

xSeries 306 Type 8836

Installation Guide

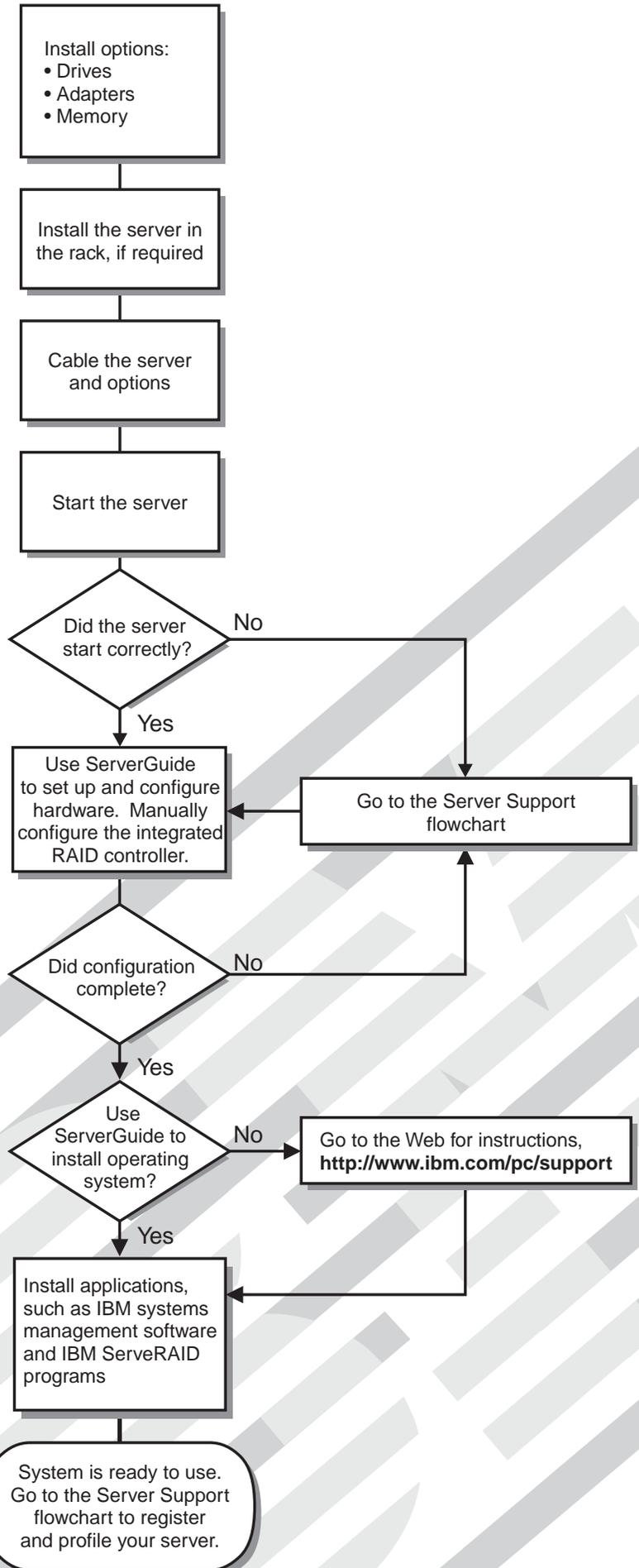
Welcome...

Thank you for buying an IBM xSeries server. Your server is based on the X-Architecture technology, and it features superior performance, availability, and affordability.

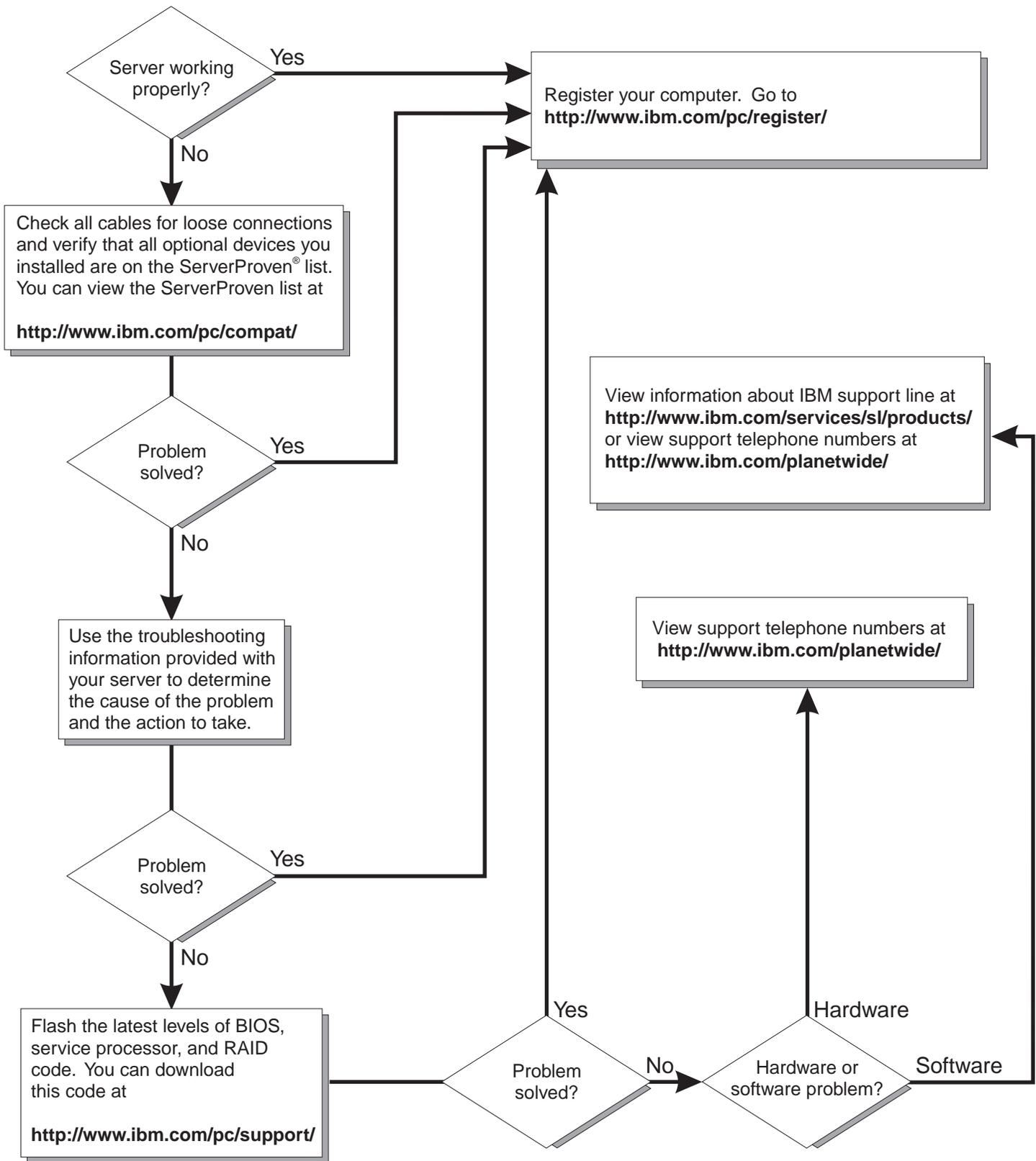
This server *Installation Guide* contains information for setting up and configuring your server.

For detailed information about your server, view the publications on the Documentation CD.

You can also find the most current information about your server on the IBM Web site at: <http://www.ibm.com/pc/support>.



Server Support





@server

IBM xSeries 306
Type 8836
Installation Guide

Note:

Before using this information and the product it supports, read the general information in Appendix B, "IBM Statement of Limited Warranty Z125-4753-07 11/2002," on page 41 and Appendix C, "Notices," on page 57.

First Edition (April 2004)

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Contents

Safety	v
Chapter 1. Introduction	1
The IBM xSeries Documentation CD	2
Hardware and software requirements	2
Using the Documentation Browser	2
Notices and statements used in this document.	3
Features and specifications.	4
Major components of the xSeries 306 Type 8836 server	5
Chapter 2. Installing options	7
Installation guidelines	7
System reliability guidelines.	7
Handling static-sensitive devices	7
Installing a memory module.	8
Installing a hard disk drive	9
Installing a simple-swap Serial ATA hard disk drive	9
Installing a SCSI hard disk drive	10
Installing an adapter	11
Completing the installation.	13
Connecting the cables	14
Updating the server configuration	15
Chapter 3. Server controls, LEDs, and power	17
Front view	17
Rear view	18
Server power features	19
Turning on the server	19
Turning off the server	19
Chapter 4. Configuring the server	21
Using the ServerGuide Setup and Installation CD	21
Using the Configuration/Setup Utility program	21
Using the Adaptec HostRAID configuration programs	22
Using the Adaptec RAID Configuration Utility programs (for Serial ATA HostRAID).	22
Using the SCSISelect Utility program (for SCSI HostRAID).	23
Using the SCSISelect utility program (SCSI models only)	24
Chapter 5. Updating IBM Director	27
Chapter 6. Solving problems	29
Diagnostic tools overview	29
POST beep code descriptions	29
POST error messages	30
ServerGuide problems	31
Troubleshooting charts	32
CD-ROM drive problems	32
Diskette drive problems.	32
Expansion enclosure problems	32
General problems	32
Hard disk drive problems	33
Intermittent problems.	33

Keyboard, mouse, or pointing-device problems	33
Memory problems	34
Microprocessor problems	34
Monitor problems	34
Option problems	35
Power problems	36
Serial port problems	36
Software problems	36
Universal Serial Bus device problems	37
Appendix A. Getting help and technical assistance	39
Before you call	39
Using the documentation	39
Getting help and information from the World Wide Web	40
Software service and support	40
Hardware service and support	40
Appendix B. IBM Statement of Limited Warranty Z125-4753-07 11/2002	41
Part 1 - General Terms	41
Part 2 - Country-unique Terms	44
Part 3 - Warranty Information	55
Appendix C. Notices	57
Edition notice	57
Trademarks	58
Important notes.	58
Product recycling and disposal	59
Battery return program	59
Electronic emission notices	60
Federal Communications Commission (FCC) statement	60
Industry Canada Class A emission compliance statement	60
Australia and New Zealand Class A statement	60
United Kingdom telecommunications safety requirement.	60
European Union EMC Directive conformance statement.	61
Taiwanese Class A warning statement	61
Chinese Class A warning statement	61
Japanese Voluntary Control Council for Interference (VCCI) statement	61
Power cords	62
Index	65

Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

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)。

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

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.

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.

Important:

All caution and danger statements in this documentation begin with a number. This number is used to cross reference an English caution or danger statement with translated versions of the caution or danger statement in the *IBM Safety Information* book.

For example, if a caution statement begins with a number 1, translations for that caution statement appear in the *IBM Safety Information* book under statement 1.

Be sure to read all caution and danger statements in this documentation before performing the instructions. Read any additional safety information that comes with your server or optional device before you install the device.

Statement 1:



DANGER

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

To avoid a shock hazard:

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

To Connect:

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

To Disconnect:

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

Statement 2:



CAUTION:

When replacing the lithium battery, use only IBM Part Number 33F8354 or an equivalent type battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

Do not:

- Throw or immerse into water
- Heat to more than 100°C (212°F)
- Repair or disassemble

Dispose of the battery as required by local ordinances or regulations.

Statement 3:



CAUTION:

When laser products (such as CD-ROMs, DVD drives, fiber optic devices, or transmitters) are installed, note the following:

- Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.
- Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.



DANGER

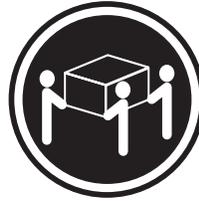
Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following.

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

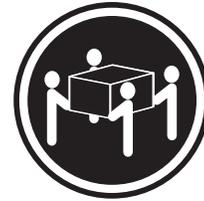
Statement 4:



≥ 18 kg (39.7 lb)



≥ 32 kg (70.5 lb)



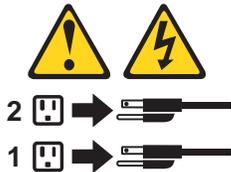
≥ 55 kg (121.2 lb)

CAUTION:
Use safe practices when lifting.

