

xSeries Server



VXA-2 Internal Tape Drive

User's Guide

Important:

Please review the maintenance information in "Using cleaning cartridges" on page 3-4 and Appendix A, "Maintaining the tape drive", on page A-1 as periodic maintenance is not covered by the IBM warranty. Repairs or exchanges resulting from improper maintenance or use of unsupported media may result in billable service charges.

xSeries Server



VXA-2 Internal Tape Drive

User's Guide

Note: Before using this information and the product it supports, read the information in Appendix D, "Warranty information", on page D-1 and Appendix E, "Notices", on page E-1.

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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 הודאות 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」。

About this book

This *User's Guide* provides installation instructions and information required for ongoing use and maintenance of the IBM® VXA-2 Internal Tape Drive. This manual contains the following information:

Chapter 1, "Introduction" provides an introduction to the VXA-2 Internal Tape Drive.

Chapter 2, "Installation" provides procedures for installing the tape drive in your xSeries™ server.

Chapter 3, "Using the tape drive" provides information on how to use the drive. This chapter contains information about caring for data cartridges, using cleaning cartridges, and setting write protection on cartridges.

Appendix A, "Maintaining the tape drive" contains information on maintaining your tape drive and caring for your storage media.

Appendix B, "Product specifications" provides information on product specifications and requirements.

Appendix C, "Problem solving" provides solutions to problems that might occur while using the tape drive.

Appendix D, "Warranty information" provides warranty information.

Appendix E, "Notices" contains trademarks and legal notices.

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

Be sure to retain your proof of purchase. It might be required for warranty service.

Registering your option

Thank you for purchasing an IBM xSeries Server option. Please take a few moments to register your product and provide us with information that will help IBM to better serve you in the future. Your feedback is valuable to us in developing products and services that are important to you, as well as in developing better ways to communicate with you. Register your option on the <http://www.ibm.com/pc/register> IBM Web site.

IBM will send you information and updates on your registered product unless you indicate on the Web site questionnaire that you do not want to receive further information.

Chapter 1. Introduction

The IBM VXA-2 Internal Tape Drive is a versatile backup and restore device for low to mid-range servers. This SCSI tape drive is capable of storing up to 80 gigabytes (GB) of native data on a 230-meter VXA tape. It can transfer data at a sustained rate of up to 6 megabytes (MB) per second. Both capacity and transfer rates are further enhanced with its onboard hardware data compression feature.

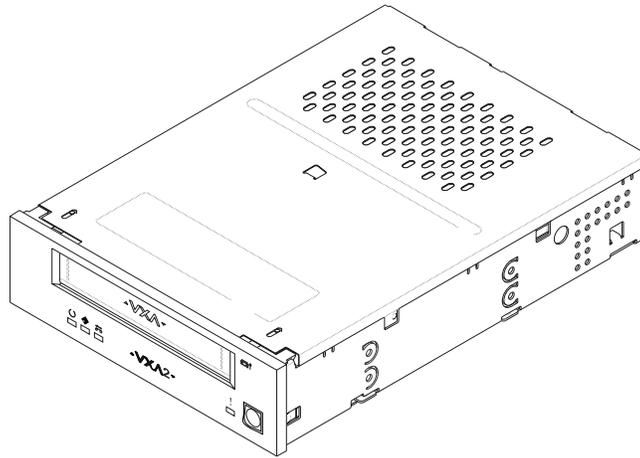


Figure 1-1. VXA-2 tape drive

In addition to this user's guide, the option package contains:

- IBM VXA-2 Internal Tape Drive
- Mounting screws
- Backup application CDs (trial versions)
- Cleaning cartridge
- Quick Start Guide
- Device drivers (on the *Documentation CD*)
- SCSI cable

Contact your place of purchase if an item is missing or damaged. Be sure to retain your proof of purchase and packing material. They might be required to receive warranty service.

Software description

The IBM VXA-2 Internal Tape Drive option package includes trial-version backup application CDs. These CDs contain popular backup and restore applications for Microsoft® Windows® 2000, Novell NetWare, and Linux. You can install the appropriate application for your computer system by following the installation instructions that come with the CD you select. These trial versions expire after 30 to 90 days, depending on the application you use.

Use the trial period to determine the best application for your specific computer configuration. For information on purchasing a permanent installation copy of the

desired tape drive backup application, go to the IBM tape drive Web site at <http://www.pc.ibm.com/ww/eserver/xseries/tape.html> or follow the instructions from the CD.

The CDs also contain backup applications that are used with other products but are not applicable to the VXA-2 Internal Tape Drive. For a current list of supported tape drive configurations, go to the <http://www.pc.ibm.com/us/compat> IBM Server Compatibility Web page, select **Tape Backup Units**, and search for "59P6746."

Chapter 2. Installation

The VXA-2 Internal Tape Drive is compatible with several xSeries servers. For a list of supported servers go to <http://www.pc.ibm.com/us/compat> and click on "Tape Backup Units." Refer to the documentation that comes with the server for instructions on installing the tape drive. If you cannot locate your xSeries server user manual, follow the instructions in the following sections to install the tape drive.

Installation requirements

To install the tape drive in your xSeries server, you will need the following:

- A low voltage differential (Ultra2) SCSI host adapter
- Documentation for your computer, SCSI bus adapter, or external enclosure
- Phillips head and flat blade screwdrivers for the mounting screws, and for opening your computer
- Flat-nose pliers (optional) to install and remove jumpers
- An available 5.25-inch half high drive bay

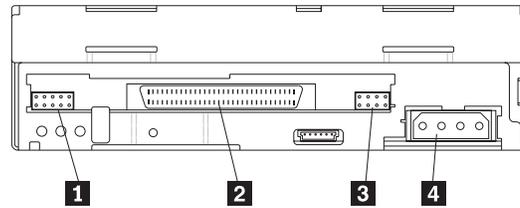
Preparing for installation

To prepare for installation, complete the following procedure:

1. Touch a known grounded surface to discharge static electricity from your body and ensure that the work area is free from conditions that could cause ESD.
2. Turn off all devices attached to the computer in which you plan to install the drive, then turn off the computer.
3. Disconnect all power cables.
4. Remove the drive bay's cover plate according to the system manufacturer's instructions.
5. Before opening the static-protective bag containing the tape drive, touch the bag to an unpainted metal surface on the computer for at least two seconds. Remove the drive from the static-protective bag. If you must put the drive down, place the drive on the static-protective bag. Do not touch any exposed components of the tape drive. Instead, handle it carefully by the edges.

