeiro, RJ.

CHILE

Jurisdiction: *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the Civil Courts of Justice of Santiago.

COLOMBIA

Jurisdiction: *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the Judges of the Republic of Colombia.

EQUADOR

Jurisdiction: *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the Judges of Quito.

MEXICO

Jurisdiction: *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the Federal Courts of Mexico City, Federal District.

PARAGUAY

Jurisdiction: *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the courts of the city of Asuncion.

PERU

Limitation of Liability: *The following is added at the end of this section:*

In accordance with Article 1328 of the Peruvian Civil Code the limitations and exclusions specified in this section will not apply to damages caused by IBM's willful misconduct ("dolo") or gross negligence ("culpa inexcusable").

URUGUAY

Jurisdiction: *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the City of Montevideo Court's Jurisdiction.

VENEZUELA

Jurisdiction: *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the Courts of the Metropolitan Area Of the City of Caracas.

NORTH AMERICA

How to Obtain Warranty Service: *The following is added to this Section:*
To obtain warranty service from IBM in Canada or the United States, call 1-800-IBM-SERV (426-7378).

CANADA

Limitation of Liability: *The following replaces item 1 of this section:*

1. damages for bodily injury (including death) or physical harm to real property and tangible personal property caused by IBM's negligence; and

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:*
laws in the Province of Ontario.

UNITED STATES

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:*
laws of the State of New York.

ASIA PACIFIC

AUSTRALIA

What this Warranty Covers: *The following paragraph is added to this section:*
The warranties specified in this Section are in addition to any rights you may have under the Trade Practices Act 1974 or other similar legislation and are only limited to the extent permitted by the applicable legislation.

Limitation of Liability: *The following is added to this section:*
Where IBM is in breach of a condition or warranty implied by the Trade Practices Act 1974 or other similar legislation, IBM's liability is limited to the repair or replacement of the goods or the supply of equivalent goods. Where that condition or warranty relates to right to sell, quiet possession or clear title, or the goods are of a kind ordinarily acquired for personal, domestic or household use or consumption, then none of the limitations in this paragraph apply.

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:*
laws of the State or Territory.

CAMBODIA AND LAOS

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:*
laws of the State of New York, United States of America.

CAMBODIA, INDONESIA, AND LAOS

Arbitration: *The following is added under this heading:*
Disputes arising out of or in connection with this Statement of Limited Warranty shall be finally settled by arbitration which shall be held in Singapore in accordance with the Arbitration Rules of Singapore International Arbitration Center ("SIAC Rules") then in effect. The arbitration award shall be final and binding for the parties without appeal and shall be in writing and set forth the findings of fact and the conclusions of law.

The number of arbitrators shall be three, with each side to the dispute being entitled to appoint one arbitrator. The two arbitrators appointed by the parties shall appoint a third arbitrator who shall act as chairman of the proceedings. Vacancies in the post of chairman shall be filled by the president of the SIAC. Other vacancies shall be filled by the respective nominating party. Proceedings shall continue from the stage they were at when the vacancy occurred.

If one of the parties refuses or otherwise fails to appoint an arbitrator within 30 days of the date the other party appoints its, the first appointed arbitrator shall be the sole arbitrator, provided that the arbitrator was validly and properly appointed.

All proceedings shall be conducted, including all documents presented in such proceedings, in the English language. The English language version of this Statement of Limited Warranty prevails over any other language version.

HONG KONG S.A.R. OF CHINA AND MACAU S.A.R. OF CHINA

Governing Law: *The following replaces “laws of the country in which you acquired the Machine” in the first sentence:*

laws of Hong Kong Special Administrative Region of China.

INDIA

Limitation of Liability: *The following replaces items 1 and 2 of this section:*

1. liability for bodily injury (including death) or damage to real property and tangible personal property will be limited to that caused by IBM’s negligence; and
2. as to any other actual damage arising in any situation involving nonperformance by IBM pursuant to, or in any way related to the subject of this Statement of Limited Warranty, the charge paid by you for the individual Machine that is the subject of the claim. For purposes of this item, the term “Machine” includes Machine Code and Licensed Internal Code (“LIC”).