Statement 5:



CAUTION:
The power control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.



Statement 8:



CAUTION:

Never remove the cover on a power supply or any part that has the following label attached.



Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

Chapter 1. Introduction

This *Installation Guide* contains instructions for setting up your IBM® @server™ xSeries® 306 Type 8836 server and basic instructions for installing some options. More detailed instructions for installing options are in the *Option Installation Guide* on the IBM *xSeries Documentation* CD, which comes with your server. This document contains information about:

- Setting up and cabling your server
- Starting and configuring your server
- Installing some options
- Solving problems

Your server might have features that are not described in the documentation that you received with the server. The documentation might be updated occasionally to include information about those features, or technical updates might be available to provide additional information that is not included in your server documentation. These updates are available from the IBM Web site. Complete the following steps to check for updated documentation and technical updates:

1. Go to <http://www.ibm.com/pc/support/>.
2. In the **Learn** section, click **Online publications**.
3. On the "Online publications" page, in the **Brand** field, select **Servers**.
4. In the **Family** field, select **xSeries 306**.
5. Click **Continue**.

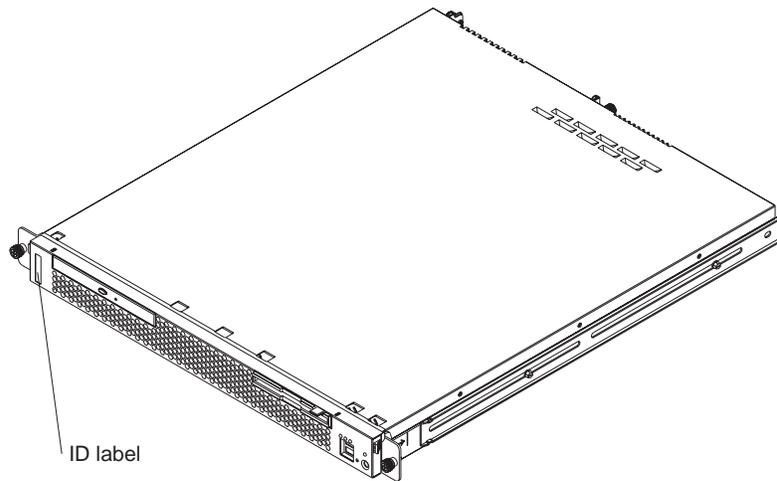
Your server comes with an IBM *ServerGuide™ Setup and Installation* CD to help you configure the hardware, install device drivers, and install the operating system.

Your server comes with a limited warranty. If you have access to the World Wide Web, you can obtain up-to-date information about your server and other IBM server products at <http://www.ibm.com/eserver/xseries/>.

Record information about your server in the following table. You will need this information when you register your server with IBM.

Product name	IBM @server xSeries 306 server
Machine type	8836
Model number	_____
Serial number	_____

The model number and serial number are on the ID label located on the bezel, as shown in the following illustration.



See the *Rack Installation Instructions* document for complete rack installation and removal instructions.

For a list of supported options for your server, go to the ServerProven® Web site at <http://www.ibm.com/pc/compat/>.

The IBM xSeries Documentation CD

The IBM *xSeries Documentation* CD contains documentation for your server in Portable Document Format (PDF) and includes the IBM Documentation Browser to help you find information quickly.

Hardware and software requirements

The IBM *xSeries Documentation* CD requires the following minimum hardware and software:

- Microsoft® Windows NT® 4.0 (with Service Pack 3 or later), Windows® 98, Windows 2000, or Red Hat Linux.
- 100 MHz Intel™ Pentium® microprocessor.
- 32 MB of RAM.
- Adobe Acrobat Reader 3.0 or later. Acrobat Reader software is included on the CD, and you can install it when you run the Documentation Browser.

Using the Documentation Browser

Use the Documentation Browser to browse the contents of the CD, read brief descriptions of the documents, and view documents using Adobe Acrobat Reader. The Documentation Browser automatically detects the regional settings in use in your system and displays the documents in the language for that region (if available). If a document is not available in the language for that region, the English version is displayed.

Use one of the following procedures to start the Documentation Browser:

- If Autostart is enabled, insert the CD into your CD-ROM drive. The Documentation Browser starts automatically.
- If Autostart is disabled or is not enabled for all users:

- If you are using a Windows operating system, insert the CD into your CD-ROM drive and click **Start --> Run**. In the **Open** field, type
`e:\win32.bat`

where *e* is the drive letter of your CD-ROM drive, and click **OK**.

- If you are using Red Hat Linux, insert the CD into your CD-ROM drive; then, run the following command from the `/mnt/cdrom` directory:
`sh runlinux.sh`

Select your server from the **Product** menu. The **Available Topics** list displays all the documents for your server. Some documents might be in folders. A plus sign (+) indicates each folder or document that has additional documents under it. Click the plus sign to display the additional documents.

When you select a document, a description of the document appears under **Topic Description**. To select more than one document, press and hold the Ctrl key while you select the documents. Click **View Book** to view the selected document or documents in Acrobat Reader. If you selected more than one document, all the selected documents are opened in Acrobat Reader.

To search all the documents, type a word or word string in the **Search** field and click **Search**. The documents in which the word or word string appears are listed in order of the most occurrences. Click a document to view it, and press Ctrl+F to use the Acrobat search function within the document.

Click **Help** for detailed information about using the Documentation Browser.

Notices and statements used in this document

The caution and danger statements that appear in this document are also in the multilingual *Safety Information* document, which is on the IBM *xSeries Documentation* CD. Each statement is numbered for reference to the corresponding statement in the *Safety Information* document.

The following notices and statements are used in the documentation:

- **Notes:** These notices provide important tips, guidance, or advice.
- **Important:** These notices provide information or advice that might help you avoid inconvenient or problem situations.
- **Attention:** These notices indicate potential damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage could occur.
- **Caution:** These statements indicate situations that can be potentially hazardous to you. A caution statement is placed just before the description of a potentially hazardous procedure step or situation.
- **Danger:** These statements indicate situations that can be potentially lethal or extremely hazardous to you. A danger statement is placed just before the description of a potentially lethal or extremely hazardous procedure step or situation.

Features and specifications

The following information is a summary of the features and specifications of your server. Depending on your server model, some features might not be available, or some specifications might not apply.

Racks are marked in vertical increments of 1.75 inches. Each increment is referred to as a unit, or "U." A 1-U-high device is 1.75 inches tall.

Table 1. Features and specifications

<p>Microprocessor:</p> <p>One Intel Pentium IV 1024 KB (minimum) Level-2 cache and MMX™ (MMX2) technology</p> <p>Note: Use the Configuration/Setup Utility program to determine the type and speed of the microprocessor in your server.</p> <p>Memory:</p> <ul style="list-style-type: none"> • Minimum: 512 MB • Maximum: 4 GB • Type: PC2700/3200, 333/400 MHz, ECC, SDRAM, registered DIMMs only • Slots: Four dual inline • Supports 256 MB, 512 MB, and 1 GB DIMMs <p>Drives:</p> <ul style="list-style-type: none"> • Diskette: 1.44 MB • CD-ROM: IDE <p>Expansion bays:</p> <p>Two 3.5-inch slim-high bays for hard disk drives</p> <p>Expansion slots:</p> <p>Two 66 MHz/64-bit PCI-X slots (one low profile half-length, one full-height three-quarter-length)</p> <p>Video controller:</p> <ul style="list-style-type: none"> • ATI Radeon 7000M IGP video on system board • Compatible with SVGA and VGA • 16 MB DDR-SDRAM video memory <p>Power supply:</p> <p>300 watt (110 or 220 V ac auto-sensing)</p>	<p>Size:</p> <ul style="list-style-type: none"> • Height: 43 mm (1.75 inches, 1 U) • Depth: 508 mm (20 inches) • Width: 430 mm (16.69 inches) • Maximum weight: 12.7 kg (28 lb) depending on your configuration <p>Integrated functions:</p> <ul style="list-style-type: none"> • Dual 1000Base-T, 100Base-T, 10Base-T Ethernet controllers on the system board with Wake on LAN® support • Serial port • Four USB ports (two on front and two on rear of server) • Keyboard port • Mouse port • ATA-100 single-channel IDE controller <p>Hard disk controllers:</p> <ul style="list-style-type: none"> • Serial ATA controller with integrated RAID • Ultra320 SCSI controller with integrated RAID (SCSI models) <p>Acoustical noise emissions:</p> <ul style="list-style-type: none"> • Sound power, idling: 6.5 bel maximum • Sound power, operating: 6.5 bel maximum <p>Environment:</p> <ul style="list-style-type: none"> • Air temperature: <ul style="list-style-type: none"> – Server on: 10° to 35°C (50.0° to 95.0°F); altitude: 0 to 914 m (2998.7 ft) – Server off: -40° to 60°C (-104° to 140°F); maximum altitude: 2133 m (6998.0 ft) • Humidity: <ul style="list-style-type: none"> – Server on: 8% to 80% – Server off: 8% to 80% 	<p>Heat output:</p> <p>Approximate heat output in British thermal units (Btu) per hour:</p> <ul style="list-style-type: none"> • Minimum configuration: 307 Btu (90 watts) • Maximum configuration: 850 Btu (250 watts) <p>Electrical input:</p> <ul style="list-style-type: none"> • Sine-wave input (47-63 Hz) required • Input voltage low range: <ul style="list-style-type: none"> – Minimum: 100 V ac – Maximum: 127 V ac • Input voltage high range: <ul style="list-style-type: none"> – Minimum: 200 V ac – Maximum: 240 V ac • Input kilovolt-amperes (kVA), approximately: <ul style="list-style-type: none"> – Minimum: 0.20 kVA – Maximum: 0.45 kVA <p>Notes:</p> <ol style="list-style-type: none"> 1. Power consumption and heat output vary depending on the number and type of optional features installed and the power-management optional features in use. 2. These levels were measured in controlled acoustical environments according to the procedures specified by the American National Standards Institute (ANSI) S12.10 and ISO 7779 and are reported in accordance with ISO 9296. Actual sound-pressure levels in a given location might exceed the average values stated because of room reflections and other nearby noise sources. The declared sound-power levels indicate an upper limit, below which a large number of computers will operate.
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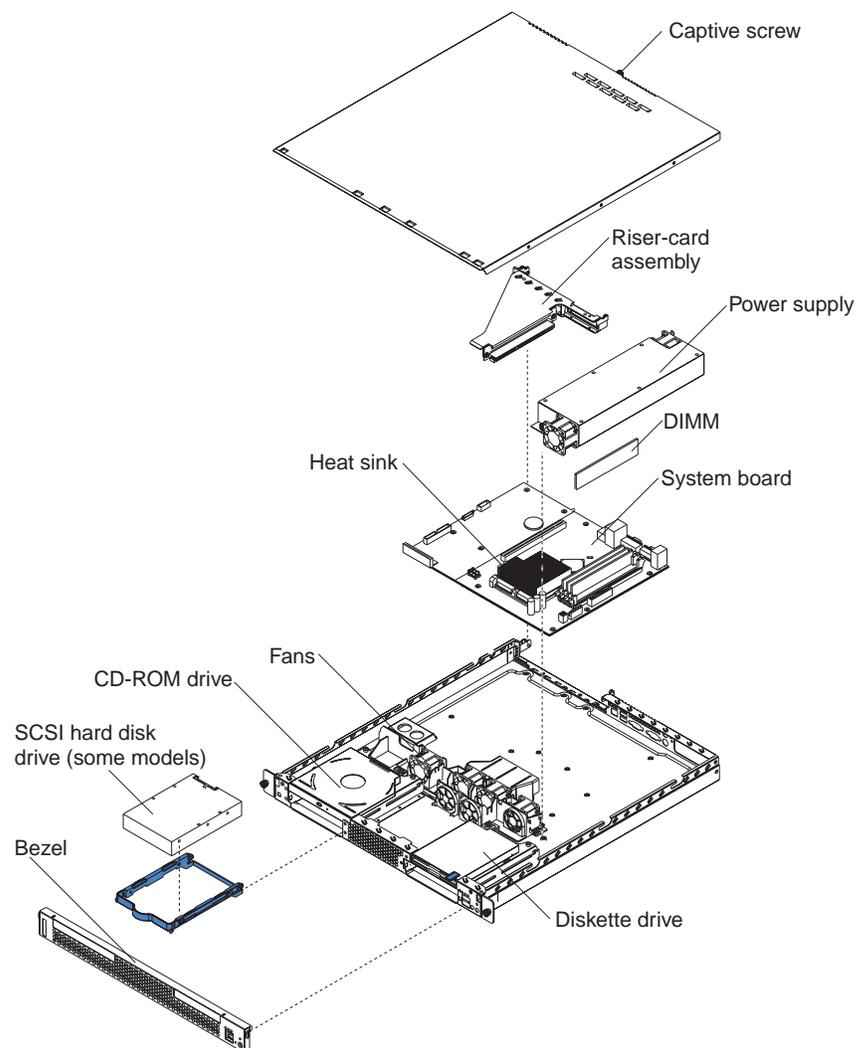
Major components of the xSeries 306 Type 8836 server

Blue on a component indicates touch points, where you can grip the component to remove it from or install it in the server, open or close a latch, and so on.

