

xSeries Server



VXA-320 Internal Tape Drive

User's Guide

Important: Review the maintenance information in "Using a cleaning cartridge" on page 3-3 and Appendix A, "Maintaining the tape drive," on page A-1, 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.

xSeries Server



VXA-320 Internal Tape Drive

User's Guide

Note: Before using this information and the product it supports, read the information in Appendix D, "IBM Statement of Limited Warranty Z125-4753-08 04/2004," 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.

مج، يجب قراءة دات السلامة

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」。

About this book

This *User's Guide* provides installation instructions and information required for ongoing use and maintenance of the IBM® VXA-320 Internal Tape Drive. This *User's Guide* contains the following information:

Chapter 1, "Introduction" provides an introduction to the VXA-320 Internal Tape Drive.

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

Chapter 3, "Using the tape drive" provides information about 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 about maintaining the tape drive and caring for your storage media.

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

Appendix C, "Solving Problems" provides solutions to problems that might occur when you use the tape drive.

Appendix D, "IBM Statement of Limited Warranty Z125-4753-08 04/2004," on page D-1 provides warranty information.

Appendix E, "Notices," on page E-1 contains trademarks and legal notices.

Chapter 1. Introduction

The IBM VXA-320 Internal Tape Drive is a versatile backup and restore device for low-range to mid-range servers. This SCSI tape drive is capable of storing up to 160 GB of native data on a 230-meter VXA tape. It can transfer data at a sustained rate of up to 12 MB per second. Both capacity and transfer rates are further enhanced with its onboard hardware data compression feature.

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

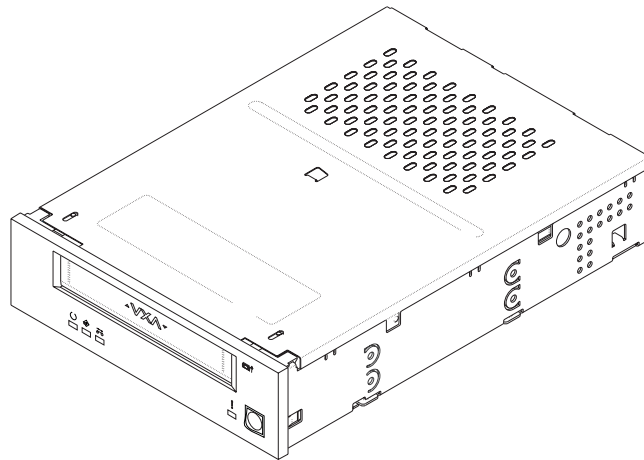


Figure 1-1. VXA-320 tape drive

In addition to this *User's Guide*, the option package contains the following items:

- IBM VXA-320 Internal Tape Drive
- Mounting screws
- 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 for you to receive warranty service.

Chapter 2. Installing the tape drive

The VXA-320 Internal Tape Drive is compatible with several xSeries servers. For a list of servers that support the tape drive, go to <http://www.ibm.com/servers/eserver/serverproven/compat/us/> and click **xSeries --> Tape Backup Units** and look for 25R0045, VXA Tape Drive. See the documentation that comes with the server for instructions for installing the tape drive. If you cannot locate your xSeries *User's Guide*, 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 items:

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

If you are installing the tape drive in an external enclosure, use the instructions that come with the enclosure.

Preparing for installation

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

To prepare for installation, complete the following steps:

1. Touch a known grounded surface to discharge static electricity from your body and make sure that the work area is free from conditions that could cause ESD.
2. Turn off all devices that are attached to the server, and then turn off the server.
3. Disconnect all power cables.
4. Remove the filler panel from the drive bay according to the instructions in the server documentation.
5. Before opening the static-protective bag that contains the tape drive, touch the bag to an unpainted metal surface on the server for at least 2 seconds. Remove the drive from the static-protective bag. If you must set down the drive, put it back into the static-protective bag. Do not touch any exposed components of the tape drive. Instead, handle it carefully by the edges.

