



IBM DVD-RAM/DVD-R Drive

User's Guide

OPTIONS
by IBM

Note: Before using this information and the product it supports, be sure to read the information under “Appendix E. Product warranty and notices” on page E-1.

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Safety: Read first

Before installing this product, read the Safety Information.

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

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

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

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

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

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

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

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

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

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

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

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

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

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

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

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítajte 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 guide contains information on the IBM® DVD-RAM/DVD-R Drive. It is translated into the following languages:

- English
- French
- German
- Spanish
- Italian
- Brazilian Portugese
- Traditional Chinese
- Japanese

The guide is divided into two parts:

Part 1: Installation and user's guide

This section contains the product description, installation, and operating instructions.

Part 2: Appendices

This section contains information on the product specifications, problem solving, customizing the device driver configuration settings, help and service, warranty, and notices.

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

Registering your option

Thank you for purchasing OPTIONS by IBM®. 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 IBM Web site at

<http://www.ibm.com/pc/register>

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.

Installation and user's guide

This section contains the product description, hardware and software installation instructions, and operating information for the IBM DVD-RAM/DVD-R Drive.

Product description

This option package is intended for multimedia applications. The drive comes with a CD containing MPEG-2 decoder software for Microsoft® Windows® 98, Windows 95, Microsoft Windows 2000 Professional, Windows NT® 4.0, and Microsoft Windows Millenium Edition (Me).

In addition to this User's Guide, provided on the *IBM DVD-RAM/DVD-R Drive User's Guide and Software CD*, your option package contains the following:

- IBM DVD-RAM/DVD-R Drive
- Four mounting screws (M3 x 5-mm, slotted)
- IDE cable for connecting two IDE devices
- Internal audio "Y" cable
- *IBM DVD-RAM/DVD-R Drive Quick Start Guide*
- *Safety Information* book (on CD)

Contact your place of purchase if an item is missing or damaged. Be sure to retain your proof of purchase; it might be required to receive warranty service. See "Appendix D. Help and service information" on page D-1 for technical support information.

Your drive can read many DVD and CD formats, including DVD-RAM, DVD-R, DVD-RW, DVD Video, Video CD, and audio CD formats. The drive also reads multiple-session, extended architecture (XA) CDs, such as the Kodak Photo CD. The DVD-RAM/DVD-R drive is designed for installation in a personal computer that uses integrated drive electronics (IDE) or enhanced IDE (EIDE) architecture.

Software description

Your *IBM DVD-RAM/DVD-R Drive User's Guide and Software CD* contains the following software:

- **MGI VideoWave:**

With this software you can record video files to DVD-R media that can be played in most stand-alone DVD players. You can also use this software to edit and modify your own video assets prior to recording.

If you have an analog or IEEE 1394 capture device installed in your computer, you can use this software to record video from a camera.

Note: MGI VideoWave does not support Windows NT 4.0

- **Veritas Drive Letter Access (DLA)**

With this software, you can write directly to DVD-RAM and DVD-R media using the drive letter, as you would if you were writing to a diskette. You can also format DVD-RAM and DVD-R media. With DLA, you can drag and drop files, create new directories, or save files from any application directly to a DVD.

A universal disk format (UDF) reader is also included for installation on other computers. With the UDF reader, you can read DVD-RAM media on computers with DVD drives.

- **Veritas Simple Backup**

With this software, you can create full or incremental backups of your system files and restore your system files if they become damaged or lost.

Veritas Simple Backup includes StorageGuard, which helps you identify the need to back up your files and to schedule backups.

Note: Crash recovery under Microsoft Windows NT 4.0 and Windows 2000 Professional requires the original Windows CD and CD key.

- **DVD Player**

With this software, you can play back DVD videos on your computer or play video files from your hard disk drive.

Note: Some graphics adapters, such as the FIREGL and Intergraph series, do not support DVD video playback.

Installation requirements

Be sure that your computer meets the following system requirements before you install the drive:

- Minimum microprocessor: Intel® Pentium® or equivalent

Note: For DVD authoring and playback, you must have an Intel Pentium II 266 MHz microprocessor or faster and AGP 2X Video.

- Minimum RAM: 32 MB (computers with UMA: 64 MB)
- Microsoft Windows 95 OSR2, Windows 98, Windows 2000, Windows NT 4.0, or Windows Me
- An available 5.25-inch drive bay
- An available IDE connection
- 120 MB available hard disk space for programs, and 1 GB available hard disk space for DVD authoring functions

- Screen resolution of 1024 x 768 pixels required for DVD authoring functions
- Audio adapter supporting 44.1 or 48 kHz sampling rate
- Optional stereo speakers

Before you begin

Before you install the DVD-RAM/DVD-R drive, read the information in the following section on handling precautions and on using the drive controls and connectors.

Handling precautions

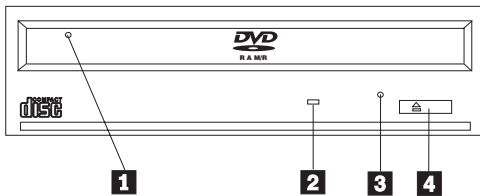
Use the following handling precautions to protect your drive:

- Keep the DVD-RAM/DVD-R drive in the antistatic bag until you are ready to install the drive. Limit your movement when installing; movement can cause static electricity buildup.
- Handle the drive with care. Dropping or jarring the drive can damage the components inside the drive housing.
- Do not force insertion of the IDE or power cables. Doing so might damage the connector or the drive.

