xSeries 445 Remote Supervisor Adapter II-EXA

IBM

Installation Guide

xSeries 445 Remote Supervisor Adapter
II-EXA

IBM

Installation Guide

> **Note**
>
> Before using this information and the product it supports, read the safety information beginning on page v and Appendix C, "Notices," on page 71.

Contents

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.

v

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 pečítaje 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.

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	To Disconnect
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.	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-ROM 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.

Statement 10

CAUTION:
Do not place any object weighing more than 82 kg (180 lbs.) on top of rack-mounted devices.

Statement 13

DANGER

Overloading a branch circuit is potentially a fire hazard and a shock hazard under certain conditions. To avoid these hazards, ensure that your system electrical requirements do not exceed branch circuit protection requirements. Refer to the information that is provided with your IBM device for electrical specifiacations.

Statement 14

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

WARNING: Handling the cord on this product or cords associated with accessories sold with this product, will expose you to lead, a chemical known to the State of California to cause cancer, and birth defects or other reproductive harm. *Wash hands after handling.*

ADVERTENCIA: El contacto con el cable de este producto o con cables de accesorios que se venden junto con este producto, pueden exponerle al plomo, un elemento químico que en el estado de California de los Estados Unidos está considerado como un causante de cancer y de defectos congénitos, además de otros riesgos reproductivos. *Lávese las manos después de usar el producto.*

Chapter 1. Introduction

This document provides information about replacing the IBM® Remote Supervisor Adapter in the IBM xSeries® 445 server with the IBM Remote Supervisor Adapter II-EXA. Before servicing an IBM product, be sure to review "Safety" on page v.

> **Important**
> 1. This document is intended for trained servicers who are familiar with IBM xSeries products. To contact IBM for the installation of this product, see "Hardware service and support" on page 48.
> 2. All documentation for the Remote Supervisor Adapter II-EXA, including the IBM *Documentation CD*, must be left with the customer after performing the procedures described in this document.

The information in this document includes instructions about how to:
- Remove the Remote Supervisor Adapter
- Replace the I/O board
- Install and cable the Remote Supervisor Adapter II-EXA
- Download the software and firmware needed to configure the adapter

For service, assistance, or additional information, see Appendix A, "Getting help and technical assistance," on page 47.

The following documents are available on the IBM *Documentation* CD (see "Related publications" on page 3):
- *IBM Remote Supervisor Adapter II User's Guide*
- *IBM Remote Supervisor Adapter II Installation Guide*
- *Safety Information*

These documents provide assistance with tasks associated with the Remote Supervisor Adapter II, including:
- Downloading the software and firmware needed to configure the Remote Supervisor Adapter II-EXA
- Performing the configuration process
- Using the Remote Supervisor Adapter II-EXA Web interface to use the Remote Supervisor Adapter II-EXA features

Installation prerequisites

Before installing the Remote Supervisor Adapter II-EXA, perform the following tasks:

- Make sure you have an Internet connection. You will need an Internet connection during the installation process to download software and firmware from the IBM Support Web site.
- Install the operating system on your server before you install the device drivers for the Remote Supervisor Adapter II-EXA. For information about installing the operating system, see the documentation that comes with your server.

Note: The most up-to-date information about the xSeries 445 and the Remote Supervisor Adapter II-EXA can be found at http://www.ibm.com/pc/support/.

Installation requirements

This manual, which is intended for trained servicers who are familiar with IBM xSeries products, is specifically intended for the IBM xSeries 445 server only. In order to perform the procedure which removes the Remote Supervisor Adapter and installs the Remote Supervisor Adapter II-EXA, the following items are required:

- IBM Remote Supervisor Adapter II-EXA Option Kit (part no. 13N0382)
- An operating system that supports the Remote Supervisor Adapter II-EXA on the xSeries 445 server. The following operating systems support the xSeries 445 and the required device drivers for the adapter:
    - Microsoft® Windows® 2000 Server
    - Microsoft Windows 2000 Advanced Server
    - Microsoft Windows 2000 Datacenter Server
    - Microsoft Windows Server 2003 Standard Edition
    - Microsoft Windows Server 2003 Enterprise Edition
    - Microsoft Windows Server 2003 Datacenter Edition
    - Novell NetWare 6.5
    - Red Hat Enterprise Linux AS 3.0
    - VMWare ESX Server 2.0

    Note: When installing the Remote Supervisor Adapter II-EXA on a server running a Microsoft Windows Datacenter operating system, you must use the Datacenter Device Drivers CD supplied with the RSA II-EXA option kit to install the Microsoft-certified device drivers for Datacenter.

- Remote Supervisor Adapter II-EXA device drivers. To determine whether there is a supported Remote Supervisor Adapter II device driver for the xSeries 445 server running a particular operating system, go to http://www.ibm.com/pc/support/.
- The remote disk function requires the following software:
  - Server (for the server operating system to support the remote disk): Microsoft Windows 2000 with Service Pack 3 or later.
  - Client: Microsoft Windows 2000 or above and the Java™ 1.4 Plug-in or later.
- Documentation that comes with your server

The Remote Supervisor Adapter II-EXA supports the following Web browsers for remote access. The Web browser that you use must be Java-enabled and must support JavaScript™.

- Microsoft Internet Explorer version 4.0 (with Service Pack 1), or later
- Netscape Navigator version 4.72, or later (version 6.x is not supported)
- Mozilla browser version 1.3 or later

Notes:
1. Java Plug-in version 1.4 or later is required.
2. The Remote Supervisor Adapter II-EXA Web interface does not support the double-byte character set (DBCS) languages.
3. The Mozilla browser is supported in Linux for accessing only the Web interface and it does not support the remote console feature.

Related publications

This *Installation Guide*, which is intended for trained servicers who are familiar with IBM xSeries products, provides information about upgrading an IBM xSeries 445 server from the Remote Supervisor Adapter to the Remote Supervisor Adapter II-EXA, including how to access and remove the existing Remote Supervisor Adapter, how to remove the existing I/O board from its backerplate and install it on the new backerplate, and how to install the Remote Supervisor Adapter II-EXA and the components that were removed during its installation.

In addition to this *Installation Guide*, the following documentation is provided in Portable Document Format (PDF) on the IBM *Documentation* CD that comes with the Remote Supervisor Adapter II-EXA.

- *IBM Remote Supervisor Adapter II Installation Guide*

  This document provides general information about the Remote Supervisor Adapter II, including information about features and configuration.
- *IBM Remote Supervisor Adapter II User's Guide*

This document describes the features and functions of the Remote Supervisor Adapter II Web interface.

- *Safety Information*

  This document contains translated caution and danger statements. Each caution and danger statement that appears in the documentation has a number that you can use to locate the corresponding statement in your language in the *Safety Information* book.

The IBM Documentation CD

The IBM *Documentation* CD contains documentation for the Remote Supervisor Adapter II-EXA in Portable Document Format (PDF) and includes the IBM Documentation Browser to help you find information quickly.

Hardware and software requirements

The IBM *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 microprocessor
- 32 MB of RAM
- Adobe Acrobat Reader 3.0 (or later) or xpdf, which comes with Linux operating systems

  Note: Acrobat Reader software is included on the CD, and you can install it when you run the Documentation Browser.

Using the IBM Documentation Browser

Use the Documentation Browser to browse the contents of the CD, read brief descriptions of the books, and view books using Adobe Acrobat Reader or xpdf. The Documentation Browser automatically detects the regional settings in use in your system and displays the books in the language for that region (if available). If a book 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 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 **Remote Supervisor Adapter II** from the **Product** menu. The **Available Topics** list displays all the books for your adapter. Some books might be in folders. A plus sign (+) indicates each folder or book that has additional books under it. Click the plus sign to display the additional books.

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

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

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

Notices and statements used in this book

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

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.

Unpacking and verifying components

The following sections list the items and describe the components that come with the option kit for upgrading an xSeries 445 server from the Remote Supervisor Adapter to the Remote Supervisor Adapter II-EXA. The Remote Supervisor Adapter II-EXA is installed in the same peripheral component interconnect (PCI) expansion slot that contains the Remote Supervisor Adapter.

Inventory checklist

The option kit for upgrading an xSeries 445 server from a Remote Supervisor Adapter to the Remote Supervisor Adapter II-EXA contains the following items.

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

- Remote Supervisor Adapter II-EXA
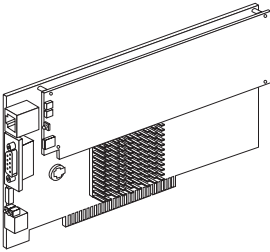
- I/O backerplate
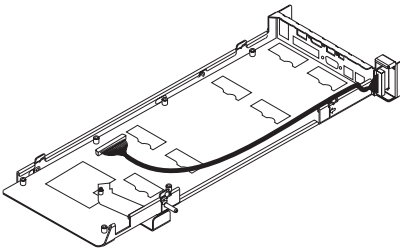
- Remote Supervisor Adapter II-EXA breakout cable with dual RS-485 connectors and two communication connectors

ASM RS-485 connector

USB connector

Management connectors

- RS-485 terminators (comes with two)

- Video port cap
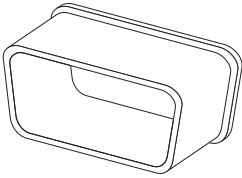
- Insulator
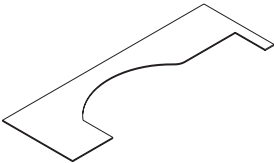
- Label palette
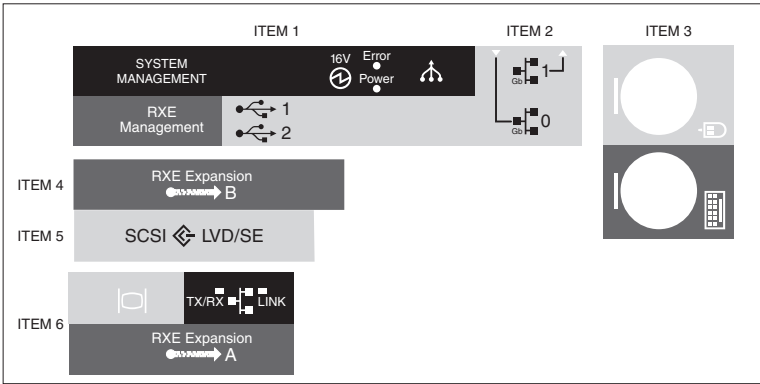
- System service label
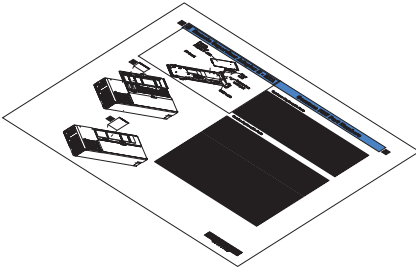
- IBM *Documentation* CD