Orange on a component or an orange label on or near a component indicates that the component can be hot-swapped, which means that if the server and operating system support hot-swap capability, you can remove or install the component while the server is running. (Orange can also indicate touch points on hot-swap components.) See the instructions for removing or installing a specific hot-swap component for any additional procedures that you might have to perform before you remove or install the component.

The following illustration shows the locations of major components in your server.

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



Chapter 2. Installing options

This chapter provides basic instructions for installing hardware options in your server. These instructions are intended for users who are experienced with setting up IBM server hardware. If you need more detailed instructions, see the *Option Installation Guide* on the IBM xSeries Documentation CD.

Installation guidelines

Before you begin installing options in your server, read the following information:

- Read the safety information beginning on page v and the guidelines in “Handling static-sensitive devices” on page 7. This information will help you work safely with your server and options.
- Make sure that you have an adequate number of properly grounded electrical outlets for your server, monitor, and other devices that you will connect to the server.
- Back up all important data before you make changes to disk drives.
- Have a small flat-blade screwdriver available.
- You do not need to turn off the server to install or replace Universal Serial Bus (USB) devices.
- Blue on a component indicates touch points, where you can grip the component to remove it from or install it in the server, open or close a latch, and so on.
- Orange on a component or an orange label on or near a component indicates that the component can be hot-swapped, which means that if the server and operating system support hot-swap capability, you can remove or install the component while the server is running. (Orange can also indicate touch points on hot-swap components.) See the instructions for removing or installing a specific hot-swap component for any additional procedures that you might have to perform before you remove or install the component.
- For a list of supported options for your server, go to <http://www.ibm.com/pc/compat/>.

System reliability guidelines

To help ensure proper cooling and system reliability, make sure that:

- Each of the drive bays has a drive tray installed in it.
- If the server has redundant power, each of the power-supply bays has a power supply installed in it.
- There is adequate space around the server to allow the server cooling system to work properly. Leave approximately 50 mm (2.0 in.) of open space around the front and rear of the server. Do not place objects in front of the fans.
- You have followed the cabling instructions that come with optional adapters.
- You have replaced a failed fan within 48 hours.
- You do not remove the air baffle while the server is running. Operating the server without the air baffle might cause the microprocessor to overheat.

Handling static-sensitive devices

Attention: Static electricity can damage electronic devices, including your server. To avoid damage, keep static-sensitive devices in their static-protective packages until you are ready to install them.

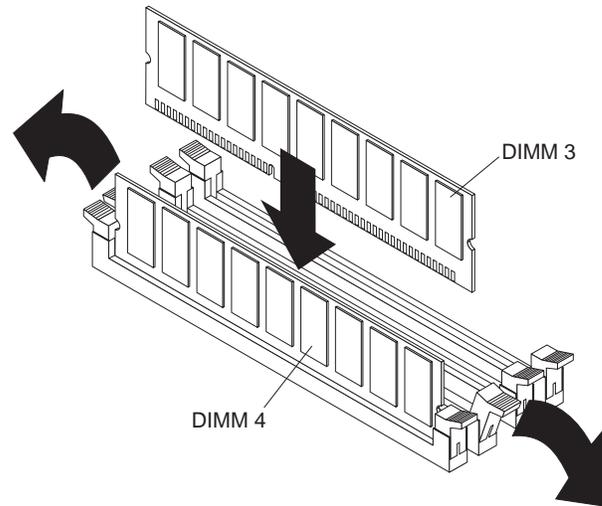
To reduce the possibility of damage from electrostatic discharge, observe the following precautions:

- Limit your movement. Movement can cause static electricity to build up around you.
- Handle the device carefully, holding it by its edges or its frame.
- Do not touch solder joints, pins, or exposed circuitry.
- Do not leave the device where others can handle and damage it.
- While the device is still in its static-protective package, touch it to an unpainted metal part of the server for at least 2 seconds. This drains static electricity from the package and from your body.
- Remove the device from its package and install it directly into the server without setting down the device. If it is necessary to set down the device, place it back into its static-protective package. Do not place the device on your server cover or on a metal surface.
- Take additional care when handling devices during cold weather. Heating reduces indoor humidity and increases static electricity.

Installing a memory module

The following notes describe the types of dual inline memory modules (DIMMs) that your server supports and other information that you must consider when installing DIMMs:

- Your server supports 256 MB, 512 MB, and 1 GB DIMMs, for a maximum of 4 GB of system memory. Go to the ServerProven list at <http://www.ibm.com/pc/compat> for a list of memory modules you can use with your server.
- The amount of usable memory will be reduced depending on the system configuration. A certain amount of memory must be reserved for system resources. The BIOS will display the total amount of installed memory and the amount of configured memory.
- Your server comes with one 512 MB DIMM installed in DIMM connector 1. If your system has one DIMM installed, when you install an additional DIMM, it must be installed in DIMM connector 3, and must be the same size, speed, type, and technology as the DIMM installed in DIMM connector 1. You can mix compatible DIMMs from various manufacturers.
- If you install a second pair of DIMMs in DIMM connectors 2 and 4, they do not have to be the same size, speed, type, and technology as the DIMMs installed in DIMM connectors 1 and 3. However, the size, speed, type, and technology of the DIMMs you install in DIMM connectors 2 and 4 must match each other.
- Install only 2.5 V, 184-pin, double-data-rate (DDR), PC2700 or PC3200, unbuffered synchronous dynamic random-access memory (SDRAM) with error correcting code (ECC) DIMMs. These DIMMs must be compatible with the latest PC2700 and PC3200 SDRAM unbuffered DIMM specification.
- When you restart the server, the system displays a message indicating that the memory configuration has changed.



Complete the following steps to install a DIMM:

1. Read the safety information beginning on page v and “Installation guidelines” on page 7.
2. Turn off the server and peripheral devices, and disconnect the power cord and all external cables. Remove the cover.

Attention: To avoid breaking the retaining clips or damaging the DIMM connectors, open, and close the clips gently.
3. Open the retaining clip on each end of the DIMM connector.
4. Touch the static-protective package containing the DIMM to any unpainted metal surface on the server. Then, remove the DIMM from the package.
5. Turn the DIMM so that the keys align correctly with the slot.
6. Insert the DIMM into the connector by aligning the DIMM edges with the slots at each end of the DIMM connector. Firmly press the DIMM straight down into the connector by applying pressure on both ends of the DIMM simultaneously. The retaining clips snap into the locked position when the DIMM is firmly seated in the connector. If there is a gap between the DIMM and the retaining clips, the DIMM has not been correctly inserted; open the retaining clips, remove the DIMM, and then reinsert it.
7. If you have other options to install, do so now.
8. Replace the cover. Go to “Completing the installation” on page 13.

Installing a hard disk drive

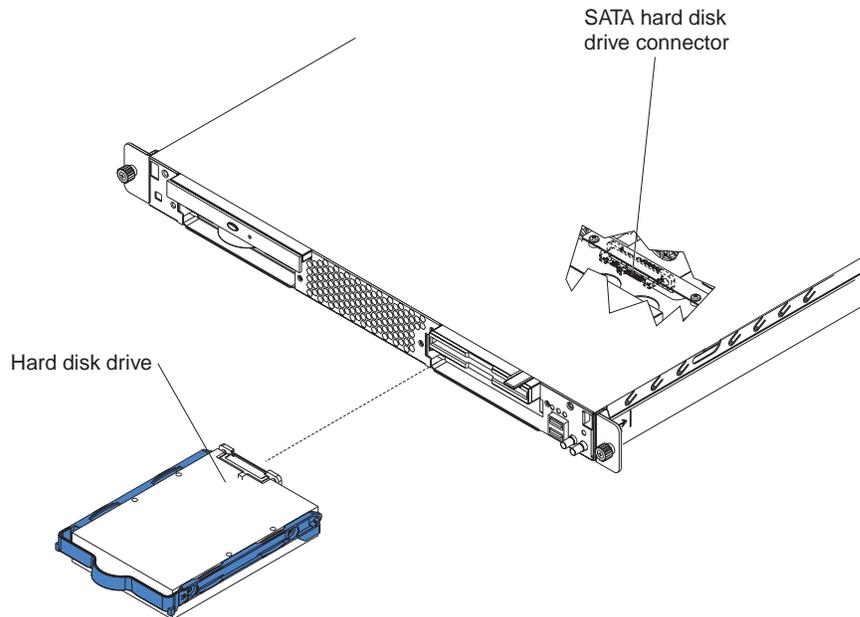
The following notes describe the types of hard disk drives that your server supports and other information that you must consider when installing a hard disk drive:

- Locate the documentation that comes with the hard disk drive and follow those instructions in addition to the instructions in this chapter.
- The server comes with one integrated drive electronics (IDE) CD-ROM drive, one 1.44 MB diskette drive, and a serial advanced technology attachment (ATA) or SCSI hard disk drive, depending on server model.
- If you are installing a SCSI hard disk drive, see the documentation that comes with your drive before installing it.

Installing a simple-swap Serial ATA hard disk drive

Complete the following steps to install a simple-swap Serial ATA hard disk drive.

Note: If you have only one hard disk drive, install it in the left drive bay.

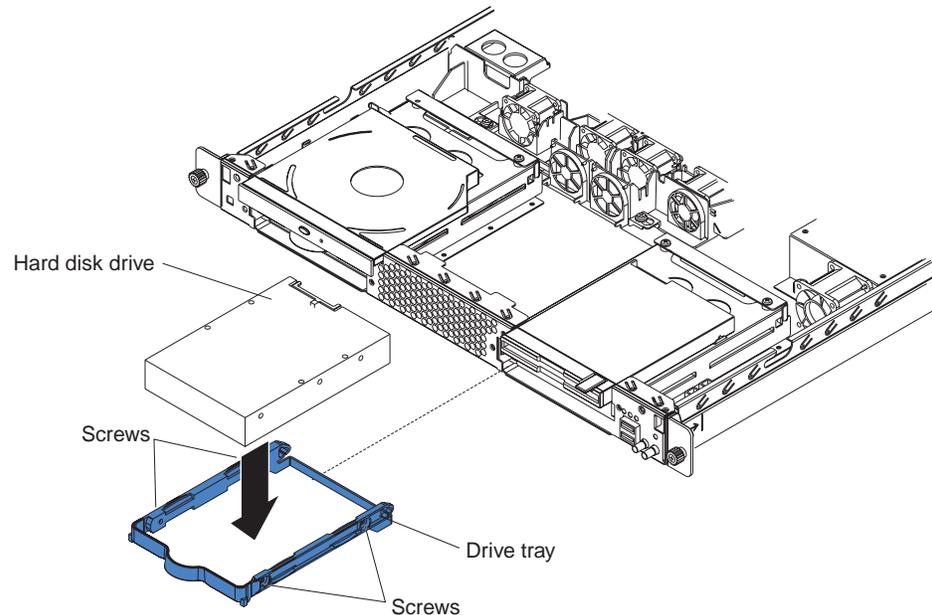


1. Read the safety information beginning on page v and “Installation guidelines” on page 7.
2. Turn off the server and peripheral devices, and disconnect the power cord and all external cables.
3. Press the release tabs on the bezel and pull the bezel away from the server.
4. Slide the drive into the server until the drive connects to the backplane.
5. If you have other options to install, do so now.
6. Reinstall the bezel. Go to “Completing the installation” on page 13.