Attention: Tape drives are sensitive to static electricity discharge. The drive is wrapped in a static-protective bag to prevent damage.

The tape drive complies with industry-standard, 5.25-inch half-high form factor mounting requirements and can be mounted either horizontally or vertically, but not upside down. When installing the tape drive, refer to Figure 2-1 on page 2-2 for the location of the back-panel components.



- 1** Term power connector
- 2** SCSI connector
- 3** SCSI ID jumpers
- 4** Power connector

Figure 2-1. Back-panel components

Setting the SCSI ID and termination

The drive is shipped with a SCSI ID of 0. If you want to change the default ID, install the jumpers on the jumper block (**3** in Figure 2-1) for the desired ID, as shown in Figure 2-2. (If necessary, use flat-nose pliers to remove the jumpers.) If you need an additional jumper, use a 2 mm jumper.

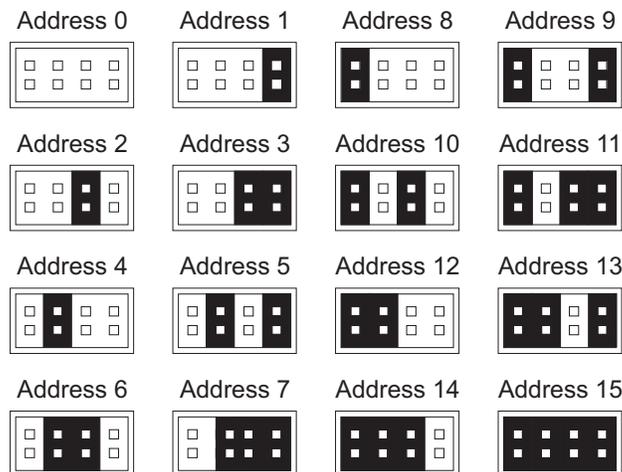


Figure 2-2. SCSI ID settings

You can use the connector (**1** in Figure 2-1) to enable the terminator power signal. (The drive is shipped from the factory with termination power disabled.) To enable termination power, place a jumper across the far right pins on the auxiliary connector. Make sure the jumper is firmly in place. Be sure to use a 2 mm jumper.



Figure 2-3. Term power enabled

Note: To protect the drive components if termination power is shorted, the tape drive includes a self-resetting power fuse.

Mounting the drive

Generally, you will mount the tape drive and then attach the SCSI and power cables. However, if there is insufficient working space to attach the connectors after mounting the drive, attach the cables first.

Slide the drive into the server bay or external enclosure. Ensure that no cables are caught or crimped between the drive and the chassis. Using the screws provided with the tape drive, secure the drive in the drive bay using one of the screw mounting combinations.

Attention:

To avoid damaging the drive, follow these precautions:

- Use only the M3 x 0.5 x 4 mm Phillips screws provided.
- Ensure that the chassis is not distorted. (Alignment to the horizontal or vertical plane should not exceed $\pm 10^\circ$.)
- Ensure that no objects (screw heads, cables, or adjacent devices) are pressing against the frame.
- Do not use a combination of the two sets of mounting holes.
- Do not obstruct the drive's ventilation slots (top and rear).

Attaching the cables

Locate the host system's internal power cable and connect it to the drive's power connector (**1** in Figure 2-4). The enclosure's power cable connector must be an AMP 1-480424-0 series, or equivalent.

Using the provided SCSI cable, attach the non-terminated end to the host system's SCSI adapter and the terminated end to the back of the tape drive (**2** in Figure 2-4).

Attention: To avoid damaging the tape drive, make certain you connect pin 1 on the cable to pin 1 on the drive. Pin 1 is on the right, top row of the connector pins.

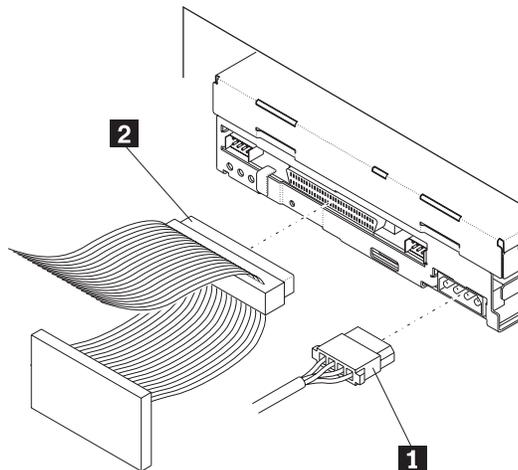


Figure 2-4. Installing the SCSI cable

Completing the installation and turning on the device

Before completing the installation, check your work to ensure that the power and SCSI connectors are securely attached, and that the cables are properly routed. Then, power on the host system.

During the tape drive's power-on self-test, the LEDs scroll sequentially right to left, then left to right. For more information, see Table 3-1 on page 3-3.

Updating the configuration

For most computers, the configuration-setup utility program automatically recognizes the new tape drive. However, you might need to provide information about your system changes after you restart your computer.

Ensure that the appropriate advanced SCSI programming interface (ASPI) device drivers are installed to support the tape drive. Device drivers are usually provided with the SCSI adapter.

If your computer does not recognize the tape drive after startup or if you receive startup errors, run the configuration-setup utility program as described in the documentation that comes with your computer.

Installing backup and restore software

The tape drive is used for backing up and restoring data. Consequently, to use the drive, you must install an appropriate backup and restore application for your computer operating system. Use the instruction below that best fits your situation:

- If you are using software not included in the option package, follow the directions that come with your software.
- If you are using the trial software that comes with the option, insert a trial application CD into the CD-ROM drive and follow the on-screen installation and operating instructions.
- If you are using the hardware installation support that your operating system provides, and the operating system requests a device driver, insert the *Documentation CD* and look in the "device driver" folder.

Chapter 3. Using the tape drive

This section provides information on using the tape drive. Figure 3-1 shows the front panel of the tape drive and identifies the components.