  This CD contains the Remote Supervisor Adapter II-EXA documentation and the Documentation Browser.
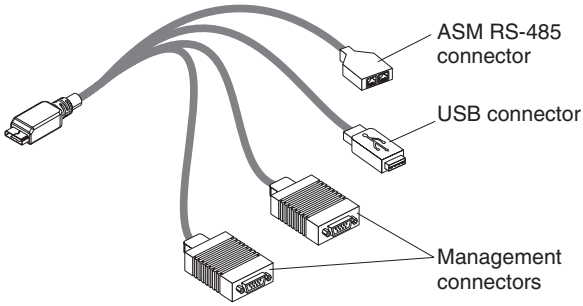
You might need the following items that are not provided with the Remote Supervisor Adapter II-EXA option package:

- Category 3 or Category 5 cable to connect the Remote Supervisor Adapter II-EXA to the LAN
- Category 3 or Category 5 cable to connect the Remote Supervisor Adapter II-EXA to an ASM interconnect network
- Serial RS-232 cable to connect a modem to the Advanced System Management (ASM) breakout cable

Remote Supervisor Adapter II-EXA components

The following illustration shows the Remote Supervisor Adapter II-EXA and the locations of the connectors and components.
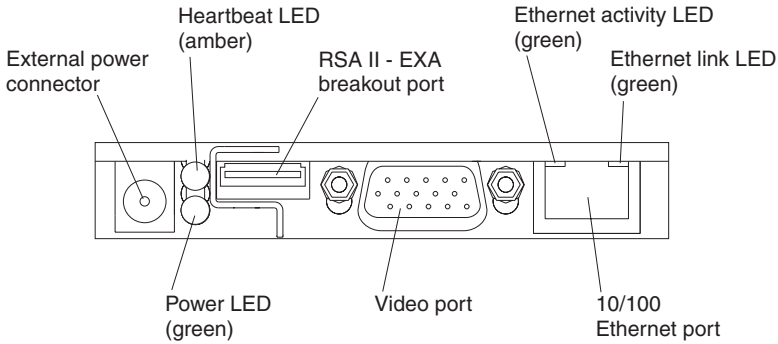
Figure 1. Remote Supervisor Adapter II-EXA connectors

- **External power connector:** This connector is used to connect the Remote Supervisor Adapter II-EXA to an external power source.
- **Heartbeat LED:** This amber LED flashes continuously to indicate that there is activity on the Remote Supervisor Adapter II-EXA.
- **RSA II-EXA breakout port:** The RSA II-EXA breakout cable is connected to this port to provide two serial (communication) ports, one USB port, and one RS-485 port with two connectors.
- **Ethernet activity LED:** When the LED is green, there is activity on the Ethernet LAN.
- **Ethernet link LED:** When the LED is green, the link is active.
- **10/100 Ethernet port:** Ethernet Signal cables are connected to the Ethernet port.
- **Video port:** Connect the signal cable for a monitor to this port.

  Important: When the Remote Supervisor Adapter II-EXA is installed in place of the Remote Supervisor Adapter, you must connect the monitor or console switch to this video port. The integrated video controller on the server is disabled for models with a Remote Supervisor Adapter II-EXA installed.

- **Power LED:** This green LED comes on and stays on when you plug in the server.

Chapter 2. Installing and cabling the Remote Supervisor Adapter II-EXA

This chapter describes how to replace the Remote Supervisor Adapter in the xSeries 445 server with the Remote Supervisor Adapter II-EXA. It also describes how to download software and firmware files from the IBM Support Web site.

Before you begin

Important: When the current Remote Supervisor Adapter is removed, all configuration information stored there will be lost, including:
- System-error log data
- Advanced PCI utility settings
- Vital Product Data
- Service processor configuration data

The Vital Product Data loss might result in warning messages the next time POST is run.

Before you begin installing the Remote Supervisor Adapter II-EXA 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 12. This information will help you work safely with your server and options.
- Before opening the server to begin the installation procedure:
  1. Turn off the server and all peripheral devices.
  2. Disconnect all external cables from the server.
  3. Disconnect the server power cords from the power source.
- Verify and complete the installation prerequisites. See "Installation prerequisites" on page 2.
- Unpack and verify the components. See "Unpacking and verifying components" on page 6.
- The current TCP/IP address for the server will be lost when the current Remote Supervisor Adapter is removed. If possible, have this information available before you begin. The default IP address for the Remote Supervisor Adapter II-EXA is 192.168.70.125.
- Back up all important data before you make changes to disk drives.
- Have available both a small flat-blade screwdriver and a Phillips screwdriver.

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- The blue color on components and labels indicates touch points, where a component can be gripped, a latch moved, and so on.

- For a list of supported options for your server, go to http://www.ibm.com/pc/compat/.

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.

- Use a static-protective mat and wrist strap when handling static-sensitive devices.

- Take additional care when handling devices during cold weather. Heating reduces indoor humidity and increases static electricity.

Major components of the xSeries 445

The basic component configuration of the xSeries 445 server are illustrated in following illustrations, which might differ slightly from the server being serviced.
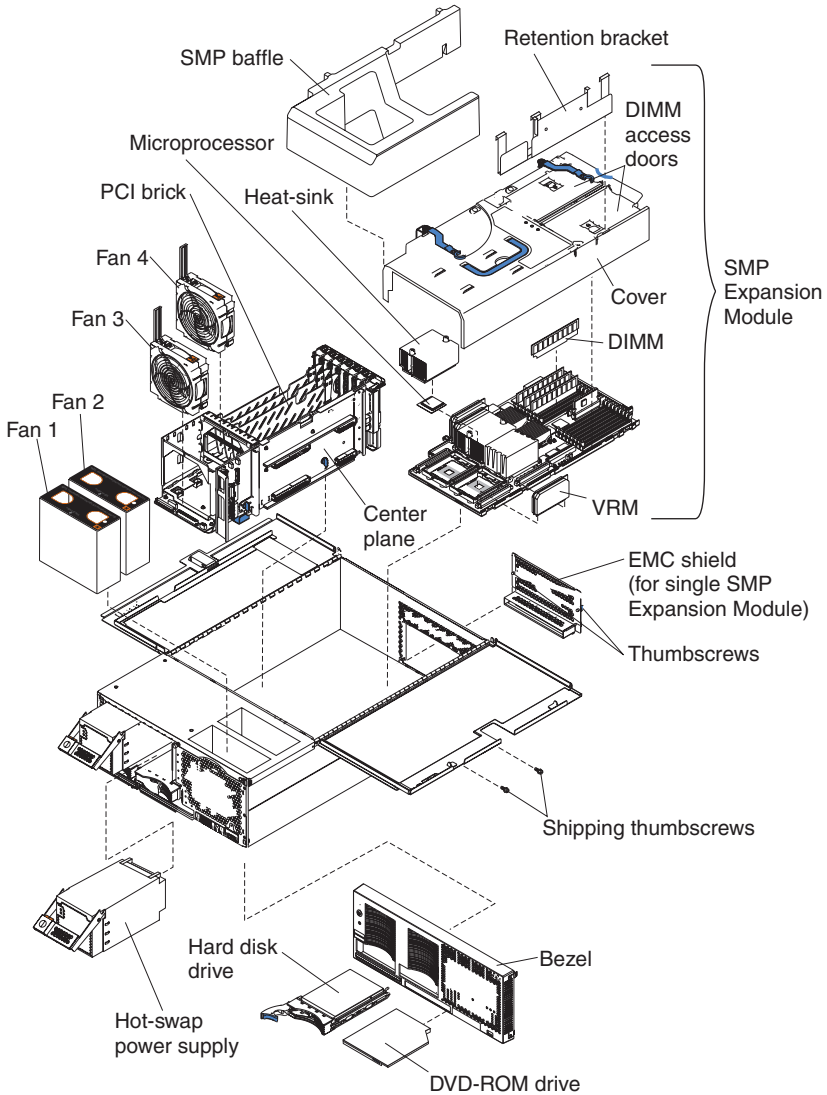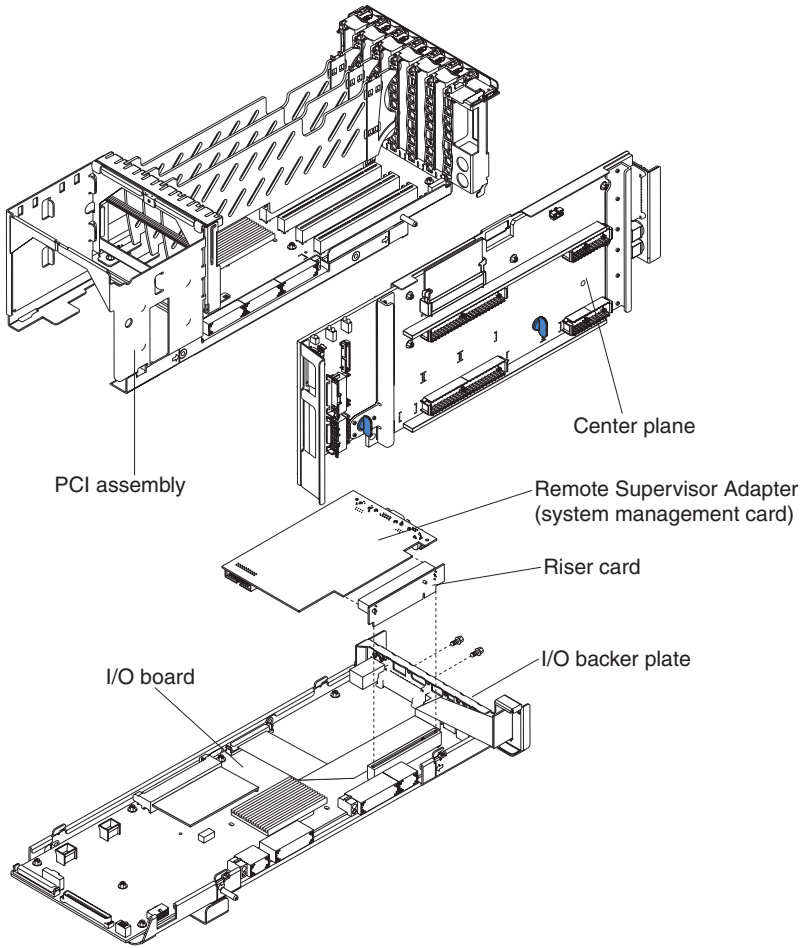

Figure 2. Major components of the xSeries 445

Figure 3. Major components of the PCI brick

Labels in figure: PCI assembly, Center plane, Remote Supervisor Adapter (system management card), Riser card, I/O board, I/O backer plate

Removing the Remote Supervisor Adapter

This section provides instructions to remove the Remote Supervisor Adapter from the xSeries 445 server, as well as the components that need to be removed in order to access the adapter.