Arbitration: *The following is added under this heading:*

Disputes arising out of or in connection with this Statement of Limited Warranty shall be finally settled by arbitration which shall be held in Bangalore, India in accordance with the laws of India then in effect. The arbitration award shall be final and binding for the parties without appeal and shall be in writing and set forth the findings of fact and the conclusions of law.

The number of arbitrators shall be three, with each side to the dispute being entitled to appoint one arbitrator. The two arbitrators appointed by the parties shall appoint a third arbitrator who shall act as chairman of the proceedings. Vacancies in the post of chairman shall be filled by the president of the Bar Council of India. Other vacancies shall be filled by the respective nominating party. Proceedings shall continue from the stage they were at when the vacancy occurred.

If one of the parties refuses or otherwise fails to appoint an arbitrator within 30 days of the date the other party appoints its, the first appointed arbitrator shall be the sole arbitrator, provided that the arbitrator was validly and properly appointed.

All proceedings shall be conducted, including all documents presented in such proceedings, in the English language. The English language version of this Statement of Limited Warranty prevails over any other language version.

JAPAN

Governing Law: *The following sentence is added to this section:*

Any doubts concerning this Statement of Limited Warranty will be initially resolved between us in good faith and in accordance with the principle of mutual trust.

MALAYSIA

Limitation of Liability: *The word "SPECIAL" in item 3 of the fifth paragraph is deleted.*

NEW ZEALAND

What this Warranty Covers: *The following paragraph is added to this section:*

The warranties specified in this section are in addition to any rights you may have under the Consumer Guarantees Act 1993 or other legislation which cannot be excluded or limited. The Consumer Guarantees Act 1993 will not apply in respect of any goods which IBM provides, if you require the goods for the purposes of a business as defined in that Act.

Limitation of Liability: *The following is added to this section:*

Where Machines are not acquired for the purposes of a business as defined in the Consumer Guarantees Act 1993, the limitations in this section are subject to the limitations in that Act.

PEOPLE'S REPUBLIC OF CHINA (PRC)

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:*

laws of the State of New York, United States of America (except when local law requires otherwise).

PHILIPPINES

Limitation of Liability: *Item 3 in the fifth paragraph is replaced by the following:*

SPECIAL (INCLUDING NOMINAL AND EXEMPLARY DAMAGES), MORAL, INCIDENTAL, OR INDIRECT DAMAGES FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES; OR

Arbitration: *The following is added under this heading:*

Disputes arising out of or in connection with this Statement of Limited Warranty shall be finally settled by arbitration which shall be held in Metro Manila, Philippines in accordance with the laws of the Philippines then in effect. The arbitration award shall be final and binding for the parties without appeal and shall be in writing and set forth the findings of fact and the conclusions of law.

The number of arbitrators shall be three, with each side to the dispute being entitled to appoint one arbitrator. The two arbitrators appointed by the parties shall appoint a third arbitrator who shall act as chairman of the proceedings.

Vacancies in the post of chairman shall be filled by the president of the Philippine Dispute Resolution Center, Inc. Other vacancies shall be filled by the respective nominating party. Proceedings shall continue from the stage they were at when the vacancy occurred.

If one of the parties refuses or otherwise fails to appoint an arbitrator within 30 days of the date the other party appoints its, the first appointed arbitrator shall be the sole arbitrator, provided that the arbitrator was validly and properly appointed.

All proceedings shall be conducted, including all documents presented in such proceedings, in the English language. The English language version of this Statement of Limited Warranty prevails over any other language version.

SINGAPORE

Limitation of Liability: *The words "SPECIAL" and "ECONOMIC" in item 3 in the fifth paragraph are deleted.*

EUROPE, MIDDLE EAST, AFRICA (EMEA)

THE FOLLOWING TERMS APPLY TO ALL EMEA COUNTRIES:

The terms of this Statement of Limited Warranty apply to Machines purchased from IBM or an IBM reseller.