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, see Figure 2-1 on page 2-2 for the location of the back-panel components.

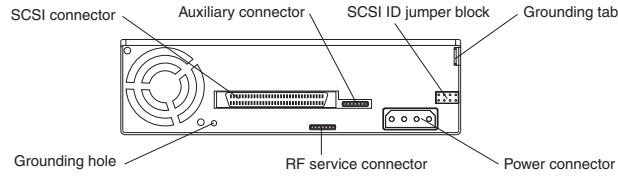


Figure 2-1. Back-panel components

Setting the SCSI ID and termination

The drive comes with a default SCSI ID of 15. If you want to change the default SCSI ID, install the jumpers on the jumper block (see Figure 2-1) for the ID that you want as shown in Figure 2-2. (If necessary, use flat-nose pliers to add or remove the jumpers.)

Note: Make sure you select a SCSI ID that is not used by another SCSI device, including the SCSI host adapter.

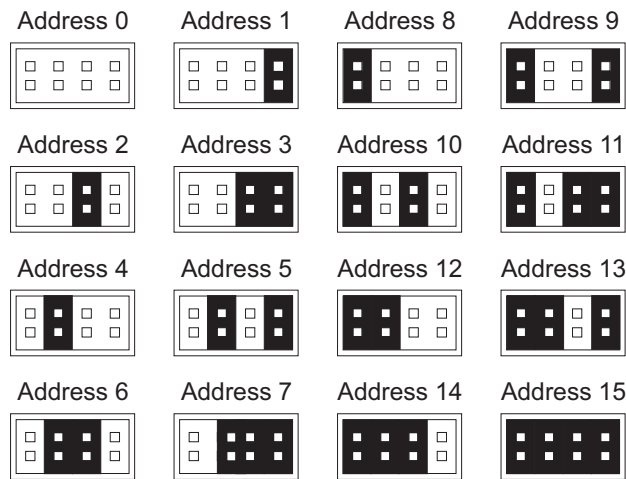


Figure 2-2. SCSI ID settings

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 you mount the drive, attach the cables first.

Slide the drive into the server bay or external enclosure. Make sure that no cables are caught or crimped between the drive and the chassis. Using the screws that come 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 mounting screws that are provided. If different screws must be used, the length must be 5mm or less.
- Make sure that the chassis is not distorted. (Alignment to the horizontal or vertical plane should not exceed $\pm 10^\circ$.)
- Make sure 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 ventilation slots (top and rear) in the drive.

Attaching the cables

Locate the internal power cable in the server and connect it to the power connector on the drive (see Figure 2-3).

Using the provided SCSI cable, attach the non-terminated end to the SCSI adapter in the server and the terminated end to the back of the tape drive (see Figure 2-3).

Attention: To avoid problems with the tape drive, follow these precautions:

- Be sure to connect pin 1 on the cable to pin 1 on the drive. Pin 1 is the rightmost pin in the top row of the connector pins.
- Do not attach this tape drive to a SCSI RAID adapter.

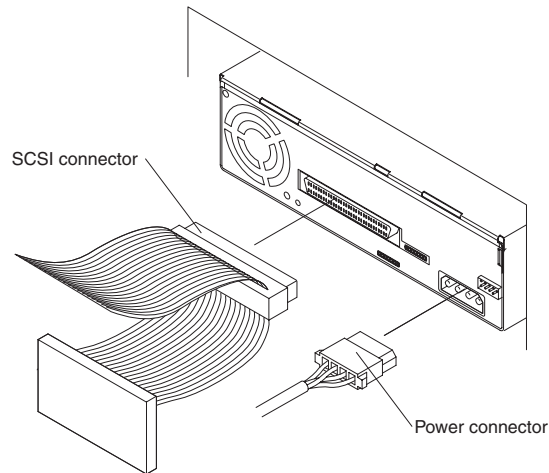


Figure 2-3. Installing the SCSI cable

Completing the installation and turning on the tape drive

Before completing the installation, check your work to make sure that the power and SCSI connectors are securely attached and that the cables are properly routed. Then, turn on the server.