> **Important**
>
> Before disconnecting any cables at the rear of the xSeries 445 server, make a record of where each cable is connected. This will facilitate reconnecting the cables later. Detailed cabling information for the xSeries 445 server can be found in the xSeries 445 *Hardware Maintenance Manual,* the *Installation Guide,* and the *Option Installation Guide.*

If the xSeries 445 is installed in a rack enclosure, remove it and place it on a secure work surface before performing this procedure.

The components must be removed in the order in which they appear in this section. Before performing any procedure in this section, review "Before you begin" on page 11 and the safety information beginning on page v.

Notes:

1. Before beginning the replacement procedure, flash the BIOS code on the xSeries 445 with the updated version to support the Remote Supervisor Adapter II-EXA. You can download this file from the IBM Web site at http://www.ibm.com/pc/support.

2. After performing the replacement procedure, you must update the system with the latest levels of firmware and install the Remote Supervisor Adapter II device drivers.

Complete the procedures in the sections that follow, in the order in which they are presented, to remove the Remote Supervisor Adapter from the xSeries 445 server.

Opening the top cover

This section provides information about how to open the top cover.

Complete the following steps to open the server cover:

1. Pull the release latch on the left half of the top cover to the right.
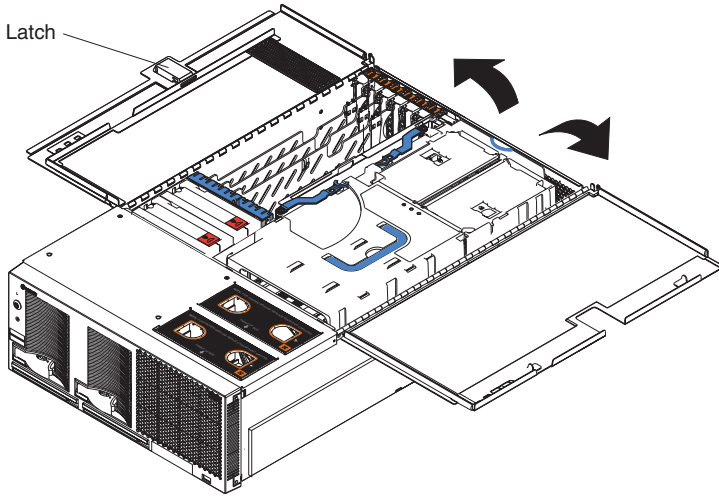
Figure 4. Opening the cover

2. Using the finger hole in the release latch, open the left half of the cover; then, open the right half of the cover.

   Attention: For proper cooling and airflow, close the cover before turning on the server. Operating the server for extended periods of time (more than 30 minutes) with the cover open might damage server components.

3. Continue with "Removing fans 3 and 4."

Removing fans 3 and 4

Attention: All failed fans must be replaced within 48 hours of failing.

As shown in Figure 5 on page 17, these two fans (fan 3 and fan 4) are located in front of the I/O board and the PCI-X slots.

Complete the following steps to remove fans 3 and 4:
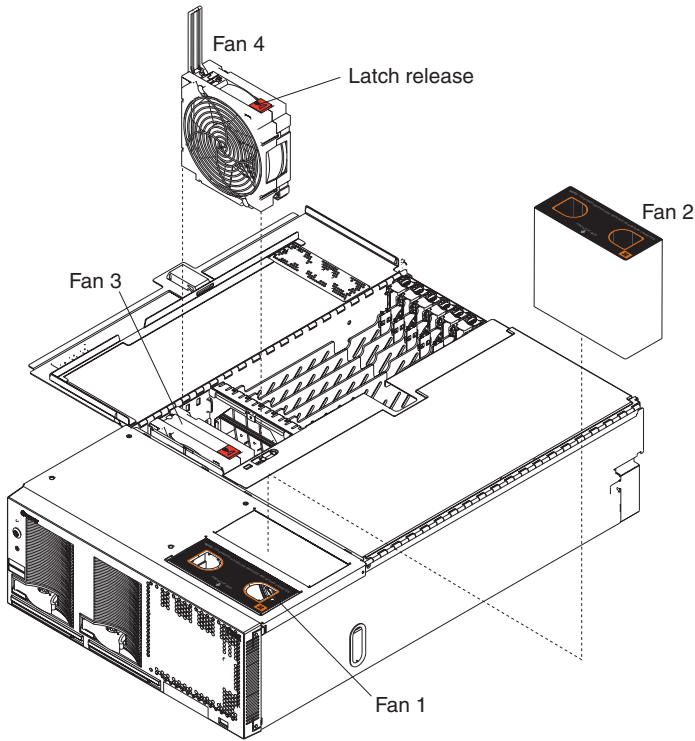
Figure 5. Fans

1. Press the latch release to the right and let the handle come up; then, grasp the handle and lift the fan out of the server.
2. Continue with "Removing adapters."

Removing adapters

Complete the following steps to remove the adapters:

1. Make a note of the slot number in which each adapter is installed so that all adapters can be reinstalled in the same location.
2. Disconnect any cables that connect the adapter to internal components.
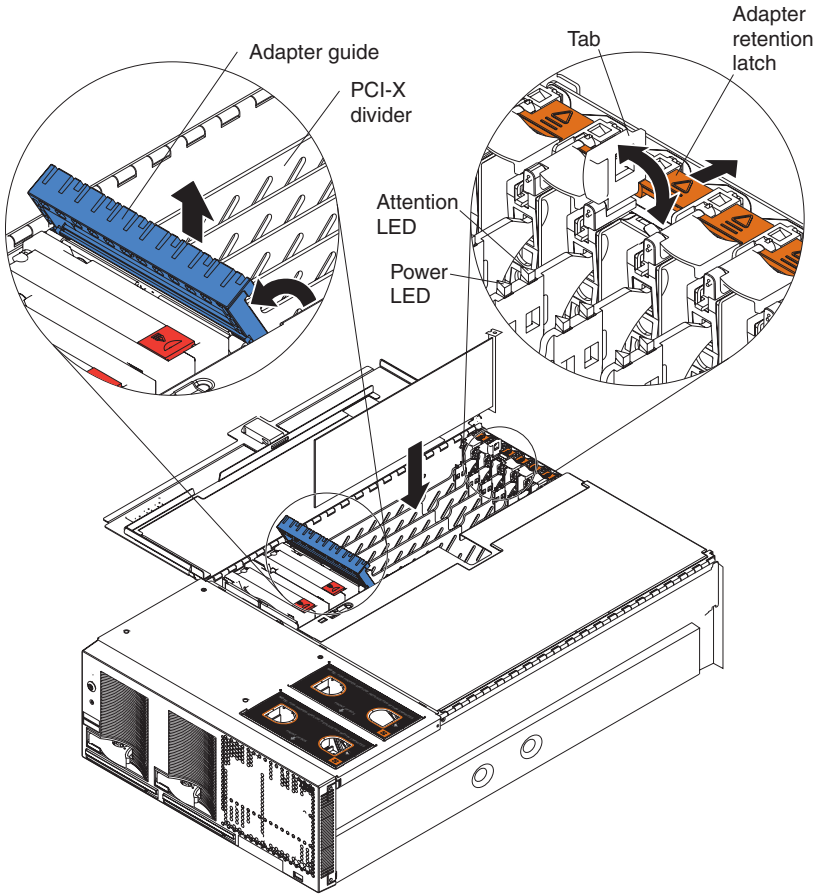
Figure 6. PCI-X slot components

3. Open the blue adapter guide by lifting the front edge.

4. Push the orange adapter retention latch toward the rear of the server and open the tab.

5. Carefully grasp the adapter by its top edge or upper corners and gently pull it out of the connector and set it on a safe, static-protective surface.

6. Continue with "Removing the SMP Expansion modules" on page 19.

Removing the SMP Expansion modules

This section provides information on how to remove the SMP Expansion modules.

Complete the following steps to remove an SMP Expansion module from the server:

1. If necessary, remove the SMP baffle.
2. Remove the retention bracket from the server:

   a. Remove the shipping thumbscrews from the right side of the server.

      Note: There are two shipping thumbscrews per retention bracket.
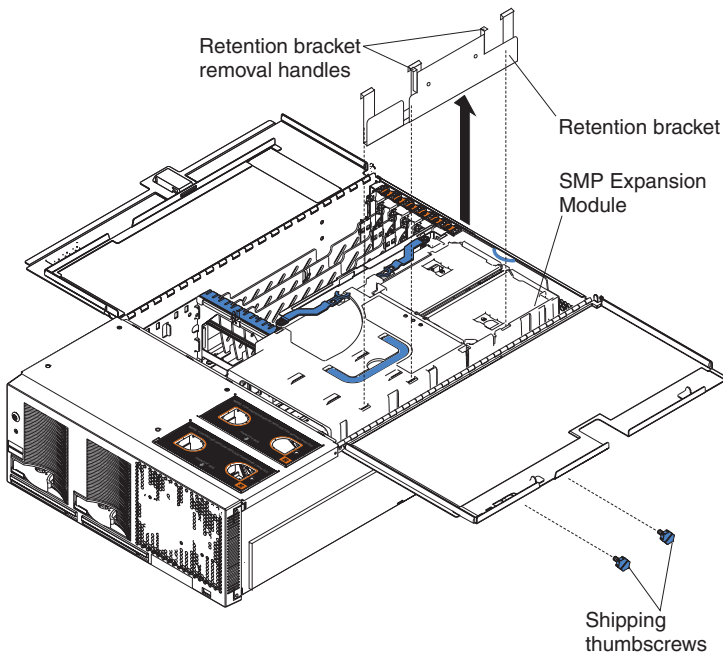
Figure 7. Removing the retention bracket and shipping thumbscrews

b. Grasp the retention bracket by the removal handles and lift it up and out of the server. Store the retention bracket or brackets in a safe place for use later.

> **Note:** If there is one SMP Expansion Module installed, you will need to remove the SMP baffle from the server; then, remove the retention bracket from the lower SMP Expansion Module as described in step 2 on page 19.