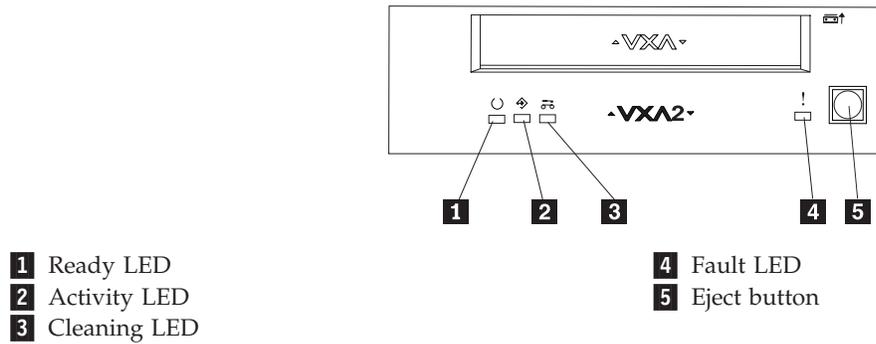


Figure 3-1. Front view of the tape drive

Front panel LEDs

The tape drive contains four LEDs to indicate its operational status, as shown in Table 3-1 on page 3-3.

Table 3-1. Definition of status light combinations

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

Notes:

1. A solid amber LED indicates the drive needs cleaning. The drive will continue to function, but, needs cleaning as soon as possible. A power cycle must not turn off this indicator.
2. The **Fault** LED will flash to indicate an unrecoverable error. An unrecoverable error is an error condition that results in the drive not being able to function unless initiator, operator, or service intervention is applied. An unrecoverable drive failure is usually the result of a hardware error condition. One of the following actions will be needed to clear the flashing Fault LED:
 - Hard SCSI Reset
 - Cartridge Eject
 - Power Cycle
 - Retry Microcode Download

An unrecoverable cartridge (media) failure is usually the result of a defective cartridge, media, or cartridge state and will require the drive to eject the cartridge (if possible) to clear the flashing LED.
3. The firmware download failed and the drive is not functional. The drive boot code is in control and the microcode download should be retried.
4. The **Fault** LED will be on solid to indicate an over temperature condition.

Loading data cartridges

The tape drive uses data-quality VXA tape data cartridges, in various lengths, available from IBM. These cartridges do not require formatting or other media conditioning before use. See “Data capacities” on page B-1 for the capacities of the VXA tape cartridges. See “Storage and shipping environments” on page A-2 for storage guidelines.

Attention: The VXA-2 tape drive only operates with IBM recommended VXA data cartridges. Do not attempt to use other types of cartridges, or you may damage the tape drive.

Insert the front of the cartridge through the tape drive door into the loader mechanism. (The colored write-protect tab on the cartridge should be closest to the drive’s eject button.) Gently push the cartridge until the drive’s loader mechanism activates the tape-loading process. The drive will then pull the cartridge the remaining distance into the drive.

The tape drive loads the tape in approximately 40 seconds, during which time, the **Activity** LED flashes green. When the **Activity** LED is steady green, the tape drive is ready to begin write and read operations.

Unloading data cartridges

To unload a cartridge, press the eject button. The tape drive completes any command in process, writes any buffered information to tape, rewinds to the beginning of the tape, and ejects the cartridge in approximately 1 to 2 minutes.

Using cleaning cartridges

Clean the tape drive whenever the **Cleaning** LED status light comes on or a system I/O error related to the device occurs.

Attention: Only use the IBM recommended VXA cleaning cartridges to clean the tape drive. Use of other than recommended cleaning cartridges can damage your drive and may void the warranty.

To clean the tape drive:

1. Make sure that the power is on.
2. If a tape cartridge is in the tape drive, eject and remove the cartridge.

Notes:

- a. Cleaning cartridges can be used approximately 20 times. Once a cleaning cartridge has been used to its maximum number of uses, the cartridge is considered expired. The tape drive will detect, and automatically eject, an expired cartridge. Never attempt to reuse an expired cleaning cartridge as it will reintroduce debris removed during a previous cleaning of the tape drive.
 - b. The IBM cleaning cartridge is shipped with a label on it that has 20 boxes that are designed to be used to log the use of the cartridge. Each time the cartridge is used, mark one of the boxes on the label with a pen or marker. When all of the boxes have been marked, discard the cleaning cartridge.
3. Grasp the cleaning cartridge by the outer edges, with the window side up and the write-protect switch facing you.

- Slide the cartridge into the opening on the front of the tape drive (see figure Figure 3-2) until the loading mechanism pulls the cartridge into the drive and the drive door closes.

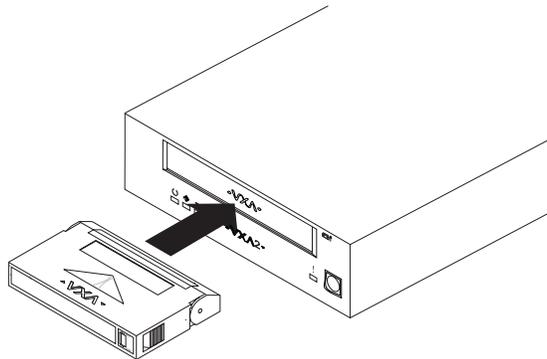


Figure 3-2. Loading the cleaning cartridge

After the cleaning cartridge has been inserted, the remainder of the cleaning process is automatic. The tape drive will do the following:

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

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

To determine how many times a cleaning cartridge may be used, check the information printed on the cartridge. If you attempt to use a depleted cleaning cartridge, the tape drive automatically detects the error and ejects the cartridge. If the **Cleaning** LED was on prior to the cleaning process, it stays on; if the **Cleaning** LED was off, the depleted cartridge causes the light to come on.

Setting write protection on the tape cartridge

Before you insert a cartridge into the tape drive, make sure the write-protect switch on the cartridge is set correctly, as shown in Figure 3-3 on page 3-6.

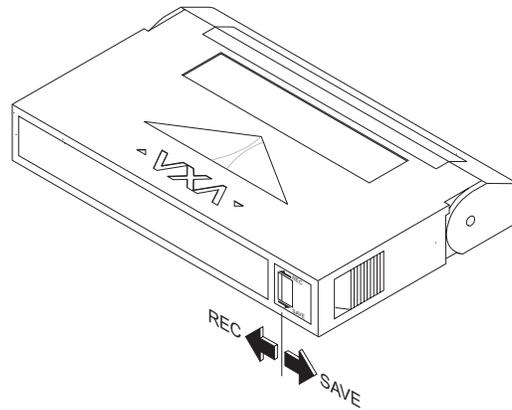


Figure 3-3. Setting the write-protect switch

Resetting the drive

To reset the VXA-2 drive, perform one of the following steps:

- Press and hold the eject button for 10 seconds.
- Turn off the tape drive and turn it on again (do not perform this step if the drive contains a cartridge).
- Use the backup/restore application software to send a reset.