How to Obtain Warranty Service:

*Add the following paragraph in **Western Europe** (Andorra, Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, Netherlands, Norway, Poland, Portugal, San Marino, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom, Vatican State, and any country subsequently added to the European Union, as from the date of accession):*

The warranty for Machines acquired in Western Europe shall be valid and applicable in all Western Europe countries provided the Machines have been announced and made available in such countries.

If you purchase a Machine in one of the Western European countries, as defined above, you may obtain warranty service for that Machine in any of those countries from either (1) an IBM reseller approved to perform warranty service or (2) from IBM, provided the Machine has been announced and made available by IBM in the country in which you wish to obtain service.

If you purchased a Personal Computer Machine in Albania, Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Federal Republic of Yugoslavia, Former Yugoslav Republic of Macedonia (FYROM), Moldova, Poland, Romania, Russia, Slovak Republic, Slovenia, or Ukraine, you may obtain warranty service for that Machine in any of those countries from either (1) an IBM reseller approved to perform warranty service or (2) from IBM.

If you purchase a Machine in a Middle Eastern or African country, you may obtain warranty service for that Machine from the IBM entity within the country of purchase, if that IBM entity provides warranty service in that country, or from an IBM reseller, approved by IBM to perform warranty service on that Machine in

that country. Warranty service in Africa is available within 50 kilometers of an IBM approved service provider. You are responsible for transportation costs for Machines located outside 50 kilometers of an IBM approved service provider.

Governing Law:

The phrase “the laws of the country in which you acquired the Machine” is replaced by:

1) “the laws of Austria” in **Albania, Armenia, Azerbaijan, Belarus, Bosnia-Herzegovina, Bulgaria, Croatia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, FYR Macedonia, Moldova, Poland, Romania, Russia, Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan, and FR Yugoslavia;** 2) “the laws of France” in **Algeria, Benin, Burkina Faso, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo Republic, Djibouti, Democratic Republic of Congo, Equatorial Guinea, French Guiana, French Polynesia, Gabon, Gambia, Guinea, Guinea-Bissau, Ivory Coast, Lebanon, Madagascar, Mali, Mauritania, Mauritius, Mayotte, Morocco, New Caledonia, Niger, Reunion, Senegal, Seychelles, Togo, Tunisia, Vanuatu, and Wallis & Futuna;** 3) “the laws of Finland” in **Estonia, Latvia, and Lithuania;** 4) “the laws of England” in **Angola, Bahrain, Botswana, Burundi, Egypt, Eritrea, Ethiopia, Ghana, Jordan, Kenya, Kuwait, Liberia, Malawi, Malta, Mozambique, Nigeria, Oman, Pakistan, Qatar, Rwanda, Sao Tome, Saudi Arabia, Sierra Leone, Somalia, Tanzania, Uganda, United Arab Emirates, the United Kingdom, West Bank/Gaza, Yemen, Zambia, and Zimbabwe;** and 5) “the laws of South Africa” in **South Africa, Namibia, Lesotho and Swaziland.**