Installing a SCSI hard disk drive

Complete the following steps to install a SCSI hard disk drive.

Note: If you have only one hard disk drive, install it in the left drive bay.



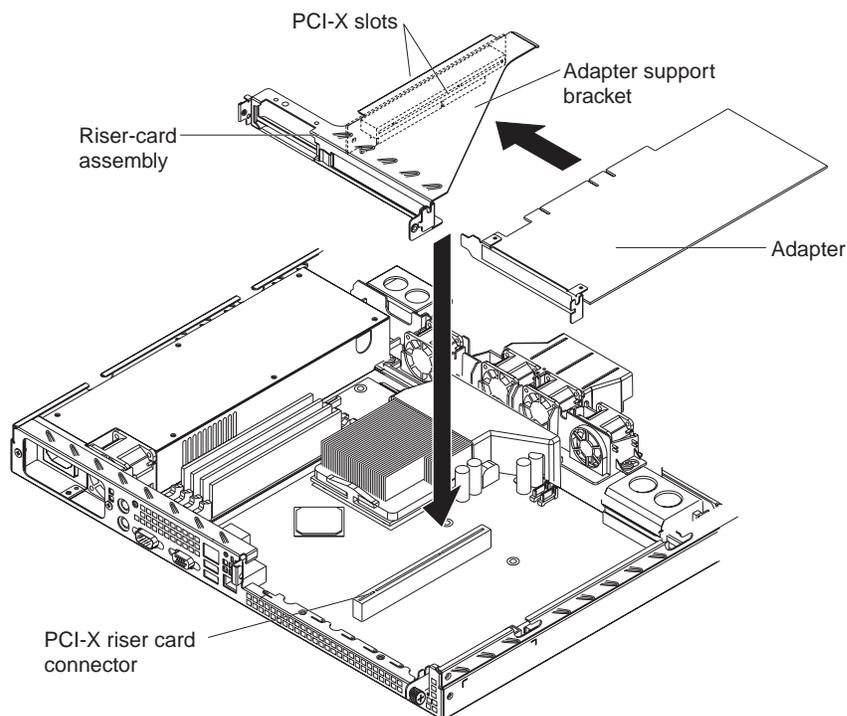
1. Read the safety information beginning on page v and “Installation guidelines” on page 7.
2. Turn off the server and peripheral devices, and disconnect the power cord and all external cables. Remove the cover.
3. Press the release tabs on the bezel and pull the bezel away from the server.
4. Slide the drive tray out of the server.
5. Position the drive on the drive tray.
6. Secure the drive using the screws that come with the option.
7. Slide the drive tray back into the server.
8. Connect the signal and power cables to the drive.
9. If you have other options to install, do so now.
10. Reinstall the bezel and replace the cover. Go to “Completing the installation” on page 13.

Installing an adapter

The following notes describe the types of adapters that your server supports and other information that you must consider when installing an adapter:

- Locate the documentation that comes with the adapter and follow those instructions in addition to the instructions in this section. If you need to change the switch settings or jumper settings on the adapter, follow the instructions that come with the adapter.
- Your server comes with two peripheral component interconnect-extended (PCI-X) adapter slots located on the riser-card assembly. You must first remove the riser-card assembly to access the PCI-X connectors.
- There are two 64-bit 66 MHz PCI-X slots.
- You can install one low profile half-length adapter in expansion slot 1 and one full-height three-quarter-length adapter in expansion slot 2.
- Your server supports 3.3 V or universal adapters.

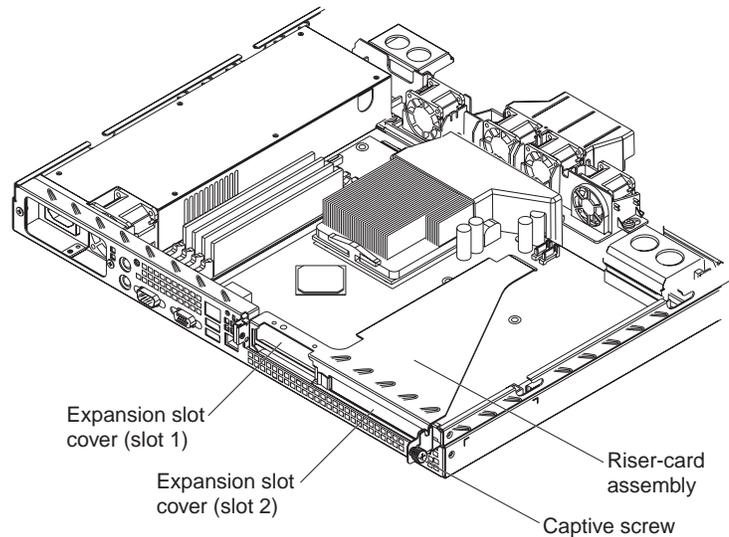
- Your server uses a rotational interrupt technique to configure PCI-X adapters so that you can install PCI-X adapters that do not support sharing of PCI-X interrupts.
- The server scans PCI-X slots to assign system resources. If you have not changed the default startup sequence, the server starts devices in the following order: the CD-ROM and diskette drives first; then, PCI-X slot 2, PCI-X slot 1, and the integrated Ethernet controllers.
- The optional Remote Supervisor Adapter II can be installed only in PCI-X slot 2.
- You can install an optional RAID controller in your server to control the internal hard disk drives, for example, to enable you to configure the internal hard disk drives into disk arrays. See your RAID controller option documentation for complete instructions on installing a RAID controller in your server and for additional information on RAID controllers.
- The optional ServeRAID™ -7t S-ATA controller can be installed only in PCI-X slot 1. The low-profile bracket that comes with the controller is required to install the controller.
- The optional ServeRAID-6i+ controller can be installed only in PCI-X slot 1. The low-profile bracket that comes with the controller is required to install the controller.
- No rerouting of the internal SCSI cable (SCSI models only) is required if you are installing the ServeRAID-6i+ controller. The ServeRAID-6i+ controller uses the SCSI connector (SCSI models only) for output.



Complete the following steps to install an adapter:

1. Read the safety information beginning on page v and “Installation guidelines” on page 7.
2. Turn off the server and peripheral devices, and disconnect the power cord and all external cables. Remove the cover.
3. Follow the cabling instructions, if any, that come with the adapter. Route the adapter cables before you install the adapter.

4. Follow the instructions that come with the adapter to set jumpers or switches, if any.
5. Loosen the captive screw on the rear of the server and remove the riser-card assembly. Place the riser-card assembly on a flat, static-protective surface.



6. Remove the expansion-slot cover.
Attention: PCI expansion-slot covers must be installed on all vacant slots. This maintains the electronic emissions characteristics of the server and ensures proper cooling of server components.
7. Touch the static-protective package containing the adapter to any unpainted metal surface on the server. Then, remove the adapter from the static-protective package. Avoid touching the components and gold-edge connectors on the adapter.
8. Place the adapter, component side up, on a flat, static-protective surface and set any jumpers or switches as described by the adapter manufacturer, if necessary.
Attention: When you install an adapter, make sure that it is completely and correctly seated in the PCI expansion slot before you turn on the server. Incomplete insertion might cause damage to the system board or the adapter.
9. To install the adapter in the riser-card assembly, carefully grasp the adapter by its top edge or upper corners, and align it with the PCI-X expansion slot; then, press the adapter *firmly* into the expansion slot.
10. Reinstall the riser-card assembly. Make sure that the riser-card assembly is fully seated in the riser-card connector.
11. Tighten the captive screw on the rear of the server.
12. If you have other options to install, do so now.
13. Replace the cover. Go to "Completing the installation."

Completing the installation

Complete the following steps to complete the installation:

1. Reinstall the cover.
2. Install the server in the rack cabinet. See the *Rack Installation Instructions* that come with your server for detailed information about how to install the server in a rack cabinet.

Attention:

- Install your server only in a rack cabinet with perforated doors.
 - Do not leave open space above or below an installed server in your rack cabinet. To help prevent damage to server components, always install a filler panel to cover the open space and to help ensure proper air circulation. See the documentation that comes with your rack cabinet for more information.
3. Connect the cables and power cords. See “Connecting the cables” on page 14 for more information.
 4. Update the server configuration. See “Updating the server configuration” on page 15 for more information.

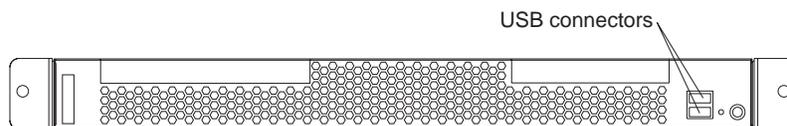
Connecting the cables

The following illustrations show the locations of the input and output connectors on the front and rear of your server.

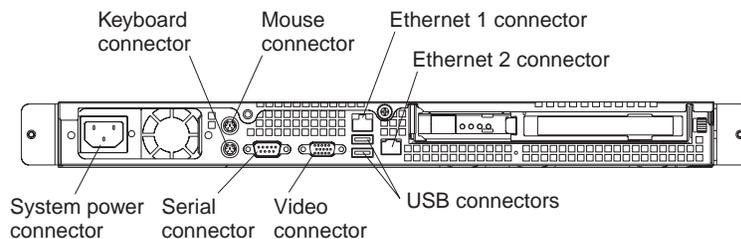
Notes:

1. You must turn off the server before connecting or disconnecting cables from your server.
2. See the documentation that comes with your external devices for additional cabling instructions. It might be easier for you to route cables before you connect the devices to the server.
3. Cable identifiers are printed on the cables that come with your server and options. Use these identifiers to connect the cables to the correct connectors.
4. If your server comes with an operating system installed, see the documentation that comes with your software for additional cabling instructions.
5. There is one keyboard connector on the back of the server. Use this connector to connect the server to a keyboard or optional console switch. You can also connect a USB keyboard to the server using one of the USB ports. After installing a USB keyboard, you might need to use the Configuration/Setup Utility program to enable keyboardless operation and prevent the POST error message 301 from being displayed during startup. For detailed information about this option and how to connect it to your server, see the documentation that comes with the option.

Front



Rear



Updating the server configuration

When you start the server for the first time after you add or remove an internal option or external SCSI device, you might receive a message that the configuration has changed. The Configuration/Setup Utility program starts automatically so that you can save the new configuration settings. For more information, see the section about configuring the server in the *User's Guide* on the IBM *xSeries Documentation* CD.

Some options have device drivers that you need to install. See the documentation that comes with the device for information about installing any required device drivers.

If the server has a RAID configuration using the SCSI controller with integrated RAID (SCSI models only) or the integrated Serial ATA controller with integrated RAID and you have installed or removed a hard disk drive, you might have to reconfigure your disk arrays. See the RAID documentation on the IBM *ServeRAID-7e (Adaptec HostRAID) Support* CD for more information about reconfiguring the disk arrays.

If the server has an optional RAID adapter and you have installed or removed a hard disk drive, see the documentation that comes with the RAID adapter for information about reconfiguring the disk arrays.

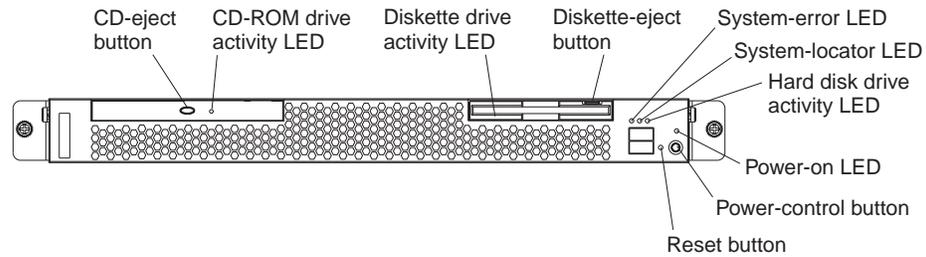
For more information about configuring the integrated Gigabit Ethernet controllers, see the *User's Guide*.