Packaging the drive for shipping

If you are shipping the tape drive to another location or returning it for repair, pack the tape drive in its original shipping container and packing materials.

Attention: To avoid damaging the tape drive, use the original shipping materials when you ship it. Your proof of purchase might be required to receive warranty service. If you are returning the tape drive for service, only return the tape drive. Remove and keep all cartridges, cables, and terminators.

Appendix A. Maintaining the tape drive

The tape drive uses cartridges with VXA technology for saving and restoring system data. It is designed to use only VXA cartridges.

The tape drive is only backward compatible to previous VXA technology media.

Attention:

- **The VXA-2 tape drive only operates with IBM recommended VXA data cartridges. Do not attempt to use other types of cartridges, or you may damage the tape drive.**
- **Only use the IBM recommended VXA cleaning cartridges to clean the tape drive. Use of other than recommended cleaning cartridges can damage your drive and may void the warranty.**

Types of tape cartridges

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

Cleaning cartridge

Use the specially labeled cleaning cartridge to clean the tape drive. For instructions about how to clean the tape drive, see "Using cleaning cartridges" on page 3-4).

To order additional cartridges, see "Ordering tape cartridges" on page A-5.

Recommendations for data cartridge usage

The following list describes recommended guidelines that will help to protect your data and prolong the life of your tape cartridges and the tape drive:

- 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 data 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 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 clog the drive load mechanism.
- Do not use poor-quality tape cartridges. They can cause excessive read or write errors, and may damage the tape drive.
- Discard any tape cartridges that are dropped, as the impact may damage the tape's internal mechanism.
- Make sure the environment is kept clean and constant. Do not operate in a dusty environment and always maintain a constant environment. A consistent storage and operating environment reduces media exposure to climatic stress.

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

- Printers and copiers can produce paper and toner dust. Locate the tape unit away from these items. High traffic areas near hallways and doors can also produce excess dust and dirt.
- All important information should be recorded on the tape label. Information, such as the model and number of the system or tape drive, the date, the density, any error statistics, and a log number should be included. The operating environment and compression mode should also be noted.

Data cartridge erasure

Most bulk eraser devices do not have the capability to erase the data cartridge. To properly erase a VXA data cartridge with a bulk eraser device, the erasure coercivity rating must be a minimum of 3900 Oersted.

Storage and shipping environments

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 "Tape cartridge conditions" on page B-2.)

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

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

The recommended environment for storage and shipment of VXA data cartridges is shown in Table A-1.

Table A-1. Recommended environment for VXA data cartridges

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

Tape cartridge storage

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

Use the following guidelines for storing your tape cartridges:

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

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

Operating in harsh environments

Do not use as an archival tape any tape that has been used outside of the operating ranges specified in Appendix B, "Product specifications", on page B-1 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 tape drive in a poor air-quality environment. If your environment contains an excessive amount of particulates, contact your service representative for more information.

Placing the cartridge labels

Use care when placing the cartridge labels on the VXA tape cartridge. Use the following guidelines for tape cartridge labels.

- Use only labels provided with the cartridge and place them only in the designated locations.
- IBM VXA tape cartridges are shipped 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 **1**.
- Place the smaller label on the top of the cartridge in the designated area **2**.

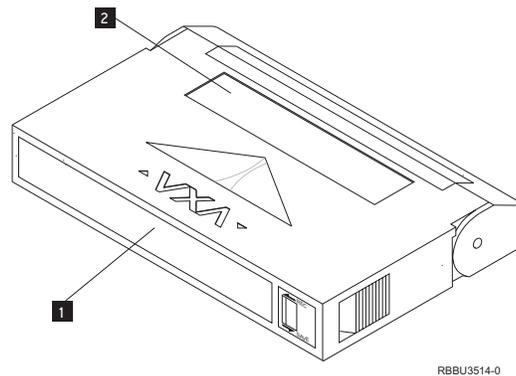


Figure A-1. Placing the tape cartridge labels

Ordering tape cartridges

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

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

Table A-2 lists the tape cartridges that you can order for the VX2-A Internal Tape Drive. To order cartridges in the United States and Canada, call 1-888-IBM-MEDIA. To order cartridges in other locations, contact your local provider of IBM storage products.

Table A-2. Tape cartridges for the tape drive

IBM part number	Type of cartridge	Length
19P4876	VXA 80GB data cartridge	230 m
19P4877	VXA 59GB data cartridge	170 m
19P4878	VXA 21GB data cartridge	62 m
19P4879	VXA test cartridge	--
19P4880	VXA cleaning cartridge	--

Appendix B. Product specifications

This appendix includes the product specifications and requirements.

Data capacities

Table B-1 lists the data capacities for the VXA tape cartridge models.

Table B-1. Data capacities in gigabytes (GB)

Cartridge model	Tape length	Capacity ^a , native	Capacity ^a , compressed ^b
V23	230 meters	80 GB ^c	160 GB
V17	170 meters	59 GB	118 GB
V10	120 meters	40 GB	80 GB
V6	62 meters	20 GB	40 GB

^a Maximum capacity; assumes the host computer keeps the drive streaming.

^b Assumes a 2:1 compression ratio. Actual compressed capacity varies depending on the type of data being recorded. The tape drive uses the ALDC (Adaptive Lossless Data Compression) algorithm and integrated circuit chip. The ALDC algorithm is compliant with the European Computer Manufacturers Association (ECMA) standard. Data compression is controlled by the software application.

^c One gigabyte equals 1,000,000,000 bytes.

Size and weight

Table B-2 shows the dimensions and width for the tape drive. The tape drive is a 5.25-inch form factor drive for integration into an enclosure.

Table B-2. Size and weight

Specification	Tape drive
Height	41.2 mm (1.62 in)
Height (bezel)	42.6 mm (1.68 in)
Depth	203.0 mm (8.0 in)
Width	146.0 mm (5.75 in)
Width (bezel)	149.2 mm (5.87 in)
Weight	1.0 kg (2.2 lbs)

Tape drive conditions

Table B-3 summarizes the environmental requirements for the tape path in the tape drive.