Drive controls and connectors

The following diagrams show the location and functions of the drive controls and connectors.

Front view of the drive



1 Disc drawer

This drawer is where you load and unload a disc.

2 Busy indicator

This light comes on when the drive reads from, writes to, or plays a disc.

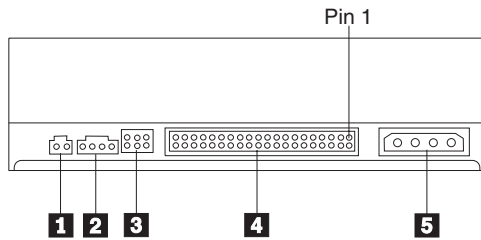
3 Emergency eject hole

This hole provides access to the eject mechanism to remove a disc from the drive.

4 Open/Close button

This button opens and closes the disc drawer when you push it.

Rear view of the drive



1 Reserved

2 Audio-out connector

This connector transmits the analog audio signals to an audio adapter.

3 Configuration pins

These pins are used to set the drive configuration.

4 IDE port

This connects the DVD-RAM/DVD-R drive to the IDE cable.

5 Power connector

This connects the DVD-RAM/DVD-R drive to the power cable.

Installing the drive

Follow these steps to install the DVD-RAM/DVD-R drive:

Step 1. Opening the computer

1. Turn off the computer and all attached devices.
2. Unplug all power cords from the computer and all attached devices.
3. Remove the cover from the computer. Refer to your computer documentation for instructions on removing the computer cover.

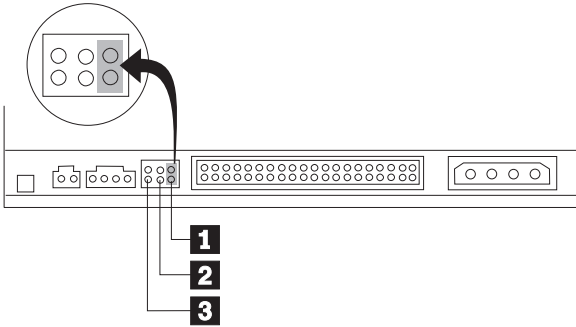
Step 2. Unpacking the drive

1. Before opening the antistatic bag that the drive is packed in, touch the bag to an unpainted metal surface for at least 2 seconds. This drains the static electricity from the package and your body.
2. Remove the drive from the bag.

If you must put the drive down, place the antistatic bag on a flat, padded surface, and place the drive on the antistatic bag.

Step 3. Setting the configuration jumpers

You can configure your drive as master **1**, slave **2**, or cable-select **3**, by placing the jumper over the configuration pins as shown.



Use the following guidelines to determine the correct configuration for your DVD-RAM/DVD-R drive:

- Configure the DVD-RAM/DVD-R drive as a master if it will be the only device that is connected to the IDE cable. This is the preset configuration.
- Configure the DVD-RAM/DVD-R drive as a slave if it will be the second device on an IDE cable. Be sure to configure the other device as a master. In some cases, a hard disk drive might require a "master with slave present" jumper setting when another device on the same cable is configured as a slave. For more information on setting configuration jumpers on other devices, refer to the documentation that comes with your computer.
- Some non-IBM computers use special ATA cables with two wires reversed in the device connectors so that the drives can be configured by the cable instead of by jumper position. Use the cable-select position only for computers that are equipped with these special cables. See the documentation that comes with your computer to determine if your ATA adapter requires that you place the jumpers in the cable-select position.

If you place the jumper in the cable-select position, the IDE cable automatically assigns the master and slave settings based on the position of the drive on the cable. You must use the cable-select setting for this cabling system, regardless of whether the DVD-RAM/DVD-R drive is the only device or the second device connected to the cable. The drive closest to the IDE controller is automatically the master drive. Any other devices on the IDE cable must also be set to cable-select.

Step 4. Mounting the drive in the bay

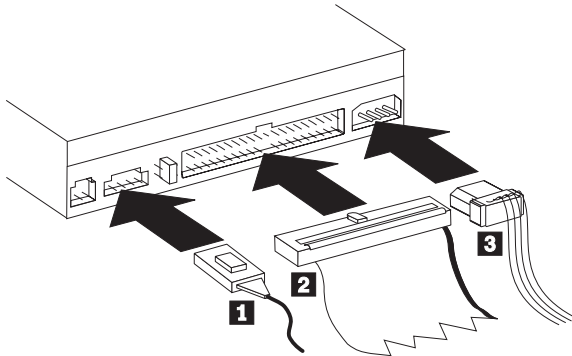
Attention: Be sure to use the M3 x 5-mm mounting screws in the option package when you are driving screws directly into the drive. Using screws that are too long might damage the drive.

You can mount the DVD-RAM/DVD-R drive horizontally or vertically in the computer. If you mount the drive vertically, you must secure any discs that you place into the drive before the drive tray is closed, or the DVD-RAM/DVD-R drive will not be able to read the disc properly.