Updating the configuration

For most xSeries servers, the Configuration Setup Utility program automatically recognizes the new tape drive. However, you might have to provide information about your the tape drive after you restart the server.

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

If the server does not recognize the tape drive after startup or if you receive startup errors, run the Configuration Setup Utility program as described in the server documentation.

Installing backup and restore software

The tape drive is used for backing up and restoring data. Therefore, to use the drive, you must use a backup and restore application.

- If you are using your own software, follow the installation instructions that come with your software.
- If you are using the native backup and restore function that your operating system provides, and the operating system requests a device driver, insert the *Documentation* CD and look in the device driver folder. If the required device driver is not on the CD, go to <http://www.ibm.com/support/us/> and search on "25R0045" for a list of new and updated drivers.

Chapter 3. Using the tape drive

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

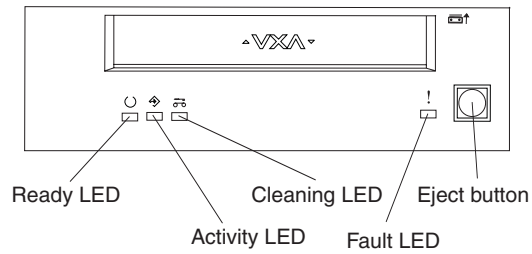


Figure 3-1. Front view of the tape drive

Front panel LEDs

The tape drive has four LEDs to indicate its operational status, as shown in Table 3-1 on page 3-2.

Table 3-1. Definitions of status light combinations

Operation	LED 1 (Ready)	LED 2 (Activity)	LED 3 (Cleaning)	LED 4 (Fault)
LED power-on test	On for 2 seconds	On for 2 seconds	On for 2 seconds	On for 2 seconds
Power-on test activity	Flashing ¹	Off	Off	Off
No tape cartridge loaded	Off	Off	On or off ²	Off
Tape cartridge loaded, no activity	On	Off	On or off ²	Off
Data or cleaning cartridge loaded, activity	On	Flashing	On or off ²	Off
Cleaning cartridge loaded, activity	Off	Flashing	On	Off
Cleaning cartridge loaded, cleaning failed	Off	Off	On ²	Off
Tape cartridge loading or unloading	Off	Flashing	On or off ²	Off
Unrecoverable tape drive failure ³	On or off	Off	On or off ²	Flashing ³
Firmware downloading	Flashing	Off	On or off ²	Off
Firmware updating	Flashing	Flashing	On or off ²	Off
Firmware download failure	Flashing	Flashing	On or off ²	Flashing
Over temperature ⁴	Off	Off	On or off ²	On

Notes:

1. The power-on self-test might complete while the LED test is being performed. In this case, the LED will not flash.
2. When LED 3 is amber, the drive needs to be cleaned. The drive will continue to function; however, the drive must be cleaned as soon as possible.
3. LED 4 flashes to indicate that an unrecoverable error has occurred. An unrecoverable error means that the tape drive cannot function without intervention by an operator or service representative. One of the following actions should clear the fault:
 - Hard SCSI reset
 - Emergency cartridge ejection
 - Turn power off and then on
 - Retry a firmware download

An unrecoverable cartridge or media failure is usually the result of a defective cartridge, media, or cartridge state. This requires that the cartridge be ejected to clear the fault.

4. LED 4 is lit for an over temperature condition. If a cartridge is loaded when this LED is lit, the cartridge is ejected. The LED will not turn off until the temperature of the drive goes below 47 degrees C, and either the tape cartridge is reloaded or the tape drive power is turned off and then on.

Loading a data cartridge

The tape drive uses data-quality VXA tape data cartridges, in various lengths. 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: For best results, use only IBM recommended VXA data cartridges. For a current list of IBM recommended media, go to <http://www.ibm.com/support/us/> and search for “MIGR-39931”.