Table B-3. Temperature and humidity specifications for the tape drive

Specification	Operating ^{a, b}	Storage ^c /nonoperating	Transporting ^c
Temperature range	+5°C to +45°C (+41°F to +113°F)	-40°C to +60°C (-40°F to +140°F)	
Temperature variation	1°C per min; max 10°C per hour (2°F per min; max 18°F per hour)	1°C per min; max 20°C per hour (2°F per min; max 36°F per hour)	
Relative humidity	20% to 80% non-condensing	5% to 95% non-condensing	
Wet bulb	29°C (84.2°F) max.		
Altitude		-304.8 to +3,048 m (-1,000 to +10,000 ft)	-304.8 to +12,192 m (-1,000 to +40,000 ft)
<p>^a The drive temperature and humidity must be stabilized in the specified environment for at least 24 hours.</p> <p>^b Temperature measurements are made in the tape path.</p> <p>^c The tape drive is in its original shipping container. When the tape drive is moved from a cooler storage environment to a warmer operating environment, it must acclimate in its packaging for 24 hours to prevent damage from condensation.</p>			

Tape cartridge conditions

Table B-4 summarizes the environmental requirements for the tape path in the tape drive.

Table B-4. Temperature and humidity specifications for the tape cartridge

Specification	Operating ^{a, b}	Storage ^a /nonoperating	Transporting ^c
Temperature range	+5°C to +45°C (+41°F to +113°F)	+5°C to +32°C (+41°F to +90°F)	-40°C to +45°C (-40°F to +113°F)
Temperature variation	1°C per min; max 10°C per hour (2°F per min; max 18°F per hour)	1°C per min; max 20°C per hour (2°F per min; max 36°F per hour)	
Relative humidity	20% to 80% non-condensing	5% to 95% non-condensing	

Table B-4. Temperature and humidity specifications for the tape cartridge (continued)

Specification	Operating ^{a, b}	Storage ^a /nonoperating	Transporting ^c
Wet bulb	26°C (79°F) max.		
Altitude		-304.8 to +3,048 m (-1,000 to +10,000 ft)	-304.8 to +12,192 m (-1,000 to +40,000 ft)
<p>^a The cartridge temperature and humidity must be stabilized in the specified environment for at least 24 hours.</p> <p>^b Temperature measurements are made in the tape path.</p> <p>^c The cartridge is in its original packaging. When the cartridge is moved from a cooler storage environment to a warmer operating environment, it must acclimate in its packaging for 24 hours to prevent damage from condensation.</p>			

Note: When a VXA tape is brought into the room where the drive is located, allow the VXA tape to adjust to room temperature and humidity before using it.

Appendix C. Problem solving

This appendix provides information on problem solving. Computer problems can be caused by hardware, software, or user error. You might be able to use the information in this section to solve problems yourself, or to gather helpful information you can pass on to a service technician.

If, after attempting the recommended actions listed in the table, the problem still exists or recurs, a hardware failure might be the cause. Contact your IBM service representative.

Problem	Solution
TAPE DRIVE WILL NOT ACCEPT A CARTRIDGE	<ol style="list-style-type: none"><li>1. Determine if there is already a cartridge loaded. Press the eject button; there may be a cartridge already loaded in the drive.<li>2. Make sure you are using VXA Tape cartridges. If the cartridge you are attempting to load is not a VXA Tape cartridge, the tape drive automatically ejects it.<li>3. Power cycle the drive. Power down the drive. Wait 10 seconds, then turn the drive back on. On power-up, observe the drive's LED code sequence. If the LEDs do not illuminate, check the power supply and power cable connection. If the drive completes the power-on sequence normally, but still does not accept the cartridge, contact IBM technical support. If power to the drive was interrupted when you originally attempted to load a cartridge, the drive detects the tape when its power is restored and then rewinds the tape. If this is the case, press the eject button, remove the cartridge, and begin the session again.

Problem	Solution
<p>FAULT LED IS STEADY AMBER (This means the tape drive is over temperature and must cool down before operations can continue.)</p>	<ol style="list-style-type: none"> 1. Wait for the tape drive to cool. When the drive cools down, LED 4 turns off. Do not attempt to load a cartridge or perform any operations during this time. If there is a tape loaded in the drive, press the eject button to unload the tape and move it to a cooler environment. 2. If necessary, power cycle the drive. If the tape drive does not cool down on its own, power down the drive. Wait a few minutes, then turn the drive back on. If Fault LED is still amber after power-up, the tape drive may be in an environment that is too hot. If the drive is an internal model, check that the top and rear ventilation slots are not blocked in the enclosure and that the drive is not located near devices that are emitting excessive heat. If the drive is an external model, the enclosure's fan may not be working properly and you should return the drive for service. If you cannot determine the cause of the over-temperature condition yourself, contact IBM technical support.
<p>TAPE DRIVE WILL NOT EJECT A CARTRIDGE</p>	<ol style="list-style-type: none"> 1. Determine if the backup application is preventing media removal. Check for an option in the software that may be preventing media removal and reset that option. If necessary, use the backup application to eject the cartridge. 2. If you cannot eject the cartridge through the application, reset the drive. Turn off power to the drive, wait 10 seconds, then turn it on again. Depending on what function the drive was performing before the reset, the drive may automatically start a lengthy format recovery process; wait for the format recovery to complete. 3. If the cartridge appears to be stuck in the drive, return it for service. If you still cannot eject the cartridge, you may need to return the drive for repair with the cartridge in place. The cartridge will be removed and returned to you. If it is absolutely mandatory that the cartridge be removed before returning the drive for repair, contact IBM technical support.

Problem	Solution
<p>DRIVE DOES NOT RESPOND TO SOFTWARE COMMANDS (The drive powers up, loads and unloads cartridges, but will not respond to any software commands.)</p>	<ol style="list-style-type: none"> 1. Make sure the tape drive is installed properly on the SCSI bus. Make sure you followed the correct procedures, described in Chapter 2, "Installation", on page 2-1, to install the drive on the SCSI bus. The SCSI cable should be firmly connected. Also make sure the connector pins are not bent or broken. 2. Perform a SCSI bus reset. If a SCSI bus reset does not cause the drive to reset, check the following: <ul style="list-style-type: none"> • Is there a broken SCSI cable or defective connector? • Is SCSI cable pin 1 aligned with SCSI connector pin 1? • Is the drive set to a unique SCSI ID? If a SCSI bus reset does cause the drive to reset, the problem may be with the SCSI bus addressing or termination. Do the following: <ul style="list-style-type: none"> • Check the SCSI bus addressing and termination. • Try another known good SCSI device in the same location.
<p>LEDS BLINK IN AN UNKNOWN SEQUENCE</p>	<ol style="list-style-type: none"> 1. Clean the drive. See "Using cleaning cartridges" on page 3-4 for cleaning instructions; LED 2 flashes yellow when the drive needs to be cleaned. Use only an IBM-approved VXA tape cleaning cartridge. 2. Retry the read or write operation. If the drive was attempting to perform a read or write operation when the error occurred, eject the cartridge, insert it again, and retry the operation. If this does not solve the problem, load a new cartridge and try again. 3. Power cycle the drive. If the problem persists, turn the drive off, then back on again.