Chapter 3. Server controls, LEDs, and power

This section describes the controls and light-emitting diodes (LEDs) and how to turn the server on and off.

Front view

The following illustration shows the controls and LEDs on the front of the server.



CD-eject button: Press this button to release a CD from the CD-ROM drive.

CD-ROM drive activity LED: When this LED is lit, it indicates that the CD-ROM drive is in use.

Diskette drive activity LED: When this LED is lit, it indicates that the diskette drive is in use.

Diskette-eject button: Press this button to release a diskette from the diskette drive.

System-error LED: When this LED is lit, it indicates that a system error has occurred.

System-locator LED: Use this blue LED to visually locate the server if it is in a location with numerous other servers. If your server supports IBM Director, you can use IBM Director to light this LED remotely.

Hard disk drive activity LED: When this LED is flashing, it indicates that a hard disk drive is in use.

Power-on LED: When this LED is lit and not flashing, it indicates that the server is turned on. When this LED is flashing, it indicates that the server is turned off and still connected to an ac power source. When this LED is off, it indicates that ac power is not present, or the power supply or the LED itself has failed.

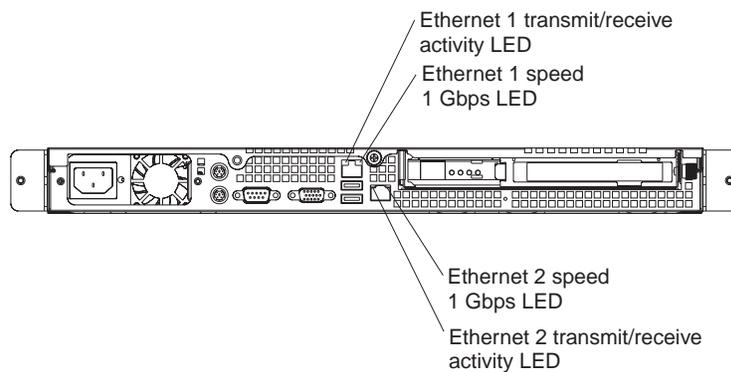
If this LED is off, it does not mean that there is no electrical power in the server. The LED might be burned out. To remove all electrical power from the server, you must disconnect the power cord from the electrical outlet.

Power-control button: Press this button to turn the server on and off manually.

Reset button: Press this button to reset the server and run the power-on self-test (POST). You might have to use a pen or the end of a straightened paper clip to press the button.

Rear view

The following illustration shows the LEDs on the rear of the server.



Ethernet 1 transmit/receive activity LED: This LED is on the Ethernet connector. When this LED is lit, it indicates that there is activity between the server and the network.

Ethernet 1 speed 1 Gbps LED: This LED is on the Ethernet connector. When this LED is lit, it indicates that the Ethernet network speed is 1 Gbps. When this LED is off, it indicates that the Ethernet network speed is 10 Mbps or 100 Mbps.

Ethernet 2 speed 1 Gbps LED: This LED is on the Ethernet connector. When this LED is lit, it indicates that the Ethernet network speed is 1 Gbps. When this LED is off, it indicates that the Ethernet network speed is 10 Mbps or 100 Mbps.

Ethernet 2 transmit/receive activity LED: This LED is on the Ethernet connector. When this LED is lit, it indicates that there is activity between the server and the network.

Server power features

When the server is connected to an ac power source but is not turned on, the operating system does not run, and all core logic except for the service processor is shut down; however, the server can respond to requests from the service processor, such as a remote request to turn on the server. The power-on LED flashes to indicate that the server is connected to ac power but not turned on.

Turning on the server

Approximately 20 seconds after the server is connected to ac power, the power-control button becomes active, and you can turn on the server and start the operating system by pressing the power-control button.

The server can also be turned on in any of the following ways:

- If a power failure occurs while the server is turned on, the server will restart automatically when power is restored.
- If the server is connected to an Advanced System Management interconnect network that contains at least one server with an optional Remote Supervisor Adapter II installed, the server can be turned on from the Remote Supervisor Adapter II user interface.
- If your operating system supports the system-management software for an optional Remote Supervisor Adapter II, the system-management software can turn on the server.
- If your operating system supports the Wake on LAN feature, the Wake on LAN feature can turn on the server.

Note: When 4 GB or more of memory (physical or logical) is installed, some memory is reserved for various system resources and is unavailable to the operating system. The amount of memory that is reserved for system resources depends on the operating system, the configuration of the server, and the configured PCI options.

Turning off the server

When you turn off the server and leave it connected to ac power, the server can respond to requests from the service processor, such as a remote request to turn on the server. To remove all power from the server, you must disconnect it from the power source.

Some operating systems require an orderly shutdown before you turn off the server. See your operating-system documentation for information about shutting down the operating system.

Statement 5:



CAUTION:

The power control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.



The server can be turned off in any of the following ways:

- You can turn off the server from the operating system, if your operating system supports this feature. After an orderly shutdown of the operating system, the server will be turned off automatically.
- You can press the power-control button to start an orderly shutdown of the operating system and turn off the server, if your operating system supports this feature.
- If the operating system stops functioning, you can press and hold the power-control button for more than 4 seconds to turn off the server.
- If the server is connected to an Advanced System Management interconnect network that contains at least one server with an optional Remote Supervisor Adapter II installed, the server can be turned off from the Remote Supervisor Adapter II user interface.
- If an optional Remote Supervisor Adapter II is installed in the server, the server can be turned off from the Remote Supervisor Adapter II user interface.
- If the Wake on LAN feature turned on the server, the Wake on LAN feature can turn off the server.
- You can turn off the server through a request from the service processor.

Chapter 4. Configuring the server

The *ServerGuide Setup and Installation* CD provides software setup tools and installation tools that are specifically designed for your IBM server. Use this CD during the initial installation of the server to configure basic hardware features and to simplify your operating-system installation.

In addition to the *ServerGuide Setup and Installation* CD, you can use the following configuration programs to customize the server hardware:

- Configuration/Setup Utility program
- Adaptec[®] HostRAID[™] configuration programs
- SCSISelect utility program

For more information about these programs, see “Configuring your server” in the *User’s Guide* on the IBM *xSeries Documentation* CD.

Using the ServerGuide Setup and Installation CD

The *ServerGuide Setup and Installation* CD provides state-of-the-art programs to detect the server model and hardware options that are installed, configures the server hardware, provides device drivers, and helps you install your operating system. For information about the supported operating-system versions, see the label on the CD. If the *ServerGuide Setup and Installation* CD did not come with your server, you can download the latest version from the ServerGuide Web page at <http://www.ibm.com/pc/qtechinfo/MIGR-4ZKPPT.html>.

Complete the following steps to start the *ServerGuide Setup and Installation* CD:

1. Insert the CD, and restart the server. If the CD does not start, see “ServerGuide problems” on page 31.
2. Follow the instructions on the screen to:
 - a. Select your language.
 - b. Select your keyboard layout and country.
 - c. View the overview to learn about ServerGuide features.
 - d. View the readme file to review installation tips about your operating system and adapter.
 - e. Start the setup and hardware configuration programs.
 - f. Start the operating-system installation. You will need your operating-system CD.

Using the Configuration/Setup Utility program

The Configuration/Setup Utility program is part of the BIOS code. You can use it to:

- Change interrupt request (IRQ) settings
- Change the startup drive sequence
- Configure serial-port assignments
- Enable USB keyboard and mouse support
- Resolve configuration conflicts
- Set the date and time
- Set passwords and security settings

Complete the following steps to start the Configuration/Setup Utility program:

1. Turn on the server and watch the monitor screen.
2. When the message Press F1 for Configuration/Setup appears, press F1. If a supervisor (administrator) password has been set, you must type the supervisor password to access the full Configuration/Setup Utility menu.
3. Follow the instructions on the screen.

Using the Adaptec HostRAID configuration programs

Use the Adaptec RAID Configuration Utility programs and SCSISelect Utility to add RAID levels 0 and 1 functionality to the integrated Serial ATA controller and the SCSI controller. Be sure to use these programs as described in this document. Use these programs to:

- Configure a redundant array of independent disks (RAID) array
- View or change your RAID configuration and associated devices

Consider the following information when using the Adaptec RAID Configuration Utility programs and SCSISelect Utility program to configure and manage arrays:

- The SCSI controller with integrated SCSI RAID (SCSI models) and the integrated Serial ATA controller (SATA models) with integrated SATA RAID support RAID levels 0 and 1. Installing an optional ServeRAID controller provides additional RAID levels.
- You cannot use the *ServerGuide Setup and Installation* CD to configure the integrated Serial ATA controller with integrated RAID and the SCSI controller with integrated RAID.
- Hard disk drive capacities affect how you create arrays. Drives in an array can have different capacities, but the RAID controller treats them as if they all have the capacity of the smallest hard disk drive.
- To help ensure signal quality, do not mix drives with different speeds and data rates.
- To update the firmware and BIOS code for an optional ServeRAID controller, you must use the IBM *ServeRAID Support* CD that comes with the ServeRAID option.
- If you install a different type of RAID controller in your server, use the configuration method described in the instructions that come with that RAID controller to view or change SCSI settings for attached devices.

Using the Adaptec RAID Configuration Utility programs (for Serial ATA HostRAID)

Use the Array Configuration Utility within the Adaptec RAID Configuration Utility programs to add RAID levels 0 and 1 functionality to the integrated Serial ATA (SATA) controller with integrated RAID. This utility is a part of the BIOS code in your server. For additional information about using the Adaptec RAID Configuration Utility programs, see the documentation on the IBM *ServeRAID-7e (Adaptec HostRAID) Support* CD. If this CD did not come with your server, you can download the *ServeRAID-7e (Adaptec HostRAID) Support* CD from the IBM Web site at: <http://www.ibm.com/pc/support/>.

The Serial ATA RAID feature comes disabled by default. You must enable the SATA RAID feature and install the device drivers before you can use it. The SATA RAID feature configuration utilities, device drivers, and information are available on the *ServeRAID-7e (Adaptec HostRAID) Support* CD.

Enabling the Serial ATA HostRAID feature

Complete the following steps to enable the SATA HostRAID feature:

1. Turn on the server and watch the monitor screen.
2. When the message Press F1 for Configuration/Setup appears, press F1. If you have set a supervisor password, you are prompted to type the password.
3. Select **Devices and I/O Ports**.
4. Scroll down and select **SATA RAID Enable**.
5. Select **Enabled**.
6. Press Esc; then, select **Yes** to save your changes.

Using the Serial ATA HostRAID feature

The instructions in this section are for using the Array Configuration Utility program to access and perform an initial RAID level-1 configuration. If you install a different type of RAID adapter in your server, use the configuration method described in the instructions that come with that adapter to view or change settings for the attached devices.

See the documentation on the *ServeRAID-7e (Adaptec HostRAID) Support CD* for additional information about using the Array Configuration Utility program to create, configure, and manage arrays.

Configuring the controller: Complete the following steps to use the Array Configuration Utility program to configure a RAID level-1 array on your server.

1. Turn on the server and watch the monitor screen.
2. When the message Press <CTRL><<A> for Adaptec RAID Configuration Utility appears, press Ctrl+A.
3. Select **Array Configuration Utility (ACU)**.
4. Select **Create Array**.
5. From the list of ready drives, select the two drives that you want to group into the array.
6. Select **RAID-1** when asked to select the RAID level.
7. (optional), Type an identifier for the array.
8. Select **Quick Int** when asked for the array build method.
9. Follow the instructions on the screen to complete the configuration, and select **Done** to exit.
10. Restart the server.