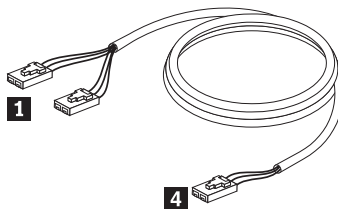
1. Slide the drive into the bay. Your computer might have specific required procedures for installing storage devices. For more information on storage devices, refer to the documentation that comes with your computer.
2. Align the drive-bay screw holes with the threaded holes in the drive housing or mounting bracket.
3. Thread the screws in loosely to check their position. Two screws are usually used on each side. Verify that the alignment is correct; then tighten the screws to secure the drive. Do not overtighten.

Step 5. Attaching the cables to the drive

The following diagram shows where to connect the cables to the drive.



The following is an illustration of the internal audio cable that comes with your option package.



Note: Some computers have a smaller connector that is incompatible with the included internal audio cable. If your computer has this kind of connector, you must purchase a new audio cable.

1. Connect the single-connector end **4** of the included internal audio cable to the appropriate connector on the computer system board.
2. Connect one of the dual-connector ends **1** of the included internal audio cable to the audio-out connector on the DVD-RAM/DVD-R drive. If you have another optical drive in your computer, you can connect the other dual-connector end to that drive.
3. Attach a 40-pin IDE-cable connector **2** to the IDE connector on the drive. Align the cable so that the color-coded edge is closest to the power cable connector **3**. Use the IDE cable that is provided with this option if there is no cable attached to the IDE port or if there is only one device connector on the computer IDE cable. The IDE cable can have up to three connectors. For the best signal quality when you are connecting only one device to the IDE cable, connect one end of the cable to the IDE port, and connect the other end of the cable to the device. Do not use the middle connector.

If you are connecting two devices to the IDE cable, connect one end of the cable to the IDE port, and connect the master and slave devices to the remaining connectors on the other end. Many computers have two cables for attaching up to four ATA devices. For best performance, attach fast devices (such as hard disk drives) to the cable that is connected to the primary IDE port, and connect the DVD-RAM/DVD-R drive or other slower devices (such as CD-ROM drives, tape drives, and diskette drives) to the cable that is connected to the secondary IDE port.

4. Attach a four-pin power cable **3** to the power connector on the DVD-RAM/DVD-R drive.

Be sure that the cables will not be pinched or crowded by the computer cover and that all other cable and power connections are secure.

Step 6. Completing the hardware installation

1. Be sure that the DVD-RAM/DVD-R drive is securely mounted and that the connectors are firmly attached.
2. Be sure that the cables do not interfere with the computer cover and that they do not block the power-supply fan blades or airflow paths.
3. Reinstall the computer cover.
4. Reconnect all external devices.
5. Plug all power cords into the electrical outlets.

Step 7. Installing the software

All of the software for the drive is contained on the *User's Guide and Software CD*. To install the software, follow this procedure:

Note: For full drive functionality, install all software applications listed in the browser window.

1. Insert the CD into the CD or DVD drive. If the CD automatically starts, skip to step 5 below.
2. If the CD does not automatically start, click **Start** → **Run**.
3. Type `e:/1aunch/.htm` where *e* is the drive letter of the CD or DVD drive.
4. Click **OK**.
5. Select your language from the browser page.
6. Select the software you want to install from the lower-right pane of the next browser page.
7. Follow the on-screen instructions for software installation.
8. When the software installation is complete, restart the computer.
9. Repeat the installation steps for each software application.

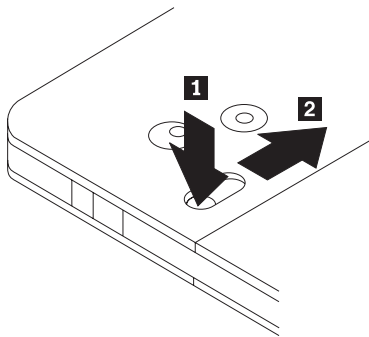
Using the DVD-RAM/DVD-R drive

This section contains information on using the DVD-RAM/DVD-R drive.

Write-protecting the cartridge

To write-protect DVD-RAM/DVD-R cartridges to prevent accidental loss of data, do the following.

1. Insert the tip of a ballpoint pen into the hole located in the **protection** slot of the cartridge **1** and push the slider toward the top of the cartridge **2** to protect the media.



2. Reverse the procedure to enable writing on the media again.

Using single-sided and double-sided DVD-RAM/DVD-R media

DVD-RAM/DVD-R media is available in single-sided and double-sided versions.

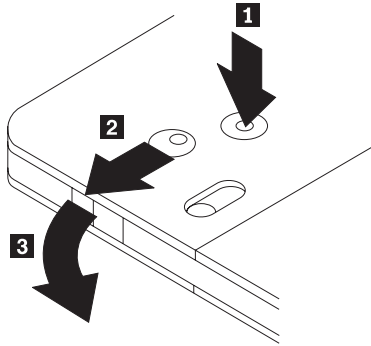
The 2.6 GB and 4.7 GB versions are single-sided and are available in Type I or Type II cartridges. The 5.2 GB and 9.4 GB versions are double-sided and are available in Type I cartridges. To access the data on both sides of the media,

you must remove the media from the drive, turn it over, and insert it into the drive again. For convenience, double-sided cartridges are labeled "side A" and "side B."