Jurisdiction: *The following exceptions are added to this section:*

1) **In Austria** the choice of jurisdiction for all disputes arising out of this Statement of Limited Warranty and relating thereto, including its existence, will be the competent court of law in Vienna, Austria (Inner-City); 2) **in Angola, Bahrain, Botswana, Burundi, Egypt, Eritrea, Ethiopia, Ghana, Jordan, Kenya, Kuwait, Liberia, Malawi, Malta, Mozambique, Nigeria, Oman, Pakistan, Qatar, Rwanda, Sao Tome, Saudi Arabia, Sierra Leone, Somalia, Tanzania, Uganda, United Arab Emirates, West Bank/Gaza, Yemen, Zambia, and Zimbabwe** all disputes arising out of this Statement of Limited Warranty or related to its execution, including summary proceedings, will be submitted to the exclusive jurisdiction of the English courts; 3) **in Belgium and Luxembourg,** all disputes arising out of this Statement of Limited Warranty or related to its interpretation or its execution, the law, and the courts of the capital city, of the country of your registered office and/or commercial site location only are competent; 4) **in France, Algeria, Benin, Burkina Faso, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo Republic, Djibouti, Democratic Republic of Congo, Equatorial Guinea, French Guiana, French Polynesia, Gabon, Gambia, Guinea, Guinea-Bissau, Ivory Coast, Lebanon, Madagascar, Mali, Mauritania, Mauritius, Mayotte, Morocco, New Caledonia, Niger, Reunion, Senegal, Seychelles, Togo, Tunisia, Vanuatu, and Wallis & Futuna** all disputes arising out of this Statement of Limited Warranty or related to its violation or execution, including summary proceedings, will be settled exclusively by the Commercial Court of Paris; 5) **in Russia,** all disputes arising out of or in relation to the interpretation, the violation, the termination, the nullity of the execution of this Statement of Limited Warranty shall be settled by Arbitration Court of Moscow; 6) **in South Africa, Namibia, Lesotho and Swaziland,** both of us agree to submit all disputes relating to this Statement of Limited Warranty to the jurisdiction of the High Court in Johannesburg; 7) **in Turkey** all disputes arising out of or in connection with this Statement of Limited Warranty shall be resolved by the Istanbul Central (Sultanahmet) Courts and

Execution Directorates of Istanbul, the Republic of Turkey; 8) in each of the following specified countries, any legal claim arising out of this Statement of Limited Warranty will be brought before, and settled exclusively by, the competent court of a) Athens for **Greece**, b) Tel Aviv-Jaffa for **Israel**, c) Milan for **Italy**, d) Lisbon for **Portugal**, and e) Madrid for **Spain**; and 9) **in the United Kingdom**, both of us agree to submit all disputes relating to this Statement of Limited Warranty to the jurisdiction of the English courts.

Arbitration: *The following is added under this heading:*

In Albania, Armenia, Azerbaijan, Belarus, Bosnia-Herzegovina, Bulgaria, Croatia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, FYR Macedonia, Moldova, Poland, Romania, Russia, Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan, and FR Yugoslavia all disputes arising out of this Statement of Limited Warranty or related to its violation, termination or nullity will be finally settled under the Rules of Arbitration and Conciliation of the International Arbitral Center of the Federal Economic Chamber in Vienna (Vienna Rules) by three arbitrators appointed in accordance with these rules. The arbitration will be held in Vienna, Austria, and the official language of the proceedings will be English. The decision of the arbitrators will be final and binding upon both parties. Therefore, pursuant to paragraph 598 (2) of the Austrian Code of Civil Procedure, the parties expressly waive the application of paragraph 595 (1) figure 7 of the Code. IBM may, however, institute proceedings in a competent court in the country of installation.

In Estonia, Latvia and Lithuania all disputes arising in connection with this Statement of Limited Warranty will be finally settled in arbitration that will be held in Helsinki, Finland in accordance with the arbitration laws of Finland then in effect. Each party will appoint one arbitrator. The arbitrators will then jointly appoint the chairman. If arbitrators cannot agree on the chairman, then the Central Chamber of Commerce in Helsinki will appoint the chairman.

EUROPEAN UNION (EU)

THE FOLLOWING TERMS APPLY TO ALL EU COUNTRIES:

The warranty for Machines acquired in EU countries is valid and applicable in all EU countries provided the Machines have been announced and made available in such countries.

How to Obtain Warranty Service:*The following is added to this section:*

To obtain warranty service from IBM in EU countries, see the telephone listing in Part 3 - Warranty Information.

You may contact IBM at the following address:

IBM Warranty & Service Quality Dept.
PO Box 30
Spango Valley
Greenock
Scotland PA16 0AH

CONSUMERS

Consumers have legal rights under applicable national legislation governing the sale of consumer goods. Such rights are not affected by the warranties provided in this Statement of Limited Warranty.