Viewing the configuration: Complete the following steps to view information about the Serial ATA controller:

1. Start the Array Configuration Utility.
2. From the Array Configuration Utility window, select **Manage Arrays**.
3. Select an array and press Enter.
4. Press Esc to exit the program.

Using the SCSISelect Utility program (for SCSI HostRAID)

Use the SCSISelect Utility to add RAID levels 0 and 1 functionality to the SCSI controller (SCSI models only). This utility is part of the BIOS code in your server.

The SCSI RAID feature comes disabled by default. You must enable the SCSI RAID feature and install the device drivers before you can use it. SCSI RAID configuration utilities, device drivers, and information are available on the

ServeRAID-7e (Adaptec HostRAID) Support CD. If this CD did not come with your server, you can download the *ServeRAID-7e (Adaptec HostRAID) Support CD* from the IBM Web site at <http://www.ibm.com/pc/support/>.

Enabling the SCSI HostRAID feature

Complete the following steps to enable the SCSI HostRAID feature:

1. Turn on the server and watch the monitor screen.
2. When the message Press <CTRL><A> for SCSISelect Utility appears, press Ctrl+A. If you have set a supervisor password, you are prompted to type the password.
3. Use the arrow keys to select the channel for which you want to change settings and press Enter.
4. Select **Configure/View SCSI Controller Setting**; then, select **HostRAID**.
5. Select **Enabled**.
6. Press Esc; then, select **Yes** to save the changes.

Using the SCSI HostRAID feature

The instructions in this section describe how to access the SCSI HostRAID feature from the SCSISelect Utility program and perform an initial RAID level-1 configuration on your server. If you install a different type of RAID adapter in your server, use the configuration method described in the instructions that come with that adapter to view or change SCSI settings for attached devices.

See the documentation on the *ServeRAID-7e (Adaptec HostRAID) Support CD* for additional information about how to use the SCSI HostRAID feature.

Configuring the controller: Complete the following steps to use the SCSI HostRAID feature to configure a RAID level-1 array on your server:

1. From the SCSISelect main menu, select **Configure/View HostRAID Settings**.
2. From the list of ready drives, type C to create an array.
3. Select **RAID-1** when asked to select the RAID type.
4. From the list of ready drives, select the two drives that you want to group into the array.
5. Select **Create new RAID-1**.
6. Type an identifier for the array.
7. Select **Yes** to create the array.
8. Press Esc to exit the utility.
9. Restart the server.

Viewing the configuration: You can use the SCSISelect Utility program to view information about the SCSI controller. From the list of available arrays, select an array and press Enter. Press Esc to exit the utility.

Using the SCSISelect utility program (SCSI models only)

Use the SCSISelect utility program to view or change SCSI controller settings and view SCSI ID assignments. The SCSISelect utility program is available on SCSI models only.

Complete the following steps to start the SCSISelect utility program:

1. Turn on the server and watch the monitor screen.

2. When the message Press <CTRL><A> for SCSISelect Utility appears, press Ctrl+A. If a supervisor password has been set, you are prompted to type the password.
3. Select the channel for which you want to change settings, and press Enter.
4. When the message Would you like to configure the SCSI controller, or run the SCSI Disk Utilities? appears, select a choice and press Enter.
5. Use the arrow keys to select a choice from the menu, and follow the instructions on the screen.

Chapter 5. Updating IBM Director

If you plan to use IBM Director to manage your server, you must check for the latest applicable IBM Director updates and interim fixes.

Complete the following steps to install the IBM Director updates and any other applicable updates and interim fixes:

1. Check for the latest version of IBM Director:
 - a. Go to
http://www.ibm.com/pc/us/eserver/xseries/systems_management/dwnl.html.
 - b. If a newer version of IBM Director than what comes with the server is shown in the drop-down list, follow the instructions on the Web page to download the latest version.
2. Install the IBM Director program.
3. Download and install any applicable updates or interim fixes for your server:
 - a. Go to <http://www.ibm.com>.
 - b. Click **Support & downloads**.
 - c. Click **Downloads & drivers**.
 - d. In the search field, type `director 8836` and click **Submit**.
 - e. Select any applicable update or interim fix that you want to download.
 - f. Click the file link for the executable file to download the file, and follow the instructions in the readme file to install the update or interim fix.
 - g. Repeat steps 3e and 3f for any additional updates or interim fixes that you want to install.

Chapter 6. Solving problems

This chapter provides basic troubleshooting information to help you solve some common problems that might occur while you are setting up your server.

If you cannot locate and correct the problem using the information in this chapter, see Appendix A, “Getting help and technical assistance,” on page 39, the *Hardware Maintenance Manual and Troubleshooting Guide* on the IBM xSeries Documentation CD, and the “Server Support” flowchart in the front of this book.

Diagnostic tools overview

The following tools are available to help you diagnose and solve hardware-related problems:

- **POST beep codes**

The power-on self-test beep codes indicate the detection of a problem.

- One beep indicates successful completion of POST, with no errors.
- More than one beep indicates that POST detected a problem. Error messages also appear during startup if POST detects a hardware-configuration problem.

See “POST beep code descriptions” and the *Hardware Maintenance Manual and Troubleshooting Guide* on the IBM xSeries Documentation CD for more information.

- **Troubleshooting charts**

These charts list problem symptoms and steps to correct the problems. See “Troubleshooting charts” on page 32 for more information.

- **Diagnostic programs and error messages**

The system diagnostic programs are provided on the *IBM Enhanced Diagnostics* CD. These programs test the major components of your server. See the *Hardware Maintenance Manual and Troubleshooting Guide* on the IBM xSeries Documentation CD for more information.

POST beep code descriptions

POST emits one beep to signal successful completion. If POST detects a problem during startup, other beep codes might occur. Use the following beep code descriptions to help diagnose and solve problems that are detected during startup.

Note: See the *Hardware Maintenance Manual and Troubleshooting Guide* on the IBM xSeries Documentation CD for more information about the POST beep codes.

One beep

POST was completed successfully.

Repeating long beeps

A memory error has occurred. Make sure that all DIMMs are correctly installed.

One long beep and two short beeps

A video error has occurred, and the BIOS cannot initialize the monitor screen to display additional information.

POST error messages

The following table provides an abbreviated list of the error messages that might appear during POST. See the *Hardware Maintenance Manual and Troubleshooting Guide* on the IBM xSeries Documentation CD for more information about the POST error messages.

Table 2. Abbreviated list of POST error messages

POST message	Failing device or problem found	Suggested action
161	The real-time clock battery has failed.	Replace the battery or call for service.
162	A device configuration has changed.	<ul style="list-style-type: none">• Run the Configuration/Setup Utility program; then, exit, saving the configuration settings.• Make sure that optional devices are turned on and installed correctly.
163	The time of day has not been set.	Set the date and time.
201	The memory configuration has changed.	Make sure that DIMMs are fully seated and installed correctly.
289	A failing DIMM was disabled.	Make sure that DIMMs are supported by your server and that they are installed correctly.
301, 303	Keyboard and keyboard controller	Make sure that the keyboard cable is connected and that nothing is resting on the keyboard keys.
962	Parallel port configuration error	Run the Configuration/Setup Utility program and make sure that the parallel port setting is correct.
1162	Serial port configuration conflict	Run the Configuration/Setup Utility program and make sure that the IRQ and I/O port assignments needed by the serial port are available.
00019xxx	Microprocessor <i>x</i> is not functioning or failed the built-in self-test.	Make sure that microprocessor <i>x</i> is installed correctly. If the problem remains, replace microprocessor <i>x</i> .
00180xxx	A PCI adapter requested a resource that is not available.	Run the Configuration/Setup Utility program and make sure that the resources needed by the PCI adapter are available.
012980xx 012981xx	Data for microprocessor <i>x</i>	Download and install the latest level of BIOS code.
I9990305	POST could not find an operating system.	Install an operating system.

ServerGuide problems

The following table lists problem symptoms and suggested solutions.

Table 3. ServerGuide Setup and Installation CD

Symptom	Suggested action
The <i>ServerGuide Setup and Installation</i> CD will not start.	<ul style="list-style-type: none">• Make sure that the server supports the ServerGuide program and has a startable (bootable) CD-ROM (or DVD-ROM) drive.• If the startup (boot) sequence settings have been altered, make sure that the CD-ROM drive is first in the startup sequence.• If more than one CD-ROM drive is installed, ensure that only one drive is set as the primary drive. Start the CD from the primary drive.
The SCSI RAID program cannot view all installed drives, or the operating system cannot be installed.	<ul style="list-style-type: none">• Make sure that there are no duplicate SCSI IDs or IRQ assignments.• Make sure that the hard disk drive is connected correctly.
The operating-system installation program continuously loops.	Make more space available on the hard disk.
The ServerGuide program will not start the operating-system CD.	Make sure that the operating-system CD is supported by the ServerGuide program. See the <i>ServerGuide Setup and Installation</i> CD label for a list of operating-system versions that support the ServerGuide program.
The operating system cannot be installed; the option is not available.	Make sure that the operating system is supported on your server. If the operating system is supported, either there is no logical drive defined (SCSI RAID systems) or the ServerGuide System Partition is not present. Run the ServerGuide program and make sure that setup is complete.

Troubleshooting charts

The following tables list problem symptoms and suggested solutions. See the *Hardware Maintenance Manual and Troubleshooting Guide* on the IBM xSeries Documentation CD for more detailed troubleshooting charts. If you cannot find the problem in these charts, run the diagnostic programs. If you have run the diagnostic programs, or if running the tests does not reveal the problem, call for service.

CD-ROM drive problems

Symptom	Suggested action
The CD-ROM drive is not recognized.	Make sure that: <ul style="list-style-type: none">• The IDE channel to which the CD-ROM drive is attached (primary or secondary) is enabled in the Configuration/Setup Utility program. If the server has a single IDE channel, only the primary channel can be used.• All cables and jumpers are installed correctly.• The correct device driver is installed for the CD-ROM drive.

Diskette drive problems

Symptom	Suggested action
The diskette drive activity LED stays lit, or the server bypasses the diskette drive.	If there is a diskette in the drive, make sure that: <ul style="list-style-type: none">• The diskette drive cables are correctly and securely connected.• The diskette drive is enabled in the Configuration/Setup Utility program.• The diskette is good and not damaged. (Try another diskette if you have one.)• The diskette contains the necessary files to start the server.• Your software program is working properly. If the problem remains, call for service.

Expansion enclosure problems

Symptom	Suggested action
The SCSI expansion enclosure used to work but does not work now.	Make sure that: <ul style="list-style-type: none">• The cables for all external SCSI options are connected correctly.• The last device in each SCSI chain, or the end of the SCSI cable, is terminated correctly.• Any external SCSI devices are turned on. You must turn on external SCSI devices before turning on the server. For more information, see your SCSI expansion enclosure documentation.

General problems

Symptom	Suggested action
A cover lock is broken, an LED is not working, or a similar problem has occurred.	Call for service.

Hard disk drive problems

Symptom	Suggested action
Not all drives are recognized by the hard disk drive diagnostic test (the Fixed Disk test).	<ol style="list-style-type: none">1. Remove the first drive that is not recognized and try the hard disk drive diagnostic test again.2. If the remaining drives are recognized, replace the drive that you removed with a new one.
The server stops responding during the hard disk drive diagnostic test.	<ol style="list-style-type: none">1. Remove the hard disk drive that was being tested when the server stopped responding and try the diagnostic test again.2. If the hard disk drive diagnostic test runs successfully, replace the drive that you removed with a new one.