Insert the front of the cartridge through the tape drive door into the loader mechanism. (The colored write-protect tab on the cartridge must be closest to the eject button on the drive.) Gently push the cartridge until the 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 a data cartridge

To unload a cartridge, press the eject button. The tape drive completes any command that is 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 a cleaning cartridge

Clean the tape drive whenever the Cleaning LED status light is lit or a system I/O error that is related to the tape drive occurs.

Attention: For best results, use only IBM recommended VXA cleaning cartridges. For a current list of IBM recommended media, go to <http://www.ibm.com/support/> and search on “MIGR-39931”.

To clean the tape drive complete the following steps:

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

Notes:

- a. A cleaning cartridge can be used approximately 20 times. When 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, because it will reintroduce debris that was removed during a previous cleaning of the tape drive.
 - b. The IBM cleaning cartridge has a label on it that has 20 spaces that you can use to log the use of the cartridge. Each time the cartridge is used, mark one of the spaces 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.

4. 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.

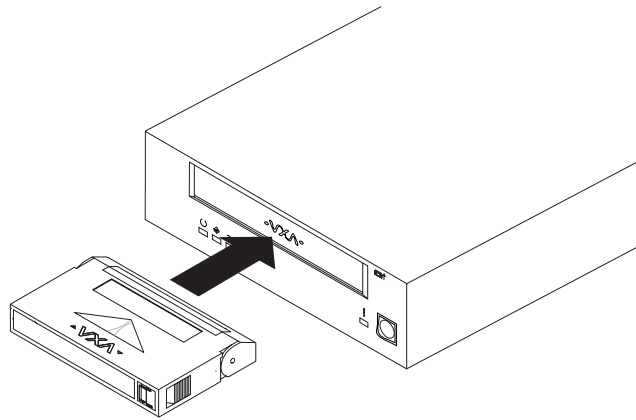


Figure 3-2. Loading the cleaning cartridge

After you have inserted the cleaning cartridge, the remainder of the cleaning process is automatic. The tape drive performs the following steps:

1. Loads the cleaning cartridge into the tape drive
2. Cleans the drive by moving the cleaning tape forward for approximately 30 seconds
3. Unloads the cleaning cartridge when the cleaning operation is complete
4. Indicates a successful cleaning operation by turning off the Cleaning LED (if the Cleaning LED was lit prior to the cleaning process).
5. If the cleaning operation is completed but the Cleaning LED remains lit, repeat the cleaning procedure with a new cleaning cartridge. If the LED still remains lit, contact your authorized service representative.

To determine how many times a cleaning cartridge can be used, check the information that is printed on the cartridge. If you attempt to use a depleted cleaning cartridge, the tape drive automatically detects the error and ejects the cartridge, without turning off the cleaning LED, if already on.

Setting write protection on the data cartridge

Before you insert a data cartridge into the tape drive, make sure that the write-protect switch on the cartridge is set correctly, as shown in Figure 3-3 on page 3-5.

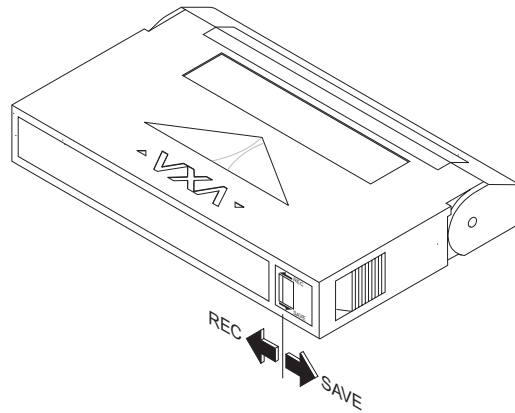


Figure 3-3. Setting the write-protect switch

Resetting the drive

To reset the VXA-320 drive, use one of the following procedures:

- Press and hold the eject button for 10 seconds.
- Turn off the tape drive and turn it on again (do not use this procedure if the drive contains a cartridge).
- Use the backup and 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 for you to receive warranty service. If you are returning the tape drive for service, return only the tape drive. Remove and keep all cartridges, cables, and terminators.