Problem	Solution
BACKUP SOFTWARE IS REPORTING AN ERROR	<p>One of the following situations may have occurred:</p> <ul style="list-style-type: none"> <li>• The drive needs cleaning. Always try cleaning the drive before you assume the cartridge is bad. Be sure to use a VXA tape cleaning cartridge. For more information, see “Using cleaning cartridges” on page 3-4. <li>• The cartridge is incompatible with the tape drive. Be sure to use a VXA tape cartridge. <li>• If you are trying to write data, the cartridge may be write-protected. Check the switch on the edge of the cartridge. If the switch does not cover the opening, the tape is write-protected. If the switch covers the opening, you can write to the tape. Use a pen or small screwdriver to move the switch. (See “Setting write protection on the tape cartridge” on page 3-5.) <li>• The cartridge is not inserted properly in the drive. Remove the cartridge, then reinsert it and retry the operation.

Appendix D. Warranty information

This section contains the warranty period for your product, information about obtaining warranty service and support, and the IBM Statement of Limited Warranty.

Warranty period

Contact your place of purchase for warranty service information.

Machine - VXA-2 Internal Tape Drive

Warranty period	Service delivery method
Parts: 3 years; labor: 0 years	CCE (customer carry in or mail in)

Service and support

The following information describes the technical support that is available for your product, during the warranty period or throughout the life of the product. Refer to your IBM Statement of Limited Warranty for a full explanation of IBM warranty terms.

Warranty information on the World Wide Web

The IBM Machine Warranties Web site at http://www.ibm.com/servers/support/machine_warranties/ contains a worldwide overview of the IBM Limited Warranty for IBM Machines, a glossary of terms used in the Statement of Limited Warranty, Frequently Asked Questions (FAQ), and links to Product Support Web pages. The IBM Statement of Limited Warranty is available from this Web site in 29 languages in Portable Document Format (PDF).

Online technical support

Online technical support is available during the life of your product through the Personal Computing Support Web site at <http://www.ibm.com/pc/support/>.

During the warranty period, assistance for replacement or exchange of defective components is available. In addition, if your IBM option is installed in an IBM computer, you might be entitled to service at your location. Your technical support representative can help you determine the best alternative.

Telephone technical support

Installation and configuration support through the IBM HelpCenter[®] will be withdrawn or made available for a fee, at IBM's discretion, 90 days after the option has been withdrawn from marketing. Additional support offerings, including step-by-step installation assistance, are available for a nominal fee.

To assist the technical support representative, have available as much of the following information as possible:

- Option name
- Option number

- Proof of purchase
- Computer manufacturer, model, serial number (if IBM), and manual
- Exact wording of the error message (if any)
- Description of the problem
- Hardware and software configuration information for your system

If possible, be at your computer. Your technical support representative might want to walk you through the problem during the call.

For the support telephone number and support hours by country, refer to the following table. If the number for your country or region is not listed, contact your IBM reseller or IBM marketing representative. Response time may vary depending on the number and nature of the calls received.

Support 24 hours a day, 7 days a week	
Canada (Toronto only)	416-383-3344
Canada (all other)	1-800-565-3344
U.S.A. and Puerto Rico	1-800-772-2227
All other countries and regions	Go to http://www.ibm.com/pc/support/ , and click Support Phone List .

IBM Statement of Limited Warranty Z125-4753-06 8/2000

Part 1 - General Terms

This Statement of Limited Warranty includes Part 1 - General Terms and Part 2 - Country-unique Terms. 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, from IBM or your reseller. 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. Unless IBM specifies otherwise, the following warranties apply only in the country where you acquire the Machine. Nothing in this Statement of Limited Warranty affects any statutory rights of consumers that cannot be waived or limited by contract. If you have any questions, contact IBM or your reseller.

The IBM Warranty for Machines: IBM warrants that each Machine 1) is free from defects in materials and workmanship and 2) conforms to IBM's Official Published Specifications ("Specifications"). The warranty period for a Machine is a specified, fixed period commencing on its Date of Installation. The date on your sales receipt is the Date of Installation unless IBM or your reseller informs you otherwise.

If a Machine does not function as warranted during the warranty period, and IBM or your reseller are unable to either 1) make it do so or 2) replace it with one that is at least functionally equivalent, you may return it to your place of purchase and your money will be refunded.

Extent of Warranty: The warranty does not cover the repair or exchange of a Machine resulting from misuse, accident, modification, unsuitable physical or operating environment, improper maintenance by you, or failure caused by a product for which IBM is not responsible. The warranty is voided by removal or alteration of Machine or parts identification labels.

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. THESE WARRANTIES GIVE YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM JURISDICTION TO JURISDICTION. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF EXPRESS OR IMPLIED WARRANTIES, SO THE ABOVE EXCLUSION OR LIMITATION MAY NOT APPLY TO YOU. IN THAT EVENT, SUCH WARRANTIES ARE LIMITED IN DURATION TO THE WARRANTY PERIOD. NO WARRANTIES APPLY AFTER THAT PERIOD.

Items Not Covered by Warranty: 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 via telephone with "how-to" questions and those regarding Machine set-up and installation, will be provided **WITHOUT WARRANTIES OF ANY KIND.**

Warranty Service: To obtain warranty service for a Machine, contact IBM or your reseller. If you do not register your Machine with IBM, you may be required to present proof of purchase.

During the warranty period, IBM or your reseller, if approved by IBM to provide warranty service, provides without charge certain types of repair and exchange service to keep Machines in, or restore them to, conformance with their Specifications. IBM or your reseller will inform you of the available types of service for a Machine based on its country of installation. At its discretion, IBM or your reseller will 1) either repair or exchange the failing Machine and 2) provide the service either at your location or a service center. IBM or your reseller will also manage and install selected engineering changes that apply to the Machine.