**AUSTRIA, DENMARK, FINLAND, GREECE, ITALY, NETHERLANDS,
NORWAY, PORTUGAL, SPAIN, SWEDEN AND SWITZERLAND**

Limitation of Liability: *The following replaces the terms of this section in its entirety:*

Except as otherwise provided by mandatory law:

1. IBM's liability for any damages and losses that may arise as a consequence of the fulfillment of its obligations under or in connection with this Statement of Limited Warranty or due to any other cause related to this Statement of Limited Warranty is limited to the compensation of only those damages and losses proved and actually arising as an immediate and direct consequence of the non-fulfillment of such obligations (if IBM is at fault) or of such cause, for a maximum amount equal to the charges you paid for the Machine. For purposes of this item, the term "Machine" includes Machine Code and Licensed Internal Code ("LIC").

The above limitation shall not apply to damages for bodily injuries (including death) and damages to real property and tangible personal property for which IBM is legally liable.

2. **UNDER NO CIRCUMSTANCES IS IBM, ITS SUPPLIERS OR RESELLERS LIABLE FOR ANY OF THE FOLLOWING, EVEN IF INFORMED OF THEIR POSSIBILITY: 1) LOSS OF, OR DAMAGE TO, DATA; 2) INCIDENTAL OR INDIRECT DAMAGES, OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES; 3) LOST PROFITS, EVEN IF THEY ARISE AS AN IMMEDIATE CONSEQUENCE OF THE EVENT THAT GENERATED THE DAMAGES; OR 4) LOSS OF BUSINESS, REVENUE, GOODWILL, OR ANTICIPATED SAVINGS.**

FRANCE AND BELGIUM

Limitation of Liability: *The following replaces the terms of this section in its entirety:*

Except as otherwise provided by mandatory law:

1. IBM's liability for any damages and losses that may arise as a consequence of the fulfillment of its obligations under or in connection with this Statement of Limited Warranty is limited to the compensation of only those damages and losses proved and actually arising as an immediate and direct consequence of the non-fulfillment of such obligations (if IBM is at fault), for a maximum amount equal to the charges you paid for the Machine that has caused the damages. For purposes of this item, the term "Machine" includes Machine Code and Licensed Internal Code ("LIC").

The above limitation shall not apply to damages for bodily injuries (including death) and damages to real property and tangible personal property for which IBM is legally liable.

2. **UNDER NO CIRCUMSTANCES IS IBM, ITS SUPPLIERS OR RESELLERS LIABLE FOR ANY OF THE FOLLOWING, EVEN IF INFORMED OF THEIR POSSIBILITY: 1) LOSS OF, OR DAMAGE TO, DATA; 2) INCIDENTAL OR INDIRECT DAMAGES, OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES; 3) LOST PROFITS, EVEN IF THEY ARISE AS AN IMMEDIATE CONSEQUENCE OF THE EVENT THAT GENERATED THE DAMAGES; OR 4) LOSS OF BUSINESS, REVENUE, GOODWILL, OR ANTICIPATED SAVINGS.**

THE FOLLOWING TERMS APPLY TO THE COUNTRY SPECIFIED:

AUSTRIA

The provisions of this Statement of Limited Warranty replace any applicable statutory warranties.

What this Warranty Covers: *The following replaces the first sentence of the first paragraph of this section:*

The warranty for an IBM Machine covers the functionality of the Machine for its normal use and the Machine's conformity to its Specifications.

The following paragraphs are added to this section:

The limitation period for consumers in action for breach of warranty is the statutory period as a minimum. In case IBM or your reseller is unable to repair an IBM Machine, you can alternatively ask for a partial refund as far as justified by the reduced value of the unrepaired Machine or ask for a cancellation of the respective agreement for such Machine and get your money refunded.

The second paragraph does not apply.

What IBM Will Do to Correct Problems:*The following is added to this section:*

During the warranty period, IBM will reimburse you for the transportation charges for the delivery of the failing Machine to IBM.