Removing the disc from the cartridge

You can remove DVD-RAM Type II discs from the cartridge for use in a DVD-ROM drive.

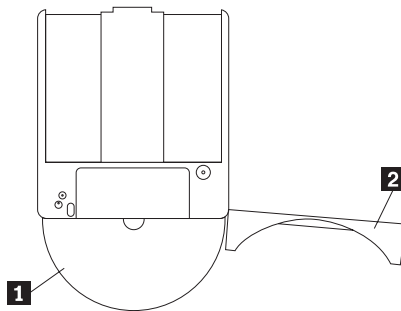
Removing the disc from the cartridge



Using the tip of a ballpoint pen, push and break the lock pin tab **1**. To remove the disc, use a ballpoint pen to push down on the cartridge-lid lock **2** and pull the cartridge lid **3** out to eject the disc. With the cartridge lid open, the disc will eject.

Attention: Do not touch the recording side of the disc while it is exposed.

Returning the disc to the cartridge



To return the disc to the cartridge, align the label side of the disc **1** with the DVD-RAM cartridge label side. Insert the disc, and close the cartridge lid **2**. A clicking sound will ensure that the lid door is closed.

Precautions for handling

Be careful when handling the removed disc. Debris, dust particles, fingerprints, smears, or scratches might impair recording and playback of the media. Use a soft, dry cloth to clean dust or other debris from the disc. Do not use solvents to clean the disc surface. When labeling a disc, write only on the printed label side using a soft felt-tip marker. Keep the disc out of direct sunlight, high temperatures, and humidity. Do not attach labels to either side of the disc.

Using the DVD-RAM/DVD-R drive with CDs and DVDs

To read a data disc, do the following:

1. Turn on the computer.
2. Press the Open/Close button on the front of the DVD-RAM/DVD-R drive.
3. Insert the disc or cartridge into the tray with the label facing up.
4. Close the tray by pressing the Open/Close button or by gently pushing in the loading tray.

Attention: Do not use force or insert objects to open the loading tray.

5. Wait for the DVD-RAM/DVD-R drive Busy indicator to turn off; then double-click **My Computer**.
6. Double-click the **CD-ROM** or **DVD-RAM/DVD-R** icon.

Securing a disc in a vertically mounted drive

The DVD-RAM/DVD-R drive has two plastic clips near the front of the loading tray that must be lifted up to secure a bare disc for vertical mounting operation. To raise the clips, open the tray, remove any discs that might be in the drive, and push the clips up using the side tabs or by pushing from the underside of the tray.

To insert the disc, slide it forward against the spring-loaded tray until the disc clears the front tabs, and then allow the spring to slide the disc back under the tabs.

To remove the disc, slide it forward against the spring until it clears the front tabs, and lift it from the tray.

Note: If you insert a DVD-RAM/DVD-R cartridge, you will have to raise the clips again before inserting a bare disc in the vertical orientation.

Manually ejecting a disc

If the drive becomes inoperable and will not allow the disc to eject, turn off the computer, and straighten a large paper clip to form a tool. The straightened end must extend at least 45 mm (1.8 in.). Insert the extended end into the

emergency eject hole on the front of the drive (see "Front view of the drive" on page 1-3). Push the paper clip until the tray opens. Gently pull out the tray until you can remove the disc.

Using the DVD Player software

This section describes how to use and customize the DVD Player software. You can find current information on DVD Player software in the README file on the *User's Guide and Software CD*.

Before using the software

DVMatics requires a compatible video device driver and IDE bus mastering in order to work. See "Appendix C. Customizing the device-driver configuration settings" on page C-1 for information on enabling DMA bus mastering and for locating video device drivers.

Using the DVD Player

When you insert a DVD video disc into the DVD-RAM/DVD-R drive, the DVD Player software will automatically load and begin to play the video disc. If the DVD disc contains both video and the program content will automatically play. To view the video content of a video/program DVD disc, open the DVD player from the Start menu, and click **Play** on the graphical user interface (GUI).

Changing the DVD region code

Regionalization and Copy Protection (the DVD region code) uses the content scrambling system (CSS) standard to prevent unauthorized duplication of the intellectual property that is distributed on DVDs. It was originally requested by the Motion Picture Association of America (MPAA) to address video piracy, but is applicable to any content. CSS works by inhibiting the transmission of unencrypted data without proper authorization. Playback systems must license CSS to decode the encrypted data.

The CSS specification divides the world into seven regions. Content that is encrypted for one region cannot be read by playback systems for other regions. While CSS is used to prevent digital copying of the DVD content, the Macrovision standard prevents analog copying of the DVD content. The Macrovision standard is a scrambling system that has been widely used by the movie industry to prevent unauthorized duplication of video content using commercial VCRs. DVD playback systems must support both CSS and Macrovision copy protection standards.