EMC shields

For use with one
SMP Module

For use with two
SMP Modules
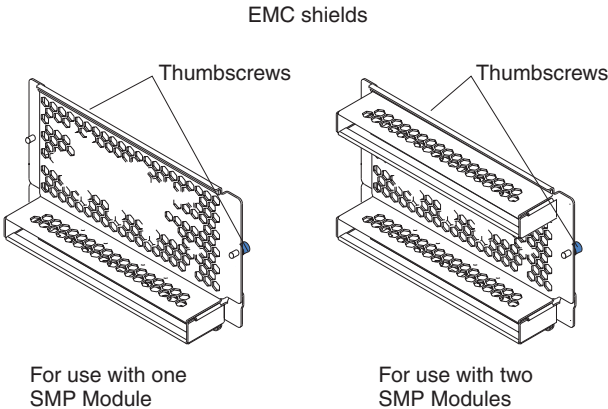
Figure 8. EMC shields

3. Loosen the blue thumbscrews securing the EMC shield; then, remove the EMC shield from the server.
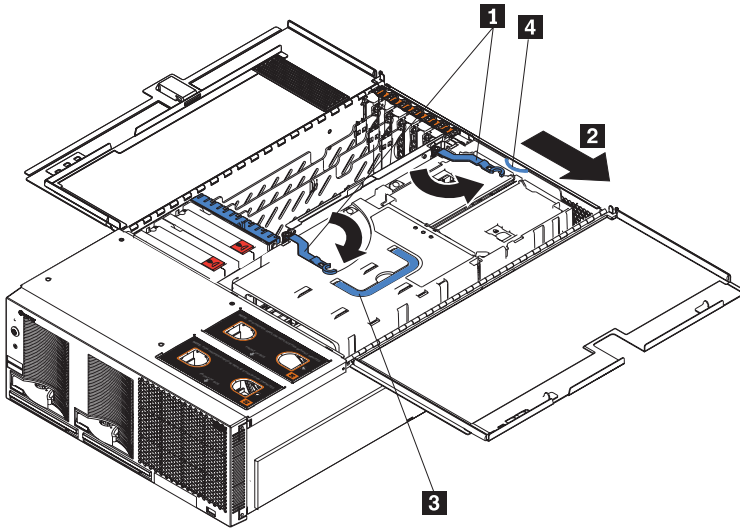
Figure 9. Rotate the locking levers to remove the SMP Expansion Module

4. Grasp each of the locking levers (**1**) on the top of the SMP Expansion Module, and lift them up slightly.

5. Working from the right side of the server, rotate the two locking levers (**1**) toward you until they are fully extended, as shown in Figure 9.

6. Slide (**2**) the SMP Expansion Module away from the center plane slightly, toward the right side of the server.

   Attention: When removing the SMP Expansion Module from the server, lift it out carefully, taking care not to damage the components on the center plane.

7. Use the handle (**3**) and the finger relief (**4**) on the SMP Expansion Module cover to carefully lift the SMP Expansion Module out of the server.

8. Continue with "Removing the PCI brick" on page 22.

Removing the PCI brick

Complete the following steps to remove the PCI brick from the server:
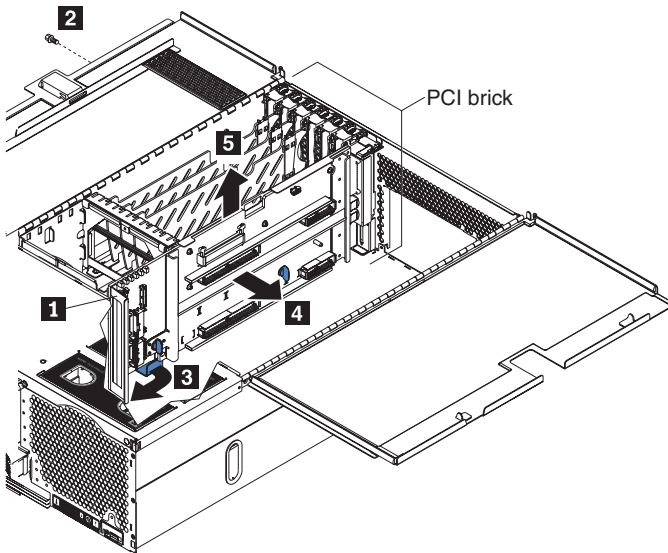
Figure 10. Removing the PCI brick

1. If the system contains a removable cable retainer (**1**), turn the thumbscrew to remove it.
2. Remove the shipping screw (**2**) from the left side of the server, if installed.
3. Disconnect all cables attached to the PCI brick, including those attached to the center plane and I/O board.
4. Disconnect the cables between the PCI brick and the DASD backplane (note that the DASD backplane itself does not have to be removed).

   Note: Failure to disconnect the DASD backplane cables might result in the PCI brick becoming entangled in these cables at step 6.
5. Push down on the release handle (**3**) and pull it forward, which causes the PCI brick to slide forward slightly.
6. Continue to slide the PCI brick as far forward as possible, and then slightly to the right (**4**).
7. Lift the PCI brick straight up and out of the server (**5**).
8. Continue with "Removing the I/O board assembly" on page 23.

Removing the I/O board assembly

If you have not already updated the BIOS to a level that will support the Remote Supervisor Adapter II-EXA, you must do so when the installation is complete.

Complete the following steps to remove the I/O board assembly from the PCI brick structure:

1. Place the PCI brick on a clean work surface.

2. If an optional serial port is installed in PCI slot one, remove the serial port:
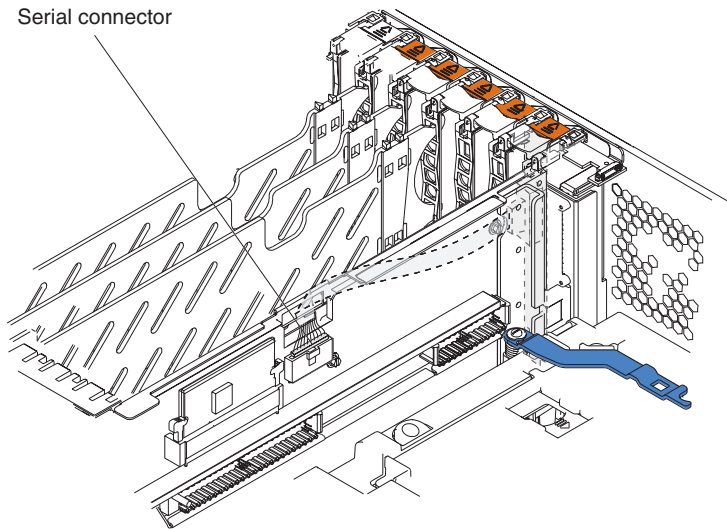
Serial connector

Figure 11. Disconnecting the optional serial port cable

> **Note:** Figure 11 is for illustration purposes only; the components are shown installed in the server.

   a. Disconnect the serial port's ribbon cable from its connector on the center plane and remove it from the slot in the center of the server.

   b. Open the adapter retention latch and tab on PCI slot one, and remove the serial port.
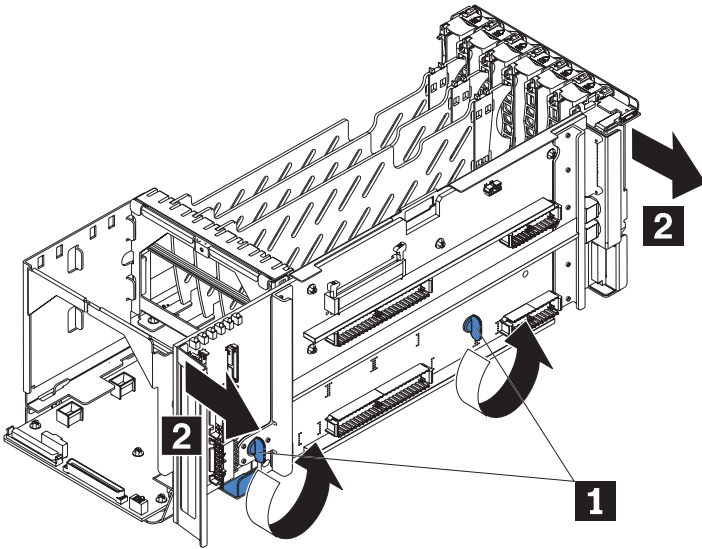
Figure 12. Removing the center plane

3. Remove the center plane by turning the two center plane thumbscrews
   (**1**) to release it.

   Note: Alternate between the thumbscrews when loosening the center plane.

4. Remove all separators in between slots 1 and 3; then, disengage the
   hot-swap PCI cable from the center plane.

5. Holding the center plane at its edges, carefully pry the center plane out of
   its socket (**2**) and set it in a safe place.
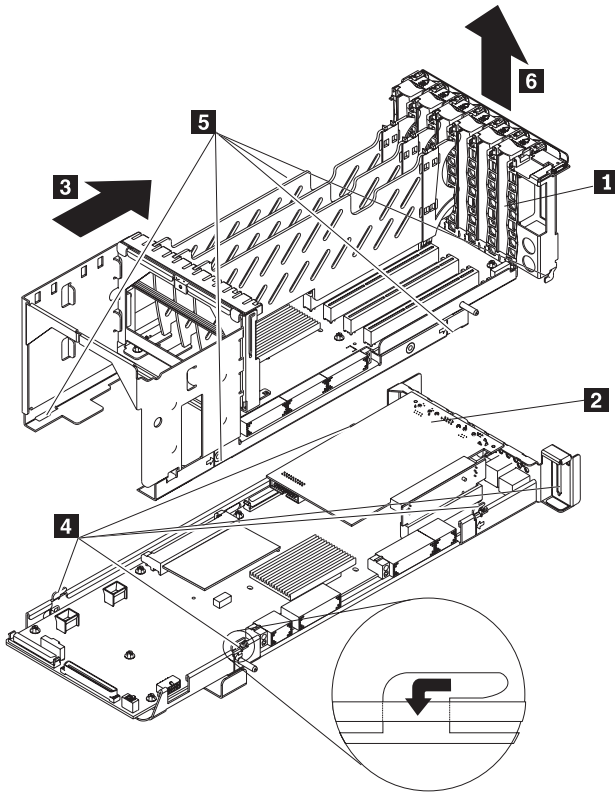
Figure 13. Removing the PCI-X assembly

6. Remove the PCI-X assembly (**1**) from the I/O board assembly (**2**):
   a. Slide (**3**) the PCI-X assembly toward the rear of the server so that the five tabs (**4**) in the I/O board assembly are released from the five notches (**5**) in the PCI-X assembly.
   b. Lift (**6**) the PCI-X assembly off of the I/O board assembly and set it in a safe place.
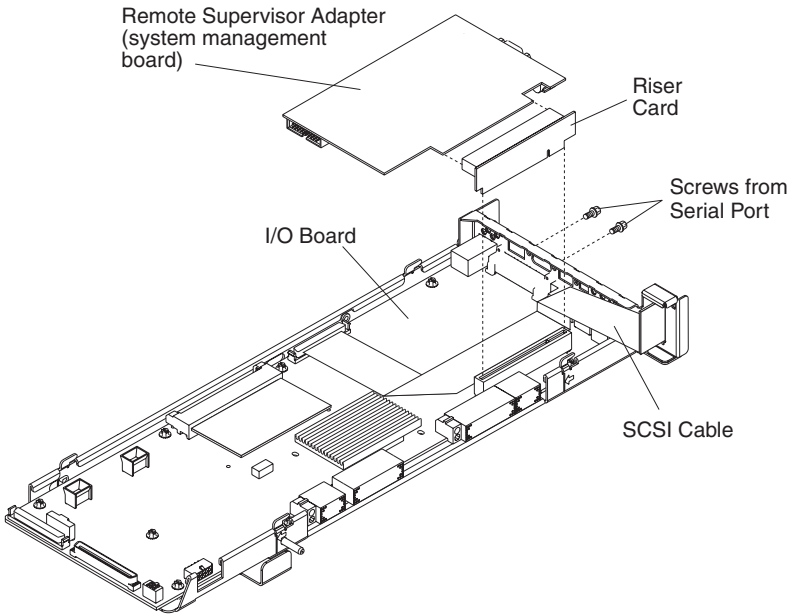
Figure 14. Removing the Remote Supervisor Adapter (system management board) from the riser card

7. Using a nut driver, remove the serial port screws that secure the serial port of the Remote Supervisor Adapter in position on the I/O backerplate.