Limitation of Liability: *The following paragraph is added to this section:*

The limitations and exclusions specified in the Statement of Limited Warranty will not apply to damages caused by IBM with fraud or gross negligence and for express warranty.

The following sentence is added to the end of item 2:

IBM's liability under this item is limited to the violation of essential contractual terms in cases of ordinary negligence.

EGYPT

Limitation of Liability: *The following replaces item 2 in this section:*

as to any other actual direct damages, IBM's liability will be limited to the total amount you paid for the Machine that is the subject of the claim. For purposes of this item, the term "Machine" includes Machine Code and Licensed Internal Code ("LIC").

Applicability of suppliers and resellers (unchanged).

FRANCE

Limitation of Liability: *The following replaces the second sentence of the first paragraph of this section:*

In such instances, regardless of the basis on which you are entitled to claim damages from IBM, IBM is liable for no more than: (items 1 and 2 unchanged).

GERMANY

What this Warranty Covers: *The following replaces the first sentence of the first paragraph of this section:*

The warranty for an IBM Machine covers the functionality of the Machine for its normal use and the Machine's conformity to its Specifications.

The following paragraphs are added to this section:

The minimum warranty period for Machines is twelve months. In case IBM or your reseller is unable to repair an IBM Machine, you can alternatively ask for a partial refund as far as justified by the reduced value of the unrepaired Machine or ask for a cancellation of the respective agreement for such Machine and get your money refunded.

The second paragraph does not apply.

What IBM Will Do to Correct Problems: *The following is added to this section:*

During the warranty period, transportation for delivery of the failing Machine to IBM will be at IBM's expense.

Limitation of Liability: *The following paragraph is added to this section:*

The limitations and exclusions specified in the Statement of Limited Warranty will not apply to damages caused by IBM with fraud or gross negligence and for express warranty.

The following sentence is added to the end of item 2:

IBM's liability under this item is limited to the violation of essential contractual terms in cases of ordinary negligence.

HUNGARY

Limitation of Liability: *The following is added at the end of this section:*

The limitation and exclusion specified herein shall not apply to liability for a breach of contract damaging life, physical well-being, or health that has been caused intentionally, by gross negligence, or by a criminal act.

The parties accept the limitations of liability as valid provisions and state that the Section 314.(2) of the Hungarian Civil Code applies as the acquisition price as well as other advantages arising out of the present Statement of Limited Warranty balance this limitation of liability.

IRELAND

What this Warranty Covers: *The following is added to this section:*

Except as expressly provided in these terms and conditions, all statutory conditions, including all warranties implied, but without prejudice to the generality of the foregoing all warranties implied by the Sale of Goods Act 1893 or the Sale of Goods and Supply of Services Act 1980 are hereby excluded.

Limitation of Liability: *The following replaces the terms of this section in its entirety:*

For the purposes of this section, a “Default” means any act, statement, omission, or negligence on the part of IBM in connection with, or in relation to, the subject matter of this Statement of Limited Warranty in respect of which IBM is legally liable to you, whether in contract or tort. A number of Defaults which together result in, or contribute to, substantially the same loss or damage will be treated as one Default occurring on the date of occurrence of the last such Default.

Circumstances may arise where, because of a Default, you are entitled to recover damages from IBM.

This section sets out the extent of IBM’s liability and your sole remedy.

1. IBM will accept unlimited liability for death or personal injury caused by the negligence of IBM.
2. Subject always to the **Items for Which IBM is Not Liable** below, IBM will accept unlimited liability for physical damage to your tangible property resulting from the negligence of IBM.
3. Except as provided in items 1 and 2 above, IBM’s entire liability for actual damages for any one Default will not in any event exceed the greater of 1) EUR 125,000, or 2) 125% of the amount you paid for the Machine directly relating to the Default.

Items for Which IBM is Not Liable

Save with respect to any liability referred to in item 1 above, under no circumstances is IBM, its suppliers or resellers liable for any of the following, even if IBM or they were informed of the possibility of such losses:

1. loss of, or damage to, data;
2. special, indirect, or consequential loss; or
3. loss of profits, business, revenue, goodwill, or anticipated savings.