The first time that you insert a DVD video disc into the DVD-RAM/DVD-R drive, you will be prompted to set the region. If you want to play DVDs that

are encrypted for a different region of the world, you can use the DVD Player software to change the region code in your DVD drive.

Note: You can change the DVD region code only five times. After you make five region code changes, the drive can play only DVDs that are encrypted for the fifth region code that you set.

To change the region code, do the following:

1. Turn on your computer, and start your operating system.
2. Click **Start**.
3. Select **Programs**.
4. Click **DVD Player**.
5. Click the **Properties** icon to open the Properties window.
6. Click the **General Properties** tab.
7. Select the correct region code for your country.
8. Click **OK** so that the change takes effect.

Using Drive Letter Access (DLA)

Drive Letter Access (DLA) is provided so you can write data to DVD-RAM and DVD-R media. DVD-RAM media can be written to many times; DVD-R media can be formatted and written to only once.

To format and write to DVD-RAM media:

1. Insert a DVD-RAM disc into the DVD-RAM/DVD-R drive.
2. Click **Start→Programs→IBM DLA→DLA Toolkit**.
3. Click **Format**. Formatting can take up to 90 minutes.
4. After formatting is complete, you can drag and drop files to the DVD-RAM/DVD-R drive letter icon, or you can move files using Windows Explorer.

To format and write to DVD-R media:

1. Insert a DVD-R disc. The disc is automatically mounted for write access.
2. You can drag and drop files to the DVD-RAM/DVD-R Drive Letter icon, or you can move files using Windows Explorer.

To make DVD-RAM or DVD-R media compatible in other computers:

1. Click **Start→Programs→IBM DLA→DLA Toolkit**.
2. Click **Make Compatible**.

To use UDF formatted DVD-RAM or DVD-R media in other computers, a UDF reader is included on the *User's Guide and Software CD*. To use the UDF reader, do the following:

1. Insert the *User's Guide and Software CD* into the CD-ROM or DVD drive of the computer you want to use the UDF formatted DVDs with.
2. Click **Start→Run**.

3. Type `e:/UDF/language` where *e* is the drive letter of the CD-ROM or DVD drive, and *language* is your language.
4. Click **OK**.
5. Double-click **SETUP.EXE**, and follow the on-screen instructions.

Note: The UDF reader is needed only on computers that do not have another DLA program for CD-RW or DVD-RW installed.

Using MGI VideoWave

With MGI VideoWave, you can capture, edit, and record video and audio files. You can also use MGI VideoWave to create and record DVD videos using your own video and audio files. For more detailed information on MGI Videowave features, see the VideoWave *User's Guide* in the Start menu.

The Video Edit window is the VideoWave main window. In this window, you can import, edit, and convert your own video and audio files into an appropriate format. To play back from DVD Video, video files must be converted into MPEG-2 format with 48 Khz audio. You can make this selection by clicking the **Produce** icon in the VideoWave video editing window.

When you have prepared and saved your video and audio files, click the **DVD** icon on the left side of the VideoWave video editing window to launch the DVD authoring application. To use the authoring application, click **Import** to bring your videos into the library; then, drag and drop them in the order that you would like to play them. You can also import still images to use as menu backgrounds and audio clips to use with menus and videos.

You can drag and drop your content in the order that it will play to the timeline of menus or videos at the top of the window. Select a menu to drag buttons to the menu.

When you have created your DVD video, click the **DVD** icon in the authoring application to record your video to the hard disk drive, the DVD-R drive, or the DVD-RAM drive. If you create a layout in the hard disk drive, you can copy it to the DVD-RAM or DVD-R drive at a later time using the drag-and-drop method. A DVD video that is recorded directly to a DVD-R drive can be played back in almost any standalone DVD player or computer. DVD videos recorded on a DVD-RAM drive can be played back in DVD-RAM drives and computers with RAM-Read DVD-ROM drives.

Maintaining the DVD-RAM/DVD-R drive

This section contains information about taking care of your DVD-RAM drive and the CDs and DVDs that you use with the drive.

Caring for a CD or DVD

Digital discs are high-density media that must be handled with care and kept clean to ensure that they remain readable. The following precautions help to prolong the life of your discs.

Attention: Wiping a disc using a circular motion can damage the disc and cause data loss.

- Handle the disc by the edges or the center hole. Do not touch the surface of the disc.
- To remove dust or fingerprints, wipe the disc from the center to the edge with a soft, lint-free cloth.
- Do not write on the surface.
- Do not place the disc in direct sunlight.
- Do not use commercial cleaners to clean the disc.
- Do not bend the disc.

Caring for the DVD-RAM/DVD-R drive

To protect your DVD-RAM/DVD-R drive during operation, observe the following precautions:

- Do not move the drive when it is in use. Doing so might cause data error or damage the drive.
- Avoid exposing the drive to the following conditions:
 - High humidity
 - High temperature
 - Excessive dust
 - Mechanical vibration
 - Sudden shock or dropping
 - Placement on an inclined surface
 - Direct sunlight
 - Sudden temperature changes
- Do not insert objects into the drive.
- Do not stack objects on the drive.
- Do not remove the drive cover or attempt to service the drive.
- Remove any discs from the disc drawer and make sure that the drawer is closed before moving the drive unit.
- Keep the original packing materials. If you need to ship the drive unit to a different location, use the original packing materials to ensure that the drive is transported safely.