8. Pull the system management board and the riser card out of the I/O board, disconnecting any cables, and set them in a safe place.

9. Go to "Installing the Remote Supervisor Adapter II-EXA" and continue with "Replacing the I/O board backerplate."

Installing the Remote Supervisor Adapter II-EXA

This section describes how to install the Remote Supervisor Adapter II-EXA and how to reassemble the xSeries 445 server.

Replacing the I/O board backerplate

Before the Remote Supervisor Adapter II-EXA can be installed in the xSeries 445 server, the backerplate on the I/O board assembly must be replaced with a backerplate designed for the new adapter.

Removing the I/O board from the backerplate

Complete the following steps to remove the I/O board from its backerplate:

1. Prepare the replacement backerplate to receive the I/O board:

a. Remove the replacement I/O board backerplate from its packaging and place it on a static-protective work surface.

b. Remove the shipping screw from the replacement backerplate.

Note: The hardware being serviced may differ slightly from the illustration.
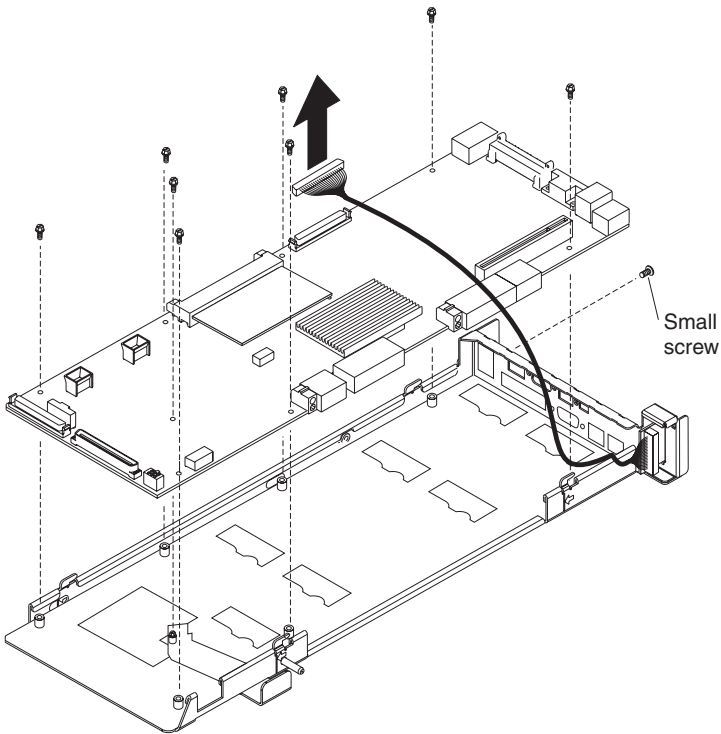
Small
screw

Figure 15. Removing the I/O board from the I/O assembly

2. Remove the eight screws that secure the I/O board to the I/O board backerplate and set them in a safe place.

3. Remove the small screw located above and to the right of RXE Expansion Port A.

4. Disengage the cable from the I/O board.

   Attention: The I/O board will resist attempts to separate it from its backerplate. Perform the procedure carefully to avoid damaging the I/O board.

5. Carefully slide and lift the I/O board off of the backerplate.

Continue with "Installing the I/O board onto the new backerplate" on page 28.

Installing the I/O board onto the new backerplate

Complete the following steps to install the I/O board on the new backerplate:

1. Position the I/O board in the correct orientation on the replacement backerplate.

2. Using the eight screws that you removed in step 2 on page 27, attach the I/O board to the replacement backerplate.

   Attention: Over-tightening the screws might result in damage to the I/O board.

3. Replace the small screw you removed in step 3 on page 27 in the same position on the new backerplate.

Continue with "Changing the I/O board FRU number."

Changing the I/O board FRU number

When the RSA-II EXA option is installed in the xSeries 445, the FRU number of the I/O board changes and the I/O board must reflect this new FRU number. It is necessary to mask the invalid FRU number on the existing label and to add a new label with the correct FRU number. Complete the following steps:
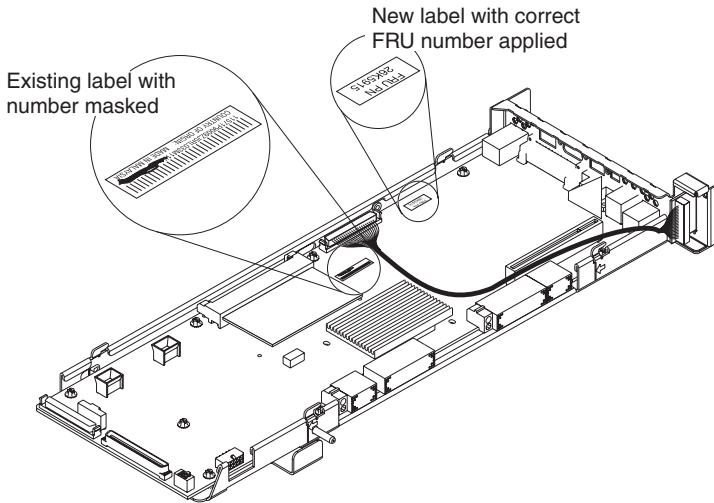
Figure 16. Updating the FRU number on the I/O board

1. Using the black magic marker from the option kit, draw a heavy line through the FRU number on the label currently on the I/O board so that the number is not readable.

2. Place the new FRU label from the option kit onto the I/O board as indicated in Figure 16.

Continue with "Reassembling and installing the PCI brick."

Reassembling and installing the PCI brick

This section describes how to reassemble the PCI brick and install it in the server.

Complete the following steps to reassemble the PCI brick and install it in the server:

1. Apply the insulator to the underside of the PCI brick:

    a. Turn the PCI brick so that the underside is facing up.

Peel away backing
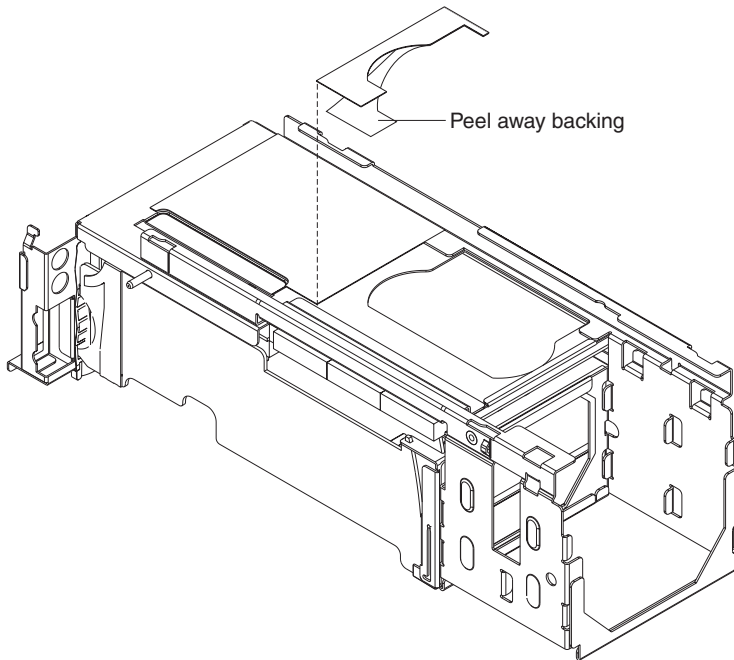
Figure 17. Installing the insulator on the PCI brick

    b. Remove the insulator (shipped with the Option Kit) from its adhesive backing and position it over the underside of the PCI brick as shown in Figure 17, placing it so that the curve in the insulator aligns with the curve in the sheet metal.

    Attention: The insulator must be installed to prevent damage to the Remote Supervisor Adapter II-EXA.

2. Reconnect to the I/O board any cables that were disconnected in step 4 on page 27, and route them so that they are out of the way.

3. Align the connector on the Remote Supervisor Adapter II-EXA with the socket in the riser card and press it firmly into place.
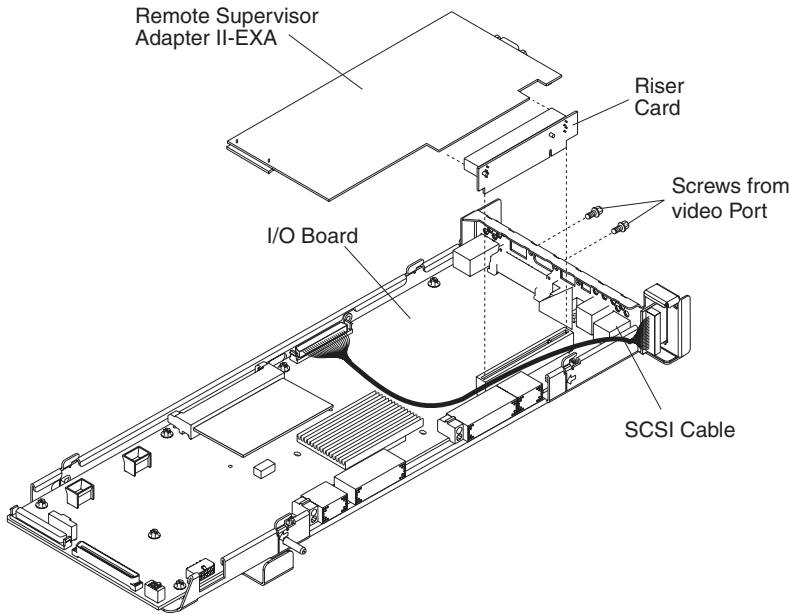
Figure 18. Installing the Remote Supervisor Adapter II-EXA

4. Attach the riser card, now holding the Remote Supervisor Adapter II-EXA, to the I/O board by inserting the riser card into its socket on the I/O board.
5. Install the screws for the video port.
6. Reassemble the PCI brick:
   a. Position the PCI-X assembly over the I/O board assembly so that the five notches are aligned with the tabs on the I/O board assembly (see Figure 13 on page 25 for reference).
   b. Insert the tabs fully into the notches so that the assembly is secure.
7. Reinstall the center plane:
   a. Position the center plane over the center plane socket on the I/O board; then, press it firmly into the socket (see Figure 12 on page 24 for reference).
   b. Turn the two center plane thumbscrews to secure the center plane.