Intermittent problems

Symptom	Suggested action
A problem occurs only occasionally and is difficult to diagnose.	<p>Make sure that:</p> <ul style="list-style-type: none">• All cables and cords are connected securely to the rear of the server and attached devices.• When the server is turned on, air is flowing from the rear of the server at the fan grille. If there is no airflow, the fan is not working. This can cause the server to overheat and shut down.• The SCSI bus and devices are configured correctly and the last external device in each SCSI chain is terminated correctly. <p>If the problem remains, call for service.</p>

Keyboard, mouse, or pointing-device problems

Symptom	Suggested action
All or some keys on the keyboard do not work.	<ul style="list-style-type: none">• Make sure that the keyboard cable is securely connected to the server and that the keyboard and mouse cables are not reversed.• Make sure that the server and the monitor are turned on.• Try using another keyboard. <p>If the problem remains, call for service.</p>
The mouse or pointing device does not work.	<ul style="list-style-type: none">• Make sure that the mouse or pointing-device cable is securely connected to the server and that the keyboard and mouse cables are not reversed.• Make sure that the mouse device drivers are installed correctly.• Try using another mouse or pointing device. <p>If the problem remains, call for service.</p>

Memory problems

Symptom	Suggested action
The amount of system memory displayed is less than the amount of physical memory installed.	<p>Make sure that:</p> <ul style="list-style-type: none"> The DIMMs are seated properly. You have installed the correct type of memory. If you changed the memory, you updated the memory configuration in the Configuration/Setup Utility program. All banks of memory are enabled. The server might have automatically disabled a DIMM bank when it detected a problem, or a DIMM bank might have been manually disabled. <p>Check the POST error log for error message 289:</p> <ul style="list-style-type: none"> If the DIMM was disabled by a system-management interrupt (SMI), replace the DIMM. If the DIMM was disabled by the user or by POST, run the Configuration/Setup Utility program and enable the DIMM. If this error remains, replace the DIMM. <p>If the problem remains, call for service.</p>

Microprocessor problems

Symptom	Suggested action
The server emits a continuous tone during POST.	<p>The startup (boot) microprocessor is not working correctly. Make sure that the startup microprocessor is seated properly. If it is, replace the startup microprocessor.</p> <p>If the problem remains, call for service.</p>

Monitor problems

Some IBM monitors have their own self-tests. If you suspect a problem with your monitor, see the information that comes with the monitor for instructions for testing and adjusting the monitor. If you cannot diagnose the problem, call for service.

Symptom	Suggested action
The screen is blank.	<p>Make sure that:</p> <ul style="list-style-type: none"> The server power cord is connected to the server and a working electrical outlet. The monitor cables are connected correctly. The monitor is turned on and the brightness and contrast controls are adjusted correctly. <p>Important: In some memory configurations, the 3-3-3 beep code might sound during POST, followed by a blank monitor screen. If this occurs and the Boot Fail Count feature in the Start Options of the Configuration/Setup Utility program is enabled (its default setting), you must restart the server three times to force the BIOS to reset the configuration settings to the default configuration (the memory connector or bank of connectors enabled).</p> <p>If the problem remains, call for service.</p>
Only the cursor appears.	<p>Call for service.</p>
The monitor works when you turn on the server, but the screen goes blank when you start some application programs.	<p>Make sure that:</p> <ul style="list-style-type: none"> The primary monitor cable is connected to the C2T breakout cable. You have installed the necessary device drivers for the application programs. <p>If the problem remains, call for service.</p>

Symptom	Suggested action
The monitor has screen jitter, or the screen image is wavy, unreadable, rolling, or distorted.	<p>If the monitor self-tests show that the monitor is working correctly, consider the location of the monitor. Magnetic fields around other devices (such as transformers, appliances, fluorescent lights, and other monitors) can cause screen jitter or wavy, unreadable, rolling, or distorted screen images. If this happens, turn off the monitor.</p> <p>Attention: Moving a color monitor while it is turned on might cause screen discoloration.</p> <p>Move the device and the monitor at least 300 mm (12 in.) apart, and turn on the monitor.</p> <p>Notes:</p> <ol style="list-style-type: none"> 1. To prevent diskette drive read/write errors, make sure that the distance between the monitor and diskette drives is at least 75 mm (3 in.). 2. Non-IBM monitor cables might cause unpredictable problems. 3. An enhanced monitor cable with additional shielding is available for the 9521 and 9527 monitors. For information about the enhanced monitor cable, contact your IBM marketing representative or authorized reseller. <p>If the problem remains, call for service.</p>
Wrong characters appear on the screen.	<p>If the wrong language is displayed, update the BIOS code with the correct language.</p> <p>If the problem remains, call for service.</p>

Option problems

Symptom	Suggested action
An IBM option that was just installed does not work.	<p>Make sure that:</p> <ul style="list-style-type: none"> • The option is designed for the server. See the "Server Support" flowchart for information about obtaining ServerProven compatibility information from the World Wide Web. • You followed the installation instructions that come with the option. • The option is installed correctly. • You have not loosened any other installed options or cables. • You have updated the configuration information in the Configuration/Setup Utility program. Whenever memory or an option is changed, you must update the configuration. <p>If the problem remains, call for service.</p>
An IBM option that used to work does not work now.	<ul style="list-style-type: none"> • Make sure that all of the option hardware and cable connections are secure. • If the option comes with test instructions, use those instructions to test the option. • If the failing option is a SCSI device, make sure that: <ul style="list-style-type: none"> – The cables for all external SCSI options are connected correctly. – The last device in each SCSI chain, or the end of the SCSI cable, is terminated correctly. – Any external SCSI devices are turned on. You must turn on external SCSI devices before turning on the server. <p>If the problem remains, call for service.</p>

Power problems

Symptom	Suggested action
The server does not turn on.	<ul style="list-style-type: none"> • Make sure that the server power cord is connected to the server and a working electrical outlet. • Make sure that the type of memory that is installed is supported in your server. • If you just installed an option, remove it, and restart the server. If the server now turns on, you might have installed more options than the power supply supports. <p>If the problem remains, call for service.</p>
The server does not turn off.	<p>Determine whether you are using an ACPI or non-ACPI operating system.</p> <p>If you are using a non-ACPI operating system, complete the following steps:</p> <ol style="list-style-type: none"> 1. Press Ctrl+Alt+Delete. 2. Turn off the server by using the power-control button. You might need to press and hold the power-control button for 5 seconds to force the server to turn off. <p>If the problem remains or if you are using an ACPI operating system, call for service.</p>

Serial port problems

For more information about the serial port, see the *Option Installation Guide* on the IBM xSeries Documentation CD.

Symptom	Suggested action
The number of serial ports identified by the operating system is less than the number of serial ports that are installed.	<p>Make sure that:</p> <ul style="list-style-type: none"> • Each port is assigned a unique address in the Configuration/Setup Utility program and none of the serial ports is disabled. • The serial port adapter, if you installed one, is seated properly. <p>If the problem remains, call for service.</p>
A serial device does not work.	<p>Make sure that:</p> <ul style="list-style-type: none"> • The device is compatible with the server. • The serial port is enabled and is assigned a unique address. • The device is connected to the serial port and the serial port is connected to serial connector (J8) on the system board. <p>If the problem remains, call for service.</p>

Software problems

Symptom	Suggested action
You suspect a software problem.	<p>To determine whether the problem is caused by the software, make sure that:</p> <ul style="list-style-type: none"> • Your server has the minimum memory needed to use the software. For memory requirements, see the information that comes with the software. If you have just installed an adapter or memory, the server might have a memory-address conflict. • The software is designed to operate on your server. • Other software works on your server. • The software that you are using works on another server. <p>If you received any error messages when using the software, see the information that comes with the software for a description of the messages and suggested solutions to the problem.</p> <p>If the problem remains, contact your place of purchase of the software.</p>

Universal Serial Bus device problems

Symptom	Suggested action
A USB device does not work.	<p>Make sure that:</p> <ul style="list-style-type: none">• You are not trying to use a USB device during POST if a standard (non-USB) keyboard is connected to the keyboard connector. If a standard (non-USB) keyboard is connected to the keyboard connector, the USB is disabled, and no USB device will work during POST.• The correct USB device driver is installed.• Your operating system supports USB devices. <p>If the problem remains, call for service.</p>

Appendix A. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you. This appendix contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your xSeries or IntelliStation[®] system, and whom to call for service, if it is necessary.

Before you call

Before you call, make sure that you have taken these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system is turned on.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system. Information about diagnostic tools is in the *Hardware Maintenance Manual and Troubleshooting Guide* on the IBM *xSeries Documentation* CD or in the *IntelliStation Hardware Maintenance Manual* at the IBM Support Web site.
- Go to the IBM Support Web site at <http://www.ibm.com/pc/support/> to check for technical information, hints, tips, and new device drivers or to submit a request for information.

You can solve many problems without outside assistance by following the troubleshooting procedures that IBM provides in the online help or in the publications that are provided with your system and software. The information that comes with your system also describes the diagnostic tests that you can perform. Most xSeries and IntelliStation systems, operating systems, and programs come with information that contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the information for the operating system or program.

Using the documentation

Information about your IBM xSeries or IntelliStation system and preinstalled software, if any, is available in the documentation that comes with your system. That documentation includes printed books, online books, readme files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to <http://www.ibm.com/pc/support/> and follow the instructions. Also, you can order publications through the IBM Publications Ordering System at <http://www.elink.ibm.com/public/applications/publications/cgibin/pbi.cgi>.

Getting help and information from the World Wide Web

On the World Wide Web, the IBM Web site has up-to-date information about IBM xSeries and IntelliStation products, services, and support. The address for IBM xSeries information is <http://www.ibm.com/eserver/xseries/>. The address for IBM IntelliStation information is <http://www.ibm.com/pc/intellistation/>.

You can find service information for your IBM products, including supported options, at <http://www.ibm.com/pc/support/>.

Software service and support

Through IBM Support Line, you can get telephone assistance, for a fee, with usage, configuration, and software problems with xSeries servers, IntelliStation workstations, and appliances. For information about which products are supported by Support Line in your country or region, go to <http://www.ibm.com/services/sl/products/>.

For more information about Support Line and other IBM services, go to <http://www.ibm.com/services/>, or go to <http://www.ibm.com/planetwide/> for support telephone numbers. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

Hardware service and support

You can receive hardware service through IBM Integrated Technology Services or through your IBM reseller, if your reseller is authorized by IBM to provide warranty service. Go to <http://www.ibm.com/planetwide/> for support telephone numbers, or in the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

In the U.S. and Canada, hardware service and support is available 24 hours a day, 7 days a week. In the U.K., these services are available Monday through Friday, from 9 a.m. to 6 p.m.

Appendix B. IBM Statement of Limited Warranty Z125-4753-07 11/2002

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 via telephone 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 call for service, you must follow the problem determination and resolution procedures that IBM specifies. A technician will attempt to make an initial diagnosis of your problem and help you resolve it over the telephone.

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 and other easily replaceable parts), IBM will ship these parts to you for replacement by you.

If the Machine does not function as warranted during the warranty period and your problem cannot be resolved over the telephone, 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

Governing Law: *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.

BRAZIL

Governing Law: *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.

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").

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, 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, United States of America.

CAMBODIA, INDONESIA, LAOS, AND VIETNAM

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: If you purchase a Machine in Austria, Belgium, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Monaco, Netherlands, Norway, Portugal, Spain, San Marino, Sweden, Switzerland, United Kingdom or Vatican State, 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.

*Add the following paragraph in **Western Europe** (Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Liechtenstein, Luxembourg, Monaco, Netherlands, Norway, Portugal, Spain, San Marino, Sweden, Switzerland, United Kingdom, Vatican State):*

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.

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:

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.

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

AUSTRIA, DENMARK, FINLAND, GREECE, ITALY, NETHERLANDS, 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

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 warranty period for Machines is 12 months from the date of delivery. 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, 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 ("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.

Machine - IBM xSeries 306 Type 8836

Country or Region of Purchase	Warranty Period	Type of Warranty Service*
Worldwide	1 year	1 and 2
* See " <u>Types of Warranty Service</u> " for the legend and explanations of warranty-service types.		

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

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

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 will ship CRU parts to you for your replacement. If IBM instructs you to return the replaced CRU, you are responsible for returning it to IBM in accordance with IBM's instructions. If you do not return the defective CRU, if IBM so instructs, within 30 days of your receipt of the replacement CRU, IBM may charge you for 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.

* 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 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.