Appendix A. Product specifications

This appendix includes the following information:

- Physical specifications
- Power requirements
- Environmental requirements
- Read speeds
- Write speeds

Physical specifications

The physical specifications¹ of the DVD-RAM/DVD-R Drive are listed in the following table.

Physical specifications	
Height	42 mm (1.7 in.)
Width	146 mm (5.7 in.)
Length	196 mm (7.7 in.)
Weight	1,100 g (2.4 lb.)

Power requirements

The following table lists the power specifications by voltage level for the DVD-RAM/DVD-R Drive. The power specifications are measured at the drive power connector and are nominal values.

Power specifications	Voltage	Average	Maximum
At voltage	5 V dc	700 mA	1200 mA
At voltage	12 V dc	500 mA	900 mA

1. Product-description data represents IBM's design objectives and is provided for comparative purposes; actual results might vary, based on a variety of factors. This product data does not constitute a warranty. Data is subject to change without notice.

Specification	Operational	Nonoperational
Temperature (noncondensing)	+5°C to +45°C (+41°F to +113°F)	-30°C to +60°C (-22°F to 140°F)
Relative humidity (noncondensing)	10% to 80%	10% to 90%

Read speeds

Media	Read speed
DVD-ROM	2.4-6X
DVD-R (4.7 GB)	1X constant linear velocity (CLV)
DVD-RW (4.7 GB)	1.5 to 3.5X constant angular velocity (CAV)
CD-ROM/CD-R	10 to 24X (CAV)
CD-RW (ISO 9660, closed)	5 to 12X (CAV)
CD-DA (DAE)	3X to (CLV)

Write speeds

Media	Write speeds
DVD-RAM	2X (CLV)
DVD-R	1X (CLV)

Note: You can mount the drive vertically or horizontally.

Appendix B. Solving problems

Computer problems can be caused by hardware, software, or user error. Using the information in this section, you might be able to solve problems yourself or gather helpful information that you can pass on to a service technician. You might also need to refer to your computer, operating system, or audio-adaptor documentation.

Review the following list for any problem description that might fit your situation.

- **Your computer or DVD-RAM/DVD-R drive does not operate correctly, or the Busy indicator light does not come on.**

Take the following actions:

1. Check that the disc is loaded with the label side up.
2. Check that all devices are properly connected to the computer and to the electrical outlet.
3. Turn off the computer, unplug the cables for your computer and all attached devices, and remove the computer cover.
4. Check that all power and IDE cables are securely attached. Disconnect the IDE cable and check for bent or misaligned pins. If you do not find any problems, reconnect the interface cable. Replace the computer cover, and reattach all cables and power cords. Turn on the computer, restart the operating system, and attempt to open the loading tray by pressing the Open/Close button. If the tray fails to open and the Busy indicator does not light, turn off the computer and try using another 4-pin dc power cable.
5. Check that the color-coded edge on the IDE cable aligns with pin 1 on the IDE port and is closest to the power cable on the DVD-RAM/DVD-R drive. See "Step 5. Attaching the cables to the drive" on page 1-7.
6. Check the DVD-RAM/DVD-R drive and any other device on the IDE cable for the proper settings. See "Step 3. Setting the configuration jumpers" on page 1-6.
7. If the middle connector on the IDE cable is attached to the IDE port on the system board, remove the connector and reattach the cable. If there is only one device on the IDE port, attach the connector at one end of the cable to the IDE port and the connector at the other end to the device, leaving the middle connector (if there is one) open.

If there are two devices on the IDE port, attach the connector at one end of the cable to the IDE port. If there is a hard disk drive, attach it to the connector at the other end of the cable, and attach the DVD-RAM/DVD-R drive to the middle connector.

- **You cannot access the DVD-RAM/DVD-R drive, or the DVD-RAM (CD-ROM) icon is not displayed.**

When the DVD-RAM/DVD-R drive is properly installed, a DVD-RAM or CD-ROM icon is displayed in the My Computer window. Double-click **My Computer**. If a CD-ROM icon is not present in the window that opens, verify that the drive has been properly installed. Verify that the configuration jumper is set properly. See “Step 3. Setting the configuration jumpers” on page 1-6. Restart your computer. If a drive icon is still not displayed, continue with the following steps:

1. Click **Start** → **Settings** → **Control Panel**.
2. Click **System**.
3. Click the **Device Manager** tab.
4. Double-click **View Devices by Type**.
5. Select **Hard Disk Controllers** from the list that is displayed in the Device Manager window. Verify that there are no conflicts with the controller. The device status indicates whether the controller is working properly.
6. Select **CD-ROM** from the list that is displayed in the Device Manager window. Verify that a CD-ROM device is present in the list and that no conflicts exist. The device status indicates whether the device is working properly.
7. Click **OK**.
8. Close all windows, and restart the computer.

If the device icon is still not present, check the cable connections and device-jumper settings, and resolve any conflicts that might exist.