   Attention: Tighten the screws alternately to prevent stripping of the screws.
   c. Secure the hot-swap cable so that it is routed correctly.

8. If an optional serial port was removed from PCI slot one, reinstall the serial port:

Serial connector
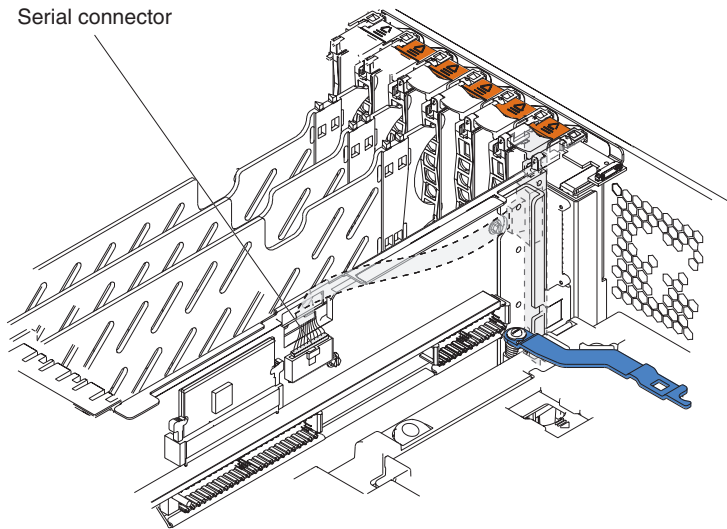
Figure 19. Reconnecting the optional serial port cable

>   **Note:** Figure 19 is for illustration purposes only; the components are shown as being still installed in the server.

   a. Open the adapter retention latch and tab on PCI slot one, and insert the serial port into the opening.

   b. Route the serial port's ribbon cable through the slot in the center of the server and connect the cable to its connector on the center plane.

   c. Close the tab and adapter retention latch on PCI slot one.

9. Install the PCI brick in the server:

   a. Align the tabs on the PCI brick with the seven slots on the bottom of the chassis and the two slots on the side of the chassis, and slide the PCI brick into place.

   >   **Note:** Make sure that the necessary cables are routed correctly in relation to the PCI brick.

   b. Pivot the release handle (see Figure 10 on page 22 for reference) so that the PCI brick slides toward the rear of the server and into place.

   c. Reconnect the cables that were disconnected when removing the PCI brick, including those of the center plane, the I/O board, and the DASD backplane.

Note: When routing the cables, make sure that they are not pinched or strained by the hardware.

   d. Reinstall the shipping screw and cable retainer, if they were removed.

   e. Continue with "Installing the SMP Expansion modules."

Installing the SMP Expansion modules

This section provides information on how to install the SMP Expansion modules.

The following notes contain information that you must consider when installing the SMP Expansion Module:

- If there are two SMP Expansion modules installed in your server, you must install the retention brackets for each of the SMP Expansion modules.
- If only one SMP Expansion module is installed in the server, you must reinstall the SMP baffle that was removed at "Removing the SMP Expansion modules" on page 19.
- If the server is going to be shipped or moved over a long distance, you must reinstall the retention brackets and shipping thumbscrews for each SMP Expansion Module.

Complete the following steps to install the SMP Expansion Module:

1. Lift the SMP Expansion Module by its handle and use the finger relief (see Figure 9 on page 21) to hold the SMP Expansion Module steady.
2. Being careful not to damage the components on the center plane, lower the SMP Expansion Module into the server.
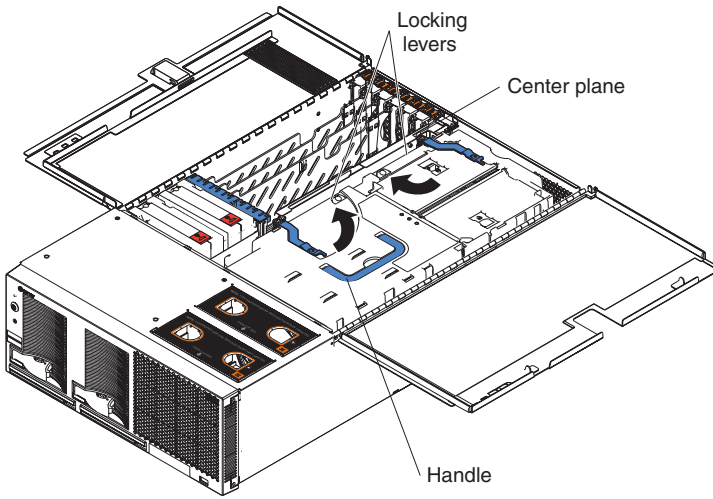
Figure 20. SMP Expansion Module locking lever position

3. Slide the SMP Expansion Module toward the center plane until it stops, making sure that the handle lies flat.
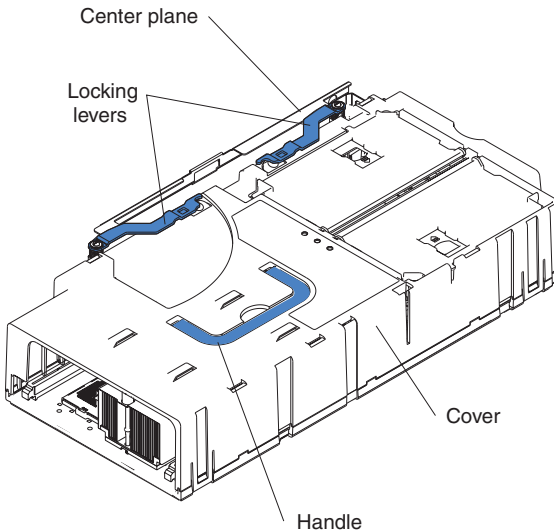
Figure 21. Locking lever position when the SMP Expansion Module is installed

4. Rotate the SMP Expansion Module locking levers forward until the SMP Expansion Module is securely fastened in place.

5. Reinstall the retention bracket for the lower SMP Expansion Module.
6. Reinstall either the upper SMP Expansion Module or the baffle.

EMC shields

Thumbscrews   Thumbscrews

For use with one
SMP Module

For use with two
SMP Modules
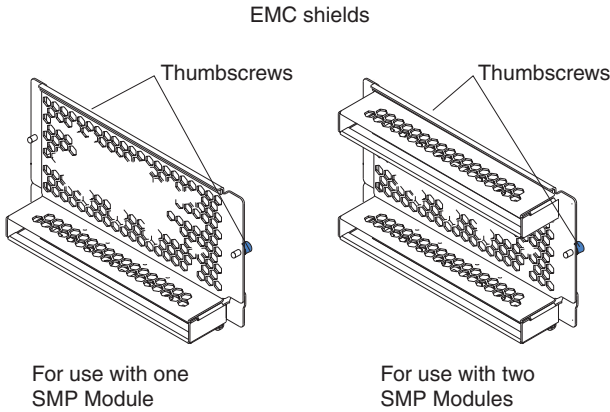
Figure 22. EMC shields

7. Install the EMC shield on the rear of the server; then, hand tighten the blue thumbscrews to secure the EMC shield.
8. If a retention bracket was removed in step 2 on page 19, reinstall it now.
9. Continue with "Installing adapters."

Installing adapters

This section provides information about installing adapters.

Complete the following steps to install the adapters:
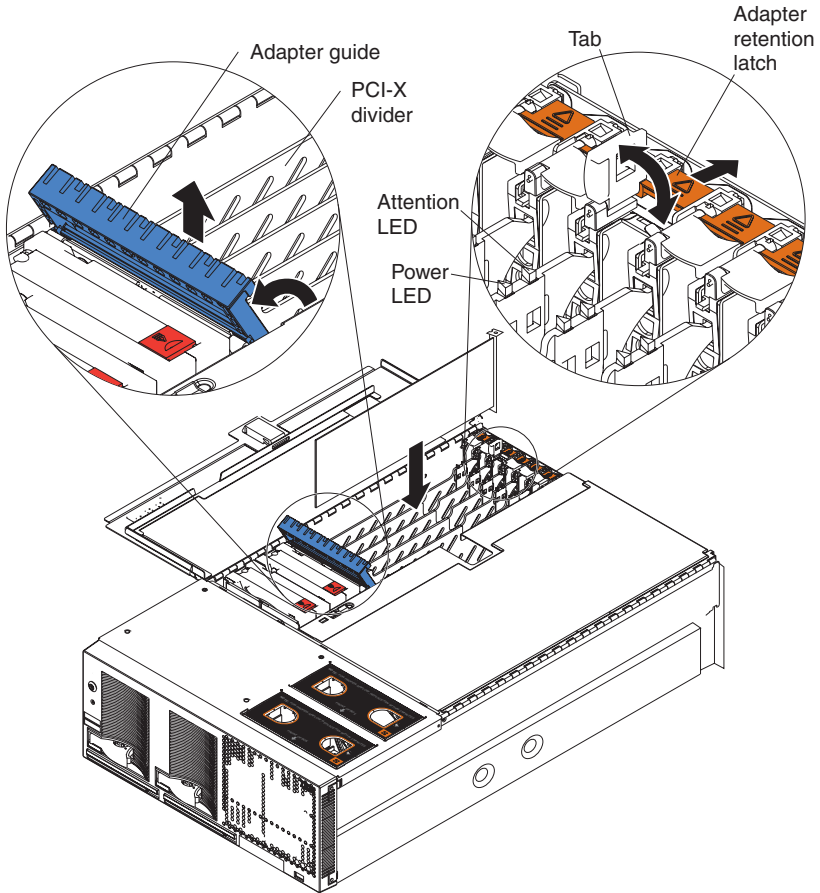
Figure 23. PCI-X slot components

1. Open the blue adapter guide by lifting the front edge.
2. Push the orange adapter retention latch toward the rear of the server and open the tab.
3. Carefully grasp the adapter by its top edge or upper corners and align it with the connector on the I/O board.