SLOVAKIA

Limitation of Liability: *The following is added to the end of the last paragraph:*

The limitations apply to the extent they are not prohibited under §§ 373-386 of the Slovak Commercial Code.

SOUTH AFRICA, NAMIBIA, BOTSWANA, LESOTHO AND SWAZILAND

Limitation of Liability: *The following is added to this section:*

IBM’s entire liability to you for actual damages arising in all situations involving nonperformance by IBM in respect of the subject matter of this Statement of Warranty will be limited to the charge paid by you for the individual Machine that is the subject of your claim from IBM.

UNITED KINGDOM

Limitation of Liability: *The following replaces the terms of this section in its entirety:*

For the purposes of this section, a “Default” means any act, statement, omission, or negligence on the part of IBM in connection with, or in relation to, the subject matter of this Statement of Limited Warranty in respect of which IBM is legally liable to you, whether in contract or tort. A number of Defaults which together result in, or contribute to, substantially the same loss or damage will be treated as one Default.

Circumstances may arise where, because of a Default, you are entitled to recover damages from IBM.

This section sets out the extent of IBM's liability and your sole remedy.

1. IBM will accept unlimited liability for:
 - a. death or personal injury caused by the negligence of IBM; and
 - b. any breach of its obligations implied by Section 12 of the Sale of Goods Act 1979 or Section 2 of the Supply of Goods and Services Act 1982, or any statutory modification or re-enactment of either such Section.
2. IBM will accept unlimited liability, subject always to the **Items for Which IBM is Not Liable** below, for physical damage to your tangible property resulting from the negligence of IBM.
3. IBM's entire liability for actual damages for any one Default will not in any event, except as provided in items 1 and 2 above, exceed the greater of 1) Pounds Sterling 75,000, or 2) 125% of the total purchase price payable or the charges for the Machine directly relating to the Default.

These limits also apply to IBM's suppliers and resellers. They state the maximum for which IBM and such suppliers and resellers are collectively responsible.

Items for Which IBM is Not Liable

Save with respect to any liability referred to in item 1 above, under no circumstances is IBM or any of its suppliers or resellers liable for any of the following, even if IBM or they were informed of the possibility of such losses:

1. loss of, or damage to, data;
2. special, indirect, or consequential loss; or
3. loss of profits, business, revenue, goodwill, or anticipated savings.

Part 3 - Warranty Information

This Part 3 provides information regarding the warranty applicable to your Machine, including the warranty period and type of warranty service IBM provides.

Warranty Period

The warranty period may vary by country or region and is specified in the table below.

Note: "Region" means either Hong Kong or Macau Special Administrative Region of China.

A warranty period of 3 years on parts and 1 year on labor means that IBM provides warranty service without charge for:

1. parts and labor during the first year of the warranty period; and
2. parts only, on an exchange basis, in the second and third years of the warranty period. IBM will charge you for any labor provided in performance of the repair or replacement(s) in the second and third year of the warranty period.

87691VX Tape Autoloader

| Country or Region of Purchase | Warranty Period | Type of Warranty Service* |
|--------------------------------------|------------------------|----------------------------------|
| Worldwide | 3 years | 1 |

| Country or Region of Purchase | Warranty Period | Type of Warranty Service* |
|--|-----------------|---------------------------|
| * See “Types of Warranty Service” for the legend and explanations of warranty-service types. | | |

Types of Warranty Service

If required, IBM provides repair or exchange service depending on the type of warranty service specified for your Machine in the above table and as described below. Warranty service may be provided by your reseller if approved by IBM to perform warranty service. Scheduling of service will depend upon the time of your call and is subject to parts availability. Service levels are response time objectives and are not guaranteed. The specified level of warranty service may not be available in all worldwide locations, additional charges may apply outside IBM’s normal service area, contact your local IBM representative or your reseller for country and location specific information.