Some parts of IBM Machines are designated as Customer Replaceable Units (called "CRUs"), e.g., keyboards, memory, or hard disk drives. IBM ships CRUs to you for replacement by you. You must return all defective CRUs to IBM within 30 days of your receipt of the replacement CRU. You are responsible for downloading designated Machine Code and Licensed Internal Code updates from an IBM Internet Web site or from other electronic media, and following the instructions that IBM provides.

When 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. 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.

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 problem determination, problem analysis, and service request procedures that IBM or your reseller provides;
 - b. secure all programs, data, and funds contained in a Machine;
 - c. provide IBM or your reseller with sufficient, free, and safe access to your facilities to permit them to fulfill their obligations; and
 - d. inform IBM or your reseller of changes in a Machine's location.

IBM is responsible for loss of, or damage to, your Machine 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 is responsible for any of your confidential, proprietary or personal information contained in a Machine which you return to IBM or your reseller for any reason. You should remove all such information from the Machine prior to its return.

Limitation of Liability: 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.

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 LIABLE FOR ANY OF THE FOLLOWING: 1) THIRD-PARTY CLAIMS AGAINST YOU FOR DAMAGES (OTHER THAN THOSE UNDER THE FIRST ITEM LISTED ABOVE); 2) LOSS OF, OR DAMAGE TO, YOUR RECORDS OR DATA; OR 3) SPECIAL, INCIDENTAL, OR INDIRECT DAMAGES OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES, LOST PROFITS OR LOST SAVINGS, EVEN IF IBM, ITS SUPPLIERS OR YOUR RESELLER IS INFORMED OF THEIR POSSIBILITY. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

Governing Law

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 Agreement, without regard to conflict of law principles.

Part 2 - Country-unique Terms

AMERICAS

BRAZIL

Governing Law: *The following is added after the first sentence:*

Any litigation arising from this Agreement will be settled exclusively by the court of Rio de Janeiro.

NORTH AMERICA

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

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

The IBM Warranty for Machines: *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, LAOS, AND VIETNAM

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.

The following is added to this Section:
Disputes and differences arising out of or in connection with this Agreement shall be finally settled by arbitration which shall be held in Singapore in accordance with the rules of the International Chamber of Commerce (ICC). The arbitrator or arbitrators designated in conformity with those rules shall have the power to rule on their own competence and on the validity of the Agreement to submit to arbitration. The arbitration award shall be final and binding for the parties without appeal and the arbitral award shall be in writing and set forth the findings of fact and the conclusions of law.

All proceedings shall be conducted, including all documents presented in such proceedings, in the English language. 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 before proceeding upon the reference. The third arbitrator shall act as chairman of the proceedings. Vacancies in the post of chairman shall be filled by the president of the ICC. 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.

The English language version of this Agreement prevails over any other language version.

HONG KONG AND MACAU

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.

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;
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, IBM’s liability will be limited to the charge paid by you for the individual Machine that is the subject of the claim.

JAPAN

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

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

NEW ZEALAND

The IBM Warranty for Machines: *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 this Section:*

Both you and IBM consent to the application of the laws of the State of New York (except when local law requires otherwise) to govern, interpret, and enforce all your and IBM’s rights, duties, and obligations arising from, or relating in any manner to, the subject matter of this Agreement, without regard to conflict of law principles.

Any disputes arising from or in connection with this Agreement will first be resolved by friendly negotiations, failing which either of us has the right to submit the dispute to the China International Economic and Trade Arbitration Commission in Beijing, the PRC, for arbitration in accordance with its arbitration rules in force at the time. The arbitration tribunal will consist of three arbitrators. The language to be used therein will be English and Chinese. An arbitral award will be final and binding on all the parties, and will be enforceable under the Convention on the Recognition and Enforcement of Foreign Arbitral Awards (1958).

The arbitration fee will be borne by the losing party unless otherwise determined by the arbitral award.

During the course of arbitration, this Agreement will continue to be performed except for the part which the parties are disputing and which is undergoing arbitration.

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.

Warranty Service: If you purchase an IBM Machine in Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland or United Kingdom, 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 an IBM Personal Computer Machine in Albania, Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Georgia, Hungary, Kazakhstan, Kirghizia, 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 an IBM 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 authorized service provider. You are responsible for transportation costs for Machines located outside 50 kilometers of an IBM authorized service provider.

Governing Law: The applicable laws that govern, interpret and enforce rights, duties, and obligations of each of us arising from, or relating in any manner to, the subject matter of this Statement, without regard to conflict of laws principles, as well as Country-unique terms and competent court for this Statement are those of the country in which the warranty service is being provided, except that in 1) Albania, Bosnia-Herzegovina, Bulgaria, Croatia, Hungary, Former Yugoslav Republic of Macedonia, Romania, Slovakia, Slovenia, Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan, the laws of Austria apply; 2) Estonia, Latvia, and Lithuania, the laws of Finland apply; 3) Algeria, Benin, Burkina Faso, Cameroon, Cape Verde, Central African Republic, Chad, Congo, Djibouti, Democratic Republic of Congo, Equatorial Guinea, France, Gabon, Gambia, Guinea, Guinea-Bissau, Ivory Coast, Lebanon, Mali, Mauritania, Morocco, Niger, Senegal, Togo, and Tunisia, this Agreement will be construed and the legal relations between the parties will be determined in accordance with the French laws and all disputes arising out of this Agreement or related to its violation or execution, including summary proceedings, will be settled exclusively by the Commercial Court of Paris; 4) 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, United Kingdom, West Bank/Gaza, Yemen, Zambia, and Zimbabwe, this Agreement will be governed by English Law and

disputes relating to it will be submitted to the exclusive jurisdiction of the English courts; and 5) in Greece, Israel, Italy, Portugal, and Spain any legal claim arising out of this Statement will be brought before, and finally settled by, the competent court of Athens, Tel Aviv, Milan, Lisbon, and Madrid, respectively.

THE FOLLOWING TERMS APPLY TO THE COUNTRY SPECIFIED:

AUSTRIA AND GERMANY

The IBM Warranty for Machines: *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 six 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.

Extent of Warranty: *The second paragraph does not apply.*

Warranty Service: *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.

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.