   Attention: When you install an I/O adapter, be sure the adapter is correctly seated in the connector slot. Improperly seated adapters might cause damage to the board, the riser card, or the adapter.
4. Press the adapter *firmly* into the adapter connector.
5. If they were removed, reinstall the PCI-X dividers between the Active PCI-X adapter slots.
6. Push down on the blue adapter guide to keep the adapter steady.

7. Close the tab. The orange adapter retention latch will click into place, securing the adapter.

8. Connect the internal cables to the adapter.

9. Continue with "Installing fans 3 and 4."

Installing fans 3 and 4

This section provides information on installing fans 3 and 4 (see Figure 5 on page 17 for reference).

Complete the following steps to install fans 3 and 4:

1. Press the latch release to the right and let the handle come up.
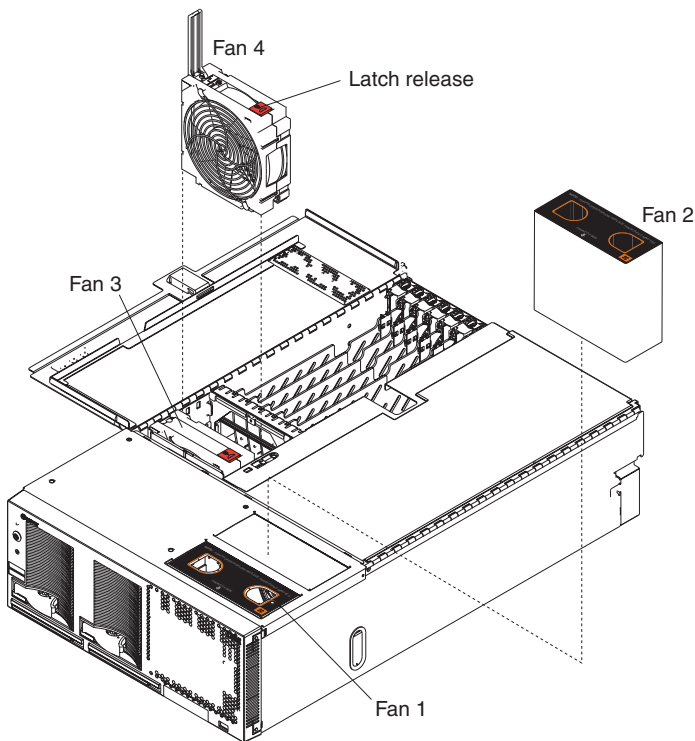
Figure 24. Fans

2. Orient the new fan so that the latch release on the top of the fan is to the right side of the server.

3. With the handle raised, push the replacement fan assembly into the server until it clicks into place.

4. Push the handle down until it clicks into place under the latch release.

5. Continue with "Closing the cover."

Closing the cover

This section provides information about how to close the top cover.

Complete the following steps to install the server cover:
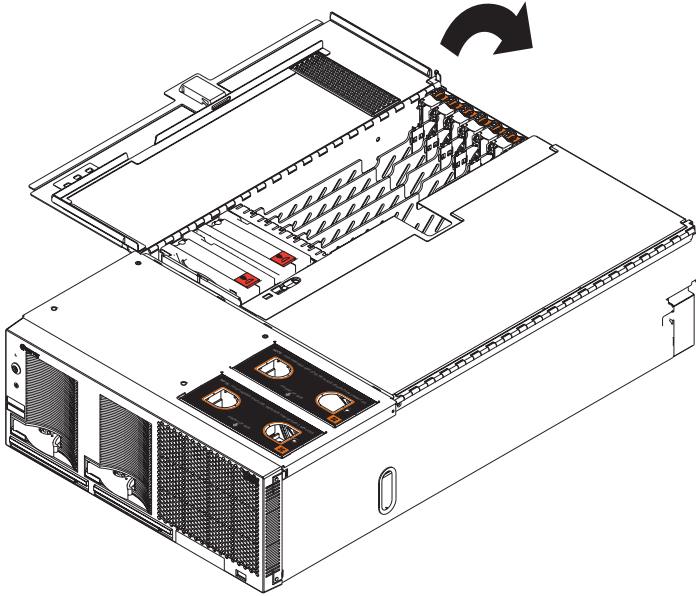
Figure 25. Closing the cover

1. Close the cover by first closing the right side; then, close the left side and press down to latch the two halves of the cover in place.
2. If the server was removed from a rack installation, return the server to the rack.
3. Reconnect all external cables and power cords to the server using the information you recorded when disconnecting the cables. Detailed cabling information for the xSeries 445 server can be found in the xSeries 445 *Hardware Maintenance Manual,* the *Installation Guide,* and the *Option Installation Guide.*
4. Continue with "Applying the labels" on page 38.

Applying the labels

This section provides information on the application of updated labels to the xSeries 445 server.
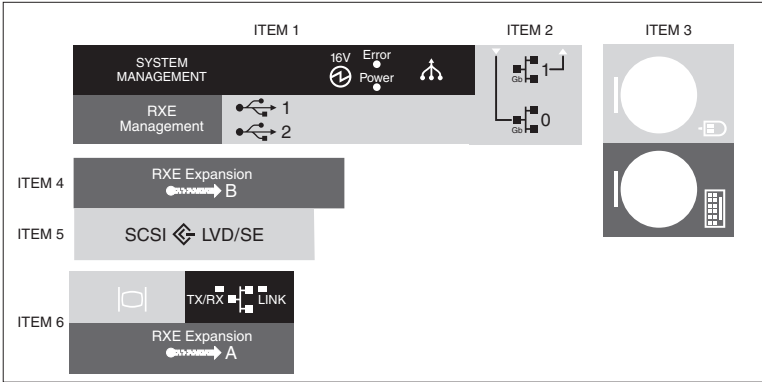
Figure 26. Label palette

- Four labels from the label palette are applied on the rear of the server.
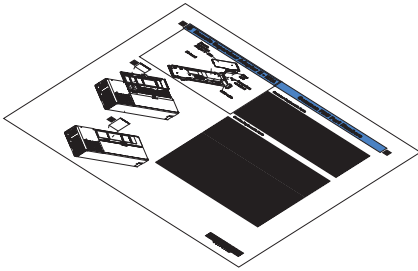
Figure 27. System service label

- One label, the system service label, is applied on the server cover, covering the existing label.

Complete the following steps to apply the labels:
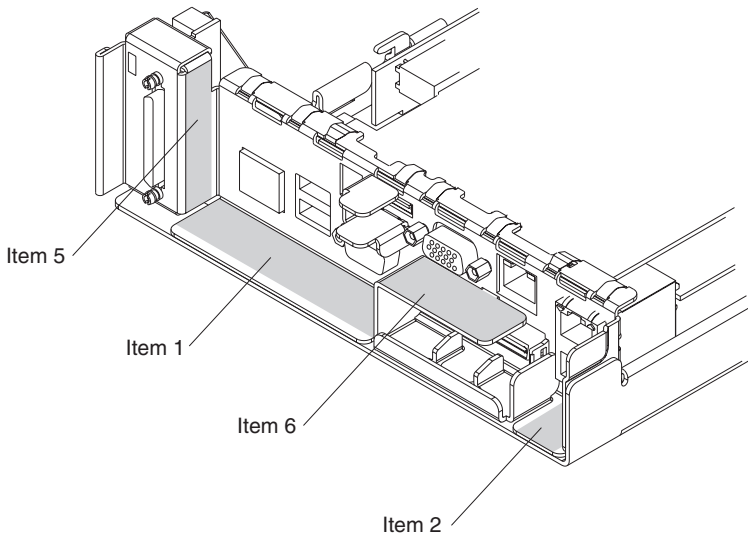
Figure 28. Applying labels to the rear of the server

1. From the label palette, remove the labels identified as Item 1, Item 2, Item 5, and Item 6, and apply them as indicated in Figure 28. Not all labels on the label palette will be needed.
2. Follow the instructions on the system service label to apply this label to the cover of the server.

Completing the installation

Complete the following tasks to cable and configure the Remote Supervisor Adapter II-EXA:

Task 1. Cable the Remote Supervisor Adapter II-EXA.

Task 2. Obtain the Remote Supervisor Adapter software and firmware.

Task 3. Complete the setup of the Remote Supervisor Adapter II-EXA.

Task 4. Return the server to the customer for configuration updates.

Note: After the adapter is initially configured, the Web-based interface can be used to create a backup copy of the configuration. If the adapter needs to be replaced in the future, the configuration can be restored and normal operation resumed more quickly. See the IBM *Remote Supervisor Adapter II User's Guide* on the IBM *Documentation* CD for details.

For service, assistance, or additional information, see Appendix A, "Getting help and technical assistance," on page 47.

Cabling the adapter

This section provides the information needed to cable the Remote Supervisor Adapter II-EXA.

The RSA II-EXA breakout cable connects the Remote Supervisor Adapter II-EXA to the ASM interconnect network, the server USB port, and an external modem.
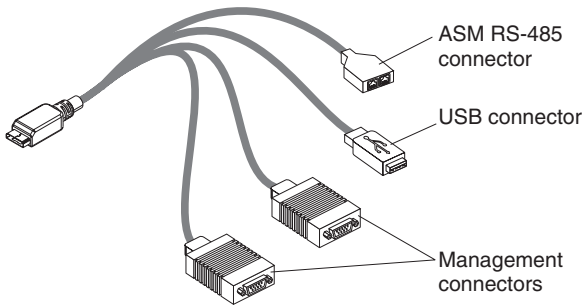
Figure 29. RSA II-EXA breakout cable

- **ASM RS-485 connector**
  To connect the Remote Supervisor Adapter II-EXA to an ASM interconnect network, connect a Category 3 or Category 5 cable to one of the ASM RS-485 connectors on the RSA II-EXA breakout cable.

  Note: You must terminate both ends of the RS-485 network. Any external-device cables that are connected here must be terminated at the end of the connected device. If no cables are connected to the RS-485 connectors, you must insert the two terminators that are supplied with this option kit.

- **USB connector**
  To connect the Remote Supervisor Adapter II-EXA to the USB port on the server for providing remote keyboard, video, and mouse control of the server, plug the USB connector on the RSA II-EXA breakout cable in to a USB port on the server.

- **Management ports**
  To connect the Remote Supervisor Adapter II-EXA to a modem, connect the modem to a management port connector on the RSA II-EXA breakout cable. Connecting a modem to the Remote Supervisor Adapter II-EXA provides dial-out support only.

Note: To employ the serial redirect function of the RSA II-EXA, a null modem cable must be installed to connect a management port on the breakout cable to the serial port of the optional serial port of the xSeries 445.