Installing new firmware

The tape drive firmware is periodically updated for bug fixes and feature enhancements. Therefore, you should periodically check for updates using the IBM Tapetool. Go to <http://www-307.ibm.com/pc/support/site.wss/document.do?sitestyle=ibm&lnocid=MIGR-39400> to download a copy of the IBM Tapetool. See the *IBM Tapetool Readme* file for more information.

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 backward compatible only to previous VXA technology media.

Attention: For best results, use only IBM recommended VXA cartridges. For a current list of IBM recommended media, go to <http://www.ibm.com/support/us/> and search on "MIGR-39931".

Types of tape cartridges

The following types of cartridges are available:

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 for cleaning the tape drive, see "Using a cleaning cartridge" on page 3-3).

To order additional cartridges, see "Ordering tape cartridges" on page A-4.

Guidelines for data cartridge usage

The following guidelines 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 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 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 interfere with the drive loading 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 cartridge that is dropped, because the impact might damage the internal mechanism of the tape cartridge.
- Do not operate the tape drive in a dusty environment, and always maintain a consistent storage and operating environment to reduce 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 the drive and might void the warranty.

- Locate the tape unit away from printers and copiers, which can produce dust from toner and paper. 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 server and tape drive, the date, the density, any error statistics, a log number, the operating environment, and compression mode.

Erasing a data cartridge

Most bulk eraser devices are not able to erase the data cartridge. For a bulk erasure device to properly erase a VXA data cartridge with, the erasure coercivity rating of the device 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 operating 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 that has been exposed to a different humidity environment or to a temperature change of 11°C (20°F) or more.

Retrieve archived data on a tape drive that is clean and fully operational. Try to make the recovery environment the same as the operating environment.

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 that are similar to those of hard disk drives. Because most servers are not located in dust-free, climate-controlled environments, you must exercise special care when dealing with tape cartridges and tape drives.

Use the following guidelines for storing tape cartridges:

- Keep temperature and humidity at a constant level that is comfortable for you.
- Always store tape cartridges in their protective cases, and keep the cases closed when not in use. The storage case helps prevent damage from dust and other hazards. When the tape cartridges are not in use, store them in their storage

cases 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 problems.

- Exercise stored tapes at least once every 12 months. Run each tape from the beginning of data (BOD) to the end of data (EOD) and back to BOD at normal operating speed. Tapes that are stored in a warmer environment should be exercised more frequently.
- Store tape cartridges out of the direct sunlight, which can damage the tapes and cartridges.

Attention: Operating the tape drive in conditions that are outside of the recommended environment can result in possible loss of data or failure of the drive.

Using tape cartridges 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 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.

Attaching the cartridge labels

Use care when attaching the cartridge labels on VXA tape cartridges. Use the following guidelines for tape cartridge labels:

- Use only labels that are provided with the cartridges and place them only in the designated locations.
- IBM VXA tape cartridges come with labels attached to them. Do not attach the label on top of an existing label. Poorly placed or multiple labels can interfere with the drive mechanism.
- Place the larger label on the end of the cartridge as shown in the illustration.
- Place the smaller label on the top of the cartridge as shown in the illustration.

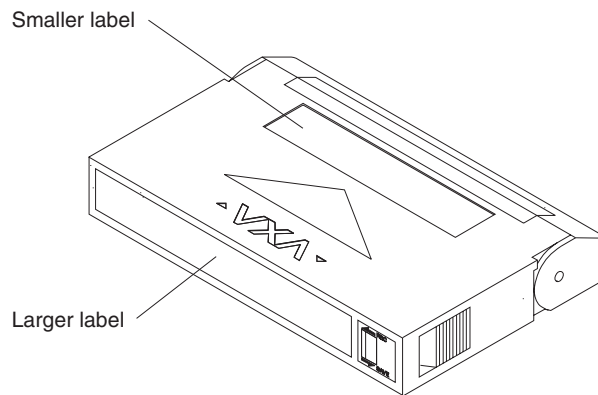


Figure A-1. Placing the tape cartridge labels

Ordering tape cartridges

IBM supports using only data cartridges and cleaning cartridges that are recommended by IBM. Tape composition and length and the construction of the cartridge can affect the quality and capacity of the recording and the performance of the tape drive. A poor-quality tape cartridge might appear to work adequately, but it can contaminate the tape path and impede the speed of the recording. Use only data-grade tape cartridges for backup and data processing.