- **The DVD-RAM/DVD-R drive is not recognized by the operating system, or the drive performs erratically.**

Some computers have Compatible and High Performance modes for mass storage devices. Typically, the DVD-RAM/DVD-R drive functions better in the High Performance mode. However, if your drive is not functioning properly in that mode, you might need to use the Compatible mode.

To check the configuration-setup information for your computer, do the following:

1. Start your configuration utility program.
2. Select **Devices**.
3. Scroll down to the **Mass Storage Devices** section.

See the documentation that comes with your computer for additional details on selecting IDE performance modes.

- **The computer does not recognize the DVD-RAM/DVD-R drive after the device drivers are loaded.**

Check for incompatibilities among the DVD-RAM/DVD-R drive device driver and other device drivers or other hardware in your computer. Create a system diskette with minimum CONFIG.SYS and AUTOEXEC.BAT system files.

1. Before creating special CONFIG.SYS and AUTOEXEC.BAT files, make a backup copy of these files in a convenient directory. From a DOS prompt, do the following:
 - a. Type copy CONFIG.SYS CONFIG.IBM and press Enter.
 - b. Type copy AUTOEXEC.BAT AUTOEXEC.IBM and press Enter.
2. Insert a blank, formatted diskette into the diskette drive.
3. Copy the CONFIG.SYS and AUTOEXEC.BAT files onto the diskette.
4. Turn off the computer, and ensure that the system diskette (the diskette that you created) is in the diskette drive.
5. Restart the computer (the computer starts up from the system diskette).
6. Observe the startup messages, and ensure that the device driver IBMIDECD.SYS loads. When MSCDEX loads, observe the drive letter that the computer assigns to the DVD-RAM/DVD-R drive.
7. Insert a data CD into the loading tray; then wait until the Busy indicator is not lit.
8. Attempt to read the disc by typing `dir e:`, where *e* is the DVD-RAM/DVD-R drive letter assigned after the MSCDEX message.
 - If the computer is able to read the disc, a conflict probably exists among the device drivers that are loaded by the CONFIG.SYS or AUTOEXEC.BAT file. You need to resolve this device conflict. Refer to the documentation that comes with your computer for more information on resolving device conflicts.
 - If you are unable to access the disc, you might have a hardware problem. If you are unable to read the disc or a drive letter is not assigned by MSCDEX, go to the next step.
9. Turn off the computer, unplug the cables for your computer and all attached devices from the electrical outlets, and remove the computer cover.
10. Disconnect the IDE and power cables for all IDE devices except the DVD-RAM/DVD-R drive.
11. Configure the DVD-RAM/DVD-R drive as a master, and connect it to the last IDE connector on the primary IDE port.
12. Reinstall the computer cover. Reconnect the keyboard; plug the power cords into electrical outlets.
13. Insert the system diskette into the diskette drive, and insert a data disc into the DVD-RAM/DVD-R drive.
14. Restart the computer.

15. Attempt to read the disc by typing `dir C:` (the DVD-RAM/DVD-R drive is drive C because it is the only device that is connected to the IDE port).
 - If the computer is able to read the disc, a conflict probably exists with one of the devices that are installed on your computer. You need to resolve this device-driver conflict. Check the configuration jumper settings for the other devices or refer to your device documentation.
 - If you are unable to access the disc, you might have a hardware problem. If the DVD-RAM/DVD-R drive still does not read the data disc, the DVD-RAM/DVD-R drive might be defective. See “Appendix D. Help and service information” on page D-1.

- **The disc cannot be read.**

Take the following actions:

1. The disc might be dirty; clean it as described in “Caring for a CD or DVD” on page 1-15.
2. The disc might be defective; try another disc.
3. The disc is not ISO-9660, High Sierra Group (HSG), or Universal Disc Format (UDS) compatible. Check with your place of purchase.

- **There is no sound from the disc.**

1. Verify that you are not using a data CD.
2. Adjust the audio-adaptor volume control. See the documentation that comes with your audio adapter and audio-CD player program.
3. Turn off the computer, unplug the cables from the electrical outlets for your computer and all attached devices, and remove the computer cover. Ensure that the audio-signal cable connects the DVD-RAM/DVD-R drive with the sound adapter.

- **You receive a common error message.**

Take the following actions for these common error messages:

- CDR-103

The disc in the DVD-RAM/DVD-R drive is not High Sierra, ISO 9660, or UDF format. The DVD-RAM/DVD-R drive does not support the media.

- CDR-101

The “not ready reading the drive” situation occurs if you try to access the DVD-RAM/DVD-R drive before the drive is ready. The Busy indicator lights when you attempt to access the drive after inserting a disc into the loading tray. Wait until the Busy indicator is no longer lit before attempting to access the drive.

- **The connectors on the audio cables that are provided do not fit the connector on your audio adapter.**

Some audio adapters might require a special cable. See the documentation that comes with your audio adapter.

You might have to separately purchase an audio cable for the DVD-RAM/DVD-R drive. If you are using an IBM computer or IBM audio adapter, refer to "Appendix D. Help and service information" on page D-1.

- **The DVD-RAM/DVD-R drive does not operate and will not allow the disc to eject.**

Turn off the computer and straighten a large paper clip to form a tool. The straightened end must extend at least 45 mm (1.8 in.). Insert the extended end into the emergency eject hole on the front of the drive (see "Front view of the drive" on page 1-3). Push the paper clip until the tray opens. Gently pull out the tray until you can remove the disc.