Complete the following steps to cable the adapter:
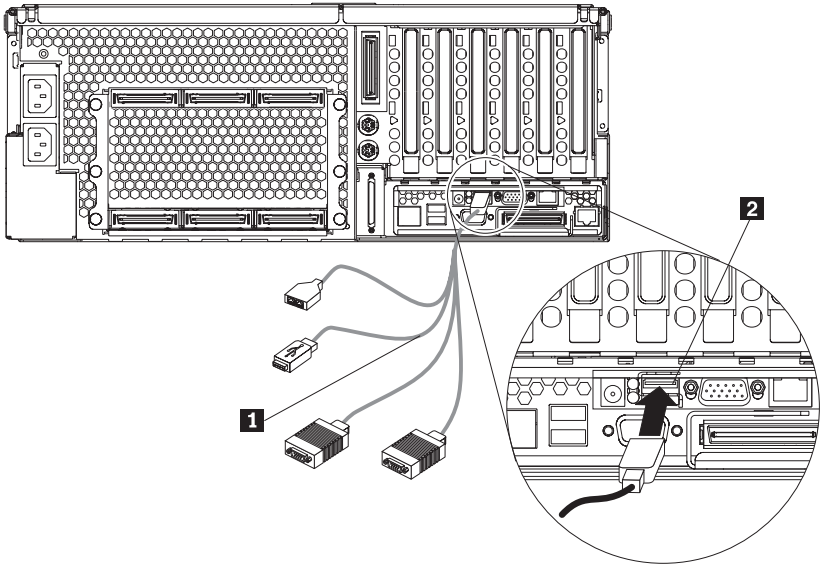
Figure 30. Connect the RSA II-EXA breakout cable to the server

1. Connect the RSA II-EXA breakout cable (**1**) to the RSA II-EXA breakout port (**2**) on the server.

   Note: The RSA II-EXA breakout cable can also be connected to the serial port on the xSeries 445 server.

2. Connect the video cable from the video device to the video port on the Remote Supervisor Adapter II-EXA.

   Note: The video port on the Remote Supervisor Adapter II-EXA will not function at this time unless the BIOS code has already been updated. If the BIOS code has not yet been updated, leave the video cable connected to the server's video port and update the BIOS code before continuing.
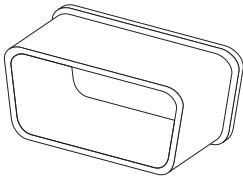
Figure 31. Video port cap

3. Install the video port cap in the video port on the xSeries 445.

Obtain the software and firmware

Complete the following steps to obtain the appropriate software and firmware:

1. Update the firmware for the service processor and diagnostics to the most current levels. Firmware updates are available from http://www.us.ibm.com/pc/support.

   Note: Flash updates for the Remote Supervisor Adapter II-EXA are available only from the web interface.

   - The default TCP/IP address is 192.168.70.125.
   - The TCP/IP address can also be configured by accessing the System Settings page of the ASM navigation pane.
   - A TCP/IP address can be assigned in the BIOS setup menus.

2. Install the device drivers for the Remote Supervisor Adapter II-EXA. The drivers can be downloaded from http://www.us.ibm.com/pc/support.

Complete the setup

Complete the following steps to complete the setup of the adapter:

1. If you did not restart the server after installing the Remote Supervisor Adapter II-EXA device drivers, restart the server now.

   Note: The first time the xSeries 445 is started after this installation is complete, a series of messages will be generated to indicate that the new card has been detected.

2. Check the Remote Supervisor Adapter II-EXA Ethernet link and activity LEDs. The location of the LEDs are shown in the following illustration.

Heartbeat LED (amber)
External power connector
RSA II - EXA breakout port
Ethernet activity LED (green)
Ethernet link LED (green)
Power LED (green)
Video port
10/100 Ethernet port
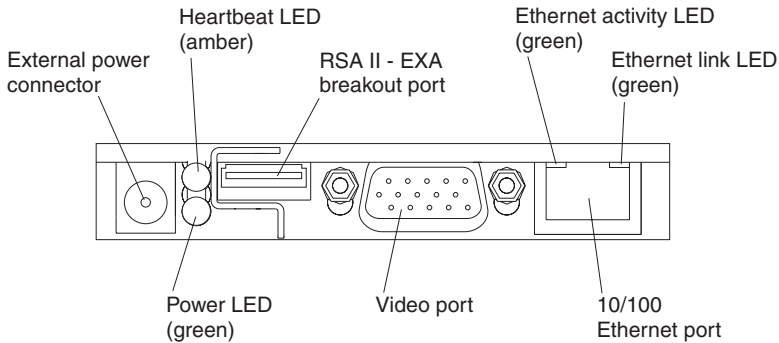
Figure 32. Remote Supervisor Adapter II-EXA connectors and LEDs

- **External power connector:** This connector is used to connect the Remote Supervisor Adapter II-EXA to an external power source.
- **Heartbeat LED:** This amber LED flashes continuously to indicate that there is activity on the Remote Supervisor Adapter II-EXA.
- **RSA II-EXA breakout port:** The RSA II-EXA breakout cable is connected to this port to provide two serial (communication) ports, one USB port, and one RS-485 port with two connectors.
- **Ethernet activity LED:** When the LED is green, there is activity on the Ethernet LAN.
- **Ethernet link LED:** When the LED is green, the link is active.
- **10/100 Ethernet port:** Ethernet Signal cables are connected to the Ethernet port.
- **Video port:** Connect the signal cable for a monitor to this port.

  Important: When the Remote Supervisor Adapter II-EXA is installed in place of the Remote Supervisor Adapter, you must connect the monitor or console switch to this video port. The integrated video controller on the server is disabled for models with a Remote Supervisor Adapter II-EXA installed.

- **Power LED:** This green LED comes on and stays on when you plug in the server.

3. Restart the server and press F1 for the Configuration/Setup Utility program, entering any necessary passwords.
4. Select **System Information**.
5. Select **Product Data**.
6. Verify the **ASM Adapter** settings:

a. If the display provides the ROM Version, ROM Date, and ROM Build Level, this indicates that the BIOS code can communicate with the adapter and the server can be returned to the customer for configuration.

b. If the display is blank where this information should appear, the BIOS code is unable to communicate with the adapter; complete the following steps for error resolution:

   1) Reflash the BIOS code.

   2) Reflash the service processor firmware.

   3) Reseat the adapter.

   4) Replace the adapter.

See the *IBM Remote Supervisor Adapter II User's Guide* on IBM *Documentation* CD for detailed instructions for completing the configuration of the Remote Supervisor Adapter II-EXA, including the following features:

- Defining the login IDs and passwords
- Selecting the events that will receive alert notification
- Monitoring remote server status using the Remote Supervisor Adapter II-EXA Web interface
- Controlling the server remotely
- Virtually attaching a remote diskette drive, CD-ROM drive, or disk image to the server

Information about setting up an ASM interconnect network is available in the IBM *Remote Supervisor Adapter II Installation Guide*.

Note

All documentation for the Remote Supervisor Adapter II-EXA, including the IBM *xSeries Documentation* CD, must be left with the customer after performing the procedures described in this document.

Chapter 3. Configuration

This chapter contains an overview of the choices available when configuring the Remote Supervisor Adapter II-EXA. For detailed information about configuring the adapter, see the *Remote Supervisor Adapter II User's Guide*, available on the IBM *Documentation* CD.

> **Note**
>
> All documentation for the Remote Supervisor Adapter II-EXA, including the IBM *xSeries Documentation* CD, must be left with the customer after performing the procedures described in this document.

Use the links under ASM Control in the navigation pane to configure the Remote Supervisor Adapter II-EXA.

- From the System Settings page, you can:
  - Set system information
  - Select the operating system to support (Windows or Linux)

    Attention:
    - For the Remote Supervisor Adapter II-EXA to function properly, the specified operating system must match the operating system of the server in which the Remote Supervisor Adapter II-EXA is installed.
    - Set this selection to Linux before attempting to install Linux device drivers.
  - Set server timeouts
  - Set ASM date and time
- From the Login Profiles page, you can:
  - Set login profiles to control access to the Remote Supervisor Adapter II-EXA
  - Configure global login settings, such as the lockout period after unsuccessful login attempts
- From the Alerts page, you can:
  - Set integrated system management processor (ISMP) alert forwarding
  - Configure remote alert recipients
  - Set the number of remote alert attempts
  - Select the delay between alerts
  - Select which alerts will be sent and how they will be forwarded
- From the Serial Port page, you can:
  - Configure the serial ports of the Remote Supervisor Adapter II-EXA

- – Configure advanced modem settings
- – Set up serial redirection
- From the Port Assignments page, you can change the port numbers of Remote Supervisor Adapter II-EXA services.
- From the Network Interfaces page, you can:
  - – Set up the Ethernet connection for the Remote Supervisor Adapter II-EXA
  - – Set up a PPP over serial port connection
- From the Network Protocols page, you can:
  - – Configure SNMP setup
  - – Configure DNS setup
  - – Configure SMTP setup
  - – Configure LDAP setup
- From the Security page, you can install and configure the secure socket layer (SSL) settings.
- From the Configuration File page, you can back up, modify, and restore the configuration of the Remote Supervisor Adapter II-EXA.
- From the Restore Defaults page, you can reset the Remote Supervisor Adapter II-EXA configuration to the factory defaults.
- From the Restart ASM page, you can restart the Remote Supervisor Adapter II-EXA.

See the *IBM Remote Supervisor Adapter II User's Guide* for detailed instructions for completing the configuration of the Remote Supervisor Adapter II, including the following features:

- Defining the login IDs and passwords
- Selecting the events that will receive alert notification
- Monitoring remote server status using the Remote Supervisor Adapter II Web interface
- Controlling the server remotely
- Virtually attaching a remote diskette drive, CD-ROM drive, or disk image to the server

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.
- 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.
- Use an IBM discussion forum on the IBM Web site to ask questions.

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.ibmlink.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.

<u>Jurisdiction</u>

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

<u>AMERICAS</u>

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").

<u>NORTH AMERICA</u>

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.

Hot 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 Remote Supervisor Adapter II-EXA

Country or Region of Purchase	Warranty Period	Type of Warranty Service*
Worldwide	Parts - 1 year Labor - 1 year	2
* See "Types of Warranty Service" 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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FlashCopy	Wake on LAN
IBM	XA-32
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Predictive Failure Analysis	

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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.

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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. 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 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

声　　明
此为 A 级产品。在生活环境中，
该产品可能会造成无线电干扰。
在这种情况下，可能需要用户对其
干扰采取切实可行的措施。

Japanese Voluntary Control Council for Interference (VCCI) statement

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