Table A-2 lists the IBM recommended tape cartridges that you can order from IBM. 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. For a list of other IBM recommended media, go to <http://www.ibm.com/support/us/> and searching on "MIGR-39931".

Table A-2. VXA data cartridge

IBM part number	Type of cartridge	Length
24R2137 (or 71P9160 5 Pack)	VXA 160 GB data cartridge	230 m

Appendix B. Product specifications

This appendix includes the product specifications and requirements.

CRU parts

The following CRU parts can be ordered:

CRU PN	Description	Tier
39M5640	Tape drive	Tier 1
25R0048	SCSI cable	Tier 1
10L5600	Screw pack	Tier 1

Data capacities

The VXA tape cartridge has the following capacities:

Cartridge model	X23
Tape length	230 meters
Capacity^a, native	160 GB ^c
Capacity^a, compressed^b	320 GB

^a Maximum capacity assumes that the host server keeps the drive streaming.

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

^c GB stands for 1 000 000 000 bytes.

Size and weight

The tape drive has the following dimensions and weight:

Height	41.2 mm (1.62 in.)
Bezel Height	42.6 mm (1.68 in.)
Depth	203.0 mm (8.0 in.)
Width	146.0 mm (5.75 in.)
Bezel Width	149.2 mm (5.87 in.)
Weight	1.0 kg (2.2 lb)

The tape drive is a 5.25-inch form factor drive for integration into an enclosure.

Tape drive conditions

Table B-1 summarizes the environmental requirements for the tape path in the tape drive.

Table B-1. 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 minute; maximum 10°C per hour (2°F per minute; maximum 18°F per hour)	1°C per minute; maximum 20°C per hour (2°F per minute; maximum 36°F per hour)	
Relative humidity	20% to 80% noncondensing	5% to 95% noncondensing	
Wet bulb	29°C (84.2°F) maximum.		
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-2 summarizes the environmental requirements for the tape path in the tape drive.

Table B-2. 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 minute; maximum 10°C per hour (2°F per minute; maximum 18°F per hour)	1°C per minute; maximum 20°C per hour (2°F per minute; maximum 36°F per hour)	
Relative humidity	20% to 80% noncondensing	5% to 95% noncondensing	

Table B-2. Temperature and humidity specifications for the tape cartridge (continued)

Specification	Operating ^{a, b}	Storage ^a /nonoperating	Transporting ^c
Wet bulb	26°C (79°F) maximum.		
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 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, 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 operating environment or for 24 hours, whichever is less.

Appendix C. Solving Problems

This appendix provides information on solving problems. Server 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 provide to a service technician.

If, after you attempt the suggested actions in the table, the problem remains, a hardware failure might be the cause. Contact your IBM service representative.

Symptom	Action
The tape drive will not accept a cartridge.	<ol style="list-style-type: none">1. Determine whether a cartridge is already loaded. Press the eject button.2. Make sure you are using a VXA tape cartridge. If the tape cartridge that you are attempting to load is not a VXA tape cartridge, the tape drive automatically ejects it.3. Turn off the drive. Wait 10 seconds, then turn the drive back on. As the tape drive starts, observe the LED code sequence on the drive. 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 is interrupted when you attempted to load a cartridge, the drive detects the tape when power is restored and then rewinds the tape. If this is the case, press the eject button, remove the cartridge, and load the tape cartridge.
The amber fault LED is lit. (This means that the tape drive is over temperature and must cool down before operations can continue.)	<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 a tape cartridge is loaded in the drive, press the eject button to unload the tape and move it to a cooler environment.2. If the tape drive does not cool down on its own, turn off the drive. Wait a few minutes, then turn the drive back on. If Fault LED is still amber after the tape drive starts, the tape drive might be in an environment that is too hot. Make sure that the top and rear ventilation slots are not blocked in the enclosure and that the drive is not near devices that are emitting excessive heat. If you cannot determine the cause of the over-temperature condition yourself, contact IBM technical support.