Appendix C. Customizing the device-driver configuration settings

Microsoft Windows 95, Windows 98, and Windows Me have two device-driver configuration parameters: Auto Insert Notify and DMA.

The Auto Insert Notify parameter enables the computer to start playing or accessing the disc automatically after being inserted in the drive. The DMA parameter improves the computer performance by having the computer DMA controller handle data transfers from the CD to memory, freeing the microprocessor to perform other tasks. For example, activating DMA might make movies and games run more smoothly because the microprocessor is allocating more processing time to video.

Changing the Auto Insert Notify and DMA parameters for Windows 95, Windows 98, and Windows Me

To change the Auto Insert Notify and DMA parameters in Windows 95, Windows 98, and Windows Me, do the following:

1. Click **Start** → **Settings** → **Control Panel**.
2. Double-click **System**.
3. Click the **Device Manager** tab.
4. Double-click **CD-ROM**.
5. Select the device driver for the **CD-RW/DVD-ROM Combination Drive**.
6. Click **Properties**.
7. Click the **Settings** tab.
8. Click to select or to clear the **Auto Insert Notification** check box and the **DMA** check box, depending on which parameters you want to enable or disable.
9. Click **OK**.

Enabling DMA for Windows 2000 Professional

To change the parameter settings for Windows 2000 Professional, do the following:

1. Click **Start** → **Settings** → **Control Panel**.
2. Double-click **System**.
3. Click the **Hardware** tab.
4. Click the **Device Manager** button.
5. Click the **IDE ATA/ATAPI** controller to expand the tree.
6. Click the device that corresponds to the controller where your DVD-RAM is located (**Primary IDE** or **Secondary IDE**).
7. Click the **Advanced Settings** tab.
8. Click **Transfer Mode**, and select **DMA** if it is available.

9. Click **OK**.
10. Click **Close** to close the System Properties window. A message is displayed informing you that the system settings have changed.
11. Click **OK** to restart your computer.

Enabling DMA for Windows NT 4.0

Enabling DMA for Windows NT 4.0 requires a DMA bus master IDE controller device driver. This might have been preinstalled, or you might have to install it. To determine whether the device driver is installed, do the following:

1. Log on as an Administrator.
2. Click **Start** → **Settings** → **Control Panel**.
3. Double-click **Devices**.
4. Select the **ATAPI** device.
5. If the status is listed as **Started**, you do not have a DMA bus master IDE controller device driver installed.

If you do not have a DMA bus master IDE controller device driver installed, go to the Web site for the manufacturer of your computer system board, and download and install the Windows NT 4.0 DMA device driver. The instructions for installing the device driver are provided on the manufacturer's Web site.

Notes:

- a. Carefully read the instructions that come with your device driver. Some versions of bus master device drivers do not support CD-recordable devices.
- b. Some device drivers are provided on the *User's Guide and Software CD* that comes with your option.

The following is a list of manufacturer Web sites that contain Windows NT 4.0 DMA device drivers:

- **IBM:** <http://www.ibm.com>
- **Intel:** <http://www.intel.com>
- **VIA:** <http://via.com.tw>
- **ALi:** <http://ali.com.tw>

Appendix D. Help and service information

This section contains information on how to obtain warranty information on the World Wide Web and online and telephone technical support.

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. Online assistance can be obtained through the Personal Computing Support Web site and the IBM Automated Fax System.

<i>Online technical support</i>	
IBM Personal Computing Support Web site	http://www.ibm.com/pc/support
IBM Automated Fax System	1-800-426-3395 (U.S. and Canada)

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 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.

<i>Support 24 hours a day, 7 days a week</i>	
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 .

Appendix E. Product warranty and notices

This section contains product warranty and notices information.

Warranty Statement

This section contains the warranty period for your product and the IBM Statement of Limited Warranty.

Machine - IBM DVD-RAM/DVD-R Drive **Warranty period*** - One year

** Contact your place of purchase for warranty service information. Some IBM Machines are eligible for on-site warranty service depending on the country where service is performed.*

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

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

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This IBM hardware product and IBM software products that might be packaged with it have been designed, when used in accordance with their associated documentation, to process date data correctly within and between the 20th and 21st centuries, provided all other products (for example, software, hardware, and firmware) used with these products properly exchange accurate date data with them.

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Electronic emissions notices

IBM DVD-RAM/DVD-R 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:

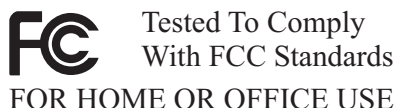
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an IBM authorized dealer or service representative for help.

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)

Zulassungsbcheinigung laut 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 Übereinstimmung mit 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 50082-1 und EN 55022 Klasse B.

EN 50082-1 Hinweis:

“Wird dieses Gerät in einer industriellen Umgebung betrieben (wie in EN 50082-2 festgelegt), dann kann es dabei eventuell gestört werden. In solch einem FA11 ist der Abstand bzw. die Abschirmung zu 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 89/366/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 legislación 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.

Union 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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