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).*

IRELAND

Extent of Warranty: *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 items one and two of the first paragraph of this Section:*

1. death or personal injury or physical damage to your real property solely caused by IBM's negligence; and
2. the amount of any other actual direct damages, up to 125 percent of the charges (if recurring, the 12 months' charges apply) for the Machine that is the subject of the claim or which otherwise gives rise to the claim.

Applicability of suppliers and resellers (unchanged).

The following paragraph is added at the end of this Section:

IBM's entire liability and your sole remedy, whether in contract or in tort, in respect of any default shall be limited to damages.

ITALY

Limitation of Liability: *The following replaces the second sentence in the first paragraph:* In each such instance unless otherwise provided by mandatory law, IBM is liable for no more than:

1. *(unchanged)*
2. as to any other actual damage arising in all situations involving nonperformance by IBM pursuant to, or in any way related to the subject matter of this Statement of Warranty, IBM's liability, will be limited to the total amount you paid for the Machine that is the subject of the claim.

Applicability of suppliers and resellers (unchanged).

The following replaces the third paragraph of this Section:

Unless otherwise provided by mandatory law, IBM and your reseller are not liable for any of the following: *(items 1 and 2 unchanged)* 3) indirect damages, even if IBM or your reseller is informed of their possibility.

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 items 1 and 2 of the first paragraph of this Section:*

1. death or personal injury or physical damage to your real property solely caused by IBM's negligence;
2. the amount of any other actual direct damages or loss, up to 125 percent of the charges (if recurring, the 12 months' charges apply) for the Machine that is the subject of the claim or which otherwise gives rise to the claim;

The following item is added to this paragraph:

3. breach of IBM's obligations implied by Section 12 of the Sale of Goods Act 1979 or Section 2 of the Supply of Goods and Services Act 1982.

Applicability of suppliers and resellers (unchanged).

The following is added to the end of this Section:

IBM's entire liability and your sole remedy, whether in contract or in tort, in respect of any default shall be limited to damages.

Appendix E. Notices

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Any performance data contained herein was determined in a controlled environment. Therefore, the result obtained in other operating environments may

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Microsoft, Windows, and Windows NT are trademarks of Microsoft Corporation in the United States, other countries, or both.

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Electronic emission notices

Machine: VXA-2 Internal Tape Drive

Federal Communications Commission (FCC) statement

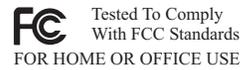
Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an IBM authorized dealer or service representative for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from IBM authorized dealers. 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.

Responsible party:
International Business Machines Corporation
New Orchard Road
Armonk, NY 10504
Telephone: 1-919-543-2193



Industry Canada Class B emission compliance statement

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

Avis de conformité a la réglementation d'Industrie Canada

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

Deutsche EMV-Direktive (electromagnetische Verträglichkeit)

Zulassungsbeseinigunglaut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) vom 30. August 1995 (bzw. der EMC EG Richtlinie 89/336):

Dieses Gerät ist berechtigt in Übereinstimmungmit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen. Verantwortlich für die Konformitätserklärung nach Paragraph 5 des EMVG ist die:

IBM Deutschland Informationssysteme GmbH, 70548 Stuttgart.

Informationen in Hinsicht EMVG Paragraph 3 Abs. (2) 2:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024:1998 und EN 55022:1998 Klasse B.
--

EN 55022 Hinweis:

“Wird dieses Gerät in einer industriellen Umgebung betrieben (wie in EN 55022:B festgelegt), dann kann es dabei eventuell gestört werden. In solch einem FA11 ist der Abstand bzw. die Abschirmungzu der industriellen Störquelle zu vergrößern.”

Anmerkung:

Um die Einhaltung des EMVG sicherzustellen sind die Geräte, wie in den IBM Handbüchern angegeben, zu installieren und zu betreiben.

European Union - emission directive

This product is in conformity with the protection requirements of EU Council Directive 89/336/ECC on the approximation of the laws of the Member States relating to electromagnetic compatibility.

IBM can not accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended 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 B Information Technology Equipment according to European Standard EN 55022. The limits for Class B equipment were derived for typical residential environments to provide reasonable protection against interference with licensed communication devices.

Union Européenne - Directive Conformité électromagnétique

Ce produit est conforme aux exigences de protection de la Directive 89/336/EEC du Conseil de l'UE sur le rapprochement des lois des États membres en matière de compatibilité électromagnétique.

IBM ne peut accepter aucune responsabilité pour le manquement aux exigences de protection résultant d'une modification non recommandée du produit, y compris l'installation de cartes autres que les cartes IBM.

Ce produit a été testé et il satisfait les conditions de l'équipement informatique de Classe B en vertu de Standard européen EN 55022. Les conditions pour l'équipement de Classe B ont été définies en fonction d'un contexte résidentiel ordinaire afin de fournir une protection raisonnable contre l'interférence d'appareils de communication autorisés.

Unione Europea - Directiva EMC (Conformidad electromagnética)

Este producto satisface los requisitos de protección del Consejo de la UE, Directiva 89/336/CEE en lo que a la legislatura de los Estados Miembros sobre compatibilidad electromagnética se refiere.

IBM no puede aceptar responsabilidad alguna si este producto deja de satisfacer dichos requisitos de protección como resultado de una modificación no recomendada del producto, incluyendo el ajuste de tarjetas de opción que no sean IBM.

Este producto ha sido probado y satisface los límites para Equipos Informáticos Clase B de conformidad con el Estándar Europeo EN 55022. Los límites para los equipos de Clase B se han establecido para entornos residenciales típicos a fin de proporcionar una protección razonable contra las interferencias con dispositivos de comunicación licenciados.

Unione Europea - Normativa EMC

Questo prodotto è conforme alle normative di protezione ai sensi della Direttiva del Consiglio dell'Unione Europea 89/336/CEE sull'armonizzazione legislativa degli stati membri in materia di compatibilità elettromagnetica.

IBM non accetta responsabilità alcuna per la mancata conformità alle normative di protezione dovuta a modifiche non consigliate al prodotto, compresa l'installazione di schede e componenti di marca diversa da IBM.

Le prove effettuate sul presente prodotto hanno accertato che esso rientra nei limiti stabiliti per le apparecchiature di informatica Classe B ai sensi della Norma Europea EN 55022. I limiti delle apparecchiature della Classe B sono stati stabiliti

al fine di fornire ragionevole protezione da interferenze mediante dispositivi di comunicazione in concessione in ambienti residenziali tipici.

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