Austria -- 43-1-24592-5901	Italy -- 39-02-482-9202
Belgium -- 02-718-4339	Luxembourg -- 352-360385-1
Denmark -- 4520-8200	Netherlands -- 020-514-5770
Finland -- 358-9-4591	Portugal -- 351-21-7915-147
France -- 0238-557-450	Spain -- 34-91-662-4916
Germany -- 07032-15-4920	Sweden -- 46-8-477-4420
Greece -- 30-210-688-1220	United Kingdom -- 01475-555-055
Ireland -- 353-1-815-4000	

Appendix C. Notices

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

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C2T Interconnect	TechConnect
Chipkill	ThinkPad
EtherJet	Tivoli
e-business logo	Tivoli Enterprise
@server	Update Connector
FlashCopy	Wake on LAN
IBM	XA-32
IBM (logo)	XA-64
IntelliStation	X-Architecture
NetBAY	Xcel4
Netfinity	XpandOnDemand
NetView	xSeries
OS/2 WARP	

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Adaptec and HostRAID are trademarks of Adaptec, Inc. in the United States, other countries, or both.

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Important notes

Processor speeds indicate the internal clock speed of the microprocessor; other factors also affect application performance.

CD-ROM drive speeds list the variable read rate. Actual speeds vary and are often less than the maximum possible.

When referring to processor storage, real and virtual storage, or channel volume, KB stands for approximately 1000 bytes, MB stands for approximately 1 000 000 bytes, and GB stands for approximately 1 000 000 000 bytes.

When referring to hard disk drive capacity or communications volume, MB stands for 1 000 000 bytes, and GB stands for 1 000 000 000 bytes. Total user-accessible capacity may vary depending on operating environments.

Maximum internal hard disk drive capacities assume the replacement of any standard hard disk drives and population of all hard disk drive bays with the largest currently supported drives available from IBM.

Maximum memory may require replacement of the standard memory with an optional memory module.

IBM makes no representation or warranties regarding non-IBM products and services that are ServerProven, including but not limited to the implied warranties of merchantability and fitness for a particular purpose. These products are offered and warranted solely by third parties.

IBM makes no representations or warranties with respect to non-IBM products. Support (if any) for the non-IBM products is provided by the third party, not IBM.

Some software may differ from its retail version (if available), and may not include user manuals or all program functionality.

Product recycling and disposal

This unit contains materials such as circuit boards, cables, electromagnetic compatibility gaskets, and connectors which may contain lead and copper/beryllium alloys that require special handling and disposal at end of life. Before this unit is disposed of, these materials must be removed and recycled or discarded according to applicable regulations. IBM offers product-return programs in several countries. Information on product recycling offerings can be found on IBM's Internet site at <http://www.ibm.com/ibm/environment/products/prp.shtml>.

Battery return program

This product may contain a sealed lead acid, nickel cadmium, nickel metal hydride, lithium, or lithium ion battery. Consult your user manual or service manual for specific battery information. The battery must be recycled or disposed of properly. Recycling facilities may not be available in your area. For information on disposal of batteries outside the United States, go to <http://www.ibm.com/ibm/environment/products/batteryrecycle.shtml> or contact your local waste disposal facility.

In the United States, IBM has established a collection process for reuse, recycling, or proper disposal of used IBM sealed lead acid, nickel cadmium, nickel metal hydride, and battery packs from IBM equipment. For information on proper disposal of these batteries, contact IBM at 1-800-426-4333. Have the IBM part number listed on the battery available prior to your call.

In the Netherlands, the following applies.



Electronic emission notices

Federal Communications Commission (FCC) statement

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

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Industry Canada Class A emission compliance statement

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

Avis de conformité à la réglementation d'Industrie Canada

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

Australia and New Zealand Class A statement

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

United Kingdom telecommunications safety requirement

Notice to Customers

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

European Union EMC Directive conformance statement

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a nonrecommended modification of the product, including the fitting of non-IBM option cards.

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

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

Taiwanese Class A warning statement

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

Chinese Class A warning statement

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

Japanese Voluntary Control Council for Interference (VCCI) statement

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

Power cords

For your safety, IBM provides a power cord with a grounded attachment plug to use with this IBM product. To avoid electrical shock, always use the power cord and plug with a properly grounded outlet.

IBM power cords used in the United States and Canada are listed by Underwriter's Laboratories (UL) and certified by the Canadian Standards Association (CSA).

For units intended to be operated at 115 volts: Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a parallel blade, grounding-type attachment plug rated 15 amperes, 125 volts.

For units intended to be operated at 230 volts (U.S. use): Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a tandem blade, grounding-type attachment plug rated 15 amperes, 250 volts.

For units intended to be operated at 230 volts (outside the U.S.): Use a cord set with a grounding-type attachment plug. The cord set should have the appropriate safety approvals for the country in which the equipment will be installed.

IBM power cords for a specific country or region are usually available only in that country or region.

IBM power cord part number	Used in these countries and regions
02K0546	China
13F9940	Australia, Fiji, Kiribati, Nauru, New Zealand, Papua New Guinea
13F9979	Afghanistan, Albania, Algeria, Andorra, Angola, Armenia, Austria, Azerbaijan, Belarus, Belgium, Benin, Bosnia and Herzegovina, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo (Democratic Republic of), Congo (Republic of), Cote D'Ivoire (Ivory Coast), Croatia (Republic of), Czech Republic, Dahomey, Djibouti, Egypt, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Finland, France, French Guyana, French Polynesia, Germany, Greece, Guadeloupe, Guinea, Guinea Bissau, Hungary, Iceland, Indonesia, Iran, Kazakhstan, Kyrgyzstan, Laos (People's Democratic Republic of), Latvia, Lebanon, Lithuania, Luxembourg, Macedonia (former Yugoslav Republic of), Madagascar, Mali, Martinique, Mauritania, Mauritius, Mayotte, Moldova (Republic of), Monaco, Mongolia, Morocco, Mozambique, Netherlands, New Caledonia, Niger, Norway, Poland, Portugal, Reunion, Romania, Russian Federation, Rwanda, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Slovakia, Slovenia (Republic of), Somalia, Spain, Suriname, Sweden, Syrian Arab Republic, Tajikistan, Tahiti, Togo, Tunisia, Turkey, Turkmenistan, Ukraine, Upper Volta, Uzbekistan, Vanuatu, Vietnam, Wallis and Futuna, Yugoslavia (Federal Republic of), Zaire
13F9997	Denmark
14F0015	Bangladesh, Lesotho, Maceo, Maldives, Namibia, Nepal, Pakistan, Samoa, South Africa, Sri Lanka, Swaziland, Uganda

IBM power cord part number	Used in these countries and regions
14F0033	Abu Dhabi, Bahrain, Botswana, Brunei Darussalam, Channel Islands, China (Hong Kong S.A.R.), Cyprus, Dominica, Gambia, Ghana, Grenada, Iraq, Ireland, Jordan, Kenya, Kuwait, Liberia, Malawi, Malaysia, Malta, Myanmar (Burma), Nigeria, Oman, Polynesia, Qatar, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Seychelles, Sierra Leone, Singapore, Sudan, Tanzania (United Republic of), Trinidad and Tobago, United Arab Emirates (Dubai), United Kingdom, Yemen, Zambia, Zimbabwe
14F0051	Liechtenstein, Switzerland
14F0069	Chile, Italy, Libyan Arab Jamahiriya
14F0087	Israel
1838574	Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Brazil, Caicos Islands, Canada, Cayman Islands, Costa Rica, Colombia, Cuba, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Jamaica, Japan, Mexico, Micronesia (Federal States of), Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Taiwan, United States of America, Venezuela
24P6858	Korea (Democratic People's Republic of), Korea (Republic of)
34G0232	Japan
36L8880	Argentina, Paraguay, Uruguay
49P2078	India
49P2110	Brazil
6952300	Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Caicos Islands, Canada, Cayman Islands, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Jamaica, Mexico, Micronesia (Federal States of), Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Thailand, Taiwan, United States of America, Venezuela

Index

A

- Adaptec RAID Configuration Utility
 - using 22
- adapter
 - installing 12
 - PCI-X bus 12
- Array Configuration Utility
 - using to configure the SATA controller 23
- attention notices 3

B

- bays 4
- beep codes 29

C

- caution statements 3
- CD-eject button 17
- CD-ROM
 - drive specification 4
- CD-ROM drive activity LED 17
- CD-ROM drive problems 32
- Class A electronic emission notice 60
- Configuration/Setup Utility program 21
- configuring hardware 21
- connectors 18
- controller
 - SCSI
 - configuring 24
 - Serial ATA
 - configuring 22, 23
 - using the SCSISelect Utility to configure 23

D

- danger statements 3
- DIMMs
 - connector locations 9
 - supported 4
- diskette drive
 - activity LED 17
 - problems 32
 - specifications 4
- diskette drive activity LED 17
- diskette-eject button 17
- documentation CD 2
- drives 4

E

- electrical input 4
- electronic emission Class A notice 60
- enabling
 - the SCSI HostRAID feature 24
 - the Serial ATA HostRAID feature 23

- environment 4
- error messages, POST 30
- Ethernet
 - speed indicator 18
 - transmit/receive activity 18
- Ethernet speed 1 Gbps LED 18
- Ethernet transmit/receive activity LED 18
- expansion bays 4
- expansion enclosure problems 32
- expansion slots 4

F

- FCC Class A notice 60
- feature
 - SATA HostRAID
 - enabling 23
- features 4

H

- hard disk drive
 - activity LED 17
 - installing 9, 10
 - SCSI 10
 - Serial ATA 10
 - simple-swap serial ATA 9
- hard disk drive problems 33
- heat output 4
- HostRAID feature
 - using to configure the integrated SATA controller 23
- HostRAID feature for SCSI
 - enabling 24
 - using to configure the SCSI controller 24
- humidity 4

I

- IBM Director 27
- important notices 3
- installation order, memory modules 8
- installing
 - adapters 12
 - DIMMs 8
 - hard disk drive 9
- integrated functions 4
- integrated Serial ATA controller
 - configuring 23
- intermittent problems 33

K

- keyboard problems 33

L

- LEDs 17, 18

M

- major components 5
- memory
 - installing 8
 - problems 34
 - specifications 4
- memory module
 - order of installation 8
- microprocessor 4
 - problems 34
- monitor problems 34
- mouse problems 33

N

- noise emissions 4
- notes 3
- notes, important 58
- notices
 - electronic emission 60
 - FCC, Class A 60
- notices and statements 3

O

- online publications 1
- option problems 35
- order of installation, memory modules 8

P

- pointing device problems 33
- POST error messages 30
- power cords 62
- power features 19
- power LED 17
- power problems 36
- power requirement 4
- power supply 4
- power-control button 17
- problems
 - CD-ROM drive 32
 - diskette drive 32
 - expansion enclosure 32
 - general 32
 - hard disk drive 33
 - intermittent 33
 - keyboard 33
 - memory 34
 - microprocessor 34
 - mouse 33
 - option 35
 - pointing device 33
 - power 36
 - serial port 36
 - software 36
 - solving 29
 - USB device 37

R

- reset button 17

S

- SATA HostRAID feature
 - enabling 23
- SCSI controller
 - configuring 24
- SCSI hard disk drives, installing 10
- SCSI HostRAID feature
 - enabling 24
 - using to configure the SCSI controller 23
- SCSISelect Utility
 - using to configure the SCSI controller 23
- SCSISelect utility program 24
- serial port problems 36
- ServerGuide 21
 - error symptoms 31
- simple-swap serial ATA hard disk drive, installing 9
- size 4
- slots 4
- software problems 36
- solving problems 29
- specifications 4
- statements and notices 3
- system-error LED 17
- system-locator LED 17

T

- temperature 4
- trademarks 58
- troubleshooting chart 32
- turning off the server 19
- turning on the server 19

U

- United States electronic emission Class A notice 60
- United States FCC Class A notice 60
- Universal Serial Bus (USB) problems 37
- using
 - Adaptec RAID Configuration Utility 22
 - SCSI HostRAID to configure the controller 24
 - the Adaptec HostRAID configuration programs 22
 - the SATA HostRAID feature 23
 - the SCSI HostRAID feature 23
 - the SCSISelect Utility 23

V

- video controller 4

W

- weight 4

X

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