1. Customer Replaceable Unit (“CRU”) Service

IBM provides replacement CRUs to you for you to install. CRU information and replacement instructions are shipped with your Machine and are available from IBM at any time on your request. Installation of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation. You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service designated for your Machine. IBM specifies in the materials shipped with a replacement CRU whether a defective CRU must be returned to IBM. When return is required, 1) return instructions and a container are shipped with the replacement CRU, and 2) you may be charged for the replacement CRU if IBM does not receive the defective CRU within 30 days of your receipt of the replacement.

2. On-site Service

IBM or your reseller will either repair or exchange the failing Machine at your location and verify its operation. You must provide suitable working area to allow disassembly and reassembly of the IBM Machine. The area must be clean, well lit and suitable for the purpose. For some Machines, certain repairs may require sending the Machine to an IBM service center.

3. Courier or Depot Service*

You will disconnect the failing Machine for collection arranged by IBM. IBM will provide you with a shipping container for you to return your Machine to a designated service center. A courier will pick up your Machine and deliver it to the designated service center. Following its repair or exchange, IBM will arrange the return delivery of the Machine to your location. You are responsible for its installation and verification.

4. Customer Carry-In or Mail-In Service

You will deliver or mail as IBM specifies (prepaid unless IBM specifies otherwise) the failing Machine suitably packaged to a location IBM designates. After IBM has repaired or exchanged the Machine, IBM will make it available for your collection or, for Mail-in Service, IBM will return it to you at IBM’s expense, unless IBM specifies otherwise. You are responsible for the subsequent installation and verification of the Machine.

5. CRU and On-site Service

This type of Warranty Service is a combination of Type 1 and Type 2 (see above).

6. CRU and Courier or Depot Service

This type of Warranty Service is a combination of Type 1 and Type 3 (see above).

7. CRU and Customer Carry-In or Mail-In Service

This type of Warranty Service is a combination of Type 1 and Type 4 (see above).

When a 5, 6 or 7 type of warranty service is listed, IBM will determine which type of warranty service is appropriate for the repair.

* This type of service is called ThinkPad EasyServ or EasyServ in some countries.

The IBM Machine Warranty World Wide Web site at http://www.ibm.com/servers/support/machine_warranties/ provides a worldwide overview of IBM's Limited Warranty for Machines, a Glossary of IBM definitions, Frequently Asked Questions (FAQs) and Support by Product (Machine) with links to Product Support pages. **The IBM Statement of Limited Warranty is also available on this site in 29 languages.**

To obtain warranty service contact IBM or your IBM reseller. In Canada or the United States, call 1-800-IBM-SERV (426-7378). In the EU countries, see the telephone numbers below.

EU Country Telephone List

Phone numbers are subject to change without notice. For the warranty service contact telephone number in a country subsequently added to the EU and not yet reflected in the list below, contact IBM in that country or visit the website above for a current telephone listing.

| | |
|------------------------------------|-------------------------------------|
| Austria -- +43-1-24592-5901 | Latvia -- +386-61-1796-699 |
| Belgium -- +32-70-23-3392 | Lithuania -- +386-61-1796-699 |
| Cyprus -- +357-22-841100 | Luxembourg -- +352-298-977-5063 |
| Czech Republic -- +420-2-7213-1316 | Malta -- +356-23-4175 |
| Denmark -- +45-4520-8200 | Netherlands -- +31-20-514-5770 |
| Estonia -- +386-61-1796-699 | Poland -- +48-22-878-6999 |
| Finland -- +358-8001-4260 | Portugal -- +351-21-892-7147 |
| France -- +33-238-557-450 | Slovakia -- +421-2-4954-1217 |
| Germany -- +49-1805-253553 | Slovenia -- +386-1-4796-699 |
| Greece -- +30-210-680-1700 | Spain -- +34-91-714-7983 |
| Hungary -- +36-1-382-5720 | Sweden -- +46-8-477-4420 |
| Ireland -- +353-1-815-4000 | United Kingdom -- +44-0870-550-0900 |
| Italy -- +39-800-820-094 | |

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