Symptom	Action
<p>The tape drive will not eject a cartridge.</p>	<ol style="list-style-type: none"> 1. Determine whether the backup application is preventing media removal. Check for an option in the software that might 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 the drive, wait 10 seconds, and then turn it on again. Depending on what function the drive was performing before the reset, the drive might automatically start a lengthy format recovery process; wait for the format recovery to be completed. 3. If the cartridge appears to be stuck in the drive, return it for service. Return the tape drive for repair with the cartridge in place. The cartridge will be removed and returned to you. If the cartridge must be removed before returning the drive for repair, contact IBM technical support.
<p>The tape drive does not respond to software commands. (The drive starts and loads and unloads cartridges but will not respond to any software commands.)</p>	<ol style="list-style-type: none"> 1. Make sure that the tape drive is installed properly on the SCSI bus. Make sure you followed the procedures, in Chapter 2, "Installing the tape drive," on page 2-1, to install the drive on the SCSI bus. Make sure that the SCSI cable is firmly connected and that the connector pins are not bent or broken. 2. Reset the SCSI bus. If a SCSI bus reset does not cause the drive to reset, check the following items: <ul style="list-style-type: none"> • Make sure that the SCSI cable is not broken and the connector is not defective. • Make sure that SCSI cable pin 1 is aligned with SCSI connector pin 1. • Make sure that the drive is set to a unique SCSI ID. If a SCSI bus reset causes the drive to reset, the problem might be with the SCSI bus addressing or termination. Complete the following procedure: <ul style="list-style-type: none"> • Check the SCSI bus addressing and termination. • Try another known good SCSI device in the same location.

Symptom	Action
<p>The LEDs are flashing in an unknown sequence.</p>	<ol style="list-style-type: none"> 1. Clean the drive. See "Using a cleaning cartridge" on page 3-3 for cleaning instructions; LED 2 flashes yellow when the drive needs to be cleaned. Use only an IBM-recommended 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. Turn the drive off and on. If the problem persists, turn the drive off, and then turn it on again.
<p>Backup software is reporting an error.</p>	<p>One of the following situations might have occurred:</p> <ul style="list-style-type: none"> • The drive needs cleaning. Always try cleaning the drive before you assume that the cartridge is bad. Be sure to use a VXA tape cleaning cartridge. For more information, see "Using a cleaning cartridge" on page 3-3. • The cartridge is incompatible with the tape drive. Be sure to use a VXA tape cartridge. • If you are trying to write data, the cartridge might 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 data cartridge" on page 3-4.) • The cartridge is not inserted properly in the drive. Remove the cartridge, and then reinsert it and retry the operation.

Appendix D. 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 1 year on parts means that IBM provides warranty service without charge for parts during the one year of the warranty period.

VXA-320 Internal Tape Drive

Country or Region of Purchase	Warranty Period	Type of Warranty Service*
Worldwide	1 year parts	1
* See " <u>Types of Warranty Service</u> " 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	

Appendix E. Notices

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

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

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xSeries

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Electronic emission notices

VXA-320 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

FC Tested To Comply
With FCC Standards
FOR HOME OR OFFICE USE

Industry Canada Class B emission compliance statement

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

Avis de conformité à la réglementation d'Industrie Canada

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

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 B Information Technology Equipment according to CISPR 22/European Standard EN 55022. The limits for Class B equipment were derived for typical residential environments to provide reasonable protection against interference with licensed communication devices.

Japanese Voluntary Control Council for Interference (VCCI) statement

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取扱説明書に従って正しい取り扱いをして下